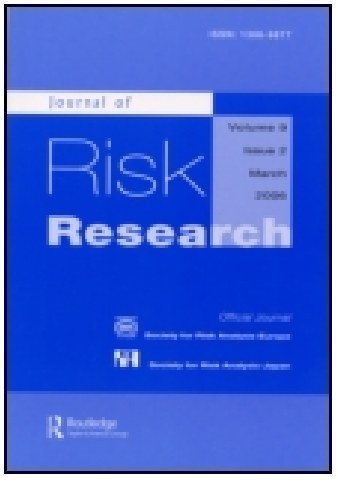

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Personality and domain-specific risk taking

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Personality and domain-specific risk taking

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Abstract

The concept of risk propensity has been the subject of both theoretical and empirical investigation, but with little consensus about its definition and measurement. To address this need, a new scale assessing overall risk propensity in terms of reported frequency of risk behaviours in six domains was developed and applied: recreation, health, career, finance, safety and social. The paper describes the properties of the scale and its correlates: demographic variables, biographical self-reports, and the NEO PI-R, a Five Factor personality inventory (N=2041). There are three main results. First, risk propensity has clear links with age and sex, and with objective measures of career-related risk taking (changing jobs and setting up a business). Second, the data show risk propensity to be strongly rooted in personality. A clear Big Five pattern emerges for overall risk propensity, combining high extraversion and openness with low neuroticism, agreeableness, and conscientiousness. At the subscale level, sensation-seeking surfaces as a key important component of risk propensity. Third, risk propensity differs markedly in its distribution across job types and business sectors. These findings are interpreted as indicating that risk takers are of three non-exclusive types: stimulation seekers, goal achievers, and risk adapters. Only the first group is truly risk seeking, the others are more correctly viewed as *risk bearers*. The implications for risk research and management are discussed.

KEY WORDS: risk; personality; management; scale development; Big Five; sensation-seeking; gender; careers; finance; health

1. Introduction

The concept of risk propensity has important implications for the theoretical modelling of risk behaviour and for practical insights into the motives underlying individual-level choices about engaging in risky behaviour. In organizational terms, a better understanding of risk behaviour could contribute significantly to risk management programmes. In this

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paper there are three objectives. First, a new measure of risk propensity is developed to capture individual differences in risk taking, and its demographic and biographical correlates examined. A central purpose underlying this interest in developing a practical and valid measure of risk propensity has been to support a three-year investigation of risk and performance among financial traders in investment banks in the City of London (Nicholson *et al.*, 2000). Second, how personality dispositions underlie risk propensity at factor and facet levels is explored. Third, the distribution of risk propensity scores across a range of organizations and job function areas is examined.

Two developments have influenced this research. First is the rapid growth in attention to, and concern with, the concept of risk in the world of business (Slovic, 2000). This is partly due to the combined effects of greater risk awareness, and incidence of high profile accidents in operational areas as well as in finance. For example the collapse of Barings bank in 1996 contributed to the development of risk-based assessment of finance organizations (Bank of England, 1997). The second development is a strong interest in trait psychology, with attention converging around the Big Five factorial model of personality (McCrae and Costa, 1997a).

2. The concept of risk propensity

The literature relating to risk propensity has three main themes. The first theme relates to expected utility theories, of which prospect theory (Kahneman and Tversky, 1979) is a much-cited example. Prospect theory proposes that risk taking is asymmetric about a reference point: people will be risk averse when they perceive themselves to be in the domain of gain, and risk seeking in the domain of loss. Prospect theory has stimulated numerous research studies into risk preferences and risk taking. One premise of the theory is that individual level risk taking is relatively inconsistent across situations – a person will take risk in some circumstances, and avoid risk in other circumstances. The prompt for behavioural change could be as simple as the semantic presentation of data, for example whether a choice outcome is presented as a loss or a gain. A meta-analysis of studies of framing effects found that framing is a robust phenomenon, particularly when reference points and outcomes are manipulated (Kühberger, 1998). Many studies of framing consider aggregate rather than individual data. This methodological issue has an important bearing upon the understanding of risk taking.

Factors that might influence risk behaviour and framing effects are considered in more detail in a stream of research that considers the individual difference factors that could influence risk taking. Among psychological factors, personality seems to be the strongest contender for major effects on risk behaviour. For example, Highhouse and Yüce (1996) suggested that findings which apparently contradict prospect theory, i.e. risk taking in situations of gain and risk aversion in the domain of loss, are due to individual differences in perceptions of what constitutes threat and opportunity (Hollenbeck *et al.*, 1994). Risk propensity could be more a characteristic of an individual than their situation. In this area, sensation-seeking has been found to be particularly important. Since Zuckerman pioneered the study of this concept (Zuckerman *et al.*, 1964), a stream of research has confirmed its importance as a highly consistent predictor of various kinds of risk taking, including compulsive gambling and participation in high risk activities (Zuckerman, 1974; Zuckerman and Kuhlman, 2000).

A related individual approach has been to consider risk propensity in terms of the variance in within-individual measures of risk. An early example of this work is Weinstein and Martin (1969), and other studies have adopted the same approach in more recent research (e.g. Salminen and Heiskanen, 1997). These empirical works focus attention on the inter-correlation of scores across a range of measures of risk taking in different decision areas. Findings have typically shown correlations between different measures of risk to be weak, suggesting that people do not have generalized tendencies to take or avoid risk. However, research on managerial decision-making by MacCrimmon and Wehrung (1986), showed that this pattern of results does not preclude the possibility of strong intra-individual convergence of different measures of risk taking. They found that a small number of people showed consistent responses on different measures of risk taking, and could be categorized as consistent risk seekers, or consistent risk averters.

