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Motivational Profiles and Safety Related Traits

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Abstract: This paper was concerned with the relationship between the job motivational and preference profile of individuals and their engagement in safety behaviours. Studies have looked personality trait but not motive and value correlates of risk-related behaviour. Over twenty-five thousand Americans completed a questionnaire on safety-related competencies in the workplace which measured six different, but related, safety-related traits. They also completed a motivational measure of preferences and values used extensively in personnel assessment and selection The six safety dimensions yielded two factors labelled *Observant* and *Resilient*, which, along with the total score were the criterion variables. Step-wise regressions indicated that those with high needs for Affiliation, Hedonism and Recognition tended to be less safety conscious. The two different factors also showed a different pattern of demographic and motivational correlates. Problems of method invariance are discussed, as well the role of job motivation individual differences in safety-related traits and competencies.

Key Words: Safety behaviours; Bright-side; Dark-side; personality; motivation.

1. Introduction

Individual difference psychologists distinguish between intelligence, motivation and personality. Each has been linked to personal safety-related behaviour, which is the primary focus of this study. There is also important literature on the definition and measurement of safety behaviour and whether it could be considered a stable trait [1-3]. The research problem investigated in this study was one that has essentially been neglected: is that that between workers motives and values, and their safety related behaviour [4].

1.1.Current State of Knowledge

There is an extensive literature over nearly a hundred years of the relationship between personality and accidents, which continues [5,6]. Early studies examined the relationship between Extraversion and car accidents [7,8]. Thirty years ago, Booysen and Erasmus [9] reviewed 43 traits related to accidents and suggested that two factors were relevant: *recklessness* (Extraversion, domineering, aggressive, sensation-seeking) and *anxiety-depressive* (instability, Neuroticism). In an important, more recent, meta-analysis on the relationship between personality and workplace safety Beus, Dhanani and McCord [10] found that Agreeableness and Conscientiousness were positively, and Extraversion and Neuroticism negatively, associated with safety-related behavior, with Agreeableness accounting for most, and Openness least, of the variance. More recent research has looked at the relationship between dark-side personality traits and safety behaviour [11].

Far fewer studies have looked at the relationship between motivation patterns and safety-related traits and competencies [12]. There are studies going back many years on specifically safety motivation [13-18], but this study is on general work motivation, and its relationship to safety-related competencies [19,20]. Most often motivation is measured by value preferences: the idea is that people are motivated by things (achievement, power) they value most. Values

50 and preferences are often used in vocational guidance to assist people selecting jobs best suited
51 to their fundamental drives, needs and aspirations.

52 The question posed here is: are some values/preferences better indicators of an individual's
53 safety-related traits and competencies than others? For instance, does a need and motivation
54 for autonomy mean that individuals are less likely to be safety-conscious and follow safety
55 guidance "restricting" behaviours [21]? This would suggest that people in some jobs would be
56 much more, and others much less, sensitive to safety-procedures of all kinds. That is, the factors
57 that lead people to select and work in certain jobs, organisations and sectors are also related to
58 their attitudes to, and beliefs about, risk-taking and following safety procedures. This means
59 that in very big organisations with people in different departments and with different expertise
60 (accounting, engineering, Human Relations, Marketing) they may have systematically different
61 attitudes to safety.

62 This study used the *Motives, Values, Preferences Inventory* (MVPI) [22] which is designed
63 to evaluate the fit between an individual and the organisational culture. Culture fit is an
64 important factor to consider as no matter how capable or hard working an individual, if their
65 values do match that of the organisation they are unlikely to perform in that organisation. In
66 some organisations (building, drilling, manufacturing) being safety conscious is essential
67 whereas in others (office work, retail) it is less crucial. The issue of interest is whether the
68 motives of people drawn to particular jobs fits the requisite safety culture. Inevitably, motives
69 are complex and multidimensional and play a part in whether individuals get selected to senior
70 management positions [23]. That is, values associated with safety may play a role in when and
71 whether an individual is considered for promotion.

