

Temporal Intelligence in Leadership:
The Conceptualisation and Evaluation of Temporal
Individual Differences among Leaders

A thesis submitted for the degree of Doctor of
Philosophy (Ph.D)

Andrew J T Doyle (2012)

Acknowledgements

In the autumn of 2006 I started my PhD research immediately following my Masters in Occupational and Organisational psychology at the University of Surrey in Guildford. It was at Guildford where I also spent my undergraduate years studying psychology. I found my time at the University of Surrey provided an excellent knowledge and skill base to begin my doctoral research. The Masters programme was highly enjoyable and led to my motivation to develop my research skills and undertake a PhD.

Since starting my PhD, I have found the University of Worcester and especially the Business School (where I spent most of my time) to characterise a very supportive and communal culture. I found the University prioritised the development of PhD students, in a number of pragmatic skills not just refined to research. I spent 3 years based within the Centre for People @ Work (CP@W) within the Business School at the University of Worcester. I very much enjoyed working within CP@W and learned a great deal from my colleagues.

My supervisory team, Mathew Jellis and Professor Roger Gill have provided feedback and guidance along my PhD studies and I wish to express my appreciation for their support over the past few years. I would very much like to thank Dr Jan Francis-Smythe my Director of Studies for all the time she has invested in supporting my PhD. In particular I would like to thank Dr Francis-Smythe for her advice, patience, keeping me on track for thesis submission and always making time to field any questions I had. While I left Worcester over 2 years ago to start full-time employment, the support I have continued to receive from my supervisory team has been most appreciated. I reflect back fondly on my time as a PhD student and the research undertaken. Subsequently I would like to thank all my colleagues and my supervisory team. I would also like to thank Robertson Cooper Ltd who provided research materials and an e-

platform for this project.

I would also like to thank all my friends and family who have supported me throughout the PhD process, providing me with encouragement at the times needed during the long writing process. In conclusion, I would also like to take time to express my gratitude to one person in particular, as I know submitting this thesis would be impossible without them, and in particular their kindness, encouragement and advice they have given to me. This person instilled a determination to achieve academically and has been truly inspirational. Even though he cannot be here today, this thesis is dedicated in memory of John William Santhouse (my grandfather).

In memory of John William Santhouse

(1921-2009)

Abstract

Time is an important research variable within an organisational setting at an individual level of analysis. For example, research has shown that the time-related behaviours of individual employees predict outcome variables such as well-being and performance (Francis-Smythe & Robertson, 2003; Slocombe & Bluedorn; 1999). There is, however, a limited understanding of the role of time in leadership, as highlighted by a number of scholars (Halbesleben, Novicevic, Harvey & Buckley, 2003; Gill, 2012). Adopting an individual level of analysis, this research aimed to identify the time-related behaviours and cognitions that leaders express to the individuals they lead (i.e. their followers) and how these vary among individual leaders. Following an individual-differences approach, a psychological construct, temporal intelligence (TI), was developed and evaluated through questionnaire research to represent the differences that occur among leaders in terms of the time-related behaviours and cognitions expressed to their followers. The results were used to draw inferences about the nature of the TI construct and to explore the implications of TI for both leadership research and practice.

A conceptual model of TI was initially developed through two literature reviews that examined over 500 articles originating from research on both time and leadership. The model proposed 13 dimensions of time. A repertory-grid interview study was conducted with 16 leaders to identify behaviours and cognitions representing the 13 dimensions of time depicted in the model. The findings from the interviews were used to develop items for the Temporal Intelligence Questionnaire (TI-Q). Two empirical studies were conducted with the TI-Q. Study 1 (n=203 leaders) used factor and reliability analysis to reduce the original 13 dimensions of time proposed by the TI model to eight dimensions, which were represented by 79 items. Results were interpreted to conclude that there are eight dimensions characterising the time-related behavioural and cognitive differences among leaders.

In study 2, 82 leaders completed the revised 79-item TI-Q, NEO PI-R personality measure and

Multi-factor Leadership Questionnaire (MLQ 5X). The MLQ 5X represented both leadership behaviour according to the Full-range Leadership Theory (FRLT) and leadership effectiveness (as self-reported by the leader). Results showed that TI represents behaviours and cognitions distinct from those measured by personality and leadership style (aligned to FRLT). Results were also shown to bridge the gap between time as a research variable at an individual level of analysis and the current conceptualisation of leadership behaviour captured by FRLT that posits the notions of transformational and transactional leadership. Results from multi-linear regression analysis showed that five of the eight dimensions of TI significantly predict self-reported leadership effectiveness, which is defined by three variables: work unit performance, subordinate effort and subordinate satisfaction. Moreover, these relationships were also demonstrated when both transformational and transactional leadership variables were entered into the regression equation. These results were interpreted to suggest that TI offers a further means for understanding how to achieve a higher level of leadership effectiveness than that accounted for by notions of transformational and transactional leadership.

Content

	Abstract	4
Chapter 1	Research Overview	11
Chapter 2	Literature Review I: Time in an Organisational Setting	16
	Historical Background	17
	The Literature Review	18
	The Literature Review Process	18
	Individual level of analysis	21
	Time Management	21
	Time Management as ‘an effective use of time’	23
	Time Management as techniques for managing time	23
	Time Management as the perceived use of time in terms of structure and purpose	27
	Time management as behaviours aiming to achieve an effective use of time while performing certain goal-directed activities	28
	Antecedents of Time Management	31
	Dispositional Characteristics	31
	Time Management Training	33
	Situational Factors	34
	Summary of Time Management	35
	Temporal Distortion	37
	Group and Team Level of analysis	40
	Team Processes under deadline conditions	41
	Organisational Level of Analysis	43
	Temporal Congruence	44
	Conclusion	46
Chapter 3	Literature Review II: Leadership Theory and Time	48
	The Literature Review	49
	The Literature Review Process	49
	Review objective I. Overview of key theories, models and approaches to the conceptualisation of leadership	50
	Leadership Styles	52
	Contingency Model of Leadership	53
	Path-Goal Theory	55
	Situational Leadership	56
	Transformational and Transactional Leadership	56
	Full Range Leadership Theory	57
	Transactional Leadership	57
	Transformational Leadership	58
	Laissez-faire Leadership	59

	Leadership versus Management	61
	Review objective II. Temporal constructs in leadership	63
	Time in Leadership Theories and Models	63
	Timescape in Leadership	63
	Timescape and Leadership Effectiveness	69
	Time and, leader, follower and leader-follower relations	71
	Entrainment in Leadership	72
	Polychronicity in leadership	76
	Pace in Leadership	78
	Temporal Depth in Leadership	79
	Time Management in Leadership	79
	Conclusion	80
Chapter 4	The Conceptual Model of Temporal Intelligence	82
	Process of developing the conceptual model of Temporal Intelligence	83
	Conceptual Model of Temporal Intelligence in Leadership	85
	Adaptive Temporal Practices	87
	Global Temporal Practices	94
	Time Dimension One: Deadlines	97
	Time Dimension Two: Pace	97
	Dimension Three: Coordination	98
	Dimension Four: Temporal Depth	99
	Dimension Five: Breaks in Workflow	99
	Dimension Six: Time Buffers	102
	Dimension Seven: Time Allocation	104
	Dimension Eight: Quality vs Speed	104
	Dimension Nine: Quality and speed	105
	Dimension Ten: Time Boundaries Between Work and Non-work	105
	Dimension Eleven: Autonomy	106
	Dimension Twelve: Timelessness	112
	Conclusion	115
Chapter 5	The Repertory Grid Interview Study	117
	The Repertory Grid Interview	119
	Personal Construct Theory	119
	The Application of the Repertory Grid Technique	120
	Research objectives and the repertory-grid interview	121
	Repertory Grid Methodology	122
	Topic	122
	Selection of Elements	123
	Elicitation of Constructs	123
	Analysis of the Grid	124
	Critical Incident Technique	125
	Pilot Repertory Grid Interviews	126
	Sample	126
	Pilot Interview 1	129

	Pilot Interview 2	130
	Pilot Interview 3	131
	Pilot Interview 4	132
	Pilot Interview 5	134
	Pilot Interview 6	134
	Main Study: Method	138
	Sample	138
	Procedure	138
	Analysis	140
	Interpretation Of The Repertory Grid Interview Data Related To The Temporal Dimensions Of The Temporal Intelligence Conceptual Model.	143
	Revised description of global temporal practices	155
	Conclusion	157
Chapter 6	Construction of the Temporal Intelligence Questionnaire	158
	Stage 1: Initial development of item pool	163
	The repertory-grid interviews	164
	The conceptual model	165
	Existing Temporal dimensions	165
	Refinement of Item Pool Based Upon Small Pilot Studies	167
	Survey Evaluation of the Temporal Intelligence Questionnaire Completed by Experts	167
	Survey evaluation and Focus Groups	168
	Evaluation of the Wording of Items	170
	Cognitive Walk-Through Interview	170
	Survey Evaluation of the Temporal Intelligence Questionnaire completed by Practicing Leaders	170
	Conclusion	174
Chapter 7	Psychometric Development of the Temporal Intelligence Questionnaire	176
	Classical Test Theory	177
	Item Response Theory	180
	Classical Test Theory versus Item Response Theory	180
	Method	183
	Sample	183
	Procedure	183
	Analysis	185
	Results	194
	Conclusion	202
Chapter 8	Development of the Temporal Intelligence Questionnaire: Study II	203
	Validity	204
	Construct validity	206
	Individual difference factor one: personality	207
	Individual difference factor two: leadership style	208
	Drawing Inferences about Individual Differences	209
	Predictive validity	210

	Method	211
	Sample	211
	Measures	211
	Procedure	215
	Data Analysis	216
	Results	218
	Descriptive Statistics of Measures	218
	Validation of the Temporal Intelligence Questionnaire	222
	Predictive Validity of the Temporal Intelligence Questionnaire	229
	Conclusion	230
Chapter 9	The Temporal Intelligence (TI) Model: Discussion	232
	Dimension one: Time personality and job role characteristics	237
	Dimension two: Pace	241
	Dimension three: Deadline orientated behaviour	242
	Dimension four: Autonomy	245
	Dimension five: Temporal stability	246
	Dimension six: Breaks in workflow	247
	Dimension seven: Time Perception	248
	Dimension eight: Temporal Depth	249
	Trait Temporal Intelligence	252
	Limitations	253
	Conclusion	257
References		259
Appendices		283
	Appendix 1. Temporal Dimensions of organizational culture	284
	Appendix 2. Repertory grid interview sample information and construct elicitation process	285
	Appendix 3 Final Repertory Grid Methodology	287
	Appendix 4. Transformational and Transactional Leadership Vignettes	289
	Appendix 5: Time Dimension Vignettes	291
	Appendix 6. Expert Evaluation of the Temporal Intelligence Questionnaire	293
	Appendix 7. Survey Evaluation of the Temporal Intelligence Questionnaire completed by a sample of final year undergraduate Psychology students.	295
	Appendix 8. Semi-Structured Interview Structure for the Temporal Intelligence Questionnaire	298
	Appendix 9: Evaluation Survey of the Temporal Intelligence Questionnaire completed by practicing leaders.	299
	Appendix 10: Key of scales and associated items used within the Temporal Intelligence Questionnaire (used in Development of the TI-Q Study I):	310
	Appendix 11: The Temporal Intelligence Questionnaire	314
	Appendix 12: Scree Plot (n=203) for Development of the Temporal Intelligence Questionnaire Study I	324
	Appendix 13: Factor Loadings	325
	Appendix 14: Syntax for Parallel Analysis.	332

Appendix 15. Revised and final version of the Temporal Intelligence Questionnaire (employed in Development of the TI-Q Study II).	334
Appendix 16. Key of dimensions of the final version of the Temporal Intelligence Questionnaire	339

1

Research Overview

Overview of the Research Process

This chapter provides a summary of the research process that was implemented to produce this thesis and subsequently presents an overview of the subsequent eight chapters. The research that is represented by these eight chapters has been developed to address one central research objective, which is to examine the time-related behaviours and cognitions that leaders express to their followers. Through presenting an overview of the eight chapters, the research process implemented to meet the aforementioned research objective will be outlined.

Chapters 2 and 3

The first stage of the research, presented in chapter 2, involved a review of the time literature to identify temporal variables relevant to organisational research. Following this review, the next stage of the research process involved reviewing the leadership literature. The review had two main goals: i) identify key theoretical developments within the leadership field and ii) identify time-related variables that were addressed in a leadership context. The two goals specified were operationalised to support the development of a conceptual model of Temporal Intelligence (TI), which is a proposed temporal individual difference factor in leaders. The literature review, conducted in chapters 2 and 3, identified a number of time-related variables that research had demonstrated to have clear implications on outcome variables such as performance, job satisfaction and well-being. This led the research to follow a theory-guided approach to ensure that the perceived valuable knowledge developed from existing temporal research was integrated to address the main research objective of this research.

Chapter 4

Drawing on the literature review presented in chapters 2 and 3, chapter 4 presents a conceptual model of the temporal individual differences occurring in leadership. This model is referred to as the model of TI in leadership. The conceptual model of TI proposes 13 dimensions of time relating to the behaviours and cognitions leaders express to their followers.

Chapter 5

Following the development of the conceptual model of TI, this chapter outlines empirical research that aims to identify specific leadership behaviours and cognitions relating to the dimensions of time outlined in the model. The empirical research involved conducting repertory grid interviews with participants currently holding leadership positions ($n = 16$). Thematic analysis was employed to align the behavioural and cognitive statements collated from the repertory grid interviews into the dimensions of time identified by the conceptual model of TI.

Chapter 6

Chapter 6 details the construction of the item pool and the structure of the Temporal Intelligence Questionnaire (TI-Q); a psychometric measure of temporal individual differences aligned to the dimensions of the TI model. Items for the TI-Q were developed through three main sources: i) existing temporal measures ii) behavioural and cognitive statements originating from the repertory grid interviews and iii) TI model (relating to behaviours not identified from sources i) and ii). In total, 220 items were developed in the first item pool of the TI-Q. Experts in the time and leadership field, practicing managers and researchers were involved to examine the face and

content validity of the TI-Q. The original item pool was subsequently reduced from 220 items to 173 items to represent the 13 time dimensions of the TI model.

Chapter 7

This chapter presents an empirical research study to investigate the psychometric properties of the TI-Q using statistical tests aligned to Classical Test Theory (CTT). The objective of this study was to examine the statistical attributes (in relation to CTT) of the 173 items to identify an underlying structure. Subsequently, based on responses subjected to statistical analyses (factor analysis, parallel analysis and reliability analysis), items that clustered into a factor indicating a group of conceptually similar items were identified. Based on 203 responses from leaders in both the private and public sector, the 173-item questionnaire reduced to 79 items representing eight factors. These factors were used to refine the structure of the TI model (i.e., into an eight dimensional structure).

Chapter 8

Chapter 8 presents an empirical research study that investigates statistical characteristics (in relation to Classical Test Theory), between, the TI-Q developed in the preceding empirical study (chapter 7) and both the NEO PI-Rand Multifactor Leadership Questionnaire (MLQ). The NEO PI-R and MLQ represent individual difference factors of personality and leadership style, respectively. Moreover these two questionnaires are arguably the most empirically supported psychometric measures of these two respective factors. Through understanding the statistical characteristics (in relation to CTT) between the TI-Q and, both the NEO PI-R and MLQ inferences can be drawn about the nature of TI as an individual difference variable. Several such inferences are discussed and linked to historic literature to develop a more detailed understanding of TI as a construct.

Chapter 9

This chapter draws on key findings from the research representative of chapters one to eight to present the final model and discussion of TI in leadership. The limitations with the research process at a macro level in terms of research approach and epistemological assumptions are deliberated in addition to more micro-level limitations associated with specific research methodologies employed in individual studies within the research process. As the key research objective of this research was to identify the time-related behaviours and cognitions expressed to followers that occur between leaders, the findings from this Doctoral thesis will be used to develop an understanding of these individual differences and outline prospective research.

Conclusion

This thesis aims to consider (empirically and theoretically) the implications of TI on outcome variables (such as performance and well-being). The primary research objective is to focus on developing a strong understanding of TI as a construct. The underlying argument is that while understanding any relationships between outcome variables and TI is important, without having a robust comprehension of an independent variable, there is little perceived value in examining its relation to an outcome variable, which is invariably a dependent variable. Subsequently, while the link between TI and outcome variables is considered, it is only a small aspect of the empirical research. Further empirical research is required into these links, which is perceived to be a longer-term research objective for future research.

In sum, this research aims to develop an understanding of differences that occur between leaders in terms of the temporal cognitions and behaviours expressed towards followers. Adopting a research focus to meet this objective has perceived value for developing our understanding of leadership and time in an organisational setting. This premise will be developed throughout the eight chapters of this thesis.

2

Literature Review I:
Time in an Organisational Setting

As outlined in chapter 1, this thesis aims to develop an account of the time-related behaviours and cognitions that occur between leaders. The first stage of this process involved deconstructing the meaning of time as a construct. This chapter examines the construct of time within an organisational setting. This account will be developed based upon a review of the time literature. The review presented in this chapter will inform the development of a conceptual model of time-related behaviours and cognitions that occur between leaders. Firstly, preceding the presentation of the literature review, insight into the contextual and historical factors that influence the way in which time as a construct is defined across disciplines will be detailed. This will be important for understanding the development of time within an organisational setting, which is addressed in the literature review.

Historical Background

The inherent properties of time have been a contentious issue across a number of disciplines. Specifically, there has been contention over whether time is an objective or subjective phenomenon that spans across multiple disciplines adopting temporal foci. This contention has become recognised as the objective-subjective dichotomy in organisational behaviour (Orlikowski & Yates, 2002). In fact, the terms of *chronos* and *kairos* in the Greek classical literature epitomise this objective-subjective dichotomy. *Chronos* refers to ‘the chronological, serial time of succession...time is measured by the chronometer not by purpose’ (Jaques, 1982; p.14). In contrast, *Kairos* refers to ‘the human and living time of intentions and goals...the time not of measurement but of human activity, of opportunity’ (Jaques, 1982; p.14-15). In physics there is a clear distinction between Isaac Newton’s absolute time and Albert Einstein’s theory of relativity. Isaac Newton asserts that ‘absolute, true, and mathematical time, in and of itself and of its own nature, without reference to anything external, flows uniformly and by another name is called duration’ (Newton, 1999; p.408). Albert Einstein's theory of relativity predicted that time does not flow at a fixed rate but is relative to its stationary counterparts. Within the social sciences, the objective-subjective

dichotomy is apparent in the distinction between clock- and event-based time. Clock-based time refers to time as being measurable, linear and with a uniform flow (Lee & Liebenau, 1999; Levine, 1997). Event-based time refers to time in events (Clark, 1985). The underlying theoretical rationale for this view is based on the notion that when time is in an event itself, the event defines time (e.g., lunchtime). Within an organisational setting, the objective-subjective divide translates so that the subjectivist position deems time as being 'defined by organizational members' (Clark, 1985; p.36) and thus being a product of social actions. While the opposing objective view on time will perceive organisational members as not being able to change time but being able to adapt to it (Orlikowski & Yates, 2002).

However, there is a view that time should not be seen as entirely paradoxical distinctions but rather as both 'a duality and dichotomy' (Adam, 1990). The term duality represents the notion of transcending the competing assumptions of two concepts so that both concepts become mutually informing and defining (Adam, 1990; Giddens, 1994). While Adam originally introduced the term of duality with reference to time in a sociological context, it is important to recognise that Halbesleben, Novicevic, Harvey and Buckley (2003), in their account of time in an organisational context, describe time as both an objective and subjective phenomenon. In further support of this view, Bluedorn (2002) stipulates that objective and subjective time 'can co-exist, interact and both become integrated in organizational processes' (p.3).

The Literature Review

The Literature Review Process

The structure and approach to the literature review developed to address a number of arising challenges facing the review process. The first stage of the review process involved the identification of literature to be included in the review through employing general keyword searches such as 'time', 'timing' and 'temporal' on a number of organisational-related journal

databases (e.g. EBSCO, JSTOR, Emerald, Business Source Complete, PsycARTICLES, IngentaConnect Complete and PsycINFO). These search terms were also entered into Google Scholar, but owing to the number of articles produced, many of which were unsuitable for the objectives of this review, keywords relating to the content reflective of the organisational domain were included in searches (such as management, business, occupational psychology, personality). From this first-stage search process, over 200 articles were reviewed; the articles that were generated, however, varied in terms of perceived relevance to the objective of the review. An iterative and more refined search process was subsequently adopted in stage two of the search for relevant articles.

Specifically, this iterative process involved defining keyword search terms through identifying keywords (relating to content) of the articles generated from stage one of the search process that were perceived to be relevant to the objectives of the review. These refined keyword search terms related to specific concepts or dimensions of time. Such terms included pace, future, past, decision-making, time personality, time management and time behaviours. The process was iterative in that from the generation of articles new keyword search terms could be continually identified. In addition to this, references presented in reviewed articles provided direction to further articles for inclusion. This search process was implemented until the search repeatedly produced very limited new articles and original content. In total, over 400 articles were reviewed, with the researcher developing narrative comments focusing on three main criteria: the key aims, methods and findings/conclusions relating to each of the articles.

Approaching the review in this way facilitated the process of identifying links between articles in terms of the content of the article and, more specifically, the way in which time is defined as a construct. This was deemed important as one of the key perceived challenges of the literature review was to distil and consolidate the time literature into an integrated account. This challenge

arose from finding that within an organisational setting, time as a construct features across multiple disciplines (e.g. psychology, management, sociology, human resources) and is a construct of multiple dimensions (e.g. pace, time perspective). A number of articles which focus on a specific dimension of the wider construct of time do not provide reference or explicit links to other temporal dimensions. As such, time as a construct was perceived to exist in the literature within 'silos'; it was therefore imperative that the review process be structured to link articles together in terms of content. Also, to facilitate the consolidation of the literature into an integrated account, the researcher developed a framework in which to structure the review. This framework is based upon recognising that time as a construct can, within an organisational setting, be analysed at three levels, which are in their very nature inextricably linked.

The organisational literature shows time to be examined at three main levels of analysis: individual, group/team and organisational. An individual level of analysis focuses on how time affects and relates to an individual. This level of analysis includes literature on temporal individual differences and behaviours (notably relating to time management). The second level of analysis focuses on time within either a group or team setting, while the third level considers temporal constructs at an organisational and cultural level. Aligned with the objectives of the review, an individual level of analysis is most relevant to developing an account of individual temporal differences. Consequently, a greater focus of the review is directed towards this end. However, both a group/team and organisational level of analysis will be included in the review for two key reasons. Firstly, it is important to note that these three levels of analysis are not mutually exclusive, and therefore consideration of all three and the links between them should be duly noted. For example, the time-related behaviours of individuals may be observed in a group/team setting to understand how individual differences can affect team/group behaviour and the temporal characteristics of that team/group. Secondly, and perhaps most importantly, temporal constructs previously discussed at a team/group or organisational level that have limited

or no previous analysis at an individual level will be reviewed in chapter 4 for potential inclusion in the conceptual model of Temporal Intelligence, which will seek to propose how these constructs are relevant at an individual level within a leadership context. The findings from the literature review will now be detailed and structured in accordance with the three levels of analysis identified.

Individual level of analysis

Comparing the three different levels of analysis, an individual level of analysis can be considered to have yielded the greatest amount of empirical research and theoretical discussion on time. A review of the literature examining time at an individual level of analysis will be presented below. The review will be structured to discuss the concept of time management and the antecedents of time management. Time management is a concept that concerns temporal behaviours and attitudes. The antecedents refer to factors that can influence the types of behaviours expressed. Antecedents of time management include dispositional characteristics and time management training (Claessens, Van Eerde & Rutte, 2007). In addition, this thesis will suggest that situational factors should be considered as a moderator for the relationship between antecedents and time management behaviours.

Time Management

There has been a considerable amount of research focused towards the notion of time management. The origins of time management can be traced to the 1950s (Mackenzie, 1954; McCay, 1959). Time management as a concept was formally introduced into an organisational context by Drucker (1966). Although time management has been a term widely used in the organisational literature, there is no general consensus on a definition of the term. However, it is proposed that the most prevalent interpretations of time management can be grouped into four

main approaches. Firstly, a number of scholars interpret the term as referring to the effective use of time (Hanel, Martin & Koop, 1990; Kotter, 1982; Orpen, 1993; Woolfolk & Woolfolk, 1986). Another approach to interpreting time management concerns the techniques used for managing time (Forsyth & Chen, 2006; Macan, 1994, 1996). Traditionally, these techniques focused on organisation (e.g. writing lists) and goal-setting (Slaven & Totterdell, 1993); however, a contemporary approach has included techniques associated with prioritising work activities (Alderman, 1995; Kaufman-Scarborough & Lindquist, 1998). The third approach to time management, also referred to as time structure, is defined by the extent to which individuals perceive their use of time to be structured and purposive (Bond & Feather, 1988; Feather & Volkmer, 1988; Strongman & Burt, 2000). The term time structure is sometimes employed rather than time management and the links between the two are not always consistently made explicit, especially in the pioneering papers associated with the development of time structure (Bond & Feather, 1988). However, reviewing the content of the concept, there seems no justification in differentiating between time structure and time management. Contemporary reviews of the time management literature also support the notion that there is no reason to warrant time structure as being conceptually distinct from time management (e.g. Claessens, Van Eerde & Rutte, 2004). The fourth interpretation of time management reflects a more modern approach that synthesises elements of other definitions of time to suggest that the concept refers to 'behaviours that aim at achieving an effective use of time while performing certain goal directed activities' (Claessens, Van Erde & Rutte, 2004; p.262).

It is also important to recognise that the approach adopted for interpreting time management will influence the theory that explains how time management works in terms of relationships to other factors. Such factors include dependent variables, and within an organisational setting these variables include job performance and job satisfaction. Understanding productivity and well-

being of individuals is important to academics and practitioners alike. It should also be acknowledged that while the most dominant accounts and empirical investigations of time management tend to revolve around these four approaches to defining time management, these are not exhaustive. For example, other interpretations of time management refer to the concept as: a self-regulation process (Eilam & Aharon, 2003; Griffiths, 2003), coping behaviour (King et al, 1996, cited in Claessens, Van Eerde & Rutte, 2004). The four main approaches to defining and studying time management will be examined in further detail below.

Time Management as ‘an effective use of time’

Orpen (1993) conducted a study examining the extent to which time management training affects time management behaviour, which is defined as the effective use of time. In Orpen’s study, fifty-six employees of a manufacturing organisation recorded their work activities in a diary over a two-week period. Half of the sample attended a three-day training course prior to making their diary recordings. The diary recordings were examined by three managers in the organisation who rated the extent to which a diary reflected an effective use of time. In addition to this, a self-report measure of time management (i.e., the effective use of time) was developed and employed by Orpen. The results from the study showed that time management effectiveness was significantly higher (both the self-report and the diary examined measures of effectiveness) for the group of individuals completing the time management training course compared to those who did not. Woolfolk and Woolfolk (1986), conducting an experimental investigation, also found time management training to increase the effectiveness of time use in academic-based activities.

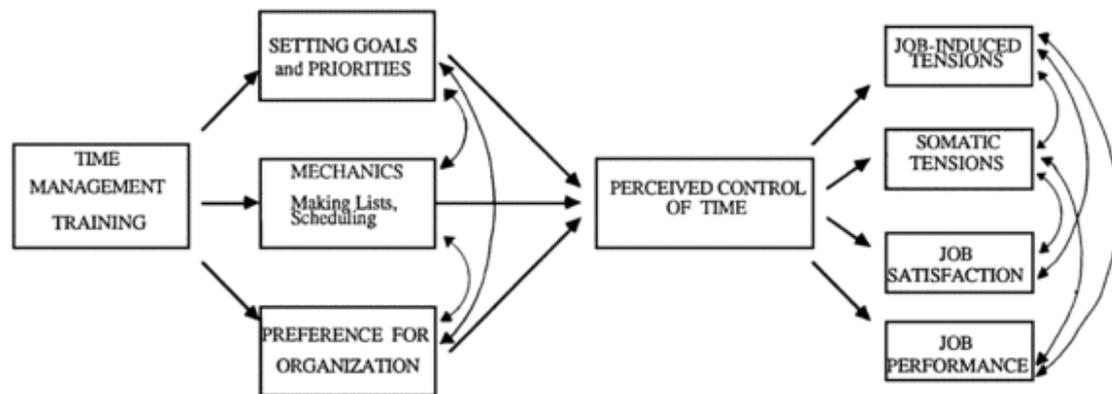
Time Management as techniques for managing time

The process model of time management proposed by Macan (1994) is one of the most influential models in the time management literature and is built around the definition of time management as techniques for managing time. The model was originally developed conceptually, drawing on

relevant research findings. However, Macan also empirically tested the model (1994; 1996).

This model is presented in Figure 2.1.

Figure 2.1 *Process model of time management (Macan, 1994, p384)*



As can be seen above, Macan states that time management training leads to time management behaviours. Specifically, Macan proposes three behavioural variables that have been designed to reflect the factors Macan, Shahani, Dipboye and Phillips (1990; cited in Macan, 1994, p379) identified through factor analysis of self-report questionnaire data designed to measure time-related behaviours. The three variables are i) the setting of goals and priorities ii) the mechanics of time management and iii) a preference for organisation. Macan's process model proposes that time management training leads to an increased frequency in behaviours associated with each of these three factors. In turn, Macan proposes that these behaviours will lead to a greater perception of having control over time (i.e., it is perception that is key). This relationship is suggested to be linear in that increased behaviours relating to these three factors (such as writing lists, scheduling and organising) is deemed to lead to a greater 'perception that one has control over one's time' (Macan, 1994, p.381). In turn, Macan posits that a greater sense of control over time was directly linked to the following outcomes: job-induced tensions, somatic tensions, job satisfaction and job performance. The notion that Macan expresses in her process model is that time management behaviours do not directly lead to an increase in performance and well-being outcome variables.

In fact, this notion was contrary to the assertion held at the time that:

‘Time management means less stress for individuals, which means more efficient, satisfied, healthy employees, which in turn means more effective organizations’ (Schuler, 1979, cited in Macan, 1994, p.382).

Thus, Macan distinguishes between time management behaviours and outcomes, whether it be performance, well-being or effectiveness. The key distinction between this approach to time management, defined by techniques for managing time, and Schuler’s is that the latter defines time management by directly associating behaviour with outcome (i.e., the effective use of time).

In the process model of time management (Macan, 1994) it is the perceived control over time that acts as a mediator between time management behaviours and job-related outcome variables. Macan’s proposition was supported by empirical research examining the effects of different levels of personal control on performance (Bazerman, 1982), job satisfaction (Greenberger, Strasser, Cummings & Dunham, 1989; Spector, 1986) and stress (Spector, 1986).

While the above outlines the process model of time management that was originally conceptually developed, the model itself was subjected to empirical analysis by Macan (1994) in two studies. In the first, the following variables representing the process model of time management were measured: i) time management training, indicated by attendance of a time management course, ii) time management behaviours measured by participants (n=353) self-reporting their 33-item Time Management Behaviour (TMB) scale (Macan, 1990), iii) perceived control over time, measured by a 5-item questionnaire devised by Macan (1990), iv) job satisfaction measured by 3 items in the General Job Satisfaction scale from the Job Diagnostic Survey (Hackman & Oldham, 1975) and v) job performance measured by supervisor ratings of participants. The process model was partially supported in this first study. Time management training shared a significant relationship

between the time management factor of setting goals and priorities ($r = .13, p < .05$), but no significant relationships were detected with the remaining two time management factors of preference for organisation and mechanics of time management. The second study Macan conducted investigated the convergence between self and other (defined as either supervisor, co-worker or friend/relative) for time management behaviours reported using the TMB scale. The correlations detected were found to be consistent with further studies at the time investigating the convergence between self- and other report ratings across different behaviours (Landy et al., 1991 and King et al., 1980; both cited in Macan, 1994, p382).

Although Macan's model was not fully supported, the structure of the model in terms of antecedents, mediators and outcome variables was supported. The key finding that was arguably the most influential in terms of the development of time management theory was that perceived control over time was significantly related to job-induced tensions, somatic tensions and job satisfaction. This led to a number of studies examining the role of perceived control over time with time management behaviours and job-related outcomes (Adams & Jex, 1999; Claessens, Van Eerde, Rutte & Roe, 2004; Davis, 2000; Jex & Elacqua, 1999). Adams and Jex (1999) found that perceived control over time partially mediated the relationships between all three time management factors (goal setting and prioritising, preference for organisation, and mechanics of time management) and both health and job satisfaction. Jex and Elacqua (1999) found that perceived control over time partially mediated the relationship between two time management factors (goal setting and prioritising, and preference for organisation) and job strain. Davis (2000) found that perceived control over time acted as a mediator between the time management factor of preference for organisation and job-related tension, somatic tension and job satisfaction.

Claessens, Van Eerde, Rutte and Roe (2004) investigated the role of perceived control over time in the time management behaviour of planning and outcome variables (work strain, job satisfaction and performance). The time management behaviour of planning was measured by the

TMB scale and one item from the Time Management Questionnaire (Britton & Tesser, 1991). Planning was interpreted to be 'roughly equivalent in meaning' (Claessens, Van Eerde, Rutte & Roe, 2004) to goal setting and prioritising (Macan, 1990) and also short-range planning (Britton & Tesser, 1991). Thus, Claessens et al. (2004) in their study aimed to test a part of Macan's model (i.e., goal setting and prioritising in Macan's model). Claessens et al. tested two models. The first only consisted of planning, perceived control over time and three outcome variables (work strain, job satisfaction and job performance). The second model was an extended version of Macan's model as it included not only planning behaviour but also workload and job autonomy that were variables from Karasek's (1998) Job Demand-Control model. Perceived control over time and the same three outcome variables as used in the first model were observed. Following Structural Equation Modelling (SEM) and using fit indices, Claessens et al. found that the extended mediation model which included aspects of the Job Demand-Control model (Karasek, 1998) produced a superior fit to the original model (model one). Model two demonstrated perceived control over time partially mediated the relationship between planning behaviour, workload and job autonomy, and the three outcome variables (work strain, job satisfaction and job performance). Planning behaviour was also found to significantly predict job performance (i.e., directly). However, as Macan's full model of time management was not tested it is difficult to infer that the extended mediation model is superior to Macan's (1990). Claessens et al.'s finding that time management behaviours directly or indirectly predict job performance is supported by recent research by Nonnis, Fenner and Sager (2011). A number of researchers have also found a link between job performance and academic performance (Britton & Tesser, 1991; Trueman & Hartley, 1996).

Time Management as the perceived use of time in terms of structure and purpose

This concept of time structure stems from research identifying a significant difference between employed and unemployed groups on the dimension of time structure (Feather & Bond, 1988).

Time structure was defined as ‘the degree to which individuals perceive their use of time to be structured and purposive’ (Bond & Feather, 1988; p.321). Bond and Feather (1988) developed a questionnaire of time structure (Time Structure Questionnaire; TSQ) to measure the perceived use of time in regard to structure and purpose. Through factor analysis the authors argued that five factors reflect the Time Structure concept: Sense of Purpose, Structured Routine, Present Orientation, Effective Organisation and Persistence. The TSQ has been used in a number of studies that aim to measure time management/time structure behaviour (Burt & Kemp, 1994; Francis-Smythe & Robertson, 1999; Kaufman-Scarborough & Lindquist, 1999; Kelly, 2002; Strongman & Burt, 2000). This approach to interpreting time has a fundamental similarity to the approach that is characterised by the effective use of time in that, although to a lesser extent, this approach does not differentiate between effectiveness as an outcome and behaviour as illustrated by the TSQ factor of Effective Organisation. However, a difference that this approach holds to the above two approaches is that it is explicitly concerned with the intent of the behaviour in terms of purposefulness, not just the behaviour per se (i.e., the techniques for managing time) or an outcome (i.e., the effective use of time).

Time management as behaviours aiming to achieve an effective use of time while performing certain goal-directed activities

Claessens, Van Eerde and Rutte (2007) reviewed empirical studies investigating time management between 1954 and 2005. Two criteria were employed in the literature review. Firstly the studies had to be in an academic or work context and secondly time management behaviours or cognitions had to be measured by instruments designed specifically for this purpose. Thirty-five studies met both criteria. From this review, time management was defined as ‘behaviours that aim at achieving an effective use of time while performing certain goal-directed activities’ (p.262). Thus, this interpretation identifies that behaviours are focused towards achieving a goal-

directed activity, which implicitly suggests an effective use of time. This definition can therefore be viewed as integrating all the above three traditional approaches, as the definition consists of behaviours, purposeful intent (i.e., aiming to achieve a goal) and effectiveness (implicit in the nature of a goal itself).

Claessens et al. specifically identify three sets of behaviours in their theory of time management: time assessment, planning and monitoring behaviours. Time assessment behaviours were described by Claessens, Van Eerde and Rutte (2004) as behaviours that aim: 'at awareness of here and now or past, present and future (Kaufman et al., 1991) and self-awareness of one's time use (attitudes, cognitions e.g. Wratcher and Jones, 1988), which help to accept tasks and responsibilities that fit within the limit of one's capabilities' (p.262).

Planning behaviours were considered to include a range of actions such as goal setting, prioritising and writing lists that aim at the effective use of time. Finally, monitoring behaviours were defined as behaviours that: 'aim at observing one's use of time while performing activities, generating a feedback loop that allows a limit to the influence of interruptions by others (e.g. Fox and Dwyer, 1996; Zijlstra et al., 1999).' (p.263)

Claessens, Rutte and Van Eerde (2009) conducted an empirical investigation aiming to further extend and examine the extended mediation model from their earlier study (Claessens, Van Eerde, Rutte & Roe, 2004), which is detailed previously. Claessens et al (2009) extend the model by introducing task assessment and monitoring behaviours to be in line with their revised definition of time management proposed in 2007 (Claessens et al., 2007). In line with Tropolli (1998),

Claessens et al. distinguish between three types of planning behaviours: anchored planning, priority focus and contingency planning. A questionnaire was developed by Claessens et al. in order to measure the three types of planning and also time-assessment and time-monitoring variables. Anchored planning was defined as ‘the cognitive process of the breakdown of goals into subgoals, actions to take, and time frames’ (Claessens et al., 2009; p.4). Priority focus was defined as ‘the work strategy characterized by a broad integrated focus on one’s work priorities – both while developing cognitive plans and when action is required’ (Claessens et al., 2009; p.5). Contingency planning was defined as ‘the anticipation of potential obstacles and the consideration of alternative plans’ (Claessens et al., 2009; p.6). There were four outcome variables measured: self-reported job performance, peer- and superior-reported job performance, job satisfaction and work strain. The results showed that task assessment directly predicted work strain and job performance. Time monitoring was not significantly related to performance or well-being variables (directly or indirectly). Contingency planning significantly predicted self-rated job performance. Perceived control over time mediated the relationships between the planning variables of priority focus and anchored planning and all four performance and well-being variables.

In sum, Claessen et al.’s (2009) study is important in terms of developing our understanding of time management, as the findings strongly suggest it is important to distinguish between different types of planning behaviour. Moreover the strength of the correlations between variables suggests that planning variables have the greatest effect on performance and well-being variables compared to task assessment and time monitoring behaviours. The results also suggest that time management behaviours are linked to job performance. Although, as reported above, previous studies have been inconsistent in detecting a significant relationship between these two variables (direct or indirect), it should also be acknowledged that previous studies have not employed an operational definition of time management as Claessens et al. (2007, 2009) have. Moreover, the distinction between three types of planning behaviours may also provide a further explanation to the finding. In fact, Tropoli’s (1998) findings partially supported the notion that the three different types of planning

predict performance. However, perceived control over time was not measured in Tropoli's study, which may explain why planning did not predict performance to the extent to which Claessens et al.'s study demonstrated.

Antecedents of Time Management

Dispositional Characteristics

A number of studies have found evidence that dispositional characteristics act as antecedents to time management behaviour. Francis-Smythe and Robertson (1999), reviewing the literature, identified temporal constructs relating to an individual's temporal preference and attitudes. This arguably represents one of the most comprehensive reviews conducted on time at an individual level of analysis to date. Seventeen temporal concepts represented by psychometric measures were identified in their literature review (see Table 2.1).

Table 2.1

Measures included in the development of the Time Personality Inventory (Francis-Smythe & Robertson, 1999, p275)

Measure	Author(s)
Time Span Capacity	Goodman (1967)
Time Attitudes	Calabresi & Cohen (1968)
Temporal Experience	Wessman (1973)
Time Perspectives	Gonzalez & Zimbardo (1985)
Time Structure Questionnaire	Bond & Feather (1988)
Future Perspective Scale	Jordan & Bird (1989)
Time Styles	Usunier & Valette-Florence (1994)
Procrastination	Lay (1986)
Time Order and People	Labinah Management Training Ltd (1988)
Time Management Behaviour Scale	Macan et al. (1990)
Time Urgency	Landy, Rastegary, Thayer & Colvin (1991)
Time Behaviours	Woodwilla (1993)
Time Urgency	Conte, Landy & Mathieu (1995)
TUPA Scale	Wright, McCurdy & Rogoll (1992)
Quality of Work	Beehr, Walsh & Taber (1976)
Polychronic Attitude Index	Kaufman, Lane & Lindquist (1991)
Temporal Culture	Schriber & Gutek (1987)

The purpose of Francis-Smythe and Robertson’s literature review (1999) was to inform the development of their time personality construct. They defined time personality as referring to self-referencing thoughts, behaviours and attitudes towards time. Specifically, the temporal dimensions identified in the review were represented in a model of time personality that was developed through the use of a psychometric measure called the Time Personality Indicator (TPI). The researchers developed an item pool using items from the seventeen temporal measures outlined above and their own items. All items were reworded or developed to reflect preferences rather than the actual execution of a particular behaviour. This is consistent with the notion of personality that relates to a set of preferences rather than the behaviours themselves. Following factor and item analysis of the TPI, a five-factor solution was retained for time personality. The five dimensions are presented in Table 2.2 along with definitions. Francis-Smythe (2006) propose that time management is ‘the behavioural manifestation of Time Personality, which in itself is the result of interaction between inherent predisposition and environmental influence’ (p.1).

Table 2.2

Structure of Time Personality

Dimension	Description
<i>Time Awareness</i>	Awareness of how time is spent
<i>Punctuality</i>	Attitudes towards ‘being on time’
<i>Planning</i>	Attitudes towards planning and sequencing of tasks
<i>Polychronicity</i>	Preference for carrying out multiple tasks at the same time
<i>Impatience</i>	Preference for the speed in which to complete a task

Time Management Training

Claessens et al. (2007), reviewing six studies that examined the effects of time management training on time management behaviours (relating to performance and well-being), found that five

of these studies demonstrated that time management training significantly increased an individual's engagement in time management behaviours (King et al., 1986; Macan, 1994; Slaven & Totterdell, 1993; Van Eerde, 2003; all cited in Claessens et al., 2007). Only one study (Macan, 1996) did not detect a significant relationship between time management behaviour and training. In five studies examining the affect of training on performance, three demonstrated a significant relationship between the two variables. These findings led Claessens et al. (2007) to conclude that time management training is an antecedent to time management behaviour. It does seem that there is enough evidence to suggest that time management training does affect time management behaviour. However, the notion that time management training effects performance should be interpreted with a degree of caution. It does seem plausible to postulate that time management training in line with Claessens's (2007; 2009) understanding of time management may positively affect performance. However, with the inconsistent findings reported over time management behaviours and job performance, training using traditional time management concepts (such as Macan, 1990) cannot be conclusively declared to enhance performance.

However, there are also other potential consequences of time management training. For example, as Macan (1996) points out, training may in fact increase the perception of control over time. This notion was suggested following her finding that participants following training reported decreases in somatic tensions. A similar study (Van Eerde, 2003) found training to significantly decrease worrying and trait procrastination compared to a control group.

Situational Factors

It is proposed based upon the review of the time literature that situational factors actually act as moderators between antecedent factors and time management behaviours. Considering firstly the

antecedent factor of time personality, at a basic level, how one prefers to manage one's time at work may not actually translate directly into *mirrored* behaviour. For example, an individual who has a high preference for being punctual (the time personality dimension of punctuality) may arrive 10-15 minutes early to an important meeting (the actual behaviour). Situational factors can therefore be an important factor affecting whether preference translates into actual behaviour. As a trivial example, in the aforementioned meeting scenario, that individual's boss may ask them to accompany them to the meeting, but the boss' behaviour may lead them both to arrive at the meeting just on time or late. Thus, in this example the individual follower was not able to autonomously determine the time of arrival to meeting. In the literature task conditions have been found to impose constraints on the expression of indifference towards temporal preferences (Gevers, Rutte & Van Eerde, 2006; Tett & Burnett, 2003). These situations, referred to as strong situations, according to Gevers, Rutte and Van Eerde (2006) 'tend to negate individual differences in response tendencies by their clarity (i.e. because everyone construes them in the same way, everyone tends to behave the same way in them)' (p.56). Thus, research suggests that 'strong situations tend to reduce the influence of personality traits on behavior' (Gevers, Rutte & Van Eerde, 2006; p.57), confirming the moderation effect.

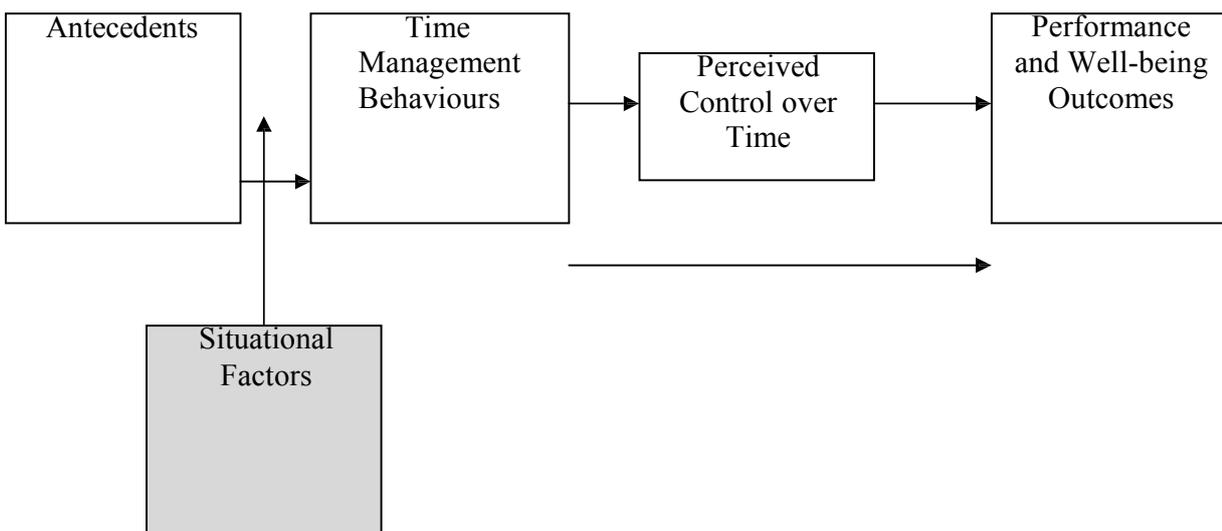
Similarly it is plausible to posit that situational factors can moderate the relationship between time management training and performance. For example, the time management behaviours that are taught during training may not necessarily be relevant for the job to be done effectively. Also the organisational temporal culture (Schriber & Gutek, 1987) may cause individuals to adapt their behaviours to be in line with the 'norm'.

Summary of Time Management

A review of the time management literature has shown that our understanding of time management has developed considerably since the introduction of the concept in the 1950s and

1960s. Although there are clearly a number of questions that still remain to be answered, a contemporary view shows that time management has an impact on employees' well-being and performance. The work of Claessens et al. (2007, 2009) has been influential in developing the contemporary view of time management. In light of the review conducted by Claessens and colleagues and to summarise, key characteristics of the time management process include: antecedents, time management behaviours, perceived control over time and, both performance and well-being related outcomes. This summary is in line with Claessens et al.'s definitions and research findings. To clarify, the antecedents to time management behaviours refer to dispositional characteristics and time management training. The time management behaviours themselves consist of planning, task assessment and time monitoring. Planning is further comprised of priority focus, contingency planning and anchored planning. There is one proposed addition to Claessen et al.'s model of time management and that is the inclusion of situational factors as a moderator between antecedents and time management behaviours. Figure 2.2 presents Claessen's (2004) model summarising the time management process with the addition of situational factors acting as a proposed moderator variable.

Figure 2.2 *Time management process(summary model)*



Source: Claessens (2004, p3). Situational Factors are a proposed addition to this model.

Temporal Distortion

At an individual level of analysis, the notion of temporal distortion has been explored by a number of researchers (Arlow, 1984; Csikszentmihalyi & LeFevre, 1989; Orgel, 1965; Hagglund, 2001; Hartocollis, 1983). Specifically, these researchers suggest that there are situations in which individuals do not consciously experience the passage of time and hence the notion of temporal distortion becomes relevant. While Csikszentmihalyi and LeFevre's (1989) theory of flow and Mainemelis's (2001) theory of timelessness arguably represent the most prominent accounts of temporal distortion in an organisational context; the latter theory provides in comparison to the former a much more detailed account of temporal distortion.

According to Mainemelis's model, timelessness represents an individual's experience of transcending time and oneself through being engrossed in a work activity (Mainemelis, 2001). According to Mainemelis (2001), timelessness is the manifest-level experience of engrossment, which refers to a state whereby 'consciousness in which one's entire affective, cognitive, and physical resources are totally invested in the task' (p.553).

It is important to recognise that Mainemelis's model of timelessness integrates three main bodies of literature: flow, ecstasy, and time experience. Firstly, flow, according to Csikszentmihalyi and LeFevre (1989), is a construct that refers to the process of optimal experience that occurs when a person enjoys a moment within an optimally challenging situation (i.e., one which matches an individual's skills with task challenges so that attention remains focused on the task). Ecstasy is described by May (1994) as a state for the 'intensity of consciousness that occurs in the creative act' (p.48). Within this state, May posits that individuals experience *joy*, 'a feeling of total participation and heightened consciousness' (May, 1994, cited in Mainemelis, 2001, p.552) and are unaware of the passage of time. May's perspective provides a theoretical basis for explaining timelessness and understanding the creative process. Finally, the time experience literature (Hartocollis, 1983; Poppel, 1988) provides a psychological-based explanation of timelessness. On reflection, the time experience literature provides a theoretical basis for understanding the

process of timelessness from a temporal perspective, but there is limited emphasis on the contextual conditions that lead to an affective state in which timelessness is experienced. In contrast, both the flow and ecstasy literatures provide detailed descriptions of the antecedent contextual conditions for an affective state in which temporal distortion can occur, but the theoretical analysis on the experience of temporal distortion is inadequate.

Mainemelis's approach for integrating the three bodies of literature is based on the inherent limitations associated with each respective literary body. Mainemelis draws on empirical research findings from the flow literature to inform the timelessness model. These findings are integrated into the model to the degree to which their origin context (i.e., flow) is unclear. While this arguably provides an empirical base to the model, it is important that the conceptual links between timelessness and flow are adequately addressed to support the inclusion of the flow within timelessness as a construct.

Firstly, Mainemelis (2001) posits that 'timelessness may or may not be part of flow, depending on how the flow state is defined in the first place' (p.553). This statement is reflective of the broad nature of the flow construct, which has been conceptualised in different ways and at different levels (Csikszentmihalyi & LeFevre, 1989; Ghani & Deshpande, 1994; Ghani, Spunick & Rooney, 1991; Hoffman & Novak, 1996; Trevino & Webster, 1992; Webster, Trevino & Ryan, 1993). Providing clarification to this ambiguity, Mainemelis (2002b) holds the proposition that timelessness is the 'quintessential experience that characterizes the most complex and advanced stages of the flow state' (p.235). However, Petranker (2002) objects to Mainemelis's flow- timelessness link, arguing that the 'very idea of flow, [...] suggests change and movement and thus a temporal dynamic' (p.339). Dismissing Petranker's objection, Mainemelis (2002b) argues that flow refers to the flow of consciousness but not time. This notion will be clarified upon discussion of the time experience literature. Mainemelis's flow-timelessness link appears justifiable as Csikszentmihalyi's (1982) original description of an advanced flow state identifies that individuals forget about time and self, which are defining characteristics of the timelessness

experience. Moreover, recent studies (Pace, 2004; Rettie, 2001) have reported individuals retrospectively reporting temporal distortion.

The time experience literature which informs the timelessness experience is rooted in the subjective perspective on time. While this has been outlined previously, it is important to understand how this literature relates to the timelessness model. Central to the timelessness account is the role of consciousness in perceiving time. According to Bergson (1960), the consciousness separates states so that they permeate each other; this is referred to as inner duration. The self is represented within these states and thus an emotional content is included (Hartocollis, 1983). When inner duration is projected into external reality, duration is experienced as states organized in a linear and horizontal pattern spanning from past states, present states and future states (Bergson, 1960). This is sometimes referred to as succession (Hartocollis, 1983; Mainemelis, 2001). Thus, the notion of time is created by each state being separated into distinct succeeding states from past to present. However, it is also proposed that unfolding moments are two-dimensional (Bergson, 1960; Hartocollis, 1983). The second dimension relates to the *depth* of the present moment, which reflects the intensity of the direct experience. It is also understood that as a consequence of limited attention resources, when the conscious focuses on one dimension, such as depth, the less attention is expended on the other (i.e., succession). Consequently, when an individual focuses strongly on the present moment (i.e., depth of the direct experience), attention is diverted from the successive states that form the self (emotional states such as anxiety) and time (past, present and future). The absence of attention focused on succession denotes the experience of timelessness as one essentially transcends both time and the self (Hartocollis, 1983; Mainemelis, 2001).

Group and Team Level of Analysis

In the organisational literature, the terms *group* and *team* have been used interchangeably. In fact the latter has tended to be employed much more frequently than *group* in the literature. Guzzo and Dickson (1996) define teams and groups as ‘individuals who see themselves and who are seen by others as a social entity, who are interdependent because of the tasks they perform as members of a group, who are embedded in one or more larger social systems (e.g. community, organization) and who perform tasks that affect others (such as customers or coworkers)’ (p.308). This definition is based upon the work of Alderfer (1992) and Hackman (1987) and a review of the group and team literature (Guzzo & Shea, 1992, cited in Guzzo & Dickson, 1996, p309). There are those who do not see the two terms as entirely equating to the same meaning. It seems for those who wish to draw a distinction between the two terms, it is argued that *team* connotes more than *group* (Guzzo & Dickson, 1996). For example, Katzenbach and Smith (1993, cited in Guzzo & Dickson, 1996, p310) posit that a group becomes a team when the individuals who belong to it develop a sense of shared commitment and strive for cohesion among members. In the review of the team and group literature in this thesis, whichever term is employed by the authors of the respective papers reviewed will remain the same. However, in line with Guzzo and Dickson (1996), this will be done with the aim of ‘recognizing that there may be degrees of difference, rather than fundamental divergences, in the meanings implied by the terms’ (p.309).

The team and group literature is vast, with research examining issues such as cohesiveness (Campion et al., 1993), structure and composition (Cannon-Bowers, Salas & Converse, 1993; Cannon-Bowers, Tannenbaum, Salas & Volpe, 1995; Smith-Jentsch, Cannon-Bowers, Tannenbaum & Salas, 2008), goals (Brawley et al., 1992), motivation (Shamir, 1990), performance and effectiveness (Guzzo & Dickson, 1996). While it is beyond the scope of this review to attend to these in detail, the literature pertaining to temporal references in a group and team context will be considered.

The nature of team work in an organisational setting provides a strong rationale for conducting

team research with operating time as a research variable. As Marks, Mathieu and Zaccaro (2001) state:

‘No work-related tasks are performed in a vacuum, unaffected by deadlines, time limits or schedules. Work teams strive toward collective goals that incorporate time as a component’ (p.358).

The importance of investigating time in teams is further reinforced by Waller, Zellmer-Bruhn and Giambattista (2002), who posit:

‘Many, maybe most, groups in organizations face deadlines, and the importance of groups’ ability to finish work on time is reflected by the amount of empirical and theoretical work investigating group processes under deadline conditions (cf. Gersick, 1988, 1989; Lim & Murnighan, 1994; Kelly & McGrath, 1985; Waller, Conte, Gibson & Carpenter, 2001)’ (p.1046).

Team processes under deadline conditions

Traditional group development models (Hare, 1976; Tuckman, 1965; Tuckman & Jensen, 1977) propose that there are different stages within a project lifespan and that these stages are universal and completed sequentially by groups. To elaborate, Tuckman (1965; cited in Tuckman & Jensen, 1977, p421) proposes that team progress through the following stages: forming, storming, norming and performing. While there are discrepancies over what the actual stages of group development are (see Gersick, 1988) the traditional group development models all share the same underlying notion that a team has to complete the stages in an ordered sequence. However, this approach has a very limited temporal focus. For instance, the influence a deadline has on each stage and the temporal behavioural patterns of the groups are not discussed in any great detail. The role of the deadline is understood as implicit within the traditional group development models. However, a number of researchers, in attempts to address this shortcoming, have conducted research to examine how deadlines affect team processes and the temporal patterns of groups within these processes (Gersick, 1988, 1989; Gevers, Rutte & Van Eerde, 2006; Kelly & McGrath, 1985; Waller, Conte, Gibson & Carpenter, 2001). The general assumption underlying

this research examining the temporal behaviours of groups is that deadlines and attention to time are linked, and this link influences how teams behave. As Gevers, Van Eerde and Rutte (2001) state, a 'deadline is an important "time marker" (McGrath & O'Connor, 1996) that puts a task within a certain frame and motivates groups to start working on the task' (p.206).

Gersick (1988) did a study on projects for eight teams, with projects spanning between seven days and six months. Through detailed observational analysis of team meetings over the lifespan of individual projects and interviews with team members, Gersick found evidence that teams did not progress gradually and sequentially through the project lifespan, as traditional group development models at the time predicted. Gersick's (1988) findings led her to conclude that 'groups develop through the sudden formation, maintenance, and sudden revision of a framework for performance; the developmental process is a punctuated equilibrium' (p.32). This punctuated equilibrium occurs, according to Gersick, at the midpoint in the project, which creates two halves of the project. According to Gersick, it is therefore the temporal midpoint that governs group development and progress thereafter, and not the development from one stage to another as proposed by traditional group development models. Gersick (1989) suggests that groups 'use time as a heuristic for deciding how long they will remain on the same track and when they must forge ahead'. The findings from Gersick's research suggest that team members are reluctant to move from one part of their project to the next within the first half of the project's lifespan. Although the source of the reluctance varied, examples included fear that the next part of the project may be too difficult and reluctance to narrow choices too soon in the project. As Gersick (1989) postulates, once the halfway mark in a project is reached, reluctance to move forwards is diminished and subsequently the pace of progression increases. Thus, Gersick's findings suggest that halfway through a project represents an important temporal milestone that is acknowledged by a group and causes a change in behaviours. Specifically, Gersick (1989) develops her theory to account for this change in behaviour by referring to the concept of pace. Pace, or more specifically task pace, refers to the rate of task performance activity (Waller, Zellmer-Bruhn & Giambattista, 2002). Gersick proposes that the midpoint of a calendar project causes an increase in the attention to

time, which in turn acts as a catalyst, increasing the pace of the work group.

The concept of pacing within teams has attracted a substantial body of research (e.g. Gersick, 1989; Marks, Mathieu & Zaccaro, 2001; Okhuysen & Waller, 2002; Seers & Woodruff, 1997; Waller, Zellmer-Bruhn & Giambattista, 2002). While Gersick's theory of group development still receives support, there is also a body of evidence that suggests that pace in a work group is not dramatically changed by a midpoint.

Organisational Level of Analysis

Schriber and Gutek (1987) produced a seminal paper into temporal aspects of organisational culture. These researchers conducted a deductive approach similar to that adopted in this research on TI as existing temporal concepts were drawn upon to propose cultural temporal dimensions, which were represented in a questionnaire. The results from factor analysis were used to develop an understanding of temporal dimensions affecting the organisation. Specifically, 12 dimensions of organisational culture were proposed following results from factor analysis on the questionnaire measuring temporal organizational culture:

1. Schedules and Deadlines
2. Punctuality
3. Future Orientation and Quality
4. Allocation of Time
5. Time Boundaries Between Work and Nonwork
6. Awareness of Time Use
7. Work Pace
8. Autonomy of Time Use
9. Synchronization and Coordination of Work with Others Through Time
10. Routine vs. Variety
11. Interorganizational Time Boundaries
12. Sequencing of Tasks Through Time

Appendix 1 presents the individual items which represent and subsequently define these dimensions. Further research on these temporal dimensions at a cultural level of analysis found a number of these dimensions predicted organizational performance. For example, Onken (1999) found work pace and polychronicity to predict organizational performance. Similarly Benabou (1999) found evidence to suggest polychronicity is important in organizational performance. Isari (2008) provides a detailed review of the literature on temporal organizational culture.

Temporal Congruence

The term temporal congruence is proposed to encapsulate the literature examining the congruence between two variables representing the same temporal construct. In line with Kristof-Brown, Zimmerman and Johnson (2005), congruence can be examined for three types of relationships: person-job, person-organisation and person-group fit. Person-job fit refers to the degree of compatibility that an individual has with his/her job (Beehr & Newman, 1976; Edwards, 1991; Kristof, 1996; Lazarus and Folkman, 1984). Person-organisation fit refers to ‘the compatibility between people and entire organisations’ (Kristof-Brown, Zimmerman & Johnson, 2005; p.285). Person-group fit refers to interpersonal compatibility between individuals and a group (Judge & Ferris, 1992; Kristof-Brown, Zimmerman & Johnson, 2005).

A number of studies have examined the notion of person-job fit from a temporal perspective (Francis-Smythe & Robertson, 2003; Hecht & Allen, 2003; Hecht & Allen, 2005; Palmer, 1997). Research has demonstrated that person-job fit has important implications for job satisfaction (Lauver & Kristof-Brown, 2001), well-being and performance (Kristof-Brown, Zimmerman & Johnson, 2005) for variables not related to time (e.g. non temporal attitudes and values). From a temporal perspective, Hecht and Allen (2005) investigated the relationship between person-job fit in terms of the construct of polychronicity. The origins of this concept can be traced to the work of Hall (1983) who distinguished between monochronic time and polychronic time. Monochronic

time was referred to as a preference for carrying out one task at a time (i.e., completing one task before moving on to another). Hall cited polychronic time as a preference for carrying out more than one task at the same time. A current issue of contention surrounding the polychronicity concept is whether it is multi-dimensional. More recent research suggests that the original meaning attributed to polychronicity (i.e., preference for carrying out one/multiple tasks) may in fact be only a specific aspect of the construct. Elaborating this point, Palmer and Schoorman (1999) argue that polychronicity is multidimensional, consisting of polyphasia, time intangibility and context. Polyphasia refers to the preference for carrying out one or multiple tasks and is therefore what some others refer to as polychronicity (Slocombe & Bluedorn, 1999).

