

# DISCOVERING AN INDIVIDUAL'S "RISK BEHAVIOUR PROFILE"

**Margaret Greenwood, M Sc.**

*The Faculty of the Built Environment, The University of the West of England and Burrough House Associates. Research Institute in Advanced*

Today's world is increasingly dynamic and technologically complex. Risk, both to the individual and society is more profound. As decisions made in the face of uncertainty become more frequent the management of risk becomes increasingly important. Risk management envelopes identification, analysis, evaluation, judgement and action skills. Throughout this process the individual's behaviour is implicated. Behaviour is affected by internal factors, the person (personality, experience, knowledge) and external factors, the situation (environment, culture). This paper builds a case that Human Behaviour Towards Risk is unique. It is connected to the situation and the person. It may be measured and profiled. Collections of individuals, like an organisation or profession, have unique and "mappable" profiles. An original questionnaire has been developed to determine an individual's perceived behaviour towards risk in Task, Team and Individual climates together with a measurement of the person and the situation. To date, 215 data sets from Senior Managers, a 59% return, have been received and analysed. Definite sub-group trends (i.e. by age, length of service, sex, management type) in perceived behaviour towards risk have been identified. The questionnaire and the Personal Risk Behaviour Profile are being used successfully as a management training tool. The author is convinced that an understanding of behaviour towards risk should become fundamental to more effective management.

Keywords: Bandura, behaviour, behaviour profile, culture, leadership style, perception, risk, risk management.

## INTRODUCTION

Increasing mortality amongst young people, attributed to Creutzfeldt Jacob's Disease (C.J.D.), is alarming the British Medical Association. The true incidence of Mad Cows Disease may never be known. Scientists moved from postulating that Bovine Spongiform Encephalitis (B.S.E.) in cows predisposes C.J.D, to proving the link. - "Have another beef burger my dear?"

But what is the risk of premature death from eating British beef?

There are hard facts.... Increased deaths, confirmed B.S.E. cases and the proven links in the food chain, all making it possible to calculate the probability of the event, its frequency and the effect or outcome. However, my decision will not be based solely on facts....How often do I eat beef? How much do I like it? Which reports do I read and perceive as true? Is beef cheap? Are there equally tasty and inexpensive substitutes readily available? Such subjective issues influence my perception and help determine my attitude towards the risks. In turn this conditions my current behaviour.

Likewise, Commerce, in an increasingly global and competitive environment, is concerned with risk. Manufacturing is subjected to vagaries in demand, cost of money

and raw materials. In Marketing, where profits may occur from incursion into new markets or products, the size and timing of investment is subject to risk. Primary in Projects, particularly construction, is the successful management of risk. Striking the balance between multi-stakeholder demands and the timely, ecological and economic completion of the task is essential. From the strategic through to the operational, the successful management of risk is implicit to survival and growth.

Myriad tools, models and programmes purport to observe, analyse and manage diverse risks but will decisions emanating from their use be based solely on facts, probabilities and frequencies? Surely individuals input into the decision making process? S/he will have a perception of and an attitude towards the subject. This may predispose rejection or acceptance of evidence and of experience and may influence the decision process i.e. the behaviour towards the risk.

Intangible by nature, psychologists suggest human behaviour is also unique and variable. Like sociologists they link it to personality i.e. that unique convergence of genes, growth environment, attitude, perception, expectations and experience and the situation - the micro/macro environment pertaining. Abundant research confirms these three elements are definable, measurable and mappable and through their observation an individual may be profiled.

This is the foundation of this paper. "Risk" and "Behaviour" are interpreted and a system, to measure perceived behaviour towards risk, the person and the situation, proposed. It is based on sampling of over 350 Senior Business Managers with a bespoke questionnaire, from which 215 data sets were completed and returned. Analysis of that data has enabled behaviour profiles to be mapped and trends, between perceived behaviour, situation and to a lesser extent the person, established. Inter alia specific profiles for Project and Incremental managers are discussed.

## **THE LANGUAGE OF RISK**

"Risque" arrived from France in the mid-17th century, usurping the word "hazard" [Moore, 1986]. As "risk" it remains a portmanteau, implying "a danger located in the outside world" or "to act in a way that involves chance".

