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Time-related individual differences

Abstract

Post-modernism has brought about changing demands with respect to time in work organisations. Whilst the impact of this has been given some attention at both the organisational and individual level far less has been given to a consideration of the extent to which individual differences might moderate the impact of such changes. In order to proceed with this line of enquiry it is necessary first to be able to measure individual differences related to time. This paper, through an analysis and synthesis of existing measures of individual attitudes/approaches to time, a subsequent qualitative study, and large quantitative survey study (N=683) identifies a five factor structure for time-related individual differences (Time Personality) and reports on the development of five complementary measurement scales : Leisure Time Awareness, Punctuality, Planning, Polychronicity and Impatience. A series of reliability and validity studies indicate that the scales are psychometrically sound. The findings are discussed in the context of the role Time Personality might play in moderating the effects that differing organisational structures and changing work demands might have in organisational settings.

As part of a mooted societal change from modernity to postmodernity a number of authors have drawn attention to changes in our familiar understanding of the relations between time and space. In his *The Condition of Postmodernity* (1989) David Harvey coined the term time-space compression to capture the sense that the speed with which global communication now takes place has substantially altered our temporal and spatial horizons. Technological innovation in service of the economic need to accumulate capital more thoroughly has rendered global communications instantaneous and thereby reduced our perceptions of spatial distance. Giddens too (1994) is concerned with the changing nature of these horizons, though he refers to time-space distantiation, by which he means that increasingly social relation between people no longer requires their mutual physical presence.

While these changes represent important developments at a societal level, there has been little work on exactly how temporal horizons are mediated by the actors themselves. This paper focuses on the role of individual differences in this process, specifically in an organisational context.

Schein (1990) suggests these temporal horizons within an organisation are manifest as part of their culture defining organisational culture as : 'a pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration -that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.'

This definition acknowledges the role of the individual (a new member) as a ' learner' within the society being taught how to behave (a process of organisational socialisation)....but what factors might determine the extent to which this is accomplished ? There has been much debate in the academic literature over the years as to whether an individual's behaviour within a group or society is determined by a person's traits or characteristics (e.g. see Staw & Ross, 1985) or whether the situation determines the behaviour (e.g. see Salancik & Pfeffer,1977). It is generally agreed now that both of these approaches are too narrow and that interactionism (e.g. see Schneider,1983;1987), in which it is assumed that behaviour is jointly determined by the person and the situation is more appropriate.   The interactionist perspective within organisational psychology acknowledges this two-way process, accepting that jobs can modify people (socialisation processes) and people can modify jobs (Semmer, 1994).   The emphasis is on attaining best 'fit' between the person and the job (P-E or P-J fit theory, Edwards,1991) on the basis that a fit produces positive outcomes (such as high job satisfaction and job involvement), a mis-fit negative outcomes (such as high absenteeism, poor psychological and physical health).

Fraisse (1963) made specific reference to the socialisation process in relation to time and organisations, saying that work in general and the work organisation more specifically, have a major influence on people's time-related behaviours, with workers often becoming so entrained to their work organisation that families and others become residual claimants of their time.

Paolucci (1996) suggests that the types of entrainment to work have changed over the years, in that "whilst the postmodern temporal condition continues to maintain some of the characteristics of the concept of time typical of the

modern age, it presents some radically different aspects from those of the past." Time now is fragmented and multiple, no longer linear, continuous, regular and uni-directional. Now people are required to be able to master fluid and flexible temporal regimes, flexibility being the key, indeed tele-working is a characteristic of post-industrial production processes. Tele-working highlights a move towards more 'task-oriented' working where work is focused on the task not the time taken to carry it out. This in turn promotes less separation between 'work and leisure', the working day lengthens or shortens according to what is to be carried out, not to clock time. Whilst these changes have been noted and their effects on the home-work interface documented (e.g. Garhammer,1995), little attention has been paid to the role of individual differences in this process - have some people become more easily entrained in this respect than others and if so what factors determine this? Do we have a Time Personality that predisposes us to react in certain ways to different types of entrainment? Given that there is much evidence in the literature to support the moderating role of individual differences such as ability, personality and motivation in 'learning' generally (see Noe,1986) then the most likely answer to this question is yes.

This paper sets out to explore, on an empirical basis, the notion of 'Time Personality' as a multi-dimensional construct which takes account of individual behaviours, cognitions and affect, and which is modifiable. It then goes on to consider ways in which such a Time Personality might moderate organisational socialisation effects in some specific work settings.

