THE APPLICATION OF THE SOCIAL AXIOMS SURVEY II (SASII) IN THE SOUTH AFRICAN CONTEXT

By

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PREFACE AND DECLARATION

The article format was chosen for the current study. The researcher, Adi Barnard, conducted the research and wrote the manuscripts. Professor Deon Meiring acted as promoter. Three manuscripts were written.

I declare that the Doctoral thesis, which I hereby submit for the degree PhD in Industrial and Organisational Psychology at the University of Pretoria, is my own work and has not been submitted by me for a degree at another university.

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SUMMARY

Title: The cross-cultural application of the Social Axioms Survey II (SASII) in the South African context.

The SASII which is a measure of social axioms, a concept based on an understanding of the core construct of general beliefs, was investigated in this study. The objective was to determine whether the SASII model fits the data collected in a South African context and whether it measures the same social axiom constructs of the a priori five-factor model. Secondly, the study tested the SASII for configural, metric, scalar and full invariance. Thirdly, social axioms' nomological network was investigated by relying on personality factors to validate social axioms. This study also tested the linkages between social axioms and the Big-Five personality factors. Finally, social axioms' ability to predict personality across cultures was investigated.

Beliefs are social in nature and are universally shared amongst individuals within cultures. Shared beliefs represent how people organise their world and make sense of and interpret social realities. Values are widely used in the conceptualisation of cultures as this allows comparisons of the value profiles of individuals socialised into different cultures. Personality represent self-views and is related to culture. Establishing the relationship between social axioms and the constructs of personality and values is an important area for research and intervention.

The first article on generalised beliefs, often referred to as social axioms, was published in 2002. It described the axiomatic nature of beliefs based on truth assumptions, personal experience and socialisation. The article sparked a global research interest on social axioms designed to evaluate the universality and meaning of the structure of beliefs across cultures. This interest has resulted in an array of articles, chapters and even a book on the subject. South Africa is ideally positioned for cross-cultural research because of its 11 official languages, diversity in educational levels and unemployment rates, inequality and a divided society due to the historical legacy of apartheid. Language differences create specific environments, defined in terms of culture, race, ethnic grouping, values and

attitudes. Globalisation has accelerated the rate of intercultural contact, guiding research attempts to comprehensively describe the emerging cross-cultural dynamics. Recent research findings indicate that South Africans exhibit extreme social axiom scores that are similar to trends in other developing countries. Social axioms research also seeks to assess overlap with other constructs such as values and personality. Efforts to refine social axioms and to expand their nomological network are therefore the main focus of this study. This study aims to contribute towards previous research efforts to improve the validity and expand the nomological network of social axioms through assessing the relationship between generalised beliefs, namely social axioms (labelled Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity) and personality factors (i.e., Extraversion, Agreeableness, Conscientiousness, Neuroticism and Intellect) in the South African context. A cross-sectional survey design was used to collect data regarding these constructs as experienced by students and their family members and friends. A convenience sample ($N = 1567$) of university students and their family members and friends participated in this study. The measuring instruments used were the Social Axioms Survey (SASII), Mini-International Personality Item Pool (Mini-IPIP) and a biographical questionnaire.

The results of Study 1 indicated that the SASII five factor structure exhibited an unacceptable model fit within the South African context when conducting a confirmatory factor analysis (CFA). However, as an exploratory step, and by creating a parsimonious model, the improved CFA of the SASII presented a fit that improved on previous research findings, suggesting a reasonable fit, taking into account the complexity of the SASII model.

Study 2 assessed the measurement invariance (configural, metric, and scalar invariance) of the five factor structure of the SASII parsimonious model across male and female groups in a South African sample. Evidence was obtained through multi-group confirmatory factor analyses, which supported a baseline configural model. This finding indicated that the number of factors and factor structure of the SASII parsimonious model are considered equivalent across male and female groups. Proof for partial metric invariance was found and scalar invariance could not be achieved. Results thus indicated

that male and female respondents did not exhibit the same understanding of certain latent constructs and that some items did not have the same meaning for both groups. Males and females also differed in terms of their levels of trust on the SASII's scales of Social Cynicism, Social Complexity and Religiosity. Because scalar invariance could not be achieved, comparisons of the SASII five factors' means across groups could not be computed. This study provided support for previous research findings and indicated that some items and latent factors of the SASII need refinement.

The findings of Study 3 affirmed the validity of SASII's five factor structure in a South African context through predictable correlations with personality. These findings also provided insight into predicting behaviour across different cultures and contributed towards previous research findings in establishing social axioms' nomological network. Social Cynicism, which is a negative view of human nature and social events, related positively to Neuroticism, but negatively to Agreeableness as an orientation of getting along with others, caring for and helping fellow humans. Religiosity, which reflects belief in a supreme being and the positive effects of religious belief, related positively to Agreeableness. Reward for Application, which places an emphasis on effort, related positively to Conscientiousness as an orientation to diligent self-application. Positive correlations were also found between Social Complexity, which is the belief in the uncertainty of events and the belief that there are numerous solutions to problems, and Agreeableness. However, no significant relationships were found between Fate Control, which is a deterministic view of social events, and any of the personality factors. Lastly, contributing further towards establishing social axioms' nomological network, results from a regression analysis identified the following statistically significant relationships: Social Cynicism and Agreeableness and Neuroticism; Reward for Application and Conscientiousness and Intellect; Social Complexity and Agreeableness and Neuroticism; Fate Control and Neuroticism; and Religiosity and Agreeableness and Conscientiousness. Social axioms' ability to be predictive of the personality factor Extraversion was small, but medium for the personality factors Conscientiousness, Neuroticism and Intellect. However, social axioms' ability to be predictive of the personality factor Agreeableness was large and significant.

Recommendations for interventions to enhance the validly of the SASII and to expand its nomological network are made.

