

ANTECEDENTS TO ENTREPRENEURIAL INTENTIONS: TESTING FOR MEASUREMENT INVARIANCE FOR CULTURAL VALUES, ATTITUDES AND SELF-EFFICACY BELIEFS ACROSS ETHNIC GROUPS

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ABSTRACT

Building on previous research on antecedents of entrepreneurial intentions, various measures were tested across different ethnic groups in South Africa. Factorial homogeneity is an important attribute for any scale intended for use in multicultural research, and since tests of equivalency are not routinely applied, this article hypothesised measurement invariance across ethnic groups. Theoretical discussions on Hofstede's (2001) value survey module (VSM 94), attitudes towards and beliefs about entrepreneurial intentions, general self-efficacy (GSE), and entrepreneurial self-efficacy (ESE) preceded the use of statistical analysis. Confirmatory factor analysis based on 210 respondents indicated that equivalence for the underlying factors across the different ethnic groups could not be established, and that the three groups demonstrated different underlying structures. In conclusion, stereotypic declarations of an integrated South African culture were not supported by this research in terms of entrepreneurial intentions and their antecedents.

Keywords: Entrepreneurial intentions; self-efficacy; culture; attitudes; measurement variance

The central theme of this article is integrated into the broader framework of existing theory and research on culture/ethnicity/race, self-efficacy and entrepreneurship. The relationship between self-efficacy and entrepreneurial intentions has been extensively documented (e.g. Krueger, Reilly & Carsrud, 2000; Krueger & Brazeal, 1994), and more recently different cultural dimensions – as defined by Hofstede's (2001) Value Survey Module (VSM 94) - have conceptually been linked to personality and belief variables in other studies (Triandis & Su, 2002). However, the validity of these measures has been called into question (Kruger & Roodt, 2003). Concerns have been expressed as to whether imported instruments would stand up to cross-validation across multi-ethnic groups (Nkosi & Roodt, 2004; Van de Vijver & Rothmann, 2004). "An instrument administered in different cultural groups shows structural equivalence if it measures the same construct in all these groups" (Van de Vijver & Rothmann, 2004, p. 4). The attainment of equivalent measures is a central issue in cross-cultural comparative research, and equivalency has to be first established if comparisons are to be made between individuals belonging to different subgroups (Foxcroft & Roodt, 2001). As Van de Vijver and Leung (2001) note, tests of equivalency are not routinely applied in cross-cultural research.

Consequently, the present research examines the factor structures of measures of entrepreneurial intentions, which include: attitudes, beliefs and motives and Hofstede's (2001) VSM 94 instrument to determine whether the same factor structure holds across multiple South African ethnic groups. Specifically, the manner in which the general self-efficacy (GSE) (Chen, Gully & Eden, 2001) and entrepreneurial self-efficacy (ESE) (Chen, Greene & Crick, 1998) constructs express themselves in observable measures in different groups is tested, i.e. the study tests for measurement invariance (MI) across different ethnic/cultural/race groups in South Africa. MI can be thought of as operations yielding measures of the same

attribute under different conditions (Meade & Kroustalis, 2006, p. 369), in this case across major South African ethnic groups.

Although multiple methods of establishing MI exist, confirmatory factor analysis (CFA) has been most commonly used and an adequate model fit is a prerequisite for conducting CFA tests of MI (Meade & Kroustalis, 2006). MI tests inherently examine the null hypothesis that MI exists between groups, and is expressed as the overall hypothesis for this study in that:

Measurement invariance exists for the measures of attitudes and utilities, normative beliefs and motives, perceived behavioural control (GSE and ESE), and cultural dimensions across different South African ethnic groups.

With CFA, one derives a factor model *a priori* (i.e. reasoning deductively to hypothesise the structure beforehand) and then evaluates its goodness of fit to data (Bryant & Yarnold, 1995). In restricted CFA, the researcher has an explicit hypothesis regarding the number of latent variables and how they relate to the observed variables (De Bruin, 2004). For the present study, both exploratory factor analysis EFA and CFA were used to determine whether the same factor structures (and theorised sub-scales) hold across multiple samples.

The theoretical underpinnings of this model and related measurement specifications are discussed.

Theoretical underpinnings

Social cognitive theory (SCT) was used as the underlying framework where intention plays a prominent role in the self-regulation of behaviour. Intentions, whether expressed in determination to engage in a specific course or to perform, increase the likelihood that sought futures will be realised (Bandura, 1986, p. 467).

Measures for determining the antecedents of intentions were based on two behavioural models - Ajzen's (1991) theory of planned behaviour (TPB) and Shapero's (1982) model of the entrepreneurial event (EE). TPB identifies three attitudinal antecedents of intentions; the first two reflect the perceived desirability of intentions and the third perceived behavioural control reflects perceived feasibility of intentions and is thus related to perceptions of self-efficacy. Self-efficacy occupies a pivotal place in the causal structure of social cognitive theory because self-efficacy beliefs affect adaptation and change not only directly, but also indirectly through its impact on other determinants. Such beliefs influence whether individuals intend to exploit promising opportunities (Bandura, 1997).