A review of the literature shows that an interest in time and individual differences spans a period from the early 1900s (e.g. Munsterberg, 1913) to the present day (e.g. Conte, Landy & Mathieu, 1995; Macan, 1996) and

highlights the importance of the topic for both individual and organisational health and productivity. However, research in each of the areas has often proceeded along quite disparate paths with the result that there exists in the literature a number of different measures of 'individual differences related to time'. Most of the research has been carried out since the late 1980s in the fields of psychology, management and organisation studies, marketing, consumer behaviour and sociology. Table 1 presents a chronological list of measures identified in the literature which purport to measure either individuals' attitudes towards time, their thoughts or feelings about time or their time-related behaviours.

Insert Table 1. about here

Kaufman, Lane and Lindquist (1991) first proposed the use of the term 'Time Personality' but in a somewhat more restricted sense to that proposed here. They proposed that individuals have *styles* of time use which combine to form overall time personalities which govern responses to different time-related situations. Their approach then was purely behavioural, the multi-dimensional Time Personality proposed here considers behaviours, cognitions and affect.

To achieve an integration and synthesis of the individual temporal dimensions identified from the literature, a thematic analysis of each of the studies was carried out. This revealed a considerable duplication of concepts across the measures. Fourteen dimensions were identified as shown in Table 2.

Insert Table 2. about here

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Given the variety of time-related constructs identified the first research goal was to identify a conceptually coherent set which might contribute to a Time Personality and from this develop sets of scale items using qualitative interviews and past literature. This initial set of 200 items were then refined through factor analysis of responses from a large UK sample to 43 items. Factor analysis is a statistical process which identifies (a) which items from the questionnaire are measuring a particular factor, and (b) the extent to which they do this compared to the other items for that factor. This allows small scales of relevant items to be developed. To confirm the factor structure responses from two other samples were analysed in the same way. Concurrence in factor structure across the samples indicates robustness. Finally, a series of reliability and validity studies were carried out to check that the scales were psychometrically sound (i.e. that they were reliable measures of the constructs we purported them to be).

PILOT STUDY

To generate an initial set of items, refine and reduce them to a manageable set.

A qualitative study based on the template approach (Crabtree & Miller, 1992), was carried out to: (i) affirm those temporal dimensions previously identified, (ii) to identify any new temporal dimensions, and (iii) to provide material for item generation. Data collection was through five individual in-depth interviews and three focus groups of a diverse occupational sample of 13 people (9 males aged between 18 and 30 and 4 females aged between 30 and 50), each lasting between 45 minutes and 2 hours. Interviews were recorded and began by being unstructured and non-directional and then key

words depicting the original 14 temporal dimensions (see Table 2) were used to prompt subjects to talk freely about their experiences of time.

Analysis of the transcripts resulted in one of the original dimensions being removed (speed/accuracy) and two new ones (time wasting and perceived task load) being added. The most important theme to emerge from the data was that of the importance of the effect of situational context on many of the dimensions. Attitudes to time were often very different dependent on whether they related to being at work, at home or on holiday. This notion is supported by both Feldman and Hornik (1981) in the marketing and consumer behaviour literature and O'Driscoll, Ilgen and Hildreth (1992), who suggest that time issues should be investigated both in and out of work.

An inital set of 200 items was generated both from the literature and interview data, corresponding to the hypothesised dimensions. Where items in existing measures originally referred to organisations or working in groups the wording was changed to apply to the individual. Where feasible, general statements were changed to refer specifically to work and identical items were constructed, where appropriate, to refer to home and holidays. Where no existing items could be identified in the literature they were generated by the researchers (e.g. need for variety within a day). Items referring to job behaviours were re-worded to reflect individual preferences to take account of the fact that actual work behaviours do not necessarily reflect choice or preference.

A framework was then developed to facilitate the selection of items for the new scales from the large item pool, based on the use of a blue-print representing the content areas to be sampled and the ways in which the

content areas manifest themselves i.e. preferences or behaviours in each of the three contexts: work, home and holidays, as proposed by Rust and Golombok (1989). At this stage 141 items were selected.