The work of Weber and Milliman (1997), and subsequent work by Weber *et al*. (2002), represents an important development in this field. These authors found that while the degree of risk perceived in a situation can vary according to the characteristics of the situation, attitude to perceived risk (the degree to which people find perceived risk attractive) remained stable across situations for a significant portion of their sample. This work is part of the third stream of literature – the combination of situational and individual approaches to risk propensity through consideration of individual responses to different risk domains. Work in this area (e.g. Fagley and Miller, 1997; Weber and Milliman, 1997) shows that it is possible to be risk seeking in some areas of one's life and risk averse in others while having a relatively consistent view of risk.

Data from perceived risk attitude studies, such as Weber *et al*. (2002) suggests that both general (e.g. sensation-seeking) and domain-specific (e.g. perceived risk) risk propensities are possible. The premise in this paper is that the construct of risk propensity should encompass several risk domains. People who are inconsistent in their approaches to risk in different risk domains can be regarded as lacking a strong propensity either to take or avoid risks. These individuals can be seen as likely to take risks in some situations, but not others. The domains in which they take or avoid risks could vary depending on the demands of situations, or could be consistent – a finance trader might take risks routinely at work, but avoid risk when making family, leisure and personal finance choices.

Moreover, there could be gender differences in risk taking. A study comparing risk perceptions of men and women found that men, especially white males, perceive risks to be lower than women and non-white men (Finucane *et al*., 2000). The results are suggested to be attributable to a complex mix of socio-political factors, trust in institutions that impose and control risk, and perceived individual control over risks.

A number of theories of risk propensity have been published, the most detailed of which has been the modelling set out by Sitkin and Pablo (1992). In this framework it is suggested that the two key inputs to risk taking are risk perception and risk propensity, with risk propensity conceptualized as a confluence of dispositional tendencies, cognitive inputs and past experience.

Here, some of the constructs from this model have been selected to form the basis of a measure that could be widely applicable. In their discussion, Sitkin and Pablo define risk propensity as 'the tendency of a decision maker either to take or to avoid risks' (p. 12). It could be implied from this definition that to apply the concept it is necessary to establish that risk orientation is consistent across multiple decision domains, as discussed above. In addition, since Sitkin and Pablo highlight the importance of past behaviour in shaping

current risk perceptions and preferences, and given Sitkin and Weingart's (1995) research which showed that outcome history had a significant impact on risky decision-making behaviour via risk propensity and risk perception, past risk taking is assessed. In short, risk propensity is defined as the reported frequency with which people take different kinds of risks. Risk propensity is measured as a summation of the reported risk-taking behaviour of an individual across situations and time.

This modelling supports the idea that risk propensity will have a domain-general aspect, underpinned by stable personality dispositions. It was desired to have a measure that is sensitive to domain-specific patterns, on the reasoning that situations have the capacity differentially to evoke risk behaviours, for example, when there is a conducive match between circumstances and the interests, skills and orientations of individuals. Too little is known about these patterns and establishing their likelihood could have important implications for the understanding of risk taking and for the management of risk in organizations. With this in mind, the Risk Taking Index was developed – a scale that asked participants about their current and past risk behaviour in different domains. Six risk domains were included: recreation, health, career, finance, safety and social risk taking. The Risk Taking Index is shown in Appendix I.

The aim of the measure was to assess domains that would be broad enough to encompass several dimensions of risk taking, yet be applicable to all respondents. Data gathered from the sample discussed in this paper have been tested by means of structural equation modelling. The results, shown in Appendix II, confirm the viability of the objective in seeking a valid overall measure of risk taking as well as capturing domain-specific tendencies. The analysis demonstrated that the optimal statistical solution is one overall Risk Taking Index, plus six domain-specific scales combining now and past ratings. Cronbach's alphas for the scales are shown in Appendix III.

3. Hypotheses

The first objective was to test relationships between the Risk Taking Index and demographic variables. Previous research suggests that young males take more risks than older males or women. This is the combined result of stable sex differences (Powell and Ansic, 1997; Byrnes *et al*., 1999), an inverse age-risk taking function (Ungemack, 1994; Martin and Leary, 2001) and a combination of risk perception factors (Finucane *et al*., 2000). Accordingly it is predicted that:

H1a: Men will have report more frequent risk taking than women.
H1b: Risk propensity will be inversely related to age.
H1c: Age effects will be more pronounced for men than women.

An important component of risk-taking in many people's lives is career experience. Switching employers and career changes are typical high-risk career strategies (Nicholson and West, 1988), a pattern that links with career success via proactive personality factors (Seibert *et al*., 1999; Boudreau *et al*., 2001). Moreover, it has been found that people who are prepared to try to start a new business have a greater willingness to consciously engage risks (Rauch and Frese, 2000; Simon *et al*., 2000). Hence it is proposed that:

H2: Higher risk propensity will be associated with greater frequency of
(a) Career changes

(b) Employer changes
(c) Business start-ups.

