Construct Validity of Psychometric Instruments Developed in the United States, when Applied to Professional People in South Africa

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1 INTERCULTURAL VALIDITY OF MEASURING INSTRUMENTS

The study reported in this paper was part of a joint research programme by the Universities of Pretoria, Orange Free State and the Rand Afrikaans University. The aim of the joint programme was to examine the values, motives and work experiences of highly educated individuals in professional occupations. The structures of seven psychometric instruments used in the joint programme are investigated here. These instruments measure the following variables: Type A Behaviour, Locus of Control, Career Orientation, Job Involvement, Job Satisfaction, Self-Concept and Entrepreneurial Attitude.

All the psychometric instruments used in the study, except the questionnaire for measuring Locus of Control, were developed in the United States. It is therefore important to compare the constructs of the instruments used in the South African sample to those identified in the United States by the developers of these various instruments. A retest of the South African Locus of Control instrument developed by Schepers (1995) was also required and carried out.

Triandis, Vassiliou, Vassiliou, Tanaka & Shanmugam (1972) have made the point that different cultural groups also show differences in behaviour. These authors refer to this phenomenon as the subjective culture of a cultural group, that is, the characteristic way in which its social environment is perceived. They argue that cross-cultural studies imply the need for a scale to be constructed for each culture, and for the independent validation of such scales. Anastasi (1990) argues that cross-cultural testing is not only associated with sub-cultures within a dominant culture. This author also emphasises the need for cross-cultural testing in newly developing nations in Africa and elsewhere. She points out that this is of particular importance with increased industrialisation, where psychometric instruments serve as aids in job selection and personnel placement in the professional, mechanical and clerical fields of employment.

The application of psychometric instruments to people from different cultural backgrounds has been questioned by Samuda (1983), Taylor (1987) and Anastasi (1990). Samuda (1983) states that the issue of cross-cultural measurement in multicultural societies is of universal concern. Anastasi (1990) argues that cultural differences may lead to group differences that affect responses to particular psychometric instruments, thus reducing the validity of a particular instrument for specific groups. She also argues that it would be futile to try to devise an instrument that is free from cultural influences, seeing that the behaviour of the individual is affected by the cultural milieu, which encourages and fosters certain abilities and forms of behaviour and discourages others. One may therefore infer that it is risky to apply a psychometric instrument developed in an American culture to a South African culture, without validating the instrument.

Bhagat, Kedia, Crawford and Kaplan (1990) emphasise that as the realities of competition in a global marketplace come closer, the more rapidly must cross-cultural and cross-national issues and the importance of their measurement be addressed. These authors warn that it is no longer acceptable for unexplained variances to be conveniently related to an error term, adding that psychometric instruments should be evaluated in terms of the true theoretical significance of their characteristics. These authors state that growing international economic interdependence makes it imperative for management to take informed decisions

about human resources. Towards this end, accurate measurement of the variables involved in the management of people becomes highly significant.

Malpass and Poortinga (1986) assert that the application of psychometric instruments in different cultures is used for the evaluation of intercultural differences on the one hand, and the determination whether measurement procedures yield equivalent results on the other. They refer to three different meanings of the term "equivalence" in cross-cultural research, namely, functional equivalence of activities, conceptual equivalence of the meaning of behaviour and metric equivalence indicated by the properties of psychometric instruments.

This paper describes an investigation of the metric equivalence of psychometric instruments, with a view to identifying the psychometric properties of the data and preventing quantitative method bias effects when the instruments are used. The intercultural use of instruments has been questioned in the South African context (Taylor, 1987; Edwards & Riordan, 1994; Edwards & Leger, 1995), just as doubt has been thrown on the portability of certain psychometric instruments in Industrial and Organisational Psychology between the United States and South Africa (Boshoff, Julyan, & Botes, 1996; Boshoff & Hoole, 1998b; Kamfer, Venter & Boshoff, 1998).

The operational objective of this particular study, as an autonomous part of a larger national research programme, is to determine the portability of the factorial structures and the internal consistency of six psychometric instruments developed in the United States. One South African instrument is re-tested in order to determine reliability. These instruments are then applied to a sample of South African professionals in the accountancy and pharmacy occupations. The constructs or structures to be measured are individually discussed.

Type A Behaviour: The term Type A Behaviour was coined by two cardiology researchers, Friedman and Rosenman (1959). In their work with cardiac patients they realised that most of these patients showed a discernible behaviour pattern, and they named it Type A Behaviour. Friedman and Rosenman (1959: 1286) described the manifestation of this as: (1) an intense drive for achieving self-selected though poorly defined goals; (2) eagerness to compete, even in non-competitive situations; (3) persistent aspiration towards recognition and advancement; (4) involvement in more than one activity at a time; (5) habitual inclination to accelerate the rate of simultaneous mental and physical functions; and (6) exceptional physical and mental alertness.

De Beer, Steyn, Rossouw, Ferreira, Swanepoel, Nel & Kotze (1981) found that the measurement of Type A Behaviour is quite complex because it entails a

large variety of behavioural activities. Thoresen and Öhman (1987) are of the opinion that the precise composition of the Type A Behaviour pattern is not definitive, as researchers have not yet reached consensus on its conceptualisation. Assessment of this behaviour pattern is therefore not cut and dried.

The Structured Interview (Rosenman, Swan & Carmelli, 1988) was the first instrument developed to measure Type A Behaviour. However, the time-consuming nature of this measurement technique and problems of expense in administering an interview for purely research purposes, ruled out the use of this instrument in the present study.

Another instrument is the Jenkins Activity Survey. This is a pre-coded, self-administered questionnaire developed in collaboration with the authors of the Structured Interview (Jenkins, Zyzanski & Rosenham, 1979). Jenkins *et al.* (1979) developed the Jenkins Activity Survey as a 52-item self-report inventory to measure Type A Behaviour. According to the authors, a person scoring high on this inventory is characterised by extremely hurried, impatient, competitive, aggressive and restless emotions, feelings of high responsibility and being challenged, experiencing time pressure in a continuous striving for achievement.

According to its authors, the Jenkins Activity Survey measures three statistically independent factors, namely: Speed and Impatience, Job Involvement, and Hard-Driving and Competitive behaviour (Jenkins *et al.*, 1979). These factors are characterised as follows:

- *Speed and Impatience* (Factor S): This factor indicates the Type A individual's urgent manner of behaviour. This includes rapid speaking, walking and eating, easily irritated, as well as being strong-willed and hurrying other people along. It is an expression of the Type A Behaviour components: time urgency and low irritability threshold. The Speed and Impatience component typifies an individual who often attempts to do more than one thing at a time, and inclined to anticipate what is likely to take place next in order to react in advance.

- *Job Involvement* (Factor J): The Job Involvement factor evaluates the element of devotion in occupational activity. A high score on this factor is an indication of an individual's preference for high-pressured and challenging tasks, working against tight deadlines and doing overtime. This factor indicates the level of planning, motivation, challenge and dedication that are part of one's occupational activities.

- *Hard Driving and Competitive behaviour* (Factor H). This dimension relates to a compulsive attraction to involvement in challenges and competition. It is also associated with self-perceptions of putting in more effort than others do, being hard driving, responsible, competitive, serious and conscientious. This kind of behaviour suggests self-assessment of how seriously a person is taking his/her job and the associated efforts, competitiveness and feelings of responsibility concerning the job.

A shortened version of the Jenkins Activity Survey was developed by Pred, Spence and Helmreich (1986). These authors identified two factors that measure Type A Behaviour, namely Achievement Striving and Impatience/ Irritability.

Locus of Control: Anastasi (1990) writes that the "Locus of Control" construct came into prominence when Rotter (1966) published his assessment scale of an individual's generalised expectancies of reinforcement. According to Rotter (1966) reinforcement could be perceived as being either internally or externally controlled. The Rotter instrument, said to measure "Locus of Control" was developed on the basis of the social-learning theory (Anastasi, 1990 & Schepers, 1995). The term itself may be seen as part of the concept of causal attribution (Anastasi, 1990).

According to Anastasi (1990) Internal Control refers to the perception that it is one's own characteristics or behaviour that cause and lead to certain events. On the other hand, External Control indicates the belief that external positive or negative reinforcement takes place. This is perceived as the result of control by powerful individuals, chance, fate, luck or unpredictable forces.

Anastasi (1990) identifies three major dimensions of causal attribution, namely "Locus of Control", "Stability" and "Controllability". According to the author the "Locus of Control" dimension is either internally caused by aptitude, health or effort; or externally caused by luck, task difficulty or help from others. The second dimension, which the author also classifies as internal but calls "stability", is described as differentiating between the enduring permanent causes of aptitude and its modifiable, changeable causes such as mood, effort or health. The third dimension of "controllability" is described by the author as different degrees of controllability perceived by a person. An example would be task failure attributed to an individual either for lack of effort or temporary conditions beyond the individual's control, like illness.

A variety of Locus of Control scales have been designed to measure this variable in different populations. A South African "Locus of Control" scale was developed by Schepers (1995). This was called the Locus of Control Inventory.

Schepers sees the Social Learning and Attribution Theories as the foundation of this measuring instrument. This author outlines the perception of Locus of Control according to the Social Learning Theory as the way in which reinforcement takes place from the social environment, and the effect it has on future behaviour. According to the author, the Social Learning Theory in conjunction with the Attribution Theory explains the way in which a person selects information according to inherently stable or invariant characteristics. Schepers (1995) developed his Locus of Control Inventory on the responses of 1662 first-year university students.

Schepers (1995) divides the incentives for personal behaviour into the two categories of dispositional and situational causes. Dispositional causes are seen as the organic attributes of a person, that is, all his/her natural characteristics. Situational causes are seen as the environmental factors influencing the individual.

According to Schepers (1995) the Locus of Control Inventory measures three factors, namely Internal Control, External Control and Autonomy. Plug, Meyer, Louw and Gouws (1986) describe the term "autonomy" as a condition of the independence and self-determination of an individual, and add that it also refers to something that is self-regulating and free from external control.

Career Orientations: Schein (1975, 1977) coined the term "career anchor" as the occupational self-concept of the individual, meaning the interaction between the perceptions of the individual and his/her work experiences. The term career anchor is used by Schein (1975) to describe the phenomenon of powerful anchoring of career decisions in certain patterns of perceptions. According to the author the occupational self-concept develops into clear and stable perceptual patterns of (a) talents and abilities, (b) motives and needs, and (c) attitudes and values. Schein (1975, 1977) identifies the career anchor of the individual as a dynamic guide that operates either as a conductor or a constraint in personal career decisions in the course of a lifetime. The career anchor is said to eventually become a broad occupational self-concept, the result of the interaction of different patterns of talents, motives and values.

Schein (1975, 1977) identified nine different career anchors. DeLong (1982a, 1982b) again developed an instrument, the Career Orientations Inventory, in an attempt to accurately measure these dimensions. Kaplan (1990) in turn describes the distinction between the two terms Career Anchor and Career Orientations as being based on theory and empirical measurement, respectively. DeLong (1982a) conceives the Career Orientation Inventory as consisting of nine sub-scales that depict the general career orientation of self-perceived needs, attitudes and values (DeLong, 1982b). The self-perceived talents and abilities

element of Schein's conceptualisation of the career anchor notion, is not measured by the Career Orientations Inventory developed by DeLong (1982a, 1982b).

Job Involvement: This is defined by Plug *et al.* (1986) as the degree of emotional commitment that a person makes in a specific work situation. The authors see this kind of involvement as the participation of a worker in decision-making and problem-solving processes.

Kanungo (1979, 1982a) takes the analysis of involvement further. He sees work alienation as the opposite pole of job involvement and argues that a distinction should be made between what he calls (a) involvement in a particular job context and (b) involvement in work generally. He regards Job Involvement as a term descriptive of an individual's belief about one's present job, a function of the satisfaction of the individual's present needs. He goes on to argue that job involvement is a specific belief resulting from the relationship with one's present job. According to Kanungo (1979, 1982a) this is different from organisational commitment, which should be seen as the general attitude toward an organisation as a whole. This author relates job involvement to the importance of a person's intrinsic and extrinsic needs. On the other hand he sees work involvement as the result of socialisation, which he warns must not be confused with intrinsic motivation. Work involvement is however also seen as satisfaction with work in general, and the perceptions a person has about the need-satisfying potential of his/her work.

In the light of these arguments and the lack of distinction between (a) job and (b) work involvement of existing instruments, Kanungo (1982a) felt it necessary to develop new instruments to measure the two variables that were valid and reliable. According to him such an instrument should measure both job and work involvement, and this resulted in the development of the Kanungo Job Involvement Questionnaire and the Kanungo Work Involvement measure. The author states that a scale which measures both job and work involvement would achieve the following objectives in future research:

- explore the nature of antecedents and consequences of both job and work involvement;
- emphasise alienation and involvement in the various life spheres, for example work, family and community;
- enable theoretical predictions relating to alienation and involvement to be made more accurately; and
- promote cross-cultural validity and allow findings related to both job and work involvement to be determined more meaningfully.

Job Satisfaction: Landy (1985) emphasises the importance of work satisfaction (having one's ability recognised) to human beings. He refers to the Hawthorne studies that found the following: (a) workers' feelings affect their work behaviour, and (b) their perception of objective reality is more important than the facts of objective reality itself.

McCormick and Illgen (1985) describe "intrinsic" satisfaction as the experience of a sense of competence, and "extrinsic" satisfaction as contentment derived from external rewards. General satisfaction should be seen as the sum total of intrinsic and extrinsic satisfaction. Landy (1985) again defines general job satisfaction as the total combination of worker feelings from all the important facets of his/her job.

The Minnesota Satisfaction Questionnaire is one of the many questionnaires that measure the extent to which people are satisfied with their jobs. It was developed by Weiss, Dawis, England and Lofquist (1967), based on previously published job satisfaction scales. These authors constructed their job satisfaction theory around the assumption that individuals have a need to achieve and maintain correspondence with their environment. The individual's interchange with the work environment is described in terms of fulfilment of environmental requirements (satisfactoriness), as well as individual requirements (satisfaction).

Weiss *et al*. (1967) have a long (100 items) and a short (20 items) version of the Minnesota Satisfaction Questionnaire, measuring twenty and two dimensions respectively. The authors assert that the twenty-item short questionnaire assesses three dimensions, namely intrinsic, extrinsic and general satisfaction, where the last-mentioned is the sum of intrinsic and extrinsic satisfaction.

Self-Concept: According to Loevinger (1966) the ability to form of a self-concept increases with age, socio-economic level, education and intelligence. This author sees the infant at the lowest point of self-conceptualisation, which develops to a stereotypically conventional self-concept in adolescence. With the increase in maturity, the individual is seen to advance beyond the stereotyped concept formed in adolescence to a more differentiated and realistic self-concept in adulthood. Anastasi (1990) remarks that a resurgence of interest in the self-concept has been witnessed during the 1980s, especially concentrating on the degree of self-acceptance by the individual.