The items were further reduced to 134 as a result of a small pilot study which identified problems in item interpretation. To monitor the effects of respondents making socially desirable responses, five items comprising a social desirability scale (Hays, Hayashi & Stewart, 1989) were spread throughout the questionnaire. Pilot questionnaires were distributed to fifteen organisations (public and private sector) and returned either personally, by post or by company internal mail systems. One hundred subjects (70% employed, 30% students) returned completed questionnaires.

An analysis of the social desirability response scale showed evidence of a socially desirable response set only for college students. Given that students formed a small proportion of the intended Main Study sample, the scale was removed at this stage. Items pertaining to each dimension were then grouped together as sub-scales. An iterative process of item analysis was then used to refine each of the sub-scales to make sure they were internally consistent . This process resulted in the reduction of 129 items to 82 across 17 sub-scales. Of the sub-scales seven showed reliabilities (coefficient alpha) above 0.7, four were between 0.6 and 0.7 and six were below 0.6.

MAIN STUDY

Item Refinement Through Factor Analysis Of Responses From A Large

UK Sample

Sample

The 15 organisations used in the Pilot study accepted 1412 modified questionnaires, of which 683 (48%) were returned completed. Sample composition was balanced in terms of gender, age, job and type of organisation.

The 683 completed questionnaires were split randomly into two groups of 341 (Group one) for exploratory factor analysis and 342 (Group two) for replication of the exploratory factor analysis to demonstrate the robustness of the identified factor structure. Sample composition of each group in terms of age, sex, organisation and job showed no significant differences between samples. Of the 82 items, only 4 differed significantly across groups ($p<0.05$) and hence the sample was considered to be split in a random and unbiased way.

The 82 items in the Group 1 data-set were factor analysed using squared multiple correlations in the diagonals and the Principal Axis Factoring procedure. The factors were rotated using an Oblimin rotation and five non-orthogonal factors were retained, accounting for 27% of the common variance. The five factors were: Leisure Time Awareness; Punctuality; Planning; Polychronicity and Impatience. Factor descriptions, sample items and an indication of the variance explained by each factor are shown in Table 3. The full factor matrix is available from the authors.

Insert Table 3. about here

A second-order factor analysis of the factor-derived sub-scales extracted one factor with loadings of Leisure Time Awareness 0.56, Punctuality 0.28,

Planning 0.47, Polychronicity 0.21 and Impatience 0.49, thus providing support for a single higher-order 'Time Personality' construct.

Replication Of Factor Structure On Other Data-Sets

Two other samples, Group two (as detailed above, N=342) and a third sample, Group three, were subjected to an identical factor analysis. A similar five factor structure emerged. Group three contained 156 people, 46% male. Both item distribution across factors (see Table 4) and inter-correlations of factored sub-scales across all three samples were very similar (mean inter-correlation across sub-scales = 0.16, 0.27 and 0.16 respectively). The average percentage of items with their highest loading on the keyed scale was 96% across the 3 samples. Using a similar type of analysis Hashemi (1981) claimed 94% to be good across four samples on the EPQ. In the Hashemi (1981) study, for the scales presumed well replicated, the minimum mean factor loading was 0.37 and the maximum 0.51 with a mean of 0.43. In this study, the minimum was 0.42 and maximum 0.51 with a mean of 0.46. On the basis of these criteria the factor structure was deemed well replicated in the two independent samples.

Insert Table 4. about here

Reliability And Validity Studies

Reliability

Test-retest reliability ensures measurement on two different occasions will produce very similar results and internal consistency reliability ensures that all items within the scale are measuring the same thing.

Test-retest reliability

Two hundred of the Group one and Group two subjects completed a second set of identical items within a month of completing the first set (response rate 55%). Test-retest reliability was above 0.7 for each of the scales (Table 5).

Internal consistency reliability

Cronbach's alpha and item-total correlations were computed for each sub-scale on the original Group one sample data (Table 5). Scales one, two and three were very acceptable at alpha >0.7 and scales four and five were acceptable for research purposes at 0.63 and 0.65 respectively. The fact that the mean scale inter-correlation is substantially lower than the mean of the individual scale reliabilities (0.16 vs. 0.68) provides support for the discriminant validity of the scales (see Briggs & Cheek, 1986).

Insert Table 5. about here

Validity

Convergent validity (the testing for convergence across different measures of the same trait or behaviour) and discriminant validity (the testing for divergence between measures of related but conceptually distinct behaviours or traits) (Campbell & Fiske, 1959) can be demonstrated through a multi-trait

analysis where the sub-scales are analysed together with other self-report scales (theoretically related and unrelated). Convergent validity may also be demonstrated by showing covariation between two different methods of measuring the same construct.

