Development of the Temporal Intelligence Questionnaire

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Summary

Research has demonstrated that the temporal characteristics of individuals and jobs significantly predict outcome variables such as well-being and performance (Francis-Smythe & Robertson, 2003; Hecht & Allen, 2003; Slocombe & Bluedorn; 1999). This paper will present an account of the development of the Temporal Intelligence Questionnaire (TI-Q). This instrument is proposed to represent individual differences in leaders' (including management roles) time related thoughts, attitudes and behaviours directed towards followers; which are known as *follower-referenced temporal practices*. These practices are 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 13 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, based on knowledge of the time related, dispositional characteristics of followers and the time demands of their respective jobs.

Introduction

Research has demonstrated time to be an important variable within an organization at an individual, group and cultural level of analysis (Francis-Smythe & Robertson, 1999; Gevers et al, 2006; Rutoski et al, 2007; Schriber & Gutek, 1987). In fact a number of researchers have called for further work to be done in this domain (Ancona, Goodman, Lawrence, & Tushman, 2001; George & Jones, 2000). In response to this call, this paper will explore the role of time in leadership and management practices. Given the increased interest into leadership and management that has prevailed over the past few years, it is somewhat surprising that there is a limited understanding of how time permeates these roles. Moreover, the importance organizations attach to time is only too clear when organizational economic goals and measures of performance (such as monthly targets, productivity measures) are considered. However, organizations have limited capability to understand how time impacts in everyday work practices.

This paper will present an account of the development of the Temporal Intelligence Questionnaire (TI-Q). This instrument has been developed to measure Temporal Intelligence (TI). TI is proposed to represent individual differences in leaders (including management roles) thoughts, attitudes and behaviours towards time. There is concern within the contemporary research arena that a preponderance of attention is directed towards the outcomes of leadership effectiveness rather than relevant individual characteristics (Gawith & Flaxman, 2007; Judge & Bono, 2000; Rubin et al. 2005). The importance of operationizing leadership effectiveness as a research variable is reflected in the end-goal of this project. At the same time it is also recognized that there is a need to identify a leader's temporally related individual characteristics that may potentially provide a fruitful basis for explaining leadership as a phenomenon and predicting effectiveness; this has clear implications on selection and development.

Literature Review

Reviewing over 300 articles relating to time, management and leadership, a conceptual model representing TI was developed by the authors. This model distinguishes between *self-* and *follower-* referenced temporal practices. The former refers to thoughts, behaviours and attitudes towards time that are within reference to the self. Francis-Smythe and Robertson (1999) found this in to be an individual difference variable comprised of a five dimensional structure (Time Personality- please refer to table 1).

Table 1- Structure of Time Personality

Dimension	Description
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 in which to complete a task

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The follower-referenced form of temporal practices refers to a leader's thoughts, attitudes and behaviours in relation to time that are directed towards followers. The TI-Q has been developed to measure specifically this form of temporal practices.

Repertory grid interviews
The sample (n=10) was obtained through a quota sampling methodology based on the following criterion variables; leader level, organizational sector and gender. The final form of the repertory grid interview (Kelly, 1955) resulted from a pilot stage of interviews (n=6) that reconciled a number of arising theoretical and practical issues. The interview methodology utilised a dyadic sorting technique and a difference method of construct elicitation. The elicitation of psychological constructs were further facilitated using two frameworks; one based upon the 8 dimensions of the Full Range Leadership Theory (Bass, 1985) and a second on the dimensions of time derived from the literature review. The psychological constructs educed from the interviews were subjected to a-priori qualitative content analysis.

Development of the TI-Q items
Drawing on literature around questionnaire development, a number of criteria were operationalised to guide the development of the instrument's items (Alimo-Metcalfe & Alban Metcalfe, 2001; Devellis, 1991; Kline; 1993; Oppenheim, 1992). In sum,

Expert Analysis of the TI-Q
The TI-Q was examined by three scholars whose expertise lay in the fields of time related individual differences, leadership and/or management. All the experts are active researchers and have previously published in peer reviewed journals in at least one of the three fields. Specifically, information relating to the experts opinion on clarity of statements, issues around response bias, structure of the questionnaire, layout of the questionnaire was obtained. A number of changes to the questionnaire were subsequently made.

Pilot of the TI-Q
A sample of practicing leaders (n=4) completed the TI-Q and an evaluation questionnaire designed for face validation purposes. In addition a cognitive walk-through based interview was conducted with a leader focusing on the clarity of wording and appropriateness of the response scales. Feedback on the questionnaire was also obtained from an independent postgraduate researcher and a focus group consisting of 15 researchers.

Psychometric Pilot of the TI-Q
The TI-Q is currently being distributed on a secure website to a sample of leaders across a range of occupations (target n=300). *It is planned that initial data from the psychometric pilot of the TI-Q will be available for discussion at the conference.*

Results

In relation to follower-referenced temporal practices, this is further broken down into two typologies called: *global* and *adaptive* temporal typologies. Currently, the TI-Q is comprised of 175 items, of which 145 measure the former typology of temporal practices while 25 items represent the latter typology. A 5 item social desirability scale (Hays, 1989) is also included in the TI-Q. The response scale is a 1-7 likert scale with an additional *not applicable* option. The global form of temporal practices refers to how a leader behaves and thinks on dimensions of time in the context of interactions with individual followers and teams/groups of followers. Two main frameworks have been drawn upon to propose that there are 13 dimensions of time (refer to table 2) influencing the global form of temporal practices (Halbesleben, Novicevic, Harvey, & Buckley; 2003 Schriber & Gutek, 1987).