72 The MVPI can also be used to directly assess and individual's key drives and motivation
73 be that money, security or hedonism/fun. This information can used to ensure that the

74 individual will be suited to the nature of a role. For instance, a high pressure, commission-
75 based sales role is likely to suit an individual that is motivated by financial gains but is unlikely
76 to sit well with someone motivated by security.

77 The ten motives and values assessed by the MVPI are set out in Table 1

78 Insert Table 1 here

79 The measure has been used in a number of studies relating motivation to personality and
80 performance [24-26]. Whilst this is an exploratory study it is possible to derive various
81 hypotheses from the above: for instance, that those motivated by *Hedonism* would be
82 negatively, and those motivated by *Security* positively associated with work-place security

83 **1.2 Work Safety and Hogan Safety Types**

84 There have been many attempts to develop safety tests and measures [27]. This study used
85 the *Hogan Safety Competencies* [28] which were developed to help organisations identify job
86 applicants' engagement in safe behaviours at work. Individual differences in personality
87 predict both safety-related behaviours and on-the-job accidents and injuries (see above). Some
88 individuals are likely to follow organisational rules, effectively handle stress, avoid emotional
89 outbursts, remain attentive while performing mundane tasks, avoid risks, and respond well to
90 training are likely to exhibit safe workplace behaviours: Others are not. Thus, it is argued, that
91 by identifying critical antecedents to safety behaviours and combining results across multiple
92 personality facets, organizations can identify traits that likely to lead to – or prevent – accidents
93 and injuries across industries, organizations, and jobs.

94 They started by identifying the antecedents of safety behavior and suggested six types.
95 They validated the test by using both supervisor ratings and actual safety behavior.

96 The six scales of safety-related behaviours are:

Defiant - Compliant: This component concerns a person's willingness to follow rules. Low scorers may ignore rules; high scorers follow them effortlessly.

Panicky - Strong: This component concerns handling stress. Low scorers are stress prone, may panic under pressure and make mistakes; high scorers typically remain steady.

Irritable – Cheerful: This component concerns anger management. Low scorers may lose their temper easily and make mistakes; high scorers control their temper.

Distractible - Vigilant: This component concerns focus. Low scorers tend to be easily distracted and may make mistakes; high scorers remain focused.

Reckless - Cautious: This component concerns risk-taking. Low scorers tend to take unnecessary risks; high scores avoid risky actions.

Arrogant - Trainable: This component concerns trainability. Low scorers tend to ignore training and feedback; high scorers pay attention to training. The manual of the test gives the usual details of norms, reliability, and validity [28]. It demonstrates concurrent validity with a range of measures including the International Personality Item Pool Representation of the NEO PI-R **(**IPIP Big 5); Revised NEO Personality Inventory (NEO PI-R); Cattell 16 Personality Factor Test (16PF); California Personality Inventory (CPI); Jackson Personality Inventory-Revised (JPI-R) More importantly scores were logically and significantly related to employability scales measuring Dependability, Composure and Customer Focus. They also report on seven unique case studies where the criterion was nearly always a particular safety behaviour. Although the samples were often small because this kind of data is difficult to obtain, there was good evidence of the scale's predictive validity.

It is argued that this analysis can help organizations improve safety by identifying rule-abiding, trainable, controlled and focused individuals who make calculated decisions and remain steady under pressure. Across industries and jobs, the research demonstrates that employees with these characteristics are less likely to engage in unsafe behaviours that lead to

expensive on-the-job accidents and injuries. Hiring safe individuals will likely contribute to an organization's safety culture and bottom line results.

The Questions Posed

This study examines the relationship between the safety-related types and a measure of normal job motivation. Motives and values lead to vocational preference as well as safety sensitivity while at work. This study sought to explore this relationship. The aim was three-fold: *First,* to examine the underlying structure of the Hogan Competency Scales. *Second,* to examine motivational correlates and *third,* to examine the incremental validity of motivations traits over demography in predicting the competencies and higher-order factors. Based on previous literature we hypothesised that females more than males (H_1) and older rather than young people (H_2) would be more safety conscious. We also hypothesised that those who valued Security would be highly safety conscious (H_3) while those who valued Hedonism would not (H_4).