Key words: Values, beliefs, social axioms, personality, culture, attitudes, behaviour, individual level, cultural level, social functioning, nomological network, cross-cultural, psychological attributes, language differences, race, ethnic grouping, diversity, invariance, equivalence, reliability, item bias.

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CHAPTER 1: INTRODUCTION TO THE STUDY

This thesis investigates the validity of generalised beliefs (social axioms) at the individual level (as appose to at the country level), measurement invariance and the relationships between social axioms and personality factors in the South African context.

The background and motivation for the research, as well as the problem statement, are discussed in this chapter. The general and specific research objectives are presented, the research method is described and the division of chapters is demarcated.

1.1 BACKGROUND AND MOTIVATION FOR THE RESEARCH

This study pays tribute to Kwok Leung (1958 – 2015) (see Bond, 2016; Bond, Van de Vijver, Morris, & Gelfand, 2016), who was a front runner in numerous methodological and analytic breakthroughs in cross-cultural research (e.g., Leung & Bond, 1989; Van de Vijver & Leung, 1997). Beginning in 1979 (Figure 1) he and his colleague Michael Harris Bond (Bond, 2016) undertook foundational work that led to the publication of the first article on social axioms (Leung et al., 2002). The groundwork for understanding social axioms was laid by Bond and Leung (Bond, 2016, p. 174):

> Kwok asked "what if" and "what about" questions frequently. My personal favorites were those we developed together and formed the basis of our two decades of work on social axioms: "What if cultural differences are not just a matter of values? What about expectancies for outcomes?"

Fig 1. Michael H. Bond and Kwok Leung, first photograph together, 1979

Fig 2. Michael H. Bond and Adi Barnard, first photograph together, 2009

Kwok and colleagues' large scale work on social axioms (e.g., Leung et al., 2002) was the inspiration for my (Figure 2) own bold step towards conducting research on social axioms in South Africa (Barnard, Meiring, & Rothmann, 2008). Their subsequent findings (Leung et al., 2012) were the motivation for this study, which humbly seeks to contribute towards the arsenal of research findings on social axioms by improving the reliability and validity of measures of social axioms and establishing social axioms' nomological network (e.g., Leung & Bond, 2009).

Considering the vast number of articles dedicated to measurement practices, as well as the numerous scientific journals reporting on measurement issues, it is clear that measurement has historically been, and will continue to be, an important topic for research. This is specifically clear with regards to the cross-cultural applicability of measurement instruments in various societies (Van de Vijver & Leung, 1997; Vandenberg & Lance, 2000).

South Africa, with its 11 official languages and multi-cultural nature, diversity in educational levels and unemployment rates, inequality and societal divisions as a result of its historical legacy of apartheid (Habib & Bentley, 2008; Rothmann & Cilliers, 2007), has implemented legislation, such as the promulgation of the Employment Equity Act (No. 47 of 2013), aimed at addressing injustices from the past. This legislation places a direct emphasis on the cultural appropriateness of

psychological tests used in South Africa (Paterson & Uys, 2005). The Employment Equity Act (No. 47 of 2013), section 8 states that:

> Psychological testing and other similar assessments of an employee are prohibited unless the test or assessment being used:
>
> (a) has been scientifically shown to be valid and reliable,
>
> (b) can be applied fairly to all employees; and
>
> (c) is not biased against any employee or group; and
>
> (d) has been certified by the Health Professions Council of South Africa established in terms of the Health Professions Act, 1974 (Act No. 56 of 1974), or any other body which may be authorised by law to certify those tests or assessments.
>
> (Government Gazette, 2014, p. 6).

The main purpose of the Employment Equity Act (No. 47 of 2013) is to ensure that psychological assessments do not unfairly discriminate. The goal of the act is to ensure that psychological assessments are conducted and implemented in a fair and equitable manner for all individuals irrespective of their historical background. This goal is aimed at addressing unfair discrimination.

Given South Africa's multi-cultural population and the Employment Equity Act's (No. 47 of 2013) emphasis on the fair and equitable use of tests, it is clear that increased research regarding the cross-cultural applicability of tests is required. According to Paterson and Uys (2005) in order for tests to be cross-culturally applicable the test scores need to be comparable across groups. This indicates that the construct that the test intends to measure does not differ across groups.

Leung et al. published their first article on social axioms in 2002. They used the term to refer to the axiomatic nature of generalised beliefs and identified a five factor structure (Leung & Bond, 2004; Singelis, Hubbard, Her, & An, 2003). Because no a priori research existed an inductive approach was followed using qualitative research and Western literature on beliefs to develop the Social Axioms Survey (SAS). The survey has five factors, namely, Social Cynicism (a pessimistic view of human nature), Reward for Application (belief that endeavours will lead to favourable results), Social Complexity (belief in numerous ways to solve a problem), Fate Control (belief that life events are predetermined) and Religiosity (belief in the existence of a superhuman being) (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung & Bond, 2004; Leung et al., 2002). This ground-breaking research by Leung et al. (2002) led to the development of the Social Axioms Survey (SAS), which aims to identify universal social beliefs across cultures (Singelis et al., 2003).

Since 2004 a global research program (Leung & Bond, 2004) has used the SAS to test the universality and structure of social axioms (e.g., attending to structural equivalence and item bias). This research program has gathered data from various nations and has provided strong endorsements for the five factor structure of social axioms and the general applicability of the SAS across cultures (e.g., Bond, Leung, Au, Tong, Reimel de Carrasquel et al., 2004; Leung & Bond, 2009; Leung et al., 2002). However, research conducted in 2008 in South Africa by Barnard et al., found only four factors consistent with Leung et al.'s (2002) model (Social Complexity did not replicate). This study concluded that language proficiency could have been a contributing factor. In 2009 a collection of social axioms articles were published (Leung & Bond, 2009) exploring the possible relations between social axioms and other constructs such as values and personality. These articles aimed to aid explanations of human behaviour across cultures and contexts through attempting to establish social axioms' nomological network (Leung & Bond, 2009). In 2011 Burgess used social axioms as a culture measure for business research in South Africa and found that social axioms have predictive value over socio-demographics, and that social axioms' theory provides a nomological network through which other constructs such as values and personality can be better understood. Burgess (2011) concluded that efforts to refine social axioms research should continue.