Hecht and Allen (2005) found that fit in terms of the construct polychronicity was significantly related to satisfaction, self-efficacy, and psychological strain (based upon a sample of n=746). In an earlier study, Hecht and Allen (2003) found evidence that person-job fit in relation to polychronicity has a significant effect on performance.

Also Francis-Smythe and Robertson (1999) examined person-job fit through measuring the relationships between an individual's time personality for each of the five temporal dimensions (polychronicity, planning, etc.) and the job characteristics for each of those five dimensions. Job Time Characteristics refer to the temporal demands of a job role (e.g. whether a job requires an individual to be punctual). Francis-Smythe and Robertson (2003) found that person-job fit significantly predicted (+ve) job-related affective well-being (n=277). In addition to this, time personality also predicted well-being. Specifically, those individuals who were higher on planning, punctuality and polychronicity had higher reported levels of well-being than those individuals who scored lower on these three time dimensions. Potential explanations for these findings were that the behaviour manifestations of low scores on these three dimensions may have caused stress between work relations (e.g. managers and peers) and also added work pressure (e.g. subsequent to missing a deadline). Importantly, the study found evidence through multiple

regression analyses that time personality moderated the relationship between personality-job fit (temporal) and well-being. Thus, in this respect, socialisation effects from the job were considered to account for individuals adapting behaviours to fit job demands.

Slocombe and Bluedorn (1999), in a study investigating person-group fit on the time dimension of polychronicity, found evidence that fit predicted organisational commitment (willingness to exert effort, desire to remain a member of the organisation, and belief in and acceptance of organisational goals) and job performance. There is, however, a diminutive amount of research into temporal person-group fit and person-organisation fit; demonstrating much potential for further research in this area.

While there is scope for such development, the current research findings do strongly suggest that *temporal fit* does affect performance and well-being variables. These findings seem to be consistent with Kaufman et al.'s theory of time congruence. In this theory, Kaufman and colleagues suggest that individuals can 'experience *temporal symmetry* if the rhythm of their work fits with the rhythm they prefer' (cited in Hecht & Allen, 2005, p3). Kaufman et al. linked temporal symmetry with higher levels of well-being and motivation.

Conclusion

The presented review shows that there has been a considerable amount of research into time. This chapter has demonstrated time to be an important variable in an organisational setting, in terms of understanding organisational behaviour and explaining performance and well-being. Time has also been shown to be a complex and multi-dimensional construct. In sum, the findings from the review support the notion that existing literature provides a ripe source of information to guide the development of a conceptual model of Temporal Intelligence that will be subjected to empirical analysis. However, while the conceptual model of TI will be presented in chapter 4, the next chapter will seek to develop an understanding of the context in which time is being researched; the leadership context. This succeeding chapter will also review literature that links the temporal

concepts introduced in this chapter to leadership.

3

Literature Review II: Leadership Theory and
Time

To facilitate the development of the conceptual model of Temporal Intelligence (TI) that seeks to outline individual differences among leaders in time-related behaviours and cognitions towards followers, the previous chapter presented a review of time in an organisational setting with a focus on an individual level of analysis. This chapter aims to augment the development of the conceptual model and hence complement chapter 2. Firstly, as the conceptual model of TI is within a leadership context, the first stage of the review contained in this chapter is to summarise the key theories and models of leadership. The underlying premise is that it is important to consider the context in which a theory is to develop. The second stage of the review is to focus on the time constructs that exist in the leadership literature. Although related, the distinction between this aforementioned review and that presented in the previous chapter is that the previous chapter focuses on defining temporal constructs in an organisational setting, while this chapter seeks to understand how those temporal constructs are relevant in a specifically leadership context.

The Literature Review

The Literature Review Process

The search process employed to identify relevant articles to the objectives of the literature review (as outlined previously) was similar to the process followed in chapter 2, and used an iterative process. However, the search process was conducted in two stages to address the main objectives of the review:

1. Present an overview of key theories, models and approaches to the conceptualisation of leadership to develop an understanding of the context in which TI as a construct will be developed.
2. Present an account of how temporal constructs have been deemed relevant to leadership by existing literature.

The first stage of the search process involved using general terms such as ‘leadership’, ‘leader’ and ‘leading’ in organisational-related journal databases (e.g. EBSCO, JSTOR, Emerald, Business Source Complete, PsycARTICLES, IngentaConnect Complete and PsycINFO). Following this search process, more specific keyword search terms were entered into these databases. Such keywords were developed firstly on the basis of identifying specific theories that reflect distinct approaches to conceptualising leadership (e.g. leadership style or situational leadership). While in the preceding literature review, this iterative process was continued until the keywords were perceived to *exhaust* the generation of new articles relevant to the review’s objectives, this stage of the leadership review was halted when an adequate summary was achieved for the purpose of providing an overview of key approaches to conceptualising leadership (i.e., the objectives of this review).

The second stage of the search process involved identifying time-related constructs in leadership. The iterative search process was developed by moving away from using general keyword search terms to more specific keyword search terms. In addition, some articles identified in the first stage of the search process did include reference to temporal variables; these were included in the review and were used to generate further time-related leadership literature. The second stage of the review also involved the researcher developing narrative comments focusing on three main criteria; the key aims, methods and findings/conclusions relating to each of the articles. These comments were valuable for structuring the literature review but also developing the conceptual model of Temporal Intelligence, which shall be discussed in the next chapter.

Review objective I. Overview of key theories, models and approaches to the conceptualisation of leadership

There has been a vast amount of literature on the concept of leadership, and yet there is no agreed-upon single framework or paradigm to represent it. Specifically, there are a number of different leadership theories and models, which conceptualise and define leadership in distinct ways. There is one process, however, that is present in virtually all the different approaches to conceptualising

leadership: the process of influence, which refers to the way in which the leader impacts the behaviour of others. For example, Stogdill (1950) defines leadership 'as the process (act) of influencing the activities of an organized group in its efforts towards goal setting and goal achievement' (p.3). However, different theories and models of leadership diverge in the specific influence processes that are proposed to occur.

It is beyond the scope of this chapter to provide a detailed account of each of these theories of leadership; an outline of each as they relate to the process of influence will be presented to provide an overview of the key findings and points of discussion that are raised. This provides a basis for discussion of the extent to which time, as a concept, is featured within the leadership domain. The approach to this review of the literature will be to detail the main frameworks present in the leadership field, and to identify the time-related links within this framework. This chapter will also consider theories identifying time as a research variable within a leadership context, which are not exclusively within the remit of existing leadership frameworks. The purpose of this review is to develop both an understanding of the main developments within the leadership literature and an appreciation of the temporal factors associated with leadership. Importantly, distilling this literature can provide a basis for developing a time-related model of leadership.

It is useful to consider the historical development of the main leadership theories for an appreciation of the evolution of the leadership field and the conceptual developments that have resulted. In the infancy of leadership research, the ability to influence was perceived to be related to a distinct set of personality and physical characteristics. For example, Carlyle (1948) suggests that leaders possess characteristics that make them superior in their ability to influence others. Stogdill (1948) conducted a detailed review of leadership characteristics and concluded that only a small number of characteristics were found to be consistent predictors of leadership ability. While it should also be acknowledged that our understanding of individual characteristics such as personality has significantly increased since Stogdill's review, Stogdill did not conclude that

individual characteristics (such as personality) are not important to leadership. Rather, what is suggested is that understanding how leaders behave is more important than considering exclusively their individual characteristics. This interpretation is reflected in the nature of leadership research that followed, which had a behavioural focus. This led to the development of theories relating leadership styles, situational leadership, ‘path-goal relationships’, leader-member exchange and ‘transformational and transactional leadership’.

Leadership Styles

In addition to considering individual characteristics, researchers focused on behavioural aspects of leadership and, specifically, the behaviours of leaders that influence the individuals they lead. Focusing on different aspects of leadership behaviour or styles of behaviour became popular among leadership researchers, which led to a number of different terms depicting leadership styles. However, a common attribute to virtually all such conceptualisations of leadership styles is that the styles of behaviour are either task-orientated or relationship-orientated in regards to their behavioural characteristics. The central characteristic of the former is behaviour that relates to the accomplishment of a task, while the latter refers to behaviour pertaining to interpersonal relations between the leader and follower, and relations within the group.

In the 1950s, Fleishman (1953; 1957) conducted research that had a substantial impact on subsequent research on leadership behaviour. Fleishman (1953) developed the Leader Behaviour Description Questionnaire (LBDQ) through detailed questionnaire research. The LBDQ comprises several statements relating to leadership behaviour that represent two factors: consideration and initiating structure. ‘Consideration’ denotes relationship-orientated behaviours that concern individual followers in terms of needs and states (such as morale). ‘Initiating structure’ reflects behaviour that relates to a task-orientated style that involves a leader clearly defining what work should be done and how it should be approached. The research on leadership styles that followed Fleishman’s work (1953; 1957) also brought to light behavioural distinctions

reflective of the task-orientated and relationship-orientated distinction. For example, the following stylistic distinctions were proposed: 'production centered' versus 'employee centered' (Likert, 1961), 'production-orientated' versus 'people orientated' (Blake & Mouton, 1964) and 'task-emphasis' versus 'relations emphasis' (Fiedler, 1967).

Contingency Model of Leadership

Fiedler (1967; 1991) proposed a model of leadership that considered both behavioural traits and situational variables of leadership. This approach was unique at the time when theories tended to be focus on either situational variables or traits. Fiedler (1967) distinguishes between relationship-motivated and task-motivated leaders by observing the effectiveness of these leaders across eight situations that were created through the combination of the following three dichotomous variables: i) leader-member relations, ii) follower-task structure and iii) leader-position power. Fiedler proposed that the eight situations vary in their degree of *favourableness*. Although favourableness is a slightly ambiguous noun in this context, the meaning can be understood with more clarity when the situations are described. For example, the eight situations are described in a manner that is akin to a bipolar scale with high and low favourableness on each side of the continuum. A situation with good leader-member relations, high task structure and strong position power is considered to be representative of a situation marked with high favourableness, which is also referred to as Octant I. In contrast, a situation with poor leader-member relations, low task structure and weak position power is deemed to be the least favourable situation, which is referred to as Octant VIII. The remaining six situations (Octants II through to VII) are graded between these two extremes.

Fiedler (1967; 1971) found that the relationship-orientated leader outperformed the task-motivated leader in four of the eight situations, and vice-versa. Specifically, a task-orientated leadership style was observed to be more effective than a relationship-orientated style in highly favourable situations representative of Octants I to III or a highly unfavourable situation, which is Octant VIII. Conversely, a relationship-orientated leader was found to be more effective within the

intermediate situations (Octants IV to VII). These findings led Fiedler to suggest that based upon their motivational trait (relationship or task), a leader should be placed in the situation that his study found complements the trait in terms of superior performance.

There have, however, been a number of challenges facing the methodology of studies supporting Fiedler's theory. Firstly, Fiedler's own study (1967) that observed the effects of a leader's trait and the situation on leadership effectiveness, was based upon small samples as the median sample sizes for the developmental and validation data sets were six and twelve respectively. This led to a number of potential statistical issues that were perceived to question the validity of Fiedler's theory (Peters, Hartke & Pohlmann, 1985). For example, while Fiedler in his studies (1967; 1971) found correlations in the predicted direction according to the leader's trait (i.e., relationship- or task-orientated), many of these were not significant at a 0.05 level. However, the small sample sizes would limit the statistical power of the analysis to be able to show true effects. In response, a number of meta-analyses were conducted to resolve the statistical issues that undermined the inferences that were drawn to support Fiedler's theory (Strube & Garcia, 1981; Peters, Hartke & Pohlmann, 1985). Strube & Garcia's results found support for the Contingency model by combining the results from eight individual situations into quadrants, which is in contrast to Fiedler's methodology involving observation of eight individual situations and leadership effectiveness. These findings led the analysts to conclude that 'the model as a whole was overwhelmingly supported' (p. 316). However, when the researchers did observe the original eight individual situations (as opposed to four), only two of the eight octants produced significant relationships with performance in the predicted directions. This does somewhat question the validity of such a strong conclusion that Strube and Garcia (1981) drew. In addition, a seminal paper written by Hunter and Schmidt (1982) on the techniques and statistical issues surrounding meta-analyses led to concerns that the procedure Strube and Garcia (1981) employed also raised statistical issues that may affect the validity of their conclusions.

Peters, Hartke & Pohlmann (1985) conducted a meta-analysis that was designed to improve on Strube et al.'s original procedure by addressing the perceived limitations in the original meta-analysis. Peters, Hartke & Pohlmann (1985) drew the following conclusion from their study: 'the results of the present meta-analysis present a mixed set of findings concerning the Contingency Theory' (p.283).

Although Fiedler's contingency model has received support, it is clear that there a number of methodological issues surrounding the studies supporting Fiedler's model and theoretical weaknesses, which are discussed in greater length by Ashour (1973), Kerr (1974), and Vecchio (1977). While the contingency model is controversial, it represented an original approach at the time of the model's introduction that was marked by its consideration of both situational and trait variables, and the interaction between them.

Path-Goal Theory

Path-goal theory is a theory about leader behaviour on 'subordinate satisfaction, motivation, and performance' (House, 1971; p.321). Path-goal theory stipulates leaders should create and develop follower paths towards individual and group goals, to clarify expectations, and to foster an environment that motivates followers and leads to higher levels of performance. Thus, central to path-goal theory is that leader behaviour must have a motivational impact on followers to optimise performance. Thus, the process of influence according to this theory is through the leader behaving in a way that will increase subordinate motivation, which is claimed to be achieved by increasing the number of benefits to subordinates to obtain work goals. The leader is, according to this theory, able to support subordinates in obtaining these benefits through 'making pathways', which House and Mitchell (1974) describe as 'clarifying the paths, reducing roadblocks, and increasing the opportunity for personal satisfaction en route' (p.52). Four main groups of behaviour are deemed important in terms of having a motivational influence on followers: leader directiveness, leader supportiveness, leader achievement orientation and leader participativeness.

Situational Leadership

The fundamental premise underlying situational leadership (Hershey & Blanchard, 1977) is that there is no single style of leadership that is consistently effective. It is proposed that leaders should adapt their behaviours in relation to the maturity of their followers. Specifically, followers with a low level of maturity require the leader to display a high level of task-orientated behaviour for optimal leadership style. It is also proposed that followers with a high maturity level require the leader to be low on both task- and relationship-orientated behaviour, while a follower with intermediate maturity requires a high level of relationship-orientated behaviour and varied task-orientated behaviour. Task behaviour is defined as the extent to which the leader provides direction to the follower, while relationship behaviour refers to the amount of socio-emotional support with which a leader provides a follower. Empirical research has led to mixed support for situational leadership theory. For example, Norris and Vecchio (1992) and Vecchio (1987) find some support for the theory, specifically the predicted level of task orientated behaviour (in regards to effectiveness) was observed for followers with a low and intermediate level of maturity but not a high level of maturity. However, Goodson, McGee and Cashman (1989) found no support for the theory. Norris and Vecchio (1992) note a few specific limitations with several empirical studies testing situational leadership. Firstly, it is difficult to achieve a statistically valid sample for each type of occurrence between the variables of follower maturity and leader behaviour (i.e., task- or relationship-oriented). Secondly, measuring follower maturity can be difficult as the most common approach (Norris & Vecchio, 1992; Vecchio, 1987; Goodson et al., 1989) involves using supervisory ratings.

Transformational and Transactional Leadership

A vast array of contemporary research focuses on ‘transactional’ and ‘transformational’ leadership styles. The notions of transactional and transformational leadership styles were introduced by Burns in 1978 and have since been addressed in the works of several scholars (Bass, 1985; Bass & Avolio, 1993; Brown & Keeping, 2005; Yukl, 1999). While there have

been a number of variations among these academics, one model of leadership has emerged as dominant and has received the largest amount of empirical support. This model has become referred to as the Full Range Leadership Theory (FRLT) and originates from the works of Bass.

Full Range Leadership Theory

Bass's (1985) original theory posited that transformational leadership was composed of four factors, and that two factors were associated with transactional leadership. Bass and his colleagues revised this theory through a number of studies (Avolio & Bass, 1991; Avolio, Waldman & Yammarino, 1991; Bass & Avolio, 1993) to yield what is currently referred to as the FRLT. In its current form, the FRLT represents nine single-order factors made up of five transformational leadership factors, three transactional leadership factors and one laissez-faire leadership factor.

Transactional Leadership

Transactional leadership, according to FRLT, comprises three dimensions: Contingent Reward, Management by Exception (active) and Management by Exception (passive). Contingent Reward concerns the extent to which the leader initiates and organises exchanges with followers. Specifically, contingent reward 'entails setting work objectives and performance standards, providing feedback, and providing financial or psychological rewards in exchange for performance that meets expectations' (Gill, 2006, p51). Management by Exception is made up of two forms. Howell and Avolio (1993) differentiate between the active and passive forms of Management by Exception based upon the timing of a leader's intervention. Active leaders monitor the behaviour of their followers, anticipate problems and tend to employ corrective action before such behavior leads to serious difficulties. In contrast, the passive element of Management by Exception is associated with situations in which the leader only takes action after the problem occurs. In summary transactional leadership is characterised by leaders who are mainly task orientated, exchange valued rewards for services, clarify roles and impose structure.

Transformational Leadership

In contrast to transactional leadership, transformational leaders have a more relationship-focused approach utilising strong interpersonal and influencing skills to motivate and direct followers (Bass, 1985). Transformational leaders are perceived as motivating subordinates to do more than they originally intended and frequently even more than they thought possible. Thus, in comparison to transactional leaders, transformational leaders are more likely to be proactive than reactive in their thinking and are more innovative in their ideas (Bass & Avolio, 1988).

Although transformational theory has been subject to a number of revisions, currently there are five dimensions to transformational leadership (Avolio & Bass, 1985). These five are: Idealized Influence (attributed), Idealized Influence (behaviour), Inspirational Motivation, Intellectual Stimulation and Individualized Consideration. Idealized Influence (attributed) refers to the extent to which a leader is perceived by his or her followers' to be powerful, confident, and focused on higher-order ideals. Leaders who behave in accordance with this dimension have been described as 'charismatic' (Bass, 1985). Idealized Influence (behaviour) is the degree to which a leader demonstrates high standards of both ethical and moral conduct. Leaders who are considered to behave in accordance with this transformational dimension avoid using power for personal gain and share risks with followers, taking a democratic approach to leadership.

Inspirational Motivation concerns how a leader motivates his or her followers. Specifically, this dimension is associated with the degree to which the leader will communicate his or her own optimistic but realistic vision of the future. Bass (1985) describes how a leader who behaves with Inspirational Motivation will encourage high standards of performance and provide the inspiration required to reach such standards. Moreover, this type of leader is deemed to articulate a shared vision among followers and to develop a commitment among followers to strive towards this vision.

Intellectual Stimulation concerns the degree to which a leader stimulates his or her followers'

efforts to be innovative and creative by challenging assumptions and reframing problems.

Finally, Individualized Consideration concerns the extent to which a leader gives attention to an individual's needs for achievement and growth by coaching or mentoring. New opportunities for the follower to learn are actively sought by the leader and a supportive climate is created to facilitate this learning.

The FRLT stipulates that the styles of transactional and transformational leadership are in fact complementary to one another. Developing this point, Bass (1998) proposes the 'augmentation effect', which refers to the extent to which 'transformational leadership styles build on the transactional base in contributing to the extra effort and performance of followers' (p.5).

Laissez-faire Leadership

The FRLT extends Burns's original concept of only two leadership styles by proposing a third typology that can denote behaviour as laissez-faire leadership. This type of leadership is very passive in nature and is in sharp contrast to the two active styles of transformational and transactional leadership (Yammarino & Bass, 1990). Bass and Avolio (1999) depict this type of leader as being characterised by their hesitation to implement plans, avoidance of decision making, reluctance to get involved with the team's work and absence in a situation where they are needed.

The process of influence according to the FRLT is very much focused on the leader's behavioural characteristics and engagement with his or her followers, with a strong focus on motivation. A key factor that seems to account for the FRLT becoming one of the most established theories is that the behaviours it conceptualises into the three distinct leadership styles have been demonstrated to be significantly related to leadership effectiveness. In particular, the transformational leadership style has been embraced by practitioners and academics alike as one possible means of improving the job performance of a leader's followers. For example, Lowe and Galen (1996), conducting a meta-analysis (22 published and 16 unpublished studies), found by averaging transformational

leadership dimensions across a range of samples examined, this leadership typology related to subordinate ($[\rho] = .73$) and superior/organisational ($[\rho] = .30$) measures of leadership effectiveness. Also within the FRLT, Bass links specific transformational behaviours to effectiveness. For example, Idealized Influence, also referred to as ‘charismatic leadership’ in the literature, is proposed by Bass (1985) to motivate followers to exceed expected levels of performance by ‘tapping followers’ higher order values and engaging their self-concepts in identifying with their mission and vision’ (Shea & Howell, 1999; p.377). This notion also receives wide empirical support (Avolio, Waldman & Einstein, 1988; Lowe, Kroeck & Sivasubramaniam, 1996).

Thite (2000), intending to empirically evaluate Bass’s FRLT model in the Information Technology domain, investigates two teams in each organisation and determines the more successful team in terms of the following variables: cost performance, technical quality, customer satisfaction and overall performance. Thite also concludes from the results that while transformational leadership has a greater impact on the aforementioned performance-related outcome variables, transformational style does compliment the transactional leadership style. This finding supports Bass’s notion of augmentation described above whereby transformational leadership builds on the transactional leadership dimension.

One of the key challenges in the leadership field is that describing and explaining leadership effectiveness is difficult as there are no established criteria representing effectiveness. As can be recognised from the empirical studies examining effectiveness detailed above, potentially a number of different outcome variables can be operationalised to represent leadership effectiveness, all of which are context dependent. The notions of leadership effectiveness being context dependent and identifying clearly defined predictor and outcome variables are challenges that face leadership research concerned with effectiveness. These notions also have potential implications for the time-based account of leadership that will be developed in this thesis, in that specific temporal behaviours, abilities and traits should be discussed in relation to specific

outcome variables rather than in relation to the more general notion of 'leadership effectiveness'. This approach should also be reflected in the literature review in that temporal variables should be linked to specific outcome variables. It should be noted that it is not being suggested that the concept of leadership effectiveness should not be implied, but that it should only after specific outcome variables have been identified.

The contingency model, path-goal theory and situational leadership theories emphasised the cognitive processes associated directly with the leader who, is expected to be aware of situational characteristics and how to adapt behaviours to these characteristics. While these theories subsequently have a behavioural component, the FRLT provides a more detailed analysis of leader behaviour that is perceived to motivate subordinates to high levels of performance. Arguably this is the attribute of the FRLT that makes it responsible for the wide support it gains; it explains how an individual can be motivated and influenced, and how this affects performance. In the contingency model and situational leadership the process of influence is explicitly determined not by the leader but by the situation. Essentially, one way to distinguish between leadership approaches is by looking at the extent to which behavioural and situational factors are detailed in the influence process. Moreover, the FRLT has a stronger emphasis on transformational, spiritual and charismatic leadership compared to the earlier situational leadership theories and path-goal relationship theories (see Yukl, 1999; 2002).

Leadership versus Management

It is deemed important in relation to developing the TI construct in the context of leadership that consideration is given to the controversial debate that surrounds comparing leadership to management. This comparison raises the issue of how to distinguish between the two concepts. Considering this issue is important for defining the context and behaviours that TI as a construct relates to. While there is at a conceptual level, a distinction between leadership and management, there are a number of inconsistencies in the literature on exactly how to draw this distinction. For example, Bennis and Nanus (1985, cited in Gill, 2006 p26) states 'managers are people who do

things right; leaders are people who do the right things'. This notion is also reflected in leadership versus management distinctions drawn by a number of scholars (Pascale, 1990). However, Gronn (2003, cited in Gill 2006, p26) suggests that this is an uneasy distinction based upon epistemological assumptions. As Gill (2006) notes, the Work Foundation draws the distinction by remarking 'managers plan, allocate resources, administer and control, whereas leaders innovate, communicate and motivate' (p26). This statement provides a clear understanding of some of the perceived key differences between leadership and management but does not completely reconcile the inconsistencies reflective of the management versus leadership debate.

While it is acknowledged that there are conceptual differences between leadership and management, the finer nuances in distinguishing between the two, can lead to consistently and comprehensively making this distinction problematic. For example, if the behaviour characteristic of transactional leadership style is considered, this can be interpreted to align more with traditional views of management. Developing this point, management-by-exception (denoting transactional leadership) is characterised by the leader setting objectives, setting processes and monitoring for problems in meeting objectives or following processes (active form). This is reflective of planning and structuring behaviour associated with management (Rajan, 2000) and Kotter's (1990, cited in Gill, 2006, p27) definition of management; 'produces orderly results that keep something working efficiently'. Moreover, making the distinction between leaders and managers can be especially difficult in practice, which appears a notion supported by Drucker (1966), who does not seek to explicitly identify the differences between the two and suggests that both are required to be effective when responsible for employees. In sum, the difficulties in distinguishing between leadership and management have one main implication on identifying individual differences in time related behaviours and cognitions in leadership. While the aim of the research is to identify time-related individual differences in leadership, it should be recognised that there may be an overlap with management behaviours but the predominant focus will be on leadership.

Review objective II. Temporal constructs in leadership

Time in Leadership Theories and Models

The development of the situational, trait and style-based accounts of leadership described above can be observed to have a limited reference to time as a concept. For example, Bass's FRLT had very little reference to time, and time as a concept cannot be observed as integral to any aspect of Bass's conceptualization of FRLT. However, Bass (1985) did remark that charismatic leaders have a keen sense of time and are most effective when social conditions are allied with the vision of the leader. Casmir (2001) conducted research into timing of transactional and transformational leadership styles. As the study was conducted in a laboratory setting, further research is required to address the issue of whether the findings are generalisable across leadership contexts in a naturalistic organisational setting. Recent research by Farh (2011) suggests that sequencing of leadership behaviours is important for action teams (n=82 surgery teams observed) in relation to team performance.

Valuable as understanding timing in leadership is, it should be recognized that timing is a dimension of time. Developing this point, in the previous chapter, time was shown to be a multi-dimensional construct at an individual, group and organisational level. Thus, time potentially has a much more significant role in leading than can be accounted for by the notion of timing within the context of leadership styles. In fact, recently, a number of these temporal concepts have emerged in the context of leadership.

Timescape in Leadership

As demonstrated earlier, time is sparsely referenced within the main theories and models of leadership. However, in addition to these central theories and models, there also are a number of accounts purporting to address temporal issues in leadership. These span across disciplines and often address one dimension of time (i.e., a uni-dimensional perspective of time in leadership) with limited consideration to the central leadership theories and models. Thus, overall the

literature linking time to leadership is fragmented, subsequently; the task of conceptual synthesis is cumbersome by nature. However, an account that integrates a number of concepts across disciplines and aims to provide a basis for guiding future research into time and leadership has been proposed by Halbesleben, Novicevic, Harvey and Buckley (2003). These scholars provide one of the most comprehensive theoretical analyses of time in a leadership context to date.

Halbesleben and colleagues propose a competency-based model that outlines how a leader's awareness of the different components of timescape form the competency 'awareness of temporal complexity'. In turn, this competency is posited to be important in influencing the leader's capability of leading creative project teams and innovative organisations through its interactions with self-, context- and vision- related leadership competencies, which are mediated by social and cognitive factors. The notion of timescape originates in the sociological works of Adam (2000; cited in Halbesleben, Novicevic, Harvey & Buckley 2003, p436) and represents a specific conceptualisation of time that 'captures both economic and social aspects of time into a holistic temporal landscape' (Halbesleben, Novicevic, Harvey & Buckley, 2003; p.436). Halbesleben, Novicevic, Harvey and Buckley postulate that timescape is formed of nine sub-components (dimensions of time): timeframe, tempo, temporality, synchronisation, sequence, simultaneity/zeitgeber, anticipated and emerging gaps and pauses, time personality and timelessness.

Timeframe

Timeframe refers to the time horizon of an event, which can be represented by 'clock time (hours and days), cosmic cycles (years, seasons, and tides) or socioeconomic timing (fiscal years and economic cycles)' (Halbesleben, Novicevic, Harvey & Buckley p.437). It is the leader's understanding of the timeframe that is deemed important for the leadership of innovation.

Tempo

Tempo represents the ‘basic rhythm in the timescape’ (p.438), which also is referred to as a pace or speed. This temporal construct has been discussed at individual, group and cultural levels in the previous chapter. At an individual level, speed was discussed in relation to an individual’s preference of the speed at which to complete a task (time personality). This was not considered in the tempo component of Halbesleben, Novicevic, Harvey and Buckley’s model of temporal complexity, but time personality is represented as a component of its own in the model. At a group level, pace was discussed in chapter 2 in relation to a project lifespan, which draws upon the work of mid-point transitions (e.g. Gersick, 1988). Halbesleben and colleagues’s discussion of tempo centred around this interpretation of pace. Specifically in relation to temporal complexity, it is proposed that a leader can facilitate mid-point transitions through initiating an appropriate structure to the task (Okhuysen & Waller, 2002). At a cultural level, pace was discussed in chapter 2 in relation to the pace of work activities within the organization.

Halbesleben and colleagues discuss both these notions of pace in their model. However, while these two notions of pace are discussed at an organisational level, the leader’s role in having a potential impact on the pace of activities or decisions is proposed by Halbesleben and colleagues. For example, in the context of innovation, the tempo of activities can be ‘represented by how quickly an innovation is developed and introduced to the market, particularly relative to competition and customer needs’ (p.438). It is also stated that:

‘An organisation that introduces an innovation significantly more quickly than their competition (and swiftly, in response to a customer need that has developed in the product market) will realize greater success (Adam, 2000; Mumford & Gustafson, 1988; Simon, 1986)’ (p.438).

While the speed at which an innovation is introduced by an organisation (organisational tempo) is the aggregation of a number of activities leading up to introduction, Halbesleben and colleagues state that ‘leaders may need to adjust tempo’. Thus, while tempo is reported to exist independently of the leader and is not directly controlled by the leader, the leader’s behaviours are deemed to have the ability to influence the tempo of the activities and the tempo of an organisation’s innovation introduction. Conceptually, the notion of a temporal dimension not occurring under the direct control of a leader (but the leader having the potential to influence that characteristic of a dimension) is significant and will be developed in the context of TI.

Temporality

Temporality, the third component of temporal complexity, refers to the ‘limited life span or durability of processes, events, and things within the timescape’ (Halbesleben, Novicevic, Harvey & Buckley, 2003; p.439). Although the authors employ the term ‘temporality’, it is clear that the construct relates to the notion of time perspectives and specifically of temporal depth and focus (Bluedorn, 2002). Halbesleben and colleagues suggest that leaders need to be aware of how temporality impacts innovation. The importance of temporality is linked with the decision-making process and specifically the extent to which decisions are based upon what has happened in the past, which relates to the notion of escalation of commitment. Escalation of commitment refers to when an investment in the past (i.e., resources) based on a decision (e.g. to develop a new product) may prevent that past decision being revisited in fear of the resources being wasted (Staw, 1976; cited in Halbesleben, Novicevic, Harvey & Buckley, 2003, p437). The notion of temporal depth refers to the ‘distance looked into the past and future’ and temporal focus as the ‘importance attached to the past, present and future’. However, the notions of temporal depth and focus refer to the individual (i.e., the importance an individual attaches), while temporality is arguably a temporal characteristic of events. A perceived limitation with the model of temporal complexity is that the focus is on temporal characteristics of events, organisations, groups and individual followers, but not of the leader. Clearly, with concepts such as temporal depth and pace, these also

vary between individual leaders.

Synchronisation

Synchronisation, the fourth component of timescape refers to ‘the integration of people, groups and events, and processes in time’ (Halbesleben, Novicevic, Harvey & Buckley, 2003). The model’s authors provide a number of specific propositions on the notion of synchronisation in the context of innovation, such as the leader’s ability to synchronise creativity in group members to produce a creative idea that will lead to innovation. Integral to the concept of synchronisation as presented in the model of temporal complexity is entrainment. Entrainment is defined as ‘the adjustment of the pace or cycle of an activity to match or synchronise with that of another activity’ (Ancona & Chong, 1996; p.253). Halbesleben, Novicevic, Harvey and Buckley deem entrainment to be critical to the leadership of innovation projects.

Sequence

The fifth component of the timescape is sequence, which refers to patterns relating to events or processes that may occur. It is proposed that patterns can lead to outcomes, so that one event must occur before another for a consistent outcome. Halbesleben and colleagues suggest that ‘leader’s through experience can develop a sense of what types of events occur in sequence during the creative process, particularly when the process leads to a desirable outcome’ (p.441). A perceived weakness associated is that there is limited empirical research to support the conceptualisation of sequence in terms of specific patterns that lead to specific outcomes. Thus, sequence is discussed in general terms without specific behaviours, events or processes identified.

Simultaneity

The sixth component is simultaneity with zeitgebers. Firstly, simultaneity refers to the co-occurrence of events, which is either the same event or a sequence of events occurring at the same time. The model’s authors make reference to the construct of polychronicity at an individual

level, recognising the different approaches to managing tasks in respect to polychronicity. However, there is limited review on the nature of the construct and relation to outcome variables. Chapter 2 demonstrated that polychronicity represents an individual difference variable while also being a construct observed at a group level. Another characteristic of simultaneity with zeitgebers refers to the construct of a zeitgeber, which is defined by Halbesleben, Novicevic, Harvey and Buckley (2003) as an ‘external synchronizing tempo with the power to entrain the internal tempo of an innovation project’. It is suggested that the concept of simultaneity is conceptually distinct from the zeitgeber, as the latter is associated with entrainment, which is a temporal construct that is more complex than the construct of simultaneity; entrainment involves the adjustment of pace to synchronise two rhythms so that they occur simultaneously.

Anticipated or emerging pauses and gaps

The seventh temporal dimension in the model of timescape is ‘Anticipated or emerging pauses and gaps’. Pauses and gaps represent breaks in the workflow. Halbesleben and colleagues propose that gaps of a social nature are critical to understanding the creative process.

Time Personality

The eighth sub-component of Halbesleben and colleagues’ model was time personality (Francis-Smythe & Robertson, 2003). The five-dimensional time personality construct was reviewed in detail in the preceding chapter. In the context of temporal complexity, Halbesleben and colleagues stipulate that ‘leaders need to be aware of the need to design creative project teams that have complementary time personalities (Burns, 1996)’ (p.444). In terms of the link between time personality and outcomes variables it is also postulated that ‘complementary time personalities will increase the fit of the team members, leading to productivity’ (p.444). This is conceptually an interesting notion. Chapter 2 showed that, at an individual level, time personality is related to job-related well-being and specific dimensions (i.e., polychronicity) related to performance. Halbesleben, Novicevic, Harvey and Buckley’s (2003) proposition represents the interrelations between different time personalities within a group setting. This also provides

direction for future research to identify the specific combinations of time personalities within a group and effects on outcome variables. With the substantial body of research investigating individual differences in temporal preferences, the notion of the role of these preferences in a leadership context is potentially very significant in terms of developing our understanding of temporal variables and leadership. While Halbesleben and colleagues focus on time personality in a group setting, it is also proposed that considering time personality at an individual level is important. Developing this point, it is suggested that it may also be important to consider the leader's and followers' own temporal preferences and behaviours (i.e, individual difference factors) to understand the role of time personality in a leadership context. This is one of the key goals of this thesis. Owing to a lack of established empirical research in this domain, developing this understanding is a challenging and lengthy process.

Timelessness

The final temporal component of the timescape situated within the model of temporal complexity is timelessness. The model of timelessness (Mainemelis, 2002) presented in chapter 2 shows the situational and individual factors deemed to cause the timelessness experience. The timelessness experience is also perceived to be linked to creativity because it leads to 'a context of highly focused, imaginative, and quality work' (cited in Halbesleben, Novicevic, Harvey & Buckley, 2003, p.445). In an earlier study by Sosik, Kahai and Avolio (1999), timelessness was found to be a mediator of the relationship between transformational leadership behaviours and group creativity. As Halbesleben and colleagues suggest, the role of timelessness in leadership is important in the context of innovation. A number of contextual conditions (such as setting clear goals, encouraging rites of passage and matching the skill level of the task with that of the follower).

Timescape and Leadership Effectiveness

Halbesleben, Novicevic, Harvey and Buckley (2003) propose that 'awareness of temporal complexity, through cognitive and social complexity, may augment/facilitate leader competencies

to lead effectively innovation in the organization' (p.446). A number of concepts contained within this statement warrant further examination. Firstly, awareness of temporal complexity per se is not articulated to influence leadership effectiveness, but rather leadership competencies are. However, temporal complexity has a 'positive influence on leader competencies by adding to the cognitive complexity that a leader brings to a socially complex task'. While cognitive complexity is deemed to influence the behavioural elements of leadership competencies, there is no discussion of the exact nature of this relationship. In sum, through a detailed analysis of Halbesleben, Novicevic, Harvey and Buckley's discussion of awareness of temporal complexity, it becomes apparent that an underlying assumption is that awareness of temporal complexity is not representative of behaviour but rather represents an internal process of awareness which subsequently 'assists the leader in understanding of the environment' (p.446). The behavioural repertoire necessary for increasing leadership effectiveness resides in the self-, context- and vision-related leadership competencies. Thus, awareness of temporal complexity is referred to as a 'competency in the cognitive, social and behavioural complexity of leaders' (p.435) instead of a leadership competency.

While Halbesleben, Novicevic, Harvey and Buckley (2003) propose that leadership competencies influence the effective leadership of creative and innovative endeavors, there is fairly limited analysis of what constitutes effective leadership in this context. In a general context, the conceptualisation and measurement of leadership effectiveness as mentioned previously is a pertinent issue in the psychological literature. As there is an absence of an agreed-upon theoretical framework of leadership effectiveness, there are no established criteria for leadership effectiveness. Many different criteria have been adopted in the past: subordinate satisfaction with leader, group morale, group performance and leader-member relationships (Fiedler, 1986). As such, a number of complications arise when leadership effectiveness becomes a central issue within a theoretical account.

While Halbesleben, Novicevic, Harvey and Buckley's work provides an original and valuable account of the potential nature of temporal constructs in leadership (which integrates temporal

variables not previously considered within the leadership domain), the main limitation of this account is that the links to the process of awareness, behaviours and leadership effectiveness are not fully explained. Due to the level of immaturity of temporal research in leadership, it is suggested that if the ultimate goal is to link temporal variables emerging in leadership to leadership effectiveness, it is first important to have a sound and empirically based understanding of what those temporal variables are. This argument provides a justification of why this thesis is focusing on developing an empirical account of the individual differences that occur between leaders for temporal variables; only after these are fully understood can specific behavioural and leadership effectiveness accounts related to temporal leadership be fully articulated.

Time and, leader, follower and leader-follower relations

Bluedorn and Jaussi (2008) provide a review of literature focusing on both leadership and temporal variables. This review offers a valuable analysis of temporal dimensions in relationships and processes related to leadership. The authors make propositions concerning the prospective roles of temporal dimensions in these leadership-related relationships and processes. The authors draw conceptual distinctions between the contexts in which time as a research variable occurs within the leadership domain. For example, the distinction is made between time occurring with a focus on the leader, on the follower, and on leader-follower relations. This is a valuable distinction that should be considered when reviewing the leadership literature. There is a clear case for considering more than one context at a time, as reflected in the notion that a leader cannot be a leader without his or her followers.

As mentioned above, the FRLT is primarily perceived as a social influence process (e.g., Bass, 1985; 1998; Bass & Avolio, 1994) and that 'leadership is about transformation....in the motivations, values and beliefs of followers'. Within the FRLT, while the leader's behaviours are considered, there is also a strong focus on how these behaviours operate in a leader-follower dyad. Thus, there is a clear case for considering not only the temporal characteristics of the

leader but also those of the follower (a follower approach to leadership) and those occurring in the leader-follower dyad (a leader-follower-relationship approach to leadership).

Bluedorn and Jaussi's literature review was structured to facilitate a theoretical discussion of five main temporal dimensions: entrainment, polychronicity, pace/speed, punctuality and temporal depth. It should be noted that it was not the intention of the authors to provide an account of all temporal variables within leadership as the authors described their approach as a 'rich sampling of the extant literature versus a completely exhaustive review' (p.654). This will be taken into consideration when drawing on Bluedorn and Jaussi's work when developing a model accounting for temporal individual differences in leadership. Presented below are the four time dimensions discussed in Bluedorn and Jaussi's review. The presentation of these dimensions, in addition to including key theoretical propositions made by the authors, will also draw on further literature not included in their review to, provide historical background of the constructs, and to critically review the constructs in a leadership context.

Entrainment in Leadership

Firstly, the origins of entrainment featuring in Bluedorn and Jaussi's work can be traced to the biological sciences (Ashcoff, 1965) when the term referred to the process 'by which one internal (or endogenous) rhythmic process is captured and modified by another (endogenous or exogenous) rhythmic process' (Kelly, 1988, p91). For example, there are physiological processes that become entrained (adjust) to the circadian rhythms in a particular time zone (sleep, digestion, etc.). Entrainment was first introduced to organisational studies by McGrath and Rotchford (1983). The social entrainment model that followed this introduction (Kelly & McGrath, 1985; 1986) consisted of four components.

The first component of the entrainment model is a set of multiple endogenous temporal (rhythmic) processes. These processes are deemed to occur on individual, group and organisational levels of behaviour. The second component is a system that acts to synchronise the endogenous processes from component one. However, as Kelly (1988) notes, a system with an adaptive response is not

as clear in the context of social phenomena as in the biological sciences. For example, the hypothalamus is responsible for regulating core body temperature in relation to physiological response to external stimuli (i.e., temperature). Kelly suggests that, within the context of social phenomena, this component simply describes the entraining process, for which Ancona and Chong provide a concise definition in the context of social sciences: 'the adjustment of the pace or cycle of an activity to match or synchronise with that of another activity.' The third component refers specifically to the behaviours that result directly from the entrainment process. This may be the timing of conversations between the leader and follower(s) or a pattern of task performance (Kelly, 1988). The fourth component of the model refers to the external cycles or events that influence endogenous patterns of behaviour in individuals. For example, a leader can set a deadline (i.e., an external event), which can affect the follower's activity pattern both in and out of the workplace.

Since the introduction of the social entrainment model, the concept of entrainment has received a significant amount of interest from researchers. Ancona and Chong (1996) and Bludorn (2002) provide a clear elaboration on the concept of entrainment within the context of organisational research. For example, Bludorn (2002) describes the entrainment process that occurs between Trenton State Prison and the same city's rail schedules. The rail system 'acted as the entrainer, the behavioral oscillation that captured the rhythm of the shift schedule' (p.147). Ancona and Chong (1996) also introduced the concept of a zeitgeber within the context of an entrainment process. A zeitgeber is defined as a signal or cue that modifies the pace or rhythm of another event or person, and therefore acts as a 'synchroniser' or 'pacing agent'. An example of a zeitgeber in an organisational context is the fiscal year. The fiscal year therefore is a powerful pacing agent, as other organisational rhythms will be entrained to it; for example, budget planning and accounting processes will be synchronised by the fiscal year and the pace of activities within these processes will be influenced by the fiscal year.

Bludorn and Jaussi (2007) developed the notion of entrainment by proposing that it is a process that can occur within and between levels of individuals and groups. These scholars justify this proposition by stating that 'because of the known psychological processes that drive individuals

towards learning, similarity, identity enhancement, and consensus, it is appropriate to apply this theory to micro-level interpersonal behaviors' (Bluedorn & Jaussi, 2008; p.654). It is also suggested that the traditional view of entrainment is that there are two rhythms that coincide with each other so that the phases within each occur at the same time. However, in addition to this traditional view of entrainment, Bluedorn (2002) and Bluedorn and Jaussi (2008) purport that entrainment can still occur if a phase within one rhythm can consistently lag behind another rhythm, rather than both occurring simultaneously. Integral to the point here is that entrainment can occur if two rhythms occur simultaneously or if 'the phases of each rhythm occur at a consistent time in relation to each other' (Bluedorn & Jaussi, 2008, p.653). An example of the latter type of entrainment is provided by Bluedorn and Jaussi, who describe an example of leading entrainment. Specifically, the leader's schedule is described as a rhythm, while the follower's own schedule as another rhythm. In their example, a subordinate is described as likely to arrive to a meeting with their superior a few minutes early to avoid any negative sanctions or perceptions. Thus, the two rhythms do not occur simultaneously but there is a consistent relationship between both rhythms, as the follower typically arrives before the leader. However, while this does provide an example of entrainment, it should also be considered that the time personality of individuals in the workplace may be an important factor in such a situation. Time personality could be perceived to be a mediating factor in such a situation. For example, individuals who have a very strong preference for punctuality (i.e., high on the Punctuality scale of the Time Personality Inventory (TPI), are likely to be consistently earlier to a meeting than individuals who have a weaker preference for being on time. Thus, if a leader has a much stronger preference for punctuality than the follower, or vice-versa, entrainment as described by Bluedorn and Janussi (2008) could be deemed to occur.

It has been mentioned that a zeitgeber is a powerful synchroniser or pacing agent. The notion of a leader representing a zeitgeber will now be introduced. Bluedorn and Jaussi (2008) and Clemens and Darlrymple (2005) describe how leaders and, specifically, the behaviours they exhibit can potentially entrain the individuals they lead. While the notion of a leader representing a zeitgeber

appears tangible, it is proposed here that the leader can create behaviour per se. The perceived problem with such an approach is that arguably a number of factors may influence whether the leader actually consistently (aligned to the notion of entrainment) changes an individual's behaviour. Bluedorn and Jaussi (2008) propose that a situation where a subordinate shows up to a meeting early is a situation where entrainment has occurred through a leader acting as a zeitgeber. However, as noted, individuals differ in terms of their preference for punctuality, and it is therefore possible that this individual difference factor (punctuality) is responsible for the pattern (either the leader or subordinate arriving early) rather than the leader him- or her- self. Similarly, Clemens and Dalrymple (2005), provide an example of a leader representing a 'human zeitgeber'. Their example concerns a CEO of a North American company who is having problems with absenteeism (staff arriving late or early for work). While in response to this issue the company initially introduced formal working times, the CEO's own habit of arriving early at work was described as actually influencing staff to arrive before the formal start time for the day. However, as Clemens and Dalrymple acknowledge, characteristics related to the leader (such as personality) were likely to be influential in causing the observed employee behaviour.

While it appears a leader could represent a zeitgeber (through his or her behaviour), there seem to be a number of factors (e.g., individual and situational) which may influence whether entrainment is successful; these warrant further investigation. It is, however, proposed that there are zeitgebers a leader can use to synchronise processes in the workplace or influence the pace of processes (such as work activity). For example, a leader can set deadlines for his or her followers. As reviewed in chapter 2, there is a fairly substantial amount of research on the effects of deadlines. Locke et al. (1990) provide an account within goal setting theory of the positive effects of deadlines (in relation to a goal) on motivation and behaviour. Research also shows that deadlines increase activity on the deadline-related task (Bluedorn & Denhardt, 1988). As Bluedorn (2002) states, a deadline can operate as a zeitgeber influencing the speed or tempo aspect of entrainment. The review of group activity also shows that deadlines can influence pace and phase patterns within project teams (Gersick, 1989; Seers & Woodruff, 1997). There is, however,

as noted in chapter 2, disagreement upon the specific effects on pacing and phase patterns from deadlines on group behaviour within a project environment. Nevertheless, as Bluedorn (2002) notes, 'the key point is that these patterns seem to be in response to a deadline' (p.154). It is proposed that deadlines are very powerful zeitgebers that will have an impact on work pace and phase patterns of subordinates. The link between leadership and deadlines as zeitgebers has, to the author's knowledge, not been discussed. With research demonstrating a number of effects that deadlines have on both individual and group behaviour, this could potentially be a valuable investigation for understanding the influence of entrainment within a leadership context.

Polychronicity in leadership

The next temporal dimension discussed within a leadership context by Bluedorn and Jaussi (2008) is polychronicity. Since the concept of polychronicity originates from a temporal context independent of leadership, it was reviewed in the previous chapter. Chapter 2 demonstrated polychronicity to be a temporal construct operating at individual, group and organisational levels. Research (as outlined in the previous chapter) has shown that polychronicity relates to outcome variables such as performance and well-being. Bluedorn and Jaussi (2008) posit that polychronicity has a potentially very important effect on the leader-follower relationship. They describe opposing polychronic preferences can have a negative impact in a leader-follower dyad. To confirm, these authors define polychronic preferences as 'the extent to which people (1) prefer to be engaged in two or more tasks or events simultaneously and actually so engaged (the preference strongly implying the behaviour and vice-versa), and (2) believe their preference is the best way to do things' (p.155). These researchers describe a situation where a manager is observed to have relatively monochronic preferences, while those exhibited by the follower are polychronic. This dyad was described as encountering a difficult working relationship. Bluedorn & Jaussi proposed that these polychronic differences between the two individuals could account for the difficulties encountered. One perceived limitation with this statement is that the research methods employed when observing these employees were not detailed.

Bluedorn and Jaussi (2008) also suggest that evaluation of a follower's work by the leader can potentially enhance leader-follower relations. Specifically, it is purported that leaders should have a strong understanding of polychronicity, which should facilitate managers to focus their evaluation judgments on the outcomes of behaviour at work rather than on the behavioural pattern itself. Performance variables have been reported to influence leader and follower outcomes (Martinko et al., 2007; cited in Bluedorn & Jaussi, 2008) through the attribution process.

Bluedorn and Jaussi propose that a leader's attributions about a temporal construct such as polychronicity could be related to outcome variables (such as satisfaction, well-being and performance, etc.). It is suggested that leaders being aware of polychronicity, and specifically the different approaches to work that can result from these preferences, will likely reduce errors relating to this attribution. Such a reduction in error is deemed to lead to higher follower perceptions of perceived evaluation fairness. Further to Bluedorn and Jaussi's suggestions, it is proposed that for leaders to achieve a strong understanding of polychronicity and the effects on followers' work, they should first be aware of the behavioural manifestations of the polychronic preferences of their individual followers. For example, an individual who engages in tasks in a serial manner (attempting and completing one task before moving onto the next) reflects a monochronic preference – provided that the work environment allows the individual to exhibit their temporal preferences. Arguably a leader should be aware of how to create such an environment. As noted by Bluedorn and Jaussi (2008) there are several tasks that can be approached differently in terms of polychronic behavioural patterns, but the outcomes remain indifferent. Thus, a leader can potentially provide the follower with the autonomy to approach a task in their preferred temporal pattern. Secondly, a leader should be aware of the demands of a job in terms of the temporal pattern required for it to be completed effectively. It is proposed that there are roles and, more at a micro level, tasks that require a specific temporal pattern of polychronicity for the outcome to be effective.

Pace in Leadership

Another temporal concept Bluedorn and Jaussi discuss as an aspect of the leader-follower relationship is pace. The notion of pace has already been discussed in a leadership context in Halbesleben, Novicevic, Harvey and Buckley's (2003) model of temporal complexity. In addition to Halbesleben, Novicevic, Harvey and Buckley's discussion of the concept, Bluedorn and Jaussi identify a body of research investigating the effects of leader and follower immediacy on the quality of Leader Member Exchange (LMX). Although not specifically investigating pace, this research aims to examine the notion of the immediacy of follower responses to leader requests for carrying out an action, and therefore has an implicit notion of pace specifically in relation to a follower's response (i.e., pace of their response). Research has found a negative relationship between immediacy in a leader-follower relationship and higher quality of a leader-member exchange (Sparrow & Liden, 1997; Uhl-bien & Maslyn, 2000; cited in Bluedorn & Jaussi, 2008). Thus, the more immediate a follower conducts a request from the leader there is a negative relationship to higher quality leader member exchange. Sparrow and Liden (1997) explain this in terms of immediate reactions may cause the relationships to be based upon a 'tick for tack basis' and subsequently limits the quality of the relationship. Uhl-Bien and Maslyn develop the aforementioned explanation by arguing that consistent immediate reactions to a leader's request become limited by nature to a transaction- based relationship.

Another body of research Bluedorn and Jaussi (2008) present in their discussion of pace in a leadership context is the pace of leaders' actions. This turns the focus away from the relationship nature of leadership (leader-follower) and focuses instead on leader behaviour. The pace of leaders' actions was considered in Halbesleben, Novicevic, Harvey and Buckley's model of temporal complexity in leadership, for example in relation to decision making (e.g. Eisenhardt, 1989), as described above. However, Bluedorn and Jaussi provide a more detailed and diverse (in terms of behaviours) account of the pace of leaders' actions. The notion of different situations requiring different rhythms of pace is discussed. For example, Hunt and Ropo (1996) suggest that

as their assignments will, by nature, be relatively short, fast-track leaders are required to display a high pace for action so that leadership results are clearly visible to followers.

Temporal Depth in Leadership

As mentioned upon discussion of temporality within the model of temporal complexity, temporal depth refers to the distance looked into the past and future (Bluedorn & Ferris; Bluedorn & Jaussi, 2008). Bluedorn and Jaussi state that in leadership the notion of temporal depth in the context of leadership is more complex than when an individual's temporal depth is considered in a non-leadership context. The complexity in leadership appears to derive from research that found temporal depth to influence tasks that are predominantly only found in a leadership context. For example, Mumford et al.'s (2007; cited in Bluedorn & Jaussi, 2008) found that leaders select strategies for addressing crisis partly dependent on the timeframes they adopt. Similarly, Boal & Schultz (2007; cited in Bluedorn & Jaussi, 2008, p664) state that 'strategic leadership forges a bridge between the past, present and the future'. On reflection of the literature linking temporal depth to leadership, Bluedorn and Jaussi (2008) to conclude:

'Leaders and followers should acknowledge their individual temporal depths and negotiate the temporal depth parameters for significant activities regarding tasks and organizational orientations' (p664).

Time Management in Leadership

While time management and leadership have rarely been linked, recently Gill (2011) has made a call for further research linking these two concepts:

'We need to understand the interaction that takes place among the cognitive processes, emotions and volitional action (behavioural skills) in leadership, for example in effective time management' (p.288).

Gill (2011) proposes links between time management concept and different forms of intelligence

in the context of leadership:

‘Effective time management requires not only cognitive intelligence in prioritizing tasks and deciding what to do and how to do it, but also spiritual intelligence in deciding the meaning and value of these tasks in the first place, moral intelligence in assessing and deciding the ‘rightness’ of the tasks, emotional intelligence in using self-discipline and self-control in the face of anticipated boredom, fatigue, unpleasantness, etc., and behavioural skills in actually acting. It is no wonder that time management is difficult for many people’ (p.317).

This statement suggests that time management is complex and cognitively demanding for leaders. This statement reinforces the importance of further research into this area. This statement is also profound as it highlights intelligence as a construct is multi-dimensional. This is a notion that will be discussed further in the next chapter.

Conclusion

In conclusion, the literature review presented in this chapter is focused on identifying and examining the leadership literature with two main objectives. Firstly, key theories and models representative of leadership were examined to develop an understanding of the leadership context in which TI is being developed within. Secondly, literature examining temporal constructs in leadership was reviewed to support the development of the conceptual model of TI. This model will be presented in the next chapter. This aforementioned review demonstrated that the current literature tends to focus on specific aspects of time in leadership (often adopting a uni- dimensional perspective) and detached from central leadership theories and models (such as Full Range Leadership Theory). Shamir (2011) calls for further research into time and leadership, and proposes that this is important for the development of the leadership field. The next chapter will aim to integrate a number of temporal concepts into one account of time in leadership (the TI model). The shortcoming in existing literature is that a number of temporal theories in leadership are detached from central leadership theories and models will also shape the research

methodologies that aim to develop the conceptual model of TI. Subsequently, the development of TI will also seek to identify any potential links to one of the key leadership theories, the FRLT.

4

The Conceptual Model of Temporal Intelligence

The literature review presented in chapter 2 identified a number of temporal constructs that had been examined in an organisational setting. The literature review presented in chapter 3 demonstrated how a number of these constructs are relevant to a leadership domain. In this chapter, the findings from both literature reviews are critically examined to develop a conceptual model of Temporal Intelligence (TI) in a leadership context. While TI will be developed within leadership, consideration will be given to the structure of TI in a generalised context (i.e, not restricted to leadership). Following the presentation of this structure, aligned to research objectives, this chapter and succeeding research presented in this thesis will focus on developing the aspect of TI that accounts for leader individual differences in time related behaviours and cognitions directed to followers.

Process of developing the conceptual model of Temporal Intelligence

The process of developing the conceptual model of TI involved examining the temporal constructs identified in chapters 2 and 3, and critically reflecting on these to seek how these constructs may represent the time related behaviours and cognitions leaders direct to followers. Moreover, as time has been demonstrated to be a multi-dimensional construct, the model aimed to organize temporal behaviours and cognitions by dimensions of time.

Firstly, the temporal constructs that the literature review presented in chapter 3 showed to emerge in a leadership context were identified. The constructs were critically examined to understand how they may account for individual differences among leaders. This was an important stage as a number of the temporal concepts discussed in leadership, (such as the model of temporal complexity by Halbesleben, Novicevic, Harvey & Buckley, 2003), did not specifically discuss temporal constructs in the context of leader individual differences. The next stage was to compare and contrast the temporal constructs that emerged in leadership to identify unique dimensions of time. For example, temporality (as discussed by Halbesleben, Novicevic, Harvey & Buckley, 2003) was perceived as conceptually similar to temporal depth (as discussed by Bluedorn, 2008)

and time orientation (Zimbardo & Boyd 2008). The premise is that the conceptual model of TI proposes broad dimensions of time encompassing temporal constructs perceived to be conceptually similar. The development of the TI questionnaire that will feature in the next chapter will represent the TI model and will be subjected to statistical analysis (chapters 7 and 8) to define and redefine the dimensions of time. Thus, the emphasis in the development of the conceptual model was to ensure the dimension of time proposed adequately represented different sources of literature; this notion is central to the development of TI.

The next stage of the development of the TI model involved identifying the temporal constructs not emerging in a leadership context (i.e., therefore not featuring in chapter 3) and seeking for potential inclusion in the model by reflecting on how the construct may represent an individual difference between leaders. This included temporal concepts analysed at an organisational level that were not previously linked to individual differences (as shown in chapter 2).

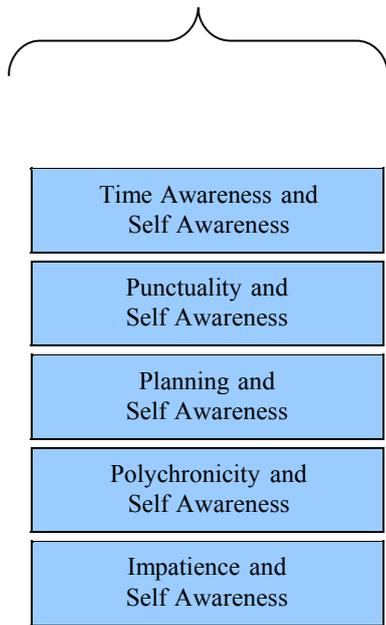
The development of the conceptual model was an iterative process, where temporal constructs were continuously compared and contrasted to identify either a fit into dimensions of time already accounted for by the model or to create a new dimension. To support this process, the researcher drew on the notes created from both literature reviews that were formed on the basis of three main criteria: the key aims, methods and findings/conclusions relating to each of the articles. The researcher also developed further notes on each of the dimensions of time identified in the model to facilitate the process of comparison and contrast. This led to the refined TI model, which is presented in this chapter. It is very important to acknowledge that while the TI model presented in this chapter was developed from two structured literature reviews, the term ‘Temporal Intelligence’ was introduced by Clemens and Dalrymple (2005) and was proposed to represent time-related behaviours of leaders. A number of examples of leadership behaviours was discussed by Clemens and Dalrymple. This doctoral research aims to build on the inspiring work of Clemens and Dalrymple by defining the structure of TI as an individual difference factor through drawing on research into time through a literature review and conducting empirical research.

Conceptual Model of Temporal Intelligence in Leadership

The diagrammatic representation of the refined TI model is presented in Figure 4.1

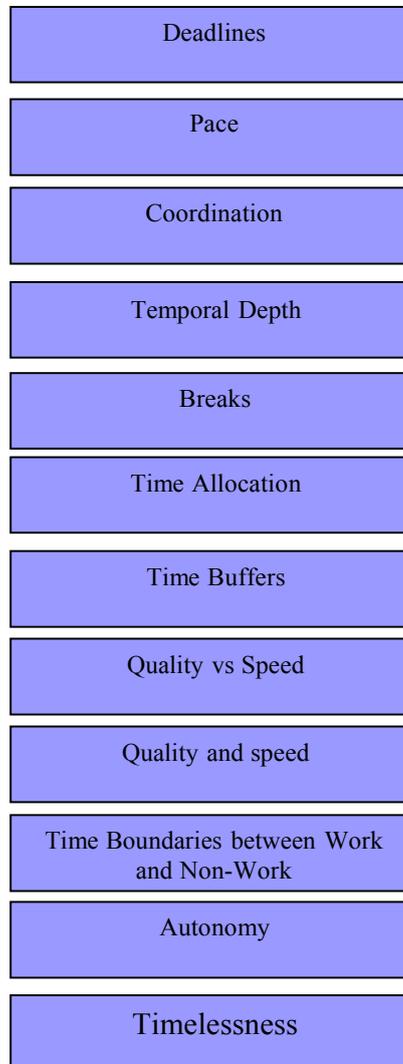
Figure 4.1 *Conceptual model of Temporal Intelligence*

Self-Referenced Temporal Practices

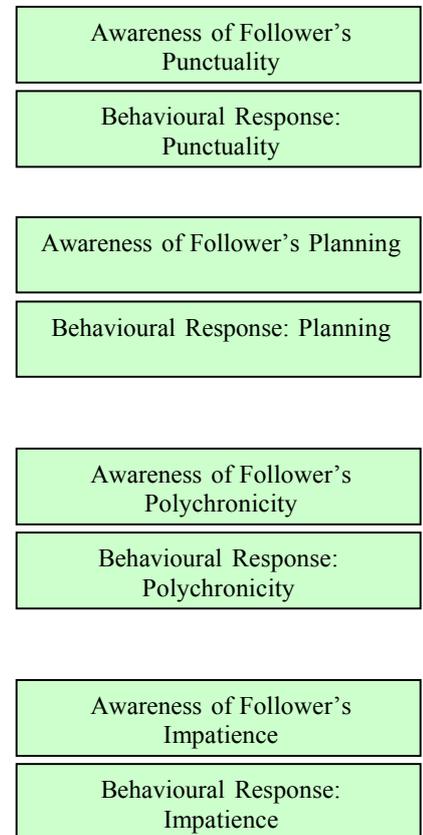


Inter-Individual Referenced Temporal Practices (leadership specific)

Global Temporal Practices



Adaptive Temporal Practices



The proposed model of Temporal Intelligence (TI) distinguishes between *self-* and *inter-individual* referenced temporal practices. The former refers to thoughts, behaviours and attitudes towards time that are with reference to the self. As reviewed in chapter 2, Francis-Smythe and Robertson (1999) found this to be an individual difference variable composed of a five-dimensional structure (time personality; please see Table 4.1).