2. Method

2.1.Participants

In all 26,571 people completed the measures: 14,492 Males; 12.079 Females. Their mean age was 36.88 years (SD= 8.90 years). They came from all job sectors. The data was almost exclusively from working adult Americans and collected over many years.

2.2 Measures

1. *Values*. The Motives, Values, Preferences Inventory (MVPI) [22] measures 10 Motives/Preferences. Each scale is composed of five themes: a) *Lifestyles,* which concern the manner in which a person would like to live, b) *Beliefs,* which involve 'shoulds', ideals and ultimate life goals, c) *Occupational Preferences,* which include the work an individual would like to do, what constitutes a good job, and preferred work materials, d) Aversions, which reflect attitudes and behaviours that are either disliked or distressing, and e) preferred *Associates,* which include the kind of persons desired as co-workers and friends. MVPI scores are quite stable over time, with test-retest reliabilities ranging between 0.64 and 0.88 (mean = 0.79). More than 100 validation studies have been conducted on the MVPI with results indicating that the inventory is effective in predicting

2. *Safety Competency Scales* [28].

These are described above. The manual details evidence of reliability and validity.

2.2. Procedure

The data were collected from Hogan Systems over a number of years. All ethical procedures were followed. Data was logged over many years by the organisation and made available to the present author.

3. Results

Insert Table 2 and 3 here

Table 2 shows the correlations between the six competencies and the Safety total score. Each score correlated $r>0.57$ with the total score except the Strong dimension.

Table 3 shows the results of a Varimax Rotated factor analysis which was performed to investigate the underlying pattern in the safety competency data. There were two clear factors which accounted for 71% of the variance: Factor 1 Eigenvalue 2.62; Variance 41.62%; Factor 2 Eigenvalue 1.67; Variance 29.84%; Because of the loadings the first factor was labelled *Observant* and the second factor *Resilient.*

Three scores were then computed: one for each factor and a total score. These became the criteria variable for step-wise regression where demographics (age and gender) were entered as the first step; then the ten motives in the second. The central question was which of the 10 motives/preferences is most closely linked to the safety competencies.

Insert Tables 4 here

Table 4 shows the regression onto the *Total* factor score which was significant and accounted for just under a third of the total variance. The demographic variables indicated that females more than males, and older rather than younger, participants were more safety-observant though these two variables accounted for less than 2% of the variance. Three of the values were negatively associated with Overall safety: Consciousness (Recognition, Hedonism and Affiliation) while Security was positively associated with Safety. All four hypotheses were thus confirmed.

Table 4 also shows the regression onto the *Observant* factor. The demographic variables indicated that females more than males, and older rather than younger, participants were more observant though these two variables accounted for less than 2% of the variance. When the motivational variables were added it was clear only two were positive (Security and Tradition) while three were strongly negative (Recognition, Affiliation, Hedonism). In all these factors accounted for nearly 40% of the variance.

Table 4 also shows the regression onto the *Resilient* factor. The demographic variables indicated that females more than males were more resilient though these two variables accounted for less than 2% of the variance. When the Motivational variables were added two were strongly negative (Hedonism and Recognition) while four were strongly positive (Power, Affiliation, Science and Commerce). Together, the motivational factors accounted for around a fifth of the variance. In other words, an individual's motivational profile plays an important role in the way he or she relates to safety issues.

4. Discussion

The results of this study confirmed many findings in the literature: males are less safety conscious than females; older people are more safety conscious than younger people. This has been found many times and various explanations are given including evolutionary and socialisation factors. It is reassuring that these findings were established using this particular instrument,

The uniqueness of this study, however, lay in the identification of various, but related, "safety types", based on six dimensions. Thus, rather than having a single, accident-prone trait, like extreme extraversion, or neuroticism, the Hogan measures assesses six related traits that have an identifiable higher order structure. Further, this measure has a meaningful higher order structure with Compliant, Vigilant and Cautious people being highly safety conscious and *Observant* and Strong, Stable and Trainable people being *Resilient.* This offers a more nuanced way of dividing people between those who are risk-taking and not safety conscious from those that are.