Moreover, culture is depicted as a moderator in the relationship between entrepreneurial intentions and self-efficacy. This suggests that culture acts as a catalyst rather than a causal agent of entrepreneurial intentions (Marino, Strandholm, Steensma & Weaver, 2002).

Together with a growing cohort of researchers (Douglas & Shepherd, 2002; Rauch & Frese, 2000; Shane, Locke & Collins, 2003; Vecchio, 2003), the focus of this study is on entrepreneurs' intentions, attitudes, norms and beliefs. Starting a business or initiating a new venture is often described as a purposive, intentional career choice with the role of entrepreneurial self-efficacy being emphasised as a key antecedent (Chen *et al.*, 1998).

Entrepreneurial intentions are generally measured as the probability of starting a business in the foreseeable future; the question then becomes: "What determines entrepreneurial intentions?" Kolvereid and Moen (1997) advise researchers to include measures of attitudes, norms and perceived behavioural control, since these factors have been found to be related to entrepreneurial intentions.

The term entrepreneurial intentions has affinity with other frequently used terms with a similar meaning; e.g. entrepreneurial awareness, entrepreneurial potential, aspiring entrepreneurs, entrepreneurial proclivity, entrepreneurial propensity, and entrepreneurial orientation. Krueger (1993) defines entrepreneurial intentions as a commitment to starting a new business. This is accepted as a more encompassing concept than merely owning a business; since intentions have been found to be immediate antecedents of actual behaviour; intention models predict behaviour better than either individual (e.g. personality) or situational (e.g. employment status) variables, and predictive power is critical to improving post hoc explanations of entrepreneurial behaviour (Krueger *et al.*, 2000).

The success of entrepreneurs is dependent on personal motivation and the will to succeed. Previous results on the study of motivation in the context of entrepreneurship in terms of personality constructs such as achievement need, risk taking, tolerance of ambiguity and locus of control have yielded mixed results. Results have been more consistent for constructs such as goal setting and self-efficacy (Stajkovic & Luthans, 1998), with empirical results identifying a positive relationship between self-efficacy and entrepreneurship (Markman, Balkin & Baron, 2002). The self-efficacy construct is well established in literature (Bandura, 1982, 1986, 1997, 2001; Gist & Mitchell, 1992; Krueger & Brazeal, 1994; Vancouver, Thompson, Tischner & Putka, 2002). To be motivated to act, potential entrepreneurs must perceive themselves as capable and psychologically equipped to function. Several intention-based models offer a well-developed theory base, for instance Ajzen's (1991) theory of planned behaviour and Shapero's (1982) model of entrepreneurial event. By highlighting the overlap between these models, it has been suggested that perceived credibility,

perceived desirability, and propensity to act explain well over half the variance in intentions towards entrepreneurship, with feasibility perceptions explaining the most (Krueger & Brazeal, 1994).

Examining entrepreneurial motivation across cultural groups is pivotal to understanding entrepreneurial intentions, since little evidence exists that intentions and self-efficacy are salient to entrepreneurs from non-Western cultures (Vecchio, 2003). The controversy as to which historical and societal processes are responsible for creating distinct communities, that may render individual meanings trivial, or what makes humans similar, is important for this study, since trying to study entrepreneurial intentions and self-efficacy without insight into culture/ethnicity may not adequately address important similarities or differences between groups (Cooper & Denner, 1998).

Moreover, by acknowledging the legacy of apartheid it becomes apparent that damage was very likely to have occurred to the self-esteem, motivation, and creativity of specific ethnic groups in South Africa (Ahwireng-Obeng & Piaray, 1999). Disadvantaged communities often suffer from deficits in self-efficacy, and Rabow, Barkman and Kessler (1983) found that victims of poverty visibly reflect the symptoms of learned helplessness. Many individuals in transitional economies may have the desire to pursue entrepreneurial ventures but are not engaging, not because they do not have the knowledge and skills, but because they are lacking in self-belief, or, as conceptualised for this paper, self-efficacy.

An extension of the self-efficacy construct, the ESE, as conceptualised by Chen *et al.* (1998, p. 295) refers to the strength of a person's belief that he/she is capable of successfully performing the various roles and tasks of the entrepreneur. Those with high ESE seem to assess the environment as opportunistic rather than fraught with risks; they believe in their ability to influence the achievement of their goals, and they perceive a low probability of failure. Research by Chen, Gully and Eden (2001) focused on the more trait-like generality of self-efficacy, which is termed general self-efficacy (GSE). GSE is defined as one's belief in one's overall competence to affect requisite performance across a wide variety of achievement situations. Moreover, when people are likely to encounter situations that are not fully known, predictability is better for common situations than for uncommon ones (Bandura, 1997). Conceivably the GSE construct has applicability to entrepreneurship and has been employed to link inventors with new venture formation (Markman *et al.*, 2002). For this study GSE is not proposed as a substitute or replacement for ESE, rather it is a supplement that is predicted to be useful when the performance under scrutiny is generalised, such as in entrepreneurship.