In 2012, based on research involving 11 countries (including South Africa), Leung et al. (2012) introduced the new Social Axioms Survey (SASII). The SASII follows a theory based culturally decentred approach with the main goal of improving the reliability of the five social axioms factors (Leung et al., 2012). Although the SASII included more and improved items to support the same five-factor structure as the original SAS (Leung et al., 2002), two additional sub-factors were included as part of the Fate Control factor, namely Fate Determinism and Fate Alterability (Leung et al., 2012). By relying on personality factors in their study, Leung et al. (2012) tested the SASII's validity in various cultures and found that the SASII's five-factor structure was supported. In addition, the new SASII was found to be more reliable than the original SAS. However, the cross-cultural equivalence of the SASII was lower than expected. Furthermore, Social Complexity and Fate Control, whilst improved from the original SAS, still showed only marginal reliability in some countries (Leung et al., 2012). The Social Complexity factor thus remains problematic; this is the same factor from the original SAS that Barnard et al. (2008) were unable to replicate in their South African study.

In 2014 Malham and Saucier used a short version (30 items) of the SASII to investigate measurement invariance of social axioms in 23 countries by making use of multi-group confirmatory factor analysis. They reported an acceptable fit for configural invariance and a reasonable fit for factorial invariance (Malham & Saucier, 2014). However, they concluded that although conservative proof was found for the generalisability of the SASII's five-factor structure, there was still a need for development and refinement. The SASII clearly still requires extensive research to establish its validity and to explore the nomological network of social axioms (Leung et al., 2012). Thus, in order to contribute towards the growing body of literature on social axioms and their cross-cultural applicability thereof, this study aims to test the SASII in a South African sample by relying on personality factors and testing for configural, metric, scalar and full invariance.

1.2   PROBLEM STATEMENT

Research has shown that individuals' beliefs relate to various interpersonal behaviours (Leung & Bond, 2004; Leung & Bond, 2009). Belief items are present in the measurement scales used in the individual differences literature, but they are frequently utilised in conjunction with items that relate to values or behaviours (Leung & Bond, 2004). According to Leung and Bond (2004) this merging causes theoretical ambivalence and inaccuracy in model development. However, despite the danger of theoretical ambiguity, scales based solely on beliefs were sparse (Leung & Bond, 2004) until Leung et al. (2002) identified five pan-cultural social axiom factors. Leung et al.'s (2002) ground breaking research led to the development of the Social Axioms Survey (SAS) to identify general beliefs (Singelis et al., 2003). The SAS exclusively measures beliefs. This distinguishes it from other measures, and allows it to investigate the relative contributions of beliefs and values to behaviours (Singelis et al., 2003). However, there is a need for more research to verify and validate the proposed universality of the SAS (Kurman & Ronen-Eilon, 2004). Subsequent research by Leung et al. (2012) aimed at improving the measurement of social axioms has included the development of additional and improved items to form a new Social Axioms Survey II (SASII). Although Leung et al. (2012)'s initial findings regarding the SASII were promising with indications of increased reliability, the internal consistency for two of the axiom factors was found to be low and the reliability of these two scales needs to be improved. Thus considerable research is still required to establish the validity of SASII (Leung et al., 2012).

1.2.1   Values and culture

Values have been the cross-cultural construct of preference since the construct was legitimised by Hofstede (1980) for studying at the country level and by Schwartz (1992) for studying at the individual level. Values have thus traditionally been used to describe and conceptualise culture (e.g., Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Hofstede, 1980; Leung & Bond, 2009; Schwartz, 1992; Singelis et al., 2003) and research into this construct has aided the plotting of the value sphere

(Bond, Leung, Au, Tong, Reimel de Carrasquel et al., 2004; Leung & Bond, 2004). In addition, researchers have produced considerable proof that the theory of basic human values can be applied across a broad range of cultures (e.g., Schwartz et al., 2001; Schwartz, 2011; Schwartz, 2012). However, trying to use individuals' values to predict behaviour often leads to unsatisfactory results (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung et al., 2007). Despite values' predictive weakness, values are still frequently used to explain differences in cross-cultural behaviour (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004). Thus, values have been, and always will be, vital constructs in describing cultures (Leung & Bond, 2009; Singelis et al., 2003). However, social axioms have been advanced as a supplementary framework to enhance the values perspective (Leung et al., 2007; Singelis et al., 2003). Although social axioms are a fairly new construct, research has shown that this constructs adds to the predictive power of values by capturing important aspects of culture, which are not presented in values (e.g., Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Kurman & Ronen-Eilon, 2004; Leung et al., 2002). Leung and Bond (2004) therefore argued that social axioms have their own nomological network (see Leung & Bond, 2009), linking them to constructs such as values to guide behaviour (Kurman & Ronen-Eilon, 2004) across cultural contexts (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Cheung, Leung, & Au, 2006).

Research is only beginning to explain the complex relationships between values and social axioms, and therefore Leung et al. (2007) argued that, in order to increase our understanding of these relationships, more evaluations and research are required in future. According to Stankov and Saucier (2015), future research should focus on establishing the relationship between social axioms and the constructs of personality and values. Thus, given that beliefs, values and personality are psychological attributes of individuals that influence behaviour and underpin culture, the objective of this study is to rely on personality factors to assist in contributing towards validating the SASII and its nomological network in a South African context.