The aim of the selection of a Self-Concept scale in the present study, was to obtain a multifaceted scale, in order to do justice to the multivariate nature of the construct. The Six-Factor Self-Concept Scale for Adults developed by Stake (1994) was selected here, as a comprehensive instrument that provides a

multifaceted view of the individual's self-concept across life settings, roles and activities.

Stake (1994:56) defines the term self-concept in relation to the Six-Factor Self-Concept Scale for Adults as "the domain of self-descriptions that have a self-evaluative connotation". The author argues that the global measurement of self-worth has proved less successful in research studies than domain-specific measures for the prediction of behaviour, hence the development of a multi-faceted adult self-concept scale. She holds that the need for an adult self-concept scale is inferred from the argument that maturity leads to self-evaluation from a broad range of life experiences, roles and relationships. It is further argued that measurement can be generally applied only if it pertains to a wide variety of adult roles, relationships, situations and occasions. According to Stake (1994) the development of this scale was aimed at the identification of sub-scales to represent self-evaluation (a) of universal relevance to adults, and (b) significant in a broad range of life experiences.

Entrepreneurial Attitude: The Entrepreneurial Attitude Orientation Scale (EAOS) was developed by Robinson, Stimpson, Huefner and Hunt (1991) as a means of evaluating the attitudes of entrepreneurs, closely associated with business entrepreneurship in particular. Attitude is described by Shaver (1987) as the predisposition of behaving in a favourable or unfavourable manner towards a particular class of social objects. The authors of the EAOS see the general principles of the learning of attitudes applied here, namely those of association, reinforcement and imitation. They argue that behaviour is influenced by preferences that lead to attitudes, and that entrepreneurial attitude is therefore a potentially important predictor of entrepreneurial behaviour.

Robinson *et al.* (1991) identified four entrepreneurial attitudes closely associated with business entrepreneurship: attitudes towards Economic Innovation, Achievement, Control and Self-Esteem. These variables are measured on the Entrepreneurial Attitude Orientation Scale by means of 26, 23, 12 and 14 items respectively.

The notion that machiavellianism is an important element in entrepreneurial behaviour was added later by Stimpson (1993). It was however not included in the scale used in the present study, as little is known about the psychometric properties of the revised scale and the machiavellian sub-scale.

2 METHOD

The present study explores various constructs of psychometric instruments developed in the United States with a view to determining their portability to a South African sample of professional people. The psychometric variables measured are those discussed above, namely: Type A Behaviour, Career Orientations, Job Involvement, Job Satisfaction, the Self-Concept and Entrepreneurial Attitude. The retest reliability of a South African-developed Locus of Control instrument is also examined.

A group of professional people was selected in accordance with the aim of the study. A random sample was thus selected from the national registers of two occupational categories (sub-groups) - pharmacists and accountants. A survey research design was used.

3 PARTICIPANTS

The biographical characteristics of the sample and sub-samples of participants are next discussed in order to gain a clear impression of the survey group(s). Information on the following biographic/demographic characteristics of the participants is given in table form below: professional occupation, age, gender, home language, private practitioner or employee status, number of jobs, number of years, number of organisations, marital status, urban or rural origin and province where respondents grew up.

The respondents are classified into the two occupational groups shown in Table 1:

Table 1 Distribution of Occupations

Occupation	Number (N)	Percent (%)
Pharmacists	200	53.3
Accountants	175	46.7

Two hundred pharmacists and one hundred and seventy five accountants therefore took part in this study, respectively forming 53.3% and 46.7% of the total sample. Male participants represented a somewhat larger portion (58,9%) of the respondents than females (41.1%) in the total sample.

The age distribution of the participants is as follows: The mean age of males was 45.72 years (SD = 12.79) and that of females 35.70 years (SD = 9.52 years). The age ranges of males and females were respectively 22 to 84 and 22 to 72

years. The mean age for the total sample is 41.6 years with a standard deviation of 12.46.

The age variable is also differentiated according to occupation and employee status as shown below.

Occupation: The mean age of the pharmacists is 39.46 years (N = 200) and that of the accountants 44.05 (N = 175). The standard deviation for pharmacists and accountants is 12.70 and 11.95 years respectively. The minimum age of the pharmacists is 22 and the maximum 84 years. The minimum age of the accountants is 24 and the maximum 82 years.

Employee status: The participating professionals are divided into the categories of private practitioners and employees. The mean age of the private practitioners (N = 169) is 46.14 years (SD = 12.01). Private practitioners had a minimum age of 23 years and a maximum age of 84 years. The mean age of employees (N = 201) is 37.61 years (SD = 11.47) with a minimum and maximum age of 22 years and 74 years respectively. The home language distribution of the participants is shown in Table 2.

Table 2 Home Language Distribution

Language	Number (N)	Percent %
Unknown	1	0.3
Afrikaans	158	42.1
English	211	56.3
Venda	1	0.3
Zulu	2	0.5
North Sotho	2	0.5

The home languages of the vast majority of participants in this survey were Afrikaans (N = 158) or English (N = 211), representing 42.1% and 56.3% of the sample respectively. The other language groups represented only between 0.3 and 0.5% of the sample. The low representation of the other language groups would make separate analysis of their responses invalid.

Table 3 distinguishes between the private practitioner and employee groups of the sample.

Table 3 Distribution of Private Practitioner and Employee Status of Participants

Employment	Number (N)	Percent %
Private practitioner	169	45.1
Employee	201	53.6
Unknown	5	1.3

The entire group of participants therefore consisted of 169 private practitioners and 201 employees, representing 45.7% and 54.3% of the total sample respectively, with the occupational status of five (1.3%) of the participants unknown.

Table 4 shows the number of jobs previously and currently held by the participants, whether in the same or different organisations.

Table 4 Distribution of Number of Jobs Held by Participants

Number of jobs	Number (N)	Percent %
One	81	21.6
Two	73	19.5
Three	91	24.3
Four	67	17.9
Five	38	10.1
Six	15	4.0
Seven	5	1.3
Eight	1	0.3
Unknown	4	1.1

This table shows that the majority of persons participating in this project held between one and four jobs (21.8, 19.7, 24.5 and 18.1% of the total sample respectively) before the date of the present study. A smaller number of participants held between five and eight jobs, representing 10.2, 4.0, 1.3 and 0.3% of the total sample respectively.

The mean number of years worked by participants is 18.07 (SD = 12.56). The number of organisations to which the participants have been attached is shown in Table 5.

Table 5 Number of Organisations to which Participants have been Attached

Number of organisations	Number (N)	Percent %
0	1	0.3
1	91	24.3
2	74	19.7
3	92	24.5
4	56	14.9
5	33	8.8
6	14	3.7
7	6	1.6
8	2	0.5
Unknown	6	1.6

This table shows that a large proportion of participants had worked for between 1 and 5 different organisations. The mean number of organisations worked for is 2.83 with a standard deviation of 1.56.

The marital status of the participants is represented in Table 6.

Table 6 Marital Status of Participants

Marital status	Number (N)	Percent %
Single	62	16.5
Married	295	78.7
Divorced	10	2.7
Widow/er	6	1.6
Cohabiting	2	0.5

According to the above data the great majority of the participants were married (78.7%) and less than one-fifth (16.5%) single. An even smaller number were divorced, widowed or cohabiting, respectively forming only 2.7, 1.6 and 0.5% of the sample.

The majority of participants (77.6%) grew up in an urban environment. The largest single group of participants (57.0%) are currently working in the Gauteng Province. This is in line with the proportion of the South African population living in this province, which is the main urban area in the country.

4 MEASURING INSTRUMENTS

The statistical properties of the instruments tested in the study (and outlined above) are as follows.

Type A Behaviour: The shortened version of the Jenkins Activity Survey, as developed by Pred, Spence and Helmreich (1986), was used in the present study.

The reliability and internal consistency coefficient of the global score of the Jenkins Activity Survey, developed by Jenkins, Rosenman & Zyzanski (1974) ranges between 0.73 and 0.83. Jenkins *et al.* (1979) reported that, in different studies, the internal consistency of the Jenkins Activity Survey varied between 0.83 and 0.85. The authors also report test-retest reliabilities of 0.65 and 0.82 after intervals of four to six months respectively.

Pred *et al.* (1986) who developed the shortened version of the Jenkins Activity Survey, took the items assigned to the factors Achievement and Impatience/Irritability from the original survey and applied these to 713 students. The responses were factor analysed by means of a Principal Axis solution and an oblinum (oblique) rotation. An eigenvalue-one criterion was used and a two-factor solution preferred. For men, eight items loaded on the Achievement factor using a 0.35 criterion and 5 items loaded on the Impatience/Irritability factor (N = 362). In the female sample (N = 351), the authors identified 7 items loading on the Achievement factor and 5 items on the Impatience/Irritability factor. The data were subjected to Confirmatory Factor Analysis and the results validated the two-factor structure. All the items loaded 0.30 or more on either of the two factors for both the male and female samples. The Chronbach Alpha coefficients for the scales were: 0.79 for the achievement striving scale for both men and women, and 0.65 and 0.64 for the impatience/irritability scale for men and women respectively.

Pred *et al.* (1986) determined correlations between the long version of the Jenkins Activity Survey (measuring A-B Types, Hard-Driving Competitive Behaviour, Speed and Impatience and Achievement Striving) and the shortened version developed by them (measuring Achievement Striving and Impatience/Irritability). These correlations are shown in Table 7.

Table 7 Correlations Between the Three Original Jenkins Activity Survey Scales and the New Jenkins Activity Survey Scales (Male & Female) (Spence, Helmreich & Pred 1987)

Original JAS Scale	**New JAS Scale** A-B	H	S	AS	II
A-B		0.73**	0.80**	0.76**	0.43**
H	0.68**		0.58**	0.83**	0.37**
S	0.78**	0.53**		0.57**	0.70**
AS	0.73**	0.82**	0.52**		0.21**
II	0.40**	0.30**	0.67**	0.13**	

** r = 0.01. H = Hard-Driving Competitiveness; S = Speed and Impatience; AS = Achievement Striving; I/I = Impatience/Irritability. Correlations for males (N = 362) are above the diagonal. Correlations for females (N = 351) are below the diagonal.

Locus of Control: The Locus of Control Inventory developed by Schepers (1995) standardised on 1662 first-year university students, and is used in this study to revalidate the instrument in the South African working environment. The questionnaire used consisted of eighty items with a seven-point Likert-type response scale. This scale varies from "not at all" to "very strongly". The reliability of the Locus of Control questionnaire was reported by Schepers (1995) as having a Cronbach Alpha of 0.841 for the External Control scale, 0.832 for the Internal Control scale and 0.866 for the Autonomy scale. This author reported the standard deviation of the scores to range between 13.359 and 17.079, and the mean scores between 79.730 and 148.001 on the three respective factors (Schepers, 1995).

Career Orientations: The Career Orientations Inventory (Schein, 1995) was used in this study. It measures eight Career Anchors namely: "Security"; "Pure Challenge"; "Entrepreneurship"; "Lifestyle Integration"; "Managerial Competence"; "Technical/Functional Competence"; "Service Dedication" and "Autonomy/Independence". The Career Orientations Inventory used here consists of forty items on a six-point scale. The response scale varies between "never true for me" and "always true for me". Schein disclosed in a personal communication with Boshoff (1996) that the 40-item inventory actually measures eight career orientations, with the two security factors regarded as one variable, rather than nine orientations as was the case with the 1985 instrument.

DeLong (1982b) verified the test-retest reliability coefficients of the Career Orientations Inventory sub-scales to lie between 0.71 and 0.91. Schein (1985) reported a revised 10-point Career Orientations Inventory to measure the

following nine Career Orientations: Geographic Security; Job Security; Pure Challenge; Entrepreneurship; Lifestyle Integration; Managerial Competence; Technical/Functional Competence; Service Dedication and Autonomy/ Independence. Boshoff, Kaplan and Kellerman (1988) found the Alpha coefficients for eight career orientations on the revised instrument to range from 0.73 to 0.86. According to these authors, only the Lifestyle Integration factor had an unacceptable internal reliability of r = 0.45. Kaplan (1990) used Varimax Rotation in his factor analysis of the Career Orientation Inventory in his South African study of fourteen professions (N = 1771). In this case, the Career Orientation Inventory factor-analysed into nine factors and the different factors accounted for between 5 and 16 per cent of the total variance. The psychometric properties of the later slightly revised instrument (Schein, 1995) consisted of eight factors. In the case of this instrument, the geographic and job security factors measure as one factor, namely security. The other seven factors are the same as on the previous scale and the psychometric qualities of these sub-scales can also be assumed the same as in earlier studies.

Job Involvement: Only the Job Involvement scale of the Kanungo Job and Work involvement questionnaire was used in the current study. The Kanungo Job Involvement Questionnaire consists of ten items on a ten-point scale measuring one factor, namely "Job Involvement". The response scale categories vary between "do not agree/not applicable to me" to "fully agree/fully applicable".

The Job and Work Involvement Questionnaire is reported by Kanungo (1982b) to have reasonably high levels of internal consistency, test-retest reliability, as well as validity. Kanungo (1982b) reports the Alpha coefficients for three Job Involvement measures (semantic differential, questionnaire and graphic items) used in the development of his scale to be 0.81, 0.87 and 0.70 respectively. He reported test-retest coefficients of 0.74, 0.85 and 0.82 respectively. Kanungo (1982b) also stated that the Job Involvement scale showed both convergent and discriminant validity. He concluded that his factor analysis proved Job Involvement to be a uni-dimensional construct.

Blau (1985) as well as Reddy and Rahman (1984) report a high validity and reliability of the job and work involvement questionnaire developed by Kanungo. Kaplan, Boshoff and Kellerman (1991) verify a factorial distinctness of the "Job Involvement" and "Job satisfaction" constructs measured by Kanungo's Job Involvement questionnaire. Kaplan (1990) concludes from his research on a South African sample of fourteen professional groups, that the Kanungo Job Involvement Scale is a robust and uni-dimensional measure, seeing that all the job involvement items loaded well above the 0.30 criterion on the single job involvement factor. These results support Blau's (1985a) view

that the factor structure of the Kanungo Job Involvement Scale is not only stable across samples but also across cultures.

Kamfer, Venter & Boshoff (1998) report from a sample of 237 employees of the South African Department of Correctional Services that eight of the original 10 items could be retained after factor analysis (discarding the two negatively phrased items numbers 2 and 7). These authors confirm that the Job Involvement single-factor solution has good internal consistency. Kamfer *et al.* (1998) suggest a one-factor solution for the Kanungo Job Involvement scale with a Cronbach Alpha of 0.86, that explains 47.95% of the total variance. The Confirmatory Factor Analysis done by these authors showed this to represent a good model-data fit. Kamfer *et al.* (1998) conclude that the scale could be considered highly applicable to non-native English speakers in South Africa.