Validation Against Other Self-Report Measures

Several existing time-related scales were used to explore the discriminant validity of the new scales. The scales used were: the time urgency (TU) and perpetual activation (PA) scales of (Wright et al., 1992) and five scales from the Time Structure Questionnaire (TSQ - Bond & Feather, 1988) measuring sense of purpose (P), structured routine (SR), present orientation (PO), effective organisation (EO) and persistence (PE). Given the fact that the most prolific reference to date to time-related individual differences is to Type A behaviour pattern, and time urgency is the time-related facet of this, it was deemed important to use the TUPA scale to demonstrate the new scales were measuring more than time urgency alone. The TSQ was used as it appears to be the most frequently used individual time measure to date.

Assuming the maximum correlation possible between two identical constructs might be 0.72 (based on average alpha coefficients of 0.7) then the proportion of variance they might have in common is 0.52. Taking an overlap of 33% as substantial, a minimum correlation of 0.41 (square root of (1/3 of 0.52)) was taken as the criterion of similarity.

Sample

One hundred and fifty six subjects (46% male, 54% female, 37% under 25, 34% between 26 and 35, 45% between 36 and 45, 28% between 46 and 55

and 4% over 56) completed the scales for the validation study and the correlations between all variables are shown in Table 6.

Insert Table 6. about here

The correlational analysis suggested Leisure Time Awareness, Polychronicity and Impatience did not overlap with any of the other constructs. Planning showed some overlap with Time Urgency and Perpetual Activation.

These results are consistent with the nature of the constructs thought to be measured by the new scales.

Validation Against Measures Of Time Estimation

To demonstrate convergent validity (that two different means of measuring a construct concur), measures on a sub-set (Punctuality and Impatience) of the sub-scales were correlated with objective measures of punctuality and impatience involving estimations of time durations.

Being able to judge accurately how long one has been engaged in an activity may facilitate punctuality (i.e. being on time for the next activity). Under-estimating the duration of an activity may make someone late for subsequent appointments, whereas over-estimating the duration of an activity may make someone early. Thus, people who describe themselves as very punctual (and therefore score high on self-report measures of Punctuality) might be expected to overestimate the duration of an activity just completed, and those who score low on self-report measures of Punctuality to under-estimate.

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It might also be expected that people who describe themselves as highly impatient feel that time passes more slowly than those who describe themselves as less impatient. It is the 'impatient' people in a queue who complain they have been 'waiting for hours'. Thus, if asked to judge when 10 minutes has passed, the most impatient people will judge it to have passed soonest. In a related study, subjects were required to carry out a task and to estimate retrospectively how long they thought the task had actually taken. In a later part of the experiment they were asked to estimate time-in-passing by indicating when they thought a specified time interval of 10 minutes had passed. Findings provided support for the construct validity of the new Punctuality and Impatience scales by showing that: (a) those people who perceive themselves as most punctual are most likely to over-estimate the duration of a task just completed and those who are least punctual will most under-estimate the duration of a task just completed ($r=0.31, p<0.05$); and (b) those people who perceive themselves as being impatient, under-estimate the duration of time in-passing and hence judge time to be passing more quickly than it actually does ($r=-0.41, p<0.01$). (See Francis-Smythe (1996) for more details).

Normative data

Values of items within sub-scales were summed and then divided by the number of items in the sub-scale to give sub-scale scores on a common range of 1 through 5. The overall time personality score was computed as a sum of all sub-scale scores.

Means, standard deviations and ranges are provided in Table 5 for Groups one and two, broken down by age, gender and job type. There is a statistically significant age difference in Polychronicity (young people are more

polychronic than older people (F=3.30, (5,673) p<0.001)). There are statistically significant differences in each of the four work-related factors across jobs (Punctuality: F=5.87, (7,669) p<0.001; Planning: F=24.03, (7,669) p<0.001; Polychronicity: F=5.85, (7,669) p<0.001; Impatience: F=2.73, (7,669) p<0.001). When sub-scales are summed to give a total 'Time Personality' score, there are statistically significant differences across jobs (F=9.31, (7,669) p<0.001) but not age or gender. Teachers, managers and professionals score higher than students, careworkers and manual workers.

