An Evaluation of the Relationships between Psychological Climate and the Styles of Cognitive Preference and Manifest Ideas

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Abstract

This study challenges the assumption that the bipolar characteristics of adaption and innovation associated with individual cognitive style preferences directly characterise the content of manifest ideas and in turn the characteristics of organisational change. The findings show psychological climate (in support of the organisational change process) used in this study is significantly related to ideas with adaptive characteristics, but less so to those with innovative characteristics. Furthermore, cognitive style is significantly related to the characteristics of innovative ideas but much less so to adaptive ideas. These two relationships show how the bi-polar characteristics of the Adaptive -Innovative continuum fits with the two characteristics of the manifest ideas where the latter appears as independent. However, while cognitive style and psychological climate have significant relationships with both styles of ideas, climate dominates for ideas with adaptive characteristics, and cognitive style dominates for ideas with innovative characteristics. The lack of a relationship between psychological climate and cognitive style suggests that psychological climate and cognitive style can be considered as independent predictors of adaptive and innovative idea characteristics respectively.

Keywords: cognitive style, manifest ideas, psychological climate

Introduction

The extensive use of the KAI inventory (Kirton, 1976) in organisational settings has assumed that individual cognitive style preferences substantially characterise the manifest creativity of individuals at work and thereby have a direct congruence with the style of change outcomes those individuals initiate in their organisations. Also, as behaviour is not determined solely by an individual's personal characteristics, Lewin's (1952) suggestion that behaviour is a function of the interaction between the environment

and the personal characteristics of an individual is used to complete the study context. Thus, this study investigates the contribution of the variable psychological climate in support of the process of organisational change and its effects on individual cognitive style preferences and the characteristics of manifest ideas. The Environment concerns the structure within which the problem is to be solved and for the individual it is a psychological interpretation of the significance of acceptable and unacceptable behaviours within the organisation. Moreover, whether this psychological interpretation offers the people attempting to solve the problem support or unnecessary constrains in their activities remains to be seen. However, if effective outcomes are to be achieved all aspects of problem-solving need to be managed. The leadership challenge (Hemlin et al., 2013) is to provide a working environment that protects the people in both the problem-solving group and the organisation from conflict and the resulting lack of effective outcomes (Gryskiewicz, 1999). While debate and disagreement can be helpful in evaluating the worthiness of a proposed solution, conflict, stemming from cognitive dissidence can be costly to both personal relationships as well as organisational and problem-solving performance. Furthermore, it is within this context that the problem is defined along with the style of solution expected which can range from improvements through to transformation of existing arrangements and from the simple to the most complex, in Drucker's words (1969) from doing things the same through to doing things differently. A further group of variables are associated with the individual(s) that solve the problems. Here diversity is of importance to provide a rich source of resources that can be match to a wide range of problems to be solved - whether as a formal group, or as a project or just working collaborations. The first diversity is of thinking as in Kirton's (2005) definition of individual cognitive style preference and the Adaption-Innovation (A-I) continuum. The second diversity which is independent of style is that of individual

capacity which ranges from the ability to understand the simple to the most complex of issues.

It is within this framework of organisational problem-solving that the relationships of the three variables of interest are evaluated. The environment is represented by the variable psychological climate in support of the stages of the organisational change process, the A-I continuum is represented by the Kai measure of cognitive style preference, while behaviour is represented by a measure of the characteristics of manifest ideas. The moderation by psychological climate of the relationship between cognitive style preference and manifest behaviour has been well established and in more general terms by Katz and Kahn (1978). The moderation results in the bell-shaped curve of cognitive style preference behaviours being converted into a J shaped curve of actual behaviours that have moved towards the climatic mean (coping) *while retaining the content of the cognitive style construct intact* (Clapp & de Ciantis, 1989; Kirton & McCarthy, 1985). Furthermore, the opportunity to provide ideas for organisational change can be promoted as part of individual psychological climate and has been seen to provide many contributions from the individuals involved (Clapp, 1991; Clapp & Ruckthum, 2016). Whether cognitive style behaviour produces ideas with the corresponding A-I style characteristics and, whether psychological climate and cognitive style preference operate as independent or joint predictors of these characteristics has yet to be established.

Research Objectives

This study tests the hypothesis that cognitive style preferences for adaption and innovation are directly related to adaptive and innovative styles of manifest ideas. Also, the role of psychological climate is evaluated in terms of its relationship with the two styles of manifest ideas.