The re-analysis by Boshoff and Hoole (1998b) of Kaplan's (1990) data based on a sample of 1791 white collar South African professionals, shows an acceptable internal consistency (Cronbach Alpha 0.83) of the Kanungo Job Involvement Questionnaire. One factor was measured accounting for 44.1% of the total variance. Only one item (no 7) was eliminated in this analysis. These authors conclude that this scale is probably uni-dimensional. They further state that the Job Involvement Questionnaire could be used with a great deal of confidence in South African samples and regard the construct to be quite portable between the USA and South Africa.

Job Satisfaction: The short form of the Minnesota Satisfaction Questionnaire (MSQ) was used in this study. This consists of twenty items responded to on a five-point Likert-type scale, which varies from "very dissatisfied" to "very satisfied".

Weiss *et al.* (1967) reported internal reliability coefficient medians of 0.86 for intrinsic satisfaction, 0.80 for extrinsic satisfaction and 0.90 for general satisfaction. According to the authors, the Minnesota Satisfaction Questionnaire provides in a sound measure of overall job satisfaction. Kaplan (1990) investigated the responses of a South African sample of fourteen professional groups and found the three sub-scales of the MSQ to be highly correlated, sharing at least 32% common variance. Kaplan nevertheless retained the three-factor structure, arguing that it is conceptually meaningful and has a distinct appearance. This author reasons that the correlation between the sub-scales implies that the individual job facets are to some extent coloured by one's view of the job as a whole.

A two-factor solution for the Minnesota Satisfaction Questionnaire is suggested by Kamfer *et al.* (1998), who argue that all the original 20 items are retained by

this procedure. In the case of non-aggregated analysis, Cronbach Alpha is reported as 0.87 and 0.75 for factors one and two respectively. These two factors explained 40.62% of the total variance. Whereas factor one explains 31.51% of the total and 77.57% of the common variance, factor two accounts for 9.11% of the total and 22.43% of the common variance. The correlation between factors one and two is reported to be 0.41. In the case of aggregated analysis, Kamfer *et al.* (1998) report a Cronbach Alpha of 0.86 for factor one and 0.73 for factor two, the two factors explaining 71.58% of the total variance. Factor one explained 55.72% and factor two 15.86% of the total variance; whereas the first factor accounted for 77.84% and the second for 22.16% of the common variance. These factors correlate 0.55 when based on aggregated item scores.

Boshoff and Hoole (1998b) report that the different items of the Minnesota Satisfaction Questionnaire seem to belong to one scale in a South African sample of 1791 professional people. The Cronbach Alpha coefficient is reported as 0.90 with the single factor containing 36.3% of the total variance. In this case, the authors argue that the MSQ was probably essentially one-dimensional. This conclusion was reached by Boshoff and Hoole (1998b) after a re-analysis of the data on which Kaplan based his view of the dimensionality of the Minnesota Satisfaction Questionnaire.

Self-Concept: The Six-Factor Self-Concept Scale for Adults (Stake, 1994) was used, reportedly a carefully researched, easily administered and widely applicable instrument. The Six-Factor Self-Concept Scale for Adults consists of thirty-six items. This seven-point Likert-type response scale varied from “if it is never or almost never true of you” to “if it is always or almost always true of you”. This scale measures six factors, namely Likeability, Morality, and the four aspects of “agentic” functioning, namely Task Accomplishment, Giftedness, Power and Vulnerability. Stake (1994) associates “agentic” functioning with ability and performance, as seen in the four factors of Task Accomplishment, Giftedness, Power and Vulnerability.

Stake (1994) also reports the test-retest reliabilities of the sub-scales of the Six-Factor Self-Concept Scale for Adults as: Power 0.84; Morality 0.88; Likeability 0.74; Task Accomplishment 0.78; Vulnerability 0.80; and Giftedness 0.82. The Cronbach coefficient of composite scores has an internal consistency of 0.97. This author states that in order to prove the validity of this instrument, the Self-Concept sub-scales should correlate higher with a Self-Esteem measure than a measure of Social Desirability. She further explains that the correlation with a Well-Being measure should fall between a Self-Esteem and a Social Desirability measure.

Convergent and discriminant validity of the sub-scales were tested as a set, as well as individually, by means of three studies consisting of 216 undergraduates, with the Rosenberg Self-Esteem Scale, the Ford Social Desirability Scale and the Monge Well-Being Scale. Stake (1994) reports correlation patterns to be consistent with expectations. Correlation among the Global Self-Esteem and sub-scales ranged from - 0.38 to + 0.42 with vulnerability yielding the only negative coefficient. The median absolute value is 0.38. All the correlations were significant at the 0.0001 probability level except for the Morality sub-scale ($r = 0.19$, $p < 0.01$). The reported multiple correlation between the six sub-scales and Global Self-Esteem is 0.62 ($p < 0.001$). The different correlations between Social Desirability and the Self-Concept sub-scales ranged between - 0.18 to + 0.32. The median absolute value is 0.16. Only the Morality sub-scale was reported to correlate higher with Social Desirability ($r = 0.32$) than Global Self-Esteem ($r = 0.19$). Social Desirability scores correlated between 0.23 with the Rosenberg and 0.20 with the Monge scales. The well-being correlations fell between the self-esteem and social desirability measures with coefficients ranging between - 0.33 and + 0.37. The median absolute value is given as 0.24. According to Stake (1994) three sub-scale validity tests provide substantive support for the convergent and discriminant validity of each of the sub-scales. She concludes that the sub-scales of the instrument are internally consistent and congruent across gender and age groups. These sub-scales should therefore be able to predict different variables.

Entrepreneurial Attitude: The Entrepreneurial Attitude Orientation Scale [Robinson *et al.* (1991)] as used in the present study consists of seventy-five items responded to on a five-point Likert-type scale. The response scale varies between “strongly agree” to “strongly disagree”. The constructs measured are: attitudes to Economic Innovation, Achievement, Locus of Control and Self-Esteem in business. Robinson *et al.* (1991) report on the internal consistency of their scales in terms of Cronbach Alpha coefficients as follows: Achievement (0.84); Self-Esteem (0.73); Personal Control (0.70); and Economic Innovation (0.90). The test-retest reliabilities of the attitudinal sub-scales are reported as: Innovation (0.85); Achievement (0.76); Personal Control (0.71); and Self-Esteem (0.76). The test-retest reliability and Alpha coefficients for the machiavellianism sub-scale are not available and this sub-scale was not used in the present study. Robinson *et al.* (1991) measured the discriminatory validity of their scale by comparing the means of entrepreneur and non-entrepreneur scores with MANOVA. The authors report a significant overall difference and also significant differences in the total score as well as the different sub-scale scores. On each of the sub-scales, the univariate test showed a significant difference between entrepreneurs and non-entrepreneurs, with the former scoring significantly higher. A Stepwise Discriminant Analysis was utilised in the estimation of the predictive value of the four sub-scales. With the exception of

the achievement sub-scale, the sub-scales contributed significantly to the discriminant function. A 77% overall accuracy was shown by the classification coefficients in the prediction of group membership. Statistically significant correlations between the sub-scales are reported, indicating a common variance of between 20.5% and 51.4%. This shows a higher degree of redundancy than expected between the sub-scales. The correlations were however not high enough to combine the sub-scales. Robinson *et al.* (1991) regard the psychometric qualities of the Enterpreneural Attitude Orientation sub-scales as satisfactory when applied to North American respondents.

Hoole and Boshoff (1997) report a three-factor solution when the instrument is applied to a South African sample (N = 299), consisting of entrepreneurs, engineers and managers. According to them, the factors in the three-factor solution may be interpreted as attitudes to Innovation, Achievement and Self-Esteem in business. To determine the discriminant validity of the Entrepreneurial Attitude Orientation Scale these authors used MANOVA, which showed the three sub-scales to have some degree of discriminant attribute. Hoole and Boshoff (1997) reported the scores of the three occupational groups to differ significantly on the scales measuring attitudes to Innovation and Achievement, but the scores of the three groups did not differ on attitude to Self-Esteem in business. These authors come to the conclusion that there is some justification for using an attitude-based approach for distinguishing entrepreneurs from non-entrepreneurs in the South African context.

Boshoff and HooIe (1998a) evaluated the construct validity of the longer Entrepreneurial Attitude Orientation Scale, which included the machiavellianism sub-scale. This study was done on the same South African sample as in their 1997 study of three occupational groups, namely entrepreneurs (N = 110), engineers (N = 113) and individuals in managerial positions (N = 76). Boshoff and HooIe (1998a) report that the four-factor structure envisaged by Robinson *et al.* (1991) could not be replicated on this sample. In this study, a three-factor structure (containing interpretable factors) was seen as the best fit on the data. Boshoff and Hoole (1998a) explain that in their study, 40 items were left out of consideration in their factor analysis, representing a loss of 44.9% of the items. These authors accepted a three-factor solution containing items that measure Attitudes to Innovation, Assertiveness and Achievement, reasoning that this shows slightly better fit indices than the four-factor structure. Boshoff and Hoole (1998a) warn that the portability of at least two or probably three of the five constructs that were originally embodied in the Entrepreneurial Attitude Orientation Scale, must be called into question. They argue that the items included in the original United States factor scales of Personal Control, Self-Esteem and Machiavellianism disappear when applied to South Africa. It is therefore vital to consider the portability of a construct used in intercultural

research in an international context. Boshoff and Hoole (1998a) admit that their study has its limitations, as they did not investigate the predictive and discriminatory validity of the instrument. They also acknowledge that the sample on which the study was carried out was somewhat too small.

5 PROCEDURE

Two methods of probability sampling were used in this survey, as expressed by Kerlinger (1986): (a) stratified sampling and (b) systematic sampling. Stratified sampling was used, by dividing the population into the two strata of professional groups (societies), respectively chartered accountants and pharmacists in the Gauteng Province of South Africa – the country's economic heartland. Systematic sampling was used by dividing the total number of listed professionals (pharmacists and accountants respectively) by the size of each sample. The total number of individuals on the professional lists of accountants and pharmacists was divided by 60. The result was used as the interval from which sixty persons from each profession were initially selected in the Gauteng area. A questionnaire was mailed to every individual selected in this way. The questionnaire consisted of a covering letter (in English), a section eliciting biographic/demographic information and a section containing the psychometric tests. A pre-addressed, pre-stamped envelope was enclosed for the return of the questionnaire. From this selection a total of only 42 questionnaires were received back, which was inadequate for the purposes of the present study. A second sample of 50 persons was then selected from the two professions, accountants and pharmacists, omitting the previously selected participants. A total of 35 questionnaires were received back, which brought the total number of received questionnaires to 97. Twenty-nine questionnaires completed by individuals in the pharmacy and auditing professions were simultaneously gathered in the Western Cape. These individuals were randomly selected from the same professional lists as the members of the Gauteng sample and represented 29% of the 100 questionnaires distributed in a similar fashion in the Western Cape.

It was decided on reconsideration that the sample of 137 respondents was still too small. A further random selection of 500 participants was made from each profession by means of systematic sampling. The total number of registered professionals was divided by 500 and this number was used as interval in the selection of 500 individuals from each professional registrar omitting the previous selected individuals. A letter informing selected persons about the research project was sent to them, and the participants were told that a questionnaire would follow. Three days later the questionnaires were posted. Each questionnaire contained a covering letter and a pre-addressed and pre-

stamped return envelope. The questionnaires were completed anonymously and participation was voluntarily, however, if participants requested feedback of the research results, they willingly identified themselves. Participants were reminded of the questionnaire and asked to forward it as soon as possible by means of a letter posted one week after the questionnaire. Three weeks after the reminder letter, yet another letter was posted as a last attempt to get co-operation. A total of 273 of these questionnaires were returned in addition to the previous 137 responses. Of the total number of 410 questionnaires only 375 were regarded as usable, that is, all the psychometric items of the questionnaires had been completed.

The analysis of the responses was planned and directed by the present authors and the statistical analysis carried out at the Information Technology Department of the University of Pretoria.

The structure and internal reliability of each instrument used was revalidated by means of factor analysis. These structures were then compared to the structures of the original questionnaires. The following steps were executed.

Eigenvalues > 1.00 were identified. "Clear" breaks between the eigenvalues > 1.00 were identified by means of a Scree test. These identified breaks were taken as indications of the number of possible factors. A Principal Factor Analysis with Direct Quartimin rotation was done according to the number of determined factors. The BMDP 4M programme was used for this purpose. For example, if the Scree test identifies that potentially three, four and five factors are present, than a Principal Factor Analysis is done on all the items specifying three, four and five factor solutions. The results of the Principal Factor Analysis is evaluated by taking the following into account: (a) items are identified which do not load ≥ 0.25 on any factor in any solution, as well as (b) those items loading ≥ 0.25 on more than one factor in any of the solutions. These identified items are left out of the following round of Principal Factor Analysis again carried out for the three, four and five factor solutions. With the results of this subsequent round of Principal Factor Analysis, the same decision rules are followed as in the previous round: should an item not load ≥ 0.25 on any factor in any solution or load ≥ 0.25 on more than one factor in any solution, these factors are removed from further analysis. The process is repeated until no "problematic" items remain on any factor according to the described evaluative procedure. In order to choose the best solution, Confirmatory Factor Analysis is done using SAS (Proc Callis) on the "clean" structures obtained. The purpose of Principal and Confirmatory Factor Analysis is to eliminate error variance in the measurements, as far as possible.

Bagozzi and Heatherton (1994) indicated that the indices obtained from a Confirmatory Factor Analysis could be an underestimation of the quality of the fit between a measurement model and the data on which it is based. This could happen when the factors included in the analysis contain a large number of items. Bagozzi and Heatherton (1994) suggest that aggregation of factor scores can be used to reduce the problem, and to obtain more accurate estimates of the value of the indices generated by Confirmatory Factor Analysis. The analysis carried out leads to a revalidation of the constructs and measurements of the responses of this South African sample.

The results of the statistical analysis of the different instruments used for measuring the variables included in the study are next presented.

6 TYPE A BEHAVIOUR PATTERN

In order to determine the acceptability of the psychometric qualities of the shortened version of the Jenkins Activity Type A Survey (1979) when applied to a South African sample, the factor analytical procedure as described above was followed. This analysis of 13 items identified four eigenvalues > 1. The eigenvalues were respectively 2.48, 1.73, 1.45 and 1.048. It seemed that there were clear "breaks" between the third and fourth and the fourth and fifth eigenvalues. It was therefore decided to extract both three and four factors during the first round of analysis. (The existence of two factors would be in agreement with the findings of the authors of the shortened version of the Jenkins Activity Survey.) Principal Factor Analysis was used to analyse the responses of the total sample (N = 375) with Direct Quartimin rotation of the axes. In the four-factor solution two factors consisted of only two items each. Moreover, seeing that the Cronbach Alpha coefficient for the third factor was only 0.41 and for the fourth factor only 0.48 in the four-factor solution, it was decided not to pursue this solution any further. The four-factor structure obtained is shown in Table 8.