Culture and entrepreneurship

A variety of studies lend support to the argument that cultural values influence entrepreneurial behaviour (Gartner & Shane, 1995; McGrath, MacMillan & Scheinberg, 1992). Much of the study of ethnic entrepreneurs is based on issues of culture, with a growing body of literature supporting the argument that national culture influences a variety of economic/management behaviour (Bygrave & Minniti, 2000; Chrisman, Chua & Steier, 2002; Hofstede, 1980, 2001). In the series of Global Entrepreneurship Monitor (GEM) reports, cultural and social norms are emphasised as the major strength of entrepreneurial orientation and seem to be the differentiating factor for high levels of entrepreneurial activity in different countries (Minniti & Bygrave, 2003). In South Africa, Foxcroft, Wood, Kew, Herrington & Segal (2002, p. 26) report significant differences in entrepreneurial activity between race groups. Such findings are not surprising given South Africa's socio-political history, particularly the effects of apartheid education,

spatial segregation and job discrimination on different race groups. Studies in Africa find that psychological variables (Frese, 2000), and race and ethnicity (Ramachandran & Shah, 1999) are important predictors of entrepreneurial activity. More specifically, Bandura (1986) reasoned that the influence of self-efficacy is partially socially constructed and that such construction may differ as a function of national culture (Allik & Realo, 2004).

Based on extensive research findings (e.g. Hayton, George & Zahra, 2002; Kinunda-Rutashobya, 1999; Lee & Peterson, 2000), it has been suggested that entrepreneurial activity is more prevalent in countries with cultural configurations of higher individualism (IND), lower power distance (PDI), lower uncertainty avoidance (UAI), higher masculinity (MAS), and long-term orientation (LTO) as defined in terms of Hofstede's (2001) dimensions.

Nonetheless, Hofstede's (1980,2001) work has been the subject of considerable debate (Kruger & Roodt, 2003), with researchers adopting a more emic perspective arguing that culture in all its complexity cannot be captured quantitatively and reduced to four or five variables. According to Hofstede the VSM 94 is relevant to respondents without employers, such as entrepreneurs, students, and housewives, and can be used to assess the level of ethnicity.

RESEARCH DESIGN

Research participants

Attempts to characterise cultures or individuals in broad cultural dichotomies, such as ethnic or race groups, may be considered overly simplistic, and although an attempt was made to capture as many South African ethnic groups as possible, a crude version of Asian, Black, and Caucasian South Africans was used due to practicalities of sampling (Coloured South Africans as a category was dropped after only very few responses were obtained).

Respondents were required to provide background information, namely gender, age, years of education, job level category (7-point depending on level of skill), and nationality/ethnicity (open-ended). Participants described themselves as Black/African, Indian/Asian, or White/Caucasian South Africans.

The final pooled sample consisted of 210 MBA students of whom 64% are men, 53% are in the 30- to 40-year age group, 68% have 16 years or more of formal education, 39% work as academically trained professionals, and belong to one of the three major ethnic groups; Black (n = 70), Indian (n = 70), or Caucasian (n = 70) South Africans.

The rationale for targeting MBA students with work experience, and not the general population, is that they were more likely than full time students - with no work experience - to embark on an entrepreneurial career. Scherer, Adams, Carley and Wiebe (1989) suggest that student populations add control and homogeneity to such a study because individuals studying business already have an interest in pursuing business-related careers and students have the education required to run a business, i.e. they have a basis for evaluating self-efficacy in some skills and abilities used in entrepreneurial careers. Research into entrepreneurial potential allows for improvement of predictive abilities and, in providing a fertile ground from which seeds of entrepreneurship can sprout, Hemmasi & Hoelscher 2005, found that student samples are very similar to actual entrepreneurs provided that they have high entrepreneurial potential.

Moreover, to establish if biographical variables, which are often related to response styles (Van de Vijver & Leung, 2001, p.1020) were similar or different for each group, frequency percentage

analysis revealed only relatively small differences between the groups, and subsequently the control variables (apart from ethnicity) were not used in further analysis.

Measurements

Attitudes, beliefs and motives

The measures identified as antecedents to entrepreneurial intentions were based on the two behavioural models previously discussed - Ajzen's (1991) theory of planned behaviour (TPB) and Shapero's (1982) model of the entrepreneurial event (EE). TPB identifies three attitudinal antecedents of intentions; two reflect the perceived desirability of intentions and the third perceived behavioural control reflects perceived feasibility of intentions and is thus related to perceptions of self-efficacy. These formative indicators of an attitude latent variable include:

- (1) The attitude towards the act: "Is starting your own business an attractive idea to you?" This attitude depends on expectations and beliefs about personal outcomes resulting from the behaviour, measured as expected utilities: "Rate the perceived value of the following five outcomes of starting your business and the likelihood of them occurring — autonomy, stress, financial performance, personal satisfaction, personal quality of life." This measure is the sum of the values weighted by the expected likelihoods;
- (2) Normative beliefs and motives: "Rate the perceived reactions of four different normative influences (friends, parents/family, mentor/role model, significant other) to the subject of starting your own business and the perceived importance of their opinions." This measure sums the strengths of the perceived reactions weighted by the perceived importance;
- (3) The degree of perceived behavioural control corresponding to global and specific perceived feasibility in Shapero's (1982) model. Both concepts are related to self-efficacy, which has been linked theoretically and empirically with many managerial and entrepreneurial phenomena (Krueger, Reilly & Carsrud, 2000), and were modified for the purposes of this study to capture beliefs which are predictive of entrepreneurial behaviour.

