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## The measurement of values: A psychometric evaluation of the Schwartz Value Survey in the South African context

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### Abstract

Over the years a great deal of research has been devoted to the study of values in relation to work, since values are strongly associated with behaviour. Values are deeply held views that act as guiding principles for individual and organisational decision-making. Cultural values are the broad goals that members of a social institution pursue, since they justify individual actions in pursuit of valued goals. Cultural values thus play an important role in the way that social institutions function by sanctioning which attitudes and behaviour are normative. In the organisational context, the broad goals that members are expected and encouraged to pursue make up the cultural values of that organisation. Values may prove to be an important unifying force for organisational leaders, especially in the multicultural work context in South Africa. In the literature, however, the linkages between individual values and attitudes, behaviour, and social experiences are fragmented. In part, the inconsistency in results can be explained by measurement and methodological problems associated with the measurement of personal values. The purpose of this study is to re-visit the issue of personal values by investigating the psychometric properties of the Schwartz Value Survey (SVS). Although the SVS is one of the most widely used values measures, only limited research has been conducted on the instrument in the South African context. The SVS may be of value in this context in part because it has proven to be particularly adept at measuring value priorities in cross-cultural environments.

A convenience sample of 537 students from four prominent universities in South Africa participated in the research study. A confirmatory factor analytic (CFA) approach was used to investigate the internal structure of the SVS. The findings of the study suggest that the SVS holds promise as a measure to study value priorities, but that it may suffer from a lack of discriminant validity.

### Introduction

The universality of values, as well as their structural organisation, serves as an important theoretical base to link the individual to the larger society (Fischer and Schwartz, 2011; Schwartz, 2006). Initially described by Allport (1961: 543) as the “dominating force in life”, values can be described as socially shared conceptions of what is good, right, and desirable

(Knafo, Roccas and Sagiv, 2011). Values determine what is important, guide behaviours, and reflect real differences between cultures, social classes, occupations, religions, and political orientations (Lee, Souter, Daly and Louriere, 2011). One branch of this values research has focused primarily on work (e.g. Elizur, 1984; Hofstede, 1991; 1980) – that is, how values can be used as a theoretical base to understand behaviours, goals, and attitudes in the workplace.

If one considers organisations as social institutions with particular shared goals, personal values can be regarded as the shared motivational force that guides actions in pursuit of these goals. As a consequence, cultural values play an important role in how social institutions, including organisations, function. Scholars agree that values develop and evolve in response to basic challenges that are collectively faced (Sagiv and Schwartz, 2007). Organisations, like larger societies, differ in their response to the challenges that they face. Their responses are largely motivated by their shared cultural values, which dictate the preferred ways of interpreting and resolving disagreements. Some organisational cultures are more effective and adaptive than others. Research over the past decade has indicated that shared values, expressed as the organisation's culture, can be a powerful mechanism for management to fend off external threats or to capitalise on opportunities. Collins and Porras (1994) found that the main reason that many companies outperform their competitors over many years can be attributed to a strong orientation towards values.

Despite the importance of values in organisational research, the conceptualisation and measurement of values have been the source of much confusion and disagreement. This confusion has resulted in a lack of definitional cohesion and conceptual conformity across disciplines (Fischer, 2012). This lack of agreement has been perpetuated by the fact that the term 'values' is often used interchangeably with related constructs such as 'attitudes', 'traits', 'norms', and 'needs', leading many researchers to avoid the topic completely. It is thus important that a clear definition of values is provided as a way to avoid possible confusion and to distinguishing the construct from other related concepts.

### **The concept 'values'**

In moving towards an integrated definition of 'values', Schwartz and Bilsky (1987: 551) emphasised five elements common to most definitions of values, noting that "values are (a) concepts or beliefs, (b) about desirable end states or behaviours, (c) that transcend specific situations, (d) that guide selection or evaluation of behaviour and events, and (e) are ordered by relative importance". Schwartz's (1992: 2) definition of values encompasses all five elements: he describes values as "desirable states, objects, goals, or behaviours, transcending specific situations and applied as normative standards to judge and to choose amongst alternative modes of behaviour". Furthermore, Schwartz (2006; 1992) argued that all basic values are grounded in the basic requirements of human existence: organismic needs, requisites of social interaction, and the needs of groups. For example, values focus on attaining personal or social outcomes, values promote growth and self-expansion or anxiety-avoidance and self-protection, values express openness to change or conservation of the status quo, and values promote self-interest or the transcendence of self-interest in the service of others (Schwartz, 2011).

Although values are often confused with a number of related constructs, they differ from other personal attributes or concepts in several distinct ways. Firstly, values transcend specific actions and situations, distinguishing them from narrower concepts such as 'norms' and 'attitudes', which usually refer to specific instances or events (Schwartz, 2011; 1992). Values are thus broader than attitudes, which are regarded as individuals' beliefs about specific objects or situations (Hollander, 1971). Another distinct difference between attitudes and values is that attitudes can be either positive or negative, whereas values are always positive – i.e., in favour of something (Schwartz and Boehnke, 2004). Secondly, values follow a priority structure, whereby certain values can take precedence in specific situations, and altogether different values can take precedence in other situations (Schwartz and Boehnke, 2004). The general consensus is that – because values are linked to basic human needs – they occupy a higher position in an individual's internal evaluative hierarchy, and are more enduring in nature than attitudes.

Distinctions are also drawn between values and traits. Roccas, Sagiv, and Knafo (2002) differentiated between these concepts by noting that traits should be seen as enduring dispositions, while values should be viewed as enduring goals. Consistent with this distinction, Epstein (1989) argues that an individual may have a disposition towards being aggressive (trait), but may not value aggression highly.

### **Values in the workplace**

Values play an important role in organisations, since they dictate which actions are normative in pursuit of shared organisational goals. Shared norms, practices, rituals, and symbols are expressions of common cultural values in the workplace. Values play an important role in modern organisations in particular, since they are not only desired outcomes or behaviours but also reinforce job satisfaction (Zytowski, 1994). Thus, the degree of alignment between one's personal values and the organisation's values can be regarded as a source of job satisfaction along with other motivators such as income, growth opportunities, autonomy over work processes, and opportunities to use one's skills. Values can thus be regarded as one of the most pervasive antecedents of decision-making, since they play a key role in the way people interpret information. In their daily engagements at work, employees communicate their important values through the ideas, preferences and choices they make in pursuing organisational goals. Against this background, the valid and reliable measurement of personal values is clearly very important, since it is likely to impact on the internal organisation of human resources. Herein lies the research-initiating question of the current study: What are the psychometric properties of the Schwartz Value Survey, one of the most popular measures developed to assess personal value constellations? In the South African context, establishing the psychometric properties of the SVS not only serves a practical need, but also a legal one. The use of psychometric tools is governed by the Employment Equity Act No. 55 of 1998 (Republic of South Africa, 1998), which prohibits the use of psychological testing and other similar assessments of an employee unless the test or assessment being used

1. has been scientifically shown to be valid and reliable;

2. can be applied fairly to all employees; and c) is not biased against any employee or group. It is thus apparent that the focus on values in organisational settings is only likely to take place if credible measures are available to measure the values priorities.

### **Values research and prominent theoretical frameworks**

Researchers from a variety of disciplines have made valuable contributions to the theory and measurement of the value construct, including, amongst others, Gordon Allport (1961; 1955), Clyde Kluckhohn (1951), Norman Feather (1975), Geert Hofstede (1980), Shalom Schwartz (1992), and Milton Rokeach (1973). Allport (1961: 543) was one of the first psychologists to recognise the potential of values, and regarded the construct as “the dominating force in life”. Clyde Kluckhohn (1951: 400) stated that values exist “because without value systems individuals could not get what they want and need from other individuals in personal and emotional terms, nor could they feel within themselves the requisite measure of order and unified purpose”. The functionalist, deterministic approach advocated by Kluckhohn (1951) maintains that values hold potential for both action and reward, suggesting that values are cultural imperatives that lead to specific actions.