1.2.2   Generalised beliefs

General beliefs are considered to be free of context and involve a variety of concepts and their characteristics (Barnard et al., 2008; Kurman, 2011). According to Leung and Bond (2009) beliefs are an essential part of our functioning as well as our assumptions regarding our social world (Leung & Bond, 2004). Beliefs are also a key component of attitudes as they are often used to explain and predict social behaviour (e.g., Chen, Bond & Cheung, 2006; Leung & Bond, 2009; Leung et al., 2012). Some researchers even consider general beliefs to be axiomatic in nature and refer to these beliefs as social axioms. These researchers argue that these beliefs are based on truth assumptions gained from personal experience and socialisation (e.g., Leung & Bond, 2004; Leung et al., 2002; Singelis et al., 2003). Social axioms are seen as steering behaviour and can therefore be helpful in predicting and explaining cultural differences (Singelis et al., 2003). Social axioms thus present truth statements for an individual (Leung & Bond, 2004) and are a new way for researchers to investigate a variety of subjects within the paradigm of social psychology (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung et al., 2007).

1.2.3   Measurement invariance of social axioms

Multi-item surveys, such as the SAS, are often utilised to examine scores on latent factors for across group comparisons (Van de Schoot, Schmidt, & De Beuckelaer, 2015). Thus, checking for measurement invariance (MI) is an important requirement for cross-cultural research in order to address the development of culturally appropriate measuring instruments (Van de Schoot, Lugtig, & Hox, 2012; Vandenberg & Lance, 2000).

In their study to contribute towards the development of the Portrait Values Questionnaire's fifth experimental version (PVQ-5X) multi-item measuring instrument, which is used in measuring values, Cieciuch, Davidov, Vecchione, Beierlein, and Schwartz (2014) provided some support for MI. Studies on values

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have helped researchers improve the SAS (Malham & Saucier, 2014). Bond, Leung, Au, Tong, and Chemonges-Nielson (2004) and Leung et al. (2007) argued that social axioms enhanced values' predictive power and also contributed towards the understanding of general beliefs. Given that social axioms' five-factor structure was identified in various cultures (Kurman & Ronen-Eilon, 2004; Leung et al., 2002), Malham and Saucier (2014) provided support for MI in social axioms, which can be used for further development of the SAS (Leung et al., 2012).

1.2.4 Social axioms and their relation to personality outcomes

Personality is often seen as including constructs such as values and beliefs. Thus, to contribute towards the nomological network of social axioms, Chen, Fok Bond and Matsumoto (2006) investigated the relationship between personality and beliefs and found only weak overlap between personality dimensions and social axioms. Their findings were similar to the findings of Chen, Bond et al. (2006), who reported only moderate correlations between the social axiom factors and personality constructs, suggesting that beliefs and personality are two distinct constructs (Chen, Bond et al., 2006). Leung et al. (2012) also investigated correlations between personality dimensions and social axiom factors and found a reasonably good fit between social axioms and personality, indicating that the five-factor structure of social axioms is supported. More specifically, Leung et al.'s. (2012) findings were comparable with the earlier findings of Chen, Fok et al. (2006). These findings suggest that the five-factor structure of social axioms is distinct from personality dimensions with minimal overlap. However, considerable research is still required to establish the validity of the SASII.

1.2.5 Specific research problems

In 2008 Barnard et al. investigated the replication of Leung et al.'s (2002) SAS five-factor structure in the South African context and found support for only four factors (the factor Social Complexity could not be replicated). Although Barnard et al. (2008)

reported that item bias was not a vital interference in seven different African language groups, reliability was found to be low for three of the factors (the Cronbach's alpha for Reward for Application, Fate Control and Religiosity were $\alpha = 0.57$, $\alpha = 0.52$ and $\alpha = 0.38$ respectively). Subsequent research by Leung et al. (2012) achieved higher reliabilities for the five social axiom factors, which supported the general applicability of the SAS, but concluded that more research is required to improve the validity of social axioms.

Recently Malham and Saucier (2014) investigated measurement invariance of social axioms and found only conservative proof for factorial invariance that supported a five-factor model of social axioms. Their findings indicated that although some general cultural applicability for the five-factor structure of social axioms exists, only modest loadings could be achieved. Malham and Saucier (2014) concluded that there is a need for further refinement and development of the Social Axioms Survey.

According to Burgess (2011) social axioms research should continue as it seeks to access overlap with other constructs such as values and personality, and to expand its nomological network. In this regard, Burgess (2011) used social axioms as a culture measure for business research in South Africa and reported on extreme social axiom scores mimicking trends in other emerging markets. Subsequent research by Leung et al. (2012) utilised an improved Social Axioms Survey II (SASII) and although initial findings showed increased reliability, two axiom dimensions were found to need improvement. Leung et al. (2012) also used personality factors in their research to validate the SASII, but concluded that more research is required to demonstrate the validity of SASII (Leung et al., 2012).

1.3   RESEARCH OBJECTIVES

1.3.1   General objective

The general objective of the study is to determine whether the new Social Axioms Survey (SASII) model fits the data collected in a South African context and to determine whether it measures the social axiom constructs of the SASII's a priori social axiom five-factor model. Secondly, the study aims to test the SASII for configural, metric, scalar and full invariance in a South African sample. Lastly, this study aims to contribute towards social axioms' nomological network by relying on personality factors and it also aims to contribute to validating social axioms in a South African context. This study also tests the linkages between social axioms (as measured by the SASII) and the Big-Five personality factors (as measured by the Mini-IPIP) through bivariate correlations. Finally, the study tests social axioms' ability to predict personality across cultures through regression analyses.

1.3.2   Specific objectives

The specific objectives of this research are:

- To investigate social axioms as measured by the SASII on the individual level in a South African context as defined by the SASII instrument.
- To investigate measurement invariance (configural, metric, and scalar invariance) of social axioms in a South African context.
- To test the linkages between social axioms' five-factor structure as measured by the SASII instrument, by comparing social axioms to the Big-Five personality factors' Five Factor Model (FFM) as measured by the Mini-International Personality Item Pool (Mini-IPIP), by relying on bivariate correlations and regression analyses.
- To contribute towards previous research efforts in establishing social axioms' nomological network.