Its two components are a future outcome, which may take a number of forms and a non-zero chance that the least favourable outcome(s) may occur. It depends on the starting asset base (value), the consequences (gain or loss) and the probability of occurrence (chance). Risk may involve a pure gamble where, like the toss of a coin, we are unable to control the outcome.

Risk is branded according to the environment. In probability terms it is a measure of the likelihood of an event occurring along a scale ranging from 0 (no way) to 1 (for sure). In sociological terms it can be categorised as social, commercial, political technological, human, religious, destined, motivational or simply knowledge. In global economic terms it is connected with changes in debt, financial fragility, systemic risk, stationary probability distributions and decision-making processes towards diversification. In corporate terms risk varies through organisational levels and is linked with disparate values, costs, impacts, time-spans, management accountabilities and responsibilities. It may be strategic (long-term, high value and the concern of Directors), tactical (medium-term, lower value, the concern of Senior Management) or operational (short term, lowest value and the preserve of First Line Managers. In safety terms, where safety is defined as the freedom from danger or risk, it is connected with dynamic situations or events that have systems, procedures,

hardware and operators. In project management terms, a successful Project Manager must attend to three overlapping elements: the task, the team and the individual [Adair in Mullins, 1996], all areas of risk.

Risk is all-pervasive. It enters our lives in some form in virtually all fields of endeavour and at numerous points. Linked with an aura of achievement and progress, risk is fundamental to economic growth. Indeed a "willingness to take risks is an important positive factor in the future dynamic development of the Western Industrial Society" [Gunter Lehr in Dierkes et al, 1980].

## **DEALING WITH RISK**

A wide variety of models is available to analyse risk quantitatively or qualitatively, mathematically or verbally, manually or electronically. These systems appear to evolve from Risk Assessment through Management to Engineering.

Risk Assessment is defined as the point at which Risk Determination (identification and estimation) overlaps Risk Evaluation. Each element may take place separately but all three need to overlay for complete assessment [Rowe, 1977].

An individual's assessment of risk may be objective or subjective or a mix. Objective assessment will only be as good as the information base used (possibly faulty or incomplete) and the processing of that data (which may be inconsistent or limited). Griffiths lists uncertainties in this numerical estimation approach: systematic error, random fluctuation, classification of information, estimation of consequences, the use of statistical correlations to establish causal links and dose-effect relationships. While Moore criticised judgement as being dependent on publicity and memory recall, perception, ability to cope with qualitative and/or quantitative data, confidence, ability to value additional data, insensitivity to sample size, anchoring (a knock-on effect, realised from anchoring current circumstances to past experience) and training (enabling potential bias identification). [Griffiths, 1981; Moore, 1986].

The Management of Risk is referred to as the successful handling of risk requiring assessment and incorporation in the decision making process. [Moore, 1981]. One effective model [Dickson, 1987] suggests a chain, linking cause and effect. It identifies all discrete features which may cause failure, evaluates their potential impacts on time, cost, performance and ultimately life. Subsequently control of them by reduction, retention or transfer has been added [Dickson et al, 1991].

In the 1970's, Chapman [1994] designed a risk management process for BP Oil, his "SCERT" program, which he argued could be adapted to any project. To him the crucial issue was "focus on simplification". Reduce effort and costs without losing key benefits. His four-phase system comprised (briefly):

1. Scope phase: listing activities, risks and likely responses.
2. Structure phase: qualitative analysis of risk and response links.
3. Parameter phase: quantitative analysis using probability distributions.
4. Risk management: interpretation/development of alternative approaches.

The occurrence of a high risk event or "choice under strict uncertainty" occurs when the decision alternatives have several uncertain outcomes whose likelihoods are unknown and cannot be inferred from available information. Many disagree about how decisions are made here, under for example: the maximisation of utility [Seale,

Rapoport & Budesco, 1995], probability weighted outcome [Kahneman & Tversky, 1979], "risky shift" [Stoner, 1961] and heuristics (dependent themselves on the decision conditions) [Hansen & Helgeson, 1996].