In contrast, Rokeach (1973), a leading scholar in values research, emphasised the importance of the valuing process, proposing that – rather than values influencing actions in and of themselves – values give meaning to action. He also accentuated the difference between values by distinguishing between modes of conduct – termed ‘instrumental values’ – and end-state values – termed ‘terminal values’ (Rokeach, 1973). Instrumental values represent modes of conduct such as honesty, courage, and responsibility, while terminal values encompass enduring goals such as equality, freedom, and inner harmony (Rokeach, 1973). In Rokeach’s (1973) Value Survey, respondents are instructed to arrange a list of 18 instrumental and 18 terminal values “in order of importance to YOU, as guiding principles in YOUR life” (Rokeach, 1973: 27). Although Rokeach’s Value Survey has arguably been the most widely used instrument for the measurement of value priorities, its single largest critique stems from the fact that there is no coherent theory underlying the test’s construction (Rohan, 2000). In other words, no theory is proposed by Rokeach to explain how terminal and instrumental values are related. This limitation stands in stark contrast to the greater body of research on values, which presumes that values are interrelated. As such, the endorsement of a specific value may have consequences for the endorsement of other complementary and conflicting values. For example, it seems improbable that someone will claim to value stimulation and traditional values simultaneously, due to the obvious conflicting intent of the two value dimensions.

Schwartz’s (1992) theory of value context and structures offers an integrated theory derived from the universal requirements of human existence. The theory suggests a universal set of ten individual-level value types, constituting a continuum of related motivations. ‘Power’ values refer to valuing social status and prestige, control, or dominance over people and resources. ‘Achievement’ values capture an emphasis on personal success by demonstrating competence according to social standards. ‘Hedonism’ values prioritise pleasure and sensuous gratification for the self. ‘Stimulation’ includes seeking excitement,

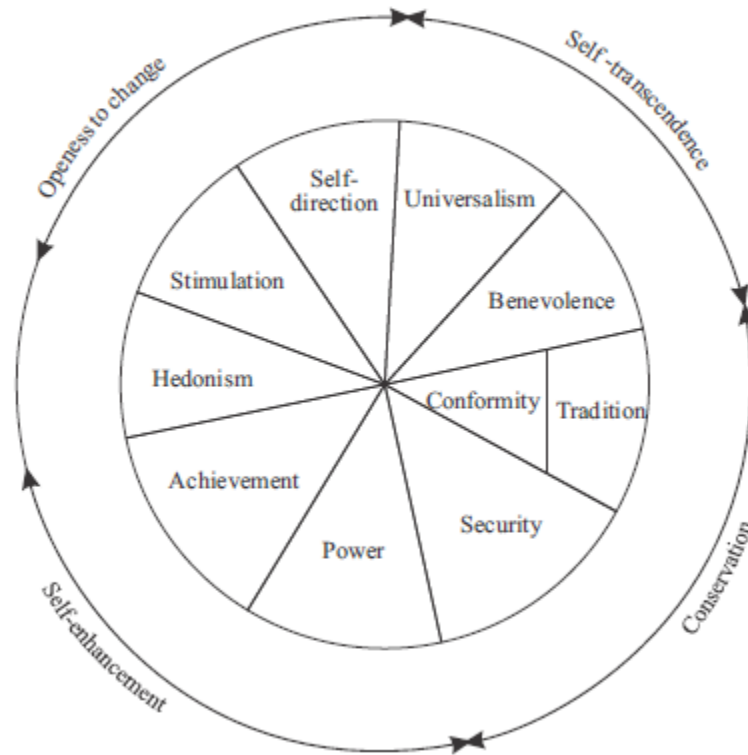
novelty, and challenge in life. 'Self-direction' is endorsed by those who value independent thought and action, thus choosing, creating, and exploring. 'Universalism' values are concerned with understanding, appreciation, tolerance, and protection for the welfare of all people and for nature. 'Benevolence' reflects motivations related to the preservation and enhancement of the welfare of people with whom one is in frequent personal contact. 'Tradition' values are related to respect, commitment, and acceptance of the customs and ideas that traditional culture or religions provide the self. 'Conformity' values are derived from motivations of restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms. Finally, 'Security' values are concerned with the safety, harmony, and stability of society, of relationships, and of self.

In addition, the theory proposes two higher-order dimensions: Firstly, Self-transcendence (Benevolence and Universalism) versus Self-enhancement (Achievement and Power); and secondly, Openness to change (Self-direction and Stimulation) versus Conservation (Security, Conformity and Tradition). Each one of these higher-order dimensions combines one or two of the ten value types that share motivational intent (Schwartz, 2007). The pursuit of any one value thus results in consequences that may either conflict or remain congruent with the pursuit of other values. The conflicts and congruities present amongst and between all ten values form a circular and integrated structure (see Figure 1).

According to Schwartz's theory, behaviour is a function of the trade-off between competing values, rather than the result of an individual's standing on any single value (Sagiv and Schwartz, 2002). The circular structure portrayed in Figure 1 suggests a continuum of related motivations in which values lying close to one another on the schematic representation possess similar underlying motivations and values. Those lying far from one another possess more conflicting or divergent motivations (Schwartz, 2006). Using this coherent structure makes it possible for researchers to theorise about the relationships between distinct value dimensions, and about the relationships between collections of values that lie close to one another in the conceptual space. Although there has been some scepticism about the methodology used to arrive at the circular structure (Hitlin and Piliavin, 2004), strong empirical support has been found worldwide for Schwartz's ten-value taxonomy (Schwartz, 2011).

The theory views the circular arrangement of values like a circular continuum of colours (Cieciuch and Schwartz, 2012). Accordingly, the idea of a continuum implies that values can be partitioned into broader value domains or more narrowly defined constructs, depending on how finely one wishes to discriminate between motivations. For this reason, Schwartz (1982) proposed the grouping of the ten basic values into broader higher-order values that form two bipolar dimensions (Cieciuch and Schwartz, 2012). In the first continuum, self-transcendence values (universalism and benevolence) are contrasted with self-enhancement values (power and achievement). In the second continuum, conservation values (tradition, conformity, and security) are contrasted with openness to change values (simulation and self-direction). Hedonism is not allocated to either of the continuums, but is located between openness to change and self-enhancement.

**FIGURE 1  
STRUCTURAL RELATIONS AMONG BASIC VALUES**



Source: Adapted from Schwartz (1992)

### **Schwartz's value taxonomy and the Schwartz value survey**

Schwartz (1992) developed the Schwartz Value Survey (SVS) based on his universally applicable theory of human values. This instrument, along with a less abstract version (e.g. it includes short descriptive of 29 different people) that is known as the Personal Values Questionnaire (PVQ) (Schwartz, 2005), is one of the most widely used instruments for the examination of cross-cultural value structures. The instrument captures ten value types that are believed to be “a reasonable approximation of the structure of relations among the ten value types in the vast majority of samples” (Schwartz, 1994: 35). Considerable evidence has been found worldwide for the proposed structure, and efforts to validate the theory have replicated all ten value dimensions in over 60 different countries (Schwartz, 2011). However, support for the theory has proven to be somewhat stronger in Western societies than in samples from the Far East, Sub-Saharan Africa, or South America (Hitlin and Piliavin, 2004). It is noteworthy that the validity evidence is somewhat mixed with regard to South African samples, particularly when factor analytic approaches are applied. One study focused on 1 364 South African working adults from the four racial groups who completed the SVS (Burgess and Schwartz, 1993). Smallest Space Analysis (SSA) was used to investigate the structure of the data. Support was found for the ten basic dimensions and the polar, higher-order types for the total sample and white sub-sample. The structure did not replicate well for the Black sub-sample in South Africa (Burgess and Schwartz, 1993).

In an earlier study using a sample of Black South African university students, Schwartz (1992) found support for only one value, and the items measuring the remaining values were intermixed in a random pattern. Cronbach's coefficient alpha values ranged between 0.45 (Self-direction) and 0.76 (Achievement)<sup>i</sup>.

### **Values in the South African context**

One of Schwartz's most significant findings regarding the Basic Human Values theory involved its individual and cultural generalisability. Although Basic Human Values have been tested worldwide, a systematic literature review on values structure found that only three studies have confirmed the values structure in South Africa (Becker, 2010; Schwartz, Melech, Lehman, Burgess, Harris and Owens, 2001; Welthagen, 2005).