DISCUSSION

This paper has presented a five factor scale of Time Personality, the Time Personality Indicator (TPI), derived as a result of the analysis and synthesis of many of the existing known measures and dimensions of time attitudes and behaviours. The TPI comprises five complementary measurement scales : Leisure Time Awareness (an awareness of the actual clock time and how time is being spent outside of work), Punctuality (attitude towards being on time - at the level of both minutes and days), Planning (attitude towards planning and sequencing tasks in advance), Polychronicity (preference for doing more than one thing at a time) and Impatience (tendency to want to complete task in hand quickly).

It is interesting to note the significant differences between different job holders on each of the four work-related factors. The extent to which people have selected themselves into the best 'fit' occupation (Holland,1985) or the extent to which they and the job have gone through a process of adaptation is impossible to tell from cross-sectional studies such as those cited here. This can only be fully assessed through longitudinal studies, although the point being made in this paper, written from an interactionist perspective, is that both are indeed possible and likely, the need is simply to acknowledge the possible contribution of both sources of influence . The age difference in polychronicity is most likely a manifestation of the decrease in activity (mental and physical) with increasing age. It was interesting to note there was no significant gender difference in polychronicity, as previous work has suggested the forced enactment of triple roles for many women (paid worker, housekeeper and childcarer) often serves to develop an ability and indeed, a preference, for polychronicity (Reeves & Szafran,1996; Davies,1994; Hantrais,1993).

As well as considering the constructs independently, it is important to also acknowledge the possible interactions that might exist between them and the role that these may play in moderating some of the factors associated with the post-modern temporal condition. One example pertains to the notion of 'task-oriented' working, which may generate perceptions of task overload. This has been acknowledged as a contributory factor in psychological distress, anxiety and job dissatisfaction (Kirmeyer, 1988 and Beehr et al., 1976)). It has also been noted that when time demands are high, those people most concerned about the passage of time suffer most (Landy et al., 1991). This suggests that those high on *Impatience* and *Leisure Time Awareness* may well be predisposed to stress/strain reactions under conditions of task overload. It may, however be important to speculate on the possible interaction of these

two traits with the other three (i.e. Punctuality, Planning and Polychronicity).
People high on *Punctuality, Planning* and *Polychronicity* may well use these
to help them control the situation, for example by planning carefully how long
and when to do each task, keeping to the schedule set and carrying out some
tasks together. Thus, whilst perception of task overload may still be present, it
might be accompanied by a perception of control which then removes or
lessens the negative outcomes (stress/strain) and enhances positive outcomes
such as achievement satisfaction. Interplays such as these between factors are
important areas for further consideration.

At a summative level, the notion of a 'high scoring' Time Personality depicts
someone who is generally very aware of passing time, has a need to set and
meet deadlines, to plan their time and activities, to have several things on the
go at the same time and to generally try to do more in less time by maybe
hurrying along both other people and themselves. The findings of significant
differences across jobs in terms of overall Time Personality (from high to low:
teacher, manager, professional/technical, sales/finance, clerical, student,
careworker, manual) would appear to add further validity to the findings.
Teachers' lives are governed by clocks and deadlines (the 40 minute lesson),
whereas careworkers need to accommodate the often unpredictable needs of
others (thus necessitating a need to be flexible and not constrained by clock
time and deadlines). Indeed, in her study of care-workers, Davies (1994)
describes these differences in terms of 'clock time' and 'process time'. These
findings have important implications for theories of vocational choice and
development.

As far as the writers are aware there are no other measures in the literature
which have been developed with the objective of integrating and

synthesising so many of the previously identified time -related constructs. Three other multi-dimensional instruments do exist which reflect differing aspects of the TPI (Conte et al., 1995; Landy et al., 1991; Usunier & Valette-Florence, 1994). The TPI therefore appears to measure a modifiable, multi-dimensional construct which relates to individual behaviours, cognitions and affects concerned with time which we have called Time Personality .

The final section of this paper begins to suggest ways in which this Time Personality might relate to issues of organisational structure and change in the world of work.

Adopting the P-E fit perspective outlined earlier consideration is first given to the ways in which this might be most easily achieved in, by way of example, two differently structured organisations: mechanistic and organic. Then, using change theory, consideration is given to how fit might be best achieved in both a 'planned approach' and an 'emergent approach' to change, and how a consideration of time personality might impact on the management of change.