Risk Engineering became vogue as recently as March 1993 when it became mandatory for all UK Chartered Engineers to take "a systematic approach to risk issues" [Engineering Council, 1993]. The term describes "systematic methods of hazard and risk identification, assessment, evaluation, creation of risk management strategies and performance monitoring". Identifying risk as a long-term issue, risk engineering, used as a reiterative process, must be at the centre of both performance and monitoring systems. The Engineering Council also concurred that the most important tool in risk management is professional judgement.

Plainly stated subjectivity underpins both the practitioners' art and the myriad models used for managing risk. Hitherto it has been deemed a quantitative science unconnected with sociology or psychology. However, it is now evident that the individual impacts throughout the process. It is s/he who determines what is identified, interpreted, analysed and monitored. Individuals devise evaluation and selection criteria, influence the process, ordain judgement prior to action and take or delegate the action. Ultimately it is s/he who influences and educates society as to which are "acceptable" and "bearable" risks.

## **A HUMAN BEHAVIOUR MODEL**

Impressive literature exists on the mechanisms through which we acquire and indeed modify behaviour. Theories have ranged from external manifestations of evil spirits to modern social learning theory encompassing roles played by vicarious, symbolic and self regulatory processes.

In the 1960's, one eminent psychologist, concentrated on experience, suggesting behaviour "is regulated by antecedent stimulus events that convey information about probable consequences of certain actions in given situations" [Bandura 1969]. Later, his "Reciprocal Determination Model", sought to demonstrate man's behaviour as a function of "an internally impelled system and a passive reaction to external stimulation" (Figure 1). It focuses on people as active agents influencing events. It emphasises the importance of the cognitive process. Separating the internal psychological factors (person, emotion and motivation) from external, observable factors, he connected behaviour, situation and person in a triangular continuum.

Bandura's model comfortably forms the foundation for the behavioural aspects of this paper. Each of us is different with a unique set of genes, attitudes, perceptions and experiences. Made up of unique elements each situation is different. Everyone therefore will have a unique behaviour pattern or response to given circumstances, which is both observable and measurable.

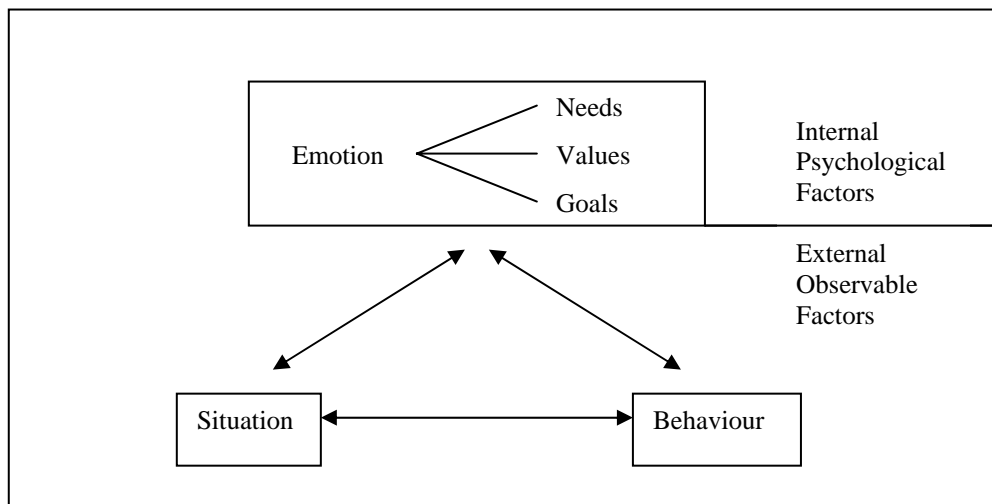


Figure 1: Reciprocal Determination Model

Source : A. Bandura,1986, Social Foundations of thought and action.

## MEASUREMENTS

Measuring risk behaviour : Observation and recording of "real time" behaviour can be lengthy and costly. Measuring an individual's own perception of what their behaviour would be in a particular risk circumstance is much more rapidly established.

Perception, or how we receive, select, organise, analyse and judge information, is unique to the individual. It is dependent on internal factors (the sensory system, personality, motivation, previous experience) and external factors (the nature, pattern and context of the stimuli).