General and entrepreneurial self-efficacy

Self-efficacy as an antecedent to entrepreneurial intentions was emphasised since intention cannot be inferred from action otherwise it would provide a circular explanation in which the same event is taken as evidence of both cause and effect. Rather, intention must be defined independently of the behaviour it regulates. Perceived self-efficacy is a major determinant of intention but the two-constructs are conceptual and empirically separable (Bandura, 1997). Efficacy beliefs affect performance both directly and by influencing intentions. The view that efficacy beliefs are intentions is conceptually incoherent and empirically disputed (Bandura, 1997).

Self-efficacy beliefs vary across three dimensions: magnitude (particular level of task difficulty), strength (certainty of successfully performing a particular level of task difficulty), and generality (the extent to which magnitude and strength beliefs generalise across tasks and situations). When measuring ESE and GSE respondents were asked whether they could perform at specific levels on a specific task (yes or no) and then asked for a degree of confidence in that endorsement (rated on a near continuous scale from total uncertainty to total certainty) at each specific performance level (Bandura, 1986; Lee & Bobko, 1994). Self-efficacy magnitude (not measured previously by the existing ESE and GSE measures) and strength as separate non-combined measures appear to have generally weaker predictive validities and correlations than self-efficacy composites (Lee & Bobko, 1994). In other words a composite measure of self-efficacy, which includes magnitude and strength, was used

for this study; this is the first time GSE and ESE have been measured using both strength and magnitude dimensions.

The items for the self-efficacy assessment were based on Chen *et al.*'s (1998) ESE scale as well as the revised GSE scale (Chen *et al.*, 2001). Since self-efficacy is the foundational concept of GSE and ESE, it was expected that these constructs may be correlated.

The GSE measure has previously been tested in respect of item face validity, inter-item correlations, and factor loadings, with eight items reported as capturing the GSE measure. Chen *et al.* (2001) repeatedly found additional items added little or nothing to their measure in terms of reliability (coefficient alpha = 0.86) and content or predictive validity, the only contribution of adding items beyond the eight included in the GSE scale was to artificially inflate coefficient alpha by adding items that were redundant with items already included and, therefore, highly inter-correlated with them.

The ESE measure was considered highly appropriate for the study of the entrepreneur; as a task specific construct rather than a global disposition, it helps address the problem of lack of specificity in previous entrepreneurial personality research (Chandler & Jansen, 1992; Noble, Jung & Ehrlich, 1999). A Cronbach alpha of 0.89 has been reported for ESE, and it was established that the various sub-scale ESE scores are related to various criterion variables differently (Chen *et al.*, 1998). The ESE sub-scales (four sub-scales; total of 10 items) incorporated several roles/tasks, with respondents indicating degree of certainty (strength) in performing roles/tasks in marketing (Mkt), innovation (Inn), management (Mngt) and financial control (Fin) – all of which were surveyed on a 5-point Likert-type scale, as well as on a dichotomous yes/no component to each question, measuring the magnitude of self-efficacy. Self-efficacy magnitude was defined as the total number of yes answers divided by the total number of items. The self-efficacy composite measure of strength and magnitude were computed by taking raw scores of self-efficacy strength and then summed across self-efficacy magnitude scores which reflected yes answers. The sub-scales were abbreviated as: Sub-scale 1 = GSE (8-items); Sub-scale 2 = ESE Mkt (3 items); Sub-scale 3 = ESE Inn (2 items); Sub-scale 4 = ESE Mngt (3 items); Sub-scale 5 = ESE Fin (2 items).

Culture

Culture was measured with the VSM 94, which consists of 20 content questions. Computational formulae were used which allowed comparison of culturally determined value dimensions between people from two or more countries/regions/ethnic groups. Hofstede's (2001) latest Value Survey Module (VSM 94) instrument is considered the best-validated and most efficient instrument for arriving at an empirical replication of his five dimensions of culture. Hofstede's VSM 94 instrument was designed for comparing mean scores of two or more countries/regions/ethnic groups. It is not a personality test for comparing individuals within countries. It is with this in mind that different ethnic groups are compared, what can be measured are only the differences in the statistical distributions of scores for groups – which have to be sufficiently large (20-50 per group), and sufficiently matched, i.e. similar in all respects except nationality. Absolute scores are meaningless (Hofstede, 2001, p. 66).

Analysis techniques

Confirmatory Factor Analysis (CFA) was used as the main analytical technique. This builds on classical measurement theory, where each measure in one's data set is considered to be an observed indicator of one or more underlying constructs or factors (Bryant & Yarnold, 1995, p. 110). Fig. 1 represents the schematic diagrams of the CFA model as used in LISREL (software programme). In diagramming CFA results (Bryant &