Mechanistic structures are characterised by specialisation of tasks, closely defined duties, responsibilities and technical methods, and a clear hierarchical structure. In contrast, organic structures are characterised by much greater flexibility, adjustment and continual redefinition of tasks, a network structure of control, authority and communication, lateral consultation, and commitment to the work group and its tasks (Burnes, 1996).

A mechanistic structure is perhaps more likely to work to set schedules and deadlines, and in this respect it might be expected that in terms of initial 'fit'

might be more suited to a person high on Punctuality and Planning. For example, being late when working for a large multi-national mechanistic organisation, is unlikely to be tolerated. The notion of closely defined duties and responsibilities also suggests that monochronicity, with a focus on one thing at a time might be more appropriate than high Polychronicity; for example, working on a mechanistic production line may entail repeatedly doing the one same task. A person high on Impatience may find this mechanistic structure frustrating, in that tasks are required to be completed according to clearly defined procedures, for example, there may be little flexibility in terms of say 'jumping the queue for typing or copying a report'.

In contrast, an organic structure focuses on the task and flexibility. This is likely to provide a better 'initial fit' for a person who is low on Leisure Time Awareness and flexible about working times (perhaps with few set schedules in their social life), who is low on Punctuality (i.e. comfortable with not meeting deadlines (short and long-term), and happy to work flexible hours), who is low on Planning and hence can change direction in their work easily without feeling a sense of non-achievement, who is high on Polychronicity and hence can have many tasks/projects on the go at the same time, and who can be high on Impatience as the flexible structure will allow them 'do things themselves' if they want to. For example, working as a secretary in an 'organic' type of office may require doing several things at the same time such as speaking on the phone and filing, and also being late when working in a small informal organic setting may well be acceptable. Polychronics are far less likely to compartmentalise home and work than monochronics, they often see the opportunity to combine tasks from work and home and thereby complete more in less time thus suiting a flexible organic environment.

In respect of organisational change, the planned approach, which sees change as a process of moving from one fixed state to another through a series of predictable and planned steps (Burnes,1996), is likely to suit a person high on Planning, Punctuality and Monochronicity, whereas the emergent approach which sees change as a continuous, open-ended and unpredictable process of aligning and realigning an organisation to its changing environment (Burnes,1996) might better suit a person low on Planning and Punctuality but high on Polychronicity.

There are two schools of thought with respect to change management for whom the notion of Time Personality has relevance: the Individual Perspective school and the Group Dynamics school (Burnes,1996). The Individual Perspective school acknowledges that to change organisations, one must change the people in those organisations through either behaviour modification techniques or changing perceptions. Change management here then would focus on changing the individual's time personality to 'fit' better with the new model of the organisation. The Group Dynamics school emphasises bringing about change through team work, in the belief that individuals' behaviour is constrained by group pressures to conform and that change should be targeted at changing the group's norms, roles and values. One approach here may also be to build complementary 'time teams', where the teams have an appropriate mix of 'time team' types approach aimed at meeting new organisational goals similar to Belbin's (1981).

In summary, this paper has argued that any consideration of changing temporal horizons in a societal change from modernity to post-modernity should take account of how such changes are mediated by people themselves, and in this respect has presented a set of scales, based on an exhaustive

review of earlier measures, designed to measure the time-related individual

differences representing 'the person' in this process.

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Table 1 A chronological list of studies identified from the literature which purport to measure some aspect of individual time-related attitudes or behaviours

Study & Date	Focus of measure
Goodman (1967)	Time span Capacity: Time Extension, Time Value Orientation
Jenkins, Rosenman & Friedman (1967)	Jenkins Activity Survey
Calabresi & Cohen (1968)	Time Attitudes: Time Anxiety, Time Submissiveness, Time Possessiveness, Time Flexibility
Bortner (1969)	Bortner scale for TABP
Wessman (1973)	Temporal Experience: Immediate time pressure, Long-term personal direction, Time utilisation, Personal inconsistency
Beehr, Walsh & Taber (1976)	Quality of work, Quantity of work
Rosenman (1978)	Structured Interview to measure TABP
Haynes, Levine, Scotch, Feinleib & Kannel (1978)	Framingham scale for TABP
Levine, West & Reis (1980)	Punctuality
Gonzalez & Zimbardo (1985)	Time Perspectives: Future-Work motivation, Present-Fatalism, Present-Hedonism, Future-goal seeking, Time sensitivity, Future-Pragmatic action, Future-Daily Planning
Lay (1986)	Procrastination
Spence, Helmreich & Pred (1987)	AS and II scales of TABP
Schriber & Gutek (1987)*	Organisational Temporal Dimensions: Schedules and deadlines, Punctuality, Future Orientation, Quality vs. Speed, Allocation of time, Time boundaries, Awareness of time use, Work pace, Autonomy of time use, Synchronisation and coordination, Routine vs. variety, Intraorganisational time boundaries, Time buffer in workday, Sequencing of tasks
Bond & Feather (1988)	Time Structure: Sense of Purpose, Structured Routine, Present Orientation, Effective Organisation, Persistence