Table 2: Thematic descriptions of the dimensions of time

Theme	Description
Deadlines	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: *External deadlines*- not set by the leader. Thus, these external deadlines may be set by client demands or by a leader's superior. *Internal Deadlines*-set/imposed by the leader.
Example Item	When giving an **external** deadline to others……. I make sure they are aware of the impact that missing the deadline would have on other people
Decisive Timing	The leader's attitudes towards making delayed decisions in the workplace. Also the leaders awareness and reactions to how the individuals they lead may perceive the timing of their decisions (e.g. immediate decisions, delayed decisions).
Example Item	I consider the consequences of what others may think of me if I decide to delay a decision
Pace	The leader's influence on the rate of activities in the workplace (e.g. tasks). Also the rate of leadership and management activities are considered in this dimension of time (e.g. deadlines and delayed decisions)
Example Item	I expect people to work quickly all the time
Co-ordination	The leader's sequencing and co-ordination of their followers and follower's activities in the workplace. This includes the concept of entrainment.
Example Item	If an individual is working with another team, I encourage them to contact the other team just to see how work is progressing
Temporal perspective interaction	The leader's reflection in 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 3 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.
Example Item	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
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.
Example Item	I encourage people to take short breaks (under 10 minutes) if I perceive their concentration reduced from the demands of a work activity
Time Buffers	The breaks ('free time') a leader plans between work schedules and tasks involving followers.
Example Item	When given an external deadline, I will impose my own deadline on others before the formal date of the external deadline
Time Allocation	The cues the leader uses when estimating how long a task will take a follower.
Example Item	When setting a work activity to an individual, I consider their capabilities to help estimate how long it should take them to complete
Quality and speed	The extent to which the leader prioritizes speed or quality based on situational aspects.
Example Item	The priority of getting something done fast compared to getting something done with high quality changes
Quality vs. Speed	The leader's preference for speed or quality in their followers works output.
Example Item	I always expect the quality of work from others to be high regardless of how long it may take
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 out of *formal* times is 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.
Example Item	I often contact an individual about a work-related issue outside their working hours
Autonomy	The leader's behaviours that affect the extent to which followers are autonomous in their work activities.
Example Item	Individuals are responsible for how they use their own time at work
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.
Example Item	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

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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 firstly, the behavioural manifestations of four dimensions of Time Personality for each of his or her followers (the leisure time awareness scale is omitted due to deemed conceptual irrelevance to work). Secondly, the job time characteristics that are required for the job to be done effectively (relating to the four dimensions of Time Personality). For example, a job (not the leader) may require a follower to juggle many tasks at the same time (polychronicity). 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.

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
I am aware of who like to juggle several activities at the same time
Depending on who the individual is, influences whether I delegate a number of activities at the same time to them
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

There is a body of empirical research that supports the structure of the adaptive typology of temporal practices and also provides a basis for predicting the relationship between TI and outcome variables such as well-being (followers) and performance. Firstly, Francis-Smythe and Robertson (1999) found that Time Personality significantly predicted (+ve) 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 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). The adaptive typology of temporal practices argues that a leader/manager can play a facilitative role in supporting a follower to manage their behaviours based upon the related temporal demands of the job. Further support for this derived from the same study that also measured job time characteristics and found evidence through multiple regressional analysis that Time Personality moderated the relationship between personality-job fit (temporal) and well-being. Thus, in this respect socialization effects from the job were considered to account for individuals adapting behaviours to fit job demands. The items measuring adaptive temporal practices are based upon the Time Personality Indicator-TPI (Francis-Smythe & Robertson, 1999) and Job Time Characteristics- JTC measure (Francis-Smythe & Robertson, 2003).

Further empirical evidence supporting the potential importance of this aspect of TI in relation to outcome variables derive from time related person-job characteristics fit studies that found the more congruent the *fit* relationship, the higher the job performance

(Hecht & Allen, 2003; Slocombe & Bluedorn; 1999). The notion of drawing on Time Personality in the realms of leadership and management may have potential beneficial implications for time management training.

Discussion and Future Research
The following prospective research methodologies are due to commence in September 2008 for the aims of further developing and validating the TI-Q and the TI construct:

Study 1
Administration of self-report questionnaires for construct validation of the TI questionnaire using a between-subjects design (convergent and divergent validity). The following three conditions will be randomly assigned to participant managers (total sample size for phase 5a, n=600):
1. TI questionnaire and NEO PI-R personality inventory (n=200).
2. TI questionnaire and Swift aptitude assessment (n=200).
3. TI questionnaire and leadership style (n=200).

Study 2
Obtain organizational and subordinate leadership effectiveness ratings for participant managers. The Effectiveness ratings will be accomplished through:
i) Team performance/productivity (organizational measure). Performance ratings of this type will derive from managers within one organization (target n=100 managers).
ii) The managers subordinates ratings, including Leader Member exchange, employee engagement, collective identity, satisfaction with leader, Asset stress analysis and subjective team performance measures (n=2-4 subordinates per manager, n= 100 managers).

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