Literature Review

Psychological Climate

Within the general climate literature are many constructs, each with a wide variety of definitions, e.g. Kirton and McCarthy (1985) uses the term 'cognitive climate' to represent the modal cognitive problem-solving style of the group. For Payne and Pugh (1976) organisational climate variables stem from the more physical, objective aspects of the organisation e.g. size, process, technology, management style. The visibility of these variables is generally limited to people within the organisation and defined from the aggregation of perceptions measured at the individual level (Hage, 1980; Payne & Pugh, 1976). However, according to Eckvall (1996) such observations exist independently of perceptions and understanding of individuals within the organisation.

A more social perspective is followed by this study (e.g. Schneider, 1987) where individuals such as the immediate supervisor who constitutes a ‘significant other’ in as far as the general behaviours of individuals in the organisation are concerned, reflect the view that 'my behaviour, is your environment' (March & Simon, 1958). It follows that the purpose of the climate construct is not to measure organisational characteristics such as technology, size, management style or hierarchy. But to measure how these factors and other organisational characteristics are processed and assigned meaning by the individual (James, 1982). This follows Schneider's (1975) proposal that climate, if it is to be meaningful, cannot be considered a general construct but must focus on a set of behaviours that define an area of research, e.g. Safety (Clarke 2010; Zohar, 1980). Furthermore, the moderation of behaviours by the psychological climate perceptions (associated with the change process) suggests that the individual is controlled by perceived unilateral constraints. However, if as March and Simon (1958) suggest person A contributes to the environment for person B, then as a neighbour, it is equally true that person B contributes to

the environment for person A. This interactive dynamic avoids unilateral control and provides for the accommodation of differences between individuals by moderating all behaviour towards consensual climatic norms while leaving the relatively fixed domain of cognitive style preferences intact (Clapp & de Ciantis, 1989). However, the resultant reduction in the diversity of behaviour leads to a narrowing of view (conformity) and a reduction in depth of thought (Amabile, 1996; Pink 2009). The psychological environment of interest in this study is described by behaviours within the organisation that either facilitate or handicap the performance of the various stages of the change process (i.e. problem definition, idea generation, evaluation and implementation, e.g. Delbecq & Mills, 1985; Van Gundy, 1987).

Cognitive Style

Cognitive style (Kirton, 1976) is the preference for the way in which individuals construct their mental models using predominantly either adaptive or innovative thinking, which in turn determines the way structure is used (be it permeable or fragmented), (Kelly 1963) to form individual concepts. While some structure is ever present else we do not function, the more adaptive individuals prefer the more permeable form that has easy consensual agreement while the more innovative individual, less concerned with consensual agreement, prefers a looser more fragmented structure. This preference for the different forms of structural thinking is independent of capacity or level of the individual and is described by Kirton (1976; 2005; 2011) in his theory of cognitive style. The theory describes a style continuum that is bipolar and is determined by individual *preferences* where an individual at one end is concerned with efficiency and rule/group conformity (Adaption). While at the other end of the same continuum, an individual is more concerned with originality (Innovation) and is indifferent to (even unaware of) rules and group

conformity. The two poles of the bipolar adaption-innovation creative style continuum with their different preferences offer a link to transactional/transformational styles associated with Leadership (Bass, 1998), Values (Swartz, 1999) and Complexity Theory (Stacey, 2000). These preferences have also been related to the personality domain through the dimensions of intuitive/sensing (Myers & McCauley 1985; Tefft, 1990) as well as the open/closed-minded (Costa & McCrea 1992; Von Wittich, 2011) and has shown to be stable over the years (Clapp 1993).

Characteristics of Manifest Ideas

The idea characteristics of interest are those consistent with the two polar descriptions of the Adaption -Innovation continuum. At one end is adaption which defines ideas derived from algorithmic thinking within existing paradigmatic constrains (e.g. environmental, technical and personal) in the words of Drucker (1969) "doing things better". The other end of the continuum is concerned with ideas defined by heuristic thinking outside of existing paradigms and concerns the difficulties regarding the making effective use of transformative ideas "doing things differently" Drucker (1969). These definitions of ***manifest*** idea characteristics are consistent with the polar definition of the A-I continuum while remaining independent of the quantity of ideas involved. These polar outcomes are broadly opposite in nature and aspects such as: Organisational Disruption (skills, structure and competencies), Supply Chain disturbance, Costs, Profits, Time-scales and Risk, all tend to be lower for paradigm consistent (Adaptive) outcomes and higher for paradigm breaking (Innovative) outcomes. However, irrespective of these differences both styles of outcome have been recognised as providing creative solutions when suitably addressing the problem-solving context (Kirton, 2011; Clapp, 2014).