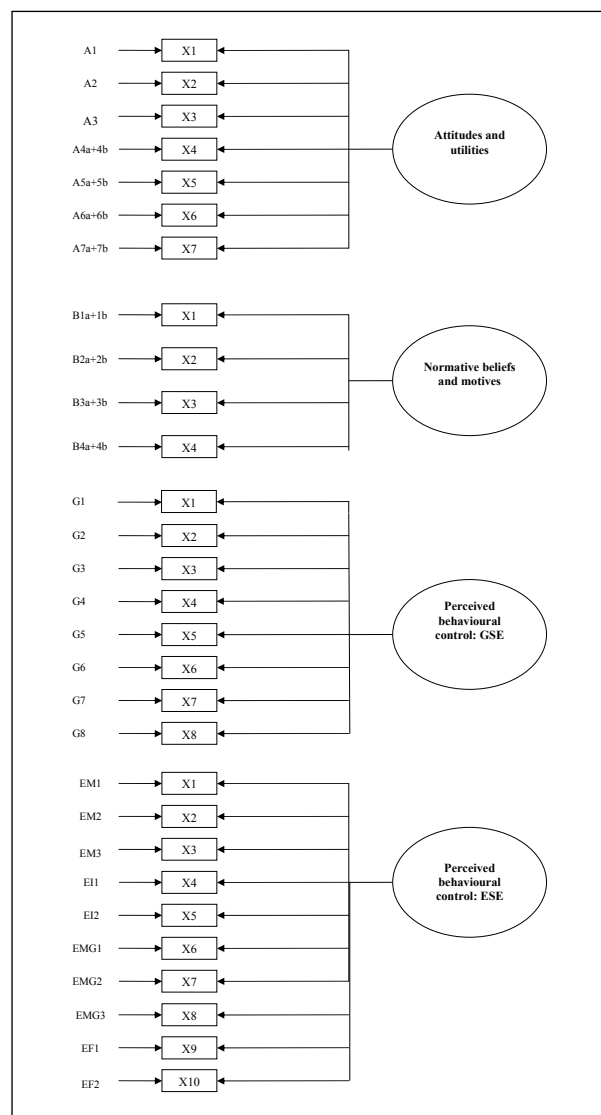


FIGURE 1
Data model of observed indicators and latent factors for antecedents to entrepreneurial intentions

Yarnold, 1995) each observed indicator is enclosed in a square and designated by the letter X. In the first section of Fig. 1 there are seven observed indicators, labelled X1-X7. The effect of measurement error on each observed indicator is marked by a small straight line to the indicator, and are designated A1-A7. The attitudes and utilities latent construct (or factor) is enclosed in a circle, and the effect of a latent factor on an observed indicator is marked by a straight line from the factor to the indicator. The other remaining latent factors are diagrammed in the same manner, leading to B1-B4 as observed indicators to the Normative Beliefs and Motives factor; G1-G8 as observed indicators to Perceived Behavioural Control, GSE factor; and for the ESE factor, observed indicators are EM1-EM3 as sub-ESE Mkt factor; items EI1-EI2 as sub-ESE Inn factor; items EM G1-EM G3 as sub-ESE Mngt factor; and items EF1-EF2 as sub-ESE Fin factor. For the cultural dimensions (model was not incorporated due to space constraints) observed indicators C1-C4 depicted the IND factor; C5-C8 the PDI factor; C9-C13 the MAS factor; C14-C17 the UAI factor; C18-C20 the LTO factor.

Measurement invariance has been defined with varying degrees of stringency, depending on which parameters are constrained to be equal. It is also possible to test for equality of error variances and covariances across groups, although the testing of equality constraints bearing on error variances

TABLE 1
Final factor categorisations and loadings for attitudes, beliefs and motives

VARIABLES	INDIANS		BLACKS		CAUCASIANS	
	Factor 1	Factor 1	Factor 2	Factor 1	Factor 2	
A1 Probability of starting own business	0.683	0.781	0.074	0.810	-0.028	
A2 Attitudes towards the act	0.842	0.847	0.074	0.827	-0.025	
A3a Expected utilities of occurring: autonomy	0.746	0.856	-0.013	0.718	0.087	
A3b Expected likelihood of occurring: autonomy	0.787	0.744	-0.075	0.835	-0.040	
A4a Expected utilities of occurring: stress	0.620	0.652	-0.152	0.141	0.922	
A4b Expected likelihood of occurring: stress	0.678	0.484	-0.085	0.454	0.657	
A5a Expected utilities of occurring: financial performance	0.725	0.666	0.198	0.443	0.163	
A5b Expected likelihood of occurring: financial performance	0.814	0.662	0.182	0.524	0.135	
A6a Expected utilities of occurring: personal satisfaction	0.836	0.825	0.044	0.786	0.270	
A6b Expected likelihood of occurring: personal satisfaction	0.836	0.766	0.128	0.864	0.056	
A7a Expected utilities of occurring: personal quality of life	0.762	0.738	0.101	0.712	-0.178	
A7b Expected likelihood of occurring: personal quality of life	0.708	0.709	0.032	0.737	-0.271	
B1a Normative beliefs and motives: friends	0.574	0.076	0.711	0.300	0.033	
B1b Normative beliefs the perceived importance: friends	0.481	-0.133	0.649	0.248	-0.299	
B2a Normative beliefs and motives: parents/family	0.710	0.122	0.629	0.661	-0.211	
B2b Normative beliefs the perceived importance: parents	0.812	-0.007	0.650	0.331	-0.279	
B3a Normative beliefs and motives: mentor/role model	0.755	0.181	0.609	0.547	0.030	
B3b Normative beliefs the perceived importance: model	0.680	0.112	0.731	0.560	0.062	
B4a Normative beliefs and motives: significant other	0.648	0.057	0.753	0.343	0.185	
B4b Normative beliefs the perceived importance: significant	0.621	-0.086	0.698	0.037	0.198	
Eigenvalue(s)	10.896	8.755	3.035	7.684	2.295	
Cronbach alpha (s)	0.954	0.926	0.929	0.902	0.914	
Variance explained	52.110	41.550	12.900	34.960	9.770	