Although error and/or bias may be inherent (space precludes discussion here), observations on perceived behaviour lend themselves to a questionnaire data collection technique.

At work, a risk circumstance can be found in a Task, a Team and an Individual climate, all elements of successful Project Management [Adair in Mullins, 1996]. They are undoubtedly common to all managers. Using action contexts with a range of defined reaction scenarios and a measurement scale from low to high, perceived preferred behaviour towards risk in these three elements can be quantified.

Measuring the situation : An individual's situation can be described in macro or micro terms.

In the former, s/he interacts constantly with a wider environment, i.e. the culture, politics and economics. Culture describes the rules (usually unwritten) for social behaviour, how one, rather than what one, does. Considerable differences between nations have been observed in values, i.e. "that which determines for the people the meaning of their practices" [Hofstede,1991] and "goal profiles and priorities" [Hunt, 1992]. Nationality may therefore have a bearing but in a group of individuals from one nation this culture influence will be common.

The micro or local view is certainly significant. Individuals in organisations are influenced by their immediate surroundings, the systems, structure and strategy or the "people, processes and purpose" [Bartlett & Sumantra, 1994/1995]), the market, the

team and the task. People in organisations do not always share the same goals. They exist in one environment and have their own environment within. Survival depends on the success of their systems, both formal and informal, to identify the need for and facilitate change.

The "culture" of an organisation describes the unique way people within one organisation act and interact. It sets an organisation apart and describes the programming of the collective "mind". Hofstede revealed these cultures are based more on shared perception of daily practices than values (see above). The work place is a place of socialisation. Entering with values in place (from growing up in the family and a community) individuals are hired against preset criteria (e.g. age/sex/education) and the learning of work practices (symbols/rituals/heroes) follows.

The situation or cultural context can then be set by questioning on the type of organisation (academic, consultant, Government or industry) and the individual's age, sex, length of service and management function (project or incremental). It is assumed the organisation's culture and national cultures remain constant throughout.

Measuring the person : Through the many bespoke nomothetic and/or idiographic "personality tests" it is possible to measure the person in terms of emotion or other personality definitions. However, they can be lengthy to complete and expensive to purchase and have professionally marked.

An alternative depiction is leadership style. Dependent on personality, experience and situation an individual's leadership style is unique. It can also be measured.

Management writers agree leadership is the process of influencing the activities of an individual/group towards goal achievement in a given situation. Philosophies have moved from trait, through attitude, to situational and contingency models.

Based on observed behaviour, the latter suggests the effectiveness of any leadership style is dependent upon the situation in which it is used. "Effective leaders identify and understand the situation and demonstrate flexibility by adapt to it" [Hersey & Blanchard, 1993]. Specifically, they model leadership on a three dimensional matrix. Quadrants describing preferred style are placed on two dimensions of task and relationship behaviour. These are then placed on a third dimension of effectiveness. The quadrants are delegating: low relationship/ low task, participating (or supporting): high relationship/low task, selling (or coaching): high relationship/high task and telling (or directing): low relationship/high task. They confirm that an individual may have a preference for one or a combination of two to four styles at any one time.

These terms are successfully descriptive, transfer well and can be quantified and thus enable weightings for preferred style.

The measurement tool : Organisational Behaviour, a 'modern science', offers tests and thereafter explanations for a "multiplicity of interrelated factors which influence the behaviour and performance of people as members of a work organisation" [Mullins, 1996].

Building on all the above examples then a questionnaire has been designed, piloted and used to gather information on:

1. Perceptions about behaviour towards risk : Six scenarios were created :

Task climate : "When taking on new work I believe..."

- "How do you view failure?"
- Team climate : "When leading my team I..."  
"As a leader I..."
- Individual climate : "I perceive myself as..."  
"In a changing environment I value..."

Each scenario has eight preset responses describing behaviours graded from low to high perceived risk. Respondents select one or more responses, awarding a total of 10 points for each scene, thereby weighting their preferred perceived behaviour for each scenario. The points in each climate are totalled and further weighted to accentuate the low to high perceived risk taking behaviour. These weighted totals are then expressed graphically from which their profiles emerge.