The third objective of the research is to examine the relationship of personality to risk behaviour, beyond the predominant concern with sensation-seeking in earlier research, especially in the light of the advent of comprehensive Big Five (N-E-O-A-C) measures (Costa and McCrae, 1991; Digman, 1997; McCrae and Costa, 1997a, 1997b). Research has confirmed the importance of the Five Factor model of personality in understanding risk behaviour (e.g. Kowert and Hermann, 1997). Following Eysenck's theory of extraversion as a generalized need for stimulation, the extraversion scale (E) is expected to follow the pattern predicted above for sensation-seeking (Eysenck, 1973; Segal, 1973). Openness to experience (O) can be seen as a cognitive stimulus for risk seeking – acceptance of experimentation, tolerance of the uncertainty, change and innovation (McCrae and Costa, 1997b). Conversely, conscientiousness (C), which can be summarized as a desire for achievement under conditions of conformity and control, is antithetical to these qualities and can be predicted to be inversely related to risk-propensity (Hogan and Ones, 1997). The literature also suggests that consistent risk-takers require resilience (Klein and Kunda, 1994), which would suggest that they should also score low in emotional sensitivity, implicating the neuroticism (N) dimension of personality. The same logic could be applied to agreeableness (A), the tough to tender-mindedness dimension. Robust self-interest, and a lack of concern for the consequences to others of one's risk taking, could help to underpin the risk-taker (West and Hall, 1997). Thus, in relation to personality variation it is hypothesized:

H3: Overall risk propensity will be related directly to the factors of extraversion and openness, and related inversely to neuroticism, agreeableness and conscientiousness.
H4: The extraversion facet of sensation-seeking will predict overall risk propensity.

The final objective of the research was to examine the distribution of risk propensity across organizations and job functions. Given that the nature of risks varies across organizations and job functions, selection and self-selection could operate such that people with different risk orientations gravitate towards and away from certain job and organization types according to their risk profiles. There is little research to date on the distribution of risk propensity across industries and job functions. Thus, therefore, there is a general hypothesis as follows:

H5: Differences in risk propensity by job function and by sector are expected.

4. Method

PROCEDURE AND PARTICIPANTS

The data reported were collected from heterogeneous samples of research participants. The Risk Taking Index was administered alongside the NEO PI-R personality questionnaire in the field and in class. A sizeable NEO PI-R personality database (N=2700) has been accumulated. The respondent sample reported from this data set here comes from these sources, comprising student and executive participants on various graduate courses, including MBAs, and executives on company-specific training programmes. Table 1 below shows the sample characteristics.

Table 1. Sample characteristics.

	Whole sample
Sample size (*N*)	2151
Age (years)	2114
Minimum	20
Maximum	60
Mean	32.51
Standard deviation	7.06
Sex (*N*)	2074
Male	1634
Female	440

MEASURES

Participants completed a short biographical questionnaire that requested information concerning age, sex, job level (low numbers indicate higher seniority), organization size, tenure, the number of employers and entrepreneurship (whether the participant has set up an organization).

To measure risk taking, a short, simple measure with high face validity was developed that asked about risk behaviours in several areas of life experience in which most people would potentially be exposed to risk. The use of short measures has precedents in the risk literature. There is evidence that short questionnaires and even single item measures can be used effectively to measure some psychological constructs (Robins *et al.*, 2001). Robins and colleagues proposed that such measures are best used in reference to schematized, unidimensional, subjective constructs. The Risk Taking Index fulfils these criteria first, by using an approach to risk that is likely to be understood by participants and part of their everyday thinking, i.e. asking respondents how frequently they engage in certain behaviours. Second, questions are presented for each of six domains of risk taking rather than assume generalized risk taking. Third, given the research evidence concerning the subjectivity of risk perception and behaviour (summarised in Slovic, 2001) subjective experiences of risk are assessed.

The Risk Taking Index is shown in full in Appendix I. Each item was answered using a 5-point Likert scale ranging from strongly disagree to strongly agree. Since past risk taking is a component of the Sitkin and Pablo (1992) model of risk taking, participants were asked to rate their risk taking in each domain both now and in the past. The relationship between reported current and past risk taking enabled consistency over time to be examined and the implications for dispositional orientations to risk to be considered.

Personality was measured using the NEO PI-R. This is a 240-item scale that yields 30×8-item facet scales from a Likert-type format, with 6 facets each aggregating to provide scores on the Big Five personality factors. This measure was chosen because it is a comprehensive measure based upon the Five Factor model, which is reported to be the current optimal framework for understanding personality. Moreover, the NEO PI-R has been more extensively tested for reliability and validity than any other Big Five measure, including cross-cultural validation (Costa and McCrae, 1991; McCrae and Costa, 1997a). This makes it especially well suited for the international business sample of the present research.

5. Results

The first set of results considers the differences between men and women's reported risk taking. Table 2 shows the mean scores for men and women for the overall risk scale and domain subscales, and independent samples *t*-test results to examine the magnitude and significant of gender differences.

Hypothesis 1a was partially confirmed. Men reported significantly greater risk taking than women in four domains, including the health and safety-oriented domains, and in the overall risk-taking scale. Women, however, took greater risks in the career and social domains. These results probably reflect a survivor self-selection bias among women in business samples (Nicholson and West, 1988), for whom achieving equality with men requires a greater willingness to be socially prominent and career risk taking.

Hypotheses 1b and 1c proposed that risk propensity will be inversely related to age, and that age effects will be more pronounced for men than women, respectively. Table 3 shows the relationships between the risk scales and age for the overall sample and for men and women.

Table 2. Mean scores and independent *t*-test results on the overall risk taking scale and domain subscales.

	Whole sample			*Males*			*Females*			*t-test*
	Mean	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	
Recreational	5.00	2.25	2–10	5.10	2.24	2–10	4.61	2.25	2–10	−4.06***
Health	4.62	2.21	2–10	4.72	2.19	2–10	4.31	2.24	2–10	−3.41**
Career	3.69	2.03	2–10	3.63	1.99	2–10	3.80	2.15	2–10	1.46
Finance	4.14	1.92	2–10	4.27	1.93	2–10	3.65	1.82	2–10	−6.32***
Safety	5.50	2.19	2–10	5.65	2.16	2–10	4.98	2.24	2–10	−5.59***
Social	4.59	2.08	2–10	4.55	2.07	2–10	4.72	2.13	2–10	1.52
Overall scale	27.53	7.65	12–56	27.90	7.54	12–56	26.10	7.91	12–51	−4.29***

N(whole sample)=2041; *N*(male)=1571; *N*(female)=421. **$p<0.01$, ***$p<0.001$.