Table 8 Rotated Factor Loading Pattern in the four-factor solution of the shortened form of the Jenkins activity survey (N = 375)

Item	Factor 1	Factor 2	Factor 3	Factor 4
Jenkins 5	0.722			
Jenkins 6	0.728			
Jenkins 8	0.402			
Jenkins 2		0.819		
Jenkins 3		0.445		

Table 8 continued

Item	Factor 1	Factor 2	Factor 3	Factor 4
Jenkins 4			0.401	
Jenkins 9			0.553	
Jenkins 10			0.521	
Jenkins 13			0.374	
Jenkins 11				0.488
Jenkins 12				0.554

	Factor 1	Factor 2	Factor 3	Factor 4
Cronbach Alpha	0.66	0.52	0.41	0.48
Total variance	14.92	7.65	6.50	2.27
Common variance	47.60	24.39	20.75	7.26

The intercorrelation between the four factors is shown in Table 9:

Table 9 Intercorrelation of the Jenkins Activity Scale four-factor solution

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	0.318	1.000		
Factor 3	0.166	0.134	1.000	
Factor 4	0.262	-0.283	-0.126	1.000

Item B4 did not load on any factor in the three-factor solution. A loading of ≥ 0.30 was found for each of the remaining items of the three factors. The three-factor structure obtained is shown in Table 10.

Table 10 Rotated Factor Loading Pattern in the three-factor solution of the Shortened Form of the Jenkins Activity Survey (N = 375)

Item	Factor 1	Factor 2	Factor 3
Jenkins 5	0.621		
Jenkins 6	0.734		
Jenkins 8	0.391		
Jenkins 11	0.374		
Jenkins 12	0.524		
Jenkins 7		0.401	
Jenkins 9		0.584	
Jenkins 10		0.490	
Jenkins 13		0.362	

Table 10 continued

Item	Factor 1	Factor 2	Factor 3
Jenkins 1			0.326
Jenkins 2			0.689
Jenkins 3			0.502
	Factor 1	**Factor 2**	**Factor 3**
Cronbach Alpha	0.65	0.53	0.49
Total variance	15.90	7.96	6.42
Common variance	52.52	26.27	21.21

The intercorrelation between the factors is shown in Table 11.

Table 11 Intercorrelation of the Jenkins Activity Scale three-factor solution

	Factor 1	Factor 2	Factor 3
Factor 1	1.000		
Factor 2	0.041	1.000	
Factor 3	0.050	0.216	1.000

The Confirmatory Factor Analysis carried out on the three-factor structure yielded the indices shown in Table12.

Table 12 Results of Confirmatory Factor Analysis of the Shortened Form of the Jenkins Activity Survey on the three-factor model (N = 375)

Indices	Value
Fit criterion	0.4138
Goodness of Fit Index (GFI)	0.9337
GFI Adjusted for Degrees of Freedom (AGFI)	0.9043
Root Mean Square Residual (RMR)	0.0883
Parsimonious GFI (PGFI)	0.7640
Chi-square (df = 54, p > Chi^2 = 0.0001)	154.7617
Null Model Chi^2 (df = 66)	589.8012
RMSEA Estimate (90% CI = 0.0577 to 0.0838)	0.0706
Probability of Close Fit	0.0050
ECVI Estimate (90% C I = 0.4564 to 0.6584)	0.5468
Bentler's Comparative Fit Index	0.8076
Normal Theory Reweighted LS Chi-square	159.2797
Akaike's Information Criterion	46.7617

Table 12 continued

Indices	Value
Bozdogan's (1987) CAIC	-219.2923
Schwarz's Bayesian Criterion	-165.2923
McDonald's (1989) Centrality	0.8743
Bentler & Bonett's (1980) non-normed Index	0.7649
Bentler & Bonett's (1980) NFI	0.7376
James, Mulaik, & Brett (1982) Parsimonious NFI	0.6035
Z-Test of Wilson & Hilferty (1931)	6.6182
Bollen (1986) Normed Index Rhoi	0.6793
Bollen (1988) non-normed Index Delta2	0.8119
Hoelter's (1983) Critical N	176
RNI	0.8076

From the above Confirmatory Factor Analysis, it is concluded that the three-factor structure seems to represent an inadequate to reasonable fit on the data. The three factors identified were respectively: Achievement (factor 1), Hard Driving/Competitive (factor 2) and Impatience/Irritability (factor 3).

Following the argument by Bagozzi and Heatherton (1994), an aggregation of the factors and Confirmatory Factor Analysis of the three-factor solution was carried out. The results of the Confirmatory Factor Analysis are shown in Table 13.

Table 13 Confirmatory Factor Analysis of the three factor model of the Jenkins Activity Survey with Item Aggregation (N = 375)

Indices	Value
Fit criterion	0.0756
Goodness of Fit Index (GFI)	0.9793
GFI Adjusted for Degrees of Freedom (AGFI)	0.9585
Root Mean Square Residual (RMR)	0.0633
Parsimonious GFI (PGFI)	0.6528
Chi-square (df = 14, p > Chi^2 = 0.0131)	28.2742
Null Model Chi^2 (df = 21)	296.2957
RMSEA Estimate (90% CI = 0.0232 to 0.0800)	0.0522
Probability of Close Fit	0.4095
ECVI Estimate (90% C I = 0.1214 to 0.2040)	0.1521
Bentler's Comparative Fit Index	0.9481
Normal Theory Reweighted LS Chi-square	27.7207
Akaike's Information Criterion	0.2742
Bozdogan's (1987) CAIC	-68.7027

Table 13 continued

Indices	Value
Schwarz's Bayesian Criterion	-54.7027
McDonald's (1989) Centrality	0.9811
Bentler & Bonett's (1980) non-normed Index	0.9222
Bentler & Bonett's (1980) NFI	0.9046
James, Mulaik, & Brett (1982) Parsimonious NFI	0.6030
Z-Test of Wilson & Hilferty (1931)	2.2216
Bollen (1986) Normed Index Rhoi	0.8569
Bollen (1988) non-normed Index Delta2	0.9494
Hoelter's (1983) Critical N	315
RNI	0.9481

The indices shown in Table 13 indicate a good fit of the measurement model on the data. The result must however be interpreted with caution as the indices shown may represent an overestimation of the quality of the fit. This could be the case due to the relatively short factor scales shown in Table 10.

7 STATISTICAL PROPERTIES OF THE LOCUS OF CONTROL QUESTIONNAIRE

The current analysis included all 80 items of the original questionnaire and produced 23 eigenvalues > 1. These eigenvalues were: 11.73, 5.89, 3.15, 2.53, 2.18, 2.04, 1.93, 1.77, 1.66, 1.56, 1.50, 1.48, 1.39, 1.35, 1.29, 1.26, 1.23, 1.21, 1.16, 1.13, 1.05, 1.03, and 1.03. Clear "breaks" were evident between the second and third, and the third and fourth eigenvalues. Both two and three factors were extracted during the first round of the analysis. (The existence of three factors would be in agreement with the findings of the author of the instrument.) The responses of the total sample (N = 375) for this Locus of Control scale were analysed by means of Principal Factor Analysis with Direct Quartimin rotation of the axes. A Principal Factor Analysis was done to develop two- and three-factor models and the factor loadings obtained for the two solutions shown in the following two tables.

Table 14 Rotated Factor Loading Pattern in two-factor solution of the Locus of Control Questionnaire (N = 375)

Item	Factor 1	Factor 2
LC1	0.366	
LC2	0.439	
LC3	0.319	
LC5	0.538	
LC6	0.298	
LC7	0.260	
LC8	0.299	
LC10	0.369	
LC11	0.282	
LC13	0.644	
LC14	0.603	
LC15	0.419	
LC16	0.253	
LC17	0.479	
LC18	0.251	
LC19	0.350	
LC22	0.537	
LC24	0.497	
LC25	0.463	
LC27	0.536	
LC28	0.606	
LC29	0.463	
LC30	0.610	
LC31	0.307	
LC37	0.485	
LC40	0.393	
LC42	0.390	
LC44	0.560	
LC46	0.488	
LC48	0.320	
LC49	0.267	
LC54	0.371	
LC55	0.517	
LC60	0.488	
LC62	0.361	
LC63	0.335	
LC66	0.602	
LC67	0.503	
LC68	0.491	

Table 14 continued

Item	Factor 1	Factor 2
LC69	0.529	
LC70	0.550	
LC73	0.516	
LC74	0.640	
LC75	0.437	
LC76	0.286	
LC9		0.339
LC12		0.577
LC20		0.394
LC26		0.253
LC34		0.564
LC35		0.527
LC36		0.664
LC38		0.270
LC39		0.396
LC41		0.648
LC43		0.417
LC45		0.468
LC47		0.364
LC50		0.278
LC51		0.454
LC52		0.383
LC53		0.509
LC56		0.524
LC57		0.526
LC58		0.306
LC59		0.300
LC65		0.364
LC72		0.250
LC79		0.604
LC80		0.519

	Factor 1	Factor 2
Cronbach Alpha	0.92	0.85
Total variance	15.13	7.01
Common variance	68.31	31.69

The two factors correlated –0.164 with each other. Of the 80 items 62 were included in this solution.

Table 15 Rotated Factor Loading Pattern of the three-factor solution of the Locus of Control Questionnaire (N = 375)

Item	Factor 1	Factor 2	Factor 3
LC1	0.386		
LC2	0.486		
LC3	0.342		
LC5	0.570		
LC8	0.306		
LC10	0.341		
LC11	0.264		
LC13	0.657		
LC14	0.606		
LC15	0.417		
LC17	0.491		
LC22	0.582		
LC24	0.527		
LC25	0.465		
LC27	0.532		
LC28	0.630		
LC29	0.505		
LC30	0.643		
LC37	0.464		
LC39	0.258		
LC40	0.379		
LC42	0.381		
LC44	0.558		
LC46	0.454		
LC48	0.283		
LC54	0.344		
LC55	0.482		
LC60	0.440		
LC63	0.285		
LC67	0.496		
LC68	0.484		
LC69	0.511		
LC70	0.559		
LC71	0.271		
LC73	0.533		
LC74	0.658		
LC75	0.425		
LC76	0.260		
LC9		0.364	

Table 15 continued

Item	Factor 1	Factor 2	Factor 3
LC20		0.378	
LC26		0.273	
LC43		0.378	
LC45		0.434	
LC47		0.328	
LC50		0.336	
LC51		0.515	
LC52		0.382	
LC53		0.535	
LC56		0.652	
LC57		0.610	
LC58		0.519	
LC59		0.350	
LC12			0.693
LC34			0.726
LC36			0.782
LC41			0.688
LC79			0.538

	Factor 1	Factor 2	Factor 3
Cronbach Alpha	0.91	0.78	0.84
Total variance	17.12	7.04	3.11
Common variance	62.75	25,84	11.4

In the three-factor structure 23 of the 80 items in the questionnaire were excluded. The three-factor structure produced factors which were named as: Factor 1: Internal Locus of Control; Factor 2: External Locus of Control and Factor 3: Vicissitudes in Life. The correlations between the factors are shown in Table 16:

Table 16 Intercorrelation of the Locus of Control Questionnaire three-factor solution

	Factor 1	Factor 2	Factor 3
Factor 1	1.000		
Factor 2	-0.250	1.000	
Factor 3	-0.093	0.300	1.000

Confirmatory Factor Analysis was carried out on the two- and three-factor structures yielding the indices shown in Table 17.

Table 17 Results of Confirmatory Factor Analysis of the Locus of Control three-factor model (N = 375)

Indices	**Two**	**Three**
Fit criterion	16.0170	8.6544
Goodness of Fit Index (GFI)	0.6588	0.7610
GFI Adjusted for Degrees of Freedom (AGFI)	0.6395	0.7433
Root Mean Square Residual (RMR)	0.0892	0.0944
Parsimonious GFI (PGFI)	0.6407	0.7339
Chi-square ($p > Chi^2 = 0.0001$)	5990.3632 (df = 2627)	3236.7345 (df = 1539)
Null Model Chi^2	10686.9806 (df = 2701)	7534.4831 (df = 1596)
RMSEA Estimate (90% CI)	0.0585 (0.0566 to 0.0605)	0.0543 (0.0517 to 0.0569)
Probability of Close Fit	0.0000	0.0035
ECVI Estimate (90% C I)	17.0070 (16.3714 to 17.6688)	9.3759 (8.9268 to 9.8499)
Bentler's Comparative Fit Index	0.5788	0.7141
Normal Theory Reweighted LS Chi-square	7167.9204	3346.9316
Akaike's Information Criterion	736.3632	158.7345
Bozdogan's (1987) CAIC	-12206.671	-7423.8046
Schwarz's Bayesian Criterion	-9579.6715	-5884.8046
McDonald's (1989) Centrality	0.0113	0.1040
Bentler & Bonett's (1980) non-normed Index	0.5670	0.7035
Bentler & Bonett's (1980) NFI	0.4395	0.5704
James, Mulaik, & Brett (1982) Parsimonious NFI	0.4274	0.5500
Z-Test of Wilson & Hilferty (1931)	34.3916	23.4148
Bollen (1986) Normed Index Rhoi	0.4237	0.5545
Bollen (1988) non-normed Index Delta2	0.5827	0.7168
Hoelter's (1983) Critical N	173	190
RNI	0.5788	0.7141

The indices obtained from the two-factor solution of the Confirmatory Factor Analysis do not seem to represent as good a fit as the three-factor solution. The

three-factor pattern was accepted for future analysis. The three factors were, as stated above, identified as Internal (factor 1), External (factor 2) and Vicissitudes of Life (factor 3). The three-factor model does, however, not represent a good fit on the data.

The indices fit obtained from a Confirmatory Factor Analysis of the measurement model with the items aggregated are shown in Table 18.

Table 18: Results of Confirmatory Factor Analysis of the three-factor structure (aggregated items) of the Locus of Control Questionnaire (N=385)

Indices	**Value**
Fit criterion	0.5162
Goodness of Fit Index (GFI)	0.9132
GFI Adjusted for Degrees of Freedom (AGFI)	0.8727
Root Mean Square Residual (RMR)	0.1339
Parsimonious GFI (PGFI)	0.7472
Chi-square (df = 45 p > Chi² = 0.0001)	193.0543
Null Model Chi² (df = 55)	1742.6490
RMSEA Estimate (90% CI = 0.0804 to 0.1076)	0.0938
Probability of Close Fit	0.0000
ECVI Estimate (90% C I = 0.5287 to 0.7621)	0.6377
Bentler's Comparative Fit Index	0.6377
Normal Theory Reweighted LS Chi-square	195.4583
Akaike's Information Criterion	103.0543
Bozdogan's (1987) CAIC	-118.6574
Schwarz's Bayesian Criterion	-73.6574
McDonald's (1989) Centrality	0.8209
Bentler & Bonett's (1980) non-normed Index	0.8928
Bentler & Bonett's (1980) NFI	0.8892
James, Mulaik, & Brett (1982) Parsimonious NFI	0.7275
Z-Test of Wilson & Hilferty (1931)	8.9625
Bollen (1986) Normed Index Rhoi	0.8646
Bollen (1988) non-normed Index Delta2	0.9128
Hoelter's (1983) Critical N	121
RNI	0.9123

The indices in Table 18 show a reasonable fit between the measurement model and the data when aggregation of item scores is carried out. The residuals (RMR and RMSEA) still seem somewhat too high, both estimated well above the level of 0.05 which is accepted as the maximum for a good fit.