Table 4.1

Structure of Time Personality (Francis-Smythe & Robertson, 1999)

Dimension	Description
Leisure-Time Awareness	Awareness of how time is spent
Punctuality	Attitudes towards 'being on time'
Planning	Attitudes towards planning and sequencing of tasks
Polychronicity	Preference for carrying out multiple tasks at the same time
Impatience	Preference of the speed at which to complete a task

However, in TI, the process of awareness is also considered. Subsequently, in the model, self-temporal practices refers to an individual's time personality and awareness of their own time personality.

It is suggested that this awareness is important for self-managing one's own behaviour. For example, one's preference for punctuality may have implications on which job roles are suitable for the individual in terms of temporal person-job fit (e.g. driving a train requires a high degree of punctuality). Thus, it is proposed that being aware of one's own preferences can support self-management of behaviours, which may include selecting a job or adapting one's behaviour to support a person-job fit. Similarly, if an individual is aware that they have a preference for monochronicity, this awareness, can be used to strategise selecting a job (i.e., for a congruent fit) and planning work tasks. The positive effects of such behaviour according to temporal person-job fit studies presented in chapter 2 (e.g. Hecht & Allen, 2005) may relate to performance and well-

being. Thus, it is proposed that being aware of one's own preferences can support self-management of behaviours, which may include selecting a job or adapting one's behaviour in a team setting or for particular tasks. In sum, being aware of one's temporal own preferences and the implications that these preferences have in an organisational setting is potentially beneficial to an individual's performance, well-being and individual relations.

Clearly self-referenced temporal practices require further research to develop this aspect of TI. The primary research objective of this Doctorate thesis is to identify time related differences in leadership, and specifically a leader's temporal behaviours and cognitions directed to followers. TI in leadership will subsequently focus on inter-individual referenced temporal practices, which refers to a leader's cognitions and behaviours in relation to time that are directed towards followers. In terms of developing the TI construct in leadership, it is important to recognise that one aspect of TI is being empirically investigated. Thus, the self-referenced form of temporal practices is perceived to predominantly relate to managing one's own behaviour in a general organisational setting (i.e., not just the leader) and therefore does not fall within the primary research objective of this doctoral research. However, this area (self-referenced temporal practices) of TI is proposed to represent a potentially fruitful source for future research. In conclusion, all succeeding research will focus on the notion of TI in leadership, which will focus on inter-individual temporal practices. In relation to inter-individual referenced temporal practices, this is further broken down into two typologies: *global* and *adaptive* temporal typologies.

Adaptive Temporal Practices

The adaptive form of temporal practices represents a leader's process of awareness and behavioural adaptation based upon the time-related dispositional characteristics of followers and the time characteristics of their respective jobs. More specifically, this typology of temporal practices is concerned with the extent to which a leader is aware of the behavioural manifestations of four dimensions of time personality for each of his or her followers. The leisure-time awareness dimension is omitted due to its deemed conceptual irrelevance to workplace

behaviours, since the construct focuses on time awareness outside a work context. It is also proposed that the leader should be aware of the Job Time Characteristics (JTC; see chapter 2) that are required for the job to be done effectively (relating to the four dimensions of time personality). The final component of the adaptive typology of temporal practices refers to the behavioural responses employed as a result of the awareness of the aforementioned job and individual time-related characteristics.

Considering the process of awareness, we can see that there are two elements to this. The first is an awareness of Polychronicity, Punctuality, Planning and Impatience in relation to the behavioural manifestations of an individual's preferences of these temporal dimensions, and the second is the demands of the job. Firstly, in regard to the former type of awareness, it is proposed that leaders will vary in terms of the extent to which they are aware of the preferences their individual followers' have across the four temporal dimensions described above. This awareness as mentioned is proposed to be acquired through observing the behavioural manifestations of these temporal preferences. This requires a leader who is perceptive to how a follower tends to work when he or she has a choice and thus does not have direction or expectation on how to work in relation to the four dimensions of time. This is important; an environment (which may be limited to a task or project as opposed to a role) where specific temporal demands have not been requested allows the individual an opportunity to approach work in their preferred manner. For example, an individual who prefers to work on tasks in a sequential and linear manner (denoting a preference for monochronicity) would have an opportunity to approach a task in such a way if the demands of the job or the leader were not explicit on how the task should be approached in relation to polychronicity. The circumstance of a follower being free from temporal demands is dependent on situational factors (i.e., temporal demands of a task) and will depend on his or her leader's behaviour. That is to say that the extent to which this situation can occur will be influenced by the degree to which a leader requests, expects or encourages a follower to approach tasks in the same way that he or she would. Secondly, it is proposed that a leader can develop awareness of their followers' temporal preferences through perceiving a follower's negative emotional reactions to

situations in which a follower is working in a way that is not aligned to their preference. For example, an individual who usually prefers to work on tasks one at a time may show stress when their in-tray includes a number of tasks. While potentially there may be a few ways to be aware of an individual's temporal preferences, a fundamental requisite to developing this awareness is to understand the behaviours that are attributable to the four factors of time personality.

The process of awareness in this component of the TI model also includes an awareness of the JTC (Francis-Smythe & Robertson, 2003). As reviewed in chapter 2, the development of the JTC construct was based upon a study asking respondents about behavioural expectations in relation to the four dimensions of time personality. This therefore focuses on the role. Within the model of TI, however, it is proposed that it is not only the role that a leader should consider but also, at more of a micro level, the tasks or projects that a follower engages in. The premise here is that temporal demands (although likely to be role specific) can potentially vary at more of a micro level (i.e., task of project). Thus it is proposed that a leader should be perceptive of changing temporal demands.

The final aspect of adaptive temporal practices refers to the actual behavioural responses employed by the leader as a result of their awareness of both the temporal preferences of the follower and the temporal demands of the job role (including individual tasks and projects). The process of awareness is proposed to be a pre-requisite of a leader's behavioural repertoire. It is proposed that there are a number of ways in which the leader can behave which represent this behavioural repertoire within the context of TI. It is proposed that the fundamental purpose to a leader adapting their behavior to situational and follower time-related characteristics is to support the development of a congruent fit between the follower's individual time-related behaviours and the time-related characteristics of the work experienced by the follower. To develop this point, temporal- job-fit-related studies will be drawn upon. These studies, as reviewed in chapter 2, examine the temporal preferences of followers (the way in which they would prefer to approach tasks in a time-related sense) and the experienced time characteristics of the work, and the effects if the two are aligned. It is worth noting that the time dimensions studied were the same for both

individual preferences and experienced characteristics. For example, the preferences of an individual towards planning tasks (i.e., the time dimension of punctuality) will also be examined in terms of the extent to which their role is deemed to require the individual to plan their tasks (experienced temporal characteristic). The empirical evidence in support of the above proposition of a leader matching the job characteristics to an individual derives from time-related person-job characteristics (on specific temporal dimensions) studies introduced in chapter 2 that found the more congruent the *fit* relationship, the higher the job performance (Hecht & Allen, 2003; Slocombe & Bluedorn, 1999) and well-being (Francis-Smythe & Robertson, 2003; Hecht & Allen, 2005). Firstly, Hecht and Allen (2005) showed that polychronicity was related to job satisfaction, self-efficacy and psychological strain. They found that individuals with more congruent a match reported higher levels of job satisfaction and self-efficacy and lower levels of psychological strain, compared to individuals with a less congruent match (n=745). There was one exception to this; the results showed that if the experienced work characteristics were slightly higher (a slight excess and therefore not perfectly congruent) than those preferred by the follower, this resulted in the highest levels of job satisfaction and self-efficacy. A potential explanation for this finding has been put forward by Hecht and Allen who suggest that the slight excess in polychronicity may actually satisfy other values that polychronicity may affect, such as desire for challenge or complexity. However, the positive effects (in terms of outcome variables) were only observed for when the excess was slight (in terms of experienced polychronic work), and any greater ‘mismatch’ would potentially become threatening and challenge values such as competence.

It is proposed that the leader’s role in terms of developing a congruent temporal fit as described above is facilitative in nature, as situational factors will determine the feasibility of a congruent temporal fit. The process of developing a congruent fit, which represents the behaviours a leader employs (behavioural repertoire) is proposed to involve the concept entrainment (McGrath & Rotchford, 1983), as reviewed in chapter 2. Bluedorn and Jaussi extended the concept of ‘entrainment’ within a leadership context to mean a ‘phenomenon that can occur within and between levels of individuals’ (Bluedorn & Jaussi, 2008; p.657). Based upon the aforementioned

conceptual discussion of entrainment, it is proposed that this concept is an underlying process within TI. Developing this point by drawing on the work of Clemens and Dalrymple (2005), Bluedorn and colleagues (Bluedorn, 2002; Bluedorn & Jaussi, 2008; Standifer & Bluedorn, 2006), chapter 3 proposed that a leader could entrain followers' temporal preferences to experienced temporal work characteristics, and vice-versa. For example, the leader can play a facilitating role in adapting the behaviours of the follower to meet the time demands of the job. There is empirical research that supports this proposition and provides a basis for predicting the relationship between TI and job-related affective well-being of followers.

As reviewed in chapter 2, Francis-Smythe and Robertson (2003) found that time personality and temporal person-job fit significantly predicted job-related affective well-being ($n=277$). Specifically, those individuals higher on planning, punctuality and polychronicity had higher reported levels of well-being than those individuals who scored lower on these three time dimensions. Potential explanations for these findings were that the behavioural manifestations of low scores on these three dimensions may have caused stress between work relations (e.g. managers and peers) and also added work pressure (e.g. subsequent to missing a deadline). However, the key finding that suggests that leaders can facilitate a behavioural change in followers' temporal behaviours relates to multiple regression analyses that found time personality moderated the relationship between personality-job fit and well-being (this model producing the *best* prediction of well-being out of all models examined). Thus, in this respect, socialisation effects from the job were considered to account for individuals adapting behaviours to fit job demands. Ostroff (1997) suggests that individuals are attracted to organisations that have similar characteristics to their own, and that organisations tend to select individuals on a similar 'fit' basis. The degree of fit is thus proposed to increase with tenure as employees who do not 'fit' leave. However, Francis-Smythe and Robertson did not find support for this hypothesis in their study. They in fact argue that Attraction-Selection-Attrition as a theory may be better reworked as Attraction-Selection-Adaptation for their study, to reflect the possibility that individuals who do not initially fit with the organisation change rather than leave. The analyses

between fit and tenure provide partial support of this proposed amendment to Ostroff's original theory.

Thus, in the context of TI, a leader can arguably have a significant role in the socialisation process to facilitate an employee changing their temporal behaviours, which aligns with the concept of entrainment. The regression model in Francis-Smythe and Robertson's (2003) study demonstrating time personality to have a moderating relationship between person-job fit and well-being suggests that the leader can entrain an employee to workplace characteristics and in this way cultivate a congruent person-job fit. Although a change may not consistently be necessary, there are two situations in which it may be *appropriate* to employ this specific adaptive behaviour (in terms of performance or well-being). Firstly, the demands of the job for it to be accomplished effectively are specific (i.e., a project requires an individual to work on a number of tasks at the same time). Secondly, the individual's temporal preferences may increase work pressure experienced by them if they do not change their behaviour. For example, an individual may have a preference for being punctual but have a low preference for planning. Subsequently, behavioural manifestations of these preferences may impede (referring to a low preference on planning) their ability to complete the work on time and cause negative consequences on well-being for that individual (Francis-Smythe, 2006). The leader therefore can arguably support planning-related activities in this situation so that the negative consequences of not implementing any such planning activities are eliminated.

In both these situations, the entrainment concept could be perceived as prevalent, as essentially the leader is playing a facilitative role in entraining the individual to the temporal work environment. This seems consistent with Bluedorn and Jaussi (2008) who state that entrainment can occur at micro-level interpersonal behaviours. It is important to note that the extent to which an individual can be entrained may be affected by the extent of the *discrepancy* between the follower's temporal preferences and the temporal demands of the job (and the leader).

Another proposed means to develop a congruent work-employee temporal fit and yield the

potential positive outcome variables related to performance and well-being, is for the leader to select a follower to complete a task or project based upon whether the temporal preferences of that follower are aligned with the temporal characteristics that will be experienced on that task or project (hence producing a congruent person-job role fit). For example, a leader who is *highly* aware of their subordinate's temporal preferences and the time demands of the job has the potential, depending on the situation, to adapt their behaviour in a number of ways. Firstly, the leader may adapt characteristics of the work to suit the individual follower's temporal preferences. For example, a leader who is aware of an individual who prefers to work on one task at a time (monochronicity) could delegate tasks one at a time to that follower (such as in an in-tray). Similarly, there are a number of temporal work characteristics that could be fostered by the leader to meet polychronic preferences of an employee. Typically, polychronicity is interpreted as a uni- or multi-dimensional construct (Adams, 2009). Benabou (1999) provides evidence of work characteristics that are significantly correlated with a uni-dimensional measure of polychronicity. Consideration of this field of work may provide further discussion into the exact nature of the work characteristics that can be nurtured to meet the needs of *polychronic* employees.

Global Temporal Practices

Table 4.2

The dimensions of time in existing literature that have guided the development of the global temporal practices situated within the conceptual model of temporal intelligence

Dimension of Time in Conceptual Model of Temporal Intelligence	Relevant Theoretical or Empirical Body of Literature	Specific Dimension of Time
Deadlines	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	Schedules and Deadlines
	Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003)	Timeframe Awareness
Pace	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987) Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003)	Work Pace Tempo Awareness

Coordination	Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003)	Synchronisation Awareness Simultaneity Awareness Sequence Awareness
Temporal Depth	Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003); Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	Temporality Future Orientation
Breaks	Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003)	Pauses/Gaps Awareness
	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	
Time Buffers	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	Time Buffer in Work Day

Time Allocation	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	Allocation of Time
Quality vs Speed	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	Quality vs Speed
Time Boundaries Between Work and Non-work	Time Dimensions of Organisational Culture Questionnaire (Schriber & Gutek, 1987)	Inter-organizational Time Boundaries
Autonomy	Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003)	Autonomy
Timelessness	Model of Temporal Complexity (Halbesleben, Novicevic, Harvey & Buckley, 2003); Flow Theory (Csikszentmihalyi, 1975, 1982, 1990); Flow Theory	Timelessness Flow

Table 4.2 provides a summary of the main theoretical and empirical models contributing to the development of the conceptual model of TI. The following discussion of each individual time dimension provides a detailed analysis of the literature guiding the development of the TI model.

Time Dimension One: Deadlines

There has been a number of studies investigating the implications of deadlines on performance, intrinsic motivation and task progress (Amabile, DeJong & Lepper, 1976; Gevers, Rutte & Van Eerde, 2006; Sanna, 2005; Waller, Conte, Gibson & Carpenter, 2001; Waller, Zellmer-Bruhn & Giambattista, 2002). Deadlines have also been considered at a cultural level (Benanou, 1999; Onken, 1999; Schriber & Gutek, 1987). However, to the author's knowledge there has been no investigation into how leaders differ on this time dimension. Thus, TI proposes to investigate the leader's thoughts and behaviours about imposing deadlines on a subordinate. It is also important to recognise the different stages of a deadline (i.e., the start and end deadline parameters). A number of papers have acknowledged the effect of different stages of a deadline on individuals but these have not considered the leader's role (Gevers, Rutte & Van Erde, 2006; Waller, Conte, Gibson & Carpenter, 2001).

Time Dimension Two: Pace

Pace refers to the frequency of a specific domain of activities in a social unit of time (Lauer, 1982). While pace has been employed here, it is important to recognise that several terms have been applied to this construct, such as speed (Bluedorn, 2000, 2002; Onken, 1998) and tempo (Harvey & Novicevic, 2001; Halbesleben, Novicevic, Harvey & Buckley, 2003; Lauer, 1981). The use of different terms appears to underlie a personal preference rather than any principal conceptual distinctions. Importantly, in line with Lauer (1981), pace is defined within the conceptual model of TI as activity specific. Pace (or referent term) of activities has been operationalised as a research variable in a number of studies at an organisational cultural level (e.g. Onken, 1999; Schriber & Gutek, 1987). Furthermore, Onken (1999) found organisational cultural values towards speed (i.e., a referent of pace) to be linked to organisational performance. Task pace is clearly not directly controlled by the leader, but this dimension intends to represent the pace a leader encourages/expects from his or her subordinates. Firstly, it is important to consider whether the leader consistently expects a

certain level of pace (e.g. *high pace*: high rate of task accomplishment). However, variances in pace expectations should also be considered to demonstrate the leader's flexibility in the pace of task progression. This is based on the premise that task pace can be constant or change (Halbesleben, Novicevic, Harvey & Buckley, 2003)

Dimension Three: Coordination

This dimension of time is proposed to include 3 sub-dimensions; synchronization, sequence and simultaneity with zeitgebers. While these three sub-dimensions are presented in one dimension in this model, items will be developed to represent all three sub-dimensions in the Temporal Intelligence Questionnaire. This will ensure that statistical analyses can confirm or restructure the proposed dimensional structure.

These three sub-dimensions feature in Halbesleben, Novicevic, Harvey and Buckley's (2003) model of temporal complexity. Synchronization, sequence and simultaneity with zeitgebers have been included in one dimension as it is perceived that they are conceptually related constructs. For example, sequence refers to 'patterns in the timescape' (Halbesleben, Novicevic, Harvey & Buckley, 2003. p441) and simultaneity reflects 'a cooccurrence of events' and is discussed in relation to sequence and the notion of coordination. For example, Halbesleben, Novicevic, Harvey and Buckley (2003) suggest that leaders need to be aware of the sequencing of activities to facilitate the process of simultaneity as the cooccurrence of events can refer to when 'a sequence of events occur at the same time' (p442). Coordination is considered by Halbesleben, Novicevic, Harvey and Buckley (2003) in relation to simultaneity as these scholars posit 'leaders should design coordination' to 'realize the most opportunities for the success of their organizations' (p442). Coordination is subsequently implicitly linked to simultaneity and sequence. It is proposed that coordination is also reflected in the notion of synchronization that is defined as the 'integration of people, groups and processes' (Halbesleben, Novicevic, Harvey & Buckley 2003, p442).

Coordination is proposed to represent an individual difference factor in TI as it is the leaders awareness and behaviours relating to:

- i) synchronizing followers, groups and events . ii)
sequencing in events or processes.
- iii) cooccurrence of events.

Dimension Four: Temporal Depth

As reviewed in chapters 2 and 3, the notion of temporal perspectives, notably the past, present and future orientation, has appeared frequently in the time literature. This review has however shown that the manner in which the three temporal orientations are examined does vary. Traditionally, the three orientations have been examined in individuals by referring to the extent to which they align themselves to one orientation. This approach is followed by the future-orientation concept (Ashkanasy, Gupta, Mayfield & Trevor-Roberts, 2004; Schriber & Gutek, 1987). However, a more contemporary approach to examining temporal orientations is to specify the distance an individual focuses into a specified orientation (such as the past). This is reflected in Bluedorn's notion of Temporal Depth (2000; 2002), which is defined as: 'The temporal distances into the past and future that individuals and collectivities typically consider when contemplating events that have happened, may have happened, or may happen' (2002; p.114). TI is concerned with both the behaviours and cognitions that relate to the interaction of different timeframes (e.g. using more than one time perspective, frequently but not exclusively at the same time). Subsequently the notion of 'depth' in TI is defined by the extent to which a leader uses more than one temporal perspective (reflecting depth in temporal perspective). This approach to conceptualising temporal perspective has also been aligned closely to Bluedorn and Ferris's (2004) notion of total temporal depth.

Dimension Five: Breaks in Workflow

This time dimension refers to breaks or gaps in the workflow. Roy (1960) observed that workers tend to take socially orientated breaks (ie., breaks and interruptions in workflow) and

concluded that his observations supported the notion that ‘one key source of job satisfaction lies in the informal interaction shared by members of a work group’ (p.166). Ancona, Okhuysen and Perlow (2001) argue that that socially orientated breaks serve as a ‘punctuation device that can easily be put on a temporal map to show how work and social activity alternate throughout the day’ (p.521). Original work on interruptions by management scholars (e.g. Grove, 1983; Mintzberg, 1990; Perlow, 1999) tended to interpret interruptions as having a negative effect on organisational members (i.e., by being disruptive). For example, Perlow (1999) proposes that the frequent coworker interruptions experienced by software engineers lead to ‘a time famine’, which was described as the perception among the engineers of having more job responsibilities than the time in which to do them. However, some studies have considered the more positive outcomes of interruptions. For example, an early research study by Zeigarnik (1927) showed that interrupted tasks were recalled more easily, which led a number of researchers to examine the positive effects of interruptions (Anconca, Okhuysen & Perlow, 2001; Beeftink, Van Eerde, & Rutte 2008; Roy, 1960; Waller, 1999).

The literature on interruptions however was criticised in the late 1990s for not having clear definitions of what represents an interruption. For example, Moray (1993) stated that there was ‘no systematic body of research on what physical or psychological characteristics make an interruption’ (p.120). However, to address this perceived shortcoming, Jett and George (2003) aimed to introduce ‘meaningful distinctions between different conceptualisations of interruptions’ (p.495). They examined four types of interruptions to work: intrusions, breaks, distractions and discrepancies. Breaks were defined by Jett and George ‘as planned or spontaneous recesses from work that interrupts the task’s flow’ (p.5). Within TI it is proposed that breaks represent a type of interruption, although not necessarily confined to interrupting a task’s flow. For example, a break may occur before or after a task. In line with Jett and George, breaks can potentially have a positive or negative impact on followers, and this is likely to be situational dependent. The positive outcomes of a break firstly relate to recognition that an individual cannot continually be cognitively or physically engaged on a task, and a break can therefore relieve stress or fatigue. Jett

and George propose that breaks can enhance job satisfaction and performance. These scholars also suggest that breaks can provide an opportunity to develop creative ideas. Mainemelis (2006) suggests that breaks before a task can actually be helpful, and provides a detailed discussion of how socially orientated breaks, referred to as a form of diversionary play, can benefit the creative process and intrinsic task motivation. Halbesleben, Novicevic, Harvey and Buckley (2003) also propose that gaps in workflow (occurring as a result of social interaction) are linked to creativity as they allow creativity through divergent social interaction. Breaks are also proposed to have a potentially negative effect on individuals, as they may result in procrastination to complete a task. From the TI perspective, breaks refer to the extent to which the leader encourages breaks to occur and structures work to facilitate the formation of breaks. Thus, it is recognised that breaks are not exclusively determined by the leader (in fact there are potentially a number of other factors involved); TI is concerned with differences among leaders in the extent to which they encourage breaks and proactively structure the work environment to develop breaks. However, it is proposed that spontaneous breaks or the leader's intent to initiate a break with a follower can actually result in Jett and George's conceptualisation of the intrusion interruption.

An intrusion is defined by these scholars as 'an unexpected encounter initiated by another person that interrupts the flow and continuity of an individual's work and brings that work to a temporary halt' (p.495). As in the case with breaks, intrusions are proposed to have potentially both positive and negative effects on employees. For example, intrusions may have a positive impact on an individual by allowing informal information sharing or informal feedback. For example a follower may be able to share knowledge with the leader on an informal basis as opposed to in a formal meeting, or may receive valuable feedback on a task. However, as Jett and George note, intrusions may actually cause individuals to perceive time pressure if a task is time-sensitive and the intrusion reduces the time available to work on the task – a notion supported by Perlow's (1999) study cited above.

Another perceived potential negative effect from intrusions is that they can divert an individual's

attention from something cognitively demanding, such as a complex task or a task that is being learned. For example, a leader may spontaneously initiate a socially orientated conversation with a follower, which may be distractive if the follower is fully engaged in the task. While Jett and George propose that there are two other types of interruptions (distractions and discrepancies, these two relate to external environmental stimuli and individual perceptions respectively, which are therefore considered outside the remit of this TI model which focuses on how leaders' cognitions and behaviours affect followers.

It is also proposed that the distinction between breaks and intrusions is more difficult to define when considering the leader in the context of interruptions, as the result may be influenced by how the interruption is initiated and developed. One way to distinguish between the two is to consider intrusions as having the leader directly interrupting the workflow in a one-to-one interaction with the follower that may not have a socially orientated motive. In contrast, breaks may be facilitated by the leader through work structuring, but may both include or exclude the leader themselves. Ambiguity arises when a leader interrupts a follower from their task with a primarily social motive, as this type of interruption could be defined either as a break or as an intrusion. It is therefore proposed that while both breaks and intrusions should be considered in the context of interruptions within TI, these should not be considered as mutually exclusive categories.

This dimension of time considers social time in the workplace in terms of the leader's potential influence. TI will therefore measure the extent to which a leader encourages and proactively supports the development of breaks and intrusions in the workplace.

Dimension Six: Time Buffers

The time buffer concept was developed by Schriber and Gutek (1987) in their measure of temporal organisational measure. It was purported to reflect the extent to which an individual builds an unspecified amount of time into a schedule to allow for uncertainty or imprecision in

scheduling. However, following reliability analysis (low alpha coefficient) this construct did not receive sufficient support to retain it as a time dimension of organisational culture. Nevertheless at the conceptual stage of the TI model it was decided to retain this time dimension. Due to the context of TI, the definition of time buffers has been adapted from above to refer to the extent to which a leader builds an unspecified amount of time into a follower's schedule (i.e., 'to do' list) to allow for uncertainty or imprecision in scheduling, and/or encourages the follower to build an unspecified amount of time into their own scheduling (e.g., when giving lead times to clients).

The reasons for including this time dimension, despite Schriber and Gutek's results from reliability analysis, will now be detailed. Schriber and Gutek suggest a couple of plausible explanations for why time buffer was not supported by the results. Firstly, the respondents may not have been sufficiently aware of the presence or operation of buffers to report on them clearly. However, from TI perspective it is plausible to assume that followers may not be aware if their leader has built a 'buffer' into their scheduled workload (if structured by the leader). A second reason for the unsupportive results may have related to the notion that the 'concept may not have been operationally defined sufficiently well to emerge as a stable result' (Schriber & Gutek, 1987; p.645). As a possible consequence of a definitional issue, Schriber and Gutek's items representing the time buffer scale are more general statements rather than relating to specific behaviours of an individual. For example, the two items representing this concept were: 'Most people don't have time to take breaks in their day', and 'People could fit more into their workday if they had to'. The definition of time buffers has been refined for the TI model and it is suggested that the definition proposed here is more explicit in terms of identifying specific behaviours relating to an individual, which will be reflected in the items developed for this scale. Thus, reflecting on the limitations of Schriber and Gutek's conceptualisation of time buffers, the concept has to be refined within the TI context.

When the results from the factor analysis and reliability analysis are considered, there is equally a case for not excluding this time dimension at this stage of the research. Developing this point, a

principal component composed of the two items intended to measure the time buffer did emerge. Although reliability was poor, Schriber and Gutek (1987) concluded that ‘this minor result indicates that the concept has some merit and that further work to measure it is warranted’ (p.648).

Dimension Seven: Time Allocation

Time allocation originally featured in Schriber and Gutek’s conceptualisation of temporal organisational culture. In this context, time allocation was defined as ‘the amount of time, whether planned or expended, devoted to an activity, regardless of when the amount occurs’ (Schriber & Gutek, 1987; p.644). An example item representing this construct is: ‘Tasks usually take longer than planned’. Adapting this original time dimension to an individual leader, it is proposed that time allocation reflects Schriber and Gutek’s original notion of allocation time, but is amended to include a leader’s allocation behaviour relating to tasks and schedules. However, a further development to Schriber et al.’s original conceptualisation of the construct is proposed. Within TI, it is also considered that time allocation refers to the extent to which the leader is aware of task characteristics and follower attributes when allocating time to a task or schedule. This is to say, task attributes refer to the complexity of the task and what process(es) are involved in completing the task, while follower attributes refer to the individual’s skill level and experience with the task (i.e., is it a task they are competent at completing or is it a task being learnt). Thus, within the TI model, time allocation refers to the extent to which a leader uses cues (task and individual characteristics) when estimating how long a task will take a follower.

Dimension Eight: Quality vs Speed

This is a time dimension that featured as one of the twelve time dimensions of Schriber and Gutek’s (1987) organisational culture. This was originally conceptualised by the authors as whether speed was more important than quality to organisational members. Adapting the notion to be focused on a leader’s cognitions and behaviours (directed to followers) it is proposed that within TI, speed vs quality refers to the extent to which the leader prioritises speed over quality,

and vice-versa.

Dimension Nine: Quality and speed

While the previous dimension of speed vs quality represents an adaption of Schriber and Gutek's original conceptualisation of the construct, it has also been proposed to include quality and speed within the model at the conceptual stage before the rigorous empirical analysis. The *raison d'être* for this relates to one of the fundamental characteristics of TI: it focuses on the awareness of temporal characteristics (relating to the individual and the situation) and behavioural responses to this, which are proposed to include adaptive behavioural responses. It is proposed that the time dimension of quality and speed reflects an adaptive process not captured by quality vs speed.

This dimension of time is conceptualised to refer to the extent to which the leader prioritises speed or quality based on situational aspects. This dimension of time intends to measure the extent to which the leader does not consistently emphasise or require work to be of a high quality or a high speed, which may in fact be working against one's actual preference. For example, a leader may have a preference for work to be of a high quality but situational attributes may actually result in the work not necessarily needing to reach a very high quality (for example, a draft proposal).

Dimension Ten: Time Boundaries Between Work and Non-work

The origins of this time dimensions of the TI construct can be traced to Schriber and Gutek's (1987) work on temporal organisational culture. In the questionnaire developed to measure different dimensions of temporal organisational culture (as described in chapter 2), time boundaries between work and non-work was developed as a scale through factor analysis. The authors defined this time dimension as 'the strength of temporal boundaries between work and non-work activities (between work life and personal life)' (p.648). For example, an original item in this scale was 'When people go on vacation they are expected to tell their boss how to reach them'. Within TI, this construct has been adapted to suit the context (leader's self-report of their own behaviours and cognitions). Within TI it is proposed that

time boundaries between work and non-work refers to the extent to which the leader reinforces or discriminates between the temporal boundaries of work and non-work. The behaviours the leader exhibits to his or her followers on this time dimension are proposed to be perceived to be of importance by the generation Y employees, as research on generation Y has shown a strong preference for working in leaders and organisations that value work/life balance (Loughlin, 2001). Research into generational preferences looks at the general preferences representative of individuals described as falling into a particular generations (such as generation X or Y). Although there is some disagreement of how to define a generation demographically, there is a strong consensus of agreement with defining generation Y as individuals born between 1977 and 1997. For example, Dulin (2005), researching through focus groups the behaviours and values individuals representing generation Y valued, concluded that to the 'Gen Y cohort, a career is still a job, and life outside work is important to them. Their personal lives are important to them; therefore, they want their leaders to consider their needs outside the workplace' (p.69).

Dimension Eleven: Autonomy

The concept of autonomy has received a large amount of interest among researchers. Autonomy as a concept has been widely researched within the domain of job design, which examines the effects of work characteristics on outcome variables (stress, satisfaction, etc.). For example, Hackman and Oldman's Job Characteristics Model (JCM; 1975) stipulates that there are three psychological states that lead to positive work and personal outcome variables such as performance, intrinsic motivation and work satisfaction. These three states are: experienced meaningfulness of the work, experienced responsibility for the outcomes of the work, and knowledge of the results of the work activities. Five core job dimensions (characteristics) were deemed to be responsible for developing the three psychological states. Autonomy, described as the extent to which an employee was able to work autonomously, was identified as the key job dimension (when autonomy was high) for forming the state of experienced responsibility. Fried and Ferris (1987) conducted a meta-analysis on nearly 200 studies researching the JCM, and while

the results did not conclusively support the job dimension structure, evidence supported that the job dimensions did relate to outcome variables, with autonomy found to be a predictor variable. Spector (1986), conducting a meta-analysis on studies operationalising autonomy as a job characteristic, concluded that perceived control over work (i.e., autonomy) was associated with 'high levels of job satisfaction (overall and for individual facets), commitment, involvement, performance and motivation, and low levels of physical symptoms, emotional distress, role stress, absenteeism, intent to turnover, and turnover' (p.1005).

Autonomy is also a key aspect of transformational leadership, as this theory stipulates that transformational leaders should emphasise followers' development towards autonomy and empowerment (Bass, 1990; Graham, 1988). A number of studies have found a relationship between transformational leadership and autonomy.

Research clearly shows that the extent to which followers perceive their work as autonomous has an effect on a number of important outcome variables. Within the context of the TI model, it is the extent to which the leader encourages followers to work autonomously. It is at this point that it is worth justifying the inclusion of autonomy as a time dimension within TI (as it has not traditionally been considered as a temporal dimension). However, it is proposed that autonomy represents the extent to which the leader allows or encourages followers to complete tasks in the way they wish, and is thus the extent to which they can manage their own time and task completion. While autonomy has traditionally not been operationalised as a temporal variable in research, a number of researchers have adopted this viewpoint when reviewing the temporal dimensions of organisational cultures (Lim & Seers, 1993; Schriber & Gutek, 1987). Lim and Seers found evidence of a link between autonomy of time use and organisational performance. Autonomy of time use was measured by gathering the views of managers, which was deemed to capture autonomy at a cultural level. This finding is in line with previous research investigating autonomy in the context of job characteristics.

From a follower perspective, autonomy represents the extent to which followers are in control of their own time (traditionally the emphasis has been control over work) and how to approach tasks which will have time-management links. However, while followers' perceptions of control over time are perceived as related to the extent to which the leader encourages autonomy, TI focus is on the latter (leaders' individual differences). A follower's perception of control over time may be influenced by both situational and other leader traits and behaviours. For example, situational traits may include job characteristics not exclusively determined by the leader, and other leader traits and behaviours are such that would not be considered time-related by nature but that research suggest may have an impact on followers' perceptions of autonomy. For example, Ferris (1983) found that leaders structuring and considerate leader behaviours significantly impacted on followers' perceptions of autonomy. The finding that considerate leadership behaviours is not surprising, as conceptually these behaviours are similar to those denoting individualised consideration, which is an aspect of transformational leadership and is, as previously, a style suited to developing autonomous working among followers. TI therefore proposes that autonomy is one factor influencing perceived control over time. In conclusion, autonomy within TI refers to the extent to which the leader's cognitions and behaviours encourage followers to work autonomously.

Dimension Twelve: Timelessness

Timelessness was proposed as a component of Halbesleben, Novicevic, Harvey and Buckley's (2003) model of Temporal Complexity. However, there was limited theoretical analysis presented to support the inclusion of timelessness as a component in the model. Timelessness has been referred to as a time dimension of workplace processes within the notion of TI for several reasons. Firstly, it is important to reflect on TI's adoption of the dichotomy and duality perspective on the nature of time, as timelessness represents the contextual nature of time. This subjective position on time allows us to understand how the passage of time and, more specifically, the passage of the other dimensions of time and related characteristics are not consciously processed by an individual in the state of timelessness. Thus, timelessness represents a unique dimension of time in that time

is not experienced by the individual in any descriptive form. In sum, timelessness represents the time dimension of a workplace process (i.e., an activity) as perceived by an individual.

Mainemelis (2001) proposes that an individual's transition into the state of engrossment and subsequent experience of timelessness is influenced by three main domain factors: person, task and environmental factors. Drawing on the timelessness model and related work, this thesis will explore how the leader can adopt a role to facilitate timelessness among his or her subordinates. The main premise underlying Mainemelis's model is that the creation of psychological and physical space in 'which one can become totally involved in the task' (p.555) can lead to timelessness. This can be translated into a leadership context by considering the role a leader can play in facilitating this psychophysical space.

The person factors in Mainemelis's model are intrinsic motivation and emotional self-awareness. To clarify the role of intrinsic motivation in timelessness, Mainemelis (2001) posits that the more motivated one is in carrying out the task, the more likely one will enter into a state of engrossment. While this represents an individual characteristic, there is a strong case for recognising that the leader may have an indirect effect on intrinsic motivation through the environment conditions they foster. In fact, Mainemelis's own model recognises interactions between the three domain factors, albeit with somewhat limited discussion of these. The conceptual model in this paper will therefore critically consider these relationships with the intention of demonstrating the consequential implications in the leadership context.

Mainemelis (2001) and May (1994) postulate that the psychological space an individual requires to be engrossed in a task requires emotional preparation (Gardner, 1993; Mainemelis, 2001; May, 1994). Mainemelis suggests that the underlying mechanism to this preparatory process is emotional self-awareness, which refers to the 'ability to accurately assess one's own internal states, resources, and limits' (p.558); this clearly originates from the emotional intelligence literature (Boyatzis, Goleman & Rhee, 2000). This ability is suggested to facilitate the state of engrossment

and the timelessness experience through enabling the individual to recognise the emotional aids and barriers that facilitate or impede the transitional process. There is also evidence to suggest that stable individual difference factors such as need for achievement (Csikszentmihalyi & LeFevre, 1989) and playfulness (Agarwal & Karahanna, 2000) may predispose some individuals to experience timelessness more than others due to the engagement of behaviours that are likely to facilitate the transition into the state of engrossment with work. While these stable individual difference factors may provide fruitful avenues for future research, there are limited implications of these to be drawn into a leadership context.

There are four task factors associated with antecedents of timelessness: rites of passage, clear goals, optimal challenges and immediate feedback. Rites of passage are ‘habitual or ritual-based activities that facilitate the transition into the state of engrossment as they attract one’s attention away from the surrounding organisational temporality and increase emotional arousal’ (Mainemelis, 2001, p.555). The defining characteristic is the symbolic transitional function of the activity, such as whether it is a habitual activity performed that reduces anxiety and encourages a playful state (Mainemelis, 2001). Leaders can therefore establish or encourage rites of passage (Halbesleben, Novicevic, Harvey and Buckley, 2003), which include coffee breaks, organising one’s desk, having a snack, etc.

Secondly, clear goals are suggested to be important in transiting an individual into the state of engrossment as they represent a ‘means for achieving desirable outcomes within the activity’ (Mainemelis, 2001; p.555) and consequently direct the individual’s attention to the task at hand (Carson & Carson, 1993; Csikszentmihalyi, 1990; Mainemelis, 2001). This is in accordance with goal-setting theory research which has found that goals can increase individuals’ effort invested in a task (Locke & Latham, 2002; Wood, Mento & Locke, 1991). Leaders can therefore adopt goal setting behaviours to have a positive effect on timelessness. The goals set should be directly linked to the task and should represent a finite end to the task. Empirical findings from Sosik, Kahai and Avolio (1999) strongly suggest that goal setting is critical to the timelessness

experience. It was found that flow was consistently linked to transactional leadership, which was measured by the scales of contingent reward and goal setting. Importantly, goal setting represented four out of the five items of this transactional measure.

Thirdly, leaders can facilitate the timelessness experience through matching the challenges of the task with their follower's skill capabilities (Mainemelis, 2001). This proposition originates from Csikszentmihalyi's (1990) notion of *optimal challenges*, which represents the match between an individual's skill and task challenges on a continuum ranging from low (low challenge/low skill) to high (high challenge/high skill), with the latter suggested to have the most positive effect on timelessness. There is a substantial body of research suggesting that if a goal is too unattainable it can lead to negative psychological consequences such as anxiety, and that an easy task can lead to boredom (Massimini & Carli, 1988; Shalley and Oldham, 1985; all cited in Mainemelis, 2001). These psychological states are therefore not conducive to timelessness. In light of the above, it is proposed that leaders should be aware of differences in task difficulties and that this awareness should focus simultaneously on the subordinate's skill set in specific relation to the key skills required to complete the specified task.

Further support for matching task challenge with follower ability to provide an appropriate psychological space for engrossment to occur derives from reverting to research into goal setting theory that has found the highest levels of effort (and performance) are a linear function of goal difficulty (+ve). However, this relationship peaks at the individual's limits of ability for that task (Erez & Zidon, 1984; Locke & Latham, 1990, 2002; Wood, Mento & Locke, 1991). The main mechanisms in which goals affect effort and performance are by 'directing attention, mobilizing effort, increasing persistence and motivating strategy development' (Locke, Shaw, Saari & Latham, 1980). Clearly, directing attention and mobilising effort are important for enabling an individual to become totally immersed in a task and thus enter a state of engrossment. It also appears plausible to postulate that increasing persistence will help the individual remain in a state of engrossment for longer periods of time. The influence of motivating strategy development will

be clarified upon discussion of work-environmental factors.

The final task factor associated with the experience of timelessness is feedback (Mainemelis, 2001). Psychological states such as boredom and anxiety have been linked to activities that do not present the individual with any feedback (Csikszentmihalyi, 1990). However, the main challenge a leader will face in providing immediate feedback is that the feedback should not be external to the task, to prevent interrupting the individual's attention (Mainemelis, 2001). A number of tasks inherently give immediate feedback, such as surgery or piloting a plane (Mainemelis, 2001). However, other tasks may not be structured in such a way whereby feedback is intrinsic to the task, such as long-term writing assignments or research studies (Csikszentmihalyi, 1990; 1997). Although the leader's role is limited in the context of immediate feedback, the leader can use his or her understanding of a task to help an individual internalise a set of criteria for evaluating the task as it progresses. The adoption of a self-referenced evaluation framework been positively linked to timelessness (Csikszentmihalyi, 1990, 1997; Mainemelis, 2001).

Further exploration of a leader's role in facilitating timelessness among his or her subordinates will be directed to the work environment that Mainemelis (2001) deemed conducive to timelessness. There are four factors to consider according to Mainemelis' model. Firstly, autonomy refers to the extent to which an individual can select what task to perform and how to complete it. Such self-task-selection behaviours have been shown to positively affect intrinsic motivation (Amabile, Conti, Coon, Lazenby & Herron, 1996; Deci & Ryan, 1987). This implies that leaders should provide subordinates with autonomy in two respects: first, the tasks to complete; and secondly, how they should be performed. Referring to the former, there are clear practical limitations with allowing a follower to complete any task they wish to, although the limitations will likely be context specific. Moreover, if an individual perceives they have too many tasks to complete this can potentially have negative psychological consequences (stress), depending on the polychronic working preferences (time personality). Another dimension of TI

(pace of task delegation), addresses task setting in relation to volume of tasks, taking into account the time personality of subordinates. However, encouraging autonomy in regards to how a task is performed among subordinates can be employed in simultaneity with goal setting. In fact, the evidence strongly suggests that the two are complementary. Developing this point, as mentioned, one of the main mechanisms underlying goal setting's impact on performance and effort is motivating strategy development (Locke et al., 1980). Thus, setting clear goals will motivate a subordinate's strategy on how to accomplish a task, and a leader encouraging autonomous working will provide the opportunity for the subordinate to implement their own idiosyncratic strategy.

Meaningful work, according to Mainemelis (2001), is a boundary condition to timelessness and refers to whether 'one perceives that the work environment provides some opportunities for interesting and stimulating work' (p.558). Mainemelis proposes that meaningful work is an environmental antecedent factor of timelessness; it is proposed here that this forms a person factor as it is the importance an individual attaches to a particular work activity or career that varies among individuals.

Factors that Mainemelis (2002) suggests negatively impact on the potential to experience timelessness are pressure and distractions through inducing psychological states that impede engrossment (e.g., anxiety). Pressures can take the form of temporal deadlines (i.e., unrealistic time strains), which have been found to be a significant predictor of occupational stress (Noblet, 2003) and detrimental to intrinsic motivation (Amabile, DeJong & Lepper, 1976). Pressure can also take the form of unrealistic demands on productivity (Mainemelis, 2001). These factors are generally directly controlled by the leader unless, for example, deadlines are externally imposed. Distractions include 'physical events, interruptions by co workers... and boundary control activities by managers such as imposed work times and deadlines' (Mainmelis, 2001; p.559). Managers' physical monitoring of subordinates or imposition of their preferred work styles have also been linked to boundary control activities (Perlow, 1988) that will potentially interfere with an individual's focus on a task (Mainemelis, 2001). This is inevitably linked to autonomous

modes of working.

The main point to draw from the notion of distractions and pressures is that leaders should have a self-awareness of how their own behaviours could interrupt subordinates' transition into engrossment. This reinforces the notion of creating the appropriate psychological and physical space for the timelessness experience, as encompassed by the above discussion. Although there are clear practical limitations to providing this psychophysical space, which is one of the main criticisms launched at timelessness (see Petranker, 2002), a leader should demonstrate an awareness of the types of tasks that would benefit from engrossment, and should have the capability to proactively manage their behaviours to facilitate subordinates entering into this state where possible. In addition, Csikszentmihalyi and LeFevre (1989) note that the flow state occurs more at work than in leisure, which provides further rationale for endorsing the timelessness concept at a practical level into a leadership context.

The link between timelessness and creativity strongly suggests that leaders should be particularly focused on facilitating subordinates into the state of engrossment when task demands have a creative emphasis. However, on reflection of the constellation of four retrospectively reported experiences of timelessness (immersion, time distortion, task mastery and sense of transcendence), the benefits of this focused state of involvement with work tasks may go beyond those where a creative process is critical to high performance. In fact, the flow concept has been observed across a wide range of occupational contexts (Csikszentmihalyi & LeFevre, 1989; Pace, 2004; Pilke, 2004; Sherry, 2004).

It is important to clarify that analysis for timelessness in this thesis has been at an individual level. Thus, it has been discussed how a leader can facilitate an individual subordinate into timelessness on a task that does not directly involve others. A recent study conducted by Marotto, Roos and Victor (2007) provides evidence to suggest that timelessness can occur at a group level and have the effect of increasing group performance. However, research also

suggests that the processes operating at a group level may include additional factors to those at an individual level. For example, contextual conditions of anonymity may play a role in mediating the timelessness-creativity relationship (Sosik et al., 1999). There is also the potential concern for temporal dissociation among team members, which may decrease team performance (Rutkowski, Saunders, Vogel & van Genuchten, 2007). This factor may indeed operate at an individual level if an individual is completing a task that forms a group-based project, however, this is where the other dimensions of TI should be considered (e.g., a leader's ability to synchronise/entrain individuals within a team).

Conclusion

The conceptual model of Temporal Intelligence in leadership, and specifically inter-individual referenced temporal practices aims to account for individual differences in leader behaviours and cognitions leaders directed to followers. In sum, the conceptual model of TI distinguished between adaptive and global temporal practices. The former is proposed to represent differences in leaders awareness and behavioural responses to individual preferences and job time characteristics (i.e., temporal demands of a job) on the temporal dimensions of planning, punctuality, polychronicity and impatience. Global temporal practices refer to twelve dimensions of time.

Both dimensions of adaptive and global temporal practices will be represented by the Temporal Intelligence Questionnaire (TI-Q), which will in turn be subjected to statistical analyses to further develop the construct of TI proposed here. The conceptual model aims to capture as many temporal constructs deemed relevant to leadership as possible, and the empirical analyses on the questionnaire will be used to refine the structure of the construct. This process will be detailed in chapters 7 and 8. However, firstly the TI-Q and specifically the item pool of the measures needs to be developed following a process that ensures that each dimension proposed in the conceptual model of TI in leadership is adequately represented. While existing temporal measures and literature will be used to develop the item pool, an interview study is presented in the next

chapter with the aim of identifying behaviours and cognitions relating to the dimension of time proposed in the conceptual model. A number of the dimensions of time proposed have previously never been measured as an individual difference factor in leadership. Hence, it is perceived imperative that the process of developing an item pool for the TI-Q is conducted through involving individuals holding current leadership positions. Interviews are conducted to gather time related behavioural and cognitive based statements directly from examples leaders give of how they lead their followers.

5

The Repertory Grid Interview Study

In the previous chapter, a conceptual model of Temporal Intelligence (TI) was proposed, which was developed through the two literature reviews presented in chapters 2 and 3. The TI model proposes to represent leaders temporal behaviours and cognitions directed to followers (inter- individual temporal practices). These practices are further broken down into two typologies called: *global* and *adaptive* temporal typologies. The global form of temporal practices refers to how a leader thinks and behaves on 12 dimensions of time in the workplace, in the context of interactions with individual followers and teams/groups of followers. The adaptive form of temporal practices represents a leaders' process of awareness and behavioural adaptation. Specifically, this adaption process is based upon four time related dispositional characteristics of followers and the time demands of their respective jobs (i.e., planning, punctuality, impatience and polychronicity).

This chapter details a repertory grid interview study that was employed with two main objectives. The primary objective is to identify specific leadership behaviours and cognitions relating to twelve dimensions of global temporal practices in the TI model so that these can be used to develop statements (items) for the questionnaire representing the TI construct; the Temporal Intelligence Questionnaire (TI-Q). The secondary objective, which is ultimately related to the first, seeks to draw on the identified behaviours and cognitions to develop descriptions and subsequently an understanding of each of the twelve dimensions of time outlined in the model of TI (global temporal practices). Adaptive temporal practices was not considered in the interview process as the existing Time Personality Inventory and Job Time Characteristics measure (Francis-Smythe and Robertson, 1999, 2001) would be used to develop items for the TI-Q reflective of adaptive temporal practices. These were considered established measures and therefore were perceived as adequate for measuring adaptive temporal practices (although item wording needed to be modified to represent TI; this is outlined in the next chapter).

The Repertory Grid Interview

The repertory grid technique was developed by Kelly (1955; 1963) for the purpose of presenting a methodology to empirically measure an individual's personal construct system. This notion of a personal construct system is fundamental to Kelly's (1955) Personal Construct Theory (PCT).

Personal Construct Theory

The fundamental assumption of Kelly's PCT is that:

'A person's processes are psychologically channelized by the ways in which he anticipates events' (Kelly, 1955; p.46).

It can therefore be understood that Kelly (1955) is concerned with how individuals try to *make sense* of and predict the world. Kelly proposes that events are anticipated by a psychological process called 'construing'. Eden and Jones (1984) explain this process by postulating:

'We construe situations by seeking to differentiate them from others and see them as similar to others; it is only through such a process that we give meaning to events, that they have significance' (p.779).

Thus, construing is a process of interpretation that forms psychological meanings of situations and events (Duck, 1994). More specifically, these meanings derive from drawing contrasts and similarities between those *elements* of the situation that can be interpreted as objects: people, products and companies, for example (Eden & Jones, 1984). Kelly (1955) uses the term *psychological constructs* to represent the meanings formed by the process of construing. In Kelly's own words, a 'construct is a way in which some things are construed as being alike and yet different from others' (Kelly, 1955; p.105). It is these psychological constructs that are therefore integral to how an individual interprets and predicts events or situations (Eden & Jones, 1984). These constructs are posited by Kelly (1955) to be organised in a personal construct system, and are arranged hierarchically, ranging from super-ordinate (very important) to sub-

ordinate (Earl, 1986).

The Application of the Repertory Grid Technique

The repertory grid technique has been widely used in research (Marsden & Littler, 2000). For example, Senior (1996) conducted repertory grid interviews to identify the psychological constructs relating to team performance. The constructs were elicited from employees who had experience in working within a number of teams, and the elements represented the different teams in which the participants had played a part. Easterby-Smith (1981) proposes a distinction that can be drawn between elements and constructs; elements reflect the objects of people's thoughts, and constructs are the qualities individuals attribute to these objects. In the context of Senior's team-performance study, the constructs are the characteristics of the different teams. Senior specifically asked participants to identify out of those teams that they had worked for in the past, which they would consider to be *excellent*, *average* and *poor* performance teams. Thus, characteristics associated with each of these subjective performance levels could be identified.

The repertory grid interview has also been widely used in the context of management and leadership research (Alimo-Metcalfe & Alban-Metcalfe, 2001; Fairley, 2002; Smith, 1996; Song & Gale, 2008; Wright 2006). Song and Gale (2008) utilise the repertory grid technique to investigate project managers' work values and investigate their relationship to project management competence (subjective ratings). Alimo-Metcalfe and Alban-Metcalfe (2001) describe how they elicited psychological constructs pertaining to excellent leadership from a sample of leaders.

These constructs were used to develop the Transformational Leadership Questionnaire (TLQ) that represented an alternative UK-centric perspective of transformational leadership, which is in contrast to the original US-based model of the transformational leadership style (Bass, 1985).

Research objectives and the repertory-grid interview

To clarify the overall research objective of the repertory grid interview was to identify psychological constructs representing the time related behaviours and cognitions directed to followers. The identification of such behaviours and cognitions would be used for the specific objectives of developing questionnaire items and descriptions of the dimensions of time presented in the TI model. While other interview methods such as the structured or semi-structured interview were considered, the repertory grid interview was perceived to have a number of advantages. Firstly, due to the flexibility in the repertory grid method, it was perceived that this could be used to structure the interview to focus the leader's discussion around temporal concepts. This point shall become clearer upon description of the final repertory grid methodology employed. Also it was perceived that the repertory grid interview using the critical incident technique would facilitate the leader in identifying specific behaviours and cognitions (relating to time) in defined situations. In contrast the more traditional methods of interview (structured or semi-structured) were perceived to have less flexibility in developing such a structure and subsequently lead to greater risk in obtaining broad descriptive accounts in general situations (e.g. I behave in this way to followers) rather than linking specific behaviours to defined situations.

Also the observation method for identifying specific behaviours was considered (i.e., observing leaders in the workplace) rather than interviews. While the observation method has a number of advantages, it is quite an invasive method in the context of leadership (especially in the context of individual interactions with a follower) and is quite time consuming (would inhibit development

of the quantitative research stages). A diary (self report by leaders) methodology was considered but would require considerable time by leaders (i.e., much greater organisational commitment is required), and would require providing training to leaders for completing the diary (i.e., recording temporal behaviours). In sum, judging both the practical and technical, merits and limitations, with each method, the repertory grid method was selected as it required relatively less organisational commitment, shorter timeframe for implementation and greater flexibility in developing an interview methodology to meet the objectives of the research.

Repertory Grid Methodology

The repertory grid technique has four universal components (Jankowicz, 2004):

1 Topic

2 Elements

3 Constructs

4 The Grid (matrix)

The methodological processes employed by researchers adopting the repertory grid technique as a data collection tool can vary (Fransella & Bannister, 1971). These important methodological distinctions are detailed below in line with the four components of the repertory grid.

Topic

Firstly, Jankowicz (2004) considers the repertory grid interview as a technique that should be implemented so that focused information is collected. As such, the topic that the repertory grid is investigating should be defined in advance. The repertory grid technique will therefore be conducted to elicit individuals' psychological constructs relating to that topic or domain of interest. It is argued in this thesis that it is not only the topic that should be defined but also the

specific research objectives of the study. Although defining the topic and research objectives is not a methodological process as such, it is important to recognise the fact that these will have a direct impact on the methodologies employed when selecting elements, eliciting psychological constructs and analysing the grid.

Selection of Elements

Elements can be generated through a variety of procedures. Typically, elements (people, countries, incidents, etc.) can be supplied to interviewees. Alternatively, the researcher can engage in a discussion with the researcher to identify the elements; or, thirdly, a pool of elements could be defined by the researcher and the interviewee could be responsible for specifying the particular elements (Björklund, 2005). For example, the latter procedure was followed by Alimo- Metcalfe and Alban-Metcalfe (2002) who, in their study on perceptions of transformational leadership, define the pool of elements as leaders that the participant had been a superior of or worked alongside. Specifically, the researchers requested two leaders that were perceived to have excellent leadership behaviours, two who displayed average and two who displayed poor leadership behaviours.

Elicitation of Constructs

There are also a number of ways in which the construct elicitation process can be conducted. Firstly, there is the triad and dyad elicitation method. The former refers to presenting three elements at a time, while asking participants to consider the differences and similarities between the two. The difference in the dyad elicitation method is that it simply involves presenting two elements at a time and asking the interviewee to indicate how the two elements differ from one another. This process of contrast and similarity that is relevant to both the dyadic and the triadic elicitation methods can also take two forms: the difference method and the opposite method. The difference method involves asking participants to consider the differences (which need not be bi-

polar) between elements. For example, if three elements are presented to participants (triadic elicitation method), the researcher can instruct the participant to 'identify any two elements that are alike in some way, yet different from the third'. The contrast therefore does not have to be bi-polar. In contrast, the opposite method involves asking participants to draw a direct comparison between elements. For example, in a dyadic method the participant can be asked to explain how they perceive the elements differently on a bi-polar basis (e.g. good interpersonal skills versus poor interpersonal skills, if the elements were people).

Analysis of the Grid

Firstly, the traditional design of the repertory grid allows elements to be recorded on the top row of the repertory grid and psychological constructs on its far left and right columns. A rating system can be presented to participants that will involve comparing and contrasting psychological constructs with reference to elements based upon a numerical scale. Analysis of this rating system will identify the hierarchical structure of psychological constructs. For example, Alimo-Metcalf and Alban-Metcalf (2002) were able to distinguish between the super-ordinate and sub-ordinate psychological constructs pertaining to perceptions of excellent leadership. Thus, behaviours (representing psychological constructs) that the participant perceives as very important in determining the perception of excellent leadership were identified. Further analyses such as Hierarchical Clustering Analysis and Principal Component Analysis can be conducted (see Björklund, 2005 for further details).

As demonstrated above, there are a number of forms of the repertory grid interview. However, Fransella and Bannister (1971) note a number of universal characteristics of this technique (p.70):

1. a concern with eliciting the relationships for a person between sets of constructs, either in terms of construing elements or by directly comparing constructs;

2. a central aim to reveal the construct patterning for a person and not relate this patterning to some established normative data;
3. a lack of fixed form or content. It is called the repertory grid technique, not test, and the selection of the form and content is related to each particular problem.

Critical Incident Technique

The Critical Incident Technique (CIT) consists of a set of principles for collecting information about human behaviour. To specify the meaning of the term *critical incident*, an incident refers to any human behaviour that allows inferences and predictions to be made about the person engaging in the act (Flanagan, 1954; p.327). For an incident to be deemed critical, it must occur in a situation where the consequences of an action (i.e., incident) are transparent. Thus, a clear ‘cause and effect’ relationship can be inferred from the identified behaviour. The CIT does not consist of a single prescriptive set of procedures but should be interpreted as a ‘flexible set of principles which must be modified and adapted to meet the specific situation at hand’ (Flanagan, 1954).

Chell, Haworth and Brearley (1991) examined within-group behavioural differences of the business owners of Small and Medium Enterprises (SMEs). In the context of this study, behaviours that related to business development activities were deemed as being ‘critical incidents’. Other researchers have used the CIT in organisational research on typical performance (Flanagan et al. 1953), training (Ronan, 1953; cited in Flanagan, 1954, p72), leadership (Ruch, 1953; cited in Flanagan, 1954, p72).

Flanagan (1954) posits that researchers utilising the critical incident technique should establish a set of rules that ensures that the implementation of the CIT is methodologically replicable. This essentially establishes a systematic framework that allows for objective accounts of the human behaviour relevant to the research question. Flanagan posits that the rules should be based upon

the following factors: general aim, the situations observed, relevance to the general aim, extent of effect on the general aim, and persons to make the observations. *General aim* refers to the general aims or objectives underlying the activity under investigation. *Situations observed* refers to establishing information pertaining to where the incidents occur and the individuals involved in the recorded incidents. *Relevance to the general aim* refers to whether a specific behaviour outlined by a participant is relevant to the general aim of the activity. *Extent of effect on the general aim* is inextricably linked to this, but specifies whether an incident has an effect on the general aim. Flanagan specifies the final rule *persons to make the observations* as a process of establishing specifications for observers.

Pilot Repertory Grid Interviews

As detailed, there are several methodological variations to the repertory grid interview. This has led Easterby-Smith (1981) to posit that ‘repertory grids are extremely easy to adapt and modify’ (p.9). Moreover, Easterby-Smith recognises that this has encouraged many researchers to design and develop their own applications of the repertory grid technique. To determine the exact methodology of the repertory grid interview implemented in this study, a pilot study was conducted. The pilot study involved critically examining variations and original developments of the repertory grid technique to determine the most suitable methodology in line with the research objective of the repertory grid study. To clarify, the main research objective was to elicit psychological constructs of leaders that represent their perceptions of their own temporal behaviours directed at their followers.

Sample

Six interviews were conducted within the pilot phase of the repertory grid interviews. There were six participants in the pilot sample (four males and two females). All participants were in full-time employment within a higher-education institution. Table 5.1 presents the composition of the pilot sample by sex and level in their respective organisations.

Table 5.1

Composition of Pilot Sample by Sex and Level in their Organisation

Level	Senior Executive Management board	Head of Academic Department/Team Manager
Participant sex	2 female 1 male	3 male

While the main aim of the pilot stage was to determine a repertory grid methodology to meet the research objective of the study, a factor that will influence the quality of the data collected from the interview is *cognitive overload*. Subsequently, the extent to which the different methodologies did or did not contribute to perceived *cognitive overload* in participants was explored in this pilot phase. The term cognitive overload has been employed widely in organizational research, although, sometimes the term *information overload* is used interchangeably (Eppler & Mengis, 2004). However, Waddington (1996) argues that information overload is more ambiguous as a construct in comparison to cognitive overload, which refers specifically to the influence information has on cognitive processing and functioning. Studies have found information overload to cause anxiety and impede cognitive functioning (Waddington, 1996). In the context of this study, cognitive overload will be defined as occurring when information presented in the interview causes observable difficulties in the participant's ability to assimilate the information presented or any observable anxiety expressed by the participant related to the interview instructions or questions provided to the participant (e.g. not understanding what to do). Following each interview within the pilot stage, the researcher critically reflected on how the methodology influenced the data collection in line with the above prescribed research objective and any observable cognitive overload effects, which were noted during the interview itself.

A standardized introduction and debrief was read to all participants for each of the six interviews, which covered ethical issues stated by the British Psychological Society. As noted, there are four components of the repertory grid interview. Two of these four,(the topic and the grid,) are universal for all six pilot repertory grid interviews. A description of these two universal components and how they relate to the pilot repertory grid interviews in this study is presented below:

Topic

To understand how leaders perceive time to affect their leadership and management behaviours.

Grid

Elements and psychological constructs were recorded onto the repertory grid in a traditional format. While it has been acknowledged that psychological constructs are organized hierarchically and quantitative analyses can be conducted to identify this hierarchy, in the context of this study such an analysis was not conducted. There is a strong rationale for not quantitatively assessing the repertory grids. Firstly, the purpose of the repertory grid interviews was to facilitate the development of statements pertaining to temporal cognitions and behaviours of leaders and managers directed to their followers from specific situations with clear outcomes. The purpose of detailing these aforementioned statements is to develop items for the Temporal Intelligence Questionnaire (TI-Q). Thus, a hierarchical analysis would have fairly limiting value as the statements to be considered for the TI-Q are required to reflect individual differences in time related cognitions and behaviours within a leadership and management context. Thus, these behaviours and cognitions are not required to be hierarchical as such an approach will not have a perceived value for item development as statistical analyses will be used to understand any hierarchical relations between temporal dimensions.

The methodology followed for the remaining two components of the repertory grid (element selection and elicitation of constructs) changed for each of the pilot interviews. These changes are

described for each interview and precede a description of the observed effects of these changes on the research objective of the repertory grid study and perceived cognitive overload (if applicable).

Pilot Interview 1

Method

Element Selection

The elements represented individual followers that, at the time of the interview, the participants had responsibility for managing or leading. Specifically, these elements were identified through the researcher asking participants to consider the individuals they were responsible for leading and managing, and then asking participants to identify any six to eight individuals.