Spini (2003) indicated that it is possible to successfully use the SVS as a research instrument for cross-cultural research, and that separate value types can be equivalent at different levels across a large number of samples rooted in cultural diversity. Schwartz (2011) evaluated values structures with the SVS on the individual level in Sub-Saharan Africa, Uganda and South Africa, and found many deviations from the theoretical structure of basic personal values. The primary variations stem from the abstract nature of the SVS items, as well as the complex numerical rating scale that was used (Burgess and Schwartz, 1994; Schwartz, 2011). Schwartz and colleagues suggested that low levels of education, multi-lingual barriers, and low socio-economic standards could be seen as contributing factors. Schwartz (2007) subsequently developed an alternative values instrument, known as the Portrait Value Questionnaire (PVQ). This instrument presents the items on a more concrete level, provides descriptions of people, asks for similarity judgements, and uses response formats that do not require respondents to express judgements in numerical ratings. Using a representative sample of 3 493 South Africans, seven of the ten values were clearly replicated (Schwartz *et al.*, 2001).

Welthagen (2005) investigated the cross-cultural application of the adapted Schwartz values instrument in South Africa using a large sample of applicants who had applied for jobs in the South African Police Service (SAPS). The study made use of an adapted version of the SVS, the Work and Organisational Values Scale (WOVS), and investigated similarities and differences between the values of different language and gender groups in South Africa. The majority of the applicants came from the African group (97.2 per cent), and the majority of the participants spoke Sepedi (31.2 per cent), Setswana (19.5), or Tsonga (12.6 per cent), while only 0.6 per cent of the participants spoke English. The relatively small sample size for some of the language groups led Welhagen (2005) to conduct the equivalence analysis (target rotation with Tucker's phi and MANOVA) using four main groups: group 1 (Afrikaans and English), group 2 (Nguni languages – i.e., Xhosa, Zulu, Seswati, Ndebele), group 3 (Sesotho languages – i.e., Sepedi, Sesotho, Setswana), and group 4 (Venda and Tsonga). In this study two higher-order continuums emerged. The first continuum was labelled 'self-enhancement versus conservation', and the second 'individualism versus collectivism'. This higher-order structure was similar to Schwartz's

(1992) higher-order values structures of growth and self-expansion versus need of protecting oneself against threats and anxiety, and is concerned with a personal focus versus one's personal outcomes. The MANOVA results, however, suggested that only three (prestige, relations, simulation) of the ten values were equivalent across the four language groups.

Considered collectively then, it is apparent that the research conducted in the South African context is mixed and that more research is required to validate Schwartz's value theory. The primary objective of the present study was to empirically investigate Schwartz's ten-value structure using SVS in the South African context.

### **Research objectives**

The universality of the ten-value structure as proposed by Schwartz (1994) opens important avenues for individual and cross-cultural research. As such, confirming the measurement integrity of the SVS is a fundamental concern for values theory and practice, since establishing how well the measure is able to gauge the individual differences it purports to measure, and the validity of the inferences that are drawn from these, speaks directly to the design intention of the approach. Although extensive research has been conducted worldwide on Schwartz's values instruments (e.g., SVS, PVQ, RVQ-R2), relatively little research has been conducted in the African and South African contexts. Although Schwartz has conceptualised newer versions of the SVS, the original instrument is still widely used in research and practice in South Africa. Furthermore, the PVQ and PVQ-R are relatively new measures used for the operationalisation of values measurement, whereas the SVS has been used extensively in values research. Accordingly, this study can make an important contribution to investigating the psychometric tenability of the SVS in the South African context.

Smallest Space Analysis (SSA) and other variants of multi-dimensional scaling have become popular data analysis techniques when investigating the internal structure of Schwartz's values instruments. When the purpose of the research is to gain an understanding of which values cluster together, and how they cluster together, the technique is clearly very valuable. It is fair to say that SSA techniques have contributed to the cross-cultural replication of Schwartz's (1992) values theory. However, researchers who are interested in values on the individual level prefer working with narrowly defined dimensions that can be used in correlation-type cross-sectional research designs (Schwartz, 2011). From this perspective, techniques embedded in latent covariance modelling (e.g., confirmatory factor analyses, bi-factor models, principal component analyses) may be preferable due to the statistical rigour and flexibility of these approaches (Brown, 2006). Unfortunately, relatively little research has been conducted on the SVS using latent modelling approaches.

No published literature could be found that used confirmatory factor analysis (CFA) to assess the internal structure of the SVS in South Africa. The few internationally published studies that used CFA to assess the psychometric properties of the instrument reported mixed results. Thus, although Steinmetz, Schmidt, Booh, Wiczorek, and Schwartz



(2009) found relatively strong support for the ten value dimensions, Davidov (2008) did not find strong support for the existence of the ten value dimensions. To this end, the current study has made a methodological contribution towards the study of values by using a CFA approach to investigate the internal structure of the SVS.

## **Methodology**

As a basic premise, a methodology should serve the epistemological ideals of scientific enquiry (Babbie and Mouton, 2001). The credibility of the chosen research design dictates the validity of the conclusions reached. In the current study a cross-sectional correlation design was deemed appropriate to evaluate the internal psychometric properties of the SVS.

## **Sampling**

A convenience sample of 800 students from four prominent universities in South Africa participated in the study.

### The realised sample

As values research suggests that personal values are established during early adolescence (i.e.,  $\pm$  14 years old) and remain relatively stable over an entire lifespan, the targeted student sample seemed appropriate for the investigation of personal values (Rokeach, 1973; Schwartz *et al.*, 2001). The demographic characteristics of the participants are reported in Table 1.

As can be inferred from Table 1, the majority of the respondents were female (68.5 per cent). As expected when sampling from a student population, the respondents were relatively young, with 41 per cent of the respondents aged less than 20 years old and a mean age of 21 years old. The sample distribution with regard to ethnic group was as follows: Black ( $n = 97$ ), White ( $n = 195$ ), Indian ( $n = 12$ ), and Coloured ( $n = 76$ ). A large proportion (28.9 per cent) of the respondents did not disclose the ethnic group they belong to. With regard to language, the majority of respondents were either Afrikaans-speaking (46.4 per cent) or English-speaking (33.1 per cent), with Xhosa being the most represented African language (5.8 per cent). Most of the other African languages were under-represented in the sample, with Setswana (3.4 per cent), Sesotho (0.9 per cent), Siswati (0.4 per cent), Sepedi (0.2 per cent), and Tshivenda (0.2 per cent), each accounting for less than five per cent of the total sample.

## **Measurement**

Building on the earlier work of Rokeach (1973), Schwartz (1992) devised a ten-dimension values theory reflecting a universal set of related motivations (Perrinjaquet, Furrer, Usunier, Cestre and Valette-Florence, 2007). Respondents are asked to rate the importance of each value item “as a guiding principle in MY life”, by using a nine-point non-symmetrical scale stretched at the upper end and condensed at the bottom. On the nine-point scale, ‘7’ is regarded

as “of supreme importance”, ‘6’ is “very important”, ‘5’ and ‘4’ are unlabelled, ‘3’ is “important”, ‘2’ and ‘1’ are unlabelled, 0 is “not important”, and -1 is “opposed to my values”.

Limited literature is available with regard to the reliability of the ten value dimensions comprising the SVS in the South African context. However, considerable research has been conducted on the instrument internationally; and Schwartz (2005) reported the test-retest and internal reliability coefficients for each of the ten value dimensions, as reflected in Table 2.

**TABLE 1  
PARTICIPANT CHARACTERISTICS (N = 537)**

	<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
Age	< 20	220	41.0
	21-22	196	36.5
	23 +	113	21.0
	Missing	8	1.5
Gender	Male	149	27.2
	Female	368	68.5
	Missing	20	3.7
Ethnicity	Black	97	18.1
	Coloured	76	14.2
	Indian	12	2.2
	White	195	36.3
	Missing	155	28.9
Home language	Afrikaans	249	46.4
	English	178	33.1
	Xhosa	31	5.8
	Sepedi	1	0.2
	Setswana	18	3.4
	Sesotho	5	0.9
	Siswati	2	0.4
	Tshivenda	1	0.2
	Missing	41	7.6

**TABLE 2**  
**RELIABILITY OF THE SVS PER VALUE DIMENSION**

Value dimension	Number of items in each sub-scale	Test-retest reliability	Internal reliability	
			Mean	Range
Benevolence	5	0.75	0.70	0.59-0.81
Universalism	8	0.74	0.75	0.68-0.84
Self-direction	5	0.70	0.68	0.49-0.76
Stimulation	3	0.76	0.72	0.66-0.78
Hedonism	3	0.71	0.74	0.68-0.84
Achievement	4	0.70	0.72	0.61-0.78
Power	4	0.76	0.68	0.54-0.76
Security	5	0.76	0.70	0.45-0.80
Conformity	4	0.77	0.72	0.55-0.79
Tradition	5	0.82	0.60	0.47-0.67

Source: Adapted from *Basic human values: Their content and structure across countries* by Schwartz, S.H. 2005; *Valores e comportamento nas organizações [Values and behavior in organisations]*, in Tamayo, A. and Porto, J.B. (Eds.), *Valores e comportamento nas organizações [Values and behavior in organisations]* (p 21). Copyright 2008 by Elsevier Inc. Reprinted with permission.