Without doubt the most interesting findings in this study lay in the regressions (see Table 4) and the very different loadings for the two factors. The data for the first factor showed those who valued Security and Tradition being more "conservative" in their outlook tended to be

more safety observant as one may expect. However, all of the other factors especially Recognition, Hedonism and Affiliation were negatively associated with this factor. It has been observed that fun-loving, sociable and narcissistic people tend to be less interested in, and obedience to, rule following of every sort. The converse is therefore also true that introverted, "kill-joys" are the more safety conscious which may give them a poor reputation with many of their more outgoing colleagues.

However, the results of the regression onto the second factor showed some dramatic differences. The second factor was labelled *Resilient* because the safety behaviours reflected emotional stability and willingness to learn from experience. On this factor Power, Commerce and Science loaded highly, suggesting that those interested in work-success were likely to understand the role of safety in the workplace and therefore likely both to follow guidelines and get others to do likewise. These two factors suggest that rather than seeing safety beliefs and behaviours on a single obedient/rule-following and disobedient/rule breaking dimension it may be more useful to consider the above dimensions

The MVPI used in this study is, like many related measures, used primarily in management assessment and development. The aim is matching people to jobs: achieving fit. Clearly the issue of being safety-conscious and rule following is much more important in some industries compared to others (manufacturing, medicine, mining, transportation vs education, sales and marketing, journalism) though it should be recognised that all jobs have safety issues, though they differ in quality and quality.

A major problem arises when a motivational trait (that leads people to access particular jobs) seems to be opposed to safety rule following. Thus, in this study, one of the *strongest* and most *consistent* value/motive negatively associated with safety was Recognition. The MVPI manual notes that Recognition motives reflect responsiveness to attention, approval, praise, a need to be recognized, and an appreciation for the role of recognition in human motivation.

Recognition motives are associated with a desire to be known, recognized, visible, even famous, and with a lifestyle guided by opportunities for self-display and dreams of achievement—whether or not they are actualized. High scorers tend to be interesting, imaginative, self-confident, and dramatic, but also independent and unpredictable. They tend prefer to work in teams, communicate very well with his staff, have lots of ideas, but he may have trouble admitting mistakes. Certainly, this motive is associated with ambition which suggests these individuals "rise in the ranks" which could be very problematic for modelling and encouraging safety behaviours (Furnham, 2018).

It was the same pattern for the value/motive Hedonism. Hedonistic motives are associated with a desire for pleasure, excitement, variety, and a lifestyle organized around good food, good drinks, entertaining friends, and fun times. Those motivated by hedonism are expressive, playful, and changeable, and prefer to work in a dynamic and fluid environment. As a manager, they will be colourful and entertaining, but unconcerned with details and he may not learn from his mistakes. It is no wonder that those who enforce safety regulations are thought of a "kill-joys" and dull.

4.1 Practical Advice and Prescriptions

This study demonstrated that an individuals' values and job motivation profile is related to their safety-related observance. We know that values and motivations are major factors both in job choice but also success in that job. We also know that from a motivational point of view some are more sensitive to reinforcement (promise of reward) while others are particularly sensitive to punishment (threat of punishment) [29]. These two types therefore respond to advice and instructions about safety differently. Thus, those who endorse values like Recognition, Hedonism and Affiliation, and are usually attracted to "people jobs" would be more likely to follow safety instructions if these were linked to particular rewards, while those whose values

were associated with Security and Tradition would be more motivated to avoid any punishments associated with not following safety rules and regulations.

Large organisations, like exploration and mining, and transportation companies, who are very concerned that *all* staff are safety conscious and observant would do well to ensure that there are both sensitive and appropriate rewards and punishments for adhering or not to company guidelines. These may be usefully have a slightly different emphasis from department to department: reward in sales, punishment in IT. To know both an individual's and their departmental profile could help shape how safety-messages were developed.