8 CAREER ORIENTATION INVENTORY

A Principal Factor Analysis of the responses to the Career Orientation Inventory was again done as an exploratory process (as described above) followed by Direct Quartimin rotation of the axes based on the sample of N = 375 professionals. Nine eigenvalues > 1.00 were obtained, namely 8.80517, 4.22710, 2.92523, 2.48958, 1.61871, 1.54380, 1.35776, 1.14745 and 1.11325. A clear "break" was present between the fourth and fifth eigenvalues. [Schein (1995) the author of the revised instrument, indicates the existence of eight factors.] The factor loadings in the final four-factor solution are presented in Table 19.

Table 19 Rotated Factor Loading Pattern of the four-factor solution of the Career Orientation Inventory (N = 375)

Item	Factor 1	Factor 2	Factor 3	Factor 4
CO1	0.568			
CO 2	0.581			
CO 6	0.348			
CO 7	0.719			
CO 9	0.550			
CO 10	0.636			
CO 14	0.268			
CO 15	0.723			
CO 23	0.691			
CO 31	0.762			
CO 39	0.515			
CO 4		0.746		
CO 12		0.430		
CO 20		0.745		
CO 28		0.701		
CO 36		0.738		
CO 5			0.743	
CO 13			0.776	
CO 19			0.384	
CO 35			0.286	
CO 37			0.948	
CO 16				0.399
CO 24				0.649
CO 32				0.876

	Factor 1	Factor 2	Factor 3	Factor 4
Cronbach Alpha	0.80	0.81	0.80	0.72
Total variance	20.57	11.9	7.68	4.87
Common variance	45.70	26.42	17.06	10.82

In this solution 24 of the original 40 items in the instrument are retained. The four-factor structure consisted of factors interpreted as Factor 1: Service, Factor 2: Security, Factor 3: Entrepreneurial and Factor 4: Lifestyle integration.

Table 20 shows the intercorrelation between the four factors.

Table 20 Intercorrelation of the Career Orientations Inventory four-factor solution

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	0.169	1.000		
Factor 3	0.412	-0.073	1.000	
Factor 4	0.224	0.264	0.198	1.000

Confirmatory Factor Analysis carried out on the four-factor structure yielded the indices shown in Table 21.

Table 21 Results of Confirmatory Factor Analysis of the Career Orientations Inventory of the four-factor model (N = 375)

Indices	Value
Fit criterion	2.3580
Goodness of Fit Index (GFI)	0.8273
GFI Adjusted for Degrees of Freedom (AGFI)	0.7944
Root Mean Square Residual (RMR)	0.1321
Parsimonious GFI (PGFI)	0.7554
Chi-square (df = 252, p > Chi^2 = 0.0001)	881.9063
Null Model Chi^2 (df = 276)	3562.6298
RMSEA Estimate (90% CI 0.0759 to 0.0877)	0.0818
Probability of Close Fit	0.0000
ECVI Estimate (90% C I 2.3951 to 2.8929)	2.6331
Bentler's Comparative Fit Index	0.8083
Normal Theory Reweighted LS Chi-square	936.6995
Akaike's Information Criterion	377.9063
Bozdogan's (1987) CAIC	-863.6791
Schwarz's Bayesian Criterion	-611.6791

Table 21 continued

Indices	Value
McDonald's (1989) Centrality	0.4318
Bentler & Bonett's (1980) non-normed Index	0.7901
Bentler & Bonett's (1980) NFI	0.7525
James, Mulaik, & Brett (1982) Parsimonious NFI	0.6870
Z-Test of Wilson & Hilferty (1931)	17.4814
Bollen (1986) Normed Index Rhoi	0.7289
Bollen (1988) non-normed Index Delta2	0.8097
Hoelter's (1983) Critical N	124
RNI	0.8083

The indices in Table 21 point to an unsatisfactory fit between the data and the four-factor structure.

It was decided to aggregate the items in the different factors again, in order to determine whether reduction of item error variance would improve the fit between the measurement model and the data. The results of the Confirmatory Factor Analysis carried out on the four-factor structure with item scores aggregated are shown Table 22.

Table 22 Results of Confirmatory Factor Analysis of the four-factor structure with Aggregation of Item Scores (N = 375)

Indices	Value
Fit criterion	0.7022
Goodness of Fit Index (GFI)	0.8871
GFI Adjusted for Degrees of Freedom (AGFI)	0.8306
Root Mean Square Residual (RMR)	0.1612
Parsimonious GFI (PGFI)	0.7096
Chi-square (df = 44 p > Chi^2 = 0.0001)	262.6245
Null Model Chi^2 (df = 55)	1546.9906
RMSEA Estimate (90% CI = 0.1020 to 0.1289)	0.1153
Probability of Close Fit	0.0000
ECVI Estimate (90% C I = 0.6955 to 0.9728)	0.8238
Bentler's Comparative Fit Index	0.8535
Normal Theory Reweighted LS Chi-square	261.8997
Akaike's Information Criterion	174.6245
Bozdogan's (1987) CAIC	-42.1603
Schwarz's Bayesian Criterion	1.8397
McDonald's (1989) Centrality	0.7471
Bentler & Bonett's (1980) non-normed Index	0.8168

Table 22 continued

Indices	Value
Bentler & Bonett's (1980) NFI	0.8302
James, Mulaik, & Brett (1982) Parsimonious NFI	0.6642
Z-Test of Wilson & Hilferty (1931)	11.5245
Bollen (1986) Normed Index Rhoi	0.7878
Bollen (1988) non-normed Index Delta2	0.8545
Hoelter's (1983) Critical N	88
RNI	0.8535

The indices shown in Table 22 still reflect a relatively poor fit between the data and the four-factor structure.

9 KANUNGO JOB INVOLVEMENT QUESTIONNAIRE

Principal Factor Analysis followed by a Direct Quartimin rotation was carried out on the underlying dimensions of Job Involvement as manifested in the responses of the present sample members. The analysis of the 10 items yielded one eigenvalue > 1 of 5.03021. A clear "break" existed between the first and second eigenvalues, suggesting a one-factor solution. This is in agreement with the findings of the instrument's authors. All ten items loaded ≥ 0.25 on the one factor. The Principal Factor Analysis results for the one-factor solution is shown in Table 23:

Table 23 Factor Loading Pattern in one-factor solution of the Kanungo Job Involvement Questionnaire (N = 375)

Item	Factor 1
Kanungo 1	0.376
Kanungo 2	0.548
Kanungo 3	0.740
Kanungo 4	0.692
Kanungo 5	0.785
Kanungo 6	0.812
Kanungo 7	0.353
Kanungo 8	0.740
Kanungo 9	0.789
Kanungo 10	0.719
Cronbach Alpha	0.88
Total variance	45.55%
Common variance	100%

Confirmatory Factor Analysis was carried out on the one-factor structure yielding the indices shown in Table 24.

Table 24 Results of Confirmatory Factor Analysis of the Kanungo Job Involvement Questionnaire of the One-Factor Model (N=375)

Indices	**Value**
Fit criterion	0.4272
Goodness of Fit Index (GFI)	0.9174
GFI Adjusted for Degrees of Freedom (AGFI)	0.8701
Root Mean Square Residual (RMR)	0.0463
Parsimonious GFI (PGFI)	0.7135
Chi-square (df = 35, p > Chi² = 0.0001)	159.7838
Null Model Chi² (df = 45)	1726.6639
RMSEA Estimate (90% CI 0.0826 to 0.1132)	0.0976
Probability of Close Fit	0.0000
ECVI Estimate (90% CI 0.4413 to 0.6543)	0.5374
Bentler's Comparative Fit Index	0.9258
Normal Theory Reweighted LS Chi-square	168.4456
Akaike's Information Criterion	89.7838
Bozdogan's (1987) CAIC	-82.6587
Schwarz's Bayesian Criterion	-47.6587
McDonald's (1989) Centrality	0.8467
Bentler & Bonett's (1980) non-normed Index	0.9046
Bentler & Bonett's (1980) NFI	0.9075
James, Mulaik, & Brett (1982) Parsimonious NFI	0.7058
Z-Test of Wilson & Hilferty (1931)	8.3489
Bollen (1986) Normed Index Rhoi	0.8810
Bollen (1988) non-normed Index Delta2	0.9262
Hoelter's (1983) Critical N	118
RNI	0.9258

The indices in Table 24 show a good fit between the data and the one-factor structure.

Due to the finding that the Job Involvement construct was uni-dimensional, it was decided not to aggregate the item scores and not to do further Confirmatory Factor Analysis on the factor structure.

10 MINNESOTA SATISFACTION QUESTIONNAIRE

The Principal Factor Analysis of the participants' responses in the present study yielded four eigenvalues > 1 of the 20 items in the Minnesota Satisfaction Questionnaire (MSQ). These eigenvalues were respectively 7.97, 1.75, 1.29 and 1.10. Clear "breaks" seemed to exist between the first and second, second and third, third and fourth as well as fourth and fifth eigenvalues. One, two, three and four factors were extracted during the first round of the Principal Factor Analysis. The existence of two factors would be in agreement with the findings of the authors of the instrument. A Principal Factor Analysis was done with Direct Quartimin rotation of the axes extracting the stated numbers of factors. The inspection of the final factor patterns showed that all the items in the questionnaire loaded ≥ 0.25 on the one factor in the one-factor solution. Due to the relatively low Cronbach Alpha coefficients (0.81, 0.68, 0.85 and 0.71 respectively) obtained during the first round of Principal Factor Analysis, it was decided to leave out the four-factor solution from further analysis. The factor loadings obtained in the different solutions of Principal Factor Analysis are shown Tables 25, 26 and 27:

Table 25 Rotated Factor Loading Pattern of the one-factor solution of the Minnesota Satisfaction Questionnaire (N = 375)

Item	**Factor 1**
MSQ 1	0.581
MSQ 2	0.485
MSQ 3	0.642
MSQ 4	0.603
MSQ 5	0.471
MSQ 6	0.444
MSQ 7	0.486
MSQ 8	0.587
MSQ 9	0.509
MSQ 10	0.590
MSQ 11	0.732
MSQ 12	0.569
MSQ 13	0.510
MSQ 14	0.579
MSQ 15	0.752
MSQ 16	0.755
MSQ 17	0.680
MSQ 18	0.535
MSQ 19	0.678
MSQ 20	0.780

Cronbach Alpha	0.9182
Total variance	36.82

The two-factor solution pattern loading is shown in Table 26. Three items did not load satisfactorily in this solution and were excluded from the factor structure.

Table 26 Rotated Factor Loading Pattern of the two-factor solution of the Minnesota Satisfaction Questionnaire (N = 375)

Item	**Factor 1**	**Factor 2**
MSQ 1	0.589	
MSQ 2	0.521	
MSQ 3	0.690	
MSQ 4	0.604	
MSQ 7	0.480	
MSQ 8	0.562	
MSQ 9	0.597	
MSQ 10	0.610	
MSQ 11	0.782	
MSQ 13	0.445	
MSQ 14	0.506	
MSQ 15	0.740	
MSQ 16	0.777	
MSQ 17	0.563	
MSQ 20	0.786	
MSQ 5		0.818
MSQ 6		0.868

	Factor 1	**Factor 2**
Cronbach Alpha	0.90	0.85
Total variance	36.74	7.54
Common variance	82.97	17.03

The first factor correlated 0.40 with the second factor.

The loadings acquired in the three-factor solution are shown in Table 27.

Table 27 Rotated Factor Loading Pattern of the three-factor solution of the Minnesota Satisfaction Questionnaire (N = 375)

Item	Factor 1	Factor 2	Factor 3
MSQ 2	0.369		
MSQ 13	0.579		
MSQ 14	0.542		
MSQ 15	0.772		
MSQ 16	0.847		
MSQ 17	0.594		
MSQ 1		0.542	
MSQ 4		0.440	
MSQ 7		0.514	
MSQ 8		0.656	
MSQ 9		0.808	
MSQ 11		0.619	
MSQ 5			0.809
MSQ 6			0.876
	Factor 1	**Factor 2**	**Factor 3**
Cronbach Alpha	0.82	0.82	0.85
Total variance	35.31	8.67	5.41
Common variance	71.49	17.54	10.97

In this three-factor solution six items were excluded. Table 28 shows the intercorrelation between the three factors.

Table 28 Intercorrelation of the Minnesota Satisfaction Questionnaire three-factor solution

	Factor 1	Factor 2	Factor 3
Factor 1	1.000		
Factor 2	0.626	1.000	
Factor 3	0.419	0.288	1.000

Confirmatory Factor Analysis was carried out on the one-, two- and three-factor structures yielding the indices shown in Table 29.