1.4 RESEARCH METHOD

1.4.1 Research design

According to Terre Blanche and Durrheim (2002, p. 36) "paradigms are systems of interrelated ontological, epistemological and methodological assumptions" that "act as perspectives that provide a rationale for the research and commit the researcher to particular methods of data collection, observation and interpretation". This study was executed within a quantitative (positivistic) research paradigm in the social sciences (Leedy & Ormrod, 2010). A cross-sectional survey design was used to accomplish the research objectives. The data collected was analysed using descriptive and inferential statistics (Saunders, Lewis, & Thornhill, 2009). The cross-sectional survey design was also used to address the descriptive functions associated with the correlational design as well as the examination of relationships between the latent variables (Shaughnessy & Zechmeister, 1997). The design was selected because of its ability to specify the relationships between the latent variables (Leung et al., 2012) and to test the a priori model (Cheung, et al., 2006). Lastly, within the cross-sectional design, latent variable modelling was used to examine the fit of the hypothesised model and the indirect and interaction effects of this model (Muthen & Muthen, 2012).

1.4.2 Participants

Sampling consisted of a non-probability sample that was selected according to convenience, accessibility and cost effectiveness (Terre Blanche & Durrheim, 2002; Saunders et al., 2009). A total of 1,567 respondents representing 793 third year university students and 645 family members and friends (of the university students) participated in this study. In terms of race, a majority (66%) were white and 25% were non-white (Blacks, Coloureds and Indians). In terms of gender, the majority (59%) were female and 41% were male. The ages of the participants varied from

below 20 years to above 60 years with the majority (51%) respondents aged between 21 and 30 years (see Addendum A: Table A. 1 for detailed descriptions of participants).

1.4.3 Measurement instruments

In this research, the following measuring instruments were used:

- The SASII instrument developed by Leung et al. (2012) was used. The new Survey on Social Beliefs Questionnaire II (see Addendum A: Table A. 2) consists of 97 social axiom items (Leung et al., 2012). The SASII requires respondents to rate on a five-point Likert scale the degree to which they believe each of the 97 items to be true. The scale ranges from 1 (strongly disbelieve) to 5 (strongly believe). Five social axiom factors are included: Social Cynicism (20 items), Social Complexity (23 items), Reward for Application (17 items), Religiosity (17 items), and Fate Control (20 items). Fate Control consists of two sub-factors, namely Fate Determinism (nine items) and Fate Alterability (11 items). The following Cronbach's alpha for each dimension were reported by Leung et al. (2012). For Social Cynicism, the reliability coefficients were higher than 0.70 (mean α = 0.79). For Reward for Application all the alphas were higher than or close to 0.70 (mean α = 0.77). For Social Complexity alphas were below 0.65 (mean α = 0.68). For Fate Control 4 alphas were below 0.65 (mean α = 0.68). Finally, for Religiosity all alphas exceeded 0.70 (mean α = 0.85).

- The Mini-International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006), which was developed from the 50-item IPIP (Goldberg, 1999), was used in this study. The Mini-IPIP consists of 20 items and measures the five-factor structure of personality, namely Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness. Each personality factor is measured by four items, and respondents are asked to rate how well each statement describes them on a five-point Likert scale ranging from 1 (does not

describe me at all) to 5 (describes me very well). Taking into account that there are only four items per factor, Donnellan et al. (2006) reported the following acceptable alpha coefficients: 0.66 (Extraversion); 0.62 (Agreeableness); 0.65 (Conscientiousness); 0.61 (Neuroticism): and 0.62 (Openness).

1.4.4 Research procedure

As part of a third year module in psychometric testing (module BDO 372) and the application of survey questionnaire data at the University of Pretoria, questionnaires were completed by students and volunteers from the broader community (e.g., family members and friends) on social axioms (generalised beliefs) and personality (Big Five). The completion of the questionnaire formed part of the practical training for third year BDO 372 students in order to familiarise themselves with the use of questionnaires and how to administer them. The SASII and Mini-IPIP survey questionnaires were formulated so that the respondents participating in the research gave consent that the information from the survey could only be used by the researcher for research purposes. The questionnaire was accompanied by a covering letter explaining the purpose of the research with emphasis on the confidentiality of the research project. The data was collected over multiple time periods from several classes of third year university students and the participants they recruited (e.g., family members and friends) to participate in the research over a period of five years.

1.4.5 Statistical analysis

Firstly, analyses related to latent variable modelling were executed with Mplus Version 7.11 (Muthen & Muthen, 2012) to test measurement and structural models in this study. The questionnaire items were defined as categorical and a traditional confirmatory factor analysis (CFA) was executed using Mplus. Weighted least squares means and variances adjusted (WLSMV) were selected as estimators with standard errors and tests for model fit (Marsh et al., 2010), to determine whether the

five-factor structure of the SASII (Leung et al., 2012) provides a good fit to the data, as per the substantive hypothesis (Khan, 2006). A CFA was executed because factors were theoretically defined as well as onto which factors indicators of measurement items specified are loaded (Wang & Wang, 2012), confirming the factorial structure of the a priori developed measuring instrument applied to a target population. To test the a priori model fit the comparative fit index (CFI; > 0.90), Tucker-Lewis index (TLI > 0.90), root mean square error of approximation (RMSEA; < 0.08) (Hair, Anderson, Tatham, & Black, 2010) and Weighted Root Mean Square Residual (WRMR; < 1.0) (Wang & Wang, 2012) were utilised.