Jordan & Bird (1989)	Future Perspective Scale
Macan, Shahani, Dipboye & Phillips (1990)	Time Management Behaviour Scale: Setting goals and priorities, Mechanics scheduline/planning, Perceived Control of time, Preference for disorganisation.
Kaufman, Lane & Lindquist (1991a)	Polychronic Attitude Index
Landy, Rastegary, Thayer, Colvin (1991)	Time Urgency: Awareness of time, Speech patterns, Nervous energy, List making, Eating behaviour, Scheduling, Deadline control
Wright, McCurdy, Rogoll (1992)	TUPA scale: Time Urgency (TU), Perpetual Activation (PA)
Bluedorn, Kaufman & Lane (1992)	Polychronicity in organisations
Woodilla (1993a)	Time based behaviours: Individual time management, Individual pace, Internal time clock, Organisational time horizon
Lay & Schouwenburg (1993)	Procrastination
Usunier & Valette-Florence (1994)	Time Styles: Preference for economic time, Preference for non-linear and unorganised time, Orientation towards the past, Orientation towards the future, Time submissiveness, Time anxiety
Conte, Landy & Mathieu (1995)	Time Urgency: Time awareness, List making, Eating behaviour, Scheduling, Deadline control

* This study is included because although it measures organisational time norms it is proposed, by its authors, to have parallel individual constructs.

Table 2 Individual temporal dimensions identified from the literature

Dimensions	Brief definition
time orientation	preference for focusing on the past, the present or the future;
time span	capacity to carry out tasks with varying time spans;
scheduling	extent to which one sticks to schedules and meets deadlines;
punctuality	extent to which one is punctual and can tolerate unpunctuality in others:
time boundaries	extent to which one has clear boundaries between work and leisure;
synchronisation	extent to which one can organise completion of one task alongside and in unison with others;
co-ordination	extent to which one can organise the completion of one task in sequence with one or more others;
time buffers	extent to which one plans free slots into the day to allow for unpredicted events or to allow scheduled events to take longer;
pace	external pace set by the task demands;
time urgency	internal pace imposed by the individual;
speed vs. accuracy	extent to which accuracy is compromised to attain speed;
polychronicity	combining of activities simultaneously;
awareness of time use	experience of time-in-passing;
awareness of clock time	awareness of actual clock time;
autonomy	perception of control over time.

Table 3 Factor descriptions
Factor 1 - Leisure Time Awareness (9 items accounting for 10% explained variance)
Time spent outside paid work. It relates to an awareness both of the actual time and how time is being spent. High scorers on this factor tend to report being aware of how they use their time and claim to know what the clock time is. This consistent heightened awareness suggests that they are at ease with schedules and deadlines, even on holiday. Conversely, the low scorers report lower awareness of how they use their personal time and consequently prefer places with few schedules and less to do. Example items are '*I do things, at home, when it suits me not the clock* and '*I generally prefer not to be aware of what time it is whilst on holiday.'*

Factor 2 - Punctuality (10 items accounting for 6% explained variance)
Attitude towards being 'on time'. High scorers on this factor see themselves as being punctual and think others should be likewise. This punctuality applies at the level of 'minutes' with respect to meetings with other people as well as 'days and minutes' with respect to meeting deadlines for tasks set. They believe they are good judges of how long things will take to do which helps them to be on time. Conversely, low scorers believe that they are not very accurate at judging how long things will take to do but this does not perturb them, they do not worry if either they or others are late. They may well also miss agreed deadlines. Example items are '*I prefer to not be late for social appointments*' and '*I can usually estimate how long something will take, at home, to the nearest half-hour*'.