Table 29 Results of Confirmatory Factor Analysis of the Minnesota Satisfaction Questionnaire of the three-factor model (N = 375)

	Factors		
Indices	**One**	**Two**	**Three**
Fit criterion	2.5727	2.1861	1.3535
Goodness of Fit Index (GFI)	0.7777	0.8080	0.8435
GFI adjusted for degrees of freedom (AGFI)	0.7254	0.7628	0.7866
Root Mean Square Residual (RMR)	0.0775	0.1322	0.2324
Parsimonious GFI (PGFI)	0.6958	0.7229	0.7138
Chi-square (p>Chi² = 0.0001)	962.1736 (df = 170)	817.5978 (df = 170)	506.2220 (df = 77)
Null Model Chi²	3566.5807 (df = 190)	3566.5807 (df = 190)	2146.3463 (df = 91)
RMSEA estimate (90% CI)	0.1116 (0.1048 to 0.1185)	0.1009 (0.0940 to 0.1079)	0.1221 (0.1121 to 0.1323)
Probability of Close Fit	0.0000	0.0000	0.0000
ECVI Estimate (90% CI)	2.7993 (2.5425 to 3.0774)	2.4127 (2.1791 to 2.6677)	1.5095 (1.3260 to 1.7139)
Bentler's Comparative Fit Index	0.7654	0.8082	0.7912
Normal Theory Reweighted LS Chi-square	1069.1413	888.7726	485.6472
Akaike's Information Criterion	622.1736	477.5978	352.2220
Bozdogan's (1987) CAIC	-215.4038	-359.9796	-27.1514
Schwarz's Bayesian Criterion	-45.4038	-189.9796	49.8486
McDonald's (1989) Centrality	0.3478	0.4217	0.5642
Bentler & Bonett's (1980) non-normed index	0.7378	0.7856	0.76532
Bentler & Bonett's (1980) NFI	0.7302	0.7708	0.7641
James, Mulaik, & Brett (1982) Parsim NFI	0.6534	0.6896	0.6466

Table 29 continued

	Factors		
Indices	**One**	**Two**	**Three**
Z-Test of Wilson & Hilferty (1931)	21.6683	19.0643	16.3105
Bollen (1986) Normed Index Rhoi	0.6985	0.7438	0.7213
Bollen (1988) non-normed Index Delta 2	0.7668	0.8093	0.7926
Hoelter's (1983) Critical N	80	94	74
RNI	0.7654	0.8082	0.7912

None of the three measurement models represents a good fit with the data. Given the results of the Confirmatory Factor Analysis, a three-factor solution can possibly be the preferred choice. Both the two- and the three-factor solutions, however, contained a factor in which only two items were included. These solutions did not really seem psychometrically acceptable. The three-factor model did not fit the data well, although it consisted of three factors that all had acceptable internal consistency. The three factors of the three-factor solution were identified as factor 1: General satisfaction, factor 2: Intrinsic satisfaction and factor 3: Supervision.

The items were aggregated to determine whether aggregation of item scores could be useful in identifying the quality of fit between the measurement model and the data. The results of the Confirmatory Factor Analysis are shown in Table 30.

Table 30 Results of Confirmatory Factor Analysis of the three-factor structure of the Minnesota Satisfaction Questionnaire after Item Aggregation (N = 375)

Indices	**Value**
Fit criterion	0.7033
Goodness of Fit Index (GFI)	0.8145
GFI Adjusted for Degrees of Freedom (AGFI)	0.5671
Root Mean Square Residual (RMR)	0.2945
Parsimonious GFI (PGFI)	0.4887
Chi-square (df = 9, p > Chi^2 = 0.0001)	263.0445
Null Model Chi^2 (df = 15)	1010.6723
RMSEA Estimate (90% CI 0.2467 to 0.3038)	0.2747
Probability of Close Fit	0.0000
ECVI Estimate (90% CI 0.6360 to 0.9217)	0.7687

Table 30 continued

Indices	Value
Bentler's Comparative Fit Index	0.7449
Normal Theory Reweighted LS Chi-square	255.5488
Akaike's Information Criterion	245.0445
Bozdogan's (1987) CAIC	200.7022
Schwarz's Bayesian Criterion	209.7022
McDonald's (1989) Centrality	0.7127
Bentler & Bonett's (1980) non-normed Index	0.5748
Bentler & Bonett's (1980) NFI	0.7397
James, Mulaik, & Brett (1982) Parsimonious NFI	0.4438
Z-Test of Wilson & Hilferty (1931)	13.3962
Bollen (1986) Normed Index Rhoi	0.5662
Bollen (1988) non-normed Index Delta2	0.7464
Hoelter's (1983) Critical N	26
RNI	0.7449

The results shown in Table 30 indicate a poor fit between the measurement model and the data. It seems that the factor structure of the Minnesota Satisfaction Questionnaire is still unclear when applied to the sample in the present study.

11 SIX-FACTOR SELF-CONCEPT SCALE FOR ADULTS

The analysis of the responses in the present sample (N = 375) revealed eight eigenvalues > 1 of the 36 items in the questionnaire. These eigenvalues were 8.19, 3.85, 2.64, 2.55, 1.46, 1.33, 1.19, 1.01. Clear "breaks" were shown between the second and third, third and fourth as well as the fourth and fifth eigenvalues. The existence of six factors would be in agreement with the findings of the author of the instrument. Principal Factor Analysis with Direct Quartimin rotation of the axes were done for two, three and four factors. The process of evaluation and elimination of items, described earlier, was followed. The results of the final Principal Factor Analysis on the two-, three and four-factor models are shown in Tables 31, 32 and 33.

Table 31 Rotated Factor Loading Pattern of the two-factor solution of the Six-Factor Self-Concept Scale for Adults (N = 375)

Item	Factor 1	Factor 2
SC 2	0.450	
SC 6	0.668	
SC 8	0.470	
SC 9	0.543	
SC 11	0.492	
SC 18	0.566	
SC 20	0.506	
SC 21	0.561	
SC 23	0.440	
SC 26	0.650	
SC 27	0.521	
SC 28	0.552	
SC 32	0.572	
SC 33	0.484	
SC 34	0.481	
SC 1		0.273
SC 3		0.694
SC 4		0.254
SC 7		0.585
SC 10		0.343
SC 12		0.750
SC 13		0.480
SC 16		0.301
SC 17		0.715
SC 19		0.258
SC 22		0.531
SC 29		0.779
SC 31		0.275
SC 35		0.629
SC 36		0.461

	Factor 1	Factor 2
Cronbach Alpha	0.86	0.85
Total variance	19.59	10.63
Common variance	64.84	35.16

The intercorrelation between the two factors is shown in Table 32.

Table 32 Intercorrelation of the Six-Factor Self-Concept Scale for Adults two-factor solution

	Factor 1	**Factor 2**
Factor 1	1.000	
Factor 2	0.203	1.000

Six items were excluded in the two-factor structure.

Factor loadings obtained for the three-factor solution are shown in Table 33.

Table 33 Rotated Factor Loading Pattern of the three-factor solution of the Six-Factor Self-Concept Scale for Adults (N = 375)

Item	**Factor 1**	**Factor 2**	**Factor 3**
SC 3	0.732		
SC 7	0.545		
SC 10	0.357		
SC 12	0.755		
SC 13	0.465		
SC 16	0.305		
SC 17	0.698		
SC 19	0.257		
SC 22	0.545		
SC 29	0.755		
SC 30	0.436		
SC 31	0.279		
SC 35	0.618		
SC 36	0.444		
SC 2		0.488	
SC 6		0.647	
SC 9		0.551	
SC 11		0.461	
SC 18		0.693	
SC 20		0.498	
SC 21		0.622	
SC 26		0.676	
SC 27		0.510	
SC 32		0.595	
SC 33		0.400	
SC 1			0.567
SC 8			0.793

Table 33 continued

Item	Factor 1	Factor 2	Factor 3
SC 15			0.535
SC 23			0.732
SC 28			0.701
SC 34			0.738

	Factor 1	Factor 2	Factor 3
Chronbach Alpha	0.85	0.84	0.84
Total variance	42.26	20.32	13.0
Common variance	55.91	26.88	17.21

Table 34 shows the intercorrelation between the three factors:

Table 34 Intercorrelation of the Six-Factor Self-Concept Scale for Adults three-factor solution

	Factor 1	Factor 2	Factor 3
Factor 1	1.000		
Factor 2	0.127	1.000	
Factor 3	0.261	0.320	1.000

The factor-loading pattern obtained for the four-factor solution is shown in Table 35.

Table 35 Rotated Factor Loading Pattern of the four-factor solution of the Six-Factor Self-Concept Scale for Adults (N = 375)

Item	Factor	Factor 2	Factor 3	Factor 4
SC 3	0.718			
SC 7	0.556			
SC 12	0.761			
SC 13	0.413			
SC 14	0.261			
SC 17	0.595			
SC 22	0.688			
SC 29	0.754			
SC 30	0.419			
SC 35	0.647			
SC 36	0.412			
SC 2		0.465		
SC 6		0.645		
SC 9		0.515		

Table 35 continued

Item	Factor	Factor 2	Factor 3	Factor 4
SC 11		0.479		
SC 18		0.713		
SC 20		0.472		
SC 21		0.634		
SC 26		0.699		
SC 27		0.498		
SC 32		0.599		
SC 33		0.372		
SC 1			0.558	
SC 8			0.805	
SC 15			0.528	
SC 23			0.741	
SC 28			0.726	
SC 34			0.752	
SC 4				0.638
SC 10				0.552
SC 16				0.649
SC 19				0.684
SC 25				0.555
SC 31				0.589

	Factor 1	Factor 2	Factor 3	Factor 4
Cronbach Alpha	0.85	0.84	0.84	0.79
Total variance	20.09	9.38	6.27	5.98
Common variance	48.15	22.48	15.03	14.34

Table 36 shows the intercorrelation between the four factors:

Table 36 Intercorrelation of the Six-Factor Self-Concept Scale for Adults four-factor solution

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	0.185	1.000		
Factor 3	0.280	0.327	1.000	
Factor 4	0.215	-0.073	-0.148	1.000

Only two items were excluded from the final Principal Factor Analysis. Confirmatory Factor Analysis were carried out on the two-, three-, and four-factor structures. The results are shown in Table 37.

Table 37 Results of the Confirmatory Factor Analysis for the Six-Factor Self-Concept Scale for Adults on the two-, three- and four-factor models (N = 375)

	Factors		
Indices	**Two**	**Three**	**Four**
Fit criterion	2.6295	2.5158	3.0029
Goodness of Fit Index (GFI)	0.8247	0.8377	0.8420
GFI adjusted for degrees of freedom (AGFI)	0.7972	0.8123	0.8215
Root Mean Square Residual (RMR)	0.1733	0.1568	0.1286
Parsimonious GFI (PGFI)	0.7621	0.7728	0.7857
Chi-square ($p>Chi^2 = 0.0001$)	983.4179 (df = 402)	940.8941 (df = 429)	1117.0812 (df = 656)
Null Model Chi^2	1234.1502 (df = 435)	1263.3151 (df = 465)	1326.7572 (df = 703)
RMSEA estimate (90% CI)	0.0622 (0.0573 to 0.0671)	0.0565 (0.0516 to 0.0614)	0.0435 (0.0391 to 0.0478)
Probability of Close Fit	0.0000	0.0151	0.9939
ECVI Estimate (90% CI)	2.9664 (2.7305 to 3.2228)	2.8740 (2.6473 to 3.1215)	3.4653 (3.2247 to 2.7217)
Bentler's Comparative Fit Index	0.2725	0.3588	0.2608
Akaike's Information Criterion	179.4179	82.8941	-194.9188
Bozdogan's (1987) CAIC	-1801.2064	-2030.7571	-3423.4742
Schwarz's Bayesian Criterion	-1399.2064	-1601.7571	-2767.4742
McDonald's (1989) Centrality	0.4606	0.5053	0.5390
Bentler & Bonett's (1980) non-normed index	0.2127	0.3050	0.2078
Bentler & Bonett's (1980) NFI	0.2032	0.2552	0.1580
James, Mulaik, & Brett (1982) Parsim NFI	0.1877	0.2355	0.1475

Table 37 continued

	Factors		
Indices	**Two**	**Three**	**Four**
Z-Test of Wilson & Hilferty (1931)	14.8002	13.1713	10.5672
Bollen (1986) Normed Index Rhoi	0.1377	0.1927	0.0977
Bollen (1988) non-normed Index Delta 2	0.3013	0.3864	0.3126
Hoelter's (1983) Critical N	173	192	240
RNI	0.2725	0.3588	0.2608

The Confirmatory Factor Analysis of the two-, three-factor and four-factor solutions seem to show that the three-factor solution represents the best fit. The three factors were identified as factor 1: Power, factor 2: Task accomplishment/morality and factor 3: Likeablity. The model did not fit the data well.

In order to determine whether aggregation of items would influence the quality of the fit between the three-factor measurement model and the data, they were also aggregated. Confirmatory Factor Analysis on the aggregated variables yielded the results shown in Table 38.

Table 38 Results of Confirmatory Factor Analysis of Aggregated Variables of the three-factor solution of the Six-Factor Self-Concept Scale for Adults (N = 375)

Indices	**Value**
Fit criterion	0.4066
Goodness of Fit Index (GFI)	0.9042
GFI Adjusted for Degrees of Freedom (AGFI)	0.8358
Root Mean Square Residual (RMR)	0.1682
Parsimonious GFI (PGFI)	0.6781
Chi-square (df = 21, p > Chi^2 = 0.0001)	152.0666
Null Model Chi^2 (df = 28)	1065.1250
RMSEA Estimate (90% CI 0.1103 to 0.1489)	0.1292
Probability of Close Fit	0.0000
ECVI Estimate (90% CI 0.3958 to 0.6078)	0.4943
Bentler's Comparative Fit Index	0.8736
Normal Theory Reweighted LS Chi-square	158.5037
Akaike's Information Criterion	110.0666
Bozdogan's (1987) CAIC	6.6011

Table 38 continued

Indices	Value
Schwarz's Bayesian Criterion	27.6011
McDonald's (1989) Centrality	0.8397
Bentler & Bonett's (1980) non-normed Index	0.8315
Bentler & Bonett's (1980) NFI	0.8572
James, Mulaik, & Brett (1982) Parsimonious NFI	0.6429
Z-Test of Wilson & Hilferty (1931)	9.1888
Bollen (1986) Normed Index Rhoi	0.8096
Bollen (1988) non-normed Index Delta2	0.8745
Hoelter's (1983) Critical N	82
RNI	0.8736

The fit indices obtained, indicate a poor to promising fit between the three-factor measurement model and the data.

12 THE ENTREPRENEURIAL ATTITUDE ORIENTATION SCALE

Principal Factor Analysis carried out in the present study on the responses to the 75 items of the Entrepreneurial Attitude Orientation Scale, yielded 19 eigenvalues of 14.08, 4.34, 3.46, 2.70, 2.14, 2.02, 1.70, 1.62, 1.46, 1.41, 1.35, 1.32, 1.28, 1.24, 1.21, 1.11, 1.10, 1.08 and 1.04 respectively. Clear "breaks" existed between the third and fourth as well as the fourth and fifth eigenvalues. Three and four factors were therefore extracted in the first round of analysis. (The existence of four factors is in agreement with the findings of the authors of the instrument.) Principal Factor Analysis was done for three and four factors with Direct Quartimin rotation of the axes. The process described earlier for the evaluation and elimination of items was followed. A final Principal Factor Analysis was carried out to determine the three- and four-factor structures. The factor loading patterns obtained from the analysis are shown in Tables 39 and 40.