Conceptual Design

In this study, the conceptual framework is guided by Lewin's equation B=f (EI). The primary need is to test for congruence between the A/I preferences of cognitive style (I) and the same characteristics in manifest ideas (B). To complete the relationships proposed by the equation the role of psychological climate (E) as it relates to both idea characteristics and to cognitive style is also to be assessed. The assessment requires three sets of relationships to be examined. The first between the bipolar A/I continuum of the Kai measure and the Adaptive/Innovative factors of the measure of idea characteristics. The second between the measure of psychological climate Adaptive/Innovative factors of the measure of idea characteristics. The third between cognitive style and psychological climate to test for mediation.

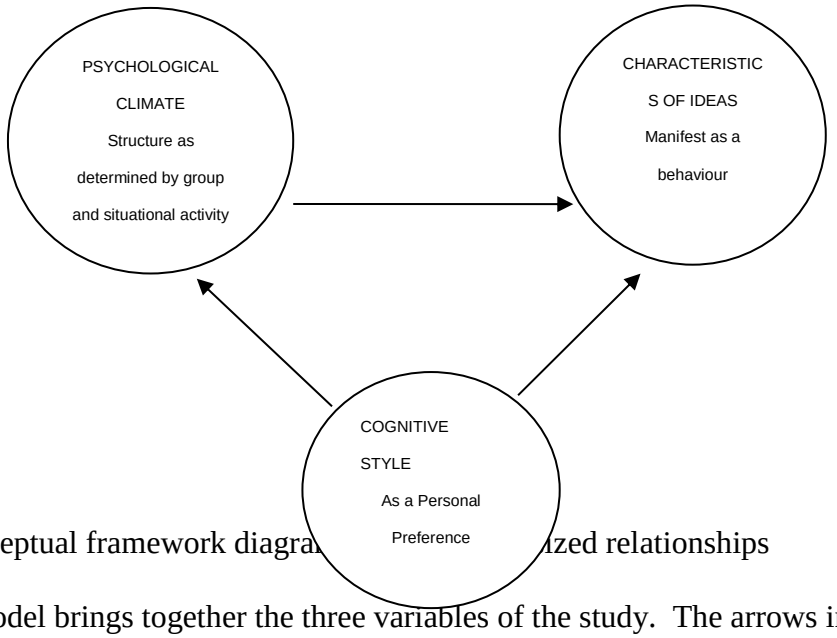

Figure 1. Conceptual framework diagra[illegible]lized relationships

This model brings together the three variables of the study. The arrows in Figure1 indicate the relationships of interest between the variables. Furthermore, the factors that form part of each variable are psychometrically robust and are evaluated within the following hypotheses outlined in the next section.

Hypotheses

H1o. As Kai is the bipolar measure of adaptive and innovative preferences (A/I), a significant amount of variance for the two characteristics of manifest ideas is expected to be accounted for.

H2o. The relationship between climate factors and the characteristics of manifest adaptive ideas, both of which concern adaptive characteristics, is expected to be significantly positive.

H3o. Similarly, for the factors of cognitive style the relationship with innovative ideas is expected to be significantly positive.

Sample

The sample used in this study (n=153) came from the Administrative Services Organisation within the head office of a multinational oil company. The operating objectives of the organisation are concerned with efficiency and responsiveness mainly within routine processes and can be considered as significantly adaptive by the nature of its activities.

Measures

Psychological Climate Measure

Several studies and their inventories (see Appendix 1) were compared with the outline stated earlier. While none of these inventories were specifically designed to cover all aspects of the change process domain, each of them had some association with organisational performance, organisational change and

creativity. To obtain a more accurate match to the target domain, each of the inventories examined were considered as a source of items that would be suitable candidates for a more complete item pool. The initial item pool consisted of 122 items extracted from scales within the five different measures after initial face value examination (see Table l). The items were then reviewed to remove duplicates along with other items that were near the boundary of domain relevance. This reduced the item pool to 59 items. These items were selectively supplemented by 29 items constructed as part of this study to provide an adequate coverage of the change process domain.