As a general rule, values in excess of 0.70 are deemed acceptable for individual sub-scales (Netemeyer, Bearden, and Sharma, 2003). Therefore, the general consistency of the sub-scales in the studies reported in Table 2 appears satisfactory.

### Missing values

Participants with more than 80 per cent missing values were deleted from the dataset. A total of 263 cases were deleted from the original dataset. We believed that this was an important first step in dealing with the missing values in the data, since the range of the missing values did not seem to be random: most of the missing cases were from a single university, and we were hesitant to keep those cases in the dataset, since this may have introduced considerable bias into the parameter estimates. We acknowledge that deleting a large number of cases can itself introduce bias into the estimates, as suggested by Arbuckle (1996); but since the cases were clearly not random, our decision to delete the cases in a list-wise fashion was judged to be more prudent than the alternative option of leaving the cases in the dataset. For this reason, the results from the analyses should be considered tentative pending further replication, as cross-validation was not possible in the current study. None of the remaining cases had more than seven per cent missing values, and upon inspection there seemed to be limited structure in the patterns of the missing values. Output from the missing value data analyses is presented in Appendix A. Although Little's Chi-square test of MCAR ( $\chi^2 = 9691.461$ ;  $df = 8527$ ;  $p = 0.0001$ ) had to be rejected, we believe that the data can be regarded as 'missing at random' (MAR) and, as a result, estimation of the remaining missing values in the data using full information maximum likelihood (FIML) seems to be a reasonable approach. The old adage that the best way to deal with missing values is not to have them has recently been rejected in favour of modern techniques that make best use of the available data resources (Graham, 2009). There is a common misperception that imputation

of missing data amounts to making up the data. However, the point of the process is not to obtain the original values, but merely to fill in new data points by borrowing information from the other variables during the estimation of parameters in order to preserve the important characteristics of the data set as a whole. FIML handles the missing data and parameter estimation in a single step by reading data for a single case in time and the selecting values that maximise the ML function for each case with the information that is available (Enders, 2001).

There seems to be some methodological consensus that it is better to estimate missing values using techniques with strong statistical underpinnings than to do nothing about the missing elements in the data. Previous research has demonstrated that multiple imputations using FIML are very accurate in reproducing unbiased parameter estimates, even under assumptions of non-normality and with large amounts of missing data (Graham, 2009). Against this background, we were encouraged to estimate the remaining missing values in the data.

Students from the four targeted universities in South Africa were asked to answer the paper-and-pencil version of the Schwartz Value Survey. Collaborators at the universities were provided with detailed instructions about the administration of the surveys to assure standardisation across the testing venues. Prior to administering the SVS, respondents were informed of their rights, and were asked to complete consent forms if they were willing to participate in the research project.

### **Statistical analysis**

**Unrestricted factor analysis:** As a first step, responses to the 46 SVS items were subjected to an unrestricted maximum likelihood factor analysis using the Statistical Package for the Social Sciences (SPSS) 24.0 for Windows. When conducting restricted factor analyses, only the items sets that reflected each of the ten value dimensions individually were subjected to EFA. The expectation was that each of the items that comprised each of the ten value dimensions of the SVS would load onto a single factor. Conducting a series of separate EFAs on the ten individual dimensions was deemed acceptable because the designers of the SVS conceptualised the ten value dimensions to be related yet conceptually distinct uni-dimensional constructs.

The scree plot, Kaiser-Guttman guideline, magnitude of factor loadings, and percentage of correlated residuals were considered conjointly when analysing the dimensionality of the ten sub-scales. Factors were obliquely rotated according to the promax criterion (Brown, 2006), since individual value dimensions as conceptualised by Schwartz (2010; 2005; 1992) are expected to correlate. Brown (2006) suggests making use of oblique rotations because this provides a more realistic representation of how factors are related.

**Confirmatory factor analysis:** In addition to the EFA, a restricted confirmatory factor analytic approach was used to investigate the internal structure of the SVS. In order to test the validity of the instrument in the South African context, specific structural assumptions

about the number of variables (latent and observed) and the pattern of relationships between variables were specified consistent with Schwartz's (1994) original design intention. The internal structure of the measure can be operationalised by means of the specification of fixed and freely estimated model parameters (Skrondal and Rabe-Hesketh, 2004).

More specifically, the SVS measurement model can be defined in terms of a set of measurement equations, expressed in matrix algebra notation (see Equation 1):

$$X = \Lambda_x \xi + \delta \quad (1)$$

Where:

$X$  is a 46 x 1 column vector of observable indicator variables

$\Lambda_x$  is a 46 x 10 matrix of factor loadings

$\xi$  is a 1 x 10 column vector of latent values dimensions

$\delta$  is a 46 x 1 column vector of measurement error

In addition, all the off-diagonal elements of the phi covariance matrix, denoting the covariance between the ten latent values constructs, were freed up to be estimated. As Schwartz's (1992) theory attempts to provide broad coverage of the diverse values domain, high correlations between adjacent values in the motivational continuum would be expected. Accordingly, statistical analyses, especially factor analysis, have found that boundaries between the ten values are fuzzy rather than distinct (Knoppen and Saris, 2009).

Model parameters of the CFA model were estimated using maximum likelihood with robust standard errors and fit indices due to the non-normality<sup>ii</sup> of the sample data. Each model was identified by standardising each of the ten latent variables, and all error variances were specified to be uncorrelated. Fit indices and model parameters were estimated using Mplus 6 (Muthén and Muthén, 1998-2008). Multiple fit indices were used to evaluate the tenability of the SVS. These indices included the Satorra-Bentler  $\chi^2$ , the comparative fit index (CFI, Bentler, 1990), the root mean square error of approximation (RMSEA, Steiger and Lind, 1980) with accompanying confidence intervals, and the standardised root mean square residual (SRMR, Jöreskog and Sörbom, 1993). CFI values in excess of 0.90 (Bentler, 1990), RMSEA values lower than 0.08 (Browne and Cudeck, 1993), and SRMR values lower than 0.06 (Hu and Bentler, 1999) were regarded as satisfactory.

**Internal consistency reliability:** The internal consistencies of the items comprising each of the ten value sub-scales were assessed by means of Cronbach's coefficient alpha ( $\alpha$ ). The important question that item analysis attempts to answer concerns the extent to which individual items succeed in capturing the constitutive meaning of the constructs under consideration. If the construct(s) being operationalised by the psychometric measure(s) are

assumed to be uni-dimensional, test items as a whole should consistently reflect the construct in an uncontaminated and synchronised fashion (Nunnally, 1978; Streiner, 2003).

## **Empirical results**

### **Unrestricted factor analysis**

Unrestricted factor analysis was conducted on each of the ten value dimensions to assess the dimensionality of the items that comprise each sub-scale of the SVS. However, due to the small item-to-scale ratio of the SVS, three of the value dimensions (Stimulation, Hedonism, and Achievement) were just-identified models (Diamantopoulos and Siguaw, 2000; Kaplan, 2000). Just-identified CFA models perfectly reproduce the data (sample covariance matrix), and this makes them impractical for the evaluation of the proposed model fit to the data, due to their ability (or limitation) to predict the sample covariances perfectly (Kaplan, 2000). Although the goodness-of-fit statistics of the just-identified Stimulation, Hedonism, and Achievement solutions is somewhat arbitrary, these models can still be evaluated in terms of the interpretability and strength of their parameter estimates (Brown, 2006).

The uni-dimensionality assumptions of the items comprising each of the ten value dimensions were investigated by means of the unrestricted EFA. The results of the dimensionality analysis are summarised in Table 3.