Factor 3 - Planning (9 items accounting for 4% explained variance)
Attitude towards planning tasks in advance. This involves the sequencing of tasks (not necessarity the scheduling), often through the writing of lists. High scorers on this factor report that they are aware of the tasks they have to complete in the future, have prioritised their sequence and attempt to be ready to start work again, at the next available moment. Low scorers on this factor say that they act spontaneously, often finding themselves without the necessary materials needed to complete a task. Example items are '*At work, I like writing lists to help me sequence my activities*' and '*While waiting for appointments I always bring something to do.*'

Factor 4 - Polychronicity (8 items accounting for 4% explained variance)
A preference for doing more than one thing at a time. High scorers on this factor enjoy flipping between activities whether it be minute by minute (e.g. reading a book and watching the television) or hour by hour (reading a company report and then preparing the dinner) or day by day or month by month (working on several projects concurrently, spending alternate days or months on each). Low scorers prefer to concentrate on one activity at a time, see it completed and then move on to the next one. Example items are '*At work I don't mind having to have several things on the go at the same time*' and '*At home I would prefer to work on tasks where I can see results at the end of the day rather than the end of the month.*'

Factor 5 - Impatience (7 items accounting for 3% explained variance
A tendency to want to complete the task in hand quickly. High scorers on this factor describe themselves as impatient and say that they frequently try to control the speed of their interactions with other people. Low scorers describe themselves as patient and do not try to control the speed of their interactions with other people. Example items are *'At work, I frequently feel like hurrying other people up' and ' I am quite often impatient'.*

Table 4

Comparison Of Factor Analyses Of Three Data-Sets

Sub-scale	No.of items	Group one		Group two		Group three	
		% items highest loading on sub-scale	mean loading of items	% items highest loading on sub-scale	mean loading of items	% items highest loading on sub-scale	mean loading of items
Leisure Time Awareness	9	100	0.51	88	0.51	100	0.48
Punctuality	10	100	0.45	100	0.47	100	0.46
Planning	9	100	0.45	100	0.42	100	0.42
Polychronicity	8	100	0.44	75	0.48	88	0.48
Impatience	7	100	0.46	86	0.43	70	0.45

Table 5

Descriptive Statistics And Reliability Data Of TPI Sub-scales

	Sub-scale 1 Leisure aware-ness	Sub-scale 2 Punctuality	Sub-scale 3 Planning	Sub-scale 4 Polychronicity	Sub-scale 5 Impatience	TOTAL Time Personality
Whole sample						
Mean	2.57	3.83	3.34	2.68	2.98	15.41
No. of items	9	10	9	8	7	43
SD	0.57	0.47	0.54	0.52	0.58	1.51
Range	1-4.5	1.9-5.0	1.66-5.0	1.12-5.0	1.14-5.0	11.4-21.7
Mean scores	*by sex*					
Male	2.55	3.85	3.32	2.63	2.97	15.35
Female	2.60	3.80	3.35	2.73	2.97	15.47
Mean scores	*by age*					
under 18	2.22	3.55	3.61	3.06**	3.36	15.80
18-25	2.56	3.75	3.25	2.79**	2.97	15.33
26-35	2.56	3.81	3.33	2.64**	3.04	15.39
36-45	2.60	3.87	3.41	2.72**	2.97	15.57
46-55	2.59	3.88	3.34	2.63**	2.98	15.43
56-65	2.63	3.85	3.34	2.50**	2.75	15.09
Mean scores	*by job*					
Teacher	2.67	3.83***	3.87***	2.72***	3.04**	16.14*
Student	2.63	3.60***	3.31***	2.81***	2.89**	15.26*
Manager	2.60	3.93***	3.47***	2.74***	3.12**	15.86*
Careworker	2.57	3.68***	3.40***	2.62***	2.88**	15.16*
Clerical	2.52	3.90***	3.14***	2.72***	3.03**	15.31*
Prof/Tech	2.66	3.84***	3.34***	2.87***	2.95**	15.66*
Sales/Finance	2.61	3.85***	3.24***	2.64***	3.08**	15.43*
Manual	2.45	3.91***	3.04***	2.47***	2.86**	14.74*
Reliabilities						
Cronbach a	0.71	0.71	0.70	0.63	0.65	
Item-total	0.61	0.45	0.55	0.53	0.57	
Test-retest	0.74	0.76	0.81	0.70	0.75	

*p<0.05; **p<0.001; ***p<0.0001