Construct Elicitation

The psychological constructs were elicited through the triadic difference method; as the differences between the elements did not have to be bi-polar, a difference method of construct comparison was employed (Kelly, 1955). Specifically, participants were asked to write down one way in which time affects how they manage/lead two of their followers (elements) and one way in which time affects how they manage/lead a third follower that is different from the first example.

Observation

A few main problems linked to this methodology were identified. The first stemmed from the interview question guiding the development of the constructs (i.e., ‘understand how time affects the way in which you manage and lead your staff’). Firstly, the question is general in that *time* is the only term to guide participants to construe psychological constructs that depict time-related behaviours. However, as demonstrated by the literature review, time is a complex and multi-dimensional construct. The question employed in pilot interview 1 therefore relies on the participant’s understanding of the term *time*, which may not relate to their actual temporal behaviours. While the basic premise underlying the repertory grid interview is to identify the individual’s own psychological construct system, a general question as employed here limits the type of information that can be collected about time. Therefore, on reflection of this interview,¹²⁹

it was decided to explore ways in which an individual's own psychological construct system could be examined while drawing on the knowledge yielded from the literature review to provide behavioural contexts to which the variable of time can occur in.

Pilot 2

Method

Element Selection

The elements again represented individual followers that, at the time of the interview, participants had responsibility for managing or leading. As in pilot interview 1, these elements were identified by the researcher asking participants to consider the individuals they were responsible for leading and managing, and then asking participants to identify any six to eight individuals.

Construct Elicitation

Interview 2 was designed to explore the relevance of time as a construct to leadership behaviours underpinned by the Full Range Leadership Theory (FRLT). The psychological constructs were elicited through the triadic difference method. Specifically, participants were asked to read a vignette that represented one of the four transformational leadership measures, one of the three transactional leadership measures or the laissez-faire dimension of the FRLT (refer to Appendix 4). Participants were then asked to write down one way in which their behaviour accorded with a specific FRLT dimension (randomly selected using a random generator) involving a situation with two of their followers (elements), and one way they behave in accordance with the aforementioned FRLT dimension in a different situation involving the final follower (element) in the presented triad. This step was repeated with the next set of three elements, and so on, until the constructs were exhausted. Repetition of elicited constructs was an indicator of this, and following exhaustion of constructs a different leadership dimension from the FRLT was randomly selected to facilitate the elicitation of a new psychological construct.

Observation

Firstly, a prominent issue highlighted during this research interview related to the utilisation of a triadic difference method. This actually presented notable difficulties for the participant in terms of ease of identifying psychological constructs. In many places during the interview, the participant reverted back to their own comparison which followed a dyadic methodology, or, in some, no comparison system was followed. These observations were deemed to be attributable to cognitive overload.

It was also clear that a list of up to seven followers may not be representative of the leader's followers (especially if they have many leadership roles). To address this concern, which is in line with Björklund's (2005) line of argument that elements should be representative, the remaining interviews firstly invited participants to consider whether they see themselves as having one or more than one leadership role (cue questions were employed to identify the number of roles and what they were). Participants were then asked to consider their different leadership roles and list five to eight followers who cover the identified leadership roles. Names of individual followers were first encouraged (especially in construct elicitation stage) but the participant was also advised to list a team if it facilitated their recall.

Pilot 3

Element Selection

The elements represented individual followers that, at the time of the interview, the participant had responsibility for managing or leading. Specifically, these elements were identified by the researcher firstly asking participants to consider whether they see themselves as having one or more than one leadership role (cue questions were employed to identify the number of roles and what they were). Participants were then asked to consider their different leadership roles and list five to eight followers or groups of followers (i.e., a group counting as one element) that cover the identified leadership roles. It was encouraged that elements represented both individual followers and groups of followers.

Construct Elicitation

A dyadic difference construct elicitation process was employed. The construct elicitation process was the same as in pilot interview 2, but elements were presented in dyads rather than triads.

Participants were asked to write down one way in which their behaviour accords with leadership aspect X, involving a situation with one of the presented followers (elements), and one way they behave in accordance with leadership aspect X in a different situation involving the second follower (element).

Observation

The dyadic comparison method appeared to be more suitable for construct elicitation than the triadic in that comparing and contrasting two elements was observed to cause fewer difficulties than when three elements were presented (as in pilot interview 2). Throughout the interview, however, the participant was unable to make comparisons between the two elements; this may be attributable to the fact that the leader did not behave in accordance with one of the FRLT's dimensions. However, it is also plausible than pre-selecting elements may inhibit this comparison process. Consequently, to address this issue and to further integrate the CIT into the repertory grid methodology, the participant was asked to draw on two elements from the sample of five to eight originally identified, in order to exemplify when they behaved in accordance with a particular leadership dimension. For example,

Pilot 4:

Element Selection

Element selection followed the same procedure as pilot interview 3.

Construct Elicitation

The aim of pilot interview 3 was to address the concerns generated from pilot interview 1 regarding employing 'time' as a term to denote psychological constructs relating to time.

Participants were asked to read a statement that had been written by the researcher that described

a dimension of time within the conceptual model of Temporal Intelligence (TI; Appendix 5). The specific temporal dimension presented to participants was randomly selected by a random number generator. A dyadic difference construction elicitation process was employed, with participants asked to write down one way in which they behave in line with time dimension X towards one of their followers (element) in a pair, and one way in which the other follower was led differently with respect to time dimension X.

Observation

The main aim of using a description of the different time dimensions was to evaluate the potential for using a framework that taps directly into time-related behaviours to guide the development of psychological constructs. Overall, the participants seemed to understand the description of the time dimensions, but there were specific dimensions that were not easily interpreted. These were noted and eight subsequent amendments were made.

The dyadic method of comparison also was concluded to be a more suitable method for construct elicitation than the triadic difference method. Firstly, through the researcher observations, the participant appeared to grasp and follow this comparison method more easily than had been the case in previous interviews.

Similarly to in pilot interview 3, the participant did at times struggle to make comparisons between the two elements. The literature review clearly demonstrates the link of time to management practice (supported by the findings in pilot interview 3), and the content of the psychological constructs yielded in pilot interview 3 aligned overall more with management. One of the major research issues at this point during the pilot research phase still related to the time-leadership issue. The question remained whether TI was a management and a leadership phenomenon. Although interview 2 provided data to suggest that TI occurred in both contexts, further interviews were completed.

Pilots 5 and 6:

Pilot interviews 5 and 6 followed the same methodology as each other.

Element Selection

Element selection followed the same procedure as pilot interviews 3 and 4.

Construct Elicitation

A dyadic difference construct elicitation process was employed for both interviews. Participants were asked to read a paragraph that represents one of the four transformational or one of the three transactional or laissez-faire leadership dimensions (refer to Appendix 4). Following this, participants were asked to identify the extent to which their own behaviour aligned with a behaviour in the transformational/transactional leadership framework selected at random (using a random number generator). They were next asked to think of a situation to represent the behaviour they outlined for themselves, and to draw on an element (i.e., an individual follower or group of followers) to describe this example. Participants were then asked questions that either clarified their discussion and/or related to temporal aspects of behaviour (construct elicited). Participants were then asked to think of another situation involving a different element and to identify any differences that occurred in comparison to the content of the previously identified psychological construct (the researcher guided and clarified this process). The key to defining the psychological construct was based on identifying behaviours that the participant perceived as important to the outcome (whether it was positive or negative).

Pilots 5 and 6: Observation

Two main methodological developments were implemented in pilot interviews 5 and 6 compared to previous interviews. Firstly, participants were explicitly asked to identify differences between the two situations (and elements). This actively encourages participants to engage in the process of drawing differences and similarities between elements, which is integral to Kelly's Personal Construct Theory (1955) underpinning the repertory grid technique. Secondly, participants were asked to select their own two elements rather than being presented with a dyad of elements. The rationale behind this methodological development relates to the observation in pilot interviews 134

3 and 4 that the participant sometimes could not describe two situations relating to leadership and time respectively for every pair of elements. Although this may be attributable to the fact that the leader did not behave in accordance with one of the FRLT's dimensions in the context of interview 3 and a time dimension in interview 4. However, it is also plausible than pre-selecting elements may inhibit this comparison process. As such, the participant was asked to draw on two elements from the sample of five to nine they originally identified to exemplify when they behaved in accordance with a particular leadership or time dimension.

It was decided that to facilitate the elicitation of the psychological constructs, principles from the CIT should be in-built within the interview process. This was arguably accomplished by asking participants to describe a situation in which a particular behaviour was employed while identifying the outcome of the situation. The main advantages with drawing on CIT principles were to ensure that the participants' individual psychological construct system was identified. This notion is based on the fact that participants were asked to recall a situation that linked a leadership dimension; subsequently participants' behaviours and cognitions within the described situation were explored. As participants were asked about the extent to which their own behaviours align with various leadership behaviours presented to them in a written paragraph (e.g., the laissez-faire leadership dimension), it was important that these could be validated with their own behaviours (i.e., by describing a situation in detail). To be in accord with Flanagan's guide for ensuring a potentially replicable CIT, the five rules that Flanagan proposed to allow replication and how they were followed in this study are presented below:

The general aim

The general aim of this interview study is to examine leaders' and managers' temporal behaviours directed towards their followers.

The situations observed

What was observed was the temporal behaviour of leaders across organisational sectors, and leader-levels directed to the individuals they are responsible for leading in their current job role.

Relevance to the general aim

Relevance to the general aim in this research is specified as the temporal behaviours of leaders directed specifically to followers.

Extent of effect on the general aim

This rule is inextricably linked to the aforementioned notion of relevance but any behaviour that has a temporal element is determined as an incident. Specifically, the behaviour should be linked to an outcome (good or bad) and thus a cause and effect is established.

Persons to make the observations

As the general aim of utilising the CIT is to identify the leader's temporal behaviours, it is therefore a pre-requisite that the interviewer has knowledge of the key theories in time and should therefore have conducted a literature review of the time, leadership and management literature (specific theories are presented in chapters 2 and 3).

Finally, consideration will be given to how psychological constructs were recorded in the interview. Firstly, the psychological constructs are traditionally short and concise descriptions. However, the pilot stage has strongly suggested this would have been an unsuitable method of data recording in this study based on methodological limitations of the traditional rep-grid interview in-line with key research questions/objectives. Developing this point, as the CIT was built into the interview process, there was a significant amount of information relating to the described situation. Although the TI-Q targets a leadership sample across organisational sector and leadership level, it was still important to record information relating to that situation, as details that can be generalised across occupations can be drawn upon for the questionnaire development phase. Also, further rationale for providing a detailed record of the psychological construct was based on the finding from the literature review that time is a complex and multi-dimensional construct. As such it was important to record information relating to the situation and behaviours relating to explicit temporal behaviours, so that the data could be subjected to post-interview analysis.

In conclusion, the final repertory grid methodology in this research project marks a departure from the more traditional repertory grid interviews. However, through a careful cycle of methodological evaluation and development, it is purported that the final repertory grid methodology has been tailored to the context of this research project in order to meet research objectives. This is in accordance with Easterby-Smith's (1981) assertion that the valuable repertory grid technique allows a great amount of flexibility in design and application, which has subsequently 'encouraged many researchers to design and develop their own applications' (p.9).

The methodology has also been linked to Kelly's PCT. This is important as it addresses the criticism of Marsden and Littler (2000), who postulate that researchers using the repertory grid do not understand the theory (i.e., PCT) from which this research method has evolved.

Main Study: Method

Sample

There were ten participants (five female; five male). A quota sampling methodology was employed to select at least one representative for combinations of the following three variables: sex, leadership level (senior and middle) and organisational sector (private and public). Table 5.2 shows the distribution of the sample by sex.

Table 5.2

Sample Composition of Repertory Grid Study

	Private Sector Senior	Private Sector Middle	Public Sector Senior	Public Sector Middle
Sex Distribution	1 Male 1 Female	1 Male 2 Female	1 Male 1 Female	1 Male 2 Female

Procedure

Interviews (N=10) were conducted at the location of the organisation in which the participant was employed (all 10 participants were from different organizations). All participants were briefed with the aims of the research during before the interview took place. However, at the beginning of each interview, the researcher would confirm the objectives of both the research project and the interviews, and how the data would be used. In terms of data use, it was briefed to participants that the data they provide will be used to develop an understanding of time in

leadership and to develop a questionnaire to measure time related behaviours in the workplace. Each participant was assured that the information they provide would be strictly confidential and that anything they said would only be reported anonymously and no information that could be used to identify the participant would be written in any aspect of the research's published records (the questionnaire was specifically mentioned).

The element selection and observation process were the same as followed in pilot interviews 5 and 6. To facilitate the development of psychological constructs relating to both the twelve dimensions of time proposed in the conceptual model of TI and dimensions (behaviours) of the FRLT into the interview, the interview was structured to elicit psychological constructs originating from two of the twelve temporal dimensions and two dimensions of FRLT. Subsequently the construct elicitation process was the same as pilot interview 4, for eliciting two temporal dimensions. Pilot interview 5 and 6 construct elicitation process was followed when presenting FRLT dimensions to participants. Appendix 2 provides an overview of the specific temporal and leadership (according to FRLT) dimensions presented to participants. A full overview of the final element selection, construct elicitation and observation process is presented in Appendix 3. Thus, the final repertory grid interview methodology developed entirely from the pilot interview stage.

During the interview, the researcher utilised a template to write down the psychological constructs gathered from the participant. The process of identifying a psychological construct involved the researcher and participant identifying the specific behaviours and cognitions that were perceived by the participant to be important (i.e. representing their construct) in the described leadership situation, and where possible a clear outcome was identified. The dimensions of time and FRLT presented to participants were therefore used to facilitate the identification of situations, which were perceived to be potentially relevant to the research objective of analysing time related behaviours. Arguably without such a structured approach, it would be harder to meet this objective. Once a psychological construct was identified, the

participant would be involved in the process of recording the construct. The researcher would write down (permission for this was gathered from the participant) what the participant said and read it back to them to ensure that the information recorded was accurate. The researcher stated to participants that the repertory grid interview is a different approach to the standard interview, subsequently key behaviours and details relating to a specific situation they describe would be recorded (i.e., the psychological construct) with the aim of accurately recording details of this situation (with as much detail as possible). Subsequently, the researcher would also ask questions about the situation to limit ambiguities and inaccuracies in the recording process. Details about the situation in which behaviours related to were recorded in as much detail as possible as this was deemed important for analysis but also to be aligned to the critical incident technique.

At the end of the interview, each participant was given a summary of how the written records would be stored and used. The participant was asked if they were happy with this data process (aligned to data protection act, 2003) and the participant was asked if they had any questions. The researcher also gave their own contact details to the participant, in case they had any questions after the interview had taken place. Immediately following each interview, the researcher read all the psychological constructs (i.e., the transcripts) to check that there were no ambiguities in the written records and no confidential data.

Analysis

The analysis of the repertory grid transcripts followed a thematic analysis methodology. This methodology was chosen from a number of qualitative analytic methods, as it was perceived to meet the research objectives and be compatible with the theory driven (deductive) research approach. Due to this theory driven approach, several qualitative analytic methods with inductive

based assumptions were not deemed appropriate (such as discourse analysis, grounded theory and interpretative phenomenological analysis). Braun and Clarke (2006) define thematic analysis as ‘a method for identifying, analyzing and reporting patterns (themes) within data’ (p6). Braun and Clarke (2006) present a detailed account of the process and method of thematic analysis to support researchers in conducting research but also to address concerns that this method analysis is not understood as well as other methods (such as narrative analysis or grounded theory). Braun and Clarke address criticism surrounding the thematic analysis method, and suggest that one of the main underlying causes of criticism is that research employing thematic analysis does not follow a clear and methodological process. Braun and Clarke’s recommendations for conducting thematic analysis are subsequently reflected in the analysis of the repertory grid interviews.

In terms of the process of thematic analysis, the repertory-grid interview transcripts were read two to three times each and then within each transcript statements representing themes were identified. Each of the twelve time dimensions featured in the model of Temporal Intelligence were defined as a theme for analysis. Subsequently each interview transcript was examined individually with any behaviours or cognitions relating to a theme being identified. The relevant theme was written down next to the psychological construct. If a statement was perceived to belong to more than one theme, both themes were recorded. This was not deemed as problematic as the goals of the research were to identify statements for a questionnaire that would be subjected to statistical procedures that would address this type of issue (i.e., through statistically identifying a relevant temporal dimension).

Statements were read carefully by the researcher several times for potential suitability to be coded for each of the twelve themes. This was important as the objectives of the interview were not only to identify behaviours and cognitions that could be used in a questionnaire but also use identified behaviours and cognitions identified to develop the description and consequently

understanding of each of the twelve temporal dimensions outlined in the TI model. Subsequently, while a theory driven approach to analysis was adopted by having pre-determined themes, the researcher used the participant's narrative to develop a greater understanding of each of the themes. In this respect the researcher was aware that behaviours and cognitions not previously identified as relating to a particular theme could occur. The transcripts were also examined for any potentially new arising temporal themes or dimensions. None were identified but a number of constructs extended the description of the twelve temporal dimensions (i.e, reflected attributes of a dimension not previously detailed). Following the process of analysis, coded statements were transferred onto a master template, whereby statements were organised by theme. The master template was examined several times by the researcher to develop an understanding of the behaviours and cognitions that emerged from the interviews and were perceived (i.e., coded) to represent the twelve different dimensions of time. This master template was used to create statements for the Temporal Intelligence Questionnaire, which represents a chief objective of the repertory grid interview study. The following chapter (6) provides specific details on how statements were developed for the questionnaire.

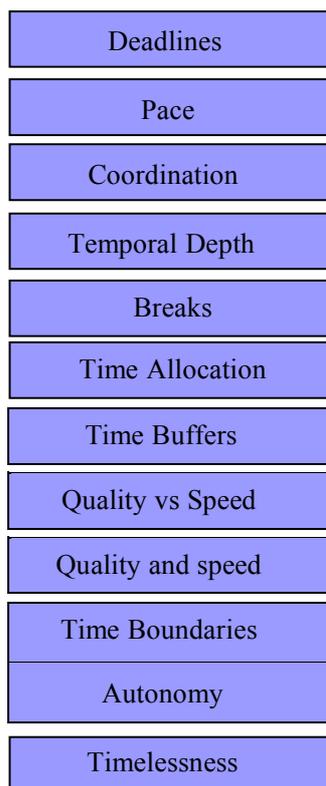
In addition, to facilitating the development of statements for the Temporal Intelligence Questionnaire, a secondary objective (related to the first) was to develop the descriptions and understanding of the dimensions of the TI model through identifying relevant leadership behaviours and cognitions. Presented below are the temporal dimensions from the conceptual model of Temporal Intelligence and a selection of example behaviours and cognitions from the interviews that have been coded under each of temporal dimensions from the repertory grid interviews.

Interpretation Of The Repertory Grid Interview Data Related To The Temporal

Dimensions Of The Temporal Intelligence Conceptual Model.

In total 14, 649 words representing 158 psychological constructs were identified as aligning to one of the twelve dimensions of global temporal practices proposed in the conceptual model of TI. A further 17 psychological constructs were removed from analysis as they were not perceived to relate to temporal behaviours of cognitions. Presented in Figure 5.1 are the temporal dimensions from the conceptual model of TI. A selection of some of the psychological constructs that have been coded under each of temporal dimensions is presented in this section to exemplify both the coding process and the types of specific behaviours and cognitions that were deemed to represent the twelve dimensions of the conceptual model of TI (global temporal practices).

Figure 5.1 *Dimensions of Global Temporal Practices*



Dimension One: Deadlines

The following psychological statements reflect psychological constructs relating to deadlines.

The psychological constructs coded under this temporal dimension refer to different aspects of the deadline lifespan. The analysis showed that the constructs included leaders' behaviours and cognitions relating to different stages of the deadline lifespan. For example, the psychological construct deriving from interview 10 shows the leader refer to communicating details of the deadline to a follower at the initial deadline setting stage. In this example, the interviewee talks about the work the deadline impacts on other members of the team. The leader in this interview in this example shows how he or she considers the importance of the deadline in terms of impact on other individuals, and also clarifies what stages are required to complete the deadline. The interviewee also mentions that recognition is given when a deadline is completed.

Participant 10:

Follower 3 is on an industrial placement, when setting a deadline it is important to identify an individual role so that they are aware of what they are doing and the effects of their actions on the team. When setting a deadline, I ask how long they think it will take. I coach each stage on how to approach as follower is inexperienced. I give personal recognition only at the end of a task. I am quite flexible in the date of deadline especially as individual is inexperienced. For example, when follower is stressed I will tell them not to worry and not push for the deadline.

In interview 8, the participant discusses how they set a deadline but did not monitor progress of the work that the deadline represented and this had a negative implication on the outcome of the deadline itself (i.e., the deadline was missed).

Interview 8:

I gave individuals a detailed outline of what needed to be done (by them). Deadline with follower 6 not met as no meetings set to monitor progress so deadline came and I then realised they had not done work.

In interview 10, the below psychological constructs demonstrate how this participant discusses their behaviours towards a follower when the deadline is missed, which therefore can be considered as post-deadline behaviour.

Participant 10:

If people do not hit deadline, I will be supportive and say don't be too hard on yourself. I have an example where a follower (7) had slipped deadline on a number of occasions, person misunderstood how to do task. I will usually try and work with a person who fails to get a task done and provide tangible steps to help them get task done. If they just don't get task done I will delegate to someone else and name and shame. For example, I will say, 'this person did it fine' (talking to the person who missed the deadline).

Another example of post-deadline behaviour is presented below, deriving from interview 12:

Participant 12:

Follower 3 missed deadline so activity did not happen as follower did not allow enough time for pre-course preparation. Initially express disappointment and explained better communication is needed.

Dimension Two: Pace

This psychological construct shows a participant's recognition of speed and how it relates to the organisation, the leader him- or herself and individuals he or she leads.

Participant 9:

Self speed different to organisation. Organisation is much slower than my own speed. I don't expect

for employees to do at same speed. I ask individual 3 when work will be done by.

The next psychological construct reflects the participant's perception that speed is situation-dependent.

Participant 15:

In some cases, time is of the essence and I need to make decisions. I was a X instructor and I had to make decisions. In that situation I have got a team (*action team*) and all I know is their names. In that situation, they do what they are told as I don't have time to ask them what to do. Time is of the essence, we won't discuss this. This is about leadership styles and it's about situational leadership, I operate in a transformational climate but every now again I will change my style.

A detailed description of a situation in which a leader made a delayed decision is given below, which is perceived to reflect the pace of the decision making process. The leader's thoughts about the situation are recorded and discussed in relation to the outcome. In this example it is very clear that the participant's followers' subjective perceptions of the decision-making process were considered throughout.

Participant 16:

A couple of years ago we went through some redundancies. We were having a bad time in the company and a number of my colleagues thought we should make redundancies and I delayed in making that decision. There was a combination of reasons, one overriding reason is that I did not want to do it from the human aspects so simply put that decision off until it was absolutely necessary because I felt it was going to be done at a time too early as we weren't sure what way the business was going and we certainly weren't sure about the number that had to be cut. I felt we could afford to delay that decision and that might mean some jobs wouldn't have to go. In the end the delay allowed us to make less redundancies and we have been successful so we were able to employ more people. I think at a lower level delaying decisions happen all the time. For example, whether we should delay the extension of the factory. Those decisions of when to do something or not happen every day. I think different people have different senses of urgency on any given problem. It seems to me if there is a consensus of urgency and you delay, it can

be damaging as it was in the redundancy situation as I did find myself a little bit on my own in terms of the way people wanted it to go at that time. They are rare situations where you get isolated. Normally there is a low-level area where the decision isn't absolutely crucial from different people's perspectives. So you might still get a difference of opinion to whether we should for example extend the factory today or in 6 months or 12 months' time. So different people will have a different idea when we should do it but that's not the kind of area we fall out. I am committed to doing what's necessary in location X. I think we should have a smaller extension than some other people think and faster than some other people think. One group wants it bigger and faster and one group wants the extension smaller and slower. I am on my own as I want it smaller and faster. At the moment we are still waiting for a compromise. What we have done is authorised two sets of plans, one bigger and one smaller. I think we've accepted we will do it faster rather than longer. So we waiting for the costing of the plans, the decision has been deferred and the decision has been deferred only because everyone cannot agree and find a consensus. Rather than me putting my foot down again, which would be in the same realms as described above, how many times I do that and what areas I do that. In the interests of trying to reach a consensus we go on a different level with two sets of plans rather than saying we will do it this way, it is in the interests of trying to get a consensus.

Dimension Three: Coordination

Presented below are psychological constructs relating to the dimension of coordination.

Participant 8:

Difficult team to manage and follower 3 is manager of this team. Try to tackle immediate issues when brought up. Adapt management style, so I do not force to be strategic. I leave follower 3 to manage own workload. Doesn't reply to emails. I therefore only intervene if manager does not complete requested work. Rearrange team structure to meet these issues.

Participant 10:

I tend to manage my work rather than directly express deadlines. I multi-task, I judge what to do by what is going to impact on other people in my team or my manager. Work is continuously prioritised. More forceful setting deadlines to more experienced/senior staff. My expectations

are that they should stick to deadlines and they will be letting people down if they don't.

Dimension Four: Temporal Depth

A number of psychological comments reflected the notion of time perspectives in that participating leaders described specific examples of reflecting on the past, focusing on the present and projecting to the future in actions or dialogue with their followers. For example, participant 14 describes a situation when a follower is focused on the past. In this example, the leader can be observed to redirect the follower's attention to the future. Specifically, the participant in this example asked their follower to consider what mistakes they perceived happened in the past and how a similar situation could be approached in the future to avoid the identified mistakes.

Participant 14:

Follower 5 always looks on the negative side and is quite difficult to change. Looking at the past to look where mistakes have been made. This involves sitting down with person and how they think it can move forward. Then I ask what went wrong. Then I ask them how they can put what they learnt into practice for the future.

Similarly, the leader participating in interview 12 describes a situation in which they reflected on the past with a follower while also making reference to the future.

Participant 12:

Follower 1 who works directly for me. All individuals are different so style is to adapt for what they need from you as a leader. He is extremely competent manager and very good with staff. In a lot of ways he is very confident but he is also quite a perfectionist and he beats himself up over things that don't go quite right. I need to make him focus on what went well and not so much on what didn't, as he will do enough of that himself. He doesn't need me to do it for him, sometimes he doesn't see it clearly and sees the negative and gets concerned. So when he is talking about performance of his offices or projects he is taking forward I really concentrate on the things he has achieved and very conscious of the need to acknowledge that with

him and go back to him with successes. You need to acknowledge (negatives) with him but the trick is for him to see them in context and not to worry. When you failed you need to look at them and understand them but add a bit of humour into the workplace to keep those things into perspective and not let it get to you.

In the same interview (12), the participant also described a situation in which she wished to develop a vision of the future among her followers. The specific behaviours involved in the vision, and how the participant thinks these contributed to the outcome of the situation, are detailed below.

Participant 12:

Involving introducing an idea with individuals 2 (team), which was a different focus (way of working/liasing with clients) within our offices. I introduce it, new approach, to a small group of managers. This morning I presented to the whole district, I introduced it to everybody after first briefing those managers so that then they could facilitate discussion after I had introduced the new idea to generate ideas, questions, thoughts, we're trying to encourage people to come forward with ideas to help us make it a reality. These managers are directly responsible for managing 600 staff (*representative of element 2*) who directly deliver the services I am accountable for and therefore these managers are key because if you get them on side and they feel engaged and involved and they feel they can support any new idea or initiative, in my opinion it will happen but those managers are able to block anything given their position. That group is key to get on side particularly when it's a new idea because of their influence they have on making it work or not, so getting them on board first was critical because I didn't want them to feel unsighted or bounced with me going to their staff and them not knowing what I was going to say. So it was really important for me to get their buy-in to me communicating directly and getting staff involved. I was then going to rely on them to take the new ideas I presented and generate discussion and without them doing their bit I couldn't have made it work, I cannot interact with 600 people, I need to work with others. When introducing idea to groups (followers 2), I put them on round tables. Created a relaxed atmosphere. Give my own personal view on level of importance. My own vision but not fully worked through. Got groups to talk about it in terms of what could be done and how it could be done and additional 149

support that would be needed. Then introduced some support materials that could help them and got feedback with them. Then we had a session about the barriers to them going forward and introducing it, then working together on what some of the solutions might be. That was the structure. I gave them a vision and how we were going to get there. So I would look where we were at the moment and where we want to go.

I think it was important to express dissatisfaction with where you are at the moment so this in this case involved challenging the status quo. It's also important to give vision of where you need to get to and get others on board by joining in. If you have all those in place you have some chance of moving forward but if any of them are missing, people are floundering where to go. If one is missing, the sum is zero, like an equation. All the three need to be done at the same time.

In the above discussion, participant 12 makes a clear reference to the present and the future time perspectives. For example, it can be seen that this participant says:

'I gave them a vision and how we were going to get there. So I would look where we were at the moment and where we want to go.'

In interview 16 the participant describes a situation in which they perceived a manager focused on the future time perspective and while acknowledging a balance between the three temporal perspectives, the present time perspective is perceived as the most important of the three. While these comments reflect more the behaviours of this participant's follower than his own behaviour, his attitude clearly shows that the future should not be considered in isolation from the present time perspective:

Participant 16:

I think I am balanced because I've been here a long time. In the past I have seen two-three marketing managers, including individual 3, so concentrated on the future they did not consider the present and that was a mistake in my mind. The present is more important and think you have one reality and the present is the most important of the three (past/present/future).

Dimension Five: Time allocation

This reflects one of three psychological constructs relating to the dimension of time allocation as the participant discusses what factors are considered when setting timeframes for work to be conducted.

Participant 9:

Follower 3 is on an industrial placement, when setting a deadline it is important to identify an individual role so that they are aware of what they are doing and the effects of their actions on the team. When setting a deadline, I ask how long they think it will take. I coach each stage on how to approach as follower is inexperienced. I give personal recognition only at the end of a task. I am quite flexible in the date of deadline especially as individual is inexperienced. I try and take pressure off when self-imposed by follower. For example, when follower is stressed I will tell them not to worry and not push for the deadline

Dimension Six: Breaks

A number of participants described a situation in which they actively encouraged non-work- orientated breaks (this also reflects the conceptual construct of interruptions, which is subsumed within the construct of breaks). There are three examples below.

Participant 7:

I encourage breaks, doing what is essential is encouraged. I also encourage follower (2) to pursue leisure activities as they tend to be in the office for long periods.

Participant 9:

I think in these situations with high work load it helps to have an environment where jokes can be made. I also offer small distractions (social interaction) for easy tasks.

Participant 9

I take time for social interaction and to be friendly to my team. Flexible to meet individual needs. Walking around being approachable I think is important.

Dimension Seven: Time Buffers

The interview data showed that some respondents tended to impose deadlines on their followers ahead of an external deadline, and therefore the concept of time buffers seems relevant to this type of behaviour.

Participant 12:

Deadlines dominate majority of my life. Combination of self and external deadlines. Some things have to be set. Training deadlines (self-imposed) are often set by trial and error. Majority of deadlines are not flexible as there are repercussions on training activity. External deadlines have to be met so will impose a deadline prior to external deadline (same work project/task) to allow for leeway.

Dimension Eight: Quality versus Speed

The below statements from leaders' reflect the dimension of quality versus speed as shows a consistent preference for quality or speed in work completed.

Participant 9:

I value quality over speed unless something happening is better than not happening at all.
Performance expectations – quality over speed. I emphasise quality over speed to my team.

Participant 11:

Quality every time, total quality initiative. Referring to individual followers for those to be quick, for example a follower in a team I lead, I would see where she was going and let her know how to achieve quality.

Dimension Nine: Speed and Quality

Presented below are statements relating to a preference over quality or speed in relation to the situation. Subsequently, this dimension and following statements are different (at a proposed conceptual level) to quality and speed presented above as this dimension specifically concerns the extent to which the leader changes their emphasis on quality over speed dependent on the situation, while the previous dimension

(quality versus speed) does not consider situational cues.

Participant 7:

Improve prototype of product. Follower 5 is involved in process of product development. Quality versus speed becomes a key issue. Priority fluctuates dependent on prioritising commercial/business objectives. For example, there may be a need to provide a prototype for an event and speed will be prioritised over quality if that event is deemed important (e.g., introducing a working model to a customer audience). Thus, it is the business/commercial objectives that ultimately guide whether speed or quality becomes a priority.

Participant 13

We have a team out there that looks after a range of performance outcomes and issues. They have tight deadlines. There are two people and they approach tasks very differently. If I gave them the same tasks I know one would get in done in half the time as the other one but I couldn't be sure that the quality would be there and someone else would have to quality assure everything they did because they would make mistake. I would try and get them to slow down. And say to him and say 'are you sure'. If I find a mistake I will go back to them and ask them to re-correct.

Participant 15:

Time is a quality control of life. Time is directly relevant to quality, so time dictates the standards you can achieve. If you're looking at perfection you can take 80% of the time doing the last 20% of the job. So it's a judgement call, is it critical or a priority will have an impact and with that comes time. Sometimes I want to get the job done, get it rough and ready but get it done and it's recognising when this applies. It's recognising when enough is enough. By nature I strive for perfection, which is a strength and weakness, it means you do aim for the highest standards- a strength as it's about quality. It also means you constantly disappointed as I think it could have been done better but time wouldn't let me so there is a frustration with that. Sometimes it's better for the organisation or task to do something rough and ready. But if you're a perfectionist you have to work against your natural style.

Interview 10 :

More pushy to achieve deadlines for this follower (1). Her map of time is different to mine. If there are lots to do on a list she will get stressed. She sees each task as an individual task and considers each task in depth. Sense of achieving is very important to her. Spends more time on the relationship than the task itself. She needs a sense of urgency. I need to encourage completion. She doesn't know what she would be doing next in a project. I know a sequence for me to get something done but she doesn't plan. I insist on a plan and will make my own plan and give to her if she doesn't do it.

Dimension Ten: Time boundaries between work and non-work

The participant in interview 12 discusses how she monitors both workload and the number of hours worked.

Participant 12:

For external deadlines, I expect staff to come to me for extra resources when the deadline is set. However, there are a couple of people who rarely say no, so they are the people I watch as they take on more than they can because they don't like saying no. I do worry as I don't want them to work long hours and put them under stress. So I sometimes have to go back to them but generally they come back to me. I would then look at other capacities/resources for help.

Dimension Eleven: Autonomy

An example of a participant discussing how they influence the degree to which followers are autonomous in their modes of working is presented below.

Participant 8:

Difficult team to manage and follower 3 is manager of this team. Try to tackle immediate issues when brought up. Adapt management style, so I do not force to be strategic. I leave follower 3 to manage own workload. Doesn't reply to emails. I therefore only intervene if manager does not complete requested work. Rearrange team structure to meet these issues.

Dimension Twelve: Timelessness

An example of timelessness is presented below (this statement was also coded under breaks).

Interview 7:

I think in these situations with high workload it helps to have an environment where jokes can be made. I also offer small distractions (social interaction) for easy tasks.

Coding multiple themes

Following the thematic analysis methodology, psychological constructs were inspected to see if the behaviours or cognitions represented more than one theme. A number of constructs representing multiple constructs were identified. As mentioned previously, duplicate coding was not a perceived issue (due to statistical analyses that will be used to discriminate between dimensions). However, the finding that a number of constructs represented more than one theme suggests that time dimensions are also not mutually exclusive and therefore interact in leadership behaviours.

Revised description of global temporal practices

Following analysis of the behaviours and cognitions representing each of the 12 dimensions of time proposed in the conceptual model of TI and aligned to research objectives, the description of each dimension was summarised based upon the conceptual model of TI and the findings from the repertory grid interviews (see Table 5.3).

Table 5.3

Revised Thematic Descriptions of the Dimensions of Time

Theme	Description
Deadlines	<p>The leader's monitoring of followers' work within the deadline lifespan, which includes responsive actions. The behaviours the leader employs if a deadline is missed. Deadlines are differentiated between:</p> <p><i>External deadlines</i> - not set by the leader. Thus, these external deadlines may be set by client demands or by a leader's superior.</p> <p><i>Internal deadlines</i> - set/imposed by the leader.</p>

Pace	The leader's influence on the rate of activities in the workplace (e.g., tasks). Also the rate of specific activities is considered in this dimension of time (e.g., decision making)
Coordination	The leader's sequencing and coordination of their followers and the followers' activities in the workplace. This includes the concept of entrainment.
Temporal Depth	The leader's reflection on the past, living in the present and projecting to the future in relation to interactions with his or her followers. This scale considers the extent to which the leader uses the three time perspectives (i.e., balances). The notion of time perspectives in a leader's decision making in relation to resource commitment and 'sunk costs' is considered here too.
Breaks	The leader's role in guiding when socially orientated breaks take place among followers. Also the leader's monitoring of non-work-orientated behaviours.
Time buffers	The breaks ('free time') a leader plans between work schedules and tasks involving followers.
Time allocation	The cues the leader uses when estimating how long a task will take a follower.
Quality and speed	The extent to which the leader prioritises speed or quality based on situational aspects.
Quality vs speed	The leader's preference for speed or quality in their followers' work output.
Time boundaries between work and non-work	The leader's monitoring behaviours within the duration of work periods. Also, behaviours that influence the extent to which the follower works outside <i>formal</i> times are considered. This dimension of time also concerns any communication the leader has with his or her followers out of formal working times on work-orientated issues.

Autonomy	The leader's behaviours that affect the extent to which followers are autonomous in their work activities.
Timelessness	The leader's role in encouraging and facilitating the state of engrossment that leads to the experience of timelessness (Mainemelis, 2001) among his or her followers.

Conclusion

This chapter has presented the process of identifying specific behaviours and cognitions relating to the dimensions of the TI model through the use of repertory grid interviews. As the pilot interviews demonstrate, structuring the interview in a way that focuses on time related behaviours in the context of leadership was a challenging process. Developing this point, the main challenges of the process were to ensure that the interviews were structured so that participants' dialogue focused on time related behaviour and cognitions. This was difficult as potentially in a leadership context there is potential for time related behaviours to be ignored and the focus to be on leadership behaviours that the literature has already examined (e.g. behaviours relating to leadership style). To meet the need to identify temporal behaviours and cognitions, the flexibility of the repertory grid methodology was beneficial as through a series of pilot interviews the methodology could be tailored to meet the research objectives of the study. The final repertory grid methodology identified a number of leadership behaviours and cognitions relating to the TI model that were used in this chapter to develop descriptions of the model's time dimensions. The next chapter will seek to use the behaviours and cognitions to facilitate the development of the item pool for the Temporal Intelligence Questionnaire.

6

Construction of the Temporal Intelligence
Questionnaire

The rationale for constructing the Temporal Intelligence Questionnaire (TI-Q) is to produce a questionnaire that represents the construct of Temporal Intelligence in leadership and management by requiring a leader-manager to report their own time related behaviours and thoughts. The development of a questionnaire allows psychometric theory to be applied to guide quantitative analyses of the questionnaire. It is these quantitative analyses that will allow inferences to be drawn about the nature of Temporal Intelligence as a construct. The underlying assumptions of psychometric theory and the associated quantitative analyses will be detailed in the subsequent two chapters. Presented below is a summary of the process guiding the construction and development of the TI-Q:

Stage 1: Initial development of item pool

Stage 2: Content validity analysis

Stage 3: Refinement of items based on face validity analysis and small studies

Stage 4: Refinement of items based upon exploratory factor analysis and item analysis

Stage 5: Testing the structure of the questionnaire based upon confirmatory factor analysis

While the construction and development phases are inextricably linked, a specific distinction between the two is proposed. The construction phase is proposed to be primarily focused on developing and refining the initial item pool of the questionnaire using qualitative methods, while the development phase involves quantitative analyses and the application of psychometric theory to refine the item pool through drawing inferences about the structure of the construct of Temporal Intelligence. Thus according to these proposed definitions, stages 1-3 represent the construction phase of the Temporal Intelligence Questionnaire, while stages 4 and 5 are representative of the development phase of the questionnaire. To reflect the distinction between the construction and development phases of the questionnaire, this chapter will address the former phase while the consecutive two chapters (7 & 8) will focus on the development phase.

Questionnaire Design

When designing a questionnaire, there are a number of options open to the researcher (Oppenheim, 1992). It is important to carefully select the type of items to be presented in the questionnaire and response formats as this will influence both the types of data that can be collected and the analyses to be conducted, which will in turn have implications on the inferences that can be drawn about the nature of Temporal Intelligence as a construct.

Question Types

There are two main types of questions that can be presented in a questionnaire; open and closed questions. Open question types also referred to as free-response questions (Oppenheim, 1992), do not provide respondents with an answer to choose from but rather allow the respondent to answer in their own words. A widely recognized advantage of the open question is that it allows the respondent to express an answer using their own language. This type of data tends to be analysed using a coding methodology such as content or thematic analysis (Oppenheim, 1992). Oppenheim suggests that open questions are particularly useful for the development of a hypothesis. However, the same merits in terms of hypothesis development can be attributed to the qualitative based repertory-grid interviews employed in this study to develop the conceptual model of Temporal Intelligence. Subsequently, the type of data to be collected from the questionnaire has been selected to be quantitative in nature so that empirical evidence can be used to further develop the model of Temporal Intelligence. Thus, closed questions that present respondents with pre-determined responses to choose from have been used in the Temporal Intelligence Questionnaire.

Scaled vs. Non-Scaled Response Types

There are a number of different ways in which the response options can be presented to participants. Firstly, there is the 'Yes/No' response type. However, there are a couple of main limitations with this binary response option. Firstly, the question may not be appropriate to be answered with a simple yes or no answer. Secondly, there is little variance produced from employing such a binary response set to participants. The Temporal Intelligence Questionnaire has been designed to measure

how leaders differ in terms of temporal behaviours and cognitions directed to followers. Thus, it is important that the response set for the questionnaire is such that a substantial amount of variance within the sample can be detected.

Odd or Even Response Options

The likert response scale is commonly used in research and presents respondents with a number of options, typically between 5 and 9 potential responses. The total number of responses can be odd (i.e. 5 or 7) or even (6). The difference between the two is that the odd response scale presents a neutral or uncertain category. Kline (1999) subsequently recommends using this type of response scale as not presenting respondents with such a category can lead respondents to feel frustrated towards completing the questionnaire.

Number of Response Options

The exact number of response options presented to participants is also worthy of careful consideration as Guilford (1956) has shown that the number of response options presented to participants does have an influence on the reliability of the scale. Guilford showed that the more options presented to participants, the more reliable the scales are, however reliability was also demonstrated not to increase (nor decrease) from a 7 point and upwards response scale. Vernon (1961; cited in Kline 1999) argues that the greater the number of response options presented to participants, the more difficult it is for individuals with a low cognitive ability to complete the questionnaire. Vernon also suggests that a 9 point scale should be considered the maximum presented to participants to prevent cognitive over-load. The sample to be used in this study will consist of leaders and managers, which according to norm tables of published psychometric tests suggest that there should not be a concern that the sample will have a cognitive ability that would warrant consideration of a 5 point likert scale. Thus, in line with Guildford's (1956) and Vernon's (1961) recommendations a 7 point scale was employed.

Anchors

Anchors represent definitions of the response options. Two sets of anchors have been used in 161

the Temporal Intelligence Questionnaire. The first anchor set was based on describing the frequency of specific behaviours outlined by the item presented (please refer to Figure 6.1) whilst the second anchor set related to the extent of agreement or disagreement the respondent held towards the presented item (please refer to Figure 6.2). The latter anchor set provides appropriate response options to items relating to cognitions and behaviours.

Figure 6.1 Anchor Set I

Not Applicable		Never	Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	Always
----------------	--	-------	-------------	--------	--------------	------------	-----------------	--------

Figure 6.2 Anchor Set II

Not Applicable		Strongly Disagree	Disagree	Slightly Disagree	Neither agree nor disagree or neutral	Slightly Agree	Agree	Strongly Agree
----------------	--	-------------------	----------	-------------------	---------------------------------------	----------------	-------	----------------

Demographic Questions

Demographic orientated questions and questions relating to the leader-manager's current responsibilities in their leadership-management role were presented to determine information about the sample that would have implications on the generalisability of the data and provide important information to facilitate the discussion of the results from quantitative analyses of the questionnaire. Demographic questions were presented to respondents immediately after the respondent completed the Temporal Intelligence Questionnaire. A study conducted by Roberson & Sundstrom (1990) found returns (n=1,188) were higher when demographic items placed at the end (85%) of the questionnaire compared to the beginning (77%). The format of the demographic questions were in line with recommendations by Sudman and Bradburn (1982).

Social Desirability Bias

Social desirability is a form of social pressure that influences how an individual wishes to be perceived. This pressure influences the extent to which people wish to be seen as either behaving in a socially desirable manner or feel that they are being approved by others. Nunally (1978) stipulates that this type of pressure can have serious implications on the validity of self reports as there is potentially either an under- or over- reporting of social desirable behaviours and cognitions.

Subsequently, a number of questionnaires have been developed that aim to identify those respondents who have a strong tendency to respond in a socially desirable manner. In turn these measures can be included into the research questionnaire to identify the respondents who have been demonstrated to respond in a socially desirable manner and these cases can potentially be deleted from statistical analyses. A number of measures of social desirability were considered for inclusion of the Temporal Intelligence Questionnaire. The Marlow-Crowne Social Desirability scale (Crowne and Marlowe, 1960) is one of the most popular measures of social desirability bias and has been very popular among researchers (Barger, 2002). However, the main limitation with this measure is that it consists of 33 items and therefore has potential to increase the completion of time of a research questionnaire by approximately 10 minutes. Therefore to reduce the respondent burden and the administration time and subsequently address concerns that this aforementioned measure may lead the respondent to experience frustration or boredom, a number of short forms of the Marlow-Crowne scale have been developed (Strahan & Gerbasi, 1972; Reynold, 1982; Hays, Hyashi & Stuart, 1989). Reviewing these short-forms, Hays, Hyashi and Stuart's Social Desirability Response Scale (1989) was utilised. The internal consistency was .68 (N=3053) and test-retest reliability was 0.75 (N=75) for this 5 item measure.

Stage 1: Initial development of item pool

This first stage of the construction of the TI-Q involved producing a pool of items to represent the model of the Temporal Intelligence that was refined following the findings from the repertory grid interviews. Specifically, the items were developed based upon three sources;

- i. The repertory-grid interviews.
- ii. The review of the time, leadership and management literature within the conceptual model of Temporal Intelligence.
- iii. Existing time related questionnaires.

All items developed from the above three sources were developed in line with the following recommendations for constructing questionnaire items proposed by Kline (1999) and Breakwell, Hammond, Fife-Shaw and Smith's (2006):

- i. Ensure each item was written to be in first person tense and therefore explicitly referring to the self.
- ii. Aim for the item to be unambiguous.
- iii. Ensure the item referred to one temporal behaviour or cognition.
- iv. Avoid double-barreled questions, hypothetical questions and questions using technical terminology.
- v. Ensure a present tense consistency apart from items relating to the time dimension of temporal depth.
- vi. Double negative questions and reverse questions are used as little as possible to avoid confusing respondents.

The repertory-grid interviews

Following thematic analysis of the data produced from the repertory-grid interviews, twelve temporal dimensions were identified. Each psychological construct that was coded under one of the temporal dimensions was inspected by the researcher to produce leadership statements. This was in line with Alimo-Metcalf's and Alban-Metcalf's (2001) methodology for constructing items for a questionnaire measuring leadership behaviours from repertory grid interview data. The leadership statements produced in this study were constructed to reflect the temporal behaviours or cognitions of the constituent psychological constructs for each of the 12 temporal dimensions.

These statements were included as items by ensuring one active

verb was presented in each item and that the item met the criteria presented above based on guidelines proposed by Kline (1999) and Breakwell, Hammond, Fife-Shaw and Smith's (2006).

The conceptual model

Based upon the review of the time, leadership and management literature a conceptual model of Temporal Intelligence was developed (Chapter 4). One of the main aims of the repertory grid interviews was to develop items for the Temporal Intelligence Questionnaire by eliciting examples of time related behaviours and cognitions from leaders. The conceptual model was also used to facilitate the construction of items for the TI-Q. Items were developed by the researcher through identifying specific behaviours or cognitions that were deemed to reflect the TI model. Items were developed from the conceptual model of TI to meet the following two criteria. Firstly to supplement those items within a temporal dimension produced from the repertory- grid interviews. Thus, if the repertory-grid interviews produced an amount of items that were not deemed by the researcher to be adequate further items would be developed. For example, Kline's (1999) recommendation that a scale should consist of no less than 3 items although 5 is preferable was taken into consideration. Secondly, if the items generated from the repertory-grid interview did not by the researcher's judgment reflect all the types of behaviours or cognitions that were outlined in the conceptual model for that particular temporal dimension, subsequent items to be reflective of the omitted temporal behaviours and cognitions were developed. Finally, an independent researcher who had published widely in the time domain inspected each item, proposing either item deletion or modification.

Existing Temporal dimensions

Items from existing questionnaires measuring temporal dimensions in an organizational setting were included in the Temporal Intelligence Questionnaire. To the author's knowledge at the time of developing the TI-Q there were no existing measures representing individual differences in temporal based behaviours and cognitions of leaders. Thus, the items from existing measures could not be directly inserted to the questionnaire but required modifying to refer to behaviours and cognitions that the leader directed to their followers.

The global form of temporal practices outlined in the conceptual model of TI (Chapter 4) identifies dimensions of time that are proposed to be embedded in a leader's behaviours and cognitions directed towards followers. Schriber and Gutek's (1987) empirical research identified 13 temporal dimensions that operate in organizational culture and influence groups and teams. As outlined in the conceptual model of TI these dimensions are experienced by groups and teams, and therefore it is perceived that a leader can have an influence on how these 13 dimensions of time are experienced. While Schriber and Gutek's work is at a cultural level, Temporal Intelligence adopts a more micro-level approach as it is the relationship between the leader and follower that is being accounted for (in a temporal sense). However, it was still deemed important that the Temporal Intelligence Questionnaire reflects the dimensions of time measured by Schriber and Gutek, subsequently the items representing each of these 13 dimensions were inspected by the researcher to see if the TI-Q adequately covered the content of the measure developed by the two aforementioned academics.

Items from the temporal culture measure that were not deemed represented by TI-Q items developed through the repertory grid interviews or the conceptual model of TI were modified and used in the TI-Q. This modification involved changing the items from first person tense to third and wording the item that behaviours referred to those directed to an individual follower. Expert evaluation of the questionnaire was used as a further source to validate this representation.

The adaptive form of temporal practices outlined in chapter 4 is concerned with a leader's awareness and behavioural responses to the individual follower's temporal preferences. The Time Personality Inventory-TPI (Francis-Smythe and Robertson, 1999) as demonstrated in the review of the literature chapter 2 was developed to represent individual differences in time related thoughts, behaviours and attitudes towards time. The TPI has therefore been selected to represent followers' temporal preferences. Subsequently, items in the TPI have been changed from first person to third person and verbs referred to followers. The TPI was specifically selected for the inclusion of the Temporal Intelligence Questionnaire rather than any other individual level measures of time as the development of the TPI involved including items from measures identified from a comprehensive literature review of individual level measures of

temporal dimensions. Thus, there seemed no clear justification to include other items from other individual level measures that were not developed using as a rigorous methodology as Francis-Smythe and Robertson (1999). As the adaptive form of temporal practices also includes a leader's awareness and responses to the temporal demands of the job, the Job Time Characteristics (Francis-Smythe & Robertson, 2003) measure was utilized as a source for item development.

Refinement of Item Pool Based Upon Small Pilot Studies

The development of an initial item pool produced 200 items. The rationale was to develop a substantial item pool that reflected temporal concepts relevant to leadership and management that were identified in the literature and embedded within the conceptual model of Temporal Intelligence, existing time measures and the repertory-grid interviews. Through producing a large number of items, a number of studies were conducted to refine the item pool and ultimately structure of the Temporal Intelligence Questionnaire. Firstly, a number of small studies were conducted prior to conducting a large scale psychometric evaluation of the Temporal Intelligence Questionnaire. These small studies involved evaluations of the TI-Q through:

- i. A survey completed by experts in the field of time, leadership and management (n=3)
- ii. Survey evaluation and two focus groups (n=21)
- iii. Evaluation of the item wording of the TI-Q (n=1)
- iv. Cognitive walk-through interview (n=1)
- v. A survey completed by practicing leaders (n=5)

These studies listed above and how they were used to further refine the TI-Q will be detailed:

Survey Evaluation of the Temporal Intelligence Questionnaire Completed by Experts

Three individuals who were prominent scholars in the time, leadership and management fields

were invited to read through the 220 items of the TI-Q and evaluate the questionnaire at item level. These three scholars (two males, one female) who all accepted the invitation had all published in peer-reviewed journals. Individuals one and two had numerous publications (more than 5) in the time domain and, the leadership and management subject areas respectively. Individual three has had more than 100 publications in peer-reviewed journals, which included articles across all three subjects. Moreover, all three scholars had developed their own questionnaires relating to time, leadership or management. The purposes of the evaluation of the TI-Q were two fold. Firstly and the primary purpose of the survey was to draw upon the opinions of the experts' for the process of content validation of the questionnaire. This refers to the extent to which experts perceive the questionnaire as employing items representative of the construct in which the measure aims to measure. The second aim of this survey's evaluation of the TI-Q was to identify aspects of the questionnaire that could be changed such as the layout of the questionnaire and wording of items. Although these issues are outside the remit of content validation, they were considered during the survey as the objective was to draw upon the experts experience and knowledge in questionnaire construction. The evaluation survey is presented in Appendix 6.

Two of the three experts feedback showed a mutual concern that a number of items were too long and complex. The two experts advised conducting further research to simplify the language of items. A few items were identified as not being relevant to the temporal dimension they were claiming to measure and were subsequently deleted.

Survey evaluation and Focus Groups

Nineteen final year undergraduate psychology students were invited to complete a survey evaluation of the TI-Q and participate in a focus group evaluating the questionnaire. This sample was selected based upon their awareness of issues relating to questionnaire construction that was developed through the undergraduate degree. Five out of the nine-teen participants were working in a leadership or management role on a part-time basis (less than 30 hours a week). Thus, the reason for selecting this sample was to focus on specifically evaluating the layout and aesthetics of

the questionnaire. The sample had knowledge of the issues surrounding questionnaire design through formal lectures within the degree course and this knowledge was perceived to be valuable for providing detailed and specific feedback in accord with the objectives of the evaluation process presented above. Due to the sample characteristics and objectives of this evaluation process, the survey did not require participants to comment on the wording of individual items (see Appendix 7).

Due to the perceived value of participating in this research by the Head of Research Methods at the participating University, this research was scheduled in the University's timetable to replace a normal weekly seminar (90 minutes). The sample was informed of the nature of the research and could choose not to attend the research seminar. The sample was split into two groups and the research was subsequently conducted over two different times on the same day. Both groups were asked to read through the Temporal Intelligence Questionnaire and complete an evaluation survey of the questionnaire.

Following completion of the evaluation survey, a 25 minute focus group took place. It was a semi-structured focus group (see Appendix 8 for interview schedule) that was intended to further discuss the issues raised by individuals completing the survey. The researcher made notes during the focus group to identify the key points that were observed during the discussions.

From the survey and focus groups, a number of changes were made to the questionnaire in terms of the spacing of instructions and items (i.e., more blank space was included). Within the instructions, a number of participants suggested that the distinction between external and internal deadlines should be accentuated by either putting the two terms in bold formatting or underlined. The former formatting was selected. The font size of each section header of the questionnaire was increased from font size 14 to 16 based on the feedback from the focus groups showing a number of participants did not identify the difference between sections one and two of the questionnaire (i.e., external and internal deadlines respectively). A number of respondents also suggested that a colour

scheme should be used in the questionnaire to make the questionnaire appear more aesthetically pleasing. As Kline (1999) states that the way in which a test looks like can affect respondents motivation to complete the questionnaire; a colour scheme was subsequently added to the research questionnaire.

Evaluation of the Wording of Items

One female PhD research student who had MSc and PhD level experience in constructing psychometric tests was invited to read through the TI-Q and comment on the clarity of each item and suggest ways in which an item could be presented more clearly. The purpose of this process was to make initial steps in addressing the experts' comments that the TI-Q employed complex wording within items through consulting an independent researcher. While care was taken to ensure that the temporal content of the item was not changed, the wording of the item was modified if the researcher of this study and the independent researcher agreed that the wording could be changed to be presented clearer and in a simpler manner (based upon the researchers' subjective interpretation). A number of such changes were made as a result of this process.

Cognitive Walk-Through Interview

One cognitive walk-through interview was conducted with a leader (female) working within the higher educational sector. The participant was asked to read through the questionnaire and think out-aloud (i.e., verbally describing her thoughts) in terms of interpretation of the instructions of the questionnaire and interpretation of each item. There were no difficulties noted in terms of the interpretation of the instructions but 6 items were deleted or modified based on the participant reporting difficulty in interpretation. Also the participant was asked to describe any problems that they experienced in answering a question that was attributable to a response option.

Survey Evaluation of the Temporal Intelligence Questionnaire completed by Practicing Leaders

The TI-Q was distributed to five individuals working in middle to senior leadership roles (n= three males, n= two females). The first aim of this exercise was to evaluate the extent to which the

questionnaire appeared to participants as measuring what it claims to (i.e., face validity), which is the temporal aspects of leadership and management in the context of this study. The extent to which a test appears to the respondent as measuring what it claims has been demonstrated to affect respondents motivation to complete the test and quality of the data collected (Kline, 1999). The second aim of the exercise was to identify usability aspects of the questionnaire. The concept of usability refers to the extent to which an individual can complete a task with ease and efficiency. Usability is a concept typically applied to electronic interfaces such as computer software and internet websites. It is proposed that when applied to the context of questionnaires, usability refers to the extent to which a respondent can complete the questionnaire based upon the ways in which the instructions, questions and responses are presented. In line with Bell's (1999) and Kline's (1999) recommendations for evaluating questionnaires, the survey gathered information relating to the time taken to complete the questionnaire, clarity of instructions, clarity of question of wording and lay-out of questionnaire. Although, Bell and Kline did not employ the term usability, their recommendations fall under the definition of usability proposed in this research within the context of questionnaire construction. Appendix 9 shows the evaluation survey distributed to the five leaders.

A major problem associated with questionnaire length is that the number of items asked can lead the participant to become bored or tired. It is generally acknowledged that there are no definite rules for the optimum length of a questionnaire (Breakwell, Hammond, Fife-Shaw & Smith, 2006), however a few guidelines relating to this issue have been proposed. Breakwell, Hammond, Fife-Shaw and Smith suggest that questionnaires which take over 45 minutes to complete are only appropriate when the respondent can be assumed to be very highly motivated to help the researcher. As there will be no reasons to make this assumption in the context of this study, it was decided to ensure that the Temporal Intelligence Questionnaire should take less than 45 minutes to complete. Based upon participants reporting of the completion time of the questionnaire within this evaluation survey, no individual reported a completion time of over 40 minutes. Thus, the 173 items were deemed as an appropriate length for a larger scale pilot of the questionnaire.

Following the small-scale pilot studies discussed in this chapter, the initial 220 item pool was refined to 168 items (excluding the 5 items of the Social Desirability Response Scale-SDRS). Thus, in sum 168 items represented the twelve dimensions of global temporal practices and the dimension of adaptive temporal practices (Appendix 10 shows items presented by dimension). As the SDRS's 5 items were randomly distributed in the TI-Q, the research questionnaire consisted of a total of 173 items. Specific information relating to the item length of each temporal scale in the TI-Q and the number of items derived from the three sources of item generation are presented in Table 6.1 for global temporal practices and in Table 6.2 for adaptive temporal practices.

Table 6.1

Information on the 12 Dimensions Global Temporal Practices of the TI-Q

Time Dimension No	Time Dimension	Sub-Dimension	No Items	No of Items Generated from	No of Items Generated from	No of Items Generated from 3
1	Deadlines					
1i.		External Deadlines	13	13	0	0
1ii.		Internal Deadlines	19	19	0	0
2	Pace		12	5	7	0
3	Coordination		17	17	0	0
4	Time Perspective Interaction		42	28	14	0
5	Breaks and Pauses		8	7	1	0
6	Time Buffers		3	2	0	1
7	Speed and Quality		4	4	0	0
8	Speed vs. Quality		4	2	2	0
9	Time Boundaries		4	1	2	1

10	Time Allocation		4	0	0	4
11	Autonomy		4	1	3	0
12	Timelessness		14	2	0	12
Total No. of Items			148	101	29	18

Item Source 1: Repertory grid Interview

Item Source 2: Conceptual model of Temporal Intelligence

Item Source 3 Existing time related questionnaire

Table 6.2

Information on the 4 Dimensions of Adaptive Temporal Practices in the TI-Q

Sub-Dimension	Time Dimension	No items	Item Origin	Item Origin	Item Origin
1	Polychronicity	8	0	0	8
2	Planning	4	0	0	4
3	Punctuality	4	0	0	4
4	Impatience	4	0	0	4
Total Number of Items		20	0	0	20

Item Source 1: Repertory grid Interview

Item Source 2: Conceptual model of Temporal Intelligence

Item Source 3 Existing time related questionnaires

Conclusion

The final 173 item Temporal Intelligence Questionnaire produced from the above pilot studies is presented in Appendix 11. This shows that items (apart from deadlines) relating to different temporal dimensions were distributed through the measure (i.e., items were not presented by

dimension). This is a standard format for questionnaire presentation and the rationale behind this format is to reduce response bias. Items relating to deadlines were presented together as to make a distinction between internal and external deadlines. The next chapter presents a study conducting statistical analysis on the TI-Q. The aim of the study is to develop an understanding of the structure of the TI- Q and subsequently the TI construct based upon Classical Test Theory (CTT). CTT will be discussed in detail in the following chapter.

7

Development of the Temporal Intelligence

Questionnaire: Study I

Following the identification of a pool of questionnaire items related to a leader-manager's temporal cognitions and behaviours, this leads onto using quantitative research methods for the next stage of developing the Temporal Intelligence Questionnaire.

Psychometrics is a broad approach theorising the measurement of latent variables reflecting mental processes such as anxiety, depression, intelligence and different dimensions of the personality (e.g. conscientiousness or extraversion). A latent variable in the context of psychometrics is a psychological based construct that cannot be directly observed or measured. However, behaviours or attitudes can be observed or self reported, and interpreted as raw data. This raw data can be used to draw inferences about the nature of the latent variable through applying statistical procedures. Currently, Classical Test Theory represents a dominant theoretical model within psychometrics, There are a number of statistical techniques associated with this model that can be applied to *raw* data (i.e. self-report or observed data) to draw inferences about the nature of latent variables. These statistical tests can therefore be applied to draw inferences about the nature of Temporal Intelligence which would be classified as a latent variable.