Table 3 reveals that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for all sub-scales exceeded the normative 0.60 level (Tabachnick and Fidell, 2001). The Kaiser-Guttman criterion, scree plots, and the number of large residual correlations ( $r \leq 0.05$ ) were considered collectively in diagnosing the number of factors responsible for the inter-correlations between scale items (Fabrigar, Wegner, MacCullum, and Strahan, 1999). With the exception of the Universalism sub-scale, the EFA results reported in Table 3 suggest that value dimensions are fairly uni-dimensional.

Furthermore, Table 3 indicates robust factor loadings ( $\lambda > 0.50$ ) for the majority of scale items, implying that the latent construct explains at least 25 per cent of the total observed variance reflected by each item (Diamantopoulos and Siguaw, 2000). Residuals provide important diagnostic information about the empirical tenability of conceptual models (Brown, 2006). The residual correlations for the unrestricted factor solutions presented in Table 3 reflect small percentages of non-redundant residuals with absolute values greater than 0.05. The biggest percentage of large residual correlations was reported for the Benevolence and Self-direction sub-scales. Large proportions of correlated residuals may be indicative of multi-dimensionality, since the primary extracted factor is unable to account comprehensively for the majority of the common variances (Netemeyer *et al.*, 2003). Factor analytic solutions that reflect large proportions of non-ignorable residuals should be examined in more detail to identify potential sources of strain. Based on the scree plot, large proportion of large correlated residuals, and eigenvalues-greater-than-one rule of thumb, the dimensionality of the Universalism sub-scale warrants closer examination.

Closer examination of the rotated pattern matrix with regard to the Universalism sub-scale resulted in the identification of two substantively meaningful sub-dimensions. Rotated factor loadings of the Universalism sub-scale are portrayed in Table 4.

**TABLE 3  
RESULTS OF THE UNRESTRICTED FACTOR ANALYSIS**

Sub-scale	No. of items	KMO	Eigenvalues >1	% Common variance reflected	Number of factor loadings $\geq 0.30$ on primary factor	Number of factor loadings $\geq 0.50$ on primary factor	% of residuals $\geq 0.05$
Benevolence	5	0.778	1	39.988	5	5	30
Universalism	8	0.810	2	39.500	8	5	14
Self-direction	5	0.728	1	27.824	5	2	30
Stimulation	3	0.650	1	37.829	3	3	0
Hedonism	3	0.618	1	37.865	3	2	0
Achievement	4	0.721	1	33.773	4	4	0
Power	4	0.691	1	32.433	4	3	0
Security	5	0.736	1	24.887	5	5	0
Conformity	4	0.751	1	39.177	4	4	0
Tradition	5	0.702	1	22.407	5	5	20

**TABLE 4  
ROTATED PATTERN MATRIX OF THE UNIVERSALISM SUB-SCALE**

Item		Factor	
		1	2
1	EQUALITY (equal opportunity for all)	-0.093	<b>0.644</b>
17	A WORLD AT PEACE (free of war and conflict)	0.027	<b>0.695</b>
24	UNITY WITH NATURE (fitting into nature)	<b>0.868</b>	-0.193
26	WISDOM (a mature understanding of life)	<b>0.378</b>	0.089
29	A WORLD OF BEAUTY (beauty of nature and the arts)	<b>0.609</b>	0.121
30	SOCIAL JUSTICE (correcting injustice, care for the weak)	0.269	<b>0.461</b>
35	BROADMINDED (tolerant of different ideas and beliefs)	0.277	0.198
38	PROTECTING THE ENVIRONMENT (preserving nature)	<b>0.621</b>	0.066

Note: Factor loadings > 0.30 are indicated in bold

With the exception of item 35, all remaining items comprising the Universalism sub-scale could meaningfully be divided into two sub-scales that make theoretical sense. Items 1, 17, and 30 all seemed to load onto a common factor, which appears to reflect an element of justice or fairness. Conceptually these items seem to capture a philanthropic undertone with regard to one's own society and the world at large.

Items 24, 26, 29, and 38 loaded significantly onto factor one. These items are concerned with the protection of the environment and living in harmony with nature. A high premium is placed on living in balance with one's natural surroundings, rather than exploiting them for material gain. In Schwartz's (1992) conceptualisation of Universalism, elements of tolerance of differences, concern for the environment, and equality were incorporated into the definition of Universalism. In the current study, results from the unrestricted factor analysis

suggest that equality and tolerance for differences clustered together, whilst concern for the environment emerged as a second distinct facet of Universalism.

Partitioning the Universalism sub-scale into finer conceptual dimensions might lead to improved theory with greater universal heuristic and predictive power (Schwartz, 2007).

#### • **Item analysis**

With the exception of the Universalism sub-scale, convincing evidence has been found for the uni-dimensionality of the other values sub-scales. It would therefore be logical to expect the inter-correlations between items comprising each individual sub-scale to be the working of a single underlying latent factor.

However, before examining the scale reliabilities, a cautionary note about the dimensionality of the Universalism sub-scale is necessary. The dimensionality analysis suggested that the Universalism sub-scale can be meaningfully refined by splitting the scale into two smaller sub-scales. Since uni-dimensionality is an important pre-requisite for the unambiguous interpretation of Cronbach's coefficient alpha, it would be prudent to conduct item analysis on each of the two scales individually. However, since the objective of the current study was to evaluate how the measure works in its current form, it was decided to conduct item analysis on the total Universalism sub-scale.

Results of the item analysis of each of the ten values sub-scales are summarised in Table 5.

The results in Table 5 illustrate the reliabilities of the ten SVS sub-scales. With the exception of the Benevolence, Universalism, and Conformity sub-scales, none of the sub-scales adhered to the minimum normative value of 0.70.

Congruent with the scale-level statistics, the item-level statistics reflected low item-total correlations and squared multiple correlations and, for two items (item 57 measuring Hedonism and item 46 measuring Power), an increase in sub-scale reliability when the items were deleted. However, all the SVS sub-scales contain relatively few items that could suppress the internal consistency statistics.

Taken together, the SVS scale reliabilities reflect inadequate levels of internal consistency. The low scale reliabilities are worrying, since this implies that the items designed to reflect latent value dimensions may be capturing systematic and random error rather than true error variance.

#### **Confirmatory factor analysis**

The objective of the CFA was to assess whether the factor structure of the SVS, as proposed by the designers of the instrument, provided an acceptable explanation for the covariances between the observed variables. As a quality control procedure, unrestricted factor analysis was also conducted on the instrument. Major discrepancies in results between the two procedures would be regarded as *prima facie* evidence of lack of convergent validity



(McDonald, 2005). In addition, the unrestricted factor analysis and item analysis procedures played an important role in the identification of sources of misfit in the CFA solution.

**TABLE 5**  
**SUMMARY OF ITEM ANALYSIS RESULTS**  
**FOR THE TEN VALUE DIMENSIONS**

Sub-scale	Mean	Variance	Standard deviation	Cronbach's alpha
Benevolence	25.87	23.60	4.86	0.762
Universalism	36.99	68.61	8.28	0.778
Self-direction	24.91	21.52	4.64	0.649
Stimulation	12.81	14.74	3.84	0.627
Hedonism	13.93	13.80	3.72	0.624
Achievement	20.65	13.31	3.65	0.648
Power	12.39	30.56	5.53	0.634
Security	23.35	24.12	4.91	0.600
Conformity	20.58	17.56	4.19	0.712
Tradition	20.41	33.56	5.79	0.582

The tenability of CFA models is assessed on both global (via fit indices) and molecular (via model parameters) levels of observation (Kline, 2011, 2005; Millsap, 2007). Initially the validity of the SVS was assessed on a global level by examining the fit indices and model residuals.

However, before specifying and estimating the CFA model, the key assumptions of SEM were tested. The dataset was initially screened for outliers, multivariate normality, collinearity, and singularity. No serious data violations were detected, and an over-identified model with 944 degrees of freedom was specified. The model converged to an admissible solution in 25 iterations using the robust maximum likelihood (due to non-normality of data) in MPLUS.