Table 3. Correlation between risk taking and age.

	Correlation coefficient		
	Whole sample	*Male*	*Female*
Overall scale	−0.24***	−0.23***	−0.19***
Recreational	−0.17***	−0.17***	−0.23***
Health	−0.05*	−0.07**	−0.08
Career	−0.11***	−0.12***	−0.05
Finance	−0.18***	−0.21***	−0.19***
Safety	−0.06**	−0.10***	−0.03
Social	−0.16***	−0.17***	−0.13**

N(whole sample)=2032;*N*(male)=1567; *N*(female)=418. *$p<0.05$, **$p<0.01$, ***$p<0.001$.

Hypotheses 1b was confirmed. Risk taking decreased with age in every domain. Hypothesis 1c was partially confirmed. There were fewer significant associations between risk taking and age for women than men, reflecting less of a change in risk taking with age and an overall lower level of reported risk taking for the women in the sample.

The second objective was to examine the relationships between the scales and biographical measures, including independent measures related to careers. Structural equation modelling was used to estimate path coefficients for the effect of all independent variables on all dependent variables simultaneously. Table 4 shows the results.

The results support H1a and H1b for age and sex differences, i.e. that risk taking is especially a young male phenomenon, particularly in the recreational, health and safety risk domains. The data presented in Table 4 also show that people who have set up their own business score higher on the career risk taking as well as financial, social and overall risk taking. Career risk taking was significantly associated with lower job level, working in small organizations, shorter tenure, having a greater number of employers and involvement in business start-ups. The combination of factors is consistent with the notion that career risk takers move frequently from one small company to another, including setting up their own organizations (Rauche and Frese, 2000). The negative association of career risk taking with job level is intriguing. Given that age is controlled for, this cannot be due simply to greater risks in early career. It is more likely to reflect the tendency in an ambitious professional population for it to be more necessary to take risks the less one has progressed. The relationship between social risk taking and setting up a company indicates that, in addition to willingness to risk finances and career development, it is necessary to be prepared to stand alone or voice a new opinion. A finding that was not predicted was the relationship between health risk taking and working in small organizations. Caution is needed against over-interpretation of unexpected findings, and in this case no obvious explanation can be derived from the literature, except possibly the tendency for health risk behaviours, such as smoking and drinking, to be associated with the greater dynamism and stress of the small business environment.

The next set of results are concerned with the relationships between personality factors and the risk scale data. Hypothesis 3 predicted that overall risk taking would be predicted by high scores in extraversion and openness, and by low scores in neuroticism, agreeableness and conscientiousness.

Results are strongly and clearly in support of Hypothesis 3. Regression analyses reveal a common pattern across almost all of the risk domains and the overall risk scale, in the pattern as hypothesized. There is but one notable exception. In the domain of health risk taking there is a direct relationship with neuroticism, in contrast to the inverse relationship found in the other domains. In line with our tentative explanation for the company size finding, it seems likely that this indicates a general tendency for people to resort to health risk behaviours to alleviate anxiety and other emotions (Vollrath and Torgerson, 2002). Health risk taking has the lowest adjusted R squared of all the scales suggesting that this is the risk-taking behaviour most strongly influenced by environmental factors, and least under the control of individual psychological dispositions, as measured by the NEO PI-R. The other domain-specific risk-taking behaviours form a major contrast, with more than one third of the variance in the overall scale and three domain subscales (recreation, career and social) accounted for by personality factors.

Hypothesis 4 proposed that sensation-seeking would emerge as the key facet of personality predicting risk taking. To test this, the forward stepwise regression method

Table 4. Structural equation modelling regressions of biographical factors on the domain subscales and the overall risk-taking scale.
The first line in each cell shows the standardized regression coefficient. The second line in each cell shows the critical ratio value and significance level.

	Standardized regression coefficients and critical ratios						
	Recreation	*Health*	*Career*	*Finance*	*Safety*	*Social*	*Overall risk*
Sex	0.15(5.50)***	0.11(3.87)**	0.02(0.65)	0.17(6.27)***	0.17(6.38)***	−0.00(−0.32)	0.18(5.85)***
Age	−0.18(−4.35)***	−0.13(−3.01)**	−0.08(−2.03)*	−0.21(−5.32)***	−0.14(−3.54)***	−0.13(−3.24)**	−0.28(−6.00)***
Job level	−0.00(−.25)	−0.02(−0.80)	0.08(2.66)**	−0.00(−0.22)	−0.04(−1.51)	0.06(2.12)*	0.02(0.78)
Organization size	0.06(1.87)	−0.08(−2.50)*	−0.09(−3.04)**	0.02(0.08)	0.06(2.17)*	−0.02(−0.61)	−0.01(−0.15)
Tenure	−0.01(−.31)	0.08(2.06)	−0.15(−3.78)***	−0.02(−0.68)	0.04(1.11)	−0.03(−0.66)	−0.04(−0.87)
Number of employers	0.03(1.05)	0.04(1.31)	0.18(5.63)***	−0.03(−0.82)	0.07(2.35)*	0.04(1.17)	0.09(2.63)**
Business start-up	0.05(1.83)	0.02(0.54)	0.13(4.89)***	0.11(4.11)***	0.04(1.32)	0.13(4.68)***	0.15(4.76)***
R squared	0.37	0.18	0.39	0.30	0.33	0.32	0.14

*$p<0.05$,**p<0.01, ***$p<0.001$.

Fit statistics for Table 4.