and covariances has been cited as being excessively stringent (Byrne, 2001; Vorster, Olckers, Buys & Schaap, 2005). Moreover, it has been suggested that the equivalence of the measures may be examined at different levels of analysis (Farruggia, Chen, Greenberger, Dmitrieva & Macek, 2004), i.e. (a) configurable invariance, with factor structures compared across groups, (b) weak factorial invariance, with factor loadings constrained to be the same across groups, (c) strong factorial invariance, with factor loadings and means constrained to be the same across groups.

Research procedure

With CFA one is able to systematically test hypotheses about the invariance of factor loadings and factor variances-covariances for a given data model across independent samples (Bryant & Yarnold, 1995, p. 121). This entailed using LISREL 8.72 for Windows with robust diagonally weighted Least Squares, as the scales were considered ordinal and the sample small with respect to the number of parameters.

To facilitate the evaluation of MI across groups, preliminary single group CFA was conducted to test the fit of the data on the proposed measurement models in respect of each ethnic group separately; as indicated in the model, factors were assumed to be correlated. A chi-square difference test was applied to determine data fit. Satisfactory fit was obtained within the Indian group, producing a non-significant chi-square and associated *p* value. Contrary to other inferential statistics for which significant *p* values represent greater accuracy of prediction, with CFA, a statistically significant chi-square denotes a model that fails to reproduce the observed data correctly. Because the chi-square statistic is extremely sensitive to sample size, the samples per ethnic group (*n*=70) were considered adequate, since when evaluating overall goodness of fit when large samples are used, even reasonable models are likely to produce statistically significant chi-square values (Bryant & Yarnold, 1995, p. 111-113).

Besides evaluating how well a given factor model fits the data of a single sample, CFA also determines whether the same factor structure holds across multiple groups. Data was fitted

in a multi-group analysis with the factor structure constrained to be equal across groups and was also fitted in a multi-group analysis with factor structure freely estimated across groups. The χ^2 (chi-square) differences were then computed to determine whether data fit significantly improved if model parameters were freely estimated (discussed in the next section separately for each measure).

Subsequently, combining all the variables in a single group EFA was conducted to provide interpretable factor structures for each group. The BMDP4M procedure with maximum likelihood and direct Quartimax rotation was used. Cronbach alpha(s), eigenvalue(s) for the factor(s), and variance explained (VP) by the respective factor(s) are displayed at the bottom of the respective Tables 1-2. Variables with maximum factor loadings less than 0.30 were not highlighted.

RESULTS

Descriptive statistics generated means, standard deviations, skewness, kurtosis, item-total correlations and coefficient alphas for the measures. The results indicated (not shown) that the data collected were normally distributed.

Attitudes, beliefs and motives: Multigroup CFA resulted in the following fit indices: Least Squares chi-square of 3228.2 with 510 d.f. ($p < 0.0001$) and a Root Mean Square Error of Approximation (RMSEA) of 0.151, suggesting that the model did not fit the total group. The RMSEA by convention indicates a good fit if it is less than or equal to 0.10 (Steiger, 1995). The 90% confidence interval for RMSEA was (0.107: 0.142). Additional goodness-of-fit indices all considered to be a good fit at 0.90 (Bentler, 1990) were the Normed Fit Index (NFI) = 0.904, Comparative Fit Index (CFI) = 0.939, and the Incremental Fit Index (IFI) = 0.939.

These results indicate that a lack of fit in a multigroup analysis is evident, and MI exists between groups. Nonetheless some of the latter indices suggest a partial degree of data fit on part-measures between the groups.