2. Preference for leadership styles : The respondent is requested to allocate a total of 40 points between Directing, Coaching, Supporting and Delegating Leadership Styles according to the use of that style.
3. The individual's situation : Respondents make simple selections to categorise themselves as project or incremental managers and identify their length of service, age band, gender and type of organisation.

## RESULTS

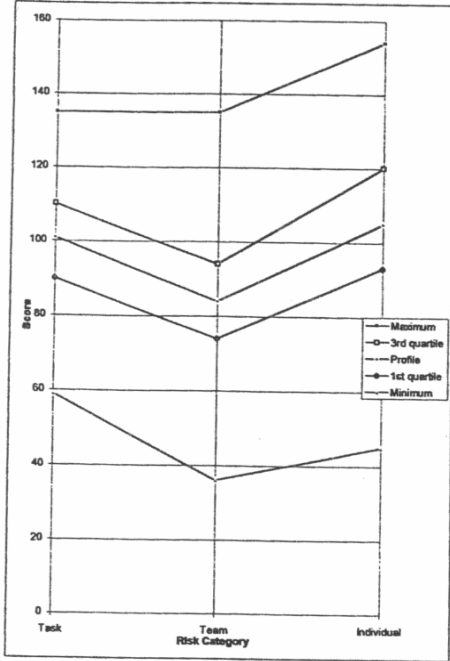
To-date over 350 managers have received the questionnaire from which 215 uncorrupted returns have been logged, reflecting a 59% response. These Data sets have been encoded for expression via 'Excel' and 'SPSS' through 'Windows'.

The profile and range of the whole population is described in Chart 1. Normal distributions are indicated. They are even, around a mean of 84, for the Team; slightly skewed to the high score around a mean of 101 for Task; and slightly skewed to the low score around a mean of 105 for Individual climates.

Firstly focusing on behaviour relative to situation:

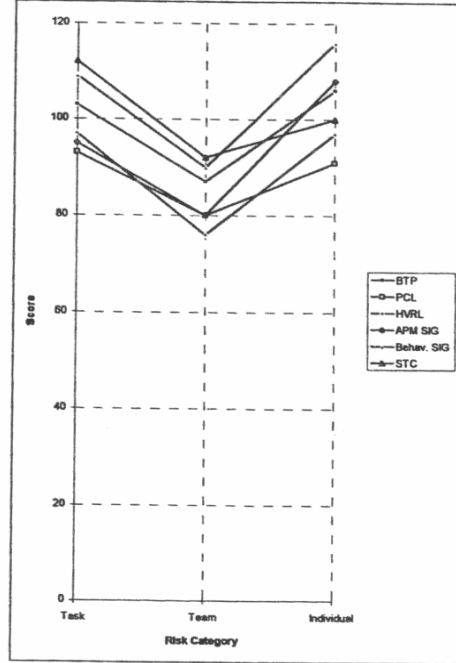
1. The data sets, when separated by organisation (Chart 2), suggest each organisation, with its unique culture, exhibits a unique perceived risk behaviour profile. The three British organisations showed parallel profiles. The Swedish company profile was again parallel with top scores for Task and Team climates but a relatively low Individual score - pointing here perhaps to the effect of a different national culture. The "APM SIG" members have a special common interest but hail from differing organisations. Interestingly, in the absence of a common organisational culture they proved behaviourally least conformist.
2. The Construction Industry sample size is small (just 15 data sets all from one organisation) and may not be representative of the industry. However, these early results indicate perception of their behaviour as low risk in all three climates. Paralleling no other organisation this may suggest in-built resistance or even failure to recognise adequately the risks inherent in tasks.
3. Chart 3 reflects perceived risk behaviour pertinent to management function. Respondents categorised themselves into one of four management classes ranging from incremental or process through to project management.