Fit statistics	*Risk subdomains*	*Overall risk scale*
χ^2	569.84	814.04
df	90	125
χ^2/df	6.33	6.51
Adjusted goodness of fit index	0.92	0.92
Non-normed fit index	0.92	0.91
Root mean square ratio	0.09	0.16
RMSEA	0.06	0.06
Parsimony ratio	0.53	0.73
Parsimony adjusted goodness of fit index	0.46	0.62

Table 5. Structural equation modelling multiple regressions of personality factors on Risk Propensity Scale and domain subscales.
The first line in each cell shows the standardized regression coefficients. The second line in each cell shows the critical ratio value and significance level.

	Standardized regression coefficients and critical ratios						
	Recreation	*Health*	*Career*	*Finance*	*Safety*	*Social*	*Overall risk*
Neuroticism	−0.16(−5.35)***	0.11(3.62)***	−0.11(−3.67)***	−0.14(−4.66)**	−0.09(−4.56)***	−0.12(−4.56)***	−0.18(−5.96)***
Extraversion	0.17(5.45)***	0.17(5.60)***	0.01(.46)	0.09(2.94)**	0.22(7.28)***	0.22(7.73)**	0.26(7.95)***
Openness	0.20(6.73)***	0.06(2.06)*	0.34(11.05)***	0.10(3.40)**	0.05(1.75)	0.32(11.56)***	0.36(10.29)***
Agreeableness	−0.12(−4.48)***	−0.17(−6.57)***	−0.18(−6.73)***	−0.21(−7.76)***	−0.19(−7.31)***	−0.16(−6.59)***	−0.31(−9.96)***
Conscientiousness	−0.09(−3.27)**	−0.13(−3.27)**	−0.08(−2.86)**	−0.17(−6.02)***	−0.16(−5.61)***	−0.07(−2.57)*	−0.20(−6.62)***
R squared	0.35	0.18	0.42	0.34	0.31	0.37	0.41

*$p<0.05$, **p<0.01, ***$p<0.001$.

Fit statistics for Table 5

Fit statistics	*Risk subdomains*	*Overall risk scale*
χ^2	474.66	736.19
df	78	103
χ^2/df	6.09	7.15
Adjusted goodness of fit index	0.93	0.92
Non-normed fit index	0.93	0.92
Root mean square ratio	0.12	0.84
Parsimony ratio	0.57	0.76
Parsimony adjusted goodness of fit index	0.49	0.64

was used – allowing free entry of the 30 NEO PI-R facets for each of the risk taking scales. The results are presented in rank order of strength of association with the dependent variable.

Table 6 confirms the prediction of Hypothesis 4 that sensation-seeking (E5) would be associated significantly with risk taking. This facet of the NEO PI-R emerges as a primary predictor of risk taking in four of the six domains, as well as for the overall risk-taking scale. There are other noteworthy results at the facet level. The O4 (actions) facet, concerned with an experimental orientation towards actions, is associated with risk taking in four domains. It is the first facet to emerge in the career risk-taking analysis, and the second predictor in the recreation and overall risk-taking scales. The openness to values facet (O6), interpreted as tolerance for multiple perspectives, is a predictor of four risk domains plus the overall risk scale. Competitiveness (A4), a preference for a fast paced life (E4), low levels of anxiety (N1), lack of straightforwardness (A2), lack of self-discipline (C5) and spontaneous decision-making (C6) were also significant predictors of risk-taking across several domains.

Overall, 24 facets out of the total of 30 personality facets were revealed by hierarchical regression to be associated with risk taking. The repeated emergence of a subset can be interpreted as strong evidence of the existence of a common set of dispositional factors that consistently influences risk taking in several domains. In view of the stability of personality over the adult lifespan (Caspi, 2000), it would follow that these common factors would be associated with consistent risk taking over time. In addition, there are a number of facets that predict risk taking in just one or two risk domains suggesting that the measure used is eliciting genuine discriminations and that combinations of general and specific personality facets underlie domain-specific risk behaviour.

Hypothesis 5 was examined by considering the differences between the risk propensity of people categorized in terms of their job function and business type using one-way analysis of variance followed by *post hoc* Tukey b tests.

The analyses of variance show that there are significant differences between the groups with respect to both job function and business type, confirming Hypothesis 5. *Post hoc* tests reveal that there was greater homogeneity of risk preferences within groups categorized in terms of function than by business type. The mean scores for each group and the results of the Tukey b tests are shown in Tables 8 and 9.

The *post hoc* test data show that people working in the HR/PR/ communications roles and the finance function have lower reported risk taking in most domains, and an overall lower risk propensity, than people working in other functions. Consultants were the greatest risk takers, with the exception of the safety risk domain. The business type analysis also revealed some strong patterns. For example, the arts and media participants rated themselves as high risk takers in the health domain but not as risk takers in other domains. This could represent the norms of an industry where smoking, drinking and emotional expression are all quite tightly associated. The finding that participants working in the finance sector were risk takers in the finance domain, but not in other domains or overall, also suggests some degree of business sector conditioning. IT/telecoms participants rated themselves as high risk takers overall and in the areas of recreational, financial and social risk taking. The data suggest that the risk profiles of different organisations and roles are likely to be an important factor in attraction, recruitment and retention of employees.

Table 6. Multiple hierarchical regression of personality facets on the domain subscales and the overall risk scale.