Table 1

Source of Items for Item Pool

	Total Number of Items from Original Measures	Source of 88 Item Pool	Number of Items Retained in 55 Item Scale	Number of Items Retained in 30 Item Scale
Litwin & Stringer (1968)	50	17	9	6
Ekvall et al (1983)	50	24	18	9
Hofstede (1982)	5	5	5	2
Rickards (1988)	10	10	6	4
Basadur & Finkbeiner (1985)	7	3	2	2
This Study (Supplement)		29	15	7

Further item analysis (as exhibited in Kirton, 2005; Nunnally, 1978; Van De Ven & Ferry, 1980) produced a 30-item scale (See Appendix 2) with a theoretical range of 30 to 150, a mean of 90 and where all items have a significant item total correlation ($r \geq 0.25$, $p \leq 0.001$). From the study sample, the scale produced an actual range of 36 to 119,

a mean of 94.58, and a standard deviation of 19.21 with a coefficient alpha of 0.90 (see Appendix 3 for detailed statistics).

An initial factor analysis using an imposed single factor solution produced significant factor loading, ranging between 0.71 and 0.29 for all items. This pattern of loading provided additional evidence that the items comprising the scale represented a consistent measurement of the domain. A further factor analysis using principal components and a varimax orthogonal model showed four significant factors (see Appendix 3) as indicated by the 'Scree Test' and substantiated by Kaiser's criteria that only factors with Eigenvalues of greater than l.0 should be considered (Cattell, 1966).

The 30-item climate scale provides a reliable measure (alpha = 0.90) that includes four specific factors that evaluate climates that are supportive of the organisational change. All factors are substantial and relate well in descriptive terms to the change process. Each factor meets the desired framework and has an alpha > 0.7, allowing the factors to be considered as subscales for further correlation analysis.

Cognitive Style

The KAI (Kirton, 1976) is used as the measure of the domain of cognitive style. The measure evaluates the position of an individual's *preference* along the Adaptive-Innovative continuum of two distinct types of problem solving. One end is concerned with Adaption which relates to algorithmic and paradigm consistent thinking. The other end is concerned with Innovation and relates to paradigm breaking thinking and transformation.

The KAI is a self-report measure consisting of 32 items scored on a five-point Likert scale the 19 adaptive items are reversed scored to align with the other 13 that represent the innovation items. While reversing the adaptive items to align with the innovative produces a scale that is innovatively oriented the item content representing both adaption and innovation of the A-I continuum remains unaltered.

From a general population sample n>1000 from many different countries (Kirton, 2005) the scores range from 46-146 with a mean of 95.0, a standard deviation of 17.9 and a coefficient alpha of >0.85. Three distinct sub-factors are contained within the overall scale and named Sufficiency of Originality accounting for 13% of the variance with alpha of 0.83, (In) Efficiency accounting for 10% of the variance with alpha of 0.76, (Non) Rule Group Conformity accounting for 14% of the variance with alpha of 0.83. The correlation between the items representing the two ends of the A-I continuum is -0.54 demonstrating bipolarity. (Within the measure the A items are reverse scored to align with the I items to produce a positive correlation with all items within the measure, a significant item-rest correlation and a higher alpha).

Idea Characteristics

The measure of idea characteristics (Clapp, 1991) is a self-report measure of individual ***manifest*** idea characteristics that are consistent with the polar definition of the A-I continuum of cognitive style. At one end are paradigm consistent (adaptive) ideas which are constrained by existing paradigms (e.g. environmental, technical and personal) while at the other end, are paradigm breaking (innovative) ideas inconsistent with and outside of existing paradigms.

To construct the measure, two groups of seven items were composed to represent the characteristics of ideas consistent with the definitions of the polar ends of the A-I continuum. These items were then formed into a 14-item scale with a theoretical range of 14-70 and a mean of 42. From the study sample (n=153) the scale produced an actual range of 14-58 with a mean of 35.65 and an alpha of 0.87. When factored two distinct factors emerged one representing paradigm consistent (adaptive) ideas accounting for 38% of the variance with an alpha of 0.88 the other factor representing paradigm breaking (innovative) ideas accounting for 16.4% of the variance with an alpha of 0.82. The correlation between the two factors is +0.38 $p<.001$. This positive correlation suggests independence rather than bipolarity where for the latter a negative correlation would be expected.

Methodology

First, a simple correlation table is to be generated to obtain an overall view of the relationships between the dependent and independent variables then using R^2 the allocation of variance is evaluated.

Second to determine in more detail the relationship of the factors of the independent and dependent variables the standardised β values of the regression equation are examined

Results

Overall Correlations

The results for the total correlations both the dependent and independent variables are shown in the table below.