Chart 1 : Risk Behaviour Profile and Range



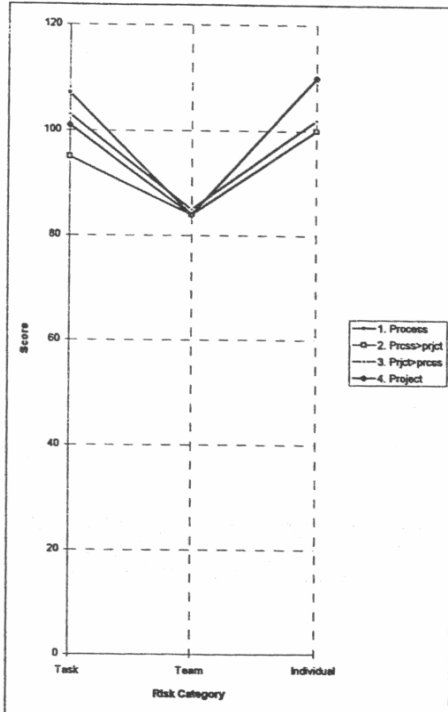
	Task	Team	Individual	Sample Size
Maximum	135	135	154	
3rd quartile	110	94	120	
Profile	101	84	105	215
1st quartile	90	74	93	
Minimum	59	36	45	

Chart 2 : Risk Behaviour by Organisation



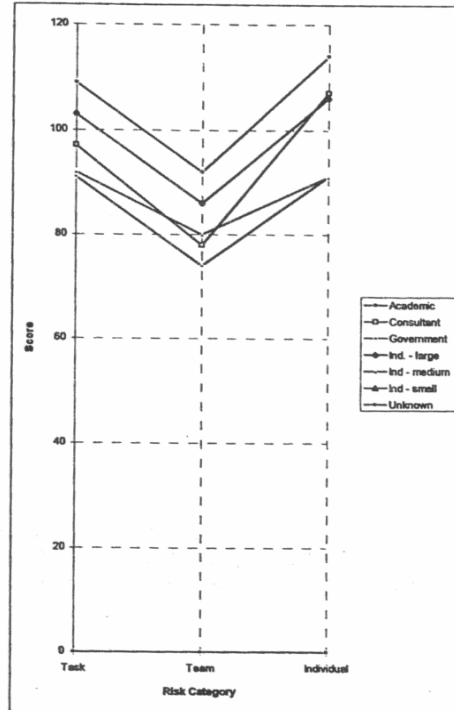
	Task	Team	Individual	Sample size
BTP	103	87	106	112
PCL	93	80	91	15
HVRL	97	76	97	20
APM SIG	95	80	108	47
Behav. SIG	109	90	116	10
STC	112	92	100	11

Chart 3 : Risk Behaviour by Management Function



	Task	Team	Individual	Sample size
1. Process	107	84	100	14
2. Proc>prjct	95	84	100	43
3. Prjct>proc	103	85	102	71
4. Project	101	84	110	85

Chart 4 : Risk Behaviour by Business Type



	Task	Team	Individual	Sample size
Academic	109	92	114	8
Consultant	97	78	107	49
Government	91	74	91	6
Ind - large	103	86	106	133
Ind - medium	92	80	91	17
Ind - small				0
Unknown				2



Unexpectedly, process managers i.e. those who use familiar resources and where similar events and outcomes happen frequently, perceive themselves as the highest risk takers in the Task category. These managers are expected to see themselves as accustomed to the environment and tasks, hence low risk takers. The high score recorded may suggest they feel unfamiliar, insecure or threatened by today's high-tech environment of change and down-sizing! Project Managers, those who oversee "one-off" events where the outcome is major change, could be expected high risk takers throughout. However they perceive high risk behaviour only in the Individual category. This may reflect either a projection of their career choice or their expertise has contributed to minimising Task and Team risks before the projects commence. A trend across classes (process, process>project, project>process and project) was anticipated. The means would either increase or decrease. In fact, an increasing project function does affect perceived behaviour in Task and Individual categories. Project managers have a distinct profile in these categories; they perceive themselves as lower Task risk takers than incremental managers but higher Individual risk takers. However no differentiation in behaviour towards Team risk is evident.