Recreation		*Health*		*Career*		*Finance*		*Safety*		*Social*		*Overall risk*	
Facet	*Beta value*	*Facet*	*Beta value*	*Facet*	*Beta value*	*Facet*	*Beta value*	*Facet*	*Beta value*	*Facet*	*Beta value*	*Facet*	*Beta value*
E5	0.18***	E5	0.16***	O4	0.15***	E5	0.13***	E5	0.17***	E3	0.21***	E5	0.22***
O4	0.17***	N5	0.17***	Age	−0.11***	A2	−0.11***	A4	−0.07***	O5	0.09***	O4	0.10***
Sex	0.14***	A2	−0.06*	O1	0.10***	C2	−0.07*	C6	−0.09***	O1	0.08**	A4	−0.11***
N1	−0.12***	O6	0.09***	A4	−0.09***	O5	0.13***	Sex	0.10***	O4	0.07**	O5	0.11***
Age	−0.11***	A6	−0.09***	O6	0.09**	Age	−0.12***	E4	0.10***	Age	−0.10***	C6	−0.09***
E4	0.13***	Sex	0.08**	N1	−0.06*	Sex	0.09***	A2	−0.07**	C2	−0.07**	Sex	0.12***
O6	0.10***	C3	−0.07*	O5	0.08**	C6	−0.11***	O4	0.05	E4	0.06*	O6	0.12***
E2	−0.06*	N3	0.08**	A6	−0.06*	N3	−0.09**	A3	−0.07**	O2	0.08**	N1	−0.10***
C4	−0.06*	C1	0.08**			N5	−0.09**	N1	−0.07**	N6	−0.11***	Age	−0.08***
A4	−0.07**	C2	−0.05*			C5	−0.08**	C5	−0.06*	C5	−0.12***	A2	0.10***
A5	0.05*					A4	−0.06*	O6	0.05*	C4	0.09**	E4	−0.08**
						O2	−0.05*			C6	−0.06*	C5	−0.09***
										A5	−0.05	E2	0.09***
												E3	0.08**
												C2	−0.06**
R	0.45		0.38		0.37		0.40		0.39		0.51		0.61
Adj R^2	0.19		0.14		0.13		0.15		0.15		0.25		0.36

N=1638. *p<0.05, **p<0.01, ***p<0.001.

Table 7. Oneway analysis of variance of domain subscales and the overall risk scale by job function and business type.

		Job function		*Business type*	
		Sum of squares	*F df*	*Sum of squares*	*F df*
Recreational	Between groups	47.12	1.34	92.37	2.66*
	Within groups	10 299.77		10 109.56	
	Total	10 346.89	*7, 2042*	10 201.93	*7, 2037*
Health	Between groups	44.51	1.31	130.59	3.84***
	Within groups	9941.48		9957.65	
	Total	9985.99	*7, 2052*	10 088.24	*7, 2049*
Career	Between groups	329.30	12.01***	229.50	8.06***
	Within groups	7907.75		8253.24	
	Total	8237.05	*7, 2032*	8482.74	*7, 2029*
Finance	Between groups	65.99	2.61*	360.81	14.73***
	Within groups	7432.23		7193.56	
	Total	7498.22	*7, 2060*	7554.37	*7, 2055*
Safety	Between groups	70.23	2.10*	14.47	0.43
	Within groups	9874.12		9879.03	
	Total	9944.34	*7, 2066*	9893.51	*7, 2063*
Social	Between groups	155.83	5.24***	310.75	10.53***
	Within groups	8743.82		8660.85	
	Total	8899.65	*7, 2059*	8971.60	*7, 2055*
Overall risk taking	Between groups	1192.16	2.67**	2421.81	7.64***
	Within groups	114 104.08		113 355.03	
	Total	115 296.23	*7, 1980*	115 776.84	*7, 2009*

*$p<0.05$, **$p<0.01$, ***$p<0.001$.

Table 8. Mean score for each job function group.

Job function	*N*	*Career*	*Financial*	*Safety*	*Social*	*Overall*
HR/PR/communications	52	3.40^{1}	3.57^{1}	4.86^{1}	4.82^{12}	25.12^{1}
Finance	805	3.25^{1}	4.27^{2}	5.35^{12}	4.28^{1}	26.85^{12}
Operations/engineering	153	3.75^{12}	3.98^{12}	5.71^{2}	4.48^{12}	27.28^{12}
General management	315	3.73^{12}	3.89^{12}	5.71^{2}	4.72^{12}	27.55^{12}
IT/systems	70	4.08^{23}	4.17^{12}	5.56^{12}	4.67^{12}	27.76^{12}
Other professional	177	4.14^{23}	4.19^{12}	5.46^{12}	4.73^{12}	28.15^{2}
Sales and marketing	226	3.81^{123}	4.02^{12}	5.67^{2}	4.89^{12}	28.17^{2}
Consulting	190	4.44^{3}	4.31^{2}	5.52^{12}	5.03^{2}	28.91^{2}

[123]Indicates membership in each Tukey b *post hoc* analysis subset (alpha=0.05).

6. Conclusion

This research has shed fresh light on the predictors of risk taking. The newly developed measure was revealed to have strong and highly interpretable relationships with biographical factors, personality profiles, and occupational/industrial category membership.

Table 9. Mean score for each organisation type group.

Organization type	*N*	*Recreation*	*Health*	*Career*	*Financial*	*Social*	*Overall*
Public service/ military/ government	191	4.62[1]	4.65[1]	3.50[1]	3.40[1]	4.27[1]	25.52[1]
Manufacturing	335	4.85[12]	4.42[1]	3.42[1]	3.75[12]	4.26[1]	26.29[12]
Sales and retail	117	4.92[12]	4.43[1]	3.73[1]	3.67[1]	4.73[12]	27.01[12]
Finance	626	4.94[12]	4.69[1]	3.42[1]	4.55[3]	4.34[12]	27.48[12]
Arts and media	134	4.95[12]	5.48[2]	3.90[12]	3.78[12]	4.81[12]	28.41[23]
Professional	107	5.16[12]	4.61[1]	3.99[12]	4.31[3]	4.66[12]	28.47[23]
Other services	268	5.22[12]	4.54[1]	4.39[2]	4.23[23]	4.99[23]	28.84[3]
IT/telecoms	205	5.42[2]	4.46[1]	3.76[1]	4.55[3]	5.44[3]	29.01[3]

[123]Indicates membership in each Tukey *b post hoc* analysis subset (alpha=0.05).