Table 6 provides the full spectrum of fit indices provided by MPLUS version 5 (Muthén and Muthén, 1998-2008). In terms of model fit, it is now widely acknowledged in SEM circles that there is no statistical 'gold standard' that objectively leads to the decision to reject or retain a particular model (Hu and Bentler, 1999, 1998; MacCullum and Austin, 2000). Best practice convention dictates using a combination of fit indices in order to gain an overall idea of how well the proposed model fits the data (Hair, Black, Babin, Anderson and Tatham, 2006; Kline, 2011). Model fit should be evaluated on three levels: (1) overall fit; (2) comparative fit to a base model; and (3) model parsimony (Hair *et al.*, 2006). Muthén and Muthén (2010) suggested that at least one index from each of these three categories should be reported in SEM studies. The Satorra-Bentler scaled  $\chi^2$  test statistic reported for the SVS was significant ( $p < 0.0001$ ), indicating that the theoretical configuration of the instrument could not reproduce the observed covariance matrix to a degree of accuracy explainable in terms of sampling error only. The non-significant p-value reported for the test of close fit ( $p$

> 0.05) suggested that the null hypotheses of close fit could not be rejected, implying that the theoretical specification of the SVS closely accounts for the variance/covariances in the sample covariance matrix. Furthermore, the low point estimate reported for RMSEA (0.049) is indicative of good model fit (Browne and Cudeck, 1993). The 90 per cent confidence level for RMSEA further corroborates the assumption that the theoretical model fits the data satisfactorily, especially when considering that the upper boundary of the confidence interval marginally exceeds the normative value of 0.05.

The standardised RMR value of 0.064 was regarded as satisfactory according to the proposed normative value of 0.08 (Hair *et al.*, 2006). However, the CFI (0.79) and TLI (0.77) values fell well short of the normative values of a good model fit stipulated by Hair and colleagues (2006).

Taken together, the fit indices reported for the SVS are somewhat ambiguous. Whereas the standardised RMR and the RMSEA are indicative of a good fitting model, the CFI and TLI suggest that the original SVS configuration does not satisfactorily account for the variances/covariances in the sample data.

In order to identify the potential areas of misfit, the fitted residuals were examined. The quantity, sign, magnitude, and distribution of residual terms provide important diagnostic information about a measure's overall model fit (Diamantopoulos and Siguaw, 2000).

**TABLE 6**  
**GOODNESS-OF-FIT STATISTICS FOR THE SVS**

<b>Absolute fit indices</b>	
Chi-square test of model fit	2175.249
Degrees of freedom	944
p-value	0.0001
Scaling correction factor for robust ML	1.138
RMSEA (Root mean square error of approximation)	0.049
p-value RMSEA ( $\leq 0.05$ )	0.664
90% C.I.	0.047 0.052
Standardised root mean squared residual (RMR)	0.064
<b>Incremental fit indices</b>	
Comparative fit index (CFI)	0.79
Tucker-Lewis fit index (TLI)	0.77
<b>Predictive fit indices</b>	
Akaike information criterion (AIC)	83967.725
Bayes information criterion (BIC)	84752.063

**TABLE 7**  
**CFA MODEL PARAMETERS OF THE SVS**

Item	Unstandardised lambda factor ( $\lambda_{\nu}$ )	Standard error (S.E.) factor loadings ( $\lambda_{\nu}$ )	Standardised Lambda	Communality ( $R^2$ )	Standardised residual variance ( $\theta_{\nu}$ )
<b>Conformity</b>					
11.	0.80**	0.06	0.58	0.35	0.66
20.	0.85**	0.06	0.59	0.36	0.64
40.	0.89**	0.06	0.68	0.47	0.53
47.	0.04**	0.06	0.65	0.42	0.58
<b>Tradition</b>					
18.	0.96**	0.08	0.51	0.27	0.73
32.	0.57**	0.10	0.30	0.09	0.91
36.	0.97**	0.06	0.62	0.40	0.61
44.	0.84**	0.11	0.38	0.15	0.85
51.	0.90**	0.09	0.46	0.22	0.78
<b>Benevolence</b>					
33.	0.69**	0.05	0.57	0.33	0.67
45.	0.78**	0.05	0.64	0.42	0.58
49.	1.0**	0.06	0.63	0.41	0.59
52.	0.80**	0.05	0.65	0.43	0.57
54.	0.99**	0.06	0.65	0.42	0.58
<b>Universalism</b>					
1.	0.61**	0.08	0.40	0.16	0.84
17.	0.98**	0.07	0.57	0.33	0.67
24.	0.15**	0.07	0.59	0.36	0.64
26.	0.62**	0.06	0.48	0.24	0.76
29.	0.14**	0.08	0.63	0.40	0.60
30.	0.99**	0.06	0.64	0.41	0.59
35.	0.65**	0.07	0.45	0.21	0.79
38.	0.16**	0.07	0.63	0.41	0.59
<b>Self-direction</b>					
5.	0.65**	0.07	0.46	0.21	0.79
16.	0.91**	0.07	0.59	0.35	0.65
31.	0.54**	0.06	0.43	0.18	0.82
41.	0.67**	0.06	0.53	0.28	0.72
53.	0.93**	0.07	0.56	0.32	0.68
<b>Stimulation</b>					
9.	0.89**	0.07	0.62	0.38	0.62
25.	0.92**	0.07	0.59	0.35	0.65
37.	1.23**	0.09	0.61	0.37	0.63
<b>Hedonism</b>					
4.	1.21**	0.13	0.71	0.50	0.50
50.	0.89**	0.12	0.55	0.30	0.70
57.	0.90**	0.12	0.56	0.32	0.69
<b>Achievement</b>					
34.	0.74**	0.05	0.62	0.39	0.61
39.	0.83**	0.07	0.51	0.26	0.74
43.	0.76**	0.05	0.62	0.39	0.61
55.	0.63**	0.05	0.56	0.31	0.69
<b>Power</b>					
3.	1.06**	0.11	0.52	0.27	0.73
12.	1.17**	0.09	0.60	0.36	0.64
27.	1.12**	0.09	0.61	0.37	0.63
46.	1.07**	0.12	0.49	0.24	0.76
<b>Security</b>					
8.	0.77**	0.07	0.51	0.26	0.74
13.	1.01**	0.09	0.52	0.27	0.73
15.	0.73**	0.08	0.41	0.17	0.84
22.	0.55**	0.05	0.49	0.24	0.76
56.	0.87**	0.07	0.56	0.31	0.69

Note: \*\*p < 0.01

Kelloway (1998) suggested that residuals should be small ( $z\text{-score} \pm |2.58|$ ) and distributed evenly around the mean in order to avoid over- and under-prediction of residuals. The presence of large positive and negative residuals ( $z\text{-score} \pm |2.58|$ ) suggests that the observed covariance terms in the observed sample covariance matrix (S) are not being gauged efficiently by the derived model parameter estimates (Muthén and Muthén, 2010).

In total, 11 large positive and 23 large negative residuals were observed in the standardised residual matrix. This means that 34 of the 1 035 observed covariance terms (i.e., 3.3 per cent) were gauged poorly. Given the small percentage of statistically significant ( $p < 0.01$ ) standardised error terms, it seems reasonable to argue that the theoretical model was relatively successful in replicating the covariances in the sample covariance matrix. However, the substantial number of large negative residuals suggests that the theoretical model overestimates the covariance between observed variables, and that the model might be over-parameterised (Diamantopoulos and Siguaw, 2000).

Lastly, Lagrange multiplier (LM) modification indices were examined to diagnose possible sources of model misfit. However, this information was not used to re-specify and adapt the original SVS measurement model. Modification indices predict which currently fixed parameters ( $\Lambda_X$  and  $\Theta_\delta$ ) would bring about significant model improvements, signified by a drop in  $\chi^2$ , if freely estimated (Diamantopoulos and Siguaw, 2000). Statistically significant  $\Lambda_X$  modification indices are indicative of cross-loading in EFA convention, insofar as observed variables that are specified to load exclusively on their designated factor are allowed to cross-load on non-designated factors. Several statistically significant modification indices could signify multi-collinearity, which erodes confidence in the discriminant validity of the ten value dimensions that the SVS assumes.

An examination of the modification indices reported for the factor loading matrix revealed 114 additional paths that would significantly ( $p < 0.01$ ) improve the fit of the SVS. Thus, 114 of 989 (11.5 per cent) elements in the  $\Lambda_X$  matrix currently constrained to zero would, if freely estimated, result in significant improvements in model fit. The large percentage of significant modification indices calculated for the factor loadings underscores the lack of discriminant validity of the SVS dimensions.