4. Profiling by business type Chart 4 highlights five distinct behaviour patterns. Surprisingly, Academics perceive themselves as highest risk takers in all climates. This may indicate their individualistic research philosophy. More likely, is the impact of the highly politicised environment which is Education in and its funding in the UK at the end of the 20th century. Government is parallel to the Academics but with unsurprisingly, the lowest scores, indicative perhaps of the very nature of a bureaucracy? Industry-large is also parallel and mid stream. Consultants, covering both self-employed and those who work for a consulting organisation (e.g. Consultant Engineers) exhibit a deep "V" profile with an accentuated high score in their perceived Individual risk behaviour, again reflecting some uncertainty perhaps in their role: marketeer, facilitator, project leader etc.? Industry-medium (predominantly the one construction organisation) on the other hand, have a low and shallow "V" profile. Risks have to be minimised in a medium size business environment.

This chart identifies it may be possible to set "business-type norms" or profiles.

Other trends have been indicated (but not charted in this paper).

5. As age increases and with it experience and responsibility (?), the perception of risk taking behaviour moves higher but to a point. The lone data set, individual aged 60-65, was extremely high in task, equal to the mean in team, and the lowest in Individual climates when compared to the population. This profile indicates with experience comes an increased understanding of Task risk with an easy accommodation of Team. However, this individual has no wish to "rock the boat" so near to retirement.
6. Individuals with less than two years service perceive their behaviour towards risk as distinctly low in all three climates. Such individuals are unlikely to have totally identified with the organisation and their place within. Lack of confidence may pre-dispose their low risks strategy. Specifically, in the Team climate, perceived increasingly high risk behaviour is matched by increasing length of service. This propounds an increased awareness/acceptance of the risks or confidence to take risks in the Team or collegiate environment. An example, perhaps, of "risky choice"?

7. Men and women are thought to take wholly different approaches to life, work, people and problems. However, only small differences were reflected in this study. In the Task climate women perceive higher risks than men suggesting an element of "must prove one's self" in the work place. In the Individual area the order is reversed. Perhaps women are less willing to risk a position perceived as "hard enough to win in the first place". Behaviour in the Team climate was similar, where working in or as a group neither gender feels relationships to be threatened.

The statistical review of the behaviour data compared with the leadership scores, the "person" measurement, was more complex. Trends here were less discernible and are not charted. One indicator is, the more even the spread over the range of coaching, directing, delegating and supporting styles, the lower is the risk taking behaviour. The definition used for "person" may bear scrutiny and thereafter, revision.

## **CONCLUSIONS**

Risk is in all actions, in all places, at all times. It can be analysed, assessed, managed, judged and engineered using a myriad of models. However, in all these processes, human behaviour is undoubtedly a prime constituent. But...Are the individuals involved inherently risk takers or risk averse? Does the situation condone risk taking or the reverse? Do individual characteristics predispose behaviour? Are there any patterns?

Psychologists suggest that human behaviour, the situation and the person interact in a triangular continuum. As each individual is unique so must be their behaviour towards that which we define as risk.

This study has looked at perceived behaviour towards risk in a statistically significant group of Senior Managers. They were questioned on their perceived behaviour towards risk in Task, Team and Individual climates and identified by person, in terms of preferred leadership style, and by situation. Their preferred behaviour responses were scored thus enabling risk behaviour profiles to be drawn for the whole population, sub-groups and individuals.

According to the situation definite trends in behaviour have been observed. Perceived risk behaviour increases with age and length of service across Task, Team and Individual climates, except near to retirement. Gender has surprisingly little effect. Incremental and project management functions behave oppositely in Task and Individual categories whilst demonstrating identical perceived behaviour to Team. Organisational and business types produce definite differences in behaviour. Academics perceive themselves high risk takers whilst Government employees are sure they are the reverse.

Trends in behaviour according to the "person", described here by leadership style, were not easily recognised.

## **ADDENDUM**

An increasing number of managers are being convinced that truly effective management requires understanding of behaviour towards risk, theirs and that of those around them. In management terms this study is already useful to this end. The questionnaire has been able to successfully focus training seminars considering the subject of risk and behaviour towards it. Organisations have declared continuing interest not only in comparison of their collective profile with individual employees

but also the profile of competitors. Risk Behaviour Norms and Models are being developed.

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