Moreover the measure and the data gathered with it paint a portrait of risk-taking tendencies that are both general and specific. Risk taking in one domain is generally associated with risk taking in others, yet at the same time individuals often incline to greater risk taking in one domain than another. These patterns are complex but quite strong nonetheless, with risk taking in any domain arising as a combination of general factors, including age, sex and several personality characteristics. The data show that risk behaviour is highly patterned at the individual difference level. Some people are likely to be consistent risk takers; others will be consistently risk averse, while a third group exhibit domain-specific patterns of risk behaviour.

Factor level analysis of the relationships between personality and risk taking suggest that personality profiles can be used to predict risk taking in all of the six domains measured, as well as overall risk taking. The general profile is strong and distinctive in terms of the Big Five. The pattern observed can be interpreted as follows: high extraversion (especially sensation-seeking) and openness supply the motivational force for risk taking; low neuroticism and agreeableness supply the insulation against guilt or anxiety about negative consequences, and low conscientiousness makes it easier to cross the cognitive barriers of need for control, deliberation and conformity.

The occupational and industrial patterns also suggest that there is the familiar dual processes of self-selection and socialization operating – differentially attracting people with appropriately tuned risk preferences and personalities to specific roles and organizations, and at the same time exposing them to situations that retune their risk profiles to fit situational demands, as seems to occur in finance, for example.

These data suggest that previous research may have been sometimes too singular and naïve in its treatment of risk propensity. It could be said that the very idea of everyone being risk seeking or avoiding is absurd. Most are in reality reluctantly *risk bearing*. Risk is something tolerated in order to live our lives. Often it is more proactive than that, as a means to various much sought-after ends, but without ever desiring to incur the risk. Just as seen with career risk-taking, job insecurity may be part of the territory of having ambitions in a position of relative lowliness. Yet, at the same time it has been seen that for some people risks are attractive because they stimulate and excite – the sensation-seekers. Personality psychology tells us that this group is a distinct minority.

The analysis of the data leads toward the following conclusion that just as risk taking is not one thing, neither are risk takers a single group. They are driven by one or more of three sets of forces, for these are not mutually exclusive:

1. *Stimulation seekers*. These are people for whom risks are intrinsically exciting. They raise thresholds of stimulation to levels that make the individuals feel psychologically gratified. They bear risk as a pleasure to be consumed. They are a minority group, but of significant proportions – as all the casinos and dangerous sports clubs of the world can testify!
2. *Goal achievers/Loss avoiders*. These are people whose drive for success, popularity, prominence, or gain leads them to be prepared to bear major risk in order to get what they want, for in many areas of life risk and return are positively linked. The personality profile we drew for them shows that their willingness to bear risk is a combination of emotional coolness, toughness, activity and a tendency to casualness about control and rules. There is also an opposite group – as identified by prospect theory (Kahneman and Tvesrky, 1979) – of those people who will bear major risk to avoid a likely loss. In either case, the individuals would be happier not to have to bear the risk, but have strong enough motives to do so.
3. *Risk adaptors*. Finally, there are those people whose risk taking is quite specific to areas of endeavour and activity. A combination of dispositions, skills and interests lead them towards roles and organizations that reinforce their risk preferences, and in many cases train them to be willing risk bearers in particular domains. Thus it is that people will take health risks as part of the landscape of media professions, and finance specialists take risks as an occupational requirement. The latter is especially true of the trading environment, where an explicit part of the formal training and informal socialisation is to bear major risks in order to perform.

These conclusions are potentially far-reaching in their implications. They suggest that future research and practice needs to take account of the dual nature of risk taking as both general and domain-specific. Both general and specific risk taking have strong and clear personality underpinnings, which suggest it often may more readily be managed by selection and placement than by training and conditioning. However, the results also suggest it would be as well to try to decompose risk-taking samples into something like the types identified – according to their motives and origins – for these may differ widely. Some may be more tolerable or trainable than others. At the same time, organizations need to consider what their own profile is: risk seeking, avoidant or neutral. Personality and risk profiling should help them achieve the best alignment with their staff's needs and attributes.

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Appendix I: The Risk Taking Index

We are interested in everyday risk-taking. Please could you tell us if any of the following have ever applied to you, *now* or in your adult *past*?

Please use the scales as follows:

1=never, 2=rarely, 3=quite often, 4=often, 5=very often

	Now	*In the Past*
a) recreational risks (*e.g. rock-climbing, scuba diving*)	1 2 3 4 5	1 2 3 4 5
b) health risks (*e.g. smoking, poor diet, high alcohol consumption*)	1 2 3 4 5	1 2 3 4 5
c) career risks (*e.g. quitting a job without another to go to*)	1 2 3 4 5	1 2 3 4 5
d) financial risks (*e.g. gambling, risky investments*)	1 2 3 4 5	1 2 3 4 5
e) safety risks (*e.g. fast driving, city cycling without a helmet*)	1 2 3 4 5	1 2 3 4 5
f) social risks (*e.g. standing for election, publicly challenging a rule or decision*)	1 2 3 4 5	1 2 3 4 5

Appendix II: Structural equation modelling of the Risk Taking Index

Table A1 shows the confirmatory factor analysis carried out using AMOS 3.6.1, a structural equation modelling package, and used to compare four theoretically plausible models:

(1) Single factor – this implies that common variance between items can be explained by a single risk propensity variable.
(2) Two factor (past and present) – this implies a single risk propensity variable that is not consistent over time.