Table 2

Correlations between the Dependent and Independent Variables (n=153)

		kaitot	clmtot
Kaitot	Pearson Correlation	1	-.030
	Sig. (2-tailed)		.711
Clmtot	Pearson Correlation	-.030	1
	Sig. (2-tailed)	.711	
Isty	Pearson Correlation	.386	.248
	Sig. (2-tailed)	.000	.002
Asty	Pearson Correlation	.177	.425
	Sig. (2-tailed)	.029	.000

The correlation between climate and cognitive style lacks significance confirming both the independence of these two variables and the lack of climate as a moderator of cognitive style when considering manifest idea characteristics.

The correlations between the dependent and independent variables are all significant.

Climate accounts for more of the variance for adaptive idea characteristics than does cognitive style preference while the latter accounts for more of the variance for innovative idea characteristics. However, while climate dominates for adaptive ides and cognitive style for innovative ideas, the relationships of innovative and adaptive ideas respectively are both significant. This indicates that adaptors and innovators are capable of manifesting both styles of ideas albeit to different extents.

Hypothesis 1

As the Kai is a bipolar measure of adaptive and innovative preferences a significant amount of variance for the two characteristics of manifest ideas is expected to be accounted for.

Table 3

Variance Accounted for by Independent Variables for the two Idea Styles

	R^2	Percentage of variance accounted for
Cognitive style plus Climate with Adaptive ideas	0.22***	
Cognitive style with Adaptive ideas	0.04*	15.00
Climate with Adaptive ideas	0.18***	85.00
Cognitive style plus Climate with Innovative ideas	0.22***	
Cognitive style with Innovative ideas	0.15***	71.00
Climate with Innovative ideas	0.07**	29.00

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

The results partly confirm the hypothesis and follow the findings from Table 2. While the two predictors are independent they in combination account for only 22% of the total variance associated with the idea characteristics. However, for the innovative style of ideas 71% of the variance is associate with cognitive style and 29% with climate while for the adaptive style of ideas some 85% is associated with climate and 15% with cognitive style. This significant imbalance between cognitive style and the two characteristics of manifest ideas casts doubt on the hypothesised relationships (positive with innovative and negative with adaptive idea characteristics) as well as cognitive style as a dominate predictor of both styles of ideas.

The lack of a substantial (negative) relationship between the bipolar measure of cognitive style and adaptive idea characteristics indicates that while A-I poles of the

preference domain are bipolar the stylistic poles of the manifest ideas' domains appear independent with no underlying bipolar coupling.

Hypothesis 2

The relationship between climate factors and the characteristics of manifest adaptive ideas, both of which concern adaptive characteristics, is expected to be significantly positive.

Hypothesis 3

Similarly, for the factors of cognitive style the relationship with innovative ideas is expected to be significantly positive.

Table 4

Standardised β Coefficients for Factors of Psychological Climate and Cognitive Style with Adaptive and Idea Characteristics

Factors of Psychological Climate and Cognitive Style	Standardised β coefficients for Adaptive Idea Characteristics	Standardised β coefficients for Innovative Idea Characteristics
F1 Support for Change Process	0.23*	0.22*
F2 Opportunity to Contribute to Change	0.53***	0.16
F3 Dynamism	0.03	-0.10
F4 Support for Idea Generation	0.29**	-0.005
Sufficiency of Originality	0.15	0.28**
Efficiency	-0.04	0.03
Rule/Group Conformity	0.12	0.22*

* $p \leq 0.05$

** $p \leq 0.01$

*** $p \leq 0.001$

The results confirm the hypothesis where three of the four climate factors show significant relationships with the adaptive style of manifest ideas and a lack of significance with the innovative style of manifest ideas. The exception is F1 Support for Change Process which is significantly related to both styles of ideas. The factors of the climate scale are all related to ideas with adaptive or algorithmic characteristics other than 'F3 Dynamism' with its orientation towards production (quantity) and is unrelated to the style characteristics of manifest ideas both adaptive and innovative.

Of the three cognitive style factors Sufficiency of Originality and Rule/Group Conformity (the latter reversed scored) are both significantly related to the innovative style of manifest ideas Efficiency (again reverse scored) lacks significance with the style characteristics of manifest ideas both adaptive and innovative. All three factor of cognitive style lack significance in their relationship to the adaptive style of ideas.