Similar, albeit less adverse, modification indices were yielded for the  $\Theta_\delta$  error matrix. In total, 83 of the 989 (8.4 per cent) elements currently fixed would result in significant ( $p < 0.01$ ) improvements in model fit if they were freely estimated. This could be interpreted to mean that, if the primary influence of the designated value construct has been taken into account, considerable proportions of variance are left unaccounted for. Schumacker and Lomax (2004) argue that model fit should be explained at a more molecular level by conveying diagnostic information about model parameters. Results pertaining to the factor loadings,  $R^2$ -values, and residual variances are reported in Table 7.

The degree to which observed variables successfully reflect (operationalise) respective latent variables is determined by the magnitude and significance of the slope of the regression of the observed variables on their respective latent variables. Indicators can only be deemed valid representations of underlying latent traits to the extent that the slope of the regression between indicators and latent variables is permissible, substantial, and significant (Diamantopoulos and Siguaw, 2000).

The results shown in Table 7 reflect that all the unstandardised factor loadings were statistically significant ( $p < 0.01$ ). Moderately strong standardised factor loadings ranging between 0.30 (item 32) and 0.71 (item 4) were reported for the SVS items. The majority of the items (76 per cent) reported factor loadings greater than 0.50 on their designated factors, implying that the majority of the items reflect at least 25 per cent common variance. Although  $R^2$ -values smaller than 0.50 would be unacceptable for some scholars (Diamantopoulos and Siguaw, 2000), considering the broad domain the SVS aims to measure, squared multiple correlations in excess of 0.25 are considered satisfactory for this study. Similar results have been reported by other authors (Davidov, 2008; Schmidt, Bamberg, Davidov, Hermann, and Schwartz, 2007).

In contrast to the  $R^2$ -values, the off-diagonal elements in the completely standardised theta-epsilon ( $\Theta\epsilon$ ) matrix reflect the proportion of non-relevant item variance (random and systematic variance). The results in Table 7 show that SVS items predominantly reflect error variance, and not variance attributable to designated latent variables. Thus, the items are contaminated with non-relevant error variance, and the results suggest rather noisy latent value dimension measures.

Finally, Table 8 shows the correlations between the ten value dimensions disattenuated for measurement error. Given the large percentage of statistically significant modification indices found with regard to the  $\Lambda_X$  and  $\Theta\epsilon$  matrices, relatively large correlations between the value dimensions that are conceptually similar would be expected.

All the correlations between the ten value sub-scales were statistically significant ( $p < 0.01$ ). According to Schwartz's (1992) individual-level theory of values, value items are arrayed on a motivational continuum. The closer any two values are to one another in the schematic representation, the more similar their underlying motivations are.

**TABLE 8**  
**STANDARDISED PHI MATRIX OF SVS DIMENSIONS**

Sub-scale	1	2	3	4	5	6	7	8	9	10
1. Benevolence	1.00									
2. Universalism	0.76**	1.00								
3. Self-direction	0.70**	0.83**	1.00							
4. Stimulation	0.44**	0.64**	0.87**	1.00						
5. Hedonism	0.33**	0.30**	0.54**	0.52**	1.00					
6. Achievement	0.84**	0.65**	0.91**	0.64**	0.35**	1.00				
7. Power	0.23**	0.27**	0.57**	0.55**	0.76**	0.50**	1.00			
8. Security	0.73**	0.83**	0.76**	0.54**	0.54**	0.79**	0.67**	1.00		
9. Conformity	0.92**	0.71**	0.64**	0.39**	0.27**	0.81**	0.27**	0.81**	1.00	
10. Tradition	0.90**	0.81**	0.66**	0.50**	0.37**	0.73**	0.32**	0.81**	0.98**	1.00

Note: \*\*p < 0.01

In contrast, the more distant the values are, the more divergent their motivations (Schwartz, 2010). People tend to behave in ways that balance their opposing values, and so they are motivated to choose actions according to underlying values of higher priority as opposed to lower priority values. Given this theoretical background, it is reasonable to expect that the positive, negative and neutral correlations between the ten values and specific behaviours will follow the order of the values circle (Schwartz *et al.*, 2001).

Accordingly, values that are closely clustered in the values motivational space would be expected to be highly correlated, and opposing values would be expected to have low or even negative correlations. Indeed, high correlations were reported between compatible values, especially Conformity and Tradition ( $r = 0.98$ ), Conformity and Security ( $r = 0.81$ ), and Security and Tradition ( $r = 0.81$ ). Earlier reservations about the discriminant validity of the value dimensions were reiterated due to the large statistically significant correlations (shown in Table 8) between Benevolence and Conformity ( $r = 0.81$ ) and between Benevolence and Tradition ( $r = 0.90$ ). Considering that these values are conceptually distinct, the high correlations can be regarded as evidence that points to a lack of discriminant ability.

Of the 45 off-diagonal elements in the phi matrix, the CFA yielded twelve inter-correlations greater than 0.80. Thus 26 per cent of the inter-correlations were greater than 0.80. Consistent with the LM results, the high inter-correlations between the ten latent value dimensions illuminate the lack of discriminant validity of the SVS dimensions.

## Discussion

Values have been used as a conceptual base in a wide variety of studies in order to examine and predict individual differences in a wide variety of attitudes, personality variables, and behaviours. Behaviours that have been studied through the prism of values include the use of alcohol; the use of condoms; the use of drugs; shoplifting; delinquency; competition; hunting; autocratic, independent, and dependent behaviour; occupation; leadership; organisational culture; person-job fit; choice of university major; participation in sport; social contact with out-groups; and political and religious association (Schwartz *et al.*, 2010; 2005).

There is general agreement in the literature that values do not influence people's activities directly, but indirectly via attitudes and goals (Roe and Ester, 1999). Thus values can be seen as a source of motivation for individual action. Applied to the organisational setting, it could be argued that the motivational potential of values is directly linked to the three basic needs of humans: the need for social interaction, the requirement for adjusted functioning, and the need for survival (Ros, Schwartz, and Surkiss, 1999). Understanding that work activities are fundamentally motivated by values has important managerial implications. The motivational meaning of work can be understood through the empirical associations between work activities and the whole integrated system of basic values. For example, some employees may view work primarily as a way to exercise power or gain security, whilst for others work may be the vehicle through which socialisation, hedonism and stimulation needs are met. Clearly organisations could profit from the knowledge of what motivates employees to work. Knowing how values enhance or restrain occupational activities could contribute to the advancement of positive work outcomes. The extant literature demonstrates that value congruence is likely to reduce workplace conflict and improve cooperation (Roe and Ester, 1999).

Applications of the theory and methods of research on basic individual values have the potential for other types of contributions to the study of organisational behaviour. With increasing globalisation, and the emergence of multicultural workplaces, it has become vital to understand the impact of national culture on organisational functioning

(Sagiv and Schwartz, 2007). At the cultural level, values present the broad goals that members of the collective are encouraged to pursue. That is, cultural values serve to justify actions taken in pursuit of these goals (Schwartz, 1999). One of the most pertinent questions in the managerial literature is why organisational interventions such as goal-setting, job enrichment, and performance-based remuneration have variant degrees of success between different business units and departments in the same organisations. Cultural self-presentation theory (Erez and Early, 1993) points at the moderating effect of values. Stated differently, workers' responses to organisational interventions are dependent on the expected impact of the intervention on the collective identity. For example, in collectivistic societies, the "collective self" is more salient than the "individual self", and interventions such as differential rewards are likely to be unproductive since they are geared to the individual self and not to the collective self. Although more research is needed, the theory seems to hold definite practical value (Roe and Ester, 1999).

The foregoing example demonstrates that values not only present a promising construct for the investigation of individual-level motivations; they could also be used to diagnose culture-level attitudes, motivations, and behaviours. Applied specifically to the South African context, the theory and practice of values hold much promise. Contemporary South African society can be described as one of the most fascinating social experiments to date.

Building a truly democratic and inclusive South African society hinges largely on understanding the value dimensions that are endorsed by members of relatively diverse cultural, language, race, and political groups. In an effort to realise these goals, the accurate measurement of values is critical. Although the SVS is one of the most widely used values instruments, limited research has been conducted on the instrument in the South African context. Research findings from the few published accounts that could be found about the psychometric properties of the instrument in the South Africa context were mixed.