Classical Test Theory

Classical Test Theory (CTT) postulates that the measurement of psychological constructs is always contaminated by some degree of error. CTT assumes that the observed scores obtained from a test are composed of both a true score and a random error score. The true score is the amount of a characteristic (such as intelligence) that a person possesses. The random error score does not provide information about the underlying psychological characteristic that a test aims to measure but rather is random error occurring in the measurement process that will either increase or decrease the score that an individual is observed to obtain on a test.

The extent to which a test both accurately and consistently measures the true score has been defined as reliability (Bartram, 1990; Kline, 1999). Reliability can therefore be understood to

have two distinct meanings; temporal stability (how consistent a test is in measuring a construct) and accuracy. The accuracy of a test is measured by estimating the amount of error that is produced by the items employed in the test. Consistency in the context of reliability refers to the stability over time and is measured by test-retest reliability. This type of reliability is an estimate of the amount of error due to temporary fluctuations in either the environment in which the test takes place or the individual's state. Test-retest reliability is therefore a correlation between scores administered on two separate occasions to the same individual (Kline, 1999).

As mentioned another distinct meaning of reliability is to calculate the amount of error of variance that is attributable due to the items employed in the test. This is sometimes referred to as the internal consistency of the test (Kline, 1999). There are several ways in which this can be done. The first is alternate or parallel form reliability and involves correlating two alternate forms of the same test in a close temporal proximity. Specifically this method for calculating reliability represents an estimate of the amount of error variance that is caused by different samples of items. Secondly, a procedure that is used that is in essence converse to alternate forms method of estimating reliability, involves taking a single pool of items representing one test and dividing it into two sub- tests. The correlation between the two halves of the test is therefore an estimate of variance that occurs due to item selection. However, as the original pool of items is split into two, the correlation is adjusted using the Spearman-Brown formula (Kline,1999). A third method for estimating the amount of error attributable to the items employed in the test is coefficient alpha. Coefficient alpha or Cronbach Alpha estimates the extent to which all the items in a test or a scale of test consistently measures a uni-dimensional construct (e.g. Extraversion).

Another assumption of Classical Test Theory is that the reliability of a test should not be considered in isolation to validity. Validity as a concept will be examined in detail in the following chapter but in sum validity refers to the extent to which a test measures what it is supposed to (Kline, 1999). When a test constructor is so focused on ensuring a test is as reliable as possible but this is done to the expense of validity, then the test could potentially just be measuring 'bloated specifics' (Cattell, 1978). Cattell used this term to describe a situation

when specific variance is being measured rather than a latent variable or construct. To illustrate this, a researcher may paraphrase one item several times and subsequently only specific variance is being measured. Thus a test or a single factor within a test could potentially be measuring bloated specifics and therefore it is important to assess the validity of a test or factor. Thus, while test reliability is necessary, it is not sufficient for validity. Methods for developing a test in accord with Classical Test Theory therefore aim to be reliable and valid. Two main approaches to test construction are the item-analytic and factor-analytic method.

Factor analysis is a statistical procedure that can be used to produce a unifactorial test (i.e., all items form one factor). According to Kilne (1999) a test that is unifactorial is ‘inevitably reliable and valid in that it measures a factor’ (p160). However, it is also possible to produce a multi-factorial test for constructs that are comprised of more than one factor (although essentially this is conducting several unifactorial tests at one time). Examples of multifactorial tests are tests of the Big Five Personality, such as the NEO-PIR (see McCrae & Costa, 1996) that measure the 5 dimensions of personality. Considering that Temporal Intelligence included distinct temporal dimensions, a multi-factorial approach was required. Empirical evidence that Temporal Intelligence is multi-dimensional in nature derives from previous psychometric measures of time in the workplace at an individual and cultural level that demonstrate time to be a multi-dimensional construct (Francis-Smythe & Robertson, 1999; Schriber & Gutek 1983, respectively).

Item analysis involves analysing responses to a pool of items and analysing each item’s correlation with the total score. As the aim of item analysis is to yield a homogenous and unifactorial test, the assumption underlying this type of analysis is that each item should be measuring what the complete test is supposed to, consequently forming a high correlation between an item and total score. However, the main criticism launched at the item analysis method is that while it can ensure homogeneity of tests it does not necessarily guarantee a one dimensional structure. For example, if two factors are correlated with each other such as anxiety and depression, then item analysis will select items relating to both those distinct psychological constructs. Factor analysis ostensible superiority to item analysis is based upon factor analysis ability to be purely

unifactorial.

While item analysis is theoretically inferior to factor analysis, the main advantage is related to sample size. While there are inconsistent estimates on the exact sample size required for factor analysis, overall much more substantial sample sizes are recommended for factor analysis compared to item analysis, whereby the general consensus is 100 (Kline, 1999). While a few researchers support the notion of a sample size of 100 for factor analysis the majority suggest a much larger sample size. Hair, Anderson and Black (1995) suggest as many as 20 responses per item for factor analysis.

Item Response Theory

However, it is also important to recognise that while Classical Test Theory is at the present time arguably the most widely followed model within psychometrics, Item Response Theory represents a contrasting approach to drawing inferences about latent variables. The difference lies in the statistical tests that are applied to the items within a psychometric test. In sum, Item response Theory does not group items of a psychometric test into a scale and assume each item has *equal variance* or in other words equal contribution to the total score as does Classical Test Theory. Instead Item response Theory statistically analyses each item and will designate a proportion that the item will contribute to the total score on the test. In this sense each item is individually weighted in terms of how it influences the total score. The statistical procedures that IRT employs are more complex than CTT (see Ayala 2008 for further details on IRT).

Classical Test Theory versus Item Response Theory

Fan (1998), conducted a study comparing the Classical Test Theory's approach to that of Item Response Theory. Specifically, this research compared and contrasted the item and person statistics produced from the two measurement frameworks. Person statistics simply refers to the total observed score (e.g., score on a personality or intelligence test). Item statistics is represented by measure of item discrimination and item difficulty, which are statistics associated with tests that employ items that have a *correct* answer out of a possible range of choices, for example these 180

are typical of attainment and ability tests (e.g., a verbal reasoning test). Item difficulty refers to the proportion of a sample of test-takers who identify the correct response on a test (e.g. the correct answer to a verbal reasoning question). This is measured by a p value that is between the values of 0 and 1; a higher value represents a larger proportion of the sample got the item correct and hence the item is *easier* to answer correctly than a p value closer to 0. Item discrimination refers to the ability of an item to discriminate between test takers who have a higher ability on a particular ability or attainment construct compared to those with a lower ability. Item discrimination is most commonly expressed as a Pearson Product-Moment correlation coefficient between the scores on a specific item (e.g. expressed in a numerical value, whether the item is correct or not, such as 1, 0 respectively) and the total test scores. Fan (1998) conducting his research on a large sample of respondents (n=193,240) completing writing, reading and math tests concluded that: 'The findings here simply show that the two measurement frameworks produced very similar item and person statistics both in terms of the comparability of item and person statistics between the two frameworks and in terms of the degree of invariance of item statistics from the two competing measurement frameworks' (p370).

As the degree of invariance of item statistics across samples has been considered as the theoretical superiority to IRT, this led Fan (1998) to conclude that his 'findings do not support the IRT framework for its ostensible superiority over CTT in producing person-invariant item statistics' (p370).

Macdonald and Paunonen (2002) conducting a similar study aiming to compare and contrast the Classical Test Theory and Item Response Theory concluded that the two methods were highly comparable. Macdonald and Paunonen also reviewed the implications of their results on test construction and concluded that Item Response Theory is recommended for developing tests of ability and attainment where there is one correct answer out of a possible range of choices. In such contexts, tests with higher item discrimination and difficulty are particularly recommended for applying IRT methods of analyses compared to CTT. However, these two researchers did not find any evidence to warrant using Item Response Theory in the construction of tests that

responses are not interpreted on a basis of a right or wrong scoring system. Thus, the benefits of adopting Item Response Theory to quantitatively develop the Temporal Intelligence Questionnaire do not outweigh those of the Classical Test Theory. CTT is a well established theoretical and statistical approach to test construction. Due to the popularity of tests following the CTT method of test construction, the values obtained following metrics and measurement methodologies representing CTT from existing individual-difference measures can be compared to those obtained from the Temporal Intelligence Questionnaire. This is perceived to be potentially fruitful in determining the nature of Temporal Intelligence as a construct. This will be discussed further in the following chapter.

Method

Sample

The sample consisted of two hundred and three participants. The sample composition is represented in Table 7.1 in terms of age, sex and organizational sector. Please note 4 respondents were removed from the initial raw data due to concerns relating to bias and subsequently validity (see section 6.3.1.7. on Social Desirability Response Bias for further information).

Table 7.1

Sample Composition

Variable	Percentage	Frequency
Sex		
Male	42.4 %	86
Female	55.7%	113
Missing	2%	4
Age		
19-15	2 %	4
26-35	10.8 %	22
36-45	34.5 %	70
46-55	36.5 %	74
56-65	12.3 %	25
66-75	1.5 %	3
Missing	2.5 %	5
Organisational sector		
Private	32 %	65
Public	64 %	130
Missing	4 %	8

Procedure

All 203 responses were collected via the internet on three websites that were specifically

designed for the collection of questionnaire data. Initially the Temporal Intelligence Questionnaire was developed on a website managed by Occupational Psychologist consultancy company *Robertson Cooper Ltd.* Invitations to complete the Temporal Intelligence Questionnaire were emailed to leaders and managers from a database that was developed by the researcher. This database was developed based upon advertising at exhibitions organized by the University of Worcester Business School and management workshops conducted by the School. The database was used for the sole purposes of contacting individuals regarding this research and this was explicitly made clear in writing to any individual who gave their contact details. The invitation sent to the individuals on the database included a web-link to the Temporal Intelligence Questionnaire and, both a username and password to access the questionnaire. A statement about the research in terms of research aims, researcher's affiliated Higher Education Institution, confidentiality, storage of data and contact details of the researcher was included. The content of this statement was designed to address ethical issues discussed in the British Psychological Society's (2008) ethical guideline handbook. This statement was presented to all participants before completing the Temporal Intelligence Questionnaire.

Individuals who completed the Temporal Intelligence Questionnaire were emailed thanking them for their participation and asking them to also forward on an email to any leader or manager who they knew that may be interested in completing the Temporal Intelligence Questionnaire. As a username and password were required to access the Temporal Intelligence Questionnaire, those individuals who received details of the research and were interested in participating, had to contact the researcher for access details. In total 40 responses were received from the aforementioned procedure over a period of 5 months. It was not possible to record the total number of invitations sent and subsequently an accurate response rate. However, the total sample was insufficient for statistical analyses. Subsequently, the Temporal Intelligence Questionnaire was uploaded on a further two websites. Both these websites did not require a participant to enter a username and password. This was a perceived advantage because a direct web-link to the questionnaire could be presented to participants rather than having individuals contact the researcher for access details.

The first website was another Occupational Psychology Consultancy called Consulting Tools 184

Ltd while the second website represented a specialist on-line survey data collection service (Survey Monkey). The layout of the Temporal Intelligence Questionnaire was identical on all three websites. Information about the *research trial* of the Temporal Intelligence Questionnaire and the web-link to the Temporal Intelligence Questionnaire (TI-Q) was presented in the CIPD website, practitioner based publications (n=3), management and leadership societies (n=4), management and leadership conferences (n=3), emails to HR directors (n=420) and West Midlands Chamber of Commerce meetings (n=2). In total 143 responses were received from the website provided by Survey Monkey and 20 from the website managed by Consulting Tools Ltd. Data collection occurred over a 9 month period.

Analysis

Factor Analysis

The fundamental assumptions underlying the factor analysis approach with reference to Classical Test Theory have been discussed above. The statistical procedures employed in factor analysis aim to identify the structure of a set of variables that form a construct. Factor analysis will identify coherent subsets of variables that are fairly independent of one another by identifying a group of variables that are correlated with one another but do not correlate highly with variables in another group or subset (Tabachnick & Fidell, 2007). A specific goal of factor analysis is to summarise the correlations between variables and therefore reduce a large number of variables into a smaller set of variables. Kerlinger (1979) describes factor analysis as ‘one of the most powerful methods yet for reducing variable complexity to greater simplicity’ (p180). As the Temporal Intelligence Questionnaire consisted of 168 items (excluding 5 items measuring social desirability), a major perceived benefit of employing factor analysis was to reduce the size of this item pool. The decision was to develop a large item pool based on the Temporal Intelligence model and use statistical methods to reduce the item pool.

There are two main procedures for conducting factor analysis; Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA tends to be used in the earlier stages of test construction to identify relationships between variables and significantly reduce the size of the item pool (Tabachnick & Fidell, 2007). CFA is statistically more advanced than EFA but is

used to test a theory about a latent construct (such as Temporal Intelligence). Thus, EFA will refine the number of variables and is used to generate hypotheses about latent constructs while CFA is used to test these hypotheses (Tabachnick & Fidell, 2007). The responses from the Temporal Intelligence Questionnaire were subjected to EFA to reduce the size of items and generate a hypothesis about the underlying structure of Temporal Intelligence. There are a number of issues that need to be considered when conducting factor analysis. These include; extraction method, suitability of data for factor analysis, factor rotation, factor retention, item loadings and missing values.

Extraction Method

Firstly, how factors (i.e. subsets of items) are identified can be based upon the Principal Components Analysis (PCA) or Factor Analysis (FA) procedure. Although PCA is frequently referred to as a procedure of EFA, there is a line of argument to suggest that PCA is not a true method of factor analysis (Costello & Osborne, 2005) and therefore raises the question to whether it is a form of EFA at all. However, the main focus of the debate surrounding PCA and EFA is based on the degree to which each procedure can be informative to the investigation of a latent construct. Some argue it will make no difference if PCA or FA is implemented (Steiger, 1990; Velicer & Jackson, 1990), while others argue in support of the FA procedure (Floyd & Widaman, 1995; Gorsuch, 1990). However, if the differences in the statistical calculations between PCA and FA are identified, there is a strong case for declaring FA as a more suitable procedure for conducting EFA in comparison to PCA. Further developing this point, FA distinguishes between the shared variance of a variable and both its unique and error variance to reveal an underlying factor structure that is based upon shared variance. PCA does not distinguish between shared and unique variance. Subsequently, PCA has been described as a purely data reduction method as it does not attempt to understand the underlying structure of the observed variables (Costello & Osborne, 2005). Thus if the underlying structure of the observed variables that form the latent construct is not considered (i.e., if PCA was to be used), this will limit our understanding of the latent construct itself. Consequently FA will be used as an extraction method and is in line with a number of recommendations proposed by researchers for conducting EFA

(e.g., Costello & Osborne, 2005).

Suitability of data for factor analysis

Due to the statistical calculations involved in factor analysis, there are certain criteria that the literature strongly suggests should be met for factor analysis to be deemed an appropriate analysis method. Firstly, sample size represents a key issue in determining whether the data is suitable for factor analysis. As mentioned, factor analysis involves performing correlations between variables, the outcome of this multi-variate analysis, referred to as the correlation coefficient will fluctuate to some degree based on sample size (Field, 2005). The main arising problem from fluctuating correlation coefficients is that the factor stability can be described as *weak* in that if EFA was conducted on a different sample but with the same variables (e.g. test) the factor solution would not be replicated (Velicer, 1974) and CFA would be less likely to confirm the structure produced from EFA (assuming different samples are used). However, there is no general consensus on the specific size of the data that is required for factor analysis to produce a stable factor structure as some researchers stipulate a substantially smaller sample size than others. Moreover the complexity of this issue is increased when it is considered that there are a number of different methodological approaches for determining an adequate sample size.

The first approach to determining a suitable sample size has a single focus on the number of responses. Gorsuch (1983) and Kline (1999) purport that the minimum sample size necessary to achieve factor solutions is 100. Furthermore Kline (1999) describes that a sample size of 200 is adequate. Guilford (1954) claims the minimum sample size should be 200 for factor analysis. Comrey and Lee (1992) define a sample of 50 as very poor, 100 as poor, 200 as fair, 300 as good, 500 as very good, and 1,000 as excellent.

There is another approach that posits that the appropriate sample size is contingent upon the number of variables being subjected to factor analysis. For example, Cattell (1978) recommends for the ratio of 3 to 6 responses per a variable (n:p ratio). Everitt (1975) argues for a minimum n:p ratio of 10:1. Hair, Anderson and Black (1995) suggest a ration of 20:1. However, Barrett and 187

Kline (1981) conducting an empirical study involving factor analysis of questionnaire data found a much lower ratio of 1.3:1 to be suitable. Moreover, a ratio of 3.9:1 was not found to improve the stability of the factor solution.

An alternative method to defining a minimum sample size is to examine the statistical properties of the factored solutions. For example, Guadagnoli & Velicer (1988) argue that factors with four or more loadings with .6 means results are reliable regardless of sample size. Ten or more loadings of .4 and above are reliable for a sample size greater than 150. MacCallum, Widaman, Zhang & Hong (1999) rather than inspecting the factor loadings argue that factor communalities should be considered to identify a suitable sample size. A sample size of 200 is deemed as adequate for factor communalities of .5 and above. The main limitation with this approach is that it relies on a post-analysis of the solution produced from EFA and therefore the suitability of the sample size can only be determined once the data is collected.

Three broad main approaches to estimating an appropriate sample size for factor analysis have been detailed. It is clear that within these approaches there are inconsistencies in relation to calculating sample size and it can therefore be argued that previous research should be used as guidelines for determining an appropriate sample size. As Costello and Osborne state (1994) 'strict rules regarding sample size for exploratory factor analysis have mostly disappeared' (p4) . The sample size of 203 used in this study therefore is above the minimum sample size recommended by many researchers (Gorsuch, 1983; Kline, 1999; Guilford, 1954; Comrey & Lee, 1992). Moreover the present data set represents a n:p ratio of 1.2:1 that is marginally lower than Barrett and Kline's (1981) 1.3:1 recommended ratio.

Another criteria widely used to assess the appropriateness of the data for factor analysis is Bartlett's test of Sphericity, which has to be significant ($p < 0.05$) for factor analysis to be deemed appropriate (Costello & Osborne, 2005; Field, 2005; Kline, 1999). The present data set was shown to be significant when subjected to Bartlett's test of Sphericity ($p < 0.05$).

Factor Rotation

The aim of factor rotation is to clarify the structure of the observed variables. There are two main methods of rotation, being orthogonal and oblique. Oblique methods allow for the factors to correlate while orthogonal factors produce uncorrelated factors. Thus, if a latent construct such as Temporal Intelligence is comprised of correlated factors then oblique methods will identify the nature of the relationship between factors while orthogonal will not. Many researchers consequently argue that an oblique method of rotation should be employed in order to understand if the factors are correlated with one another, which may have implications on understanding the nature of the construct being investigated (Costello & Osborne, 2005). Moreover, Kline (1999) suggests the use of direct oblimin (an oblique method of rotation) as it produces a more stable factor structure and the simplest structure of all the possible rotation methods.

Factor Retention

Determining the number of factors to retain from Exploratory Factor Analysis has been described as one of the most critical decisions to be made in the factor analysis process (Watkins, 2006) because incorrect retention will potentially obscure the factor structure (Cattell, 1978; Glorfeld, 1995, Goodwin & Goodwin, 1999; all cited in Watkins, 2006). Both over-extraction and under-extraction have been observed empirically to have deleterious effects (Fave & Velicer, 1996; cited in Watkins 2006). Although, it has been reported that over-extraction tends to be more serious than under-extraction (Watkins, 2006). A number of criteria have been proposed for determining the number of factors to retain. For example, among the most popular are to retain factors with eigenvalues greater than one, this is referred to as the K1 rule. However, this has often been equated with over-extraction of factors. Cattell (1978) proposed the use of a scree test in which the size of the eigenvalues associated with each factor are plotted on a graph and where the inflexion point on the curve presents itself is used as the cut-off point for the factors to retain. However, where the specific point presents itself is left to the subjective interpretation of the researcher. Zwick & and Velicer (1986) concluded that although the scree test performed better than the K1 test it was only correct 57% of the time. Moreover, in 90% of the remaining

inaccurate cases, the scree test over-extracted factors. The fact that using the scree test in the data from the pilot of the Temporal Intelligence Questionnaire produced a large number of tightly clustered data points made the identification of a unambiguous point of inflexion impossible (Appendix 12

There is some evidence that the Minimum Average Partial (MAP) developed by Velicer is more accurate than the K1 rule and the scree test (Velicer, Eaton & Fava, 2000; Zwick & Velicer, 1986). However, there is a substantial body of evidence suggesting that the most accurate of factor retention methods is Parallel Analysis, a method developed by Horn (1965). A number of empirical studies have found Parallel Analysis to be consistently more accurate than the scree test, MAP method and the K1 rule (Silverstein's, 1987; Velicer, Eaton & Fava, 2000; Zwick & Velicer, 1986). Glorfeld (1995), Hayton, Allen and Scarpello (2004), and Thompson and Daniel (1996) based upon comprehensive reviews of relevant empirical studies concluded Parallel Analysis to be the most accurate of all factor retention methods.

PA involves randomly generating a raw data matrix of the same parameters of the actual data set in terms of sample size, number of variables and numerical range of values for each variable. Thus, the random data generated in this pilot study consists of 203 response sets (reflecting of the sample size), with each response set containing 173 variables (representing the 173 items of the TI-Q) with a data value between 1-7 (reflecting the TI-Q's response scale). An SPSS syntax file from a PA study (O'Connor, 2000) was used as a template and then adapted to meet the present study's data parameters to create a random data matrix. Based on the syntax, the random matrix is then subjected to factor analysis and the resulting eigenvalues observed (see Appendix 13 for the syntax used in this study). It is recommended that a number of random data matrices are produced and factor analysed. Finally the mean eigenvalues produced for all the factored matrices should be calculated. Although typically researchers conduct between 50 and 500 replicated random matrices, PA in this study involved producing 500 random matrices to be consistent with Hayton, Allen and Scarpello's (2009) assertion that 'the greater the number of repetitions, the more

accurate will be the final results' (p199).

A factor is then extracted from the actual raw data set for any eigenvalue that is above that of the associated eigenvalue for the random data. For example, if the third eigenvalue derived from the actual data was 2.1 and the third eigenvalue from the random data set was 1.9, the third factor would be extracted from the actual data set. However, if the eigenvalue of the fourth factor from the actual data set was lower than that of the random data set, the fourth factor would not be extracted and a 3 factor solution would be retained. However, Glorflied (1995), and Harshman and Reddon (1983) suggest to address the issue that PA has been reported to have a slight tendency to over-extract, the eigenvalues of the actual data set should be compared with the associated 95th percentile of the eigenvalue from the random data set. This has been equated to setting the significance level to 0.5 (Hayton, Allen and Scarpello, 2004) and it can therefore be concluded if this procedure is followed then there is a less than 5% probability that factors retained in the actual data set occurred due to chance.

Factor Loadings

The factor loading is represented by a correlation coefficient and therefore the statistical significance of a factor loading can be assessed. This will inform the substantive importance of each variable to a specific factor. Stevens (1992; cited in Field, 2005) recommends for a sample of 200 the factor loading for each item should be .364 or higher to reflect an alpha significance level of 0.01. This recommendation was followed in this study, thus it can be inferred that variables observed in this study would have a probability of less than 1% of loading onto a factor by chance.

Missing Data

Missing data has been a long standing issue in research and as Tabachnick and Fidell (2007) state is 'one of the most pervasive problems in data analysis' (p62). There are different ways in which missing data can be dealt with. There is an option to delete the missing cases by either the pair-

wise or list-wise method. The former, excludes the responses of an individual participant for calculations (correlations in the context of factor analysis) that would otherwise include the value if it was not missing. The major problem associated with this method is that it will produce different sample parameters for different calculations, which will also cause different standard errors (Tabachnick & Fidell, 2007). List-wise deletion removes all of an individual's responses from factor analysis (hence decreasing the sample size). Missing data can also be replaced and there are a number of ways to do this. Two common choices for data substitution include replacing the missing values with the sample mean for a variable or through Expectation Maximum (EM). However, Graham, Cumsille and Elek-Fisk (2003) point out the main limitation associated with EM is that it tends to lead to inaccurate standard errors. Tabachnick & Fidell (2007) argue that the main benefit of adopting the mean method of substitution is that 'it is conservative; the mean for the distribution as a whole does not change and the researcher is not required to guess at missing values' (p67).

The missing data did not derive from unanswered responses to the questionnaire items as the web-based software used to present the questionnaire to participants did not allow respondents to complete the questionnaire if a question was not answered. However, a *Not Applicable* response option was presented. Thus, the Not Applicable response options were considered as missing data; this is in line with a number of researchers treatment of this response type (Bradley, McMillan, Datta, Honeyford & Madge, 2004; Holman, Glas, Lindeboom, Zwinderman, & de Haan, 2004; McHorney, Ware, Lu & Sherbourne, 1994). These cases were not deleted for several reasons. Firstly, list-wise deletion would lead to a substantially depleted sample size and would render the data as being considered unsuitable for factor analysis according to a number of recommendations. Secondly, pair-wise deletion would cause interpretation of factor analysis to be very difficult as a consequence of fluctuating sample parameters and standard errors. Thirdly, for 172 items out of 173 items, no more than 5% of respondents selected the NA response option. Tabachnick and Fidell (2007) argue that when less than 5% of values are missing, the problems that missing data pose are less serious especially in a larger data set, although they recognise that there are no guidelines for tolerating the percentage of missing data for a specific sample size. However, 192

the 5% will be used as a guideline in this research for whether the missing cases should be removed from analyses. The mean substitution method was chosen to replace the missing cases based on the perceived disadvantages of deleting the missing cases (list-wise or pair-wise) and the merits of the aforementioned substitution method in comparison to other replacement methods (as outline above). Only one item (89) had missing cases for more than 5% of the sample by having a total 9.13% of respondents selecting the NA option. This item was considered for deletion from the data set due to high percentage of replaced cases. With over 5% of cases substituted, there would be serious implications of producing unacceptable representation of the variable for the sample chiefly attributable to the likelihood of yielding underestimated values relating to measure of spread (such as standard deviation and inter-quartile range) and a distorted representation of the distribution of the variable. This would subsequently cause inaccurate correlation coefficients calculated in both factor and item analyses. While, initially the item was not deleted due to the potential problems arising, the item did not survive factor analysis, therefore the item was rejected from further analyses.

Response Bias

Social desirability bias, refers to the 'tendency of some people to respond to items more as a result of their social acceptability than their true feelings' (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Social Desirability is a specific form of common methods bias, which produces error as the variance in scores are as a result of the 'measurement method rather than to the constructs the measures represent (Podsakoff, MacKenzie, Lee & Podsakoff, 2003, p879). Social Desirability bias is one of the most common sources of bias that affects the validity of survey findings (Nederhof, 2006). A number of instruments have been developed that aim to measure the extent to which a respondent appears to be answering in a socially desirable manner (Crowne & Marlowe, 1960; Reynolds, 1982; Strahan & Gerbasi, 1972). Hays, Hayashi and Stewart (1989) developed a short measure referred to as SDRS, which consisted of five items. The measure was subjected to statistical analyses on two samples of 614 medical providers and 3053 outpatients of medical and mental health providers. Alpha reliability coefficients were reported to be .66 and .68 for the two respective surveys, which has been deemed sufficient for research purposes (Cohen, 1988).

The SDRS was used in this study with the aim of identifying responses that appeared to be extremely influenced by the social desirability bias; this represents 4 respondents (1.93% of initial respondents). These 4 respondents scored the maximum score across all 5 items and according to Hays, Hayashi and Stewart (1989) have been affected by extreme social desirable bias. These 4 responses were removed entirely from the data set due to concerns that responses to the Temporal Intelligence Questionnaire from these participants may have variance attributable to the respondents tendency to answer in a socially desirable manner rather than variance explained by the nature of the construct (i.e., time related thoughts and behaviours), which poses a threat to the validity of the study. To confirm the n=203 sample excludes these 4 removed biases. The Cronbach Alpha for the 5 items was .556, which does raise some questions about whether the items are consistently measuring the construct *social desirability response bias*. However, it was decided to use the SDRS as an indicator of responses appearing to show an extreme tendency to answer in a socially desirably manner based upon two main research findings. Firstly an analysis (Barger, 2002) of short forms of measures of social desirable bias (9 reviewed) found the SDRS to yield the most suitable factor structure compared to the other 8 other short form measures on a large sample size (n=867). Also Hays et al.'s original Cronbach Alpha examination of the SDRS used a much larger sample than that included in this study.

Results

Parallel Analysis

The eigen values produced for the first 15 factors produced from principal axis factoring are presented in Table 7.2 and compared to the eigen values deriving from a random data set following Horn's (1965) parallel analysis procedure. The eigen values from the random set are based on the 95th percentile of the mean eigen value of 500 random data sets. The results show that the eigenvalue of the 11th factor from the actual data set (2.80) was the first eigenvalue to be lower than the 95th percentile eigenvalue from the random data set (2.84). Figure 7.1 visually represents the point in which the eigenvalues from the random data set exceeds the eigenvalues from the actual data set. Subsequently, a 10 factor solution to the data was deemed appropriate.

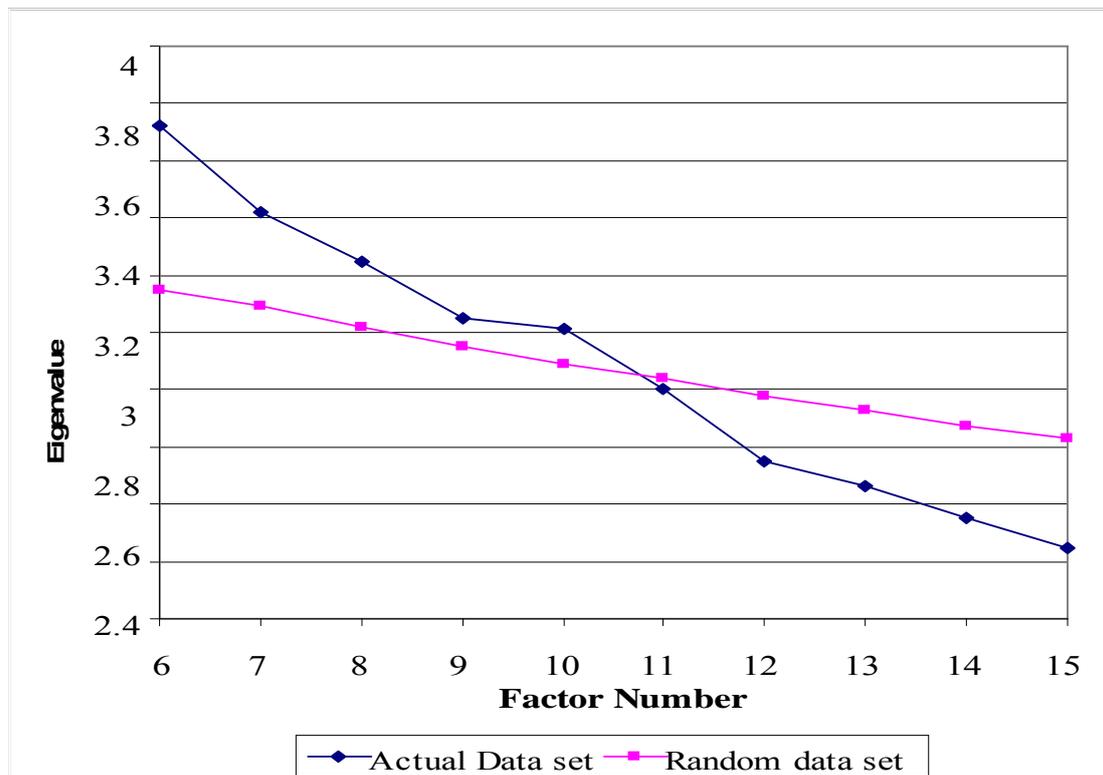
Table 7.2

Parallel Analysis: Comparing the Eigenvalues from the Actual Data Set to the Random Data Set.

Factor Number	Actual Dataset	Random Dataset *
1	24.21	3.72
2	8.61	3.53
3	8.09	3.42
4	5.34	3.31
5	4.26	3.23
6	3.72	3.15
7	3.42	3.09
8	3.25	3.02
9	3.05	2.95
10	3.01	2.89
11	2.80	2.84
12	2.55	2.78
13	2.46	2.73
14	2.35	2.67
15	2.25	2.63

*Random data set (95th percentile eigenvalue)

Figure 7.1 *Parallel Analysis: Chart Comparing the Eigenvalues from the Actual Data Set to the Random Data Set.*



Following results from Parallel Analysis suggesting a 10 factor solution be retained, the total variance explained by the 10 factors is represented in Table 7.3. The 10 factor solution shows to account for 36% of variance.

Table 7.3

Total Variance Explained by Retained Factor Solution (n=203)from Factor Analysis

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	24.211	14.412	14.412	23.632	14.067	14.067
2	8.617	5.129	19.541	7.966	4.742	18.809
3	8.097	4.820	24.360	7.523	4.478	23.287
4	5.345	3.182	27.542	4.725	2.813	26.099
5	4.262	2.537	30.079	3.635	2.163	28.263
6	3.724	2.216	32.295	3.119	1.856	30.119
7	3.423	2.038	34.333	2.780	1.655	31.774
8	3.257	1.938	36.271	2.607	1.552	33.325
9	3.059	1.821	38.092	2.429	1.446	34.771
10	3.014	1.794	39.887	2.393	1.424	36.195

6.4. Results of Reliability Analysis

The 10 factor solution presented above was represented by 108 items. The number of items belonging to each factor are presented in Table 7.4, as is the Cronbach Alpha for each of the 10 original factors.

Table 7.4

Reliability Analysis of the 10 Original Factors Extracted from Factor Analysis

Factor Number	Number of Items	Cronbach's alpha
1	18	.91
2	15	.81
3	15	.90
4	10	.74
5	9	.73
6	7	.76
7	9	.71
8	6	.60
9	3	.21
10	16	.82

Through careful consideration of the alpha values produced from reliability analysis, it was decided to remove two of the original factors produced from factor analysis based on the fact that two factors (8 and 9) produced Cronbach Alpha values that were below the criteria level of .7 stipulated by a number of researchers for preliminary research (Kaplan & Saccuzzo, 1982, Murphy & Davidshoter, 1988; Nunnally, 1978; all cited in Peterson, 1994). Preliminary research seemed an apt description of the pilot of the Temporal Intelligence Questionnaire. Subsequently an alpha value of .7 was used as a criterion for internal consistency. . It should be noted that originally Kline stipulated .6 was acceptable for research purposes but this was later amended to a level of .7. Consequently, factors 8 and 9 were removed from the analysis. The size of the sample required for Cronbach Alpha analysis is lower than factor analysis. Thus while a sample of 203 could as described as a sample size at the lower end of that needed to be suitable for factor analysis, in

comparison for reliability analysis, this sample size would be considered moderate.

Reliability analysis was used to remove two factors but also used to further refine the factor structure by removing items originally extracted through the retained 8 factors. Specifically, to remove items in the retained 8 factor solution, the inter-item correlations between items (questions) were observed. Where an item had a low inter-item correlation (below .5) with all other items the item was removed. Also if 2 items were observed to have very similar wording and thus meaning, one was removed if a high inter-item correlation was observed between the two (above .95). It is suggested when the correlation is so high between two items and the wording is very similar, this indicates they are measuring the same thing as is thus reflective of Cattell's (1978) concept of bloated specifics (described above). Subsequently, using this process of refinement, one item was removed from factor 2 and two items from factor 3, 1 item from factor 4, 4 items from factor 5, 1 item from factor 6 and 8 items for factor 8 (formerly factor 10). The refined 8 factor solution is summarised in Table 7.5 by item length, Cronbach Alpha and mean item score (1-7 likert based scaled). Table 7.5 also shows that none of the revised 8 factors have a Cronbach Alpha below .70.

Table 7.5

Reliability analysis and item for the final eight factor solution

Factor Number	Number of Items	Cronbach's a	Item Mean
1	10	.878	5.53
2	14	.809	4.31
3	13	.894	5.41
4	9	.754	5.28
5	7	.705	4.67
6	6	.769	4.87
7	9	.710	2.65
8	6	.753	5.62

The next stage of the analysis was qualitative in nature and involved two researchers firstly independent of one another, reviewing the items representing each of the 8 factors. The review involved inspecting the meaning of the items to propose a scale title to describe the time related construct the scale was proposed to measure. The researchers compared and contrasted the initial proposed scale titles and interpretation of meaning to produce a final list of 8 scale titles representing each factor. The researcher developed a summary description of the refined scales, which is presented in Table 7.6.

Table 7.6

Temporal Intelligence Questionnaire Factor Structure

Dimensions	Description
1. Time Personality and Job Role	Awareness of followers' time personality and job time characteristics.
2. Pace	The extent to which the leader consistently has high expectations of their followers work. This includes expectations in both speed and quality of work.
3. Deadline Orientated Behaviour	The leader's monitoring of followers work within the deadline lifespan and responsive actions to an achieved and missed deadline. This dimension refers to deadlines only set by the leader (i.e., internal).
4. Autonomy	The leader's expectations and behaviours that influence the degree to which followers are autonomous in their work activities.
5. Temporal Consistency	The degree to which a leader changes their emphasis on the pace of work processes in relation to situational cues (i.e., individual or task characteristics). This dimension also includes (but not exclusively) items reflecting a tradeoff between quality and speed (dependent on situational factors).
6. Breaks in Workflow	The leaders' role in guiding the occurrence of socially orientated breaks in the workplace among followers.
7. Time Perception	The extent to which the leader is aware and takes into account temporal factors in work processes. This also reflects the notion of importance attached to the timescale of processes.
8. Temporal Depth	The extent to which the leader reflects in the past, focuses on the present and projects to the future in relation to interactions with his or her followers. This scale considers the extent to which the leader simultaneously uses different time perspectives.

Following defining each of the eight final factors retained, this final eight factor solution was compared to the twelve dimensions of global temporal practices and the dimension of adaptive temporal practices (thirteen dimensions in total) that were proposed in the conceptual model of TI. Table 7.7 shows which factors from the conceptual model of TI survived factor analysis. In sum, seven dimensions out of thirteen from the conceptual model of TI did not survive factor analysis. The items relating to the final eight dimensions retained from factor analysis, were used to create a revised version of the TI- Q (Appendix 14). The items representing each of the eight factors are presented in Appendix 15.

Table 7.7

Final Eight Factor Solution Compared to the Conceptual Model of TI

Refined Eight Factor Solution	Dimension originates from conceptual model of TI	Dimensions from the conceptual model of TI not surviving factor analysis
1. Time Personality and Job Role Characteristics	Yes	Speed and Quality
2. Pace	Yes	Speed versus Quality
3. Deadline Orientated Behaviour	Yes (internal deadlines only. External deadlines did not survive analysis)	Time Allocation
4. Autonomy	Yes	Time Buffers
5. Temporal Consistency	No (new dimension)	Time Boundaries between work and non-work
6. Breaks in Workflow	Yes	Timelessness

7. Time Perception	No (new dimension)	Coordination
8. Temporal Depth	Yes	

It should be noted that originally the dimension of Deadline Orientated Behavior was presented with a behavioural frequency scaled response in Study I. For the revised version of the TI-Q (Appendix 14) developed from the findings in study I, this scale type was not employed. Subsequently the revised TI-Q only employed one scale (relating to extent to which respondent agreed/disagreed with each statement). There were several reasons behind this decision. Firstly, external deadlines and internal deadlines were presented as separate sections (i.e., to distinguish between the two types of deadlines) in the pilot of the TI-Q. As Table 7.7 demonstrates, external deadlines did not survive factor analysis, there was perceived to be no need to present a separate section for deadlines. Advice from two researchers confirmed the items seemed suitable for a scaled response based on agreement/disagreement. Also by using a consistent scale, all items could be randomly distributed in the questionnaire.

Conclusion

In sum, the final eight temporal dimensions produced from factor analysis are proposed to represent the TI construct. While at a conceptual stage (as outlined in chapter 4), there is a distinction made between self- and inter-individual referenced temporal practices, this research is as stated, empirically investigating the latter in the context of leadership. This chapter presented study I of the development of the TI-Q, and findings from this study indicate inter-individual temporal practices in leadership is represented by an eight dimensional structure. The next chapter presents study II of the development of the TI-Q presented, which will focus on the concept of validity according to CCT. It is posited in the succeeding chapter that validity is integral to the development of the TI-Q. Findings from study II will be used to develop an understanding of the behaviours and cognitions representing the eight dimensions of TI in leadership and further validate the psychometric properties of the eight factor solution presented from Study I.

8

Development of the Temporal Intelligence

Questionnaire: Study II

Chapter 7 demonstrated the factor analytic method and used reliability analysis to identify an underlying structure to the construct of Temporal Intelligence (TI) based upon analysis of the original 168-item Temporal Intelligence Questionnaire (TI-Q). The results produced an eight-factor structure. These eight factors are proposed to represent temporal dimensions of the TI construct and specifically inter-individual temporal practices in leadership. Thus, the eight factors reflect differences among leaders in the temporal behaviours and cognitions they direct or express to their followers. All eight factors met an internal consistency criterion that is widely accepted among researchers (i.e., Cronbach Alpha coefficient above .70). Thus, reliability analysis indicated that the items identified as forming each of the eight factors (i.e., dimensions of TI) consistently measured the representative temporal dimension among the sample of 203 leaders.

This chapter aims to further examine the psychometric properties of the TI-Q aligned to Classical Test Theory. A predominant focus will be on the concept of validity as it is perceived that establishing the validity of the TI-Q is an integral process of questionnaire development. This argument will be developed within this chapter. As part of the process of examining the validity of the TI-Q, the relationships among behaviours representative of TI and behaviours reflecting the Full Range Leadership Theory (FRLT) will be examined. Chapter 3 showed the FRLT to be a highly popular and respected theory of leadership among academics and practitioners alike. Subsequently, this chapter aims to seek to explore the similarities and differences between TI and FRLT to develop an understanding of TI as a construct and also how it relates to contemporary conceptualisations of leadership (behaviours).

Validity

One of the key assumptions of Classical Test Theory (CTT) is that the reliability of a test should not be considered in isolation from its validity. As previously mentioned (in chapters 6 and 7), validity, at a broad level, refers to the extent to which a test measures what it purports to measure (Nunnally & Bernstein, 1994). Validity is a central premise to CTT and the importance of validity is reinforced by Nunnally and Bernstein, who state that in test construction

‘no amount of mathematical elegance or related use of sophisticated measurement procedures can substitute for validity’ (p.83).

The notion of validity was briefly introduced in chapter 6, which specifically focused on one aspect of validity: content validity. To clarify, content validity refers to whether the item pool of a measure adequately covers the construct it is purported to measure. To summarise, a number of processes were adopted to address the issue of content validity. Firstly a thorough literature review was conducted on literature relating to time, which included a review of existing temporal concepts and measures. This review process was used to develop the initial item pool for the pilot version of the TI-Q. In addition to this, interviews were conducted with practising leaders to further validate the temporal constructs identified in the literature review and to develop behavioural examples of temporal constructs. The initial pool of the questionnaire was 220 items, which in the context of test construction and existing individual difference measures is relatively large. This was to ensure that any refinement of the item pool would be based upon item clarity, content validity and statistical analyses (using CTT). The process of content validation involved experts in test construction (on the subjects of both time and leadership) examining the item pool of the questionnaire to identify any perceived inadequacies in item content relating to the objective of measuring temporal individual differences among leaders. Following the introduction of the specific notion of content validity in chapter 6, chapter 7 discussed how validity is related to CTT and, specifically, factor analysis and reliability.

Nunnally and Bernstein (1994) recommend that validity should be considered to be structured of three forms; content validity, construct validity and predictive validity. While all three forms inform the extent to which a test measures what it purports to, and are inextricably linked (some researchers do not discriminate between the different forms), accepting Nunnally and Bernstein’s assertion, it is important to recognise the individual contribution each form makes. It should also be noted that face validity is not based on scientific generalisation; while it is not a form of validity in its true sense, it is arguably still a valuable attribute of a test (as discussed in chapter 6)

in relation to validity.

Construct validity

While content and face validity have been discussed in the two preceding chapters, this chapter will focus on the notion of construct validity, which refers to the extent to which a test measures the psychological attribute it has been designed to measure. More specifically, the process of construct validation involves correlating test scores from a sample containing other individual difference measures following a within-subjects design. The underlying premise resides in the notion that a test should not correlate highly with measures that are representative of a different psychological attribute, as this would indicate that the tests are actually measuring the same attribute; this is referred to as divergent validity. For example, a high correlation (i.e., above .70 for all scales) between a measure of emotional intelligence and one of personality would indicate that both tests are measuring the same attribute or, at the very least, that the relationship between the two attributes should be investigated further (i.e., to identify a potentially multi-dimensional construct). In contrast to the notion of divergent validity, convergent validity is concerned with demonstrating a relationship between scores on tests that have been designed to measure the same attribute. For example, two measures of personality (assuming personality as an attribute is defined in a similar way) should in theory demonstrate a high correlation between test scores following a within-subjects design.

The TI-Q aims to measure individual differences in temporal behaviours and cognitions displayed by leaders towards their followers. To seek to establish convergent validity in the TI-Q is empirically problematic since, to the researcher's knowledge, no existing psychometric tests measure what the construct of TI is proposed to represent as a psychological attribute. However, drawing on the notion of divergent validity, individual difference measures of other psychological attributes can be called upon to support establishing divergent validity of the TI-Q and, consequently, to show that TI is different from existing psychological constructs.

A number of individual difference constructs exist. The process of selecting which constructs 206

to examine in relation to TI is therefore a key research question for facilitating the process of establishing construct validity. Presented below are the two individual difference constructs that have been selected for inclusion in this research and the reasons underlying this selection.

Individual difference factor one: personality

While it should be acknowledged that there are four approaches to conceptualising personality, within an organisational setting, one of these four receives the most empirical support and is followed by academics and practitioners alike. This is the trait theory of personality, which is in contrast to the psychoanalytical, humanistic and social-learning based approaches.

Following the trait approach, McCrae and Costa (1990) define personality as ‘dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings and actions’ (p.23).

The Five-Factor Model of personality

The Five-Factor Model (FFM) provides one of the most empirically supported trait theories about the structure of the personality. The FFM is organised hierarchically, whereby co-varying lower-level traits produce five higher-level domains, being: (i) Extraversion, (ii) Agreeableness, (iii) Conscientiousness, (iv) Neuroticism and (v) Openness to Experience. Over the past two decades, there has been a substantial amount of research supporting the notion that the construct of personality is structured by five domains (Costa & McCrae, 2006, McCrae & Costa, 1990). A number of studies have also demonstrated the cross-cultural validity of the FFM (McCrae & Costa, 1996). The FFM has provided a meaningful taxonomy for exploring the dispositional source of work-related behaviours. For example, a number of studies have found that the FFM represents a fruitful basis for predicting job performance (Barrick & Mount, 1991; Hertz & Donovan, 2000; Barrick, Mount & Judge, 2001; Hough & Ones, 2001; all cited in Judge, Bono, Ilies, & Gerhardt, 2002, p767).

a

Personality was included as a research variable for a number of reasons. Firstly, personality, represents arguably the most empirically supported individual difference variable in the organisational literature (when defined by the FFM). To demonstrate that TI is a distinct psychological attribute it is important to seek to establish discriminant validity with an established psychological construct. Moreover, the FFM of personality has explained individual differences in behaviours within the workplace and been used to predict outcome variables. The FFM is thus a major theory accounting for behavioural tendencies and explaining behavioural differences in the workplace. TI as a construct also seeks to identify behavioural differences in the workplace, which means it is imperative to establish that TI as a construct is different from personality as defined by the FFM. The key perceived differences are that TI is concerned exclusively with time-related behaviours occurring in a specific context, whereas personality represents behavioural tendencies with little temporal focus in a general context. It is therefore important in terms of establishing construct validity that TI is not in fact representative of behaviours currently accounted for by the FFM of personality.

Individual difference factor two: leadership style

As presented in chapter 3, the styles of transformational and transactional leadership have received a vast amount of empirical support. Leadership style according to the Full Range Leadership Theory (FRLT) has been selected to support examining the construct validity of TI as the FRLT identifies specific behaviours for nine distinct behavioural traits, which represent differences between leaders. Included too are those behaviours that are perceived to influence and motivate subordinates to high levels of performance (i.e., transformational leadership). It is important to establish whether the behaviours representative of TI are distinct from those representing of the FRLT, to establish that they are different constructs representing different leadership behaviours.

In addition to establishing the construct validity of TI, personality and leadership style will also

be measured in this study to facilitate the process of drawing inferences about the nature of the construct. This involves developing an understanding of the nature of TI as a construct based upon any relationships shared with other individual difference constructs.

Drawing Inferences about Individual Differences

While validity most commonly seeks to establish the existence of high or low relations (i.e., related to convergent and divergent validity respectively), it is also proposed that relationships based upon moderate or lower-based correlation coefficients are important to consider. Moderate correlations do not strictly represent validity but support inferences being drawn to develop an understanding of the nature of a construct itself (in relation to other constructs) and the variance that occurs in a population. For example, Judge and Bono (2000) investigate the relationships between the five personality dimensions (measured by the NEO PI-R) and transformational leadership as measured by the Multi-factor Leadership Questionnaire (MLQ; Form 5X).

Collapsing the MLQ's five transformational sub-scales into one scale, this scale correlated moderately (according to Cohen, 1988) with $r = .32$ and $.27$ for Extraversion and Agreeableness respectively. Judge and Bono (2000, 2004) explained link between Extraversion and transformational leadership by referencing the fact that individuals who are high in extraversion are likely to be highly emotionally expressive, which has previously been remarked upon as a key characteristic of the notion of charismatic leadership that is situated within the FRLT's transformational dimension Idealized Influence (attributed). The moderate correlation between transformational leadership and Agreeableness was explained by referring to this dimension of personality as being the extent to which an individual is empathic towards others. In turn, this was perceived to be an inherent characteristic of transformational leadership, as a leader must be able to perceive their subordinate as an individual in order to build the 'transformational bond' described by Bass (1985). Judge and Bono's research demonstrates the value of considering the relationship between two individual difference factors, in terms of understanding the constructs' nature and inter-individual variance.

Predictive validity

Predictive validity is the final form of validity discussed by Nunnally and Bernstein (1994) and refers to the extent to which a test can explain the variance in a criterion variable that is external to the measure itself. In an organisational setting, such a variable would typically include a performance or satisfaction base metric (e.g. leadership effectiveness). While the model of TI provides conceptual based propositions on how TI may predict outcome variables relating to leadership effectiveness and well-being, it is not a primary objective of this research (as briefed in chapter 1). Thus, while predictive validity is perceived as important for the future development of TI, it is not imperative in the construct development stage. This is in contrast to a test which would have predictive validity perceived as imperative in the development stage, such as a university entry test which aims to predict educational achievement (such as a GMAT test).

However, while developing a research study to address predictive validity comprehensively was not feasible in this research (aligned to research objectives outlined in chapter 1), it is possible to gain indicators of outcome variables through self-reported evaluation (i.e., leaders rating their own performance). However, it should be clarified that self-report measures of outcome of performance are understandably heavily criticised in relation to validity (Podsakoff & Organ, 1986). Bass (1985) posits that self-report measures of leadership performance are prone to errors. However, the purpose of this research using self-report measures of leadership is not to test hypotheses and draw conclusions about the relationships between TI and outcome variables, as any such conclusions would be inherently weak based on the perceived concerns about the validity of self-reported performance. In contrast, the objective of integrating a self-report measure of outcome variables into the analysis of this research is to facilitate the conceptual discussion presented in the next chapter about the potential links between TI, leadership effectiveness and follower well-being. Also, the use of self-report performance is designed to support the development of recommendations for future research into time and leadership, as well as to stimulate temporal research initiatives into this area.

Method

Sample

The final sample consisted of individuals (n=82) holding leadership positions, each of whom was responsible for leading at least three individuals (n=39 male and n=43 female). Leading at least 3 individuals was a criterion to participate in this sample to ensure that respondents held leadership roles. Mean age for the sample was 48.07 years. It should be noted that the sample for descriptive statistics for the TI-Q was n=99. However, owing to attrition rates, 82 completed responses were available for all three measures.

Measures

Temporal Intelligence Questionnaire

The 78-item TI-Q that derives from research conducted in the previous chapter was utilised in this study (Appendix 14). The TI-Q represented the following eight temporal dimensions derived from factor analysis:

1. Time Personality and Job Role Characteristics
2. Pace
3. Deadline Orientated Behaviour
4. Autonomy
5. Temporal Stability (high scorers indicate temporal instability)
6. Breaks in Workflow
7. Time Perception (high scorers indicate a low perception of time)
8. Temporal Depth

NEO PI-R Personality Inventory

The NEO PI-R is a measure of the five factors of personality (Costa & McCrae, 1992). The questionnaire has been subjected to rigorous examination of its psychometric properties. The NEO PI-R has replicated factor structure in UK samples, whereby substantial reliability coefficients (from .87 to .92) have been demonstrated across all five domains (Costa & McCrae, 2006). The NEO PI-R also measures lower traits that are subsumed within the five domains. Specifically, each domain is comprised of six facets, all of which have well-established reliability and validity properties within UK samples (Costa & McCrae, 2006). The original NEO PI-R comprises 240 items, however not all items were used in this study. The item set of the NEO PI-R used in this study is based on the version used by a sponsoring consulting firm who provided the licensed instrument. Specifically, six of the original 30 facets of personality were removed (i.e., 24 facets were used). Subsequently, the final item length was 192 items (8 items representing each facet). Items require responses on a five-point scale from 'strongly disagree' to 'strongly agree'. It should be noted that none of the 24 facets of personality representing the five domains was amended and therefore represents facets of personality that are deemed as reliable and valid, and representative of the five domains of personality. The five domains of personality and both the facets that were included in this study are presented below.

Neuroticism

Measured facets: N1. Anxiety, N2. Angry Hostility, N3. Depression, N4. Self-Consciousness, N5. Impulsiveness and N6. Vulnerability.

Excluded Neuroticism facets: none.

Extraversion

Measured facets: E1. Warmth, E3. Assertiveness, E4. Activity and E6. Positive Emotions.

Excluded Extraversion facets: E2. Gregariousness and E5. Excitement-Seeking.

Openness

Measured facets: O1. Fantasy, O3. Feelings and O4. Actions.

Excluded Openness facets: O2. Aesthetics, O5. Ideas and O6. Values.

Agreeableness

Measured facets: A1. Trust, A3. Altruism, A4. Compliance, A5. Modesty and A6. Tender-Mindedness.

Excluded Agreeableness facets: A2. Straightforwardness.

Conscientiousness

Measured facets: C1. Competence, C2. Order, C3. Dutifulness, C4. Achievement Striving, C5. Self-Discipline and C6. Deliberation.

Excluded Conscientiousness facets: none.

Multi-factor Leadership Questionnaire

The MLQ (Form 5X) is a 45-item measure of the nine factors of the FRLT. A substantial amount of empirical research (e.g. Avolio, Bass & Jung, 1995; Bass & Avolio, 1997) has supported the psychometric properties of the measure. For example, Avolio, Bass and Jung (1995) using Confirmatory Factor Analysis (CFA) on responses (n=1394) supported the FRLT's nine-factor structure. Internal consistency of all nine scales was reported at above .70 for Cronbach Alpha. Of the 45 items representing the MLQ, 36 represent the nine leadership dimensions of the FRLT that were introduced in chapter 3. Each of the nine dimensions is measured by 4 items, requesting respondents to rate the perceived frequency in which they display the described behaviour on a five-point scale (i.e. from 'Not at all' to 'Frequently, if not always'). An example of a behavioural item respondents are requested to rate in the MLQ is: 'I suggest new ways of looking

at how to complete assignments' (representative of Intellectual Stimulation).

The nine leadership dimensions and their relation to transformational and transactional leadership are presented below:

Transformational leadership

1. Idealized Influence (attributed)
2. Idealized Influence (behaviour)
3. Inspirational Motivation
4. Intellectual Stimulation
5. Individualized Consideration

Transactional Leadership

6. Contingent Reward
7. Management by Exception (active)
8. Management by Exception (passive)
9. Laissez-faire

Owing to copyright restrictions, the full version of the MLQ cannot be presented in the appendices (based upon agreement with Mind Garden USA upon publication whereby 5 items are permitted for publication). The final nine items of the MLQ (Form 5X) relate to leadership outcomes, leadership effectiveness, subordinate job satisfaction and subordinate effort. As mentioned previously in this chapter, these will be used as indicators of predictive validity for preliminary research purposes. A scale description and example item is presented below for each of the three outcome variables:

1. Effectiveness

This four-item scale measures perceived leadership effectiveness defined by work unit effectiveness.

An example item is: 'I lead a group that is effective.'

2. Extra Effort

This three-item scale seeks to measure perceived impact on followers' motivation to succeed and effort in their work. An example item is: 'I heighten others' desire to succeed.'

3. Satisfaction

This two-item scale measures perceived subordinate (indirect) satisfaction. An example item is: 'I work with others in a satisfactory way.'

Socially Desirable Response Set

The five-item Socially Desirable Response Set (SDRS; Hays, Hayashi & Stewart, 1989) that was employed in the development of the TI-Q was also randomly distributed in the TI-Q to detect any potential social desirability bias.

Procedure

The refined (from preceding research study) 78-item TI-Q, representing eight temporal dimensions, was developed into an online questionnaire. Both the NEO PI-R and the MLQ were also hosted by the same online-survey software. Participants who completed the TI-Q from the previous research study presented in chapter 7 were given the chance to opt out of future research, which a small number of participants embraced. The remaining sample was emailed to request completion of the questionnaire. There was a three-month gap between the end of the previous research study and the start of this research study. Also this research was promoted in a further management workshop delivered by the Centre for People @ Work (applied research and consultancy centre) and an additional conference held at the University of Worcester for local businesses. Individuals who had not previously participated in this research were also invited to take part. These initiatives were designed to address perceived attrition rates from the previous study.

As in the previous study piloting the TI-Q, a statement about the research in terms of its aims, the affiliated Higher Education Institution, confidentiality, storage of data and contact details of the

researcher was included. The content of this statement was designed to address ethical issues discussed in British Psychological Society's (2008) ethical guideline handbook. This statement was presented to all participants before completing the three research questionnaires.

Data Analysis

The mean substitution method was chosen to replace the missing cases based on the perceived disadvantages of deleting the missing cases (list-wise or pair-wise) and the merits of ensuring sample size was not effected significantly by the NA option on the TI-Q. Only one question had a missing response rate of greater than 5% of the sample. The scores for the SDRS scales (Hays, Hayashi & Stewart, 1989) did not indicate any responses were strongly influenced by social desirable bias and therefore all responses were retained.

Reliability analysis (Cronbach Alpha) was conducted on the TI-Q and MLQ measures. While the MLQ was not affected by any missing responses the TI-Q was. As the sample size was small (n=99 for descriptive statistics for the TI-Q) reliability analysis was conducted with and without missing cases replaced. While in the results section, the reliability for coefficients is presented with missing cases replaced (as previously mentioned using the mean substitute method) for consistency of analysis, it should be noted that this in fact overall marginally decreased reliability coefficients compared to when missing cases were not replaced. This finding supports Tabachnick & Fidell (2007) assertion presented in the previous chapter that the main benefit of adopting the mean method of substitution is that 'it is conservative' (p67).

All variables were checked for violation of the assumptions of normal distribution (normality) through using the following indicators; measures of central tendency, variable distribution charts and standard error of skewness. As a result bivariate (Pearson) analyses suitable for normally distributed variables were employed for analysis of research variables. In addition to normality, statisticians stipulate three other criteria that must be met by the data for it to be suitable for multi-linear regression. These criteria are multicollinearity, linearity and homoscedasticity.

The independent variables and dependent (i.e., outcome) variables were examined against these three criteria as detailed below:

Multicollinearity refers to when independent variables are highly correlated with one another. This is problematic as it makes it difficult to derive a reliable regression coefficient. One approach to this is to check the bi-variate correlations are below $r=.80$ (Field, 2005). However, a more advanced procedure is to review the Variance Inflation Factor (VIF) scores and the tolerance values of the independent variables. A widely accepted threshold level of a VIF is to be less than 10 and a tolerance value greater than .10 (Myers, 1990). The largest VIF value among the independent variables was 1.95 and the smallest tolerance value was .51. Consequently the data did not indicate to be affected by multicollinearity and was therefore deemed suitable for multi-linear regression in relation to this criterion.

Linearity of a regression model refers to the notion that a change of the dependent variable is associated with a consistent directional change in the independent variables (Hair, Anderson, Tatham and Black, 1992). In terms of the assumptions of multi-linear regression, it is important that the association between the independent and dependent variables represent a linear model. Linearity was observed through the residual plots (p-p plot) as observed versus predicted values were symmetrically distributed around the plot's diagonal line. Thus in terms of this criterion the data was deemed suitable for multi-linear regression.

Homoscedasticity of a regression model refers to whether the residuals are symmetrical and therefore of equal variance (Hair, Anderson, Tatham and Black, 1992). To check whether the residuals produced were symmetrical a residual plot was examined. The observed versus predicted residuals ($Y = *ZRESID$, $X = *ZPRED$) were fairly symmetrical (i.e., residuals reflecting a rectangular shape). Thus in terms of this criterion the data was deemed suitable for multi-linear regression.

Results

Descriptive Statistics of Measures

Temporal Intelligence Questionnaire

The descriptive statistics for the 78 item TI-Q are presented in Table 8.1. Five of the eight scales demonstrated Cronbach Alpha coefficients above the widely accepted .70 criterion. Of the remaining three scales, two demonstrated Cronbach Alpha of above .60 and one produced an alpha of above .50. While these three scales did not demonstrate the magnitude of a coefficient that is widely accepted and respected, there are a few important points to consider. Firstly, while .70 represents a highly accepted criterion, a number of scales in the social sciences do yield lower Cronbach Alphas. Although not as widely accepted, a number of researchers do suggest that .60 is adequate for research purposes (Breakwell, Hammond & Fife-Schaw, 2006;). The reliability analysis presented in Table 8.1 also provides further support (although factor 7 only offers partial support owing to reliability coefficient of .525) for the original eight- factor solution retained from the research study presented in the previous chapter, as reliability coefficients indicate that the scales consistently measure the same temporal attribute.

Table 8.1

Temporal Intelligence Questionnaire (TI-Q): Factor Names, Item Length, Reliability Coefficient, Means and Standard Deviation (SD)

Factor	Factor Name	Items	Cronbach Alpha	Scale mean (SD)	Item mean
1	Time Personality and Job Role Characteristics	10	.845	56.88 (5.63)	5.69
2	Pace	14	.744	57.55 (9.87)	4.11
3	Deadline Orientated Behaviour	13	.726	71.00 (7.00)	5.47
4	Autonomy	9	.632	48.89 (5.30)	5.49
5	Temporal Stability	7	.755	33.73 (6.46)	4.82
6	Breaks in Workflow	6	.719	30.75 (4.78)	5.13
7	Time Perception	9	.525	23.55 (5.70)	2.63
8	Temporal Depth	10	.614	56.30 (5.20)	5.63

N=99 cases

Table 8.2 shows the inter-factor correlations of the TI-Q's eight scales (n=99). In summary, of the 28 inter-factor correlations, 11 demonstrate significant correlations ($p < .05$) in a range from $r = .227$ to $r = .536$. In terms of magnitude of correlations, this range can be considered to represent low to moderate correlations based upon Cohen's (1988) recommendations. The highest correlation represents the interaction between Time Personality and Job Role Characteristics (factor 1), and Deadline Orientated Behaviour (factor 3; $r = .536$, $p < .01$). The correlation with the second-greatest magnitude is between Deadline Orientated Behaviour (factor 3) and Pace (factor 2; $r = .433$, $p < .01$). The magnitude and number of significant inter-factor correlations between the factors of the TI-Q suggest that each individual factor is representing a distinct temporal construct. This result supports the original eight-factor solution retained from research presented in the previous chapter in specific relation to the fact that the factors measure different facets of time occurring between leaders. In this respect, the scales indicate discriminant validity among the individual facets of TI.