Conclusions

In this study, the domain of psychological climate is determined by the social processing of the behaviours associated with the stages of the organisational change process. This focus of organisational climate on process and associated behaviours of organisational change is related to the more algorithmic style of problem-solving. The lack of relationship of psychological climate with cognitive style indicates the independence of both climate and cognitive style *preference*. Furthermore, the relationship between climate and the adaptive style of manifest ideas shows climate as the dominant predictor of ideas with adaptive characteristics while cognitive style is the dominant predictor of ideas with innovative characteristics. However, both cognitive style and climate have minor (but

significant) relationships with adaptive and innovative idea characteristics respectively. These relationships provides for both Adaptors and Innovators to manifest ideas with both styles of ideas while retaining the position of dominant predictor for one or other of the idea styles (as seen in practise).

The significant relationships of cognitive style with the innovative characteristics of manifest ideas confirms the view of the Kai as a measure where an increasing personal preference for innovation results in the manifestation of ideas with the same characteristics and shows cognitive style as the dominant predictor of ideas with innovative characteristics. However, the dominance of climate as a predictor of ideas with adaptive characteristics questions the bipolarity of the two idea characteristics. While the domain of the A-I preference continuum defines semantic opposites, those same characteristics from the domain of manifest ideas appear to be independent rather than bipolar suggesting a lack of underlying cognitive coupling between the two styles of manifest ideas. This position mirrors that described by Kelly (1963) where the two postulates that describe the organisation of constructs i.e. Modulation and Fragmentation are considered independent and have no underlying cross-connections. Stacey (2000) also describes two independent domains one from rational teleology the other from transformative teleology.

From a more detailed cognitive view, when problem-solving once a problem frame is perceived within an organisational setting as having no more meaningful abstraction than the sum of its parts then, when problem-solving, the frame will contain access to all parts that constitute the whole. Also, the solution will be similarly framed where all individuals involved function as adaptive (linear) problem solvers. However, once a problem frame is perceived as a non-linear combination of parts the abstraction of the whole can look very

different from the sum its parts (Sterman, 2000; Richmond 2001; Arnold & Wade, 2015). This more abstract representation reduces the accessibility to the information from which that same abstraction is formed (Hochstein & Ahissar, 2002; Poljac et al., 2012). Thus, adaptive problem-solving is minimised and optimal solutions lay in the understanding of the non-linear problem frame, potentially by those individuals with a more innovative preference. Moreover, the non-linear re-interpretations and changes to the more abstract representations may not be readily visible to individuals with a more adaptive preference.

In recent times, the preoccupation for innovative organisational problem-solving has resulted in a psychological climate where both culture and climate emphasise innovation. This requires significant flexibility in the way tasks are re-partitioned along with the associated capital and skills and has led to the re-emergence of matrix structural configurations that provides for concentrations of expertise (minimising the search for appropriate skills in problem-solving) while at the same time providing flexibility in the way they are deployed. Furthermore, from both a strategic and tactical view the over-emphasis on innovation has ignored the finding that ideas with the more innovative characteristics tend to be produced by individuals with an innovative preference and rely on interpersonal understanding and 'champions' rather than organisational structure and process to progress them through to implementation. To be most effective innovative change should be followed by more adaptive ideas aimed at consolidating the innovation to provide the maximum of economic benefit to the organisation, here the more adaptive climate is of value in supporting ideas with adaptive characteristics. If innovation is followed by evermore innovation, costs tend to rise and the organisation moves towards a more chaotic form. The opposite occurs where innovation is avoided and adaptive ideas predominate. Here the organisation moves towards a more predictable form with low

differentiation between competitors. By continuing with either style to the point where medium-term profitability is affected, the organisation moves towards the lower end of performance ranking for the market sector albeit by different routes.

Appendix 1. Contributor Inventories for Item pool of Psychological Climate Scale

A brief description of each inventory follows, along with a discussion of the scales and items that meet the above criteria.

1 Climate for Organisational Performance (Litwin & Stringer 1968)

The measure for climate in this study consisted of nine scales (structure, responsibility, reward, risk, warmth, support, standards, conflict, and identity) which were selected from an assumption that there is a single best climate for organisational performance (Litwin & Stringer, 1968). The origins of the nine scales are stated by the authors to be rooted in three areas of organisational theory on individual behaviour. Within these scales there were many items relevant to the change process domain, these were selected as candidates for the item pool.