TABLE 2A
Final Factor Categorisations and Loadings for GSE and ESE Sub-Scales

VARIABLES	INDIANS				BLACKS				
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 1	Factor 2	Factor 3	Factor 4	
General Self-Efficacy (GSE)*									
G1	I will be able to achieve most of the goals I have set for myself	0.743	0.051	-0.020	-0.061	0.779	-0.036	-0.082	0.061
G2	When facing difficult tasks, I am certain I will accomplish them	0.643	-0.003	0.003	0.250	0.690	0.001	-0.154	0.040
G3	In general, I think I can obtain outcomes that are important	0.696	0.061	0.044	0.144	0.812	-0.071	-0.052	0.065
G4	I will be able to successfully overcome many challenges	0.803	-0.042	0.254	-0.023	0.750	-0.067	0.011	0.091
G5	Compared to other people, I can do most tasks very well	0.656	-0.078	0.167	0.212	0.739	0.068	0.032	-0.047
G6	Even when things are tough, I can perform quite well	0.243	0.083	0.083	0.608	0.641	0.103	-0.102	-0.007
G7	I am confident that I can perform effectively on different tasks	-0.030	0.149	0.007	0.896	0.701	-0.048	0.208	0.021
G8	I believe I can succeed at almost any endeavour to which I set myself	0.073	-0.153	0.090	0.798	0.551	0.153	0.208	-0.094
Entrepreneurial Self-Efficacy (ESE) Marketing *									
EM1	Set and meet market share goals	0.082	0.013	0.796	0.075	0.220	0.644	-0.014	0.055
EM2	Establish positioning in market	0.002	0.026	0.859	0.072	-0.042	0.888	-0.018	-0.057
EM3	Expand business	0.110	0.208	0.656	-0.075	-0.017	0.621	0.011	0.145
Entrepreneurial Self-Efficacy (ESE) Innovation *									
EI1	Engage in new venturing and new ideas	0.195	0.316	0.393	0.161	0.059	0.020	0.083	0.946
EI2	Engage in new markets/products/technologies	0.162	0.360	0.277	0.233	0.020	0.039	-0.005	0.780
Entrepreneurial Self-Efficacy (ESE) Management *									
EMG1	Reduce risk and uncertainty	0.373	0.561	-0.198	0.085	0.333	0.369	0.005	0.171
EMG2	Develop strategic plans with information systems	-0.098	0.572	0.111	0.202	-0.012	0.307	0.211	0.245
EMG3	Define organisational roles, responsibilities and policies	0.332	0.528	0.052	0.118	0.399	0.234	0.197	-0.098
Entrepreneurial Self-Efficacy (ESE) Financial Control *									
EF1	Perform financial analysis	0.094	0.741	0.203	-0.203	0.055	-0.157	1.012	0.099
EF2	Develop financial systems and internal controls	-0.088	0.716	0.14	-0.025	-0.105	0.166	0.772	0.034
Note. * Self-efficacy strength (ss1-ss 4) and self-efficacy magnitude (sm1-sm 4) are represented as self-efficacy composites (sc1-sc 4) in each factor.									
Eigenvalue(s)	9.185	2.121	1.195	1.021	6.85	2.474	1.326	1.266	
Cronbach alpha(s)	0.876	0.775	0.891	0.883	0.897	0.771	0.891	0.887	
Variance explained	49.090	9.850	4.900	4.130	14.040	14.140	23.960	6.980	

TABLE 2B
Final Factor Categorisations and Loadings for GSE and ESE Sub-Scales

VARIABLES	CAUCASIANS				
	Factors 1	Factors 2	Factors 3	Factors 4	
General Self-Efficacy (GSE)*					
G1	I will be able to achieve most of the goals I have set for myself	0.718	-0.001	0.099	0.029
G2	When facing difficult tasks, I am certain I will accomplish them	0.550	0.063	0.113	0.259
G3	In general, I think I can obtain outcomes that are important	0.912	-0.037	0.007	-0.008
G4	I will be able to successfully overcome many challenges	0.732	-0.017	-0.084	0.086
G5	Compared to other people, I can do most tasks very well	0.727	0.084	-0.103	0.067
G6	Even when things are tough, I can perform quite well	0.368	0.069	-0.149	0.678
G7	I am confident that I can perform effectively on different tasks	0.229	-0.267	0.019	0.873
G8	I believe I can succeed at most any endeavour to which I set myself	0.242	0.110	0.006	0.565
Entrepreneurial Self-Efficacy (ESE) Marketing *					
EM1	Set and meet market share goals	-0.001	0.772	-0.174	0.105
EM2	Establish positioning in market	0.092	0.847	0.023	-0.076
EM3	Expand business	0.183	0.631	0.125	-0.161
Entrepreneurial Self-Efficacy (ESE) Innovation *					
EI1	Engage in new venturing and new ideas	0.482	0.176	0.079	0.041
EI2	Engage in new markets/products/technologies	0.407	0.228	0.110	0.048
Entrepreneurial Self-Efficacy (ESE) Management *					
EMG1	Reduce risk and uncertainty	-0.122	0.250	0.149	0.335
EMG2	Develop strategic plans with information systems	-0.097	0.105	0.178	0.236
EMG3	Define organisational roles, responsibilities and policies	0.099	0.266	0.131	0.152
Entrepreneurial Self-Efficacy (ESE) Financial Control *					
EF1	Perform financial analysis	0.017	-0.081	0.953	-0.001
EF2	Develop financial systems and internal controls	0.068	-0.029	0.937	-0.037
Note. * Self-efficacy strength (ss1-ss 4) and self-efficacy magnitude (sm1-sm 4) are represented as self-efficacy composites (sc1-sc 4) in each factor.					
Eigenvalue(s)	6.480	2.328	1.680	1.278	6.480
Cronbach alpha(s)	0.887	0.861	0.745	0.923	0.887
Variance explained	31.970	11.280	8.240	5.150	31.970

Based on single group analysis, EFA was subsequently conducted for the three groups separately, and results yielded a 2-factor solution for the Black and Caucasian groups and 1-factor solution for the Indian group (see Table 1 for the different factors with rotated factors loadings). The results indicate that the indicator variables designed to reflect two independent, albeit related, latent variables load on a single factor, and thus reflect a single underlying latent variable for the Indian group, but that mixed variables for the Black and Caucasian groups are evident in Table 2. As discussed theoretically, since normative beliefs and motives of respondents from different ethnic backgrounds were measured, these differences may be the reason the factor structures split up for the Black and Caucasian groups.