Table 8.2

Inter-factor Correlations (Pearson for the Temporal Intelligence Questionnaire (TI-Q))

Variable	TI-Q Factor 1	TI-Q Factor 2	TI-Q Factor 3	TI-Q Factor 4	TI-Q Factor 5	TI-Q Factor 6	TI-Q Factor 7	TI-Q Factor 8
TI-Q Factor 1	1.000							
TI-Q Factor 2	.118	1.000						
TI-Q Factor 3	.536**	.433**	1.000					
TI-Q Factor 4	.091	.166	.034	1.000				
TI-Q Factor 5	.011	.241*	.065	.281**	1.000			
TI-Q Factor 6	.194	-.024	.082	.345**	.162	1.000		
TI-Q Factor 7	-.086	.383**	-.134	.150	.259*	-.012	1.000	
TI-Q Factor 8	.351**	.027	.329**	.066	-.039	.254*	.227*	1.000

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

N=99 cases

NEO PI-R Personality Inventory

The descriptive statistics for the NEO PI-R are presented in Table 8.3 (n=82). The reduced sample size compared to that of the TI-Q (n=99) for reporting descriptive statistics is attributable to attrition rates (i.e., participants not completing all measures). Cronbach Alpha reliability analysis is not available as the online survey software provided by a consulting firm calculated NEO PI-R scale scores without storing a database of the entire raw scores. The software is designed to yield developmental feedback to each participant (a perceived reward for research participation); as such, item level raw scores are not available. Consequently, particular attention to data integrity was adopted. The minimum and maximum of scale totals were reviewed for each participant to identify any potential outliers and concerns in response patterns; none were identified. However, as noted earlier in this chapter, the NEO PI-R represents arguably the most empirically supported personality measure, which would suggest that the measure has established validity and reliability.

Table 8.3

NEO PI-R Personality Inventory: Scale Mean and Standard Deviation (SD)

Variable	Scale Mean (SD)
Neuroticism	105.11 (13.34)
Extraversion	129.40 (19.77)
Openness	84.68 (13.89)
Agreeableness	74.59 (20.46)
Conscientiousness	57.81 (9.78)

Multi-factor Leadership Questionnaire

The descriptive statistics for the MLQ are presented in Table 8.4, and are drawn from a sample of 82. They show that several of the MLQ scales fall below the .60 Cronbach Alpha threshold.

Table 8.4

MLQ: Cronbach Alpha, Scale Mean and Standard Deviation (SD)

Variable	Cronbach Alpha	Scale mean (SD)
Individualized Consideration	.56	17.76 (1.8)
Idealized Influence (Attributed)	.53	15.19 (2.53)
Idealized Influence (Behavior)	.63	15.80 (2.51)
Inspirational Motivation	.77	16.77 (2.30)
Intellectual Stimulation	.68	16.56 (2.33)
Contingent Reward	.52	16.20 (2.70)
Management-by-Exception (Active)	.76	10.54 (3.46)
Management-by-Exception (Passive)	.63	7.52 (2.53)
Laissez-faire	.40	5.77 (1.84)

N=82 cases

However, owing to the amount of research (as presented earlier) that has demonstrated the internal consistency of the MLQ scales (by yielding alpha coefficients above .70) on relatively large samples, this suggests that sample size (and reduction of statistical power) may explain why reliability coefficients found in this study were lower than reported in previous studies. Moreover as scales were measured by four items, this potentially would explain why reliability coefficients for the MLQ were overall lower than those for the other two measures reported in this study. This premise delineates from Peter (1979) who states that item length has a tendency to increase Cronbach Alpha (assuming items are conceptually similar). In sum, it is suggested that there is no reason to be unduly concerned about the reliability of the MLQ scales reported in this study.

These aforementioned results indicate that it is important to consider how sample size may affect the statistical analyses employed to establish the validity of the TI-Q and draw inferences about the nature of the TI-Q based upon relationships with leadership style (MLQ) and personality (NEO PI-R). Specifically, the implications of sample size on statistical power will be considered. Statistical power refers to the probability of detecting a significant result when such a result actually exists. As such, the risk of a test with *low* statistical power is linked to making a Type II error, which means failing to reject the null hypothesis when it should. For an equal sample size (that is small or moderate in size), the probability of making a Type II error is higher when the effect size between variables is smaller. For example, the likelihood of not detecting a significant relationship when such a relationship should be detected is higher when the relationship between two variables is small compared to high. For the remaining analyses, therefore, the statistical power of a test will be reported, as this will facilitate interpretation of results in the context of construct validity and drawing inferences about the nature of Temporal Intelligence. Statistical power analyses were calculated using the G* Power 3 (see Prajapati, Dunne, & Armstrong,2010).

Validation of the Temporal Intelligence Questionnaire

Temporal Intelligence Questionnaire and NEO PI-R Personality Inventory

Results from bivariate correlational analysis (Pearson) between the eight dimensions of TI and the five dimensions of personality are presented in Table 8.5. The results show that of the 40 correlations observed, 11 were significant ($P<.05$). The range of correlations were from $r=.232$ to $r=.433$.

Table 8.5

Correlations (Pearson) between the Temporal Intelligence Questionnaire (TI-Q) and 5 Domains of Personality (NEO PI-R)

Variable	TI-Q Factor 1	TI-Q Factor 2	TI-Q Factor 3	TI-Q Factor 4	TI-Q Factor 5	TI-Q Factor 6	TI-Q Factor 7	TI-Q Factor 8
Neuroticism	-.120	.166	-.085	.116	.245*	.025	.164	-.081
Extraversion	.315*	.152	.350**	.036	.265*	.232*	-.099	.084
Openness	.179	.173	.216	-.023	-.156	.239*	-.181	.141
Agreeableness	.048	-.211	.134	-.046	-.161	.118	.303**	.143
Conscientiousness	.036	.235*	.433**	-.045	-.096	-.107	.271*	.396

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

N=82 cases

Post-hoc statistical power analyses indicated (Table 8.6) that the power of tests ranged from .55 for the lowest effect size (i.e., correlation) observed to .99. While a power of .9 is considered as substantial (Prajapati, Dunne, & Armstrong, 2010), when smaller effect sizes between TI-Q and NEO PI-R are observed, the probability of making a Type II error increases, suggesting that further significant relationships potentially exist between TI-Q and NEOPI-R for variables with a small effect size (according to Cohen, 1988, this is when $r < .30$). The results demonstrate small-to-moderate relationships between NEO PI-R and TI-Q variables, which suggests that there is not a magnitude of correlation that would suggest the two questionnaires are measuring the same attribute; thus, for the sample observed, discriminant validity is shown. The observed relationships provide a basis for drawing inferences about the nature of TI, which will be presented and discussed in the next chapter.

Table 8.6

Power for Observed Correlations (Pearson) between TI-Q and NEO PI-R

Observed correlation coefficient	Correlation coefficient (Pearson)	Sample size	Power
Minimum	.232	82	.55
Median	.271	82	.70
Maximum	.433	82	.99

There is a line of research (Ashton, 1998; Paunonen & Ashton, 2001) that suggests narrower traits situated within the five domains can account for specific work behaviours better (indicated by magnitude of effect size) than the broad domain itself. Table 8.7, which shows correlations between the eight TI-Q factors and twenty-four facets of personality, provides only partial support for this notion. Overall the range of correlations is similar with four dyad variable interactions producing correlations slightly higher than $r = .433$, which, as Table 8.6 shows, is the largest correlation between the broad five-domain and TI-Q interactions. These two facets were C1. Competence and Temporal Depth ($r = .433$, $p < .01$) and Deadline Orientated Behaviour with C3. Dutifulness ($r = .443$, $p < .01$), C4. Achievement Striving ($r = .452$, $p < .05$) and C5. Self Discipline ($r = .438$, $p < .01$).

Table 8.7

Correlations (Pearson) between the Temporal Intelligence Questionnaire (TI-Q) and 24 facets of personality (NEO PI-R)

	TI-Q Factor 1	TI-Q Factor 2	TI-Q Factor 3	TI-Q Factor 4	TI-Q Factor 5	TI-Q Factor 6	TI-Q Factor 7	TI-Q Factor 8
A1: Trust	-.010	-.081	.209	.050	-.166	-.010	-.269*	-.005
A3: Altruism	.111	-.085	.262*	.047	-.286**	.235*	-.270*	.134
A4: Compliance	.046	-.296**	-.018	-.115	.026	.043	-.242*	.051
A5: Modesty	.029	-.161	-.066	-.130	-.017	-.011	-.170	.140
A6: Tender Mindedness	-.005	-.096	.116	.018	-.147	.198	-.085	.180
C1: Competence	.062	.146	.377**	-.021	-.112	.094	-.350**	.443**
C2: Order	-.063	.241*	.315**	-.062	.003	-.058	-.201	.269*
C3: Dutifulness	.214	.196	.443**	.029	-.071	-.103	-.221*	.317**
C4: Achievement Striving	.104	.330**	.452**	-.065	-.208	-.155	-.104	.307**
C5: Self Discipline	.131	.179	.438**	-.051	-.207	-.055	-.259*	.284*
C6: Deliberation	-.226*	-.072	-.051	-.007	.145	-.157	-.139	.212
E1: Warmth	.188	-.028	.288**	.035	-.228*	.291**	-.160	.039
E3: Assertiveness	.233*	.125	.342**	.006	-.189	.171	-.040	.174
E4: Activity	.360**	.358**	.391**	.019	-.129	-.036	.000	.120
E6: Positive Emotions	.196	.047	.076	.045	-.243*	.239*	-.089	-.062
N1: Anxiety	-.027	.144	.042	-.011	.212	-.081	.007	-.009
N2: Angry Hostility	-.138	.396**	.089	.103	.161	.033	.234*	-.020
N3: Depression	-.106	.096	-.129	.056	.232*	.008	.185	-.032
N4: Self Consciousness	-.079	-.085	-.171	.148	.213	-.097	-.027	-.040
N5: Impulsiveness	.099	.102	.049	.188	.031	.397**	.123	-.057
N6: Vulnerability	-.326**	.065	-.302*	.042	.173	-.124	.250*	-.265*
O1: Fantasy	-.029	.066	-.051	-.022	-.015	.174	-.153	.011
O3: Feelings	.242*	.262*	.393**	-.012	-.125	.303**	-.215	.268*
O4: Actions	.221*	.078	.193	-.015	-.227*	.065	-.239	.064

However, the correlations between personality facets and TI dimensions do identify specific behaviours that appear to share relevance with TI; this level of detail would not be possible if only the broad domain (e.g. Extraversion) itself were observed. This detail will support discussions in the succeeding chapter about the attributes of TI.

TI-Q and MLQ Leadership Style

Table 8.8 shows that 72 correlations were observed between the nine dimensions of the MLQ and eight dimensions of the TI-Q. The results also show that 29 of these correlations were significant ($p < .05$). The range of these significant correlations is from $r = .224$ to $r = .519$. The highest correlation ($r = .519$) is between Idealized Influence (behaviour) as measured by the MLQ and Temporal Depth as measured by the TI-Q. According to Cohen (1988), this magnitude of correlation represents a strongly correlated relationship between the two variables. Contingent Reward (MLQ)-Deadline Orientated Behaviour (TI-Q) shows the only relationship above .40. Similar to the power analyses conducted for the correlations observed between the NEO PI-R and the TI-Q, Table 8.9 demonstrates that for the analyses observing small effect sizes (i.e., below $r = .30$), the probability of making a Type II error is quite high (around 47%, based on a power of .53). Consequently, some relationships (based upon small effect size) that should be significant between dimensions of the MLQ and the TI-Q may not be detected. This has implications on the extent to which we can draw inferences about the nature of TI. However, Table 8.9 shows that the power of the test for large effect sizes (above .540) is substantial (above .90), which therefore indicates that the statistical analysis is appropriate for concluding whether the TI-Q demonstrates discriminant validity with the MLQ.

Table 8.10 shows the results of bivariate analysis (Pearson) based upon collapsing individual dimensions of the MLQ into the two leadership styles of transformational and transactional leadership. The results indicate that four (Time Personality and Job Role Characteristics, Deadline Orientated Behaviour, Breaks in Workflow, Temporal Depth) of the eight dimensions of the TI-Q significantly correlate with the MLQ scale of transformational leadership ($p < .01$), while one dimension (Pace) of the TI-Q correlates significantly with transactional leadership.

Table 8.8

Correlations (Pearson) between the Temporal Intelligence Questionnaire (TI-Q) and MLQ

Variable	TI-Q Factor 1	TI-Q Factor 2	TI-Q Factor 3	TI-Q Factor 4	TI-Q Factor 5	TI-Q Factor 6	TI-Q Factor 7	TI-Q Factor 8
Individualized Consideration	.394**	-.059	.248*	.273*	-.195	.365**	-.230*	.355**
Idealized Influence (Attributed)	.161	.287**	.246**	.125	-.181	.200	-.031	.228*
Idealized Influence (Behavior)	.224*	.158	.288**	.089	.008	.333**	-.267*	.519**
Inspirational Motivation	.437*	.076	.314*	.062	-.234*	.213	-.252*	.282*
Intellectual Stimulation	.204	-.072	.149	.111	-.135	.305*	-.125	.400**
Contingent Reward	.425**	.147	.406**	.040	-.013	.246*	-.117	.230*
Management-by-Exception (Active)	-.084	.285*	.204	-.198	.079	-.044	.073	.190
Management-by-Exception (Passive)	-.264*	-.080	-.326*	.212	.310*	.069	.375**	-.372*
Laissez-faire	-.128	-.029	-.199	.123	.089	.125	.154	-.150

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

N=82 cases

Table 8.9

Power for Observed Correlations (Pearson) between Temporal Intelligence Questionnaire and MLQ

Observed correlation coefficient	Correlation Coefficient (Pearson)	Sample Size	Power
Minimum	.224	82	.53
Median	.297	82	.78
Maximum	.519	82	.99

Table 8.10

Correlations (Pearson) between the Temporal Intelligence Questionnaire (TI-Q) and, Transformational and Transactional Leadership as Measured by the MLQ

Variable	Transformational leadership	Transactional leadership
Time Personality and Job Role Characteristics	.346**	.039
Pace	.112	.246*
Deadline Orientated Behaviour	.313**	.204
Autonomy	.157	-.009
Temporal Stability	-.180	.213
Breaks in Workflow	.350**	.143
Time Perception	-.223	.185
Temporal Depth	.449**	.070

*p<.05,

**p<.01

N=82 cases

Predictive Validity of the Temporal Intelligence Questionnaire

Table 8.11 presents the results from multi-linear regression analysis between ten independent variables and three dependent (i.e., outcome) variables. The ten independent variables represent transformational leadership and transactional leadership, and the eight dimensions of the TI-Q. The three dependent variables represent perceived leadership effectiveness, subordinate effort and subordinate satisfaction (self-reported). Subsequently, three individual regression models were developed, each with the same independent variables but with a different dependent variable. All three models were significant ($p < .01$). While transformational leadership explained the most variance of all variables ($p < .01$), five of the eight dimensions of TI also significantly explained variance in at least one of the three outcome variables.

Table 8.11

Multi-linear Regression Analysis on Outcome Variables and Dimensions of the TI-Q and MLQ

Variable	Effectiveness	Extra Effort	Satisfaction
	Beta ^a	Beta ^a	Beta ^a
Transformational Leadership	.393**	.560**	.419**
Transactional Leadership	-.151	-.062	-.039
Time Personality and Job Role Characteristics	.090	.322**	.226*
Pace	-.062	.230*	-.134
Deadline Orientated Behaviour	.311*	.068	.156
Autonomy	.075	.020	.056
Temporal Stability	-.309**	-.009	-.304**
Breaks in Workflow	.025	.018	.172
Time Perception	.151	.093	.158
Temporal Depth	-.068	-.165	-.240**

Notes: ^aReported Beta is based on standardised coefficients; * $p < 0.05$, ** $p < 0.01$
 Effectiveness: $R^2 = .436$, $df = 10$, $F = 5.486$ $p < .01$
 Extra Effort: $R^2 = .536$, $df = 10$, $F = 8.205$ $p < .01$
 Satisfaction: $R^2 = .455$, $df = 10$, $F = 5.928$ $p < .01$

Transactional leadership did not significantly relate to any of the three outcome variables, nor did the following dimensions of the TI-Q: Autonomy, Breaks in Workflow and Time Perception. Time Personality and Job Role Characteristics significantly ($p < .05$) explained variance in Extra Effort and Satisfaction (subordinate). Temporal Stability (a high score represents instability) negatively related to Effectiveness and Satisfaction ($p < .01$). Deadline Orientated Behaviour explained variance in Effectiveness ($p < .05$), Pace in Extra Effort ($P < .05$) and Temporal Depth (- ve in Satisfaction ($p < .05$)).

Conclusion

The results from the bivariate analyses have yielded a number of significant correlations between the TI-Q and both the NEO PI-R and the MLQ, representing small to moderate effect sizes. The results show that Extraversion and Conscientiousness most consistently show relationships across the eight dimensions of the TI-Q. However, none of the correlations observed are large enough to indicate concerns about the TI-Q's discriminant validity. The TI-Q also shows fairly consistent correlations with the transformational leadership style as measured by the MLQ but not transactional leadership (apart from the one TI-Q dimension). The effect sizes reflective of these correlations also suggest that the TI-Q measures different behaviours from those currently reflective of transformational and transactional leadership. However, these correlations can be drawn on to support inferences about the nature of TI as a construct, and specifically how transformational leadership behaviours may support the emergence of behaviours associated with TI. The perceived effects of a leader's dispositional traits and leadership style on the emergence of behaviours relating to TI will be discussed in the next chapter, which will present the final model of TI. This model will be defined by the findings and conclusions drawn from the empirical studies employed in this research.

The results from multi-linear regression support previous research that transformational

leadership is significantly related to leadership effectiveness (work unit performance) and subordinate satisfaction and effort, although the limitations of using a self-reported source of these outcome variables should be acknowledged. Variance in the three outcome variables was also explained by five TI-Q dimensions with each outcome variable being predicted by at least two dimensions of the TI-Q. Transactional leadership did not significantly explain variance in any of the three outcome variables. The significant findings in relation to the TI-Q and measured outcome variables will be drawn upon in the next chapter to discuss how TI may predict performance and well-being. The links outlined will be based upon the final TI model (i.e., dimensional structure) refined through research presented in this thesis.

9

The Temporal Intelligence (TI) Model:
Discussion

Discussion

The empirical research conducted in chapters 7 and 8 supports the notion that Temporal Intelligence (TI) represents an individual difference construct reflecting the time-related behaviours and cognitions directed towards followers. The findings indicate that TI and specifically inter-individual referenced practices related to time in leadership is a multidimensional construct formed by eight time dimensions. The final structure of the model delineated from the entire research process detailed in this thesis is presented within this chapter.

Reviewing this doctoral research process, a detailed review of the time literature was initially conducted (chapter 2). This review provided insight into how time is conceptualised within an organisational setting in the published literature. A second review on the leadership literature was conducted (chapter 3). As the objective of this doctoral research was to identify individual differences in leaders' behaviours and cognitions directed to followers, it was perceived as imperative to develop an understanding of both the context in which the construct of TI would be developed and the key temporal developments (research related) within this context. The structure of the review was shaped around meeting these two objectives. Referring to understanding leadership as a context, this was addressed by reviewing the key theories and approaches to leadership. This showed that one of the most prevalent theories of leadership in the literature is Full Range Leadership Theory (FRLT). However, it also showed that within this theory, there is a diminutive amount of reference to time as a construct. The literature review presented in chapter 2 also showed that while time as a research variable does feature in the context of leadership, it is predominantly theory based and also fairly detached from central leadership theories such as FRLT. The findings from both literature reviews were used to inform the conceptual model of Temporal Intelligence.

Following the development of the conceptual model of TI, qualitative research, specifically

repertory-grid interviews (as outlined in chapter 5), were developed to elicit descriptions of temporal behaviours and cognitions directly from a sample of leaders (n=16). The behavioural and cognitive based descriptions gathered from leaders were used to create items for the Temporal Intelligence Questionnaire (TI-Q), which is outlined in chapter 6. The development of items for the TI-Q also included an additional two main sources: i) items from existing time-related measures and ii) theoretical propositions (i.e., were not previously measured by a survey).

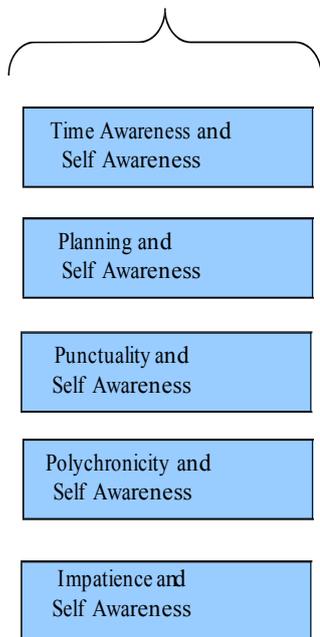
Two empirical studies (outlined in chapters 7 and 8) were conducted to further develop the TI-Q and, subsequently, the TI construct itself. Specifically, following the assumptions of Classical Test Theory (CCT), the factor structure of the questionnaire was examined, and through exploratory factor analysis, the results indicated an eight-factor solution. This factor solution subsequently was interpreted to reflect eight distinct temporal dimensions representative of leaders' behaviours and cognitions directed towards followers. Also aligned to CTT, reliability analysis was conducted to refine the TI-Q and also ensure that items representative of one of the eight dimensions consistently measures that dimension. Both the results from study I and II supported the internal consistency of the measure (adequate reliability coefficients were obtained). Study II was implemented to establish the construct validity of the TI-Q. As correlations between personality and leadership style were overall insignificant to moderate, the questionnaire was deemed to show adequate discriminant validity. Also through this correlational analysis with personality and leadership style, insight into the nature of TI as a construct, and the relation to personality and leadership style could be inferred. Further discussion of these results will be presented in this chapter to develop a more detailed understanding of the final TI model.

The final model of TI concluded from this doctoral research is presented in Figure 9.1. Each of the eight dimensions relating to a leader's temporal behaviours and cognitions expressed towards followers are discussed in detail following the model's presentation. As mentioned previously, this will include drawing on the findings from the correlational analyses presented in the previous chapter between the TI-Q and both the NEO PI-R and MLQ. In addition to this, theory will be

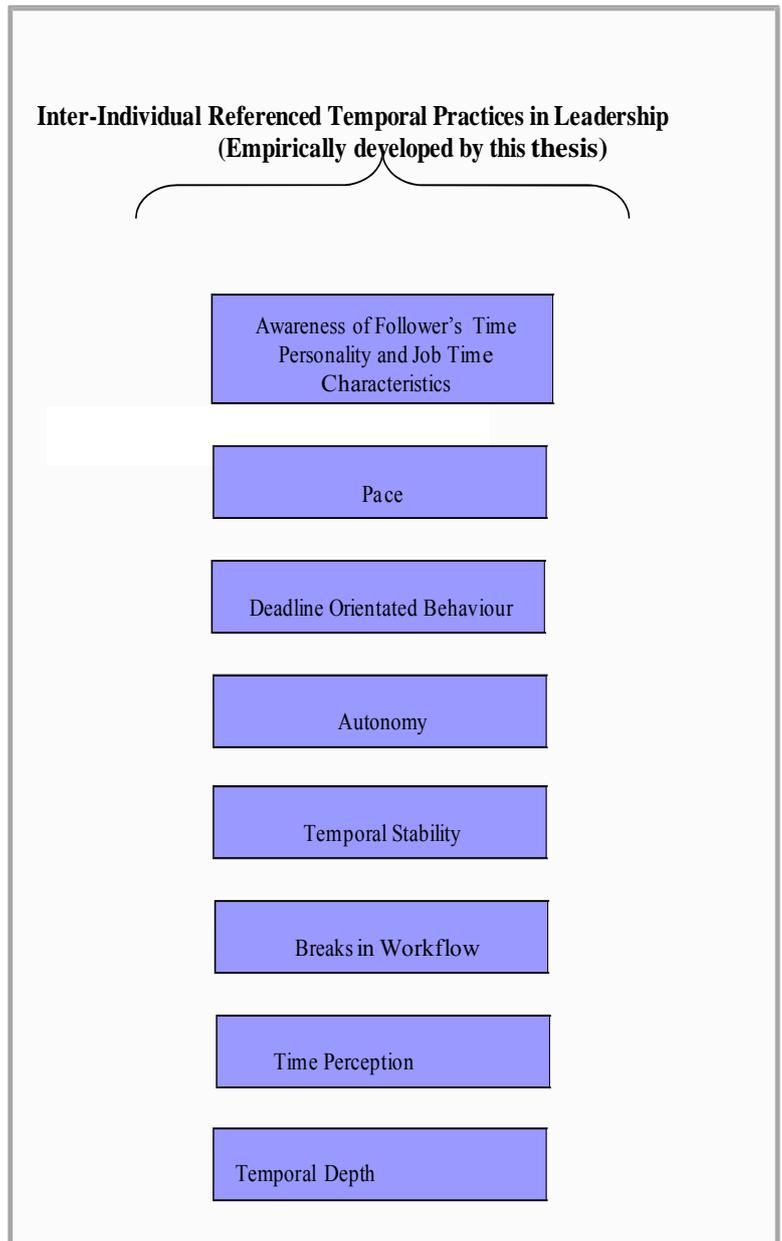
drawn upon to augment understanding the construct of TI. Also, upon discussion of each of the eight component dimensions of TI, consideration of potential links to outcome variables will be proposed based on previous research and from the regression analysis conducted in study II that incorporated three self-report outcome variables (leadership effective, subordinate satisfaction and subordinate effort).

Figure 9.1 *Model of Temporal Intelligence*

**Self-Referenced Temporal Practices
(Conceptual)**



**Inter-Individual Referenced Temporal Practices in Leadership
(Empirically developed by this thesis)**



Dimension one: Time personality and job role characteristics

The results from Exploratory Factor Analysis (EFA) conducted in chapter 7 showed that this dimension within the TI-Q explained the most variance across all eight dimensions. This dimension originates from the original conceptual model of TI presented in chapter 4. In the conceptual model, this dimension was referred to as ‘adaptive temporal practices’. This term was dropped as upon reflection of the final eight dimensions and representative items, the term ‘adaptive’ did not seem to aptly distinguish between the content of this dimension and the other seven temporal dimensions. Developing this point, a number of the behaviours that are representative of the other final seven dimensions appear to include adaptive behaviours relating to time. For example, behavioural items in the TI-Q representing deadline orientated behaviour represent behaviours that change according to situational cues (e.g. an item reads ‘Regarding others, I set them deadlines when I perceive them to be performing poorly’).

In addition to adaptive temporal practices being removed, the content of the original dimension proposed in the conceptual model of TI changed in one main respect following statistical analysis of the TI-Q. In the original theoretical model, an awareness and behavioural process was detailed in relation to the four dimensions of time personality and job time characteristics (e.g. polychronicity, planning, punctuality and impatience). However, only items relating to the awareness process survived factor analysis. An explanation for why the behavioural process did not survive factor analysis and, hence, did not show a stable factor structure may relate to the influence that the situation may have on leaders. Developing this point, Mischel (1968) posits that situations vary in the extent to which they constrain human behaviour. *Strong* situations, were defined as those with transparent norms and rigid roles, which tend to constrain the expression (i.e., behaviours) of individual differences. This research reported situational constraints to relate to the organisation (e.g. culture) and superiors. In contrast, weak situations permit more opportunity for the expression of such differences. This notion of strong and weak situations gained a substantial amount of support and stimulated further research into the constraints situations have on individual behaviour (Johns, 1991, 2006; Mowday & Sutton, 1993;

Peters, O'Connor, & Eulberg, 1985).

Items that originally measured the extent to which a leader adapts their behavioural responses are proposed to be affected by situational constraints. These constraints may lead to inconsistent reporting of behaviour for all four time dimensions (polychronicity, planning, impatience and punctuality), as the behaviour relating to one item of a group of items may vary due to fluctuations in strong and weak situations. While situational constraints may explain why behavioural items relating to this dimension did not show a stable factor structure, it is also important not to assume from this result that these behaviours are not expressed in the workplace or are not relevant to leadership.

Further research is required to investigate the adaptive behavioural processes relating to followers' time personality and job time characteristics. However, at this stage, it is suggested that these behaviours will be important in a leadership context as will directly affect the temporal experience of followers (e.g. in relation to experience of a temporal dimension such as polychronicity). However, these behaviours are perceived to be difficult to measure due to situational effects, but this can be attributable to the measurement methodology employed. The TI-Q represents a normative test, which relies on a group of items showing stability (to form a dimension) and consistency in response patterns across a population (internal consistency). However, another approach to measuring behaviours would be to adopt an ipsative test, which involves forced responses and intra-individual assessment (i.e., compares an individual's behaviour in one area to another) rather than normative testing that is based upon inter-individual assessment (i.e., comparing behaviours of an individual with those across a population). Thus, it is suggested that an ipsative test would potentially allow an alternative means to measuring adaptive behaviours in relation to follower time personality and job time characteristics. An ipsative test will not be affected by the aforementioned issues facing the measurement of these behaviours by a normative test. The use of ipsative versus normative tests for measuring TI will be discussed further upon seeking to define TI as an individual difference factor, which follows

this discussion of individual TI dimensions. In conclusion, it is proposed that the process of awareness of time personality and job time characteristics is antecedent to the behavioural process. Moreover, it is proposed that leaders who have a high awareness (indicated by a high score on this dimension of the TI-Q) will be more effective in their adaptive behaviours, which rely on an awareness and understanding of temporal differences among followers and job roles.

While the behavioural items originating from the conceptual model of TI did not survive factor analysis, all items relating to the four dimensions of follower time personality and job time characteristics did form the factor explaining the greatest variation. Subsequently, factor analysis supported the conceptual model in relation to awareness of these temporal dimensions.

Reliability analysis also provided strong support for this factor as in both empirical studies presented in chapters 7 and 8 substantial Cronbach Alphas were achieved (.878 and .845). As the Cronbach Alpha is 'high', consideration should be given to whether these results have been caused by the concept of bloated specifics (Cattell, 1978), which was introduced in chapter 7. Specifically, a pertinent question arises to determine any effects of bloated specifics: do the items relating to awareness of followers time personality on one dimension (e.g. punctuality) correlate highly with those from another dimension (e.g. planning) due to the similarity of wording rather than a conceptual difference? If the answer is yes, this would suggest this dimension has been affected by the notion of bloated specifics.

The results suggest that the phenomenon of bloated specifics has not occurred in this dimension (albeit at least not to a *strong* effect) as the inter-item correlations in study II presented in chapter 8 show that no two items correlate above $r=.70$ and only one inter-item correlation is above .60. The range of correlations is between $r=.12$ and $r=.64$, which according to Cohen (1988) are low to moderate correlations. For example, items 5 and 7 ('I am aware of who likes to plan their activities (e.g. by writing lists)' representing planning and 'I am aware of who likes to juggle several activities at the same time' representing polychronicity). While Kline (1986) suggests that inter-item correlations should be greater than .30 in a scale, this is not a widely followed

criteria and, in fact, as the four dimensions of time relating to time personality and job time characteristics represent distinct temporal characteristics (as demonstrated by Francis-Smythe and Robertson, 1999), lower inter-item correlations would be expected for items relating to different dimensions and awareness of individual preferences versus job demands (job time characteristics).

The results from study II presented in chapter 8 also indicate that the behaviours relating to this dimension of TI have a moderate relation to those associated with Extraversion (indicated by a correlation of $r=.315$, $p<0.05$). One potential explanation for this relationship is that to be aware of an individual's time preferences, one potential means to develop this awareness is through interaction with followers outside more formal processes (such as reviews). This interaction (interpersonal in relation to Extraversion) may involve identifying how a follower approaches a task, how they react (i.e. if they become stressed at experiencing a temporal dimension that is not in line with their preference) and any explicit preference shared. Reserved leaders (i.e., introversion) are potentially less likely to have frequent interaction with the follower and, therefore, may not be aware of individual temporal preferences to a degree as extraverts (e.g. high scorers on extraversion). The moderate correlation suggests that behaviours relating to Extraversion will have some commonality with this dimension but cannot substantially explain differences (in terms of awareness) on this dimension.

The results from study II show this dimension (time personality and job role characteristics) to predict self-reported Extra Effort and Satisfaction (subordinate). While further research on outcome variables is required, the results support the propositions made in the conceptual model of TI that this dimension may predict outcome variables. This prediction was made on the basis of time-related person-job characteristics (on specific temporal dimensions) studies introduced in chapter 2 that found the more congruent the fit relationship, the higher the job performance (Hecht & Allen, 2003; Slocombe & Bluedorn; 1999) and well-being (Francis-Smythe & Robertson, 2003; Hecht & Allen, 2005). Chapter 4 (conceptual model of TI) proposes that the leader's role in terms of

developing a congruent temporal fit as described above is facilitative in nature, as situational factors will determine the feasibility of a congruent temporal fit. The process of developing a congruent fit, represents the behaviours a leader employs, which is as detailed in chapter 4 related to the concept of entrainment. However, these behaviours (and subsequently entrainment) are not directly measured by the TI-Q (as discussed previously in this chapter), but the process of awareness is proposed to be a pre-requisite to the behavioural repertoire a leader can employ to develop a congruent fit. Moreover, awareness of individual and job time characteristics is proposed to limit the effectiveness of developing a congruent temporal fit (i.e., one has to be aware of temporal characteristics aligned to polychronicity, planning, punctuality and impatience before a fit can be developed).

Dimension two: Pace

Pace, a dimension in the original model of TI, has been supported by the statistical analyses. As reviewed in chapter 4, an array of research (Bluedorn, 2000, 2002; Kern, 1983; Onken, 1998; Harvey, & Novicevic, 2001; Lauer, 1981) has investigated the construct of pace, tempo or speed, which in accord with Lauer (1981) are not distinct constructs. A few items originally proposed to represent this dimension, did not survive factor analysis employed in study I. From review of the items that were removed following study I, it appears that that the final items representing this dimension refer to the extent to which the leader encourages a high work pace among followers (i.e., a continuum of consistently low to high pace) rather than any changes in pace (e.g. I occasionally allow others to work at a slow pace). Thus, pace from the statistical analyses has refined to refer to pace in terms of consistency (i.e, whether the leader consistently encourages a high work pace). This finding is consistent with previous research that has measured conceptually similar constructs such as time urgency (Landy, Rastegary, Thayer, Colvin, 1991; Woodwill, 1993; Conte, Landy & Mathieu (1995) and impatience (Francis-Smythe & Robertson, 1999). The perceived contribution that TI's pace construct offers to existing literature is that it considers the concept of speed in relation to others (followers) and specifically a leader's behaviours and cognitions on the speed of work conducted by followers. This has potential implications for

influencing the pace of work experience by followers, which may be related to outcome variables. The findings from the regression analysis found one of the three outcome variables, Extra Effort, to be predicted by this TI dimension. While leaders who expect and encourage a consistently high work pace may foster conditions that require followers to work hard (i.e, related to effort), performance and subordinate satisfaction may not be positively affected by a consistently high pace. While further research is required, it is suggested that a consistently high work pace is difficult to maintain and may lead to a negative impact on outcome variable well-being (a broader construct than satisfaction with leader). Although not measured as an outcome variable in study II, it is suggested that future research may wish to consider employee well-being (a broader construct than satisfaction with leader).

Dimension three: Deadline orientated behaviour

The statistical analysis supported the conceptual model of TI that included the original dimension of deadline orientated behaviour. The reliability coefficient was above 0.70 for both study I and study II. The finding that a substantial reliability coefficient was obtained in study II is quite important due to the structural changes in the item layout and response scaling of this dimension in study I compared to study II. In study I, all items for this dimension were presented together (to distinguish between internal and external deadlines) using a behavioural frequency response scaling. However, in study II the items were randomly distributed in the questionnaire using the same response scaling as the other dimensions (i.e., strongly disagree to strongly agree). Reasons relating to these changes are noted in chapter 7. Consequently, concerns that grouping the items together in study I was the cause of consistent scoring across the sample (a possible explanation for the Cronbach Alpha being above .70) were relieved by study II that did not present items from this dimension together.

As identified in chapter 4, there have been a number of studies investigating the implications of deadlines on individual and team/group performance, intrinsic motivation and task progress (Amabile, DeJong, & Lepper, 1976; Aalst & Rosemann, 2007 Gevers, Rutte, & van Eerde, 2006;

Sanna, 2005; Waller, Conte, Gibson, & Carpenter, 2001; Waller, Zellmer-Bruhn & Giambatista, 2002). Deadlines have also been considered at a cultural level in terms of organisational level opinions towards deadlines and meeting them (Benanou, 1999; Onken, 1999; Schriber & Gutek, 1987).

It is proposed that TI contributes to the existing literature as it considers specific behaviours employed by leaders that relate to the deadline process (internal deadlines set by the leader). If the item pool specific to this dimension is reviewed (Appendix 15), there are specific behaviours that focus on setting instructions (e.g. When giving a deadline to others, I make sure they are aware of the impact that missing the deadline would have on other people) and other items that reflect the behaviour after setting a deadline (e.g. After I have set a deadline to others, I give positive encouragement for the deadline to be completed). One of the key interpretations drawn by the researcher from this item pool is that the leader's behaviours across the deadline process are orientated towards enforcing the importance of meeting deadlines and the means of achieving this (i.e., consideration to the stages in the deadline process required to meet the deadline). This dimension of time subsequently has perceived conceptual similarity to time urgency which refers to 'the attitude that temporal resources are scarce and must be conserved, resulting in a preoccupation with passing time, deadlines, and the rate at which tasks must be performed' (Mohammed & Harrison, 2008, p48). However, it is suggested that TI focuses on behaviours and processes that are specific to leadership. Therefore, leaders who score highly on these dimensions create deadline conditions (where the importance of meeting them are emphasised). It is these conditions that have received a substantial amount of attention by existing literature. Thus, TI proposes to contribute to understanding the development of deadline conditions (and the nature of these).

The results from study II, show that the strongest correlation between this dimension and the five domains of personality is with Conscientiousness ($r=.433$, $p<.05$). The results also show that all six individual facets of Conscientiousness correlate moderately with Time Orientated Behaviour.

When the characteristics of Conscientiousness are considered, such as organised, goal orientated and self-disciplined, a number of these behaviours are perceived to translate in a temporal context. However, this dimension is shown to also correlate to Extraversion ($r=.350$, $p<.05$), which may be explained by the fact that extraverts have been described as upbeat, energetic and optimistic (Costa & McCrae, 2006), and behavioural manifestations of these traits may emerge when encouraging followers to complete a deadline. Transformational leadership behaviours and also the transactional dimension of contingent reward also correlate moderately with this dimension. This suggests that while the dimension is focused on deadlines, there is a complex interaction of leadership behaviours that emerge in the deadline process. This is potentially quite significant as these behaviours represent different ways of leading. This supports Bass' (1985) augmentation effect that states that transformational leadership complements transactional leadership rather than being contrasting styles. This dimension of TI may provide a specific situation where simultaneously employing different leadership styles can complement each other (i.e., to facilitate the development of deadline conditions).

Existing research on the effects of deadlines on outcome variables is fairly complex. For example, research suggests that the effects of time pressure on employees can vary on an individual basis (Rastegary and Landy, 1993). While research suggests that deadlines do not have a positive effect on intrinsic motivation (Amabile, DeJong, & Lepper, 1976), meeting deadlines has been linked to group performance (Gevers, 2004; Gevers, Rutte, & van Eerde, 2006). The finding that Deadline Orientated Behaviour significantly predicts Leadership Effectiveness, supports the aforementioned group literature. In conclusion, due to the complex relations between deadlines and outcome variables, it is suggested further research should be conducted to understand the specific effects of a leader's deadline-oriented behaviour on outcome variables. However, TI identifies a number of leadership behaviours representative of the deadline process and therefore these behaviours exhibited by the leaders are proposed to relate to the deadline conditions followers experience. Further research could focus on investigating this experience by examining followers (behaviours) and outcome variables (such as

performance) in relation to the deadline orientated behaviours exhibited by the leader (and captured by this dimension of TI).

Dimension four: Autonomy

Statistical analysis fully supported the dimension of autonomy that was proposed in the conceptual model of TI. Chapter 4 demonstrates that there has been a significant amount of research into autonomy, which relates to job characteristics (Hackman and Oldman, 1975; Fried & Ferris, 1987; Spector, 1986), culture (Lim & Seers, 1993; Schriber & Gutek, 1987), individual perceptions and leadership (Ferris, 1983). The findings from this study support Ferris's research into autonomy and leadership. Ferris found that leaders' 'structuring and considerate' leadership behaviours significantly impacted on the followers' perceptions of autonomy. These structuring and considerate behaviours are as mentioned in chapter 4 conceptually similar to individualised consideration, which was the only dimension in study II that correlated significantly with the TI dimension of autonomy ($r=.273$, $p<.05$). Autonomy did not correlate with any dimensions of personality.

While chapter 4 provides a review of the literature relating to autonomy and outcome variables, in summary autonomy as a job characteristic has been linked to job performance, intrinsic motivation and job satisfaction. While autonomy did not significantly predict any of the three outcome variables on the MLQ, a reflection on how these outcome variables are defined and measured may provide an explanation as to why autonomy did not predict these variables. Firstly, leadership effectiveness is defined by the MLQ scale as whether the work unit (e.g. team) is perceived to be effective. Previous research that has shown a link between autonomy and job performance has predominantly defined performance at an individual rather than group level (e.g. Fried & Ferris, 1987; Spector, 1986). This may account for the results, but future research is recommended to explore this further. Secondly, the satisfaction outcome variable on the MLQ focuses more on satisfaction with the leader than satisfaction with the job, which may again explain why a significant relationship was not found. The finding that Extra Effort was

insignificant is surprising considering previous research (Spector, 1986) has demonstrated a link between autonomy and intrinsic motivation; however, there are perceived limitations in the item wording relating to Extra Effort. For example, one item from the MLQ is 'I heighten others' desire to succeed', which is potentially relying on the leaders perceptions of which behaviours relate to follower motivation and also the leader's perceptions of motivated employees. Firstly, encouraging autonomy may not be linked by the leader as behaviours relating directly to motivation. Secondly, intrinsic motivation (the variable previous research has demonstrated to be predicted by autonomy) is arguably more challenging for the leader to perceive than the type of motivation described in the MLQ Extra Effort dimension. In conclusion, the leadership behaviours that represent promoting autonomy in followers' work is captured in this dimension of TI. Based on previous research findings, it is suggested that future research could provide fruitful links between the leader's role in promoting autonomy and outcome variables.

Dimension five: Temporal stability

This dimension is perceived to have developed from the original dimension of Speed and Quality, which referred to a set of behaviours and cognitions that seek to adapt the emphasis of quality of work over speed in relation to situational needs (such as a deadline). In the original conceptual model of TI, Speed and Quality appear to be based upon the notion of a trade-off between pace and quality. This dimension refers to the consistency of temporal behaviours expressed by a leader to their followers in terms of the consistency of expecting a high pace of activities. Items show that this consistency is not always dependent on considering a speed versus quality tradeoff. However, the items show that consistency of pace is dependent on situational cues (i.e., an individual follower or task characteristics). It is this attribute of this item that distinguishes it from pace as each item in this dimension measures pace dependent on situational cues, while the dimension of pace does not consider situational cues. Future research is suggested to focus on the effects of such behaviour on followers.

Dimension six: Breaks in workflow

Breaks in workflow is a temporal dimension that was originally proposed in the conceptual model of TI and was fully supported by the statistical analyses conducted. This dimension refers to the extent to which the leader encourages and pro-actively supports the development of breaks and intrusions in the work place.

In terms of how behaviours in this dimension may have an effect or influence on followers, a considerable amount of work has demonstrated the positive effects of breaks and interruptions on creative tasks. For example, Beeftink, van Eerde, & Rutte (2008) demonstrated that by manipulating three experimental conditions, self-initiated breaks led to more insight into problem solving compared to an imposed break (initiated by another individual) and no break condition, while the imposed break condition led to fewer impasses (feeling of not being able to solve a problem) than a no break condition. It is proposed that in the context of leadership, followers' ability to take self-initiated breaks will be influenced by the leader, similar to how the three experimental conditions were manipulated by the researchers. Thus, it is suggested that leaders who score highly on this TI dimension will have a positive influence on followers' creative problem solving (in terms of impasses and insights). Similarly, conceptual work by Mainemelis and Ronson (2006), proposes that *play* can 'facilitate the cognitive, affective, and motivational dimensions of the creative process' (p1). Play refers to a form of engagement with a task or a diversion from it and relates to four behavioural orientations. In terms of the behaviours representing breaks in workflow in the TI-Q, this is socially prescribed behaviour when the behavior occurs in a social context (Klinger, 1971, cited in Mainemelis & Ronson, 2006). This social context is proposed to be breaks and interruptions developed by the leader.

While a considerable amount of research has demonstrated positive effects of breaks in the workplace (Anconca, Okyuysen & Perlow, 2001; Beeftink, Van Eerde, & Rutte 2008; Roy, 1960; Waller, 1999 Zeigarnik, 1927), there has been little research into how breaks are developed in the workplace by individuals (such as the leader). The TI construct proposes that individual

differences in leaders' behaviours relating to the development of breaks characteristic of this dimension can influence followers' experience of social interaction and periods of work inactivity in the workplace. The notion of contextual constraints (Johns, 2006) mentioned previously in this chapter is perceived to potentially constrain the extent to which the leader behaviour can encourage breaks and cause interruptions as rigid organisational procedures (i.e., strong situations) such as factories where structured breaks take place. This factor is perceived to be particularly vulnerable to contextual constraints.

The study presented in chapter 8 showed that Breaks in Workflow correlated moderately with Transformational Leadership ($r=.350$, $p<.01$) and correlated the strongest with the MLQ's transformational dimension of Individualised Consideration ($r=.365$, $p<.01$). It is proposed that breaks provide the context in which a leader can provide attention to an individual's needs for achievement and growth, and show the follower empathy.

Dimension seven: Time Perception

This dimension was not part of the conceptual model of TI and, therefore, formed from 9 items that factor analysis grouped together (therefore were items not originally proposed to measure the same dimension). When the items representing this dimension are reviewed (Appendix 15), they are proposed to reflect the extent to which the leader is unaware of how their behaviours will effect the followers' time-related experience of work. The result that study II shows that this dimension shares a fairly small relationship to pace may be explained by the fact that leaders who have a fairly low awareness of the effects of their behaviours on experienced temporal characteristics are potentially less likely to be aware of any negative implications (e.g. stress and reduced satisfaction) that a consistent high pace of work may have on followers.

The findings from study II indicate this scale to have the lowest reliability coefficient ($\alpha=.52$). This is considered inadequate for research purposes (Nunnally, 1968), so future research would have to replicate the findings from study I that Cronbach Alpha is substantial (i.e., above .70) to

retain as a dimension in TI. A perceived limitation with this dimension relates to the item content. A number of the items represent a fairly broad range of behaviours, which are deemed to potentially vary the attribute of time that is experienced by followers. For example, if the item ‘I often contact an individual about a work-related issue outside their working hours’ is considered, the potential effect on followers temporal experience is being interrupted in activities outside work (may negatively impact on perceived work life balance). In contrast, the behaviour in the following item is different; ‘I take as much time making a decision as I want’. Subsequently, the experience that followers may have as a consequence may relate to a delay and ambiguity on direction (in relation to a task or strategy for example). It is suggested that on reflection of the item wording and reliability analysis that this dimension requires further research with the potential to refine the concept or to remove this dimension from TI. Further research with a larger sample size is recommended before firming any conclusions as to whether this dimension should be changed.

Dimension eight: Temporal Depth

Temporal depth, an original dimension in the conceptual model of TI, was supported by the statistical analyses. This temporal dimension originates from the works of Bluedorn (2000, 2008) and Bluedorn and Ferris (2004). The measurement methodology in TI is not exactly the same as Bluedorn’s (2002) measure of temporal depth, which seeks to measure a quantifiable distance that an individual looks into the past or future from the present (i.e., past distance to present is measured separately to present distance to future). This measurement is also confined to cognitions. Although not to be perceived to be a substantial difference, TI is concerned with both the behaviours and cognitions that relate to the interaction of different timeframes (e.g. using more than one time perspective, frequently but not exclusively at the same time). Thus, the notion of ‘depth’ TI is defined by the extent to which a leader uses more than one temporal perspective, which proposes to reflect depth in temporal perspective. This interpretation of ‘depth’ aligns closely with Bluedorn and Ferris’ (2004) measurement of total temporal depth that considers distance both into the past and future. One notable difference in measurement though from TI and

total temporal depth is that the former measures temporal orientation (e.g. past) by explicitly identifying a specific behaviour relating to leadership (e.g. reflecting on mistakes of followers).

The definition of temporal depth in TI is also similar with that of Temporal Focus (Shipp, Edwards, and Lambert, 2009), which is defined as the ‘attention individuals devote to thinking about the past, present, and future’ (p1). This concept was published after the literature review conducted in chapter 2 and, therefore, is not represented in the conceptual model of TI. At a conceptual level, it is suggested that the definition Temporal Focus does not distinguish itself from the concept of temporal depth (as originally defined by Bluedorn 2000). However, it should be noted that there are differences in the way in which Temporal Focus is measured. For example, the Temporal Focus Scale (TFS; Shipp, Edwards, and Lambert, 2009) refers to one time perspective at a time (e.g. I think about things from my past) and is based on cognitions with little reference to a workplace context. In contrast, TI also makes reference to two time perspectives in a single item (e.g. To move forward you have to reflect on where you are at the moment) and also makes reference to the workplace and specifically behavioural processes within leadership (e.g. When communicating a vision of the future, I tell others where we are at the moment). In sum, differences between TI (temporal depth), temporal depth as defined by Bluedorn (2002) and Bluedorn and Ferris (2004), and Temporal Focus are perceived to reflect measurement differences rather than any significant conceptual differences.

A few items representing Temporal Depth in the final version of the TI-Q appear to support Halbesleben and colleagues' (2003) notion of ‘escalation of commitment’ (Staw 1976) that was discussed in the context of temporality within the model of temporal complexity. These scholars proposed some leaders may be:

‘unwilling to revisit past decisions because they have invested resources in the decision and fear wasting those resources, a situation commonly known as escalation of commitment’ (p39).

It is suggested that using multiple time perspectives simultaneously is inherent in the notion of

reducing the risks of escalation of commitment occurring as a leader will need to consider a future or present time perspective at the same time as revisiting a decision (i.e., past perspective). An example item in the TI-Q perceived to relate to the notion of escalation of commitment (there are perceived to be 3 items in total) in relation to temporal depth is: 'I use new information to evaluate whether a past decision should be changed'.

The results from study II presented in chapter 8 show that across all eight dimensions of TI, Temporal Depth measured by the TI-Q has the strongest relationship with Transformational Leadership but is not significantly correlated to the overall dimension Transactional Leadership. In fact, this dimension of TI is significantly correlated with all four dimensions of the transformational leadership style. To clarify, these correlations still reflect moderate effect sizes (Cohen, 1988), so it is argued that the TI-Q and MLQ dimensions measure conceptually distinct constructs but the constructs themselves do appear to have some behavioural similarities. Further support for this interpretation derives from research that has found the established construct Emotional Intelligence to significantly correlate with transformational and transactional dimensions as measured by the MLQ (Palmer, 2001; Sosik & Megerian, 1999). Moreover, the magnitude of correlations (ranging from $r=.20$ to $r=.55$, $P<.05$) were very similar to those observed in this study. There are potentially a number of explanations for the moderate correlations between Temporal Depth and Transformational Leadership. For example, Intellectual Stimulation has been described as referring to developing broader level and creative thinking among followers (Sosik & Megerian, 1999). As temporal depth includes behaviours and cognitions relating to the simultaneous use of time orientation (e.g. past and future), this approach and encouraging followers to develop simultaneous use of time orientation can be interpreted to reflect the notion of developing followers to have a broader level of thinking. A TI-Q item that seems an apt example is: 'When others make a mistake, I ask them to consider how they would prevent making a similar mistake in the future'. This item also seems to relate to the underlying premise of Individualised Consideration in that an individual's development and coaching needs are being considered in this dimension of TI.

Further research is required into the implications of temporal depth on outcome variables. The findings from study II showed that Temporal Depth was negatively related to subordinate satisfaction (albeit a small effect size). A potential explanation for this finding may relate to the past time perspective featured in this dimension, which Shipp, Edwards, and Lambert (2009) found correlated (+ve) with negative affectivity and correlated negatively to life satisfaction, optimism, current time attitude, and perceptions of current job characteristics. Consequently, it is possible to postulate that reflective leadership behaviours may be correlated with negative outcome variables. It is suggested that future research should look further into this dimension's relation to outcome variables as there is a limited amount of previous research to guide hypothetical links. Research should potentially look at examining the relation of different dyads of time perspectives on outcome variables (e.g. past-present vs present-future) to identify any effects related to a specific dimension (such as the past time perspective).

Trait Temporal Intelligence

Following reflection on the empirical analyses, it is suggested that the TI-Q is a trait measure of the TI construct. This proposal is based upon the finding that while the TI-Q shows sufficient discriminant validity to indicate that TI is conceptually distinct as an individual difference variable to personality as measured by the NEO PI-R and leadership style as measured by the MLQ, there are moderate relations which suggest there are trait based inter-relationships. Importantly, there is debate about the construct of Emotional Intelligence (EI) and whether it is best described as a trait or ability (the latter relating to a standard form of intelligence). Literature demonstrates that normative tests are linked to trait measures of emotional intelligence (Petrides & Furnham, 2001, Roberts, Zeidner & Matthews, 2001; Saklofske, Austin & Minski, 2003). Furnham and Petrides (2001) suggest the terms 'ability EI' and 'trait EI' to distinguish between the types of two measurements. Thus, a normative measure of EI is proposed to represent Trait EI, while an ipsative test represents ability EI. As the TI-Q represents a normative test, it is proposed that the TI-Q represents a trait measure of Temporal Intelligence. Consequently, this doctoral research is suggested to represent trait TI. Further research into how TI meets criteria for a standard form of

intelligence should be conducted in the future using an ability (i.e., ipsative) measure of the TI construct. There is an intense debate about whether Emotional Intelligence is a standard form of intelligence (Roberts, Zeidner & Matthews, 2001). This discussion has developed over many years as the construct of Emotional Intelligence has evolved. This discussion is still at present day open to controversy (see Gill 2011, pp.304-306 for further details). In conclusion, future research will need to be conducted on TI in relation to standard forms of intelligence, but similar to emotional intelligence, this is perceived to be within the evolutionary process of the construct and, therefore, is an avenue for future research.

Limitations and Future Research

A number of limitations relating to specific research methodologies presented in each chapter have already been discussed in previous chapters. However a number of more general limitations should be acknowledged. Whilst directions for future research have been considered upon discussion of each of the eight dimensions of TI, this section will outline suggestions for future research that could seek to address some of the limitations associated with this doctoral research.

Firstly, it should be acknowledged that this research has focused on behaviours and cognitions between a leader and individual(s) who the leader is responsible for leading. One potentially fruitful avenue of interest for future research could be to develop the concept of TI within a group context. Chapter 2 demonstrates that the temporal dynamics in groups are often unique to a group setting (e.g. pace changes in project teams). Chapter 2 also identifies research showing that groups vary in temporal cognitions and that individual team member temporal characteristics (such as pacing style) can act as antecedents to shared temporal cognitions, which was linked to meeting deadlines. It is suggested that future research could consider TI in a group setting.

Secondly, this research followed a deductive approach. Theory subsequently guided the development of the conceptual model of TI and the TI-Q. The benefits of following such an approach have been linked to drawing on the vast amount of research that has previously been

conducted on time and, subsequently, using established empirical and theoretical work to develop the TI construct. However, the limitation is that any new temporal constructs or dimensions that previous research has not investigated may not be easily identified as the research identified temporal constructs proposed to relate to leadership with limited capability to allow the emergence of new temporal constructs. An example of this is in the repertory grid interview study for which a highly structured process was used to elicit psychological constructs. This process involved presenting participants' vignettes of time dimensions selected from the literature. Subsequently, this approach was in stark contrast to the grounded theory approach that if followed in this research would allow temporal constructs to emerge from the data (interview process) rather than having pre-defined temporal constructs. However, the benefit of using a structured repertory grid interview process was to focus discussion on temporal behaviours, which is perceived to be much more difficult following an inductive approach as the leader would potentially have limited relevance to time (and the research objective of this Doctoral thesis). Pilot repertory grid interview one was unstructured, and the findings indicate a limited focus on time, which supports the aforementioned argument. In sum, the deductive approach followed is deemed suitable for the research objectives in this research, but the limitations associated with this approach should be acknowledged.

A limitation associated with the development of the TI-Q (studies I and II) is with the size of the samples for both studies. Study I had 203 participants, which as argued in chapter 7 is adequate for factor analysis; however, a larger sample would be desirable as it would have increased the likelihood of reliability on further samples and strengthened the notion of generalisability to the wider leadership population. As noted in chapter 8, the sample size for study II (involving the TI-Q, MLQ and NEO PI-R) was substantial for the moderate effect sizes observed between measures (indicated by measures of power) but was potentially inadequate for small effect sizes. Future research is suggested with the TI-Q using larger samples to allow potential for the findings to be generalised across the wider leadership population if a number of demographic variables were investigated further (only feasible with a larger sample). Such factors could include age,

leadership level, nationality/culture, sex and organisation type (public versus private).

Implications for Leadership Practice

The TI construct developed through this research is proposed to represent a psychological construct that will potentially be of benefit to practitioners. The TI construct represents a detailed understanding of the specific time-related behaviours and cognitions expressed to followers, and how these vary between individual leaders. The potential implications for practice is that this understanding can be imparted to individual leaders so that they can increase self-awareness of how their own time-related behaviours and cognitions affect their leadership role. Fostering such self-awareness in an individual leader is deemed critical to a leader's ability to proactively manage their behaviour. This notion relating to self-awareness and subsequent proactive behavioural management is exemplified by established psychological constructs that currently influence leadership practice. For example, a number of leadership development courses involve leaders completing a personality measure. Through coaching or feedback from a qualified professional, the leader can reflect on the results from their personality test to develop self-awareness on how their personality influences the behaviours they express to their followers and how this can impact upon followers.

Developing self-awareness of one's own behaviours, traits and cognitions has implications for professional development. It should be acknowledged that this self-awareness could be highly beneficial even when outcome variables are not clearly linked. Developing this point, based on previous research (Judge, Bono, Ilies, & Gerhardt, 2002), neuroticism (personality trait) does not consistently predict leadership effectiveness but in practice, understanding how this trait can affect one's own behaviour is perceived as important to self-development (e.g. in terms of managing relationships with subordinates). It is suggested that the development of the TI construct is potentially of great value to practicing leaders as there is scope for the leader to build awareness of how their time-related behaviours and cognitions affect their role and interaction with followers. It is subsequently postulated that TI potentially represents an individual difference construct that can be explored by training and development professionals to facilitate the personal development of

individual leaders in the workplace. The Temporal Intelligence Questionnaire is posited to reflect a unique set of behaviours and cognitions that are not represented by current instruments in the training and development market. Future research could aim to facilitate the integration of the TI-Q into this market. For example research could focus on developing *norm groups* (i.e. a group that is used to compare a single respondent's score on a scale of a test).

The primary aim of this research was to develop the construct of TI to represent leaders' time-related behaviours and cognitions expressed towards followers. However, a secondary aim of this research was to explore any relationships that may exist between TI and leadership effectiveness. Five out of eight of the TI dimensions significantly predicted an outcome variable associated with self-reported leadership effectiveness (see chapter 8 for further details). More specifically, Deadline Orientated Behaviour and Temporal Stability predicted work unit effectiveness. Both Time Personality and Job Role Characteristics, and Pace predicted extra effort. Time Personality and Job Role Characteristics, Temporal Stability and Temporal Depth significantly predicted subordinate satisfaction (as perceived by the leader). TI's dimension of Time Personality and Job Role Characteristics explained the greatest variation in two of the three outcome variables representing leadership effectiveness. This result supports the notion that a leader should seek to foster a *congruent fit* between a follower's temporal preferences and the job time characteristics of their (follower's) role. The items in the TI-Q representing the scale of Time Personality and Job Role Characteristics (see appendix 16) represent the awareness process that reflects a pre-requisite to the behavioural process responsible for developing such a congruent fit. Leaders that demonstrate a higher awareness on this scale are proposed to be more effective in developing a congruent fit between the follower's time personality and job role characteristics. Chapter 4 presents a discussion on the types of behaviours a leader could employ in a process that develops such a temporal fit. Further research investigating this behavioural process (to develop a person-role fit), and the relationship of this process to the scale of Time Personality and Job Role Characteristics is recommended. As items relating to this behavioural process were removed following factor analysis (underlying reasons for this findings are discussed earlier in this chapter), it is suggested that future research could include observational

research.

In sum, the finding that five of the eight dimensions of TI significantly predict variables pertaining to leadership effectiveness does indicate that TI could potentially be of great value to leadership practice. However, further research is required to develop our understanding of the specific relationships between TI and leadership effectiveness due to the limitations associated with self-reported measurement of leadership effectiveness (as discussed in detail within chapter 9; see page 211). Such further research is deemed critical to informing leadership practitioners of how specific behaviours can relate to specific outcomes relating to leadership effectiveness. This is perceived to represent an exciting research opportunity to further develop the construct of TI and demonstrate how the Temporal Intelligence of leaders can be important in determining the leader's ability to effectively lead individuals.

Conclusion

This research has developed the concept of Temporal Intelligence in leadership. More specifically, this process has involved defining temporal constructs in relation to the specific time-related behaviours and cognitions leaders express to their followers. The TI construct is therefore proposed to represent an original account of time-related differences between leaders. It is these temporal differences prescribed by TI that also contribute to the time and leadership literature in a number of ways. Firstly, TI focuses on leadership behaviours and cognitions expressed to Followers; consequently, it is proposed that the time characteristics experienced by followers is influenced by the leader (aligned to the eight dimensions of time represented in TI). This approach (leadership influence on employees) to examining temporal variables is limited within the organisational literature. Subsequently, TI provides a detailed account of the temporal influence of the leader. Secondly, the leadership literature, especially key leadership theories, is fairly devoid of temporal variables and influence. TI identifies a number of symmetries between specific dimensions of time and specific behaviours representing Transformational and Transactional Leadership as defined by Full Range Leadership Theory (FRLT). It is proposed

that this research begins to bridge the gap between the leadership literature and the time literature. Thus, a number of original contributions to the current understanding of time within a leadership setting are deemed to have been a result of focusing this research on developing an account of the time-related individual differences of leaders.