Table A1(a). Modelling the Risk Propensity Scale by confirmatory factor analysis.

Fit statistics	*Independence model*	*Single factor*	*Two factor*	*Six factor*	*Second order*
χ^2	7929.30	4963.95	4807.32	323.91	473.78
df	66	54	53	39	48
$\chi^2/_{\delta\phi}$	120.14	91.93	90.70	8.31	9.87
Adjusted goodness of fit index	0.42	0.55	0.57	0.92	0.91
Non-normed fit index	0.00	0.24	0.25	0.94	0.93
Root mean square ratio	0.28	0.24	0.24	0.07	0.08
Parsimony ratio	1.00	0.82	0.80	0.59	0.73

Key:
χ^2/df: Ratio close to or below 3.0 are desirable for goodness of fit.
Adjusted goodness of fit index: Good fit indicated by values > 0.9.
Non-normed fit index. Does not depend on sample size. Good fit indicated by values >0.9.
Root mean square ratio: The root mean square residual. Values <0.08 indicate good fit (Browne and Cudeck, 1993).
Parsimony ratio: degrees of freedom of the model divided by the degrees of freedom of the independence model. More parsimonious models are to be preferred, so long as there is a good fit to the data.

Table A1(b).

Model	χ^2	*df*	χ^2/df	*AGFI*	*NNFI*	*RMSR*	*Parsimony*
Independence model	7929.30	66	120.14	0.42	0.00	0.28	1.00
Single factor	4963.95	54	91.93	0.55	0.24	0.24	0.82
Two factor	4807.32	53	90.70	0.57	0.25	0.24	0.80
Six factor	323.91	39	8.31	0.92	0.94	0.07	0.59
Second order	473.78	48	9.87	0.91	0.93	0.08	0.73

Key:
Π^2/df: Ratio close to or below 3.0 are desirable for goodness of fit.
AGFI: Adjusted goodness of fit index. Good fit indicated by values >0.9.
NNFI: Non-normed fit index. Does not depend on sample size. Good fit indicated by values >0.9.
RMSR: The root mean square residual. Values <0.08 indicate good fit (Browne and Cudeck, 1993).
Parsimony ratio: degrees of freedom of the model divided by the degrees of freedom of the independence model. More parsimonious models are to be preferred, so long as there is a good fit to the data.

(3) Six factor – separate (although correlated) risk behaviours in each behavioural domain.
(4) Six factor plus a second order overall factor – separate risk behaviours in each behavioural domain with common variance between factors accounted for by the common influence of an overarching risk propensity variable.

Table A1 shows the six-factor solution is superior to a single factor and two-factor solutions, and considerably better than the independence model. (Chi squared/df is not less

Table A2. SEM factor loadings 'now' and 'past' risk scale items on domains, and of overall risk propensity on each domain.

Item	*Domain*	*Standardized regression coefficient*
Recreational risk now	Recreational risk	0.84
Recreational risk past	Recreational risk	0.85
Health risk now	Health risk	0.79
Health risk past	Health risk	0.89
Career risk now	Career risk	0.81
Career risk past	Career risk	0.81
Financial risk now	Financial risk	0.84
Financial risk past	Financial risk	0.86
Safety risk now	Safety risk	0.94
Safety risk past	Safety risk	0.77
Social risk now	Social risk	0.86
Social risk past	Social risk	0.89
Recreational risk	Overall risk taking	0.60
Health risk	Overall risk taking	0.42
Career risk	Overall risk taking	0.54
Financial risk	Overall risk taking	0.52
Safety risk	Overall risk taking	0.55
Social risk	Overall risk taking	0.53

The fit statistics are shown in Table A1.

than three for any of them, but large samples tend to inflate Chi Squared.) The fit of the six-factor model and the six-factor model with a second-order factor are very similar. However, the second-order model is much more parsimonious (parsimony ratio of 0.73 versus 0.59). This is because the six-factor model explains the relationships between observed variables in terms of all the possible combinations of relationships between the six-factors. The second-order model explains them as a consequence of a single common influence on the six factors.

Table A2 shows the factor loadings for each domain in the six-factor case (with a second-order factor). The data do not suggest that 'past' and 'now' should be scaled separately. Scaling confirms high internal consistency for the general propensity scale (Cronbach alpha 0.80), with corrected item-whole correlations all in the acceptable range of 0.33 to 0.50. The alpha coefficient is not enhanced by the removal of any single item.

Appendix III

Table A3. Inter-item correlations and Cronbach's alpha for the domain subscales and the overall risk-taking scale.

Scale	*Inter-item correlations*	*Cronbach's alpha*
Recreational	0.71***	0.83
Health	0.71***	0.83
Career	0.67***	0.80
Finance	0.72***	0.84
Safety	0.74***	0.85
Social	0.78***	0.88
Overall risk taking		0.80

$N=2024$. *$p<0.05$, $p<0.01$, $p<0.001$.

Table A4. Correlations between the risk subscales.

	Recreational	*Health*	*Career*	*Financial*	*Safety*	*Social*
Health	0.181***					
Career	0.28***	0.14***				
Financial	0.21***	0.21***	0.30***			
Safety	0.31***	0.28***	0.15***	0.26***		
Social	0.26***	0.10***	0.33***	0.24***	0.29***	
Total	0.63***	0.54***	0.60***	0.59***	0.65***	0.61***

$N=2041$. *$p<0.05$, $p<0.01$, $p<0.001$.