2 Measure for inter organisational comparison of Innovation Ekvall, Arvonen & Waldenstrom-Lindblad (1983)

This climate measure came nearest to the design criteria previously stated. The measure, as defined by the authors is intended to differentiate between 'on the one side innovative and on the other positional or stagnated organisations'. The measure was designed to differentiate between different companies in the market place rather than different groupings within the same organisation. Seven scales (challenge, support for ideas, trust, and freedom in the organisation, freedom in the job, dynamism and tension) were derived from a factor analysis and all had items that matched the change process domain of the current study. It was considered appropriate therefore to add all the items to the item pool.

3 Measures for Interorganisational comparison of Culture (Hofstede, 1982)

These measures stem from attitude surveys used by the Hermes Corporation and cover the aspects of satisfaction, perceptions, personal goals and beliefs. The items are

centred on individual needs (need for achievement, need for power, need for affiliation, and need for social distance) (McClelland, 196l; Murray, 1938). While the main theme of the study is not concerned with organisational change, many items fitted the change process domain for this current study. These items were included in the item pool for this study.

4 Creativity for Managers – A Check List (Rickards, 1988)

This checklist was constructed as a creativity' audit for managers covering items that constitute a ‘healthy' organisation from a creative point of view. Ten items matched process domain and were included in the item pool for this current study.

5 Measures of Preference for Ideation and Preference for Premature Evaluation (Basadur & Finkbeiner, 1985)

These two measures were constructed to cover the domains of: A preference for ideation, defined as a preference for the generation of ideas; A preference for premature evaluation of ideas, defined as the inability to withhold the evaluation of an idea until after the idea is manifest Of these two measures, only the first had items that were consistent with the change process domain. Therefore, the seven items comprising the scale for preference for ideation were selected for inclusion in the item pool tor this study's measure of climate.

Appendix 2. Samples of 30 Item Scale for Psychological Climate

Name	Sex(M/F)	**Responsibilities**	
Job Title		Which descriptions best fits your supervisory or management responsibilities	
Company			
Department Divisional Ref		I do not manage or supervise staff members	
Length of time in Company		I manage staff who are not managers or supervisors	
Length of time in Job		I manage other managers/supervisors	
Date			

The following questions concern the climate (or atmosphere) which surrounds individuals at their place of work and either facilitates or handicaps the change process

To measure the Climate as you experience it, please answer each question by marking the box on under the most appropriate heading (you may use the centre column as meaning about half of the time)

		Often	Very Often		Seldom	Very Seldom
1	Does your supervisor reject your ideas if they are not completely thought out?					
2	Is it considered unacceptable to express disagreement with others?					
3	Can you openly question any aspect of the Company's activities?					
4	Are you encouraged to solve difficulties in your work for yourself?					
5	Do you spend time discussing problems?					
6	Are you encouraged to take extra responsibility?					
7	Can you make your own decisions to get things done?					
8	Is it clear who actually makes decisions about your ideas?					
9	Do your immediate colleagues accept or reject a new idea without undue fuss?					
10	Do your immediate colleagues evaluate ideas on their merits?					
11	Do your immediate colleagues think of new ideas even though there are no problems to solve?					
12	Does your supervisor or manager discus with you any new ideas and where they could be used?					

13	Do you feel able to discuss with your immediate colleagues any problem you may have?					
14	Do you meet with your immediate colleagues to talk over problems and how they can be resolved?					
15	Are ideas killed by general lack of action?					
16	Are ideas given fair hearing if they have to be progressed outside of your group?					
17	Do people in other parts of the Company resist change?					
18	Do Company rules make it difficult for your new ideas to receive due consideration?					
19	Are ideas involving significant change rejected without real consideration?					
20	Do people with influence in the company support good ideas?					
21	Do you need to keep pushing to get a decision on a new idea?					
22	Do you get rewarded or recognised for thinking up a good idea?					
23	Are the overall Company objectives for improvement well defined and clear?					
24	Are good practical ideas put into use?					
25	Are there delays before an idea is put into use?					
26	Are ideas from other parts of the Company given proper consideration by your work group?					
27	Are any staff problems resulting from changes dealt with fairly?					
28	Is there enthusiasm for change?					
29	Are the Company overall activities openly discussed?					
30	Are you able to identify somebody who is prepared to discuss your idea constructively with you?					

Appendix 3. Psychometric detail of the psychological climate scale

The factors extracted were defined as follows:

1 Support for Change Process

This factor has 10 items with a theoretical range of 10 to 50 and a mean of 30. Using the study sample, the scale scores ranged between 12 and 47 with a mean of 30.98 and a Cronbach coefficient alpha of 0.82. The four heaviest loading items are, in descending order, 20, 24, 22 and 8. These items were used to generate a description of the factor scale and are detailed as follows:

Item 20 - Do people with influence in the company support good ideas?