4.2. Limitations

Like all others this study has limitations. Whilst we had a very large representative sample completing well established, validated tests, we had the relatively usual problem of common method variance: that is, both dependent and independent samples had self-report data. This often exaggerates the relationship between the variables and could in part account for the very high amounts of variance accounted for. Ideally, we would have liked to have actual accident data (which is often very problematic and skewed) or least the safety scale completed by a knowledgeable peer rather than the participant themselves. Equally, it would have been very desirable to know more about the participants such as their education, work history and self-estimated risk-taking behaviours. Moreover, it would be very desirable to compare tests of actual safety motivation with this general work motivation model

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357
358
359 Table 1. Motives Values and Preferences Inventory Scales

Aesthetics	valuing creative and artistic self-expression, an interest in art, literature, and music, lifestyle guided by imagination, culture and attractive surroundings.
Affiliation	valuing frequent and varied social contact, an interest in working with others, and a lifestyle organised around social interactions.
Altruistic	valuing improving society and actively helping others, an interest in helping those less fortunate and making the world a better place.
Commerce	valuing business activities, money, and financial gain, an interest in realising profits and finding business opportunities.
Hedonism	valuing good company and good times, an interest in pleasure, excitement and variety.
Power	valuing success, being influential, asserting authority and control and outperforming others.
Recognition	valuing fame, being seen, visible, and noticed by others.

Science	valuing learning, an interest in new ideas, technology, and analytical problem solving, and a lifestyle organised around exploring and understanding how things work.
Security	valuing certainty, predictability, and risk-free environments, an interest in structure and order.
Tradition	valuing history and convention, an interest in high standards and appropriate social behaviour, and a life organised around well-established principles of conduct

Table 2. Correlation between the six types and the overall score

Variables	1	2	3	4	5	6	7
1.Compliant							
2.Strong	-0.11**						
3.Cheerful	0.59**	0.39**					
4.Vigilant	0.56**	-0.30**	0.19**				
5.Cautious	0.59**	-0.37**	0.20**	0.77**			
6.Trainable	0.20**	0.23**	0.30**	0.17**	0.16**		
7. Safety Tot	0.78**	0.24**	0.73**	0.66**	0.64**	0.58**	

**p<0.01

Table 3. Factor Analysis of the Six Safety types

Statement			Factor	
	M	SD	1	2
Compliant	48.87	28.69	0.74	0.45
Strong	51.60	29.48	-0.52	0.71
Cheerful	46.58	27.78	0.23	0.84
Vigilant	51.03	28.60	0.88	0.06
Cautious	49.72	28.89	0.91	0.03

	Trainable	48.80	48.79	0.13	0.61

Table 4. Results of the Regression

	Overall Score $F(12, 18810) = 725.36$ adj $R^2 = 0.32$			*DV1* $F(12,18810) = 1038.50$ adj $R^2 = 0.40$			*DV2* $F(12,18810) = 415.88$ adj $R^2 = 0.21$		
	B	**β**	**t**	**B**	**β**	**t**	**B**	**β**	**t**
Age	0.05	0.03	4.42	0.32	0.04	6.53	0.01	0.00	.026
Gender	1.77	0.05	7.59	8.85	0.06	9.42	1.73	0.01	1.91
Recognition	-0.02	-0.36	-48.73	-0.74	-0.28	-39.93	-0.60	-0.27	-33.83
Power	0.04	0.07	8.49	-0.17	-0.07	-8.88	0.41	.019	22.40
Hedonism	-0.14	-0.23	-34.35	-0.24	-0.09	-14.16	-0.61	-0.28	-38.47
Altruism	0.01	0.01	1.84	-0.07	-0.03	-4.09	0.12	0.05	7.09
Affiliation	-0.04	-0.02	-11.31	-0.60	-0.23	-36.60	0.32	0.15	20.60
Tradition	0.02	0.04	5.62	0.13	0.05	7.79	0.01	0.01	0.63
Security	0.14	0.22	32.61	0.75	0.28	44.08	0.08	0.03	4.57
Commerce	0.03	0.05	6.13	-0.05	-0.02	-2.43	0.21	0.10	12.03
Aesthetics	-0.04	-0.06	-8.94	-0.21	-0.08	-12.86	-0.01	-0.00	-0.43
Science	0.01	0.02	2.61	-0.22	-0.08	-12.51	0.28	0.13	17.04

B is the unstandardized beta (β)