Through multi-linear regression analysis, TI is demonstrated in this research to significantly predict self-reported leadership effectiveness when effectiveness is defined by three variables: work unit performance, subordinate effort and subordinate satisfaction. Moreover, these research findings therefore suggest that TI may provide insight into how temporal behaviours may explain how some leaders achieve instilling higher levels of performance and well-being in their followers compared to other leaders. Importantly, these insights will potentially augment those already developed by Full Range Leadership Theory. In sum, it is proposed that TI represents a potentially fruitful source for understanding how higher levels of employee performance and well-being can be achieved through leadership.

References

- Adam, B. (1990). *Time and social theory*. Cambridge, England: Polity Press.
- Adams, S.J.M. & Van Eerde, W. (2009, May). *Time use in Spain: Is polychronicity a cultural phenomenon?* Paper presented at the European Association of Work and Organisational Psychology 14th Congress, Santiago De Compostela, Spain.
- Adams, G. A., & Jex, S. M. (1999). Relationships between time management, control, work-family conflict, and strain. *Journal of Occupational Health Psychology, 1*, 72-77.
- Alderfer, C. P. (1977). Group and intergroup relations. In J. R. Hackman & J. L. Suttle (Eds.), *Improving the quality of work life* (pp. 227–296). Pallisades, CA: Good Year.
- Alimo-Metcalfe, B., & Alban-Metcalfe, R. J. (2001). The development of a new Transformational Leadership Questionnaire. *Journal of Occupational and Organizational Psychology, 74*, 1–27.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154–1184.
- Amabile, T. M., DeJong, W., & Lepper, M. R. (1976). Effects of externally imposed deadlines on subsequent intrinsic motivation. *Journal of Personality and Social Psychology, 24*, 920–998.
- Ancona, D., & Chong, C. L. 1996. Entrainment: Pace, cycle, rhythm in organizational behavior. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior*, (pp. 251-284). Greenwich, CT: JAI Press.
- Ancona, D. G., Okhuysen, G. A., & Perlow, L. A. (2001). Taking time to integrate temporal research. *Academy of Management Review, 26*, 512-529.
- Andersson, B.E., & Nielsson, S.G. (1964). Studies in the reliability and validity of the critical incident technique. *Journal of Applied Psychology, 48*, 398–403.
- Arlow, M. D. (1984). Disturbances of the sense of time. *Psychoanalytic Quarterly, 53*(1), 13–37.
- Ashcoff, J. (1965). The phase-angle difference in circadinaperiodicity. In J. Ashcoff (Ed.), *Circadian clocks: Proceedings of the Feldafind Summer School, 7–18 Sept. 1964* (pp. 262–276). Amsterdam, Netherlands: North-Holland.

- Ashkanasy, N., Gupta, V., Mayfield, M. S., & Trevor-Roberts, E. (2004). Future orientation. In R. J. House, P. J. Hanges, M. Javidan, P. W. Dorfman, & V. Gupta (Eds.), *Culture, leadership, and organizations: The GLOBE study of 62 societies* (pp. 9-28). Thousand Oaks, CA: Sage.
- Ashour, A. S. (1973). The contingency model of leadership effectiveness: An evaluation. *Organizational Behavior and Human Performance*, 9, 339–355.
- Ashton, M. C. (1998) Personality and job performance: The importance of narrow traits. *Journal of Organizational Behavior*, 19, 289-303.
- Avolio, B. J., & Bass, B. M. (1991). *The full range leadership development programs: Basic and advanced manuals*. Binghamton, NY: Bass, Avolio & Associates.
- Avolio, B. J., Waldman, D. A., & Einstein, W. O. (1988). Transformational leadership in a management game simulation: Impacting the bottom line. *Group and Organization Studies*, 13, 59–80.
- Avolio, B.J., Waldman, D.A., & Yammarino, F.J. (1991). Leading in the 1990s: The four I's of transformational leadership. *Journal of European Industrial Training*, 15(4), 9-16.
- Ayala, R. J. (2008). *The theory and practice of item response theory*. London, England: Guilford Press.
- Barger, S. D. (2002). The Marlowe–Crowne affair: Short forms, psychometric structure, and social desirability. *Journal of Personality Assessment*, 79, 286–305.
- Barrett, P. T., & Kline, P. (1981). The observation to variable ratio in factor analysis. *Personality Study in Group Behaviour*, 1, 23–33.
- Bartram, D. (1990). Reliability and validity. In J. R. Beech & L. Harding (Eds.), *Testing people: A practical guide to psychometrics* (pp. 45-62). Windsor, England: NFER-Nelson.
- Bass, B. M. (1985). *Leadership and performance beyond expectation*. New York, NY: Free Press.
- Bass, B.M., & Avolio, B.J. (1993). Transformational leadership: A response to critiques. In M.M. Chemers & R. Ayman (Eds.), *Leadership theory and research: Perspectives and direction* (pp.49–88). San Diego, CA: Academic Press.
- Bazerman, M. H. (1982). Impact of personal control on performance: Is added control always beneficial? *Journal of Applied Psychology*, 67, 472–479.

- Beefink, F., Van Eerde, W., & Rutte, C. G. (2008). The effect of interruptions and breaks on insight and impasses: Do you need a break right now? *Creativity Research Journal*, *20*, 358–364.
- Beehr, T. A., & Newman, J. E. (1978). Job stress, employee health, and organizational effectiveness: A facet analysis, model and literature review. *Personnel Psychology*, *31*, 665–699.
- Bell, J. (1999). *Doing your research project*. Buckingham, England: Open University Press.
- Benabou, C. (1999). Polychronicity and temporal dimensions of work in learning organizations. *Journal of Managerial Psychology*, *14*(4), 257-268.
- Bergson, H. (1960). *Time and free will: An essay on the immediate data of consciousness*. New York, NY: Harper and Row.
- Björklund, L. (2005). The repertory grid technique. In E. Chell, J. M. Haworth, & S. Brearley (Eds.), *The entrepreneurial personality: Concepts, cases and categories* (pp. 46-69). London, England: Routledge.
- Blake, R., & Mouton, J. (1964). *The managerial grid: The key to leadership excellence*. Houston, TX: Gulf Publishing Co.
- Bluedorn, A. C. (2000). Time and organizational culture. In N. M. Ashkanasy, C. P. M. Wilderom, & M. F. Peterson (Eds.), *Handbook of organizational culture and climate* (pp. 117–128). Thousand Oaks, CA: Sage.
- Bluedorn, A. C. (2002). *The human organization of time: Temporal realities and experience*. Palo Alto, CA: Stanford University Press.
- Bluedorn, A. C., & Ferris, S. P. (2004). Temporal depth, age, and organizational performance. In C. F. Epstein & A. L. Kalleberg (Eds.), *Fighting for time: Shifting boundaries of work and social life* (pp. 113–149). New York, NY: Russell Sage Foundation.
- Bluedorn, A. C., & Jaussi, K. S. (2007). Organizationally relevant dimensions of time across levels of analysis. *Research in Multi-level Issues*, *6*, 187–223.
- Bluedorn, A. C., & Jaussi, K. S. (2008). Leaders, followers, and time. *Leadership Quarterly*, *19*, 654–668.

- Bond, M., & Feather, N. (1988). Some correlates of structure and purpose in the use of time. *Journal of Personality and Social Psychology*, 55, 321–329.
- Bono, J. E., & Judge, T. A. (2004). Personality and transformational and transactional leadership: A meta-analysis. *Journal of Applied Psychology*, 89, 901-910.
- Boyatzis, R. E., Goleman, D., and Rhee, K. (2000). Clustering competence in emotional intelligence: Insights from the Emotional Competence Inventory (ECI). In R. Bar-On and J.D.A. Parker (Eds.), *Handbook of emotional intelligence* (pp343-363). San Francisco, CA: Jossey-Bass.
- Bradley, C., McMillan, C. V., Datta, J., Honeyford, R. J., & Madge, N. J. H. (2004). The development of a new measure of quality of life for young people with diabetes mellitus: The ADDQoL Teen. *Health and Quality of Life Outcomes*, 2(61), 1–14.
- Brawley, L. R., Carron, A. V., & Widmeyer, W. N. (1992). The nature of group goals in sports teams: A phenomenological analysis. *Sport Psychology*, 6, 323–333.
- Breakwell, G. M., Hammond, S., Fife-Schaw, C. R., & Smith, J. A. (Eds.). (2006). *Research methods in psychology* (3rd ed.). London, England: Sage.
- British Psychological Society. (2006). *Code of ethics and conduct*. Retrieved from http://www.bps.org.uk/the-society/code-of-conduct/code-of-conduct_home.cfm
- Britton, B. K., & Tesser, A. (1991). Effects of time management practices on college grades. *Journal of Educational Psychology*, 83, 405–410.
- Brown, D.J., & Keeping, L.M. (2005). Measuring transformational leadership with the MLQ: The role of affect. *The Leadership Quarterly*, 16, 245-272.
- Burns, J.S. (1996). Defining leadership: Can we see the forest for the trees? *Journal of Leadership Studies*, 3(2), 148 – 157.
- Burt, C. D. B., & Kemp, S. (1994). Construction of activity duration and time management potential. *Applied Cognitive Psychology*, 8, 155–168.
- Campion, M. A., Medsker, G. J., & Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology*, 46, 823–850.

- Cannon-Bowers, J. A., Salas, E., & Converse, S. A. (1993). Shared mental models in expert team decision making. In N. J. Castellan Jr. (Ed.), *Current issues in individual and group decision making* (pp. 221–246). Hillsdale, NJ: Erlbaum.
- Cannon-Bowers, J. A., Tannenbaum, S. I., Salas, E., & Volpe, C. E. (1995). Defining team competencies and establishing team training requirements. In R. Guzzo & E. Salas (Eds.), *Team effectiveness and decision making in organizations* (pp. 333–380). San Francisco, CA: Jossey-Bass.
- Carlyle, T. (1849). *On heroes, hero-worship, and the heroic in history*. Boston, MA: Houghton-Mifflin.
- Carson, P. P., & Carson, K. D. (1992). Managing creativity enhancement through goal-setting and feedback. *Journal of Creative Behavior*, 27, 36–45.
- Casimir, G. (2001). Combinative aspects of leadership style: The ordering and temporal spacing of leadership behaviors. *The Leadership Quarterly*, 12, 245 – 278.
- Cattell, R. B. (1978). *The scientific use of factor analysis in behavioral and life sciences*. New York, NY: Plenum Press.
- Claessens, B. (2004). *Perceived control of time: Time management and personal effectiveness at work* (Unpublished doctoral dissertation). University of Eindhoven, Netherlands.
- Claessens, B. J. C., Rutte, C. G., & Van Eerde, W. (2009, May). *Managing time at work: An extended mediation model*. Paper presented at the European Association of Work and Organisational Psychology 14th Congress, Santiago De Compostela, Spain.
- Claessens, B. J. C., Van Eerde, W., Rutte, C. G., & Roe, R. A. (2004). Planning behavior and perceived control of time at work. *Journal of Organizational Behavior*, 25, 937–950.
- Claessens, B. J. C., Van Eerde, W., Rutte, C. G., & Roe, R. A. (2007). A review of the time management literature. *Personnel Review*, 36, 255–276.
- Clark, P. (1985). A review of the theories of time and structure for organizational sociology. In S. B. Bacharach & S. M. Mitchell (Eds.), *Research in the sociology of organizations* (pp. 3579–3594). Greenwich, CT: JAI Press.

- Clemens, J. K., & Dalrymple, S. (2005). *Time mastery: How temporal intelligence will make you a stronger, more effective leader*. New York, NY: American Management Association.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Erlbaum.
- Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis*. Hillsdale, NJ: Erlbaum.
- Costa, P. T., Jr., & McCrae, R. R. (2006). Age changes in personality and their origins: Comment on Roberts, Walton, and Viechtbauer. *Psychological Bulletin*, *132*, 26–28.
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation*, *10*(7). Retrieved from <http://pareonline.net/pdf/v10n7a.pdf>
- Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology*, *24*, 349–354.
- Csikszentmihalyi, M. (1975). *Beyond boredom and anxiety*. San Francisco, CA: Jossey-Bass.
- Csikszentmihalyi, M. (1982). Toward a psychology of optimal experience. In L. Wheeler (Ed.), *Review of personality and social psychology* (pp. 13–36). Beverly Hills, CA: Sage.
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper and Row.
- Csikszentmihalyi, M. (1997). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: HarperPerennial.
- Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology*, *56*, 815–822.
- Davis, M. A. (2000, June). *Time and the nursing home assistant: Relations among time management, perceived control over time, and work-related outcomes*. Paper presented at the Academy of Management Conference, Toronto, Canada.
- Deci, E. L., & Ryan, R. M. (1985). The support of autonomy and control of behavior. *Journal of Personality and Social Psychology*, *53*, 1024–1037.
- Drucker, P. (1966). *The effective executive*. London, England: Pan.

- Duck, S. (1994). *Meaningful relationships*. London, England: Sage.
- Dulin, L. (2005). *Leadership preferences of a Generation Y cohort: A mixed method investigation* (Unpublished doctoral dissertation). University of North Texas, Texas, USA.
- Earl, P. E. (1986). *Lifestyle economics: Consumer behaviour in a turbulent world*. Brighton, England: Palgrave Macmillan.
- Easterby-Smith, M. (1981). The design, analysis, and interpretation of repertory grids. In M.L.G. Shaw, (Ed.), *Recent advances in personal construct technology*, (pp. 9-30). London: Academic Press.
- Eden, C., & Jones, S. (1984). Using repertory grids for problem construction. *Journal of the Operational Research Society*, 35, 791–796.
- Edwards, J. R. (1991). Person–job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 6, pp. 283–357). Chichester, England: John Wiley.
- Eilam, B., & Aharon, I. (2003). Students' planning in the process of self-regulated learning. *Contemporary Educational Psychology*, 28, 304–334.
- Eisenhardt, K. M. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Review*, 32, 543–576.
- Eppler, M., & Mengis, J. (2009). How decision makers and experts learn to talk together. *Harvard Business Manager*, 4, 50-58.
- Erez, M., & Zidon, I. (1984). Effects of goal acceptance on the relationship of goal setting and task performance. *Journal of Applied Psychology*, 69, 69–78.
- Everitt, S. (1975). Multivariate analysis: The need for data, and other problems. *British Journal of Psychiatry*, 126, 227-240.
- Fairley, S. (2002). *The effects of professional development on ministerial leaders' thinking and practice* (Unpublished doctoral dissertation). Griffith University, Brisbane, Australia.
- Fan, X. (1998). Item response theory and classical test theory: An empirical comparison favorableness in an employee attitude questionnaire. *Journal of Applied Psychology*, 75, 354–357.
- Feather, N. T., & Bond, M. J. (1988). Some correlates of structure and purpose in the use of time. *Journal of Personality and Social Psychology*, 55, 321–329.

- Feather, N. T., & Volkmer, R. E. (1988). Preference for situations involving effort, time pressure, and feedback in relation to Type A behavior, locus of control and test anxiety. *Journal of Personality and Social Psychology*, *55*, 266–271.
- Ferris, G. R. (1983). The influence of leadership on perceptions of job autonomy. *Journal of Psychology: Interdisciplinary & Applied*, *114*, 253–258.
- Fiedler, F. (1967). *A theory of leadership effectiveness*. New York, NY: McGraw-Hill.
- Fiedler, F. (1971). Note on the methodology of Graen, Orris, and Alvares studies testing the contingency model. *Journal of Applied Psychology*, *55*, 202–204.
- Field, A. (2005). *Discovering statistics using SPSS*. London, England: Sage.
- Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin*, *51*, 327–359.
- Flanagan, J. C., Miller, R. B., Burns, R. K., Hendrix, A., Stewart, B., Preston, H. O., et al. (1953). *The performance record of hourly paid employees*. Chicago, IL: Science Research Associates.
- Fleishman, E.A. (1953). Leadership climate and human relations training. *Personnel Psychology*, *6*, 205-222.
- Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment*, *3*, 35–52.
- Forsyth, D., & Chen, E. (2006). *The relationship between different email management strategies and the perceived control of time*. Retrieved from <http://mro.massey.ac.nz/handle/10179/639>
- Francis-Smythe, J. A. (2006). *Time management in timing the future: The case for a time-based prospective memory* (J. Glicksohn & M. Myslobodsky, Eds.). Hackensack, NJ: World Scientific.
- Francis-Smythe, J. A., & Robertson, I. T. (1999). Time-related individual differences. *Time and Society*, *8*, 273–292.
- Francis-Smythe, J. A., & Robertson, I. T. (2003). The importance of time congruity in the organisation. *Applied Psychology: An International Review*, *52*, 298–321.
- Fransella, F., & Bannister, D. (1971). *Inquiring man: The psychology of personal constructs*. Harmondsworth, England: Penguin.

- Fransella, F., & Bannister, D. (1977). *A manual for repertory grid technique*. London, England: Academic Press.
- Fried, Y, and Ferris G.R, (1987). The validity of the job characteristics model: A review and meta-analysis. *Personnel Psychology*, 40, 287-322.
- Fromm, M. (2004). *Introduction to the repertory grid interview*. Münster, Germany: Waxmann.
- Gersick, C. J. G. (1988). Time and transition in work teams: Toward a new model of group development. *Academy of Management Journal*, 31, 9–41.
- Gersick, C. J. G. (1989). Marking time: Predictable transitions in task groups. *Academy of Management Journal*, 32, 274–309.
- Gevers, J. M. P., Rutte, C. G., & Van Eerde, W. (2006). Meeting deadlines in work groups: Implicit and explicit mechanisms. *Applied Psychology: An Internal Review*, 55, 52–72.
- Gevers, J.M.P., Van Eerde, W., & Rutte, C.G. (2001). Time pressure, potency and progress in project groups. *European Journal of Work and Organizational Psychology*, 10(2), 205-221.
- Ghani, J. A., & Deshpande, S. P. (1994). Task characteristics and the experience of optimal flow in human–computer interaction. *Journal of Psychology*, 128, 381–391.
- Ghani, J. A., Spunick, R., & Rooney, P. (1991). The experience of flow in computer-mediated and face-to-face groups. In J. I. DeGross, I. Benbastaat, G. DeSanctis, & C. M. Beath (Eds.), *Proceedings of the Twelfth International Conference on Information Systems* (pp. 229-237). New York, NY: ICIS.
- Giddens, A. (1994). *Beyond left and right*. Oxford, England: Polity Press.
- Gill, R. (2006). *Theory and practice of leadership*. London, England: Sage.
- Gill, R. (2011). *Theory and practice of leadership* (2nd ed.). London, England: Sage.
- Glorfeld, L. W. (1995). An improvement on Horn's parallel analysis methodology for selecting the correct number of factors to retain. *Educational and Psychological Measurement*, 55, 377–393.
- Goodson, J. R., McGee, G. W., & Cashman, J. F. (1989). Situational leadership theory: A test of leadership prescriptions. *Group and Organizational Studies*, 14, 446–461.
- Gorsuch, R. L. (1983). *Factor analysis*. Hillsdale, NJ: Erlbaum.

- Gorsuch, R. L. (1990). Common factor-analysis versus component analysis—Some well and little known facts. *Multivariate Behavioral Research*, 25, 33–39.
- Graham, J. W. (1988). Transformational leadership: Fostering follower autonomy, not automatic leadership. In J. G. Hunt, R. B. Baliga, P. H. Dachler, & C. A. Schriesheim (Eds.), *Emerging leadership vistas* (pp. 73–79). Lexington, MA: Lexington Books.
- Graham, J. W., Cumsille, P. E., & Elek-Fisk, E. (2003). Methods for handling missing data. In J. A. Schinka & W. F. Velicer (Eds.), *Comprehensive handbook of psychology: Vol. 2. Research methods in psychology* (pp. 87-114). New York, NY: John Wiley.
- Greenberger, D. M., Strasser, S., Cummings, L. L., & Dunham, R. B. (1989). The impact of personal control on performance and satisfaction. *Organisational Behavior and Human Decision Processes*, 43, 29–51.
- Griffiths, R. F. (2003). Time management in telework and other autonomous work environments. *Dissertation Abstracts International: Section B. Sciences and Engineering*, 64(5), 551-570.
- Guadagnoli, E., & Velicer, W. F. (1998). Relation of sample size to the stability of component patterns. *Psychological Bulletin*, 103, 265–275.
- Guilford, J. P. (1954). *Psychometric methods*. New York, NY: McGraw-Hill.
- Guzzo, R. A., & Dickson, M. W. (1996). Teams in organizations: Recent research on performance and effectiveness. *Annual Review of Psychology*, 47, 307–338.
- Hackman, J. R. (1987). The design of work teams. In J. W. Lorsch (Ed.), *Handbook of organizational behavior* (pp. 315–342). Englewood Cliffs, NJ: Prentice Hall.
- Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology*, 60, 159–170.
- Hagglund, T. (2001). Timelessness as a positive and negative experience. *Scandinavian Psychoanalytic Review*, 24, 83–92.
- Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (1995). *Multivariate data analysis* (4th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Halbesleben, J., Novicevic, M. M., Harvey, M. G., & Buckley, M. R. (2003). The influence of temporal complexity in the leadership of creativity and innovation: A competency-based

- model. *Leadership Quarterly*, 14, 433-454.
- Hall, E. T. (1983). *The dance of life: The other dimensions of time*. New York, NY: Anchor Press.
- Hanel, F., Martin, G. L., & Koop, S. (1991). Field testing of a self-instructional manual in an institutional setting. *Journal of Organizational Behavior Management*, 11, 81-96.
- Hare, A. P. (1976). *Handbook of small group research* (2nd ed.). New York, NY: Free Press.
- Harshman, R. A., & Reddon, J. R. (1983). Determining the number of factors by comparing real with random data: A serious flaw and some possible corrections. *Proceedings of the Classification Society of North America at Philadelphia*, 14, 14-15.
- Hartocollis, P. (1983). *Time and timelessness: A psychoanalytic inquiry into the varieties of temporal experience*. Madison, CT: International Universities Press.
- Harvey, M., & Napier, N. (2004). The impact of "global time" on the role of expatriate managers. *Human Resource Management*, 12(1), 92-133.
- Harvey, M., & Novicevic, M. M. (2001). The impact of hypercompetitive "timescapes" on the development of a global mindset. *Management Decision*, 39, 448-460.
- Hays, R. D., Hayashi, T., & Stewart, A. L. (1989). A five-item measure of socially desirable response set. *Educational and Psychological Measurement*, 49, 629-636.
- Hayton, J. C., Allen, D. G., & Scarpello, V. (2004). Factor retention decisions in exploratory factor analysis: A tutorial on parallel analysis. *Organizational Research Methods*, 7, 191-205.
- Hecht, T. D., & Allen, N. J. (2005). Exploring links between polychronicity and well-being from the perspective of person-job fit: Does it matter if you prefer to do only one thing at a time? *Organizational Behavior and Human Decision Processes*, 95, 155-178.
- Hoffman, T. P., & Novak, D. L. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing*, 60, 50-68.
- Holman, R., Glas, C., Lindeboom, R., Zwinderman, A. H., & de Haan, R. J. (2004). Practical methods for dealing with "not applicable" item responses in the AMC Linear Disability Score project. *Health and Quality of Life Outcomes*, 2(29). Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=441407>

- Horn, J. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30, 179–185.
- House, R. J. (1971). A path goal theory of leader effectiveness. *Administrative Science Quarterly*, 1, 321–338.
- Howell, J. M., & Avolio, B. J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated business-unit performance. *Journal of Applied Psychology*, 78, 891–902.
- House, R. J., & Mitchell, R. R. (1974). Path-goal theory of leadership. *Journal of Contemporary Business*, 3, 81-97.
- Hunt, J. G. (2004). What is leadership? In J. Antonakis, A. T. Cianciolo, & R. Sternberg (Eds.), *The nature of leadership* (pp. 19–47). Thousand Oaks, CA: Sage.
- Hunt, J. G., & Ropo, A. (1996). Multi-level leadership: Grounded theory and mainstream theory applied to the case of General Motors. *Leadership Quarterly*, 6, 379–412.
- Hunter, J. E., Schmidt, F. L., & Jackson, G. B. (1982). *Advanced meta-analysis: quantitative methods for cumulating research findings across studies*. Beverly Hills, CA: Sage.
- Isari, D. C. (2008). *Impacts of ICTs on the temporal dimension of organizational culture: A literature review and a case study* (Unpublished doctoral dissertation). LUISS Guido Carli, Rome.
- Jacques, E. (1982). *The form of time*. London: Heinemann.
- Jankowicz, D. (2004). *The easy guide to repertory grids*. Chichester, England: John Wiley.
- Jett, Q. R., & George, J. M. (2003). Work interrupted: A closer look at the role of interruptions in organizational life. *Academy of Management Review*, 28, 494–507.
- Jex, S.M. & Elacqua, T.C. (1999). Self-esteem as a moderator: A comparison of global and organization based measures. *Journal of Occupational and Organizational Psychology*, 72, 71-81.
- Johns, G. (1991). Substantive and methodological constraints on behavior and attitudes in organizational research. *Organizational Behavior and Human Decision Processes*, 49, 80–104.

- Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of Management Review*, 31, 386–408.
- Judge, T. A., & Bono, J. E. (2000). Five-factor model of personality and transformational leadership. *Journal of Applied Psychology*, 85, 751–765.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology*, 87, 765–780.
- Judge, T. A., & Ferris, G. R. (1992). The elusive criterion of fit in human resource staffing decisions. *Human Resource Planning*, 15(4), 47–67.
- Karasek, R. (1998). Demand/control model: A social, emotional, and physiological approach to stress risk and active behaviour development. In J. M. Stellman, M. McCann, L. Warshaw, & C. Dufresne (Eds.), *Encyclopedia of occupational health and safety* (pp. 34.6–34.14). Geneva, Switzerland: International Labor Office.
- Kaufman-Scarborough, C., & Lindquist, J.D. (1999). Time management and polychronicity: Comparisons, contrasts, and insights for the workplace. *Journal of Managerial Psychology*, 14(3), 288-312.
- Kaufman, C. F., Lane, P. M., & Lindquist, J. D. (1991). Time congruity in the organization: A proposed quality of life framework. *Journal of Business and Psychology*, 6, 79–106.
- Kelly, G. A. (1955). *The psychology of personal constructs*. New York, NY: W. W. Norton.
- Kelly, J. R. (1988). Entrainment in individual and group behavior. In J. E. McGrath & J. R. Kelly (Eds.), *The social psychology of time: New perspectives* (pp. 89-110). New York, NY: Guilford Press.
- Kelly, J. R., & McGrath, J. E. (1985). Effects of time limits and task types on task performance and interaction of four-person groups. *Journal of Personality and Social Psychology*, 49, 395–407.
- Kerlinger, F. N. (1979). *Behavioural research: A conceptual approach*. New York, NY: Holt, Rinehart, and Winston.

- Kerr, S. (1974). Discussant comments. In J. G. Hunt & L. L. Larson (Eds.), *Contingency approaches to leadership* (pp. 124–129). Carbondale: Southern Illinois University Press.
- Kirsch, D. (2001). A few thoughts on cognitive overload. *Intellectica*, 30, 19–51.
- Kline, P. (1999). *The handbook of psychological testing* (2nd ed.). London, England: Routledge.
- Kotter, J. P. (1982). What effective managers really do. *Harvard Business Review*, 56, 156–167.
- Kristof, A. L. (1996). Person–organization fit: An integrative review of its conceptualizations, measurement and implications. *Personnel Psychology*, 49, 1–49.
- Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology*, 58, 281–342.
- Lakein, A. (1973). *How to get control of your time and life*. New York, NY: Nal Penguin.
- Landy, F.J., Rastegary, H., Thayer, J., & Colvin, C. (1991). Time urgency: The construct and its measurement. *Journal for Applied Psychology*, 76, 644–657.
- Lauer, R. (1981). *Temporal man: The meaning and uses of social time*. New York, NY: Praeger.
- Lauver, K. J., & Kristof-Brown, A. (2001). Distinguishing between employees' perceptions of person–job and person–organization fit. *Journal of Vocational Behavior*, 59, 545–556.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, coping, and adaptation*. New York, NY: Springer.
- Lee, H., & Liebenau, J. (1999). Time in management and organization studies: A critical review and a new direction of research. *Organizational Studies*, 20, 1035–1058.
- Levine, R. (1997). *A geography of time*. New York, NY: Basic Books.
- Likert, R. L. (1961). *The human organization*. New York, NY: McGraw-Hill.
- Lim, Y. M., & Seers, A. (1993). Time dimensions of work: Relationships with perceived organizational performance. *Journal of Business and Psychology*, 8, 91–102.
- Locke, E.A., & Latham, G.P. (1990). *A theory of goal setting and task performance*. Englewood Cliffs, NJ: Prentice-Hall.
- Locke, E.A., & Latham, G.P. (2002). Building a practically useful theory of goal setting and task

- motivation: A 35-year odyssey. *American Psychologist*, 57, 705–717.
- Locke, E. A., Shaw, K. N., Saari, L. M., & Latham, G. P. (1981). Goal setting and task performance: 1969 – 1980. *Psychological Bulletin*, 90(1), 125 - 152.
- Lowe, K.B., & Galen, K. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *Leadership Quarterly*, 7(3), 385-426.
- Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1966). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *Leadership Quarterly*, 7, 385–425.
- Macan, T. H. (1994). Time management: Test of a process model. *Journal of Applied Psychology*, 79, 381–391.
- Macan, T. H. (1996). Time-management training: Effects on time behaviors, attitudes, and job performance. *Journal of Psychology*, 130, 229–236.
- MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods*, 4, 84–99.
- Macdonald, P., & Paunonen, S. (2002). A Monte Carlo comparison of item and person statistics based on item response theory versus classical test theory. *Educational and Psychological Measurement*, 6, 921–943.
- Mackenzie, R. A. (1972). *The time trap: Managing your way out*. New York, NY: Amacom.
- Mainemelis, C. (2001). When the muse takes it all: A model for the experience of timelessness in organizations. *Academy of Management Review*, 26, 548–565.
- Mainemelis, C. (2002a). Time and timelessness: Creativity in (and out of) the temporal dimension. *Creativity Research Journal*, 14, 227–238.
- Mainemelis, C. (2002b). Timelessness and nonphemal knowledge. *Academy of Management Review*, 27, 339–345.
- Mainemelis, C. & Ronson, S. (2006). Ideas are born in fields of play: towards a theory of play and creativity in organizational settings. *Research in Organizational Behavior*, 27, 81-131.

- Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *Academy of Management Review*, 26, 356–376.
- Marotto, M., Roos, J., & Victor, B. (2007). Collective virtuosity in organizations: A study of peak performance in an orchestra. *Journal of Management Studies*, 44, 388–413.
- Marsden, D., & Littler, D. (2000). Repertory grid technique—an interpretive research framework. *European Journal of Marketing*, 34, 816–834.
- May, R. (1975). *The courage to create*. New York, NY: W. W. Norton.
- McCay, J. (1959). *The management of time*. Englewood Cliffs, NJ: Prentice Hall.
- McCrae, R. R., & Costa, P. T. (1990). *Personality in adulthood*. New York, NY: Guilford.
- McCrae, R. R., & Costa, P. T., Jr. (1996). Toward a new generation of personality theories: Theoretical contexts for the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 51–87). New York, NY: Guilford Press.
- McGrath, J. E., & Rotchford, N. L. (1983). Time and behavior in organizations. *Research in Organizational Behavior*, 5, 57-101.
- McHorney, C. A., Ware, J. E., Lu, J. F., & Sherbourne, C. D. (1994). The MOS 36-item short-form health survey (SF-36): III. Tests of data quality, scaling assumptions, and reliability across diverse patient groups. *Med Care*, 32, 40–66.
- Mischel, W. (1968). *Personality and assessment*. New York, NY: John Wiley.
- Mohammed, S., & Harrison, D. (2008). *Diversity in temporal portfolios: Understanding how time-based individual differences can affect team performance*. Unpublished manuscript.
- Moray, N. (1993). Formalisms for cognitive modeling. *Advances in Human Factor in Ergonomics*, 19, 120- 125.
- Mowday, R. T., & Sutton, R. I. (1993). Organizational behavior: Linking individuals and groups to organizational contexts. *Annual Review of Psychology*, 44, 195–229.
- Myers, R. H. (1990). *Classical and modern regression with applications*. Boston, MA: Kent Publishing Company.

- Nederhof, A. J. (2006). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology, 15*, 263–280.
- Newton, I. (1999). *The principia: Mathematical principles of natural philosophy*. Berkeley, CA: University of California Press.
- Nonis, S. A., Fenner, G. H., & Sager, J. K. (2011). Revisiting the relationship between time management and job performance. *World Journal of Management, 3*, 153–217.
- Norris, W. R., & Vecchio, R. P. (1992). Situational leadership theory. *Group and Organization Management, 7*, 331–342.
- Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory (3rd ed.)*. New York, NY: McGraw-Hill.
- O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instrumentation, and Computers, 32*, 396–402.
- Okuyesen, G. A., & Waller, M. J. (2002). Focusing on midpoint transitions: An analysis of boundary conditions. *Academy of Management Journal, 45*, 1056–1065.
- Onken, M. (1999). Temporal elements of organizational culture and impact on firm performance. *Journal of Managerial Psychology, 14*, 231-243.
- Oppenheim, A. N. (1992). *Questionnaire design, interviewing and attitude measurement*. London, England: Continuum.
- Orgel, S. (1965). On time and timelessness. *Journal of the American Psychoanalytic Association, 13*, 102–121.
- Orlikowski, W., & Yates, J. (2002). It's about time: Temporal structuring in organizations. *Organizational Science, 13*, 684–700.
- Orpen, C. (1993). Managing human resources strategically. *Work Study, 42(5)*, 15 – 17.

- Ostroff, C. (1997). The moderating effect of tenure in person-environment fit: A field study in educational organizations. *Journal of Occupational and Organizational Psychology*, 70, 173-188.
- Pace, S. (2004). A grounded theory of the flow experiences of Web users. *International Journal of Human-Computer Studies*, 60, 327-363.
- Palmer, B., Walls, M., Burgess, M., & Stough, C. (2001). Emotional intelligence and effective leadership. *Leadership and Organization Development Journal*, 22, 5-10.
- Palmer, D. K. (1997). *Harmonic temporality: An investigation of the dimensionality of polychronicity and its implications for individuals and organizations* (Unpublished doctoral dissertation). Purdue University, West Lafayette, IN.
- Palmer, D. K., & Schoorman, F. D. (1999). Unpackaging the multiple aspects of time in polychronicity. *Journal of Managerial Psychology*, 14(3/4), 323-344.
- Pascale, R. (1990). *Managing on the edge*. London, England: Penguin Books.
- Paunonen, S.V., & Ashton, M.C. (2001). Big Five predictors of academic achievement. *Journal of Research in Personality*, 35, 78-90.
- Pawar, B. S., & Eastman, K. K. (1997). The nature and implications of contextual influences on transformative leadership: A conceptual examination. *Academy of Management Review*, 22, 80-109.
- Perlow, L. (1999). The time famine: Toward a sociology of work time. *Administrative Science Quarterly*, 44, 57-81.
- Peter, J. P. (1979). Reliability: A review of psychometric basics and recent marketing practices. *Journal of Marketing Research*, 16, 6-17.
- Peters, L., Hartke, D., & Pohlmann, J. (1985). Fiedler's contingency theory of leadership: An application of the meta-analysis procedures of Schmidt & Hunter. *Psychological Bulletin*, 97, 274-285.
- Peters, L. H., O'Connor, E. J., & Eulberg, J. R. (1985). Situational constraints: Sources, consequences, and future considerations. *Research in Personnel and Human Resources Management*, 3, 79-113.

- Peterson, R. A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research*, 21, 381–391.
- Petranker, J. (2002). Time and knowledge: Comments on Mainemelis's "When the muse takes it all: A model for the experience of timelessness in organizations". *Academy of Management Review*, 27, 339–345.
- Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality*, 15, 425–448.
- Pilke, E. M. (2004). Flow experiences in information technology use. *International Journal of Human-Computer Studies*, 61, 347–357.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviours and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly*, 1, 107–142.
- Podsakoff, P.M., & Organ, D. W. (1986). Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12(2): 531-544.
- Poppel, E. (1988). *Mindworks: Time and conscious experience*. Orlando, FL: Harcourt Brace Jovanovich.
- Prajapati, B., Dunne, M.C.M., & Armstrong, A. (2010). Sample size estimation and statistical power analyses. *Optometry Today*, 7, 16-32.
- Ramanaiah, N. V., Schill, T., & Leung, L. S. (1977). A test of the hypothesis about the two-dimensional nature of the Marlowe–Crowne Social Desirability Scale. *Journal of Research in Personality*, 11, 251–259.
- Rastegary, H., & Landy, F. J. (1993). The interaction among time urgency, uncertainty, and time pressure. In O. Svenson & A. J. Maule (Eds.), *Time pressure and stress in human judgement and decision making* (pp. 217-239). New York, NY: Plenum Press.
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the Marlowe–Crowne Social Desirability Scale. *Journal of Clinical Psychology*, 38, 199–125.
- Roberson, M. T., & Sundstrom, E. (1990). Survey design, return rates, and response favorableness in an employee attitude survey. *Journal of Applied Psychology*, 75, 354–357.

- Roberts, R. D., Zeidner, M., & Matthews, G. (2001). Does emotional intelligence meet traditional standards for an intelligence? Some new data and conclusions. *Emotion, 1*, 196–231.
- Roy, D. F. (1960). Banana time: Job satisfaction and informal interaction. *Human Organization, 18*, 156-168.
- Rettie, R. (2001). An exploration of flow during Internet use. *Internet Research, 11*(2), 103–113.
- Rutoski, A., Daunders, C., Vogel, D., & van Genuchten, M. (2007). Is it 4 A.M. in your time zone? Focus immersion and temporal dissociation in virtual teams. *Small Group Research, 38*, 98–129.
- Saklofske, D. H., Austin, E. J., & Minski, P. S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences, 34*, 1091–1100.
- Schriber J.B., & Gutek B.A. (1987). Some time dimensions of work: Measurement of an underlying aspect of organization culture. *Journal of Applied Psychology, 72*(4), 642-650.
- Seers, A., & Woodruff, S. (1997). Temporal pacing in task forces: Group development or deadline pressure? *Journal of Management, 23*, 169–187.
- Senior, B. (1996). Team performance: Using repertory grid technique to gain a view from the inside. *Journal of Managerial Psychology, 11*(3), 26–32.
- Shamir, B. (1990). Calculations, values, and identities: The sources of collectivistic work motivation. *Human Relations, 43*, 313–332.
- Shamir, B. (2011). Leadership takes time: Some implications of (not) taking time seriously in leadership research. *Leadership Quarterly, 22*, 307–315.
- Shea, C. M., & Howell, J. M. (1999). Charismatic leadership and task feedback: A laboratory study of their effects on self-efficacy and task performance. *Leadership Quarterly, 10*, 375–396.
- Sherry, J. L. (2004). Flow and media enjoyment. *Communication Theory, 14*, 328–347.
- Shipp, A. J., Edwards, J. R., & Lambert, L. S. (2009). Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organizational Behavior and Human Decision Processes, 110*, 1-22.
- Silverstein, A. B. (1987). Note on the parallel analysis criterion for determining the number of common factors or principal components. *Psychological Reports, 61*, 351–354.

- Slaven, G., & Totterdell, P. (1993). Time management training: Does it transfer to the workplace? *Journal of Managerial Psychology, 8*(1), 20–28.
- Slocombe, T. E., & Bluedorn, A. C. (1999). Organizational behavior implications of the congruence between preferred polychronicity and experience work-unit polychronicity. *Journal of Organizational Behavior, 20*, 75–99.
- Smith, M., Thorpe, R., & Holman, D. (1996). Using repertory grids in management. *Journal of European Industrial Training, 20*(3), 3–30.
- Smith-Jentsch, K. A., Cannon-Bowers, J. A., Tannenbaum, S. I., & Salas, E. (2008). Guided team self-correction: Impacts on team mental models, processes and effectiveness. *Small Group Research, 39*, 303–327.
- Song, S., & Gale, A. (2008). Investigating project managers' work values by repertory grids interviews. *Journal of Management Development, 27*, 541–553.
- Sosik, J.J., Kahai, S.S., & Avolio, B.J. (1999). Leadership style, anonymity, and creativity in group decision support systems: The mediating role of optimal flow. *Journal of Creative Behavior, 33*, 1-30.
- Sosik, J. J., & Megerian, L. E. (1999). Understanding leader emotional intelligence and performance: The role of self–other agreement on transformational leadership perceptions, *Group and Organization Management, 24*, 367–390.
- Sparrowe, R. T., & Liden, R. C. (1997). Process and structure in leader–member exchange. *Academy of Management Review, 22*, 522–552.
- Spector, P. E. (1986). Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work. *Human Relations, 39*, 1005–1016.
- Standifer, R. L., & Bluedorn, A. C. (2006). Alliance management teams and entrainment: Sharing temporal mental models. *Human Relations, 59*, 903–927.
- Staw, B. M. (1976). Knee-deep in the big muddy: A study of escalating commitment to a chosen course of action. *Organizational Behavior and Human Decision Processes, 16*, 27–44.
- Steiger, J. H. (1990). Some additional thoughts on components, factors, and factor- indeterminacy. *Multivariate Behavioral Research, 25*, 41–45.

- Stogdill, R.K. (1950). Leadership, membership and organization. *Psychological Bulletin*, 52, 4-12.
- Strahan, R., & Gerbasi, K. C. (1972). Short, homogeneous versions of the Marlowe–Crowne Social Desirability Scale. *Journal of Clinical Psychology*, 28, 191–193.
- Strongman, K. T., & Burt, C. D. B. (2000). Taking breaks from work: An exploratory inquiry. *Journal of Psychology*, 134, 229–242.
- Strube, M., & Garcia, J. (1981). A meta-analysis investigation of Fiedler’s contingency model of leadership effectiveness. *Psychological Bulletin*, 90, 307–321.
- Sudman, S., & Bradburn, N. M. (1982). *Asking questions: A practical guide to questionnaire design*. San Francisco, CA: Jossey-Bass.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston, MA: Pearson.
- Tett, R. P., & Burnett, D. D. (2003). A personality trait–based interactionist model of job performance. *Journal of Applied Psychology*, 88, 500–517.
- Thite, M., (2000). Leadership styles in information technology projects. *International Journal of Project Management*, 18(4), 235-241.
- Thompson, B., & Larry, D. G. (1996). Factor analytic evidence for the construct validity of scores: A historical overview and some guidelines. *Educational and Psychological Measurement*, 56, 197–208.
- Trevino, L. K., & Webster, J. (1992). Flow in computer-mediated communication: Electronic mail and voice mail evaluation and impacts. *Communication Research*, 19, 539–573.
- Tripoli, A. M. (1998). Planning and allocating: Strategies for managing priorities in complex jobs. *European Journal of Occupational and Organization Psychology*, 7, 455–476.
- Trueman, M., & Hartley, J. (1996). A comparison between the time-management skills and academic performance of mature and traditional-entry university students. *Higher Education*, 32, 199–215.
- Tuckman, B., & Jensen, M. (1977). Stages of small-group development. *Group and Organizational Studies*, 2, 419–427.

- Uhl-bien, M., & Maslyn, J. (2000). Examining the exchange in leader member exchange (LMX): Identification of dyadic relational styles and their association with key attitudes and behavior. *Academy of Management Proceedings, 1*, 1–6.
- Vecchio, R. P. (1977). An empirical examination of the validity of Fiedler's model of leadership effectiveness. *Organizational Behaviour and Human Performance, 19*, 180–206.
- Vecchio, R. P. (1987). Situational leadership theory: An examination of a prescriptive theory. *Journal of Applied Psychology, 72*, 444–451.
- Velicer, W. F. (1974). An empirical comparison of the stability of factor analysis, principal component analysis, and image analysis. *Educational and Psychological Measurement, 34*, 563–572.
- Velicer, W. F., Eaton, C. A., & Fava, J. L. (2000). Construct explication through factor or component analysis: A review and evaluation of alternative procedures for determining the number of factors or components. In R. D. Goffin & E. Helmes (Eds.), *Problems and solutions in human assessment: Honoring Douglas N. Jackson at seventy* (pp. 41–71). Norwell, MA: Kluwer Academic.
- Velicer, W. F., & Jackson, D. N. (1990). Component analysis versus common factor-analysis—some further observations. *Multivariate Behavioral Research, 25*, 97–114.
- Waddington, P. (1996). *Dying for information: An investigation of information overload in the UK and world-wide*. London, England: Reuters Business Information.
- Waller, M. J., Conte, J., Gibson, C. B., & Carpenter, M. A. (2001). The effect of individual perceptions of deadlines on team performance. *Academy of Management Review, 26*, 586–600.
- Waller, M. J., Zellmer-Bruhn, M. E., & Giambatista, R. C. (2002). Watching the clock: Group pacing behavior under dynamic deadlines. *Academy of Management Journal, 45*, 1046–1055.
- Watkins, M. W. (2006). Determining parallel analysis criteria. *Journal of Modern Applied Statistical Methods, 5*, 344–346.
- Webster, J., Trevino, L. K., & Ryan, L. (1993). The dimensionality and correlates of flow in human-computer interactions. *Computers in Human Behavior, 9*, 411–426.

- Widaman, K. F. (1993). Common factor analysis versus principal component analysis: Differential bias in representing model parameters. *Multivariate Behavioral Research*, 28, 263–311.
- Wood, R., Mento, A., & Locke, E. (1987). Task complexity as a moderator of goal effects. *Journal of Applied Psychology*, 17, 416–425.
- Woolfolk, A. E., & Woolfolk, R. L. (1986). Time management: An empirical investigation. *Journal of School Psychology*, 24, 261–271.
- Wright, W. (2006). Rigor and relevance using repertory grid technique in strategy research. In D. Ketchen & D. Berghh (Eds.), *Research methodology in strategy and management* (pp. 289-341). London, England: JAI Press.
- Yammarino, F. J., & Bass, B. M. (1990). Transformational leadership and multiple levels of analysis. *Human Relations*, 43, 975-995.
- Yukl, G. (1999). An evaluation of conceptual weaknesses in transformational and charismatic leadership themes. *Leadership Quarterly*, 10, 285–305.
- Yukl, G. (2002). *Leadership in organizations* (5th ed). Englewood Cliffs, NJ: Prentice Hall.
- Zimbardo, P.G. & Boyd, J.N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, 77, 1271–88.
- Zwick, W. R., & Velicer, W. F. (1982). Factors influencing four rules for determining the number of components to retain. *Multivariate Behavioral Research*, 17, 253–269.
- Zwick, W. R., & Velicer, W. F. (1986). Factors influencing five rules for determining the number of components to retain. *Psychological Bulletin*, 99, 432–442.

Appendices

Appendix 1. Temporal Dimensions of organizational culture presented by Schreiber and Gutek (1987, p646)

Table 1
Correlations of Questionnaire Items in Principal Components Analysis (Varimax Rotation) With the Principal Component

Component and item	Component and item
<p>1. Schedules & Deadlines People here feel that deadlines don't really matter (R) Staying on schedule is important here It is important to meet our deadlines We don't pay much attention to schedules (R) No one gets upset when you miss a deadline (R) All of our work is tightly scheduled It is very important to be on time... for everything People do most of their work under deadlines People do things when they are ready, not on a schedule (R)</p>	<p>6. Awareness of Time Use (cont.) People here plan their time carefully (R) People expect you to know how long it will take you to do something (R)</p>
<p>2. Punctuality People get upset when you are late for work (R) People don't care what time you arrive for work No one cares if you are late returning from a meal break If people arrive an hour late for work, they will feel "rushed" all day (R)</p>	<p>7. Work Pace Working fast is not important here Most people can work at their own pace Most people can take breaks when they want to It is easy to find time to plan something new People are expected to work very fast (R)</p>
<p>3. Future Orientation and Quality vs. Speed This organization is in the future Planning for the future is important here Doing things right is better than doing things fast It is better to make a bad decision quickly than a good decision slowly (R)</p>	<p>8. Autonomy of Time Use Around here, people like to talk about the "good old days" People here do not have the freedom to use their time the way they choose Most people here cannot set their own work schedules People just expect to "kill time" on the job People expect their work to be routine</p>
<p>4. Allocation of Time Schedules usually seem too tight for most big jobs/projects We never seem to have enough time to get everything done Tasks usually take longer than planned</p>	<p>9. Synchronization and Coordination of Work with Others Through Time To get the job done, it is important for each person to coordinate his/her work with others People have to work together to get the job done Teamwork is not very important here (R)</p>
<p>5. Time Boundaries Between Work and Nonwork People usually expect to take their work home with them People expect to leave at the end of the day without worrying about their work People rarely get work-related calls during "off" hours (like nights and weekends) (R) When people go on vacation they are expected to tell their boss how to reach them</p>	<p>10. Routine vs. Variety People tend to do different things each day Our job duties seem to change from week to week Our jobs never seem to change very much (R) People expect to finish their work by the end of each day (R)</p>
<p>6. Awareness of Time Use Most people don't think about how they use their time People here worry about using their time well (R)</p>	<p>11. Intraorganizational Time Boundaries Some departments work longer hours than others (R) Everyone works about the same number of hours, no matter what jobs they hold</p> <p>12. Time Buffer in Workday Most people don't have time to take breaks during the day People could fit more into their workday if they had to (R)</p>

Appendix 2: Repertory grid interview sample information and construct elicitation process

Participant	Sex	Organisational Sector	Leadership Level	Construct Elicitation Process: Leadership dimensions (FRLT) and time dimensions presented to participants
Participant 1 (Pilot Interview 1)	Female	Public - Higher Education	Senior	NA
Participant 2 (Pilot Interview 2)	Female	Public - Higher Education	Senior	Leadership Aspects: Individualized Consideration Contingent Reward
Participant 3 (Pilot Interview 3)	Male	Public - Higher Education	Middle	Time dimensions: Time deadlines Speed Coordination
Participant 4 (Pilot Interview 4)	Male	Public - Higher Education	Middle	Leadership Aspects: Individualised Consideration Contingent Reward
Participant 5 (Pilot Interview 5)	Male	Public - Higher Education	Senior	Leadership Aspects: Intellectual Stimulation Inspirational Motivation
Participant 6 (Pilot Interview 6)	Male	Public - Higher Education	Middle	Leadership Aspects: Intellectual Stimulation Individualised Consideration Contingent Reward
Participant 7	Male	Private - Small Company	Senior (director of small company)	Leadership Aspects: Contingent Reward management-by-exception- active Management-by-exception- passive Time Dimensions Deadlines Breaks
Participant 8	Female	Public - Education	Middle	Leadership Aspects: Contingent Reward Management-by-exception- active Management-by-exception- passive Time Dimensions: Deadlines
Participant 9	Male	Public - Governmental Organisation	Middle	Leadership Aspects: Intellectual Stimulation Individualised Consideration Time Dimensions: Deadlines Speed Breaks
Participant 10	Female	Private - Large Organisation	Middle	Leadership Dimensions: Intellectual Stimulation Individual Consideration Time Dimension: Speed and Quality

Participant 11	Female	Private - Large Organisation	Senior	Leadership Aspects: Individual Consideration Contingent reward Time Dimension: Deadlines Quality vs. Speed
Participant 12	Female	Public - Governmental Organisation	Middle	Leadership Dimensions: Intellectual Stimulation Contingent reward Time Dimensions: Deadlines Breaks Quality and speed Autonomy
Participant 13	Female	Public - Governmental Organisation	Senior	Management by exception- passive Management by exception-active Time Dimensions: Deadlines Quality and speed
Participant 14	Male	Private - Medium organisation	Middle	Leadership Aspects: Idealized Influence Intellectual Stimulation Time Dimensions: Deadlines Coordination
Participant 15	Male	Public – Governmental Organisation	Senior	Leadership Aspects: Intellectual Stimulation Contingent reward Transactional Time Dimensions: Deadlines Quality vs speed
Participant 16	Male	Private - Large Organisation		Leadership Aspects: Contingent reward Management by Exception- passive Time Dimensions: Deadlines Temporal Depth Quality and speed

Appendix 3: Final Repertory Grid Methodology

Element Selection

The elements represented individual followers that the participant had responsibility for managing or leading at the time of the interview. Specifically, these elements were identified by the researcher firstly asking participants to consider whether they see themselves as having one or more than one leadership role (cue questions were employed to identify number of roles and what they were).

Participants were then asked to consider their different leadership roles and list five to eight followers or groups of followers (i.e., a group is one element) that cover the identified leadership roles. It was encouraged that elements represented both individual followers and groups of followers.

Construct Elicitation for Time Dimensions

Participants were asked to read a paragraph that was written by the researcher before that described a dimension of time within the conceptual model of TI. A random number generator randomly selected the specific temporal dimension presented to participants. A dyadic difference construction elicitation process was employed as participants were asked to write down one way in which they behave in line with time dimension to one of their followers (element) in a pair and one way in which the other follower was managed/lead differently with respect to time dimension.

Construct Elicitation for Full Range Leadership Theory

A dyadic difference construction elicitation process was employed for both interviews. Participants were asked to read a paragraph that represents one of the four transformative or three of the transactional or laissez-faire leadership dimensions. Following this, participants were asked to identify the extent to which their own behaviour aligned with a behaviour in the transformative/transactional leadership framework selected at random (using a random number generator). They were then asked to think of a situation to represent the behaviour they outlined for themselves and draw on an element (i.e., an individual follower or group of followers) to

describe this example. Participants were then asked questions that either clarified their discussion and/or related to temporal aspects of behaviour (construct elicited). Participants were then asked to think of another situation involving a different element and identify any differences that occurred in comparison to the content of the previously identified psychological construct (the researcher guided and clarified this process). The key to defining the psychological construct was based on identifying behaviours that the participant perceived as important to the outcome (whether it was positive or negative).

Observation

Participants were explicitly asked to identify differences between the two situations (and elements), this subsequently actively encourages participants to engage in the process of drawing differences and similarities between elements, which is integral to Kelly's Personal Construct Theory (1955) underpinning the Repertory Grid technique. Secondly, participants were asked to select their own two elements. Subsequently, the participant was asked to draw on two elements from the sample of five to eight they originally identified to exemplify when they behaved in accordance with a particular leadership or time dimension

Appendix 4: Transformational and Transactional Leadership Vignettes

Leadership Aspect 1

The leader presents new ideas to followers. The leader encourages followers to question assumptions. He or she encourages their followers to be creative in both rethinking assumptions and reframing problems. The leader also encourages followers to be creative and innovative in problem solving.

Leadership Aspect 2

The leader will communicate a clear vision of the future and aim to involve their team members. The leader will strive to align organisational goals with the personal goals of their followers so that followers can achieve personal and organisational goals simultaneously.

Leadership Aspect 3

The leader will actively endeavour to optimise the potential of their followers by creating new opportunities for development, such as coaching and mentoring. A two-way exchange in communication is encouraged, and 'management by walking around' workspaces is practised. Delegated tasks are monitored to see if the followers need further direction or support and to assess progress. Responsibility is encouraged for developmental purposes. Interactions with followers are personalised. For example, the leader is aware of individual concerns and sees the individual as a whole person rather than as just an employee.

Leadership Aspect 4

The leader emphasises successes as opposed to failures. The leader is a behavioural role model in work tasks and in demonstrating high standards of ethical and moral conduct. These leaders avoid using power for personal gain and share risks with followers, thus a democratic approach is adopted in this instance. The leader expresses confidence in his or her vision.

Leadership Aspect 5

The leader sets work objectives and performance standards. Feedback is provided by the leader to his or her followers. The leader exchanges approved/desired follower actions with rewards and promises of rewards. The leader is aware of their followers' self-interests and that followers will be responsive to these.

Leadership Aspect 6

The leader sets work objectives and clarifies what is expected from employees in terms of performance. The leader monitors their followers' work and aims to anticipate problems. Any identified problems are immediately addressed with corrective action.

Leadership Aspect 7

The leader sets work objectives and clarifies what is expected from employees in terms of performance. The leader will correct mistakes and only intervene in a follower's work if there is a problem reported by the follower or found by the leader.

Key of leadership aspects (not presented to participants):

1. Intellectual Stimulation
2. Inspirational Motivation
3. Individualised Consideration
4. Idealised Influence
5. Contingent Reward (transactional)
6. Management by Exception (active; transactional)
7. Management by Exception (passive; transactional)

Appendix 5: Time Dimension Vignettes

1. Deadlines

This refers to your thoughts on giving followers deadlines and the behaviours you express to your followers that involve deadline setting.

2. Speed

This refers to the speed of tasks and processes in the work place.

3. Coordination

This refers to the extent to which you see yourself as coordinating individuals or tasks in the workplace. It also refers to the extent to which you sequence your own projects involving your followers and the tasks you set your followers. For example, one task may be completed before, during or after another task's lifespan.

4. Multi-tasking

This refers to the extent to which you set a follower more than one task to do at a time.

5. Environment (*timelessness*)

This refers to the extent to which you perceive it important to create a work environment that allows individuals to concentrate exclusively on a work task without distractions. This also concerns the behaviours you express to promote this environment.

6. Temporal Depth

This refers to the extent to which you reflect on the past, live in the present and project to the future, and how this affects the way you manage/lead your staff.

7. Breaks

This refers to the extent to which you monitor the amount of time employees are not engaged in work tasks within the workplace (i.e., breaks) and any behaviours that affect when non-work breaks may or may not take place among your followers.

8. Time buffers

This refers to the extent to which you will encourage followers to allow for unexpected events when they are planning for a task. This also refers to the extent to which when you estimate how long a task should take an employee; you include 'free time' for unexpected events.

9. Quality and speed

This refers to the extent to which you value 'speed' in relation to 'quality' in your followers' work.

10. Quality vs. Speed

This refers to the extent to which you change your emphasis on 'speed' in relation to 'quality' of your followers' work in relation to the situation. The situation may be dependent on who the follower is, deadlines or the type of work involved.

11. Time boundaries between work and non-work

This refers to the extent to which you influence the start and finish time of a work day or night among your employees.

12. Autonomy

This refers to the extent to which you encourage followers to manage their own workload. This also refers to the extent to which you encourage followers to complete tasks in a manner of their own choice.

Appendix 6: Expert Evaluation of the Temporal Intelligence Questionnaire

Survey of the Temporal Intelligence Questionnaire

All responses are strictly confidential and will be used for research purposes only. At no point during this questionnaire will your name be requested. You may withdraw from this research at any time (simply destroy this document).

Instructions:

Please read the Temporal Intelligence Questionnaire and time how long it takes you to complete. After you have read the Temporal Intelligence Questionnaire, please answer the questions below.

1. Are there any items that you feel would benefit from being re-phrased? (please note item number here)

2. Are there any items that you would recommend to be removed before the questionnaire is piloted (please note item number here)?

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

Item no:

Please note why this item should be deleted:

- 3. Do you perceive any difficulties with the measurement scale for each section?**

- 4. Are there any scales (time dimensions) that you perceive would benefit from having further questions developed?**

- 5. Are there any items that you perceive should have further variations developed that are not already represented in the questionnaire?**

- 6. Would you recommend any changes to the design/layout of the questionnaire?**

- 7. Are there any further issues you wish to comment on?**

Thank you for your time.

Appendix 7: Survey Evaluation of the Temporal Intelligence Questionnaire completed by a sample of final year undergraduate Psychology students.

All responses are strictly confidential and will be used for research purposes only. The aim of this research is to gather perceptions of an instrument that has been designed to measure the role of time in leadership and management in a PhD project. At no point during this questionnaire will your name be requested. You may withdraw from this research at any time (simply destroy this document).

If you have any questions or concerns about this research, please email Andy Doyle at: a.dovle@worc.ac.uk

Instructions

Please read through the Temporal Intelligence Questionnaire and then complete the questions presented below:

On questions that involve responding on a 1 to 5 scale, please mark (fill or cross) the circle next to the number that most accurately represents your opinion.

Q1. How would you rate the clarity of the instructions that guided how to complete each section?

	Poor		Moderate		Excellent
Section 1	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Section 2	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Section 3	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Section 4	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

If you have any further comments on the clarity of the instructions, please write below (please specify the page number where the instructions you refer to are on):

Q2. Overall, how would you rate the layout of the questionnaire in terms of:

	Poor		Moderate		Excellent
Clarity	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
Aesthetics	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q3. Do you have any further comments or suggestions to improve the questionnaire?

About you:

Please note: This information is strictly confidential

Q1. Sex:

- Male
 Female

Q2. Age:

- 16-18 18-25 26-35
 36-45 46-55 56-65
 66-75 75 +

Q3. Are you currently working in a leadership, supervisory or management position. Please delete as appropriate:

i) YES / NO **If 'no' please go to question 4**

ii) How many individuals are you currently responsible for supervising/managing/leading: _____

iii) Number of years in a supervisory or management position:

Occupation: _____

iv) Is your work:

- Full-time
- Part-time (less than 30 hours a week).

Q4. The organization you are employed within is in the:

- Not Applicable- Student
- Public or Government Sector
- Private Sector

**The Centre for People @ Work Research Team would like to
Thank You for your time**

Appendix 8: Semi-Structured Interview Structure for the Temporal Intelligence Questionnaire

Q1. Please comment on the clarity of the instructions guiding the completion of the Temporal Intelligence Questionnaire?

Q2. Please comment on the layout of the questionnaire?

Probe Questions:

Size of font of instructions?

Size of font of items?

The spacing between items?

The colour of the questionnaire?

The length of the questionnaire?

Q3. Please comment on any aspects of the questionnaire you feel could be improved?

Q4. Please comment on anything you do not like about the questionnaire?

Q5. Please comment on anything you liked about the questionnaire?

Appendix 9: Evaluation Survey of the Temporal Intelligence Questionnaire completed by practicing leaders.

All responses are strictly confidential and will be used for research purposes only. At no point during this questionnaire will your name be requested. You may withdraw from this research at any time (simply destroy this document).

Instructions:

Please complete the Temporal Intelligence Questionnaire and time how long it takes you to complete. Whilst you are completing the questionnaire, **please circle any questions that are difficult to understand or are very hard to answer** (please feel free to write comments/explanations on the questionnaire). After you have completed the Temporal Intelligence Questionnaire, please answer the questions below.

Q1. How long did the questionnaire take you to complete:

_____ Minutes

Q2. Overall, how would you rate the questionnaire in terms of measuring the role of time in leadership and management practices?

Please mark (fill or cross) the circle next to the number that most accurately represents your opinion.

Poor		Moderate		Excellent
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q3. How clear were the instructions that guided you to complete each section?

	Poor		Moderate		Excellent
Section 1	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Section 2	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Section 3	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
Section 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

If you have any further comments on the clarity of the instructions, please write below (please specify the page number where the instructions you refer to are on):

Q4. Overall, how would you rate the clarity of what the questions were asking of you?