Given this gap in the literature, the primary objective of this study was to contribute to the body of literature about the psychometric properties of the SVS in the South African context. In operational terms, the measurement integrity of the SVS would be corroborated if the following empirical results could be obtained:

- uni-dimensionality of each value dimension as gauged by an unconstrained factor analytic procedure;
- high degree of internal consistency reliability of items in relation to their designated latent factors;
- close correspondence between the sample covariance matrix and the reproduced matrix expressed as goodness-of-fit indices;
- small percentage of large positive and negative correlated residuals;
- statistically significant and robust factor loadings reflecting substantial proportions of true variance ( $R^2$  communality values);
- small measurement error variances associated with each of the indicators;
- small percentage of statistically significant modification indices; and
- substantial, but not excessive, statistically significant correlations between the ten value dimensions.

Admittedly, the foregoing list includes very rigorous statistical criteria to which very few psychometric measures are likely to adhere. Nevertheless, the tenability of psychometric measures is ultimately not an “accept-reject” decision, but a matter of judgement. Judgements about model validity should have a solid basis in theory and a healthy appreciation of the strengths and limitations of statistical indices (Huberty and Morris, 1988). Accordingly, the complete basket of statistical evidence was taken into consideration in the evaluation of the validity and reliability of the SVS.

Starting with the dimensionality of the SVS, the unrestricted factor analysis results suggested that all the value dimensions, with the exception of the Universalism sub-scale, were uni-dimensional. The rotated EFA solutions showed that the Universalism sub-scale can be meaningfully divided into two separate sub-dimensions, labelled ‘fairness’ and ‘ecological protection’. Schwartz, Cieciuch, Vecchione, Davidov, Fischer, Beierlein, and Konty (2012) arrived at the same conceptual split in the Universalism scale, identifying three potential sub-scale: tolerance, societal concern, and protecting nature. However, all ensuing statistical analysis on the Universalism sub-scale was still conducted on the total



Universalism sub-scale because the primary objective of the study was not to refine the SVS but rather to evaluate the scale's current functioning.

The item analysis results were somewhat disappointing, with only the Universalism, Benevolence, and Conformity dimensions reporting values in excess of the normative value for Cronbach's coefficient alpha of 0.70 (Nunnally, 1978). The low internal consistency reliabilities are symptomatic of the test stimuli's (i.e., item's) inability to elicit a fundamentally pure and comprehensive behavioural response that is only dependent on the designated construct (Moyo and Theron, 2011).

The low internal reliability coefficients for the sub-scales can also be explained by the value dimensions' lack of discriminant validity. Although the restricted factor analysis results yielded robust and statistically significant factor loadings, several high  $\Lambda_X$  and  $\Theta_\delta$  indices were reported, which implies that the primary value dimensions did not adequately account for the majority of inter-item correlations between scale items. Multicollinearity is a common problem in scales that attempt to gauge broad conceptual constructs comprehensively (Schwartz and Boehnke, 2004). One potential remedy would be to conceptualise narrower sub-dimensions of the broader value dimensions (e.g., fission of the Universalism sub-scale into narrower sub-dimensions of fairness and ecological protection). Schwartz (2007) argued that a finer conceptualisation of more narrowly defined, conceptually distinct values would have the potential to advance the understanding of the values domain whilst allowing for a more precise prediction of related phenomena.

There are several alternative explanations for the low reliability coefficients that are worth considering. These include the English proficiency of the selected sample, and the cultural appropriateness of the scale items. Respondents' ability to express accurately their standing on the value dimensions is largely influenced by their ability to accurately encode and respond to test stimuli (Oller, 1983). This explanation was dismissed because the sample consisted predominantly of university students, whom one would expect to have higher levels of English proficiency than the general South African population. However, it is possible to argue that these levels of English proficiency – especially for those respondents whose first language is not English – although higher than those of the general population, may still not be sufficient for the unambiguous comprehension of SVS items.

Given the diverse nature of South African society, it is expected that group membership (i.e., ethnicity, gender, language) explains additional variance when taking the influence of the designated value dimensions into consideration. To this end, the equivalence of the SVS should be investigated across various race, language, and gender groups. Therefore, the possibility that the SVS stimuli elicit differential behavioural denotations based on group membership is not ruled out as a possible reason for the low internal consistency reliabilities.

Considered collectively, the statistical analysis suggests that the theoretical conceptualisation of the SVS outperformed the independence model. All the factor loadings were statistically significant ( $p < 0.01$ ) and accounted for considerable

proportions of common variance. In relation to model fit, the absolute fit indices endorsed the tenability of the theoretical model in the given sample of South African students. However, the comparative fit indices were indicative of less-than-satisfactory model fit. These results are not entirely unexpected, as comparative fit indices are sensitive to degrees of freedom, and parsimonious models generally yield better comparative fit indices (Brown, 2006; Hair *et al.*, 2006). Considering the large number of large negative and statistically significant ( $p < 0.01$ ) standardised residuals, which is indicative of overfit, the modest CFI and TLI fit values are also not entirely unexpected. Nevertheless, it is worth mentioning that items designed to measure specific dimensions will inevitably reflect related non-designated dimensions that form part of broad constructs.

### **Limitations**

One limitation of the study concerns the cross-sectional nature of the data. Although SEM analysis provides information about the possible direction of the relationships, cross-sectional study designs do not allow researchers to draw firm conclusions about the causal ordering among studied variables.

A second limitation of this study concerns the fact that it was based on self-report questionnaires. Common method bias stemming from data collection predominantly by means of self-report measures has been shown to inflate the strength of observed relationships (Bakker, van Veldhoven and Xanthopoulou, 2010). It would be useful if future research could replicate the findings in the current study by using a combination of subjective and objective measures.

Finally, the study did not investigate the equivalence of item and scale ratings across ethnic groups in the South Africa context. Given the legacy of apartheid in South Africa, it is expected that there would be significant differences between White and Black respondents. Whether these differences are attributable to differences in scale usage or to real group mean differences holds important implications for values measurement in South Africa, especially when scale scores are used to predict other important psychological constructs and processes (e.g., voting behaviour, counter-productive work behaviour, attitude towards cultural diversity). Future research should be dedicated not only to researching the equivalence of the SVS dimensions, but also to demarcating the nomological link between the concept of values and other related constructs (e.g., interests, social axioms, personality).

### **Conclusion**

The primary objective of the current study was to investigate the suitability of Schwartz's Value Survey in the South African context. Although the SVS has been instrumental in confirming the universality of Schwartz's theory of value context and structures globally, research evidence for the theory has been inconclusive. The current study contributes to the body of knowledge on values by rigorously investigating the psychometric properties of the SVS, one of the most widely used value surveys in the world.

The research results suggested that, although the SVS succeeds in measuring the broad concept of values, the instrument lacks discriminant validity. This limitation raises the question of whether the ten-factor structure is the most appropriate and representative structure with which to measure value priorities. The current study may provide some preliminary answers to these questions, especially given the finding that the Universalism sub-scale can be separated into narrower conceptual dimensions of 'fairness' and 'concern for the environment'. Partitioning the Universalism sub-scale into finer conceptual dimensions might lead to improved theory with greater universal heuristic and predictive power (Schwartz, 2007). This finer categorisation may also provide researchers with a stronger predictive platform for correlational-based studies using values.

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**Endnotes:**

- i. The following Cronbach's coefficient alpha values are reported for the ten values in the South African sample: Power (0.65), Security (0.70), Conformity (0.63), Tradition (0.53), Benevolence (0.67), Universalism (0.62), Self-direction (0.45), Stimulation (0.72), Hedonism (0.76), and Achievement (0.76).
- ii. The univariate normality was assessed with LISREL 8.72 (Jöreskog and Sörbom, 1996). The null hypothesis of univariate normality had to be rejected ( $\chi^2 = 1993.476$ ;  $p < 0.05$ ) in the case of all 46 indicator variables (see Annexure B). Therefore the data cannot be assumed to follow a multivariate normal distribution.
- iii. Schwartz's (1992) individual-level theory suggests that value items are arrayed on a motivational continuum. The motivation continuum predicts that value expression, like the colour circle, blend into one another. Thus, we would not expect each of the 10 value dimensions to be finely conceptualised constructs that exclusively reflect narrowly defined conceptual domains. However, CFA seeks to confirm relatively pure factors, and items are specified to reflect only the designated factor for which each was conceptualised. For this reason we expect items to reflect multiple factors to a greater or lesser degree, s likely to dilute the amount of common variance reflected by each item.