Table 39 Rotated Factor Loading Pattern of the three-factor solution of the Entrepreneurial Attitude Orientation Scale (N = 375)

Item	Factor 1	Factor 2	Factor 3
EAO 2	0.304		
EAO 8	0.416		
EAO 9	0.384		
EAO 13	0.603		
EAO 17	0.406		
EAO 20	0.398		

Table 39 continued

Item	Factor 1	Factor 2	Factor 3
EAO 31	0.287		
EAO 38	0.471		
EAO 39	0.316		
EAO 42	0.362		
EAO 43	0.404		
EAO 44	0.462		
EAO 46	0.666		
EAO 47	0.294		
EAO 48	0.391		
EAO 50	0.343		
EAO 52	0.495		
EAO 54	0.446		
EAO 56	0.705		
EAO 59	0.552		
EAO 60	0.537		
EAO 61	0.440		
EAO 64	0.590		
EAO 66	0.342		
EAO 66	0.342		
EAO 68	0.611		
EAO 71	0.534		
EAO 72	0.558		
EAO 73	0.604		
EAO 75	0.342		
EAO 1		0.306	
EAO 3		0.292	
EAO 4		0.380	
EAO 7		0.350	
EAO 11		0.327	
EAO 12		0.289	
EAO 15		0.307	
EAO 16		0.355	
EAO 22		0.421	
EAO 23		0.580	
EAO 24		0.569	
EAO 30		0.462	
EAO 33		0.376	
EAO 34		0.451	
EAO 40		0.379	
EAO 41		0.425	

EAO 53	0.380

Table 39 continued

Item	Factor 1	Factor 2	Factor 3
EAO 57		0.323	
EAO 62		0.461	
EAO 63		0.398	
EAO 69		0.385	
EAO 5			0.423
EAO 14			0.542
EAO 18			0.433
EAO 19			0.288
EAO 21			0.602
EAO 27			0.575
EAO 28			0.455
EAO 32			0.650
EAO 36			0.578
EAO 49			0.425
EAO 51			0.604
EAO 55			0.298

	Factor 1	Factor 2	Factor 3
Cronbach Alpha	0.90	0.80	0.77
Total variance	17.33	5.06	3.96
Common variance	65.77	19.18	15.05

Table 40 Intercorrelation of the Entrepreneurial Attitude Orientation Scale three-factor solution

	Factor 1	Factor 2	Factor 3
Factor 1	1.000		
Factor 2	0.324	1.000	
Factor 3	-0.194	–0.104	1.000

Thirteen of the 75 items in the original instrument were eliminated to get to the final three-factor structure.

Table 41 Rotated Factor Loading Pattern of the four-factor solution of the Entrepreneurial Attitude Orientation Scale (N = 375)

Item	Factor 1	Factor 2	Factor 3	Factor 4
EAOS 11	0.312			
EAOS 13	0.504			
EAOS 31	0.344			
EAOS 39	0.300			
EAOS 45	0.537			
EAOS 50	0.462			
EAOS 52	0.651			
EAOS 54	0.299			
EAOS 59	0.643			
EAOS 60	0.580			
EAOS 64	0.728			
EAOS 65	0.767			
EAOS 71	0.537			
EAOS 72	0.529			
EAOS 73	0.656			
EAOS 74	0.622			
EAOS 18		0.474		
EAOS 21		0.547		
EAOS 28		0.479		
EAOS 32		0.665		
EAOS 36		0.569		
EAOS 48		0.286		
EAOS 49		0.490		
EAOS 51		0.646		
EAOS 1			0.424	
EAOS 4			0.462	
EAOS 7			0.428	
EAOS 8			0.418	
EAOS 9			0.337	
EAOS 10			0.340	
EAOS 12			0.345	
EAOS 15			0.416	
EAOS 16			0.455	
EAOS 34			0.600	
EAOS 42			0.254	
EAOS 2				0.362
EAOS 62				0.453
EAOS 69				0.452

	Factor 1	Factor 2	Factor 3	Factor 4
Cronbach Alpha	0.87	0.76	0.7	0.45
Total variance	46.27	13.88	8.95	6.8
Common variance	60.96	18.29	11.80	8.95

The fourth factor in this solution yielded a Cronbach Alpha of 0.45, explaining only 6.8 and 8.95 per cent of the total and common variance respectively.

Table 42 indicates the intercorrelation between the four factors.

Table 42 Intercorrelation of the Entrepreneurial Attitude Orientation Scale four-factor solution

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	-0.271	1.000		
Factor 3	0.440	–0.148	1.000	
Factor 4	-0.080	–0.053	–0.010	1.000

Thirty-seven of the 75 items had to be rejected to come to the final four-factor structure.
Confirmatory Factor Analysis was carried out on the three- and four-factor structures. The results are shown in Table 43.

Table 43 Results of Confirmatory Factor Analysis for the Entrepreneurial Attitude Orientation Scale of the three- and four-factor model (N = 375)

Indices	**Three**	**Four**
Fit criterion	10.8603	3.0029
Goodness of Fit Index (GFI)	0.7275	0.8420
GFI Adjusted for Degrees of Freedom (AGFI)	0.7090	0.8215
Root Mean Square Residual (RMR)	0.1187	0.1286
Parsimonious GFI (PGFI)	0.7036	0.7857
Chi-square ($p > Chi^2 = 0.0001$)	4040.0478 (df = 1829)	1117.0812 (df = 656)
Null Model Chi^2	8396.3482 (df = 1891)	1326.7572 (df = 703)

Table 43 continued

Indices	Three	Four
RMSEA Estimate (90% CI)	0.0570 (0.0546 to 0.0594)	0.0435 (0.0391 to 0.0478)
Probability of Close Fit	0.0000	0.9939
ECVI Estimate (90% CI)	11.6629 (11.1495 to 12.2017)	3.4653 (3.2247 to 3.72171)
Bentler's Comparative Fit Index	0.6601	0.2608
Akaike's Information Criterion	382.0478	-194.9188
Bozdogan's (1987) CAIC	-8619.5191	-3423.4742
Schwarz's Bayesian Criterion	-6790.5191	-2767.4742
McDonald's (1989) Centrality	0.0516	0.5390
Bentler & Bonett's (1980) non-normed Index	0.6486	0.2078
Bentler & Bonett's (1980) NFI	0.5188	0.1580
James, Mulaik, & Brett (1982) Parsimonious NFI	0.5018	0.1475
Z-Test of Wilson & Hilferty (1931)	27.4399	10.5672
Bollen (1986) Normed Index Rhoi	0.5025	0.0977
Bollen (1988) non-normed Index Delta2	0.6633	0.3126
Hoelter's (1983) Critical N	179	240
RNI	0.66012	0.2608

The three-factor solution seemed to represent the better fit in the Confirmatory Factor Analysis of the three- and four-factor solutions. The three factors were identified as factor 1: Economic Innovation, factor 2: Achievement/Personal Control and factor 3: Self-Esteem.

Aggregation of item scores of the factors in the 3-factor solution was again done. Confirmatory Factor Analysis was carried out on the aggregate scores and is shown in Table 44.

Table 44 Results of Confirmatory Factor Analysis of the three-factor solution with Aggregated Variables of EAOS (N = 375)

Indices	**Value**
Fit criterion	0.7618
Goodness of Fit Index (GFI)	0.8864
GFI Adjusted for Degrees of Freedom (AGFI)	0.8295
Root Mean Square Residual (RMR)	0.1961
Parsimonious GFI (PGFI)	0.7091
Chi-square (df = 44, p > Chi² = .0001)	284.9047
Null Model Chi² (df = 55)	1811.1357
RMSEA Estimate (90% CI .1078 - .1346)	0.1210
Probability of Close Fit	0.0000
ECVI Estimate (90% CI 7488 - 1.0386)	0.8833
Bentler's Comparative Fit Index	0.8628
Normal Theory Reweighted LS Chi-square	263.7514
Akaike's Information Criterion	196.9047
Bozdogan's (1987) CAIC	-19.8800
Schwarz's Bayesian Criterion	24.1200
McDonald's (1989) Centrality	0.7253
Bentler & Bonett's (1980) non-normed Index	0.8285
Bentler & Bonett's (1980) NFI	0.8427
James, Mulaik, & Brett (1982) Parsimonious NFI	0.6742
Z-Test of Wilson & Hilferty (1931)	12.2268
Bollen (1986) Normed Index Rhoi	0.8034
Bollen (1988) non-normed Index Delta2	0.8637
Hoelter's (1983) Critical N	81
RNI	0.8628

The indices in Table 44 show an inadequate fit between the three-factor model with aggregated scores and the data.

13 CONCLUSION

Results of the above factor analysis indicate that certain items are factorially grouped together for each psychometric instrument. These factors are named and the items for each factor listed and compared with the factors and items of the original instruments in Tables 45 to 50.

Table 45 Jenkins Activity Survey

Item	Present study	Original instrument
Jenkins 1	Factor 3: I/I	Factor 2: I/I
Jenkins 2	Factor 3: I/I	Factor 2: I/I
Jenkins 3	Factor 3: I/I	Factor 2: I/I
Jenkins 4		Factor 2: I/I
Jenkins 5	Factor 1: Ach	Factor 1: Ach
Jenkins 6	Factor 1: Ach	Factor 1: Ach
Jenkins 7	Factor 2: H/C	Factor 1: Ach
Jenkins 8	Factor 1: Ach	Factor 2: I/I
Jenkins 9	Factor 2: H/C	Factor 1: Ach
Jenkins 10	Factor 2: H/C	Factor 1: Ach
Jenkins 11	Factor 1: Ach	Factor 1: Ach
Jenkins 12	Factor 1: Ach	Factor 1: Ach
Jenkins 13	Factor 2: H/C	Factor 1: Ach

Abbreviations: Ach: Achievement; H/C: Hard Driving/Competitive; I/I: Impatience/Irritability.

The location of the items of the Locus of Control Scale according to the results of the analysis in the present study and the original scale, is shown in Table 46.

Table 46 Locus of Control

Item	Present study	Original instrument
LC 1	Factor 1: Internal	Factor 3: Autonomy
LC 2	Factor 1: Internal	Factor 3: Autonomy
LC 3	Factor 1: Internal	Factor 3: Autonomy
LC 4		Factor 1: External
LC 5	Factor 1: Internal	Factor 3: Autonomy
LC 6		Factor 2: Internal
LC 7		Factor 2: Internal
LC 8	Factor 1: Internal	Factor 2: Internal
LC 9	Factor 2: External	Factor 1: External
LC 10	Factor 1: Internal	Factor 2: Internal
LC 11	Factor 1: Internal	Factor 1: External
LC 12	Factor 3: Vicissitudes	Factor 1: External
LC 13	Factor 1: Internal	Factor 3: Autonomy
LC 14	Factor 1: Internal	Factor 3: Autonomy
LC 15	Factor 1: Internal	Factor 3: Autonomy
LC 16		Factor 2: Internal

Table 46 continued

Item	Present study	Original instrument
LC 17	Factor 1: Internal	Factor 3: Autonomy
LC 18		Factor 2: Internal
LC 19		Factor 2: Internal
LC 20	Factor 2: External	Factor 1: External
LC 21		Factor 1: External
LC 22	Factor 1: Internal	Factor 3: Autonomy
LC 23		Factor 1: External
LC 24	Factor 1: Internal	Factor 3: Autonomy
LC 25	Factor 1: Internal	Factor 2: Internal
LC 26	Factor 2: External	Factor 2: Internal
LC 27	Factor 1: Internal	Factor 2: Internal
LC 28	Factor 1: Internal	Factor 3: Autonomy
LC 29	Factor 1: Internal	Factor 3: Autonomy
LC 30	Factor 1: Internal	Factor 3: Autonomy
LC 31		Factor 2: Internal
LC 32		Factor 2: Internal
LC 33		Factor 3: Autonomy
LC 34	Factor 3: Vicissitudes	Factor 1: External
LC 35		Factor 1: External
LC 36	Factor 3: Vicissitudes	Factor 1: External
LC 37	Factor 1: Internal	Factor 2: Internal
LC 38		Factor 1: External
LC 39	Factor 1: Internal	Factor 3: Autonomy
LC 40	Factor 1: Internal	Factor 2: Internal
LC 41	Factor 3: Vicissitudes	Factor 1: External
LC 42	Factor 1: Internal	Factor 2: Internal
LC 43	Factor 2: External	Factor 1: External
LC 44	Factor 1: Internal	Factor 3: Autonomy
LC 45	Factor 2: External	Factor 1: External
LC 46	Factor 1: Internal	Factor 3: Autonomy
LC 47	Factor 2: External	Factor 1: External
LC 48	Factor 1: Internal	Factor 2: Internal
LC 49		Factor 2: Internal
LC 50	Factor 2: External	Factor 1: External
LC 51	Factor 2: External	Factor 1: External
LC 52	Factor 2: External	Factor 1: External
LC 53	Factor 2: External	Factor 1: External
LC 54	Factor 1: Internal	Factor 2: Internal
LC 55	Factor 1: Internal	Factor 2: Internal
LC 56	Factor 2: External	Factor 1: External

Table 46 continued

Item	Present study	Original instrument
LC 57	Factor 2: External	Factor 1: External
LC 58	Factor 2: External	Factor 1: External
LC 59	Factor 2: External	Factor 2: Internal
LC 60	Factor 1: Internal	Factor 2: Internal
LC 61		Factor 2: Internal
LC 62		Factor 3: Autonomy
LC 63	Factor 1: Internal	Factor 2: Internal
LC 64		Factor 3: Autonomy
LC 65		Factor 1: External
LC 66		Factor 3: Autonomy
LC 67	Factor 1: Internal	Factor 3: Autonomy
LC 68	Factor 1: Internal	Factor 3: Autonomy
LC 69	Factor 1: Internal	Factor 2: Internal
LC 70	Factor 1: Internal	Factor 3: Autonomy
LC 71	Factor 1: Internal	Factor 3: Autonomy
LC 72		Factor 3: Autonomy
LC 73	Factor 1: Internal	Factor 3: Autonomy
LC 74	Factor 1: Internal	Factor 3: Autonomy
LC 75	Factor 1: Internal	Factor 2: Internal
LC 76	Factor 1: Internal	Factor 2: Internal
LC 77		Factor 1: External
LC 78		Factor 1: External
LC 79	Factor 3: Vicissitudes	Factor 1: External
LC 80		Factor 1: External

In the analysis of the present study, the third factor is named Vicissitudes, as it typically represented matters related to unpredictable circumstances. The Autonomy factor identified by Schepers (1995) did not feature as a separate scale in this study.

The item categorisation of the Career Orientations Inventory is shown in Table 47.