Item 24 - Are good practical ideas put into use?

Item 22 - Are you rewarded or recognised for thinking up good ideas?

Item 8 - Is it clear who makes decisions about your ideas

This factor represents the support given to the different aspects of the change process where products of the change process are viewed as valuable contributions that are wanted and are rapidly put to use. Resources are provided and pathways are cleared to minimise delay.

2. Opportunity to Contribute to Change

This factor has 7 items with a theoretical range of 7 to 35 and a mean of 21. From the study sample, the scale scores ranged between 7 and 35 with a mean of 23.92 and a Cronbach coefficient alpha of 0.83. The four heaviest loading items are in descending order, 6, 7, 5 and 13. These items were used to generate a description of the factor scale and are detailed as follows:

Item 6 - Are you encouraged to take extra responsibility?

Item 7 - can you make your own decisions to get things done?

Item 5 - Do you spend time discussing problems?

Item l3 - Do you feel able to discuss with your immediate colleagues any problem you may have?

Consistent with the theory of individual needs (Murray, 1938), this factor evaluates the needs satisfying potential or challenge of the environment (Ekvall et al, 1983). It covers the opportunities that the climate 'presses' on the individual to influence the way things are done.

3. Dynamism

This factor has 6 items and has a theoretical range of 6 to 30 and a mean of 18. From the study sample, the scale scores ranged between 6 and 30 with a mean of 18.01 and a Cronbach coefficient alpha of 0.80. The four heaviest loading items are, in descending order, 1.5,21,19 and 25. These items were used to generate a description of the factor scale and are detailed as follows:

Item 15 - Are ideas killed by a general lack of action?

Item 21 - Do you need to keep pushing to get a decision on a new idea?

Item 19 - Are ideas involving significant change rejected without any real consideration?

Item 25 - Are there delays before an idea is put into use?

This factor represents the amount of commitment to assist the change process. It is more than an absence of resistance to change - it is a perceived commitment to change, to do what is necessary rather than to delay and further evaluate the implications of the change. Individuals within the organisation perceive that given the opportunity they would be able to deal with any problem that may arise during any change.

4. Support for Idea Generation

This factor has 7 items with a theoretical range of 7 to 35 with a mean of 21. From the study sample, the scale scores ranged between 8 and 35 with a mean of 21.6 and a Cronbach alpha of 0.72. The four heaviest loading items are, in descending order, 1, 2, 11 and 9. These items were used to generate a description of the factor scale and are detailed as follows:

Item 1 - Does your Supervisor reject new ideas if they are not completely thought out?

Item 2 - Is it considered unacceptable to express disagreement with others?

Item 11 - Do your immediate colleagues think of new ideas even though there are no problems to solve?

Item 9 - Do your immediate colleagues accept or reject a new idea without undue fuss?

This factor represents support given to the individual for the parts of the process where ideas are generated that are potential solutions to problems and the opportunity or actual need for change is evaluated. Thus, the individual will find colleagues who think of new work methods and ideas for doing things differently, and a supervisor who will help with the growth of embryonic ideas.

Table A1

Psychometric Detail of 30-Item Climate Scale (n=153)

	Total Scale	F1 Support for Change Process	F2 Opportunity to Contribute to Change	F3 Dynamism	F4 Support for Idea Generation
Number of items in the scale	30	10	7	6	7
Percentage of variance accounted for	47.2	27.1	9.2	5.5	5.4
Theoretical Mean	90	30	21	18	21
Study sample mean	94.58	30.98	23.92	18.01	21.67
Standard Deviation	19.21	7.39	6.65	5.08	5.44
Standard Error of Measurement	6.08	3.14	2.74	2.27	2.88
Theoretical Minimum	30	10	7	6	7
Study Sample Minimum	36	12	7	6	8
Theoretical Maximum	150	50	35	30	35
Study Sample Maximum	139	47	35	30	35
Overall Item Mean	3.15	3.10	3.42	3.00	3.10
Inter-Item correlation mean	0.23	0.31	0.41	0.39	0.27
Coefficient Alpha	0.90	0.82	0.83	0.80	0.72
Item reference numbers in descending order of factor loading	All Items in Factors 1-4	20, 24, 22, 8, 23, 29, 26, 16, 10, 27.	6, 7, 5, 13, 14, 12, 30.	15, 21, 19, 25, 18, 17.	1, 2, 11, 9, 28, 3, 4.

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