Poor		Moderate		Excellent
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Q5. 1) Did you ever become frustrated as a result of completing this questionnaire?

Please delete as appropriate

Yes / No..... **If 'No' please move to question 8**

ii) If 'Yes' please explain why

iii) Please identify the point at which you became frustrated (e.g., question number)

Q6. Overall, how would you rate the layout of the questionnaire in terms of:

	Poor		Moderate		Excellent
Clarity	1	2	3	4	5
Aesthetics	1	2	3	4	5

Q7. Do you have any further comments or suggestions to improve the questionnaire?

The Centre for People @ Work would like to thank you for your time.

Please return this evaluation survey and the Temporal Intelligence Questionnaire to the research team using the self- addressed envelope provided.

Appendix 10: Key of scales and associated items used within the Temporal Intelligence Questionnaire
(used in Development of the TI-Q Study I): This is a key and not a document presented to participants.

Response Options Used

(Key- please note; these scales will be in the right column header and not presented here)

Scale 1

Not Applicable	Strongly Disagree	Disagree	Slightly Disagree	Neither agree nor disagree or neutral	Slightly Agree	Agree	Strongly Agree
----------------	-------------------	----------	-------------------	---------------------------------------	----------------	-------	----------------

Scale 2

Not Applicable	Never	Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	Always
NA	1	2	3	4	5	6	7

Temporal Scales (12 dimensions of global temporal practices and adaptive temporal practices)

Deadlines (External Deadlines)

This section refers to the behaviours you may or may not display to your followers in relation to external deadlines. External deadlines are deadlines that were not set by you. Thus, these external deadlines may be set by client demands or by your superior.

Statement	Scale 2 to be inserted here
If others miss an external deadline.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I ask them to present clear steps to show me what they intend to do in order to complete the work	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I am emotionally supportive to them	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I will express disappointment to them in a constructive way	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
When giving an external deadline to others.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I make clear what needs to be done for it to be met	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I make sure they are aware of the impact that missing the deadline would have on other people	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I let them know that the deadline should be met	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I explain the importance of meeting it	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
After I have set an external deadline to others.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I ask them to come back to me if there are any problems with an external deadline	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I rely on them to inform me about their progress in relation to the deadline	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I am aware of the exact date of the deadline	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I apply pressure to ensure the deadline is met	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I monitor their progress	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I give positive encouragement for the deadline to be completed	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Deadlines (Internal Deadlines)

This section refers to the behaviours you may or may not display to your followers in relation to internal deadlines. Internal deadlines are any deadlines that were set by you.

Statement	Scale 2 to be inserted here
If others miss an internal deadline.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I ask them to present clear steps to show me what they intend to do in order to complete the work	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I am emotionally supportive to them	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I will express disappointment to them in a constructive way	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
When giving an internal deadline to others.....	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I make clear what needs to be done for it to be met	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I make sure they are aware of the impact that missing the deadline would have on other people	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I explain the importance of meeting it	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

I let them know that the deadline should be met	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Statement	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
After I have set an internal deadline to others.....	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I rely on them to inform me about their progress in relation to the deadline	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I monitor their progress	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I ask them to come back to me if there are any problems with an internal deadline	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I am aware of the exact date of the deadline	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I apply pressure to ensure the deadline is met	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I give positive encouragement for the deadline to be completed	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Regarding others.....	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I set them several internal deadlines to achieve one external deadline	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I set them internal deadlines when I perceive them to be behind in their work	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I set them internal deadlines when I perceive them to be performing poorly	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I attach deadlines to the work activities I set them	
When asking for suggestions from them, I give a date to get back to me by	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I use internal deadlines to make them feel under pressure	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

Pace

Statement	Scale 1 to be inserted here
I ask others to let me know when they have a very high workload	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I expect people to complete work activities as quickly as I would do	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I always express a sense of urgency for work activities to be completed	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I expect others to approach me if they need more resources	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I offer as much resource as I can to help others, when I perceive they have a high workload	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I occasionally allow others to work at a slow pace	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>

I monitor the amount of work each individual has to do on a weekly basis	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I expect people to work quickly all the time	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
When setting a new work activity to an individual, I know exactly what their existing workload is	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I let people work at their own paces	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I always make sure people have a lot of work to do	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I encourage others to work at different paces over a long period of time (over a month)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Coordination (Sequence, Simultaneity and synchronisation)

Statement	Scale 1 to be inserted here
In a general context, I always re-prioritise the work activities I want people to do	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
When I judge what needs to be done by others, I consider how it might impact on me	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I always ask people 'how they are getting on' with the work activities I set them	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I leave it to team members to know who is responsible for doing what in the team	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I use external events to guide the deadlines I impose on others	
Negative feedback should never be given to others without positive feedback	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I coordinate what my team members do	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I always ask others to tell me when they have finished a work activity I set	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I make sure that any individual who is in a team has regular communication with every other team member	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I always end giving positive feedback to others rather than ending with negative feedback	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
When two or more teams are working together, I am aware of the effects the work on one team may have on the other	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I clearly state a common goal for individuals who are working together	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If an individual is working with another team, I encourage them to contact the other team just to see how work is progressing	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I clearly state what an individual is expected to do in their team	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I have regular communication with each individual about their work	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I prioritize what I want others to work on	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I ensure everyone in a team knows what every other team member's responsibilities are for each work activity	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Temporal Depth

Statement	Scale 1 to be inserted here
My current resources influence what I plan to do in the future	☐ — — — — ☐
For each individual, I know what skills I wish them to develop in the future	☐ — — — — ☐
When communicating a vision of the future, I tell others where we are at the moment	☐ — — — — ☐
If there is a performance related problem, it is important that those responsible recognize it	☐ — — — — ☐
If you focus on what work activities need to be done in the immediate future, the long term future will take care of itself	☐ — — — — ☐
To move forward with a vision of the future, I think it is important to recognise the current capabilities of others	☐ — — — — ☐
I never have time to reflect on work that has been done by others	☐ — — — — ☐
When communicating a vision of the future, I explain why the changes involved are needed	☐ — — — — ☐
Reflecting on the past, living in the present and looking to the future are all equally as important when it comes to leading others	☐ — — — — ☐
I give highly skilled individuals fairly difficult work activities to complete if I would like them to be totally engaged in a work activity	☐ — — — — ☐
I never have time to reflect with others on what's happened in the past	☐ — — — — ☐
To move forward you have to reflect on where you are at the moment	☐ — — — — ☐
I emphasise others' past successes as a means of motivating them	☐ — — — — ☐
I consider how an individual has worked in the past to understand how they may work in the future	☐ — — — — ☐
I consider what problems could occur in the future	☐ — — — — ☐
I talk to others about their future job prospects in the organization	☐ — — — — ☐
When others make a mistake, I ask them to consider how they would prevent making a similar mistake in the future	☐ — — — — ☐
Once an individual has completed a work activity, I give them feedback on how I think it went	☐ — — — — ☐
If others have made an unexpected mistake on a work activity in which they were previously successful, I will bring this past success to their attention	☐ — — — — ☐
I talk to others about what they should be aiming to achieve at work in 2-3 years time.	☐ — — — — ☐
I develop contingency plans for problems I foresee in the future	☐ — — — — ☐
I am aware of what each individual's immediate work priorities are	☐ — — — — ☐
	☐ — ☐ — — ☐
After I have made a decision, I will seek information to inform me whether I should change that decision	
I use new information to evaluate whether a past decision should be changed	
Once I make a decision I will stick to that decision no matter what	

If I commit others to work on a long term work objective, I will proactively seek information that may affect whether I should stop that commitment	
When I invest a lot of resources on a decision it is important to keep to that decision	
Once I make a decision about a long-term work objective others need to work towards, I won't change that decision	
Sometimes it is more costly to stick to decisions than change them	
The general consensus (held by others) on an issue has no effect on the decisions I make	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Delayed decisions should happen rarely	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Decisions should be delayed with caution	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Delayed decisions are harder to make than immediate ones	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Sometimes making a decision that goes against the general opinion of others is necessary	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Decisions are best delayed rather than made immediately	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I consider the consequences of what others may think of me if I decide to delay a decision	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Sometimes knowing the full details of a problem is more important than trying to rectify the problem immediately	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I take time in making a decision	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Problems should always be responded to immediately	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I am the leader so I can go against the general consensus of others as many times as I like	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I take as much time making a decision as I want	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I am prepared to make a decision even if I know the majority of others do not agree with that decision	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Delaying a decision can allow more relevant details to emerge that might otherwise not emerge if an immediate decision was made	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>

Breaks

Statement	Scale 1 to be inserted here
Generally I encourage non-work orientated breaks e.g. coffee breaks	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
Others' output on a work activity is more important than how much time they spend on it	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I encourage people to have breaks together	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I take time to socially interact with others in the workplace	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
When others are engaged in work activities that I consider easy, I socially interact with them	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I encourage people to take short breaks (under 10 minutes) if I perceive their concentration reduced from the demands of a work activity	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>
I prefer people to eat lunch at their desk	<input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/> --- <input type="checkbox"/>

I monitor when non-work breaks are taken e.g. coffee breaks, personal internet surfing	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Time Buffer

Statement	Scale 1 to be inserted here
I always ensure I have time to review the work of others before an external deadline expires	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
When given an external deadline, I will impose my own deadline on others before the formal date of the external deadline	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I ask others to have completed work for an external deadline before the actual date of the external deadline	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Speed and Quality

Statement	Scale 1 to be inserted here
Sometimes it is better for people to get something done fast rather than ensuring the quality is high	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I draw on the principle 'enough is enough' if I think others are spending too much time on a work activity	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
The priority of getting something done fast compared to getting something done with high quality changes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
The priority I place on others work in terms of speed or quality changes based on business objectives	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Speed VS. Quality

Statement	Scale 1 to be inserted here
In regards to others work, speed is more important than quality	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I give people more time to do a work activity, if the quality of their work is not exceptional	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I always expect the quality of work from others to be high regardless of how long it may take	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I expect others to work faster but never to the compromise of quality	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Time boundaries between work and non-work

Statement	Scale 1 to be inserted here
I encourage an individual to finish work for the day if they are working more than about 30 mins over their contacted time	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

I expect people to take work home with them	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I give praise to those who work overtime	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I often contact an individual about a work-related issue outside their working hours	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

Time Allocation

Statement	Scale 1 to be inserted here
When setting a work activity to an individual, I consider their capabilities to help estimate how long it should take them to complete	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Work activities just need to be done, therefore considering how long they will take others is not of importance to me	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Prior to confirming a deadline, I encourage input/discussion from the person whom I am setting the deadline to	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
When setting a work activity to an individual, I consider the demands of the activity to help estimate how long it should take them to complete	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

Autonomy

Statement	Scale 1 to be inserted here
Individuals are responsible for how they use their own time at work	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I allow others to schedule their own work day	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I schedule others' work for them	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
Apart from any deadlines I set, others are responsible for managing their own workload	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

Timelessness

Statement	Scale 1 to be inserted here
I encourage individuals to become totally focused on completing a work activity	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
I encourage people to become absorbed in a work activity	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>

If encouraging an individual to become totally focused on a work activity, I let them complete the work in their own way	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I let them work autonomously	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I allow them to engage in short non-work breaks (under 10 minutes)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I clearly explain what needs to be done for the work activity to be completed	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I give them information that will let them know how they are progressing on that work activity	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
I give individuals with low skill levels fairly easy work activities to complete if I would like them to become totally engaged in a work activity	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I clearly explain what I expect the outcome of the work activity to be	
If encouraging an individual to become totally focused on a work activity, I ask them how they are getting on	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I express a sense of urgency for the activity to be done	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
It is important that others can become totally focused on a work activity they are doing	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If I perceive an individual to be totally focused on a work activity, I try not to talk to them	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I set clear goals for them	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Section 4- Adaptive Temporal Practices

This section refers to the extent to which a leader reflexively regulates their behaviours based on their awareness of the behavioural manifestations of their followers' time personality and the relevant temporal job characteristics.

Please note that these items will be in random order within this section for the respondents version of the questionnaire. Also each Time Personality factor is clearly labeled and the items are numbered to represent the below 3 facets (this will not be the case for the respondents version).

- A. (Awareness of followers Time Personality)**
- B. (Awareness of Temporal Job Characteristics)**
- C. (Behavioural Responses)**

Polychronicity	Scale B to be inserted here
Depending on what I perceive an individual's job demands to be, influences whether I delegate a number of activities at the same time to them	SD D N A SA <input type="checkbox"/>
I am aware of who like to juggle several activities at the same time	SD D N A SA <input type="checkbox"/>
Depending on who the individual is, influences whether I delegate a number of activities at the same time to them	SD D N A SA <input type="checkbox"/>
I am aware of which job roles require an individual to juggle several activities at the same time in order to get their job done effectively	SD D N A SA <input type="checkbox"/>
	SD D N A SA <input type="checkbox"/>
I am aware of who likes to complete one work activity before beginning another	
I am aware of which job roles require an individual to complete one work activity before beginning another in order to get their job done effectively	
Depending on who the individual is, influences whether I wait until they have finished one work activity before giving another to do	
Depending on what I perceive an individual's job demands to be, influences whether I wait until the individual has finished one work activity before giving them another to do	
Planning	
Depending on what I perceive an individual's job demands to be, influences whether I ask them to plan their activities (e.g. by writing lists)	SD D N A SA <input type="checkbox"/>
I am aware of which job roles require an individual to plan their activities(e.g. by writing lists) in order to get the job done effectively	SD D N A SA <input type="checkbox"/>
Depending on who the individual is, influences whether I ask them to plan their activities (e.g. by writing lists)	SD D N A SA <input type="checkbox"/>
I am aware of who likes to plan their activities (e.g. by writing lists)	SD D N A SA <input type="checkbox"/>
Punctuality	
I am aware of who consistently meets deadlines on time	SD D N A SA <input type="checkbox"/>
Depending on what I perceive a person's job demands to be, influences the amount of times I explicitly remind them to complete a deadline on time	SD D N A SA <input type="checkbox"/>
I am aware of which job roles require an individual to meet deadlines on time in order to get their job done effectively	SD D N A SA <input type="checkbox"/>
Depending on who the individual is, influences the amount of times I explicitly remind an individual to complete a deadline on time	SD D N A SA <input type="checkbox"/>

	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
Impatience	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
Depending on what I perceive an individual's job demands to be, influences whether I encourage an individual to work quickly on activities	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
I am aware of which job roles require an individual to work quickly on activities in order to get their job done effectively	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
Depending on who the individual is, influences whether I encourage an individual to work quickly on activities	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
I am aware of who prefers to work quickly on activities	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>

Social Desirability Scale

No matter who I'm talking to, I'm always a good listener. 124	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
I sometimes feel resentful when I don't get my own way 132	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
I sometimes try to get even rather than forgive and forget 141	
There have been occasions when I took advantage of an individual 160	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>
I am always courteous even to individuals who are discourteous 168	SD <input type="checkbox"/> D <input type="checkbox"/> N <input type="checkbox"/> A <input type="checkbox"/> SA <input type="checkbox"/>

About you:

Please note: This information is strictly confidential

Q1. Sex:

- Male
 Female

Q2. Age:

- 16-18 18-25 26-35
 36-45 46-55 56-65
 66-75 75 +

Q3. How many individuals are you currently responsible for supervising/managing/leading: _____

Q4. Number of years in a supervisory or management position:

Occupation: _____

Q5. The organization you are employed within is in the:

- Private Sector
- Public or Government Sector

Q6. Is your work:

- Full-time
- Part-time (less than 30 hours a week).

The Centre for People @ Work Research Team would like to THANK YOU for your time

Temporal Intelligence Questionnaire *TI-Q*

This questionnaire aims to measure the time-related behaviours you show to the individuals you lead, manage or supervise. **Thus, the words ‘others’ ‘people’ and ‘individual(s)’, should be understood as any person(s) whom you are responsible for managing, supervising or leading in your current job role(s). All the statements in this questionnaire refer to the behaviours and opinions you direct to others. If any one statement is not applicable in your job role or as a result of where you work, please select the ‘Not Applicable’ response.**

All responses are strictly confidential and will be used for research purposes only. There are no right or wrong answers. Please do not think too long about any one question.

Section 1– External Deadlines

This section refers to the behaviours you display to others in relation to **external** deadlines. **External deadlines** are deadlines **that were not set by you**, typically they may be set by client demands or by your superior.

Please rate how frequently each statement applies to you by marking (filling) the most appropriate circle in the scale, using the following rating scale:

Not Applicable	Never	Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	Always
NA	1	2	3	4	5	6	7

Statement	NA	1	2	3	4	5	6	7
If others miss an external deadline.....								
I ask them to present clear steps to show me what they intend to do in order to complete the work	<input type="checkbox"/>							
I am emotionally supportive to them	<input type="checkbox"/>							
I will express disappointment to them in a constructive way	<input type="checkbox"/>							
When giving an external deadline to others.....								
I make clear what needs to be done for it to be met	<input type="checkbox"/>							
I make sure they are aware of the impact that missing the deadline would have on other people	<input type="checkbox"/>							

I let them know that the deadline should be met	<input type="checkbox"/>							
I explain the importance of meeting it	<input type="checkbox"/>							
Statement	NA	1	2	3	4	5	6	7
After I have set an external deadline to others.....								
I ask them to come back to me if there are any problems with an external deadline	<input type="checkbox"/>							
I rely on them to inform me about their progress in relation to the deadline	<input type="checkbox"/>							
I am aware of the exact date of the deadline	<input type="checkbox"/>							
I apply pressure to ensure the deadline is met	<input type="checkbox"/>							
I monitor their progress	<input type="checkbox"/>							
I give positive encouragement for the deadline to be completed	<input type="checkbox"/>							

Section 2- Internal deadlines

This section refers to the behaviours you display to others in relation to **internal** deadlines. **Internal deadlines** are any deadlines that **were set by you**, these may or may not be related to achieving a later external deadline.

Please rate how frequently each statement applies to you by marking (filling) the most appropriate circle in the scale, using the following rating scale:

Not Applicable	Never	Very Rarely	Rarely	Occasionally	Frequently	Very Frequently	Always
NA	1	2	3	4	5	6	7

Statement	NA	1	2	3	4	5	6	7
If others miss an internal deadline.....								
I ask them to present clear steps to show me what they intend to do in order to complete the work	<input type="checkbox"/>							
I am emotionally supportive to them	<input type="checkbox"/>							
I will express disappointment to them in a constructive way	<input type="checkbox"/>							
When giving an internal deadline to others.....								
I make clear what needs to be done for it to be met	<input type="checkbox"/>							
I make sure they are aware of the impact that missing the deadline would have on other people	<input type="checkbox"/>							
I explain the importance of meeting it	<input type="checkbox"/>							

I let them know that the deadline should be met	<input type="checkbox"/>							
Statement	NA	1	2	3	4	5	6	7
After I have set an internal deadline to others.....								
I rely on them to inform me about their progress in relation to the deadline	<input type="checkbox"/>							
I monitor their progress	<input type="checkbox"/>							
I ask them to come back to me if there are any problems with an internal deadline	<input type="checkbox"/>							
I am aware of the exact date of the deadline	<input type="checkbox"/>							
I apply pressure to ensure the deadline is met	<input type="checkbox"/>							
I give positive encouragement for the deadline to be completed	<input type="checkbox"/>							
Regarding others.....								
I set them several internal deadlines to achieve one external deadline	<input type="checkbox"/>							
I set them internal deadlines when I perceive them to be behind in their work	<input type="checkbox"/>							
I set them internal deadlines when I perceive them to be performing poorly	<input type="checkbox"/>							
I attach deadlines to the work activities I set them	<input type="checkbox"/>							
When asking for suggestions from them, I give a date to get back to me by	<input type="checkbox"/>							
I use internal deadlines to make them feel under pressure	<input type="checkbox"/>							

Section 3

For each statement please rate the extent to which you agree or disagree that the statement reflects your own leadership and management practices.

Please rate how frequently each statement applies to you by marking (filling) the most appropriate circle in the scale, using the following rating scale:

Not Applicable	Strongly Disagree	Disagree	Slightly Disagree	Neither agree nor disagree or neutral	Slightly Agree	Agree	Strongly Agree
NA	1	2	3	4	5	6	7

Statement	NA	1	2	3	4	5	6	7
-----------	----	---	---	---	---	---	---	---

Please read each statement and respond using the scale provided

--

<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<			

I ask others to let me know when they have a very high workload	<input type="checkbox"/>
I expect people to complete work activities as quickly as I would do	<input type="checkbox"/>
Statement	NA 1 2 3 4 5 6 7
I always express a sense of urgency for work activities to be completed	<input type="checkbox"/>
I encourage an individual to finish work for the day if they are working more than about 30 mins over their contracted time	<input type="checkbox"/>
I expect others to approach me if they need more resources	<input type="checkbox"/>
I offer as much resource as I can to help others, when I perceive they have a high workload	<input type="checkbox"/>
I occasionally allow others to work at a slow pace	<input type="checkbox"/>
I monitor the amount of work each individual has to do on a weekly basis	<input type="checkbox"/>
In a general context, I always re-prioritise the work activities I want people to do	<input type="checkbox"/>
When I judge what needs to be done by others, I consider how it might impact on me	<input type="checkbox"/>
In regards to others work, speed is more important than quality	<input type="checkbox"/>
I always ask people 'how they are getting on' with the work activities I set them	<input type="checkbox"/>
Sometimes it is better for people to get something done fast rather than ensuring the quality is high	<input type="checkbox"/>
Generally I encourage non-work orientated breaks e.g. coffee breaks	<input type="checkbox"/>
I leave it to team members to know who is responsible for doing what in the team	<input type="checkbox"/>
I expect people to take work home with them	<input type="checkbox"/>
The general consensus (held by others) on an issue has no effect on the decisions I make	<input type="checkbox"/>
I use external events to guide the deadlines I impose on others	<input type="checkbox"/>
Depending on what I perceive an individual's job demands to be, influences whether I delegate a number of activities at the same time to them	<input type="checkbox"/>
Depending on what I perceive an individual's job demands to be, influences whether I encourage an individual to work quickly on activities	<input type="checkbox"/>
I give people more time to do a work activity, if the quality of their work is not exceptional	<input type="checkbox"/>
My current resources influence what I plan to do in the future	<input type="checkbox"/>
When setting a work activity to an individual, I consider their capabilities to help estimate how long it should take them to complete	<input type="checkbox"/>

Negative feedback should never be given to others without positive feedback	<input type="checkbox"/>							
I expect people to work quickly all the time	<input type="checkbox"/>							
Individuals are responsible for how they use their own time at work	<input type="checkbox"/>							

Statement	NA	1	2	3	4	5	6	7
I coordinate what my team members do	<input type="checkbox"/>							
I always ask others to tell me when they have finished a work activity I set	<input type="checkbox"/>							
I always expect the quality of work from others to be high regardless of how long it may take	<input type="checkbox"/>							
Others' output on a work activity is more important than how much time they spend on it	<input type="checkbox"/>							
I make sure that any individual who is in a team has regular communication with every other team member	<input type="checkbox"/>							
When setting a new work activity to an individual, I know exactly what their existing workload is	<input type="checkbox"/>							
I always end giving positive feedback to others rather than ending with negative feedback	<input type="checkbox"/>							
I let people work at their own paces	<input type="checkbox"/>							
I expect others to work faster but never to the compromise of quality	<input type="checkbox"/>							
I encourage individuals to become totally focused on completing a work activity	<input type="checkbox"/>							
I am aware of who consistently meets deadlines on time	<input type="checkbox"/>							
I draw on the principle 'enough is enough' if I think others are spending too much time on a work activity	<input type="checkbox"/>							
I allow others to schedule their own work day	<input type="checkbox"/>							
I schedule others' work for them	<input type="checkbox"/>							
I always make sure people have a lot of work to do	<input type="checkbox"/>							
I encourage people to have breaks together	<input type="checkbox"/>							
I take time to socially interact with others in the workplace	<input type="checkbox"/>							
I always expect others to work hard	<input type="checkbox"/>							
When two or more teams are working together, I am aware of the effects the work on one team may have on the other	<input type="checkbox"/>							
I give praise to those who work overtime	<input type="checkbox"/>							
I encourage people to become absorbed in a work activity	<input type="checkbox"/>							

Depending on what I perceive an individual's job demands to be, influences whether I wait until the individual has finished one work activity before giving them another to do	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I let them complete the work in their own way	<input type="checkbox"/>							
When others are engaged in work activities that I consider easy, I socially interact with them	<input type="checkbox"/>							
Apart from any deadlines I set, others are responsible for managing their own workload	<input type="checkbox"/>							
Statement	NA	1	2	3	4	5	6	7
I encourage people to take short breaks (under 10 minutes) if I perceive their concentration reduced from the demands of a work activity	<input type="checkbox"/>							
After I have made a decision, I will seek information to inform me whether I should change that decision	<input type="checkbox"/>							
For each individual, I know what skills I wish them to develop in the future	<input type="checkbox"/>							
I use new information to evaluate whether a past decision should be changed	<input type="checkbox"/>							
When communicating a vision of the future, I tell others where we are at the moment	<input type="checkbox"/>							
When it is my decision, I let others work at home if they request to	<input type="checkbox"/>							
If there is a performance related problem, it is important that those responsible recognize it	<input type="checkbox"/>							
Once I make a decision I will stick to that decision no matter what	<input type="checkbox"/>							
Depending on what I perceive an individual's job demands to be, influences whether I ask them to plan their activities (e.g. by writing lists)	<input type="checkbox"/>							
If I commit others to work on a long term work objective, I will proactively seek information that may affect whether I should stop that commitment	<input type="checkbox"/>							
The priority I place for an individual to get something done fast compared to getting something done well changes	<input type="checkbox"/>							
When I invest a lot of resources on a decision it is important to keep to that decision	<input type="checkbox"/>							
Delayed decisions are harder to make than immediate ones	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I let them work autonomously	<input type="checkbox"/>							
If you focus on what work activities need to be done in the immediate future, the long term future will take care of itself	<input type="checkbox"/>							
To move forward with a vision of the future, I think it is important to recognise the current capabilities of others	<input type="checkbox"/>							
I never have time to reflect on work that has been done by others	<input type="checkbox"/>							
When communicating a vision of the future, I explain why the changes involved are needed	<input type="checkbox"/>							
I am aware of which job roles require an individual to plan their activities (e.g. by writing lists) in order to get the job done effectively	<input type="checkbox"/>							
Sometimes making a decision that goes against the general opinion of others is necessary	<input type="checkbox"/>							

Reflecting on the past, living in the present and looking to the future are all equally important when it comes to leading others	<input type="checkbox"/>							
I give highly skilled individuals fairly difficult work activities to complete if I would like them to be totally engaged in a work activity	<input type="checkbox"/>							
I am aware of which job roles require an individual to work quickly on activities in order to get their job done effectively	<input type="checkbox"/>							
Depending on who the individual is, influences whether I encourage them to work quickly on activities	<input type="checkbox"/>							
I clearly state a common goal for individuals who are working together	<input type="checkbox"/>							
Statement	NA	1	2	3	4	5	6	7
Work activities just need to be done, therefore considering how long they will take others is not of importance to me	<input type="checkbox"/>							
Decisions are best delayed rather than made immediately	<input type="checkbox"/>							
I always ensure I have time to review the work of others before an external deadline expires	<input type="checkbox"/>							
Prior to confirming a deadline, I encourage input/discussion from the person whom I am setting the deadline to	<input type="checkbox"/>							
I never have time to reflect with others on what's happened in the past	<input type="checkbox"/>							
I often contact an individual about a work-related issue outside their working hours	<input type="checkbox"/>							
Depending on what I perceive a person's job demands to be, influences the amount of times I explicitly remind them to complete a deadline on time	<input type="checkbox"/>							
To move forward you have to reflect on where you are at the moment	<input type="checkbox"/>							
I am aware of which job roles require an individual to complete one work activity before beginning another in order to get their job done effectively	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I allow them to engage in short non-work breaks (under 10 minutes)	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I clearly explain what needs to be done for the work activity to be completed	<input type="checkbox"/>							
I am aware of who likes to juggle several activities at the same time	<input type="checkbox"/>							
When given an external deadline, I will impose my own deadline on others before the formal date of the external deadline	<input type="checkbox"/>							
Before delaying a decision, I consider whether I have recently delayed any other decisions	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I give them information that will let them know how they are progressing on that work activity	<input type="checkbox"/>							
No matter who I'm talking to, I'm always a good listener.	<input type="checkbox"/>							
I emphasise others' past successes as a means of motivating them	<input type="checkbox"/>							
Once I make a decision about a long-term work objective others need to work towards, I won't change that decision until that objective has been met	<input type="checkbox"/>							
When setting a work activity to an individual, I consider the demands of the activity to help estimate how long it should take them to complete	<input type="checkbox"/>							

I consider the consequences of what others may think of me if I decide to delay a decision	<input type="checkbox"/>							
I consider how an individual has worked in the past to understand how they may work in the future	<input type="checkbox"/>							
I consider what problems could occur in the future	<input type="checkbox"/>							
I talk to others about their future job prospects in the organization	<input type="checkbox"/>							
I sometimes feel resentful when I don't get my own way	<input type="checkbox"/>							
Statement	NA	1	2	3	4	5	6	7
Sometimes knowing the full details of a problem is more important than trying to rectify the problem immediately	<input type="checkbox"/>							
Sometimes it is more costly to stick to decisions than change them	<input type="checkbox"/>							
If an individual is working with another team, I encourage them to contact the other team just to see how work is progressing	<input type="checkbox"/>							
When it is my decision, I let others work flexible hours	<input type="checkbox"/>							
Problems should always be responded to immediately	<input type="checkbox"/>							
I am the leader so I can go against the general consensus of others as many times as I like	<input type="checkbox"/>							
Depending on who the individual is, influences whether I delegate a number of activities at the same time to them	<input type="checkbox"/>							
I clearly state what an individual is expected to do in their team	<input type="checkbox"/>							
I sometimes try to get even rather than forgive and forget	<input type="checkbox"/>							
I give individuals with low skill levels fairly easy work activities to complete if I would like them to become totally engaged in a work activity	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I clearly explain what I expect the outcome of the work activity to be	<input type="checkbox"/>							
The priority I place on others work in terms of speed or quality changes based on business objectives	<input type="checkbox"/>							
I take as much time making a decision as I want	<input type="checkbox"/>							
I am aware of which job roles require an individual to meet deadlines on time in order to get their job done effectively	<input type="checkbox"/>							
I have regular communication with each individual about their work	<input type="checkbox"/>							
If encouraging an individual to become totally focused on a work activity, I ask them how they are getting on	<input type="checkbox"/>							
When others make a mistake, I ask them to consider how they would prevent making a similar mistake in the future	<input type="checkbox"/>							
I prioritize what I want others to work on	<input type="checkbox"/>							
I am prepared to make a decision even if I know the majority of others do not agree with that decision	<input type="checkbox"/>							

Depending on who the individual is, influences whether I wait until they have finished one work activity before giving another to do	<input type="checkbox"/>								
I am aware of which job roles require an individual to juggle several activities at the same time in order to get their job done effectively	<input type="checkbox"/>								
I prefer people to eat lunch at their desk	<input type="checkbox"/>								
Delaying a decision can allow more relevant details to emerge that might otherwise not emerge if an immediate decision was made	<input type="checkbox"/>								
I ask others to have completed work for an external deadline before the actual date of the external deadline	<input type="checkbox"/>								
If encouraging an individual to become totally focused on a work activity, I express a sense of urgency for the activity to be done	<input type="checkbox"/>								
Statement	NA	1	2	3	4	5	6	7	
It is important that others can become totally focused on a work activity they are doing	<input type="checkbox"/>								
I ensure everyone in a team knows what every other team member's responsibilities are for each work activity	<input type="checkbox"/>								
There have been occasions when I took advantage of an individual	<input type="checkbox"/>								
I am aware of who likes to complete one work activity before beginning another	<input type="checkbox"/>								
Once an individual has completed a work activity, I give them feedback on how I think it went	<input type="checkbox"/>								
I monitor when non-work breaks are taken e.g. coffee breaks, personal internet surfing	<input type="checkbox"/>								
If I perceive an individual to be totally focused on a work activity, I try not to talk to them	<input type="checkbox"/>								
Depending on who the individual is, influences whether I ask them to plan their activities (e.g. by writing lists)	<input type="checkbox"/>								
If others have made an unexpected mistake on a work activity in which they were previously successful, I will bring this past success to their attention	<input type="checkbox"/>								
I talk to others about what they should be aiming to achieve at work in 2-3 years time.	<input type="checkbox"/>								
If encouraging an individual to become totally focused on a work activity, I set clear goals for them	<input type="checkbox"/>								
I am always courteous even to individuals who are discourteous	<input type="checkbox"/>								
I develop contingency plans for problems I foresee in the future	<input type="checkbox"/>								
Depending on who the individual is, influences the amount of times I explicitly remind them to complete a deadline on time	<input type="checkbox"/>								
I am aware of what each individual's immediate work priorities are	<input type="checkbox"/>								
I am aware of who likes to plan their activities (e.g. by writing lists)	<input type="checkbox"/>								
I am aware of who prefers to work quickly on activities	<input type="checkbox"/>								

If you have any questions about this research, please email Andy Doyle at:

a.doyle@worc.ac.uk

About you:

Please note: This information is strictly confidential

Q1. Sex:

- Male
 Female

Q2. Age:

- 16-18 19-25 26-35
 36-45 46-55 56-65
 66-75 76 +

Q3. i) How many individuals are you currently responsible for directly line managing/supervising: _____

ii) How many individuals are you currently responsible for leading: _____

iii) Whilst recognising your job may include many activities or roles, please just consider what proportion of your job involves management as compared to leadership- out of a total of 100 please indicate the following:

_____ % Management _____ % Leadership

Q4. Job Title: _____

Q5. The organization you are employed within is in the:

- Private Sector
 Public or Government Sector

Q6. Is your work:

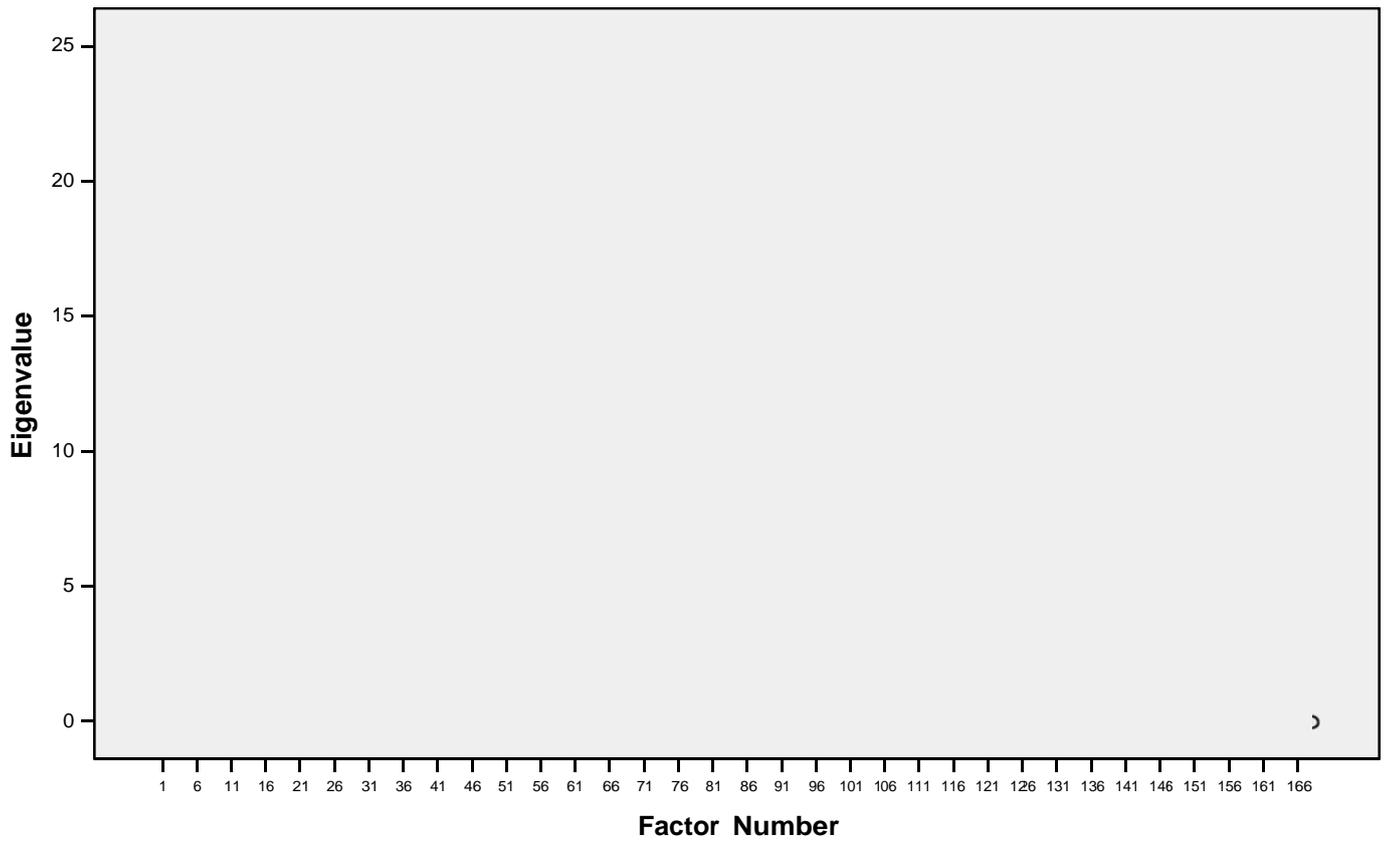
- Full-time
 Part-time (less than 30 hours a week).

Q7. Country in which you are currently working in: _____

**The Centre for People @ Work Research Team
would like to THANK YOU for your time**

**Appendix 12: Scree Plot (n=203) for Development of the Temporal Intelligence
Questionnaire Study I**

Scree Plot



Appendix 13: Factor Loadings of the TI-Q used in study I of the Development of the TI-Q

	Factor									
	1	2	3	4	5	6	7	8	9	10
SMEAN(Q161)	0.705									
SMEAN(Q153)	0.691									
SMEAN(Q173)	0.613									
SMEAN(Q172)	0.595									
SMEAN(Q120)	0.561									
SMEAN(Q146)	0.556									
SMEAN(Q171)	0.551									
SMEAN(Q106)	0.526									
SMEAN(Q117)	0.506									
SMEAN(Q77)	0.433									
SMEAN(Q108)	0.392									
SMEAN(Q139)	0.386									
SMEAN(Q158)	0.379									
SMEAN(Q152)	0.373				-0.328					
SMEAN(Q167)	0.373									
SMEAN(Q162)	0.365									
SMEAN(Q119)	0.364									
SMEAN(Q147)	0.346									
SMEAN(Q102)	0.337									
SMEAN(Q64)										
SMEAN(Q143)										
SMEAN(Q86)										
SMEAN(Q80)										
SMEAN(Q68)		0.612								

SMEAN(Q73)	0.577								
SMEAN(Q67)	0.495								
SMEAN(Q57)	0.465								
SMEAN(Q34)	0.43								
SMEAN(Q40)	0.425								
SMEAN(Q42)	0.414								
SMEAN(Q35)	0.405								
SMEAN(Q79)	0.402								
SMEAN(Q41)	0.369								
SMEAN(Q76)	0.368								
SMEAN(Q61)	0.361								
SMEAN(Q32)	0.344								
SMEAN(Q78)	0.342								
SMEAN(Q44)	0.331								
SMEAN(Q60)									
SMEAN(Q48)									
SMEAN(Q95)									
SMEAN(Q159)									
SMEAN(Q59)									
SMEAN(Q69)									
SMEAN(Q19)	-0.798								
SMEAN(Q18)	-0.793								
SMEAN(Q7)	-0.715								
SMEAN(Q20)	-0.701								
SMEAN(Q17)	-0.68								
SMEAN(Q4)	-0.675								
SMEAN(Q5)	-0.586								

SMEAN(Q14)	-0.582						
SMEAN(Q6)	-0.573						
SMEAN(Q1)	-0.557						
SMEAN(Q26)	-0.555						
SMEAN(Q23)	-0.512						
SMEAN(Q24)	-0.506						
SMEAN(Q25)	-0.496						
SMEAN(Q8)	-0.493						
SMEAN(Q13)	-0.489						
SMEAN(Q10)	-0.437						
SMEAN(Q22)	-0.432						
SMEAN(Q29)	-0.43						
SMEAN(Q33)	-0.413						
SMEAN(Q30)	-0.378						
SMEAN(Q11)	-0.376						
SMEAN(Q31)	-0.375						
SMEAN(Q12)	-0.374	-0.32					
SMEAN(Q28)	-0.348						
SMEAN(Q21)	-0.344						
SMEAN(Q27)							
SMEAN(Q37)							
SMEAN(Q71)		0.625					
SMEAN(Q83)		0.584					
SMEAN(Q72)		-0.546					
SMEAN(Q66)		0.501					
SMEAN(Q58)		0.413					
SMEAN(Q81)		0.41					

SMEAN(Q97)			0.391				
SMEAN(Q89)			0.358				
SMEAN(Q136)			0.327				
SMEAN(Q50)			0.321				
SMEAN(Q47)							
SMEAN(Q62)							
SMEAN(Q9)							
SMEAN(Q3)							
SMEAN(Q45)			-0.677				
SMEAN(Q144)			-0.476				
SMEAN(Q43)			-0.459				
SMEAN(Q94)			-0.421				
SMEAN(Q157)			-0.407				
SMEAN(Q82)			-0.405	0.325			
SMEAN(Q170)			-0.394				
SMEAN(Q70)			-0.355				
SMEAN(Q52)			-0.348				
SMEAN(Q129)			-0.332				
SMEAN(Q63)			0.32				
SMEAN(Q107)							
SMEAN(Q115)							
SMEAN(Q105)							
SMEAN(Q164)							
SMEAN(Q15)							
SMEAN(Q2)							
SMEAN(Q84)				0.59			
SMEAN(Q74)				0.589			

SMEAN(Q46)					0.548			
SMEAN(Q118)					0.545			
SMEAN(Q75)					0.501			
SMEAN(Q39)					0.454			
SMEAN(Q166)					0.342			
SMEAN(Q92)								
SMEAN(Q111)								
SMEAN(Q112)								
SMEAN(Q165)								
SMEAN(Q98)						0.573		
SMEAN(Q138)						0.508		
SMEAN(Q109)						0.458		
SMEAN(Q91)						0.448		
SMEAN(Q114)						0.38		
SMEAN(Q145)						0.373		
SMEAN(Q96)						0.341		
SMEAN(Q55)						-0.334		
SMEAN(Q100)						0.329		
SMEAN(Q154)								
SMEAN(Q38)								
SMEAN(Q126)								
SMEAN(Q51)								
SMEAN(Q113)								
SMEAN(Q36)								
SMEAN(Q110)								
SMEAN(Q128)							-0.495	
SMEAN(Q56)							-0.452	

SMEAN(Q150)									0.356
SMEAN(Q93)									0.355
SMEAN(Q133)									0.35
SMEAN(Q135)									0.349
SMEAN(Q103)									0.342
SMEAN(Q140)									0.341
SMEAN(Q90)									
SMEAN(Q127)									
SMEAN(Q155)									

Appendix 14: Syntax for Parallel Analysis.

Parallel Analysis program (O'Connor, 2000)

```
set mxloops=9000 printback=off width=80 seed = 1953125.
matrix.
compute ncases = 203.
compute nvars = 168.
compute ndatsets = 500.
compute percent = 95.
compute kind = 1 .
do if (kind = 1).
compute evals = make(nvars,ndatsets,-9999).
compute nm1 = 1 / (ncases-1).
loop #nds = 1 to ndatsets.
compute x = sqrt(2 * (ln(uniform(ncases,nvars)) * -1) ) &*
        cos(6.283185 * uniform(ncases,nvars) ).
compute vcv = nm1 * (sscp(x) -
((t(csum(x))*csum(x))/ncases)). compute d =
inv(mdiag(sqrt(diag(vcv))))).
compute evals(:,#nds) = eval(d * vcv *
d). end loop.
end if.

compute num = rnd((percent*ndatsets)/100).
compute results = { t(1:nvars), t(1:nvars), t(1:nvars)
}. loop #root = 1 to nvars.
compute ranks = rnkorder(evals(#root,:)).
loop #col = 1 to ndatsets.
do if (ranks(1,#col) = num).
compute results(#root,3) = evals(#root,#col).
break.
end if.
end loop.
end loop.
compute results(:,2) = rsum(evals) / ndatsets.

print /title="PARALLEL
ANALYSIS:". do if (kind = 1).
print /title="Principal Components".
else if (kind = 2).
print /title="Principal Axis / Common Factor
Analysis". end if.
compute specifs = {ncases; nvars; ndatsets; percent}.
print specifs /title="Specifications for this Run:"
/rlabels="Ncases" "Nvars" "Ndatsets" "Percent".
print results /title="Random Data Eigenvalues"
/clabels="Root" "Means" "Prcntyle" /format "f12.6".
```

end if. end matrix.

```
* Commands for obtaining the necessary real-data eigenvalues for
principal axis / common factor analysis using SPSS;
make sure to insert valid filenames/locations, and
remove the '*' from the first columns.
* corr var1 to var20 / matrix out ('filename') / missing = listwise.
* matrix.
* MGET /type= corr /file='filename' .
* compute smc = 1 - (1 &/ diag(inv(cr)) ).
* call setdiag(cr,smc).
* compute evals = eval(cr).
* print { t(1:nrow(cr)) , evals }
/title="Raw Data Eigenvalues"
/clabels="Root" "Eigen." /format "f12.6".
* end matrix.
```

Appendix 15: Revised and Final version of the Temporal Intelligence Questionnaire (employed in Development of the TI-Q Study II).

Temporal Intelligence Questionnaire *TI-Q*

This questionnaire aims to measure the time-related behaviours you show to the individuals you lead, manage or supervise. **Thus, the words ‘others’ ‘people’ and ‘individual(s)’, should be understood as any person(s) whom you are responsible for managing, supervising or leading in your current job role(s). All the statements in this questionnaire refer to the behaviours and opinions you direct to others.**

If any one statement is not applicable in your job role or as a result of where you work, please select the ‘Not Applicable’ response. There are no right or wrong answers. Please do not think too long about any one question.

In this questionnaire the term **deadlines** refers to any deadlines that **were set by you**, these may or may not be related to achieving a later deadline set by someone else such as your superior or client.

For each statement please rate the extent to which you agree or disagree that the statement reflects your own leadership and management practices.

Please click the mouse over the most appropriate circle in the scale, using the following rating scale:

Not Applicable	Strongly Disagree	Disagree	Slightly Disagree	Neither agree nor disagree or neutral	Slightly Agree	Agree	Strongly Agree
NA	1	2	3	4	5	6	7

Statement	NA	1	2	3	4	5	6	7
Please read each statement and respond using the scale provided								
	<input type="checkbox"/>							
If you focus on what work activities need to be done in the immediate future, the long term future will take care of itself	<input type="checkbox"/>							
The priority I place on others work in terms of speed or quality changes based on business objectives	<input type="checkbox"/>							

Depending on who the individual is, influences the amount of times I explicitly remind them to complete a deadline on time	<input type="checkbox"/>
When it is my decision, I let others work at home if they request to	<input type="checkbox"/>
I am aware of who likes to juggle several activities at the same time	<input type="checkbox"/>
I encourage people to have breaks together	<input type="checkbox"/>
I am aware of who prefers to work quickly on activities	<input type="checkbox"/>
Generally I encourage non-work orientated breaks e.g. coffee breaks	<input type="checkbox"/>
I always expect the quality of work from others to be high regardless of how long it may take	<input type="checkbox"/>
I am aware of who likes to plan their activities (e.g., by writing lists)	<input type="checkbox"/>
I monitor the amount of work each individual has to do on a weekly basis	<input type="checkbox"/>
Reflecting on the past, living in the present and looking to the future are all equally important when it comes to leading others	<input type="checkbox"/>
No matter who I'm talking to, I'm always a good listener.	
I consider what problems could occur in the future	<input type="checkbox"/>
I often contact an individual about a work-related issue outside their working hours	<input type="checkbox"/>
I sometimes feel resentful when I don't get my own way	
I give praise to those who work overtime	<input type="checkbox"/>
I am aware of which job roles require an individual to work quickly on activities in order to get their job done effectively	
Regarding others, I attach deadlines to the work activities I set them	<input type="checkbox"/>
Sometimes it is better for people to get something done fast rather than ensuring the quality is high	<input type="checkbox"/>
When setting a work activity to an individual, I consider their capabilities to help estimate how long it should take them to complete	<input type="checkbox"/>
Regarding others, I set them deadlines when I perceive them to be performing poorly	<input type="checkbox"/>
I am aware of who likes to complete one work activity before beginning another	<input type="checkbox"/>
After I have set a deadline to others, I apply pressure to ensure the deadline is met	<input type="checkbox"/>
To move forward with a vision of the future, I think it is important to recognise the current capabilities of others	<input type="checkbox"/>
I am aware of which job roles require an individual to juggle several activities at the same time in order to get their job done effectively	<input type="checkbox"/>
I use deadlines to make others feel under pressure	<input type="checkbox"/>

I am aware of which job roles require an individual to complete one work activity before beginning another in order to get their job done effectively	<input type="checkbox"/>
I expect people to work quickly all the time	<input type="checkbox"/>
I sometimes try to get even rather than forgive and forget	
I always make sure people have a lot of work to do	<input type="checkbox"/>
When it is my decision, I let others work flexible hours	<input type="checkbox"/>
I never have time to reflect on work that has been done by others	<input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I let them complete the work in their own way	<input type="checkbox"/>
When giving a deadline to others, I make sure they are aware of the impact that missing the deadline would have on other people	<input type="checkbox"/>
I am aware of which job roles require an individual to meet deadlines on time in order to get their job done effectively	<input type="checkbox"/>
There have been occasions when I took advantage of an individual	
When giving a deadline to others, I make clear what needs to be done for it to be met	<input type="checkbox"/>
I encourage people to become absorbed in a work activity	<input type="checkbox"/>
To move forward you have to reflect on where you are at the moment	<input type="checkbox"/>
After I have set a deadline to others, I give positive encouragement for the deadline to be completed	<input type="checkbox"/>
The priority I place for an individual to get something done fast compared to getting something done well changes	<input type="checkbox"/>
Sometimes knowing the full details of a problem is more important than trying to rectify the problem immediately	<input type="checkbox"/>
I take time to socially interact with others in the workplace	<input type="checkbox"/>
After I have set a deadline to others, I monitor their progress	<input type="checkbox"/>
If I commit others to work on a long-term work objective, I will proactively seek information that may affect whether I should stop that commitment	
I encourage individuals to become totally focused on completing a work activity	<input type="checkbox"/>
I encourage people to take short breaks (under 10 minutes) if I perceive their concentration is reduced from the demands of a work activity	<input type="checkbox"/>
Depending on what I perceive an individual's job demands to be, influences whether I encourage an individual to work quickly on activities	<input type="checkbox"/>
I always express a sense of urgency for work activities to be completed	<input type="checkbox"/>
Once I make a decision I will stick to that decision no matter what	<input type="checkbox"/>
After I have set a deadline to others, I am aware of the exact date of the deadline	<input type="checkbox"/>

When communicating a vision of the future, I tell others where we are at the moment	<input type="checkbox"/>
I draw on the principle 'enough is enough' if I think others are spending too much time on a work activity	<input type="checkbox"/>
I schedule others' work for them	<input type="checkbox"/>
In a general context, I always re-prioritise the work activities I want people to do	<input type="checkbox"/>
Regarding others, when asking for suggestions from them, I give a date to get back to me by	<input type="checkbox"/>
When giving a deadline to others, I explain the importance of meeting it	<input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I allow them to engage in short non-work breaks (under 10 minutes)	<input type="checkbox"/>
Apart from any deadlines I set, others are responsible for managing their own workload	<input type="checkbox"/>
I am the leader so I can go against the general consensus of others as many times as I like	<input type="checkbox"/>
I occasionally allow others to work at a slow pace	<input type="checkbox"/>
Delayed decisions are harder to make than immediate ones	<input type="checkbox"/>
Depending on who the individual is, influences whether I delegate a number of activities at the same time to them	<input type="checkbox"/>
I take as much time making a decision as I want	<input type="checkbox"/>
I use new information to evaluate whether a past decision should be changed	<input type="checkbox"/>
I expect people to complete work activities as quickly as I would do	<input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I let them work autonomously	<input type="checkbox"/>
When I judge what needs to be done by others, I consider how it might impact on me	<input type="checkbox"/>
I allow others to schedule their own work day	<input type="checkbox"/>
I am aware of which job roles require an individual to plan their activities (e.g. by writing lists) in order to get the job done effectively	
Sometimes it is more costly to stick to decisions than change them	<input type="checkbox"/>
I always expect others to work hard	<input type="checkbox"/>
Work activities just need to be done, therefore considering how long they will take others is not of importance to me	<input type="checkbox"/>
I expect others to work faster but never to the compromise of quality	<input type="checkbox"/>
If encouraging an individual to become totally focused on a work activity, I express a sense of urgency for the activity to be done	<input type="checkbox"/>
I let people work at their own paces	<input type="checkbox"/>

After I have set a deadline to others, I ask them to come back to me if there are any problems with the deadline	<input type="checkbox"/>
I am always courteous even to individuals who are discourteous	<input type="checkbox"/>
When giving a deadline to others, I let them know that the deadline should be met	<input type="checkbox"/>
Individuals are responsible for how they use their own time at work	<input type="checkbox"/>
If others miss a deadline, I ask them to present clear steps to show me what they intend to do in order to complete the work	<input type="checkbox"/>
When others make a mistake, I ask them to consider how they would prevent making a similar mistake in the future	<input type="checkbox"/>

If you have any questions about this research, please email Andy Doyle at:
a.doyle@worc.ac.uk

**The Centre for People @ Work Research Team
would like to thank you for your time**

Appendix 16. Key of dimensions of the final version of the Temporal Intelligence Questionnaire

Dimension	Question Number	Question
FACTOR 1 Time Personality and Job Role Characteristics	5	I am aware of who likes to juggle several activities at the same time
FACTOR 1 Time Personality and Job Role Characteristics	7	I am aware of who prefers to work quickly on activities
FACTOR 1 Time Personality and Job Role Characteristics	10	I am aware of who likes to plan their activities (e.g. by writing lists)
FACTOR 1 Time Personality and Job Role Characteristics	18	I am aware of which job roles require an individual to work quickly on activities in order to get their job done effectively
FACTOR 1 Time Personality and Job Role Characteristics	23	I am aware of who likes to complete one work activity before beginning another
FACTOR 1 Time Personality and Job Role Characteristics	26	I am aware of which job roles require an individual to juggle several activities at the same time in order to get their job done effectively
FACTOR 1 Time Personality and Job Role Characteristics	28	I am aware of which job roles require an individual to complete one work activity before beginning another in order to get their job done effectively
FACTOR 1 Time Personality and Job Role Characteristics	36	I am aware of which job roles require an individual to meet deadlines on time in order to get their job done effectively
FACTOR 1 Time Personality and Job Role Characteristics	64	Depending on who the individual is, influences whether I delegate a number of activities at the same time to them
FACTOR 1 Time Personality and Job Role Characteristics	71	I am aware of which job roles require an individual to plan their activities (e.g. by writing lists) in order to get the job done effectively
FACTOR 2- Pace	9	I always expect the quality of work from others to be high regardless of how long it may take
FACTOR 2- Pace	11	I monitor the amount of work each individual has to do on a weekly basis
FACTOR 2- Pace	17	I give praise to those who work overtime
FACTOR 2- Pace	29	I expect people to work quickly all the time
FACTOR 2- Pace	31	I always make sure people have a lot of work to do
FACTOR 2- Pace	39	I encourage people to become absorbed in a work activity
FACTOR 2- Pace	47	I encourage individuals to become totally focused on completing a work activity

FACTOR 2- Pace	50	I always express a sense of urgency for work activities to be completed
FACTOR 2- Pace	56	In a general context, I always re-prioritise the work activities I want people to do
FACTOR 2- Pace	67	I expect people to complete work activities as quickly as I would do
FACTOR 2- Pace	69	When I judge what needs to be done by others, I consider how it might impact on me
FACTOR 2- Pace	73	I always expect others to work hard
FACTOR 2- Pace	75	I expect others to work faster but never to the compromise of quality
FACTOR 3- Deadlined orientated behaviour	19	Regarding others, I attach deadlines to the work activities I set them
FACTOR 3- Deadlined orientated behaviour	22	Regarding others, I set them deadlines when I perceive them to be performing poorly
FACTOR 3- Deadlined orientated behaviour	24	After I have set a deadline to others, I apply pressure to ensure the deadline is met
FACTOR 3- Deadlined orientated behaviour	35	When giving a deadline to others, I make sure they are aware of the impact that missing the deadline would have on other people
FACTOR 3- Deadlined orientated behaviour	38	When giving a deadline to others, I make clear what needs to be done for it to be met
FACTOR 3- Deadlined orientated behaviour	41	After I have set a deadline to others, I give positive encouragement for the deadline to be completed
FACTOR 3- Deadlined orientated behaviour	45	After I have set a deadline to others, I monitor their progress
FACTOR 3- Deadlined orientated behaviour	52	After I have set a deadline to others, I am aware of the exact date of the deadline
FACTOR 3- Deadlined orientated behaviour	57	Regarding others, when asking for suggestions from them, I give a date to get back to me by
FACTOR 3- Deadlined orientated behaviour	58	When giving a deadline to others, I explain the importance of meeting it
FACTOR 3- Deadlined orientated behaviour	78	After I have set a deadline to others, I ask them to come back to me if there are any problems with the deadline
FACTOR 3- Deadlined orientated behaviour	80	When giving a deadline to others, I let them know that the deadline should be met
FACTOR 3- Deadlined orientated behaviour	82	If others miss a deadline, I ask them to present clear steps to show me what they intend to do in order to complete the work
FACTOR 4- Autonomy	4	When it is my decision, I let others work at home if they request to
FACTOR 4- Autonomy	32	When it is my decision, I let others work flexible hours

FACTOR 4- Autonomy	34	If encouraging an individual to become totally focused on a work activity, I let them complete the work in their own way
FACTOR 4- Autonomy	55	I schedule others' work for them
FACTOR 4- Autonomy	60	Apart from any deadlines I set, others are responsible for managing their own workload
FACTOR 4- Autonomy	68	If encouraging an individual to become totally focused on a work activity, I let them work autonomously
FACTOR 4- Autonomy	70	I allow others to schedule their own work day
FACTOR 4- Autonomy	77	I let people work at their own paces
FACTOR 4- Autonomy	81	Individuals are responsible for how they use their own time at work
FACTOR 5 Temporal Stability (high score indicates low stability)	2	The priority I place on others work in terms of speed or quality changes based on business objectives
FACTOR 5 Temporal Stability (high score indicates low stability)	3	Depending on who the individual is, influences the amount of times I explicitly remind them to complete a deadline on time
FACTOR 5 Temporal Stability (high score indicates low stability)	20	Sometimes it is better for people to get something done fast rather than ensuring the quality is high
FACTOR 5 Temporal Stability (high score indicates low stability)	42	The priority I place for an individual to get something done fast compared to getting something done well changes
FACTOR 5 Temporal Stability (high score indicates low stability)	49	Depending on what I perceive an individual's job demands to be, influences whether I encourage an individual to work quickly on activities
FACTOR 5 Temporal Stability (high score indicates low stability)	54	I draw on the principle 'enough is enough' if I think others are spending too much time on a work activity
FACTOR 5 Temporal Stability (high score indicates low stability)	76	If encouraging an individual to become totally focused on a work activity, I express a sense of urgency for the activity to be done
FACTOR 6 Breaks in workflow	6	I encourage people to have breaks together
FACTOR 6 Breaks in workflow	8	Generally I encourage non-work orientated breaks e.g. coffee breaks
FACTOR 6 Breaks in workflow	44	I take time to socially interact with others in the workplace
FACTOR 6 Breaks in workflow	48	I encourage people to take short breaks (under 10 minutes) if I perceive their concentration reduced from the demands of a work activity
FACTOR 6 Breaks in workflow	59	If encouraging an individual to become totally focused on a work activity, I allow them to engage in short non-work breaks (under 10 minutes)
FACTOR 6 Breaks in	62	I occasionally allow others to work at a slow pace

workflow		
FACTOR 7 Time Perception (High score indicates low perception)	1	If you focus on what work activities need to be done in the immediate future, the long term future will take care of itself
FACTOR 7 Time Perception (High score indicates low perception)	15	I often contact an individual about a work-related issue outside their working hours
FACTOR 7 Time Perception (High score indicates low perception)	21	When setting a work activity to an individual, I consider their capabilities to help estimate how long it should take them to complete (Reverse scored)
FACTOR 7 Time Perception (High score indicates low perception)	33	I never have time to reflect on work that has been done by others
FACTOR 7 Time Perception (High score indicates low perception)	51	Once I make a decision I will stick to that decision no matter what
FACTOR 7 Time Perception (High score indicates low perception)	61	I am the leader so I can go against the general consensus of others as many times as I like
FACTOR 7 Time Perception (High score indicates low perception)	63	Delayed decisions are harder to make than immediate ones
FACTOR 7 Time Perception (High score indicates low perception)	65	I take as much time making a decision as I want
FACTOR 7 Time Perception (High score indicates low perception)	74	Work activities just need to be done, therefore considering how long they will take others is not of importance to me
FACTOR 8- Temporal Depth	12	Reflecting on the past, living in the present and looking to the future are all equally important when it comes to leading others
FACTOR 8- Temporal Depth	14	I consider what problems could occur in the future
FACTOR 8- Temporal Depth	25	To move forward with a vision of the future, I think it is important to recognise the current capabilities of others
FACTOR 8- Temporal Depth	40	To move forward you have to reflect on where you are at the moment
FACTOR 8- Temporal Depth	43	Sometimes knowing the full details of a problem is more important than trying to rectify the problem immediately
FACTOR 8- Temporal Depth	46	If I commit others to work on a long term work objective, I will proactively seek information that may affect whether I should stop that commitment
FACTOR 8- Temporal Depth	53	When communicating a vision of the future, I tell others where we are at the moment

FACTOR 8- Temporal Depth	66	I use new information to evaluate whether a past decision should be changed
FACTOR 8- Temporal Depth	72	Sometimes it is more costly to stick to decisions than change them
FACTOR 8- Temporal Depth	83	When others make a mistake, I ask them to consider how they would prevent making a similar mistake in the future
Social Desirability Scale	13	No matter who I'm talking to, I'm always a good listener
Social Desirability Scale	16	I sometimes feel resentful when I don't get my own way
Social Desirability Scale	27	I use deadlines to make others feel under pressure
Social Desirability Scale	30	I sometimes try to get even rather than forgive and forget
Social Desirability Scale	37	There have been occasions when I took advantage of an individual
Social Desirability Scale	79	I am always courteous even to individuals who are discourteous