Self-efficacy - GSE and ESE: Multigroup CFA on the pooled sample resulted in a chi-square of 1436.2 with 186 d.f ($p < 0.0001$) and a RMSEA of 0.124 with 90% confidence interval of (0.707; 0.142) indicating that the data did not fit the measurement model. Subsequent, single group EFA conducted for the three groups yielded a 4-factor solution for the Indian, Black and Caucasian groups with different factor structures for each group (see Table 2A/2B for the different factors with rotated factors loadings).

Although it was anticipated that the ESE subscales may be sufficient in addressing independent levels of self-efficacy scores, the different ESE sub-domains, measured at the strength and magnitude levels, which allowed for a more fine-grained analytical approach, indicated little similarity in factor structures across groups (apart from ESE Mkt and ESE Fin, both of which loaded on one factor across groups). Although there is a considerable degree of overlap between the factors and groups, differences in loadings are not found on conceptually related items, which suggests that the GSE and the ESE underlying measures show little comparability across groups, as conceptualised for this study.

VSM 94: The cultural scores were based on the VSM 94 index computational formulas, as recommended by Hofstede (2001) for calculating the scores for each dimension. The cultural indices: Individualism-Collectivism (IDV), Uncertainty avoidance (UAI), Power distance (PDI), Masculinity-Femininity (MAS), and Long-term vs. Short-term orientation (LTO) were based on the individual participant's unweighted ratings for each item and mean scores were then calculated for each group (see Table 3). The scores are calculated on the original index values ranging from zero to 100. Because of the way these scores were calculated they represent relative not absolute positions of the different cultural dimensions (i.e. they measure differences only and are meaningful only when compared to each other).

Although EFA was used on individual scores, after repeated iterations only scattered items among diverse factors, with no discernable dimensions being identifiable, were obtained. Given the lack of measurement invariance no further substantial interpretations of scores obtained on the VSM 94 instrument across cultures were made.

DISCUSSION

The purpose of this article was to test for measurement invariance (MI) of the measures for antecedents to entrepreneurial intentions across three different ethnic groups in South Africa. The hypothesised invariance for the VSM 94 instrument, attitude and utilities, beliefs and motives, and the separate GSE and ESE items did not yield similar factor structures across different ethnic groups.

The lack of MI across ethnic groups and moreover the inability to replicate Hofstede's dimensions is not trivial for multicultural research in a new domain such as entrepreneurship.

On theoretical grounds, Hofstede (2001, p. 463) claims the VSM 94 was developed especially for replications; novice

TABLE 3
Cultural Values: Separate Group VSM scores

DIMENSION	INDIANS	BLACKS	CAUCASIAN
PDI	0.571	4.000	-17.642
UAI	63.928	49.285	36.857
IDV	79.000	86.785	96.857
MAS	26.149	20.285	53.428
LTO	40.285	45.428	54.285

researchers forgetting that cultures are being compared apply reliability calculations and find very low values. Perhaps the indiscernible factor structures for the VSM 94, as obtained for this present study, can be interpreted in light of Hofstede's (2001) warning that reliability can only be tested across at least 10 countries. Similarly, other replications using VSM 94 have also failed to support the five subscales as derived by Hofstede. Spector, Cooper and Sparks (2001) using 23 nations at the country level of analysis also found suspect internal consistencies in the VSM 94. In the South African context, Kruger and Roodt (2003) found that the VSM 94 lacks metric equivalence and that the reliability of this instrument cannot be justified. Such findings, together with the present results obtained, prevent the unambiguous interpretation of the validity and internal consistency of the VSM 94 instrument. Nonetheless, to avoid Hofstede's seminal work on culture altogether when attempting to undertake cross-cultural quantitative research such as this study may be unjustifiable.

Moreover, Busenitz, Gomez and Spencer (2000) indicate that cross-national differences in entrepreneurship are best explained by a broader set of institutions, i.e. educational and governmental support agencies. Additionally, Bandura (2001) argues that global cultural classifications mask intra-cultural diversity, as well as much communality among people of different cultural backgrounds; efficacy beliefs function as regulative influences for collectivists in individualistic societies and individualists in collectivists' societies, regardless of whether orientations are analysed at the cultural or individual level.

Furthermore, the research is limited by the early stage of development in the theory of the ESE construct and subsequent measures. Another caveat is the restricted sampling frame. The students sampled cannot be considered representative of the different ethnic populations in South Africa as a whole; especially since these were urban respondents and much variation exists between urban and rural populations in South Africa. Additionally, since self-reported survey data was used the study is prone to the respondent's cognitive and motivational biases (e.g. self-serving bias and social desirability). However, these response biases would probably be consistent across ethnic groups and their effect minimal on factorial equivalence.

Despite not finding factorial homogeneity in measures across ethnic groups, the study makes an important contribution in testing MI of entrepreneurial intentions and its antecedents across different ethnic groups in South Africa, since very few culturally relevant tests have been developed given the diverse range of cultural and language groups in South Africa (Foxcroft, 2004).

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