Secondly, CFAs were computed independently for male and female groups. Measurement invariance related to multi-group confirmatory factor analysis was computed (Bollen, 1989; Jöreskog, 1971; Meade & Bauer, 2007). A series of three hierarchical steps was followed, namely, configural, metric, and scalar invariance, by testing the more restricted models with the less restricted models (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998). The analyses proceeded by re-specifying the model by applying parameter constraints to restrict all successive models necessary to examine potential decreases in fit to the data for each more stringent level of measurement invariance. Changes in the chi-square (χ^2) statistic were reported for invariance between the more restrictive and the comparison model. A decrease in the model χ^2 statistic associated with one degree of freedom (df) reflected an improvement of the model fit. A significant change in the χ^2 statistic was considered proof for invariance between the more restrictive and the preceding model, considering that the CFI, TLI, RMSEA, and WRMR displayed acceptable overall model fit. According to Carmines and McIver (1981), if the ratio (χ^2/df) of the chi-square (χ^2) statistic to the degrees of freedom (df) is less than three, it is generally considered to indicate an acceptable fit. According to Wang and Wang (2012), a decrease in χ^2 of 3.84 with one df indicates a significant model fit improvement.

Lastly, bivariate correlations were computed between the SASII and the Mini-IPIP to address the call for "examination of linkages between social axioms and personality

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dimensions" (Leung et al., 2012, p. 853). Findings were reported in relation to the five-factor structure of social axioms. In addition, insight was provided into predicting personality across different cultures using social axioms factors. Social axioms were predictive of 5.8% of the variance in Extraversion, 41.6% of the variance in Agreeableness, 21.0% of the variance in Conscientiousness, 12.6% of the variance in Neuroticism and 11.8% of the variance in Intellect.

1.4.6 Ethical considerations

Research designs must be mindful of ethical issues. The primary ethical motive of research planning is to safeguard the welfare and rights of each research participant, irrespective of other ethical considerations (Terre Blanche & Durrheim, 1999). According to Terre Blanche and Durrheim (1999) three ethical principles can be applied in research proposals without reference to specific ethical codes. These principles are autonomy, non-maleficence and beneficence. Autonomy addresses the issues of research participants' voluntary and informed consent, freedom to withdraw from the research at any time and right to anonymity. The recognition of the autonomy and dignity of research participants also includes the ethical guidelines relating to debriefing. The second principle of non-maleficence refers to the intention to 'do no harm', which relates to factors such as informed consent and confidentiality. The third and last principle, beneficence, refers to the requirement that the research design be directly beneficial to the research participant or more broadly to other researchers and society at large (Terre Blanche & Durrheim, 1999). These ethical codes were applied in this study.

Survey questionnaire data on social axioms (beliefs), values and personality (Big Five) was supplied by students and volunteers from the broader community (e.g., family members and friends). The students administered the questionnaires and used this data obtained as part of a third year module for BDO 372 psychometric testing at the University of Pretoria. This formed part of the practical training for students to familiarise themselves with the questionnaire and its administration. The survey questionnaires were formulated so that respondents participating in the

research gave consent that the information from the survey could be used by the researcher for research purposes only. The questionnaire was accompanied by a covering letter explaining the purpose of the research with emphasis on the confidentiality of the research project. Permission to use the data was obtained from the University of Pretoria's ethics committee.

1.5   DIVISION OF CHAPTERS

Chapters 2 to 4 are presented in article format, while Chapter 5 addresses overall discussions, conclusions, limitations and recommendations.

Chapter 2 discusses the five factor structure of social axioms as measured by the Social Axioms Survey II (SASII) in a South African sample, and statistical significance is considered. In Chapter 3 measurement invariance of the SASII is investigated using a South African sample. Chapter 4 explores the nomological network of social axioms and addresses the effects of social axioms on the five factors of personality in South Africa. In Chapter 5 conclusions are reached, limitations highlighted and recommendations made.

1.6   CHAPTER SUMMARY

In this chapter the problem statement was discussed. The general and specific research objectives were presented, the research method described and a division of chapters demarcated. Chapter 2 focuses on the five-factor structure of social axioms as measured by the Social Axioms Survey II (SASII) and its statistical significance in a South African sample.

References

Barnard, A., Meiring, D., & Rothman, S. (2008). The cross-cultural application of the Social Axioms Survey in the South-African Police Service. *South African Journal of Industrial Psychology, 34(2)*, 1-9.

Bollen, K. A. (1989). *Structural equations with latent variables.* New York, NY: Wiley.

Bond, M. H. (2016). Kwok Leung (1958 – 2016): A life to celebrate and strive to emulate. *Journal of Cross-Cultural Psychology, 47(2)*, 172-174. doi: 10.1177/0022022115622879.

Bond, M. H., Leung, K., Au, A., Tong, K., & Chemonges-Nielson, Z. (2004). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18(3)*, 177-191. doi: 10.1002/per.509.

Bond, M. H., Leung, K., Au, A., Tong, K., Reimel de Carrasquel, S., Murakami, F., … Lewis, J. R. (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology, 35*, 548-570. doi: 10.1177/0022022104268388.

Bond, M. H., Van de Vijver, F. J. R., Morris, M. W., & Gelfand, M. J. (2016) *Negotiation and Conflict Management Research*, *9(1)*, 81–97.

Burgess, S. M. (2011). Social axioms: A new culture measure for South African business research. *South African Journal of Business Management 42(3)*, 1-21.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*, 456-466. doi:10.1207/s15328007sem1102_8.

Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobserved variables: Analysis of covariance structures. In G. W. Bohmstedt & E. F. Borgatta (Eds.), *Social measurement* (pp. 65-115). Beverly Hills, CA: SAGE.

Chen, S. X., Bond, M. H., & Cheung, F. M. (2006). Personality correlates of social axioms: Are beliefs nested within personality? *Personality and Individual Differences, 40*, 509-519. doi: org/10.1016/j.paid.2005.04.016.

Chen, S. X., Fok, H. K., Bond, M. H., & Matsumoto, D. (2006). Personality and beliefs about the world revisited: Expanding the nomological network of social axioms. *Personality and Individual Differences, 41*, 201-211. doi: org/10.1016/j.paid.2006.01.009.

Cheung, M. W. L., Leung, K., & Au, K. (2006). Evaluating multilevel models in cross-cultural research: An illustration with social axioms. *Journal of Cross-Cultural Psychology, 37*, 522-541. doi: 10.1177/0022022106290476.