Table 47 Career Orientations Inventory

Item	Present study	Original instrument
COI 1	Factor 1: Service	Factor 1: Technical/functional
COI 2	Factor 1: Service	Factor 2: General management
COI 3		Factor 3: Autonomy
COI 4	Factor 2: Job security	Factor 4: Security
COI 5	Factor 3: Entrepreneurial	Factor 5: Entrepreneurial
COI 6	Factor 1: Service	Factor 6: Service
COI 7	Factor 1: Service	Factor 7: Challenge
COI 8		Factor 8: Lifestyle
COI 9	Factor 1: Service	Factor 1: Technical/functional
COI 10	Factor 1: Service	Factor 2: General management
COI 11		Factor 3: Autonomy
COI 12	Factor 2: Job security	Factor 4: Security
COI 13	Factor 3: Entrepreneurial	Factor 5: Entrepreneurial
COI 14	Factor 1: Service	Factor 6: Service
COI 15	Factor 1: Service	Factor 7: Challenge
COI 16	Factor 4: Lifestyle integration	Factor 8: Lifestyle
COI 17		Factor 1: Technical/functional
COI 18		Factor 2: General management
COI 19	Factor 3: Entrepreneurial	Factor 3: Autonomy
COI 20	Factor 2: Job security	Factor 4: Security
COI 21		Factor 5: Entrepreneurial
COI 22		Factor 6: Service
COI 23	Factor 1: Service	Factor 7: Challenge
COI 24	Factor 4: Lifestyle integration	Factor 8: Lifestyle
COI 25		Factor 1: Technical/functional
COI 26		Factor 2: General management
COI 27		Factor 3: Autonomy
COI 28	Factor 2: Job security	Factor 4: Security
COI 29		Factor 5: Entrepreneurial
COI 30		Factor 6: Service
COI 31	Factor 1: Service	Factor 7: Challenge
COI 32	Factor 4: Lifestyle integration	Factor 8: Lifestyle
COI 33		Factor 1: Technical/functional
COI 34		Factor 2: General management
COI 35	Factor 3: Entrepreneurial	Factor 3: Autonomy
COI 36	Factor 2: Job security	Factor 4: Security
COI 37	Factor 3: Entrepreneurial	Factor 5: Entrepreneurial
COI 38		Factor 6: Service
COI 39	Factor 1: Service	Factor 7: Challenge
COI 40		Factor 8: Lifestyle

Kanungo Job Involvement Questionnaire

All the items in the Job Involvement questionnaire compiled by Kanungo (1982a) loaded on one factor – a result that replicates Kanungo's finding.

Table 48 represents the allocation of items according to the results of the present study and the original Minnesota Satisfaction Questionnaire.

Table 48 Minnesota Satisfaction Questionnaire

Item	Present study		Original instrument
MSQ 1	Factor 2:	Intrinsic	Factor 1: Internal
MSQ 2	Factor 1:	General	Factor 1: Internal
MSQ 3			Factor 1: Internal
MSQ 4	Factor 2:	Intrinsic	Factor 2: External
MSQ 5	Factor 3:	Supervision	Factor 2: External
MSQ 6	Factor 3:	Supervision	Factor 2: External
MSQ 7	Factor 2:	Intrinsic	Factor 1: Internal
MSQ 8	Factor 2:	Intrinsic	Factor 2: External
MSQ 9	Factor 2:	Intrinsic	Factor 1: Internal
MSQ 10			Factor 1: Internal
MSQ 11	Factor 2:	Intrinsic	Factor 1: Internal
MSQ 12			Factor 2: External
MSQ 13	Factor 1:	General	Factor 2: External
MSQ 14	Factor 1:	General	Factor 2: External
MSQ 15	Factor 1:	General	Factor 1: Internal
MSQ 16	Factor 1:	General	Factor 1: Internal
MSQ 17	Factor 1:	General	Factor 2: External
MSQ 18			Factor 2: External
MSQ 19			Factor 2: External
MSQ 20			Factor 1: Internal

The allocation of items to factors, of the Six-Factor Self-Concept Scale for Adults as identified in the present and original studies, is shown in Table 49.

Table 49 Six-Factor Self-Concept Scale for Adults

Item	Present study	Original instrument
SC 1	Factor 3: Likeable	Factor 1: Likeability
SC 2	Factor 2: Task Acc/Morality	Factor 3: Task accomplishment
SC 3	Factor 1: Power	Factor 5: Power
SC 4		Factor 6: Vulnerability
SC 5		Factor 4: Giftedness
SC 6	Factor 2: Task Acc/Morality	Factor 2: Morality
SC 7	Factor 1: Power	Factor 5: Power
SC 8	Factor 3: Likeable	Factor 1: Likeability
SC 9	Factor 2: Task Acc/Morality	Factor 3: Task accomplishment
SC 10	Factor 1: Power	Factor 6: Vulnerability
SC 11	Factor 2: Task Acc/Morality	Factor 2: Morality
SC 12	Factor 1: Power	Factor 5: Power
SC 13	Factor 1: Power	Factor 4: Giftedness
SC 14		Factor 3: Task accomplishment
SC 15	Factor 3: Likeable	Factor 1: Likeability
SC 16	Factor 1: Power	Factor 6: Vulnerability
SC 17	Factor 1: Power	Factor 4: Giftedness
SC 18	Factor 2: Task Acc/Morality	Factor 2: Morality
SC 19	Factor 1: Power	Factor 6: Vulnerability
SC 20	Factor 2: Task Acc/Morality	Factor 3: Task accomplishment
SC 21	Factor 2: Task Acc/Morality	Factor 2: Morality
SC 22	Factor 1: Power	Factor 5: Power
SC 23	Factor 3: Likeable	Factor 1: Likeability
SC 24		Factor 4: Giftedness
SC 25		Factor 6: Vulnerability
SC 26	Factor 2: Task Acc/Morality	Factor 2: Morality
SC 27	Factor 2: Task Acc/Morality	Factor 3: Task accomplishment
SC 28	Factor 3: Likeable	Factor 1: Likeability
SC 29	Factor 1: Power	Factor 5: Power
SC 30	Factor 1: Power	Factor 4: Giftedness
SC 31	Factor 1: Power	Factor 6: Vulnerability
SC 32	Factor 2: Task Acc/Morality	Factor 2: Morality
SC 33	Factor 2: Task Acc/Morality	Factor 3: Task accomplishment
SC 34	Factor 3: Likeable	Factor 1: Likeability
SC 35	Factor 1: Power	Factor 5: Power
SC 36	Factor 1: Power	Factor 4: Giftedness

Abbreviation: Acc: accomplishment

Table 50 shows the division of the items for the Entrepreneurial Attitude Orientation Scale according to the results of the present study and the original scale.

Table 50 Entrepreneurial Attitude Orientation Scale

Item	Present study	Original instrument
EAOS 1	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 2	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 3	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 4	Factor 2: Ach/personal cont.	Factor 3: Personal control
EAOS 5	Factor 3: Self-esteem	Factor 4: Self-esteem
EAOS 6		Factor 2: Innovation
EAOS 7	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 8	Factor 1: Economic innov.	Factor 3: Personal control
EAOS 9	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 10		Factor 3: Personal control
EAOS 11	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 12	Factor 2: Ach/personal cont.	Factor 4: Self-esteem
EAOS 13	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 14	Factor 3: Self-esteem	Factor 4: Self-esteem
EAOS 15	Factor 2: Ach/personal cont.	Factor 3: Personal control
EAOS 16	Factor 2: Ach/personal cont.	Factor 4: Self-esteem
EAOS 17	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 18	Factor 3: Self-esteem	Factor 4: Self-esteem
EAOS 19	Factor 3: Self-esteem	Factor 2: Innovation
EAOS 20	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 21	Factor 3: Self-esteem	Factor 4: Self-esteem
EAOS 22	Factor 2: Ach/personal cont.	Factor 4: Self-esteem
EAOS 23	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 24	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 25		Factor 4: Self-esteem
EAOS 26		Factor 1: Achievement
EAOS 27	Factor 3: Self-esteem	Factor 1: Achievement
EAOS 28	Factor 3: Self-esteem	Factor 4: Self-esteem
EAOS 29		Factor 4: Self-esteem
EAOS 30	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 31	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 32	Factor 3: Self-esteem	Factor 2: Innovation
EAOS 33	Factor 2: Ach/personal cont.	Factor 4: Self-esteem
EAOS 34	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 35		Factor 1: Achievement
EAOS 36	Factor 3: Self-esteem	Factor 3: Personal control

Table 50 continued

Item	Present study	Original instrument
EAOS 37		Factor 3: Personal control
EAOS 38	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 39	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 40	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 41	Factor 2: Ach/personal cont.	Factor 2: Innovation
EAOS 42	Factor 1: Economic innov.	Factor 3: Personal control
EAOS 43	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 44	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 45		Factor 3: Personal control
EAOS 46	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 47	Factor 1: Economic innov.	Factor 3: Personal control
EAOS 48	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 49	Factor 3: Self-esteem	Factor 2: Innovation
EAOS 50	Factor 1: Economic innov.	Factor 4: Self-esteem
EAOS 51	Factor 3: Self-esteem	Factor 3: Personal control
EAOS 52	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 53	Factor 2: Ach/personal cont.	Factor 4: Self-esteem
EAOS 54	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 55	Factor 3: Self-esteem	Factor 4: Self-esteem
EAOS 56	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 57	Factor 2: Ach/personal cont.	Factor 1: Achievement
EAOS 58		Factor 2: Innovation
EAOS 59	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 60	Factor 1: Economic innov.	Factor 3: Personal control
EAOS 61	Factor 1: Economic innov.	Factor 1: Achievement
EAOS 62	Factor 2: Ach/personal cont.	Factor 2: Innovation
EAOS 63	Factor 2: Ach/personal cont.	Factor 2: Innovation
EAOS 64	Factor 1: Economic innov.	Factor 3: Personal control
EAOS 65		Factor 1: Achievement
EAOS 66	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 67		Factor 1: Achievement
EAOS 68	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 69	Factor 2: Ach/personal cont.	Factor 2: Innovation
EAOS 70		Factor 1: Achievement
EAOS 71	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 72	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 73	Factor 1: Economic innov.	Factor 2: Innovation
EAOS 74		Factor 2: Innovation
EAOS 75	Factor 1: Economic innov.	Factor 2: Innovation

Abbreviations: Ach: Achievement; innov: innovation

14 DISCUSSION

The findings presented in the previous section of this monograph provide a great deal of information on the metric equivalence of measuring instruments developed (with one exception) in the United States of America, when applied to a various culture, in this case a South African sample. It is concluded that the percentage of the total variance explained by the factor structures obtained for the various instruments was rather low. Less than 30% of the total variance was explained by the factor structures of the Entrepreneurial Attitude Orientation and the Locus of Control scales. Only 30.28% of the total variance could be explained for the shortened Jenkins scale. For the factor structures of all the other scales, between 40% and 50% of the total variance could be explained. A very large percentage of the variance therefore remained unexplained.

Much of the unexplained variance could be related to the argument of Bhagat and McQuid (1982), that subjective cultures may develop within groups. In this case it can be argued that the subjective culture of the South African sample differs from that of the United States sample in which the instruments were developed. Another difference in subjective culture seems to be present in the South African-developed Locus of Control instrument, seeing that the factors identified with the sample of professional people in the present study, differed from those of the original study done on first-year university students. Bhagat and McQuid (1982) explain that group characteristics develop with their own values, norms, belief systems and stereotype formations even when two national groups have a similar language, climate or ecology.

The factor structures of the various measuring instruments identified in this study are, however, in most cases completely different from the structures found by the developers of these scales, with the exception of the Job Involvement Scale developed by Kanungo (1982b). Both the analysis in the present study and other South African studies cited in the introduction, indicate that the Job Involvement scale is to be seen as a robust measure with high portability to the South African situation.

According to the results of the present study, the shortened Jenkins Activity Scale consists of three sub-scales or factors. The Alpha coefficients of these factor scales proved unacceptably low. This may be due to the small number of items making up each of the sub-scales. In the case of all the other instruments, the Alpha coefficients of the sub-scales in the final factor structure were at an acceptable level. If the shortened Jenkins Activity Scale is excluded, four of the factor scales of the different measuring instruments have Alpha coefficients

lower than 0.80. The other factor scales had Alpha coefficients above 0.80, with one sub-scale in the in the Entrepreneurial Attitude Orientation scale and another in the Locus of Control measurement having Alpha coefficients of 0.90 and 0.91 respectively.

The factorial structure of the Locus of Control scale, which was developed in South Africa, was characterised by two out of the three factors identified by Schepers (1995), quite similar in terms of the validation and revalidation (the present) studies. The third factor (Autonomy) identified by Schepers (1995), however, differed considerably from the third factor (Vicissitudes of Life) yielded by the present application of the instrument. One should therefore be careful in applying an instrument developed in one sub-culture to another sub-culture without factor analysing the items, seeing that this study has shown that the factor structure may differ considerably.

One scale which had a completely different factor structure from the one found in North American samples, is the Career Orientation Inventory. The finding that a four-factor solution seemed to provide the best measurement model is contrary to the findings of Kaplan (1990). The findings in respect of the structure of the Minnesota Satisfaction Questionnaire, do not agree with the findings of the previous South African studies by Kaplan (1990), Boshoff and Hoole(1998b) and Kamfer *et al.* (1998).

The analysis of the responses to the Self-Concept Scale developed by Stake (1994), in the present study yielded four factors instead of the six identified during the development of the scale. The four factors did bear some resemblance to those identified by Stake (1995). Two of the factors identified by Stake (1995) could, however, not be replicated in the present study.

The findings with regard to the factor structure of the Entrepreneurial Attitude Orientation Scale indicate, taking into account previous attempts to revalidate the scale on South African samples (Boshoff and Hoole, 1998b; Hoole and Boshoff, 1997), that the factor structure envisaged by the authors cannot be replicated in South African samples. The factor structure of the instrument must under the circumstances be in doubt, as Robinson *et al.* (1991) did not factor analyse the responses to the questionnaire when it was developed.

The results of the Confirmatory Factor Analysis carried out on the factor structures of the various instruments, indicated that with the exception of Jenkins Activity Survey and the Job Involvement Scale, the measurement models developed in the present study did not represent good fits with the data. Under the circumstances, the portability of the Career Orientations Inventory,

Job Satisfaction Scale, Six-Factor Self-Concept Scale for Adults and the Entrepreneurial Attitude Orientation Scale must be seen as unacceptably low.
The results of the present study seem to indicate, overall, that the metric qualities and the metric equivalence of the instruments developed in a culture different to the South African sample used in this study, appear to be unsatisfactory. To use these instruments for research, counselling or any organisational purpose must be seen as hazardous or irresponsible. The likelihood must be stressed that instruments developed in one culture or, as is the case of the Schepers (1995) Locus of Control instrument, standardised on one sample, may well be deemed invalid when applied to a sample in another culture or even to another demographic group in the same country.

It is recommended that the present study should be extended, especially to other samples in South Africa and in other countries too. Other forms of validity should also be investigated. The results reported here seem to imply that a massive task lies ahead for psychometricians and psychologists working in an increasingly global environment and, at the least, the need to be cautious in the application of measuring instruments developed in one cultural environment to another culture or society. Even within the South African context, there is a large diversity of cultures due to different language and cultural background that may lead to the formation of subjective cultures, which necessitates the validation of psychometric instruments for these sub-cultures.

In conclusion: the rich cultural diversity of the South African society provides great opportunities to do research on the measurement of variables commonly used in psychological and managerial research. It is hoped that the findings presented in this monograph will lead to more work in this area.

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