Cieciuch, J., Davidov, E., Vecchione, M., Beierlein, C., & Schwartz, S. H. (2014). The cross-national invariance of a new scale to measure 19 basic values: A test across eight countries. *Journal of Cross-Cultural Psychology, 45 (5)*, 764-776. doi: 10.1177/0022022114527348.

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the big five factors of personality. *Journal of Applied Psychology, 86(6)*, 1270-1279. doi:10.1037/1040-3590.18.2.192.

Employment Equity Act (2013). *Employment Equity Act, No. 47 of 2013*. Republic of South Africa. http://www.labour.gov.za/docs/legislation/eea/act98-055.html Accessed on 28 September 2014.

Goldberg, L. R. (1999). The curious experiences survey, a revised version of the dissociative experiences scale: Factor structure, reliability, and relations to demographic and personality variables. *Psychological Assessment, 11(2)*, 134-145.

Habib, A., & Bentley, K. (Eds). (2008). *Racial redress and citizenship in South Africa*. Cape Town: HSRC Press South Africa.

Hair, J. F. Jnr, Anderson, R. E, Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis (5th ed.)*. Englewood Cliffs, NJ: Prentice-Hall.

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.

Jöreskog, K. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36*, 409-426. doi:10.1007/BF02291366.

Khan, J. H. (2006). Factor analysis in counselling psychology research, training and practice: Principles, advances and applications. *The Counselling Psychologist, 34(5)*, 684-718.

Kurman, J. (2011). What I do and what I think they would do: Social axioms and behaviour. *European Journal of Personality, 25*, 410-423. doi: 10.1002/per.8.

Kurman, J., & Ronen-Eilon, C. (2004). Lack of knowledge of a culture's social axioms and adaptation difficulties among immigrants. *Journal of Cross-Cultural Psychology, 35(2)*, 192-208. doi: 10.1177/0022022103262244.

Leedy, P. D., & Ormrod, J. E. (2010). *Practical research: Planning and design.* Englewood Cliffs, NJ: Pearson Educational International.

Leung, K., Au, A., Huang, X., Kurman, K., Niit, T., & Niit, K. (2007). Social axioms and values: A cross-cultural examination. *European Journal of Personality, 21(2)*, 91-111. doi: 10.1002/per.615.

Leung, K., & Bond, M. H. (1989). On the empirical identification of dimensions for cross-cultural comparisons. *Journal of Cross-Cultural Psychology*, *20(2)*, 133-151. doi: 10.1177/0022022189202002.

Leung, K., & Bond, M. H. (2004). Social axioms: A model of social beliefs in multi-cultural perspective. *Advances in experimental social psychology, 36,* 119-197. San Diego, CA: Elsevier Academic Press. doi: org/10.1016/S0065-2601(04)36003-X.

Leung, K., & Bond, M. H. (Eds). (2009). *Psychological aspects of social axioms: Understanding global belief systems.* New York, NY: Springer.

Leung, K., Bond, M. H., Reimel de Carrasquel, S., Munoz, C., Hernandez, M., Murakami, F., … Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33*, 286-302. doi: 10.1177/0022022102033003005.

Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., Gornick, L. J., Amponsah, B., … Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the five factor model of personality. *Journal of Cross-Cultural Psychology, 43(5)*, 833-857. doi: 10.1177/0022022111416361.

Malham, P. B., & Saucier, G. (2014). Measurement invariance of social axioms in 23 countries. *Journal of Cross-Cultural Psychology, 45(7)*, 1046-1060. doi: 10.1177/0022022114534771.

Marsh, H. W., Muthen, B, Morin, A. J. S., Ludtke, O., Asparouhov, T., Trautwein, U., & Nagengast, B. (2010). A new look at the big 5 structure through exploratory structural equation modeling. *Psychological Assessment 22(3)*, 471-491.

Meade, A. W., & Bauer, D. J. (2007). Power and precision in confirmatory factor analytic tests of measurement invariance. *Structural Equation Modeling, 14(4)*, 611–635. doi:10.1080/10705510701575461.

Muthen, L. K., & Muthen, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthen & Muthen.

Paterson, H., & Uys, K. (2005). Critical issues in psychological test use in the South African workplace. *South African Journal of Industrial Psychology, 31(3)*, 12-22.

Rothmann, S., & Cilliers, F. V. N. (2007). Present challenges and some critical issues for research in industrial/organisational psychology in South Africa. *South African Journal of Industrial Psychology, 33(1)*, 8–17.

Saunders, L., Lewis, P., & Thornhill, A. (2009). *Research methods for business students (5th ed.)*. Harlow, UK: Pearson Education.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology, 25,* 1–65. New York, NY: Academic Press. doi: org/10.1016/S0065-2601(08)60281-6.

Schwartz, S. H. (2011). Values: Individual and cultural. In S. M. Breugelmans, A. Chasiotis, & F. J. R. van de Vijver (Eds.). *Fundamental questions in cross-cultural psychology* (pp. 463-493).Cambridge, UK: Cambridge University Press.

Schwartz, S. H. (2012). Toward refining the theory of basic human values. In S. Salzborn, E. Davidov & J. Reinecke (Eds.), *Methods, Theories, and Empirical Applications in the Social Sciences* (pp. 39-46). Wiesbaden: Springer Fachmedien. doi:10.1007/978-3-531-18898-0_6.

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values

with a different method of measure. *Journal of Cross-Cultural Psychology, 32*, 519-542. doi: 10.1177/0022022101032005001.

Shaughnesssy, J. J., & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York, NY: McGraw-Hill.

Singelis, T. M., Hubbard, C., Her, S., & An, S. (2003). Convergent validation of the social axioms survey. *Personality and Individual Differences, 34(2)*, 269-282. doi:10.1016/S0191-8869(02)00043-0.

Stankov, L., & Saucier, G. (2015). Social axioms in 33 countries: Good replicability at the individual level but less so at the country level. *Journal of Cross-Cultural Psychology, 46(2)*, 296-315. doi: 10.1177/0022022114558333.

Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research, 25,* 78-90. doi:10.1086/209528.

Terre Blanche, M., & Durrheim, K. (2002). *Research in practice: Applied methods for the social sciences*. Cape Town, South Africa: University of Cape Town Press.

Van de Schoot, R., Lugtig, P., & Hox. J. (2012). A checklist for testing measurement invariance*. European Journal of Developmental Psychology, 9(4)*, 486-492. doi: org/10.1080/17405629.2012.686740.

Van de Schoot, R., Schmidt, P., & De Beuckelaer, A. (Eds.) (2015). *Measurement invariance*. Lausanne Switzerland: Frontiers Media SA. doi: 10.3389/978-2-88919-650-0.

Van de Vijver, F. J. R., & Leung, K. (1997). *Methods and data analysis for cross-cultural research*. Newbury Park, CA: Sage.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4-69. doi: 10.1177/109442810031002.

Wang, J., & Wang, X. (2012). *Structural Equation Modeling. Applications using Mplus*. West Sussex, UK: John Wiley & Sons.

CHAPTER 2:

2.1   MANUSCRIPT 1

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The Factor Structure of the Social Axioms Survey II (SASII) in the South African Context

Abstract

This study investigated beliefs on the individual level and the generalisability of these beliefs in the South African context. General beliefs, labelled social axioms, have their own nomological networks, linking them to constructs such as values and personality, and are used to guide behaviour. Social axioms also contribute to the general comprehension of social functioning as they represent essential characteristics of culture that are not reflected in values. The objective of this study was to investigate whether the new Social Axioms Survey (SASII) measures identical social axiom constructs (generalised beliefs), on the individual level, in the South African context. A cross-sectional survey design was used. The study sample (N = 1567) consisted of university students as well as their family members and friends. The SASII instrument was administered and descriptive statistics were used to analyse the results. The SASII exhibited an unacceptable model fit when conducting a confirmatory factor analysis (CFA). As an exploratory step, the items with the highest reliability identified through an exploratory factor analysis were then used in a CFA to form a more parsimonious model. The parsimonious SASII model exhibited a reasonable model fit and showed improvement over previous research findings when conducting a CFA. The findings of this study support the new version of the SASII.

The aim of this study is to examine beliefs on the individual level, and the generalisability of the new Social Axioms Survey (SASII) model in a South African context. Beliefs are social in nature and extensively shared amongst individuals within cultures. Shared beliefs represent how people arrange their social world, strive to find meaning and grasp social realities. These general beliefs are viewed as being context-free and relate to a universal scope of social behaviours across cultures and time (Barnard, Meiring, & Rothmann, 2008; Kurman, 2011).

In 2002 Leung et al. identified a five factor structure of general beliefs, which they labelled social axioms. This label refers to the axiomatic nature of the beliefs based on the assumption of truth resulting from personal experience and socialisation (Leung & Bond, 2004; Singelis, Hubbard, Her, & An, 2003). Leung et al. (2002, p. 289) initially defined social axioms as "generalized beliefs about oneself, the social and physical environment, or the spiritual world, [that] are in the form of an assertion about the relationship between two entities or concepts". In 2008 Leung and Bond (2008) expanded the definition of social axioms to not only include generalised beliefs about oneself, but also generalised beliefs about people, groups and social institutions, as well as generalised beliefs concerning events and occurrences in the social world.

The five factors, Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity (Leung & Bond, 2004) were developed through qualitative research and through using Western literature on beliefs (Leung et al., 2002). This research led to the development of the Social Axioms Survey (SAS), which was aimed at discovering global factors of culturally related social beliefs (Singelis et al., 2003). The SAS was used by a global research program on social axioms designed to evaluate the universality and meaning of the structure of beliefs (Leung et al., 2002). This research program involved an international survey that aimed to itemise factors across cultures (Leung & Bond, 2009). An inductive approach was initially followed in developing the SAS as no a priori research existed (Leung et al., 2012). There was thus a need for more research to verify and validate the proposed

universality of the SAS (Kurman & Ronen-Eilon, 2004). The data collected since 2002 from participating national/cultural groups provides strong support for the general applicability of the five-factor SAS structure (Leung et al., 2012). Although South Africa was one of the initial participating national/cultural groups, its data was not included in the first factor analysis (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004). In 2008 Barnard et al. investigated the replication of the SAS five-factor structure in the multicultural South African context and found support for only four factors (Social Complexity did not replicate). This finding was consistent with a later finding by Leung et al. (2012). However, Leung and Bond (2009) have since conducted substantial research and demonstrated sufficient theoretical understanding of social axiom constructs to now allow a deductive approach (Leung et al., 2012). According to Leung et al. (2012), the internal consistency for two of the axiom dimensions (Social Complexity and Fate Control) has been found to be low and the reliability of these two factors requires improvement. Subsequent research to improve on the measurement of social axioms (Leung et al., 2012) has not only included more items (increased items from 60 items to 97 items) but has also rephrased certain items to improve the quality of the items to form a new Social Axioms Survey II (SASII). In addition, the factor Fate Control has been sub-divided into two sub-factors, namely Fate Determinism and Fate Alterability (Leung et al., 2012). Findings by Leung et al. (2012) indicated increased reliability, but considerable research is still required to establish the construct validity of the SASII (Leung et al., 2012).

Background to this study

South Africa is a multi-cultural society that, in accordance with a classification system originating in Apartheid (1948-1994), is classified in terms of four main ethno-cultural groups. These groups are referred to as Blacks (individuals of African descent), who constitute 79% of the population; Coloureds (individuals of mixed descent), who constitute 9% of the population; Indians/Asians (individuals of Asian descent), who constitute 3% of the population; and Whites (individuals of European descent), who constitute 9% of the population (Statistics South Africa, 2012).

Following the end of Apartheid in 1994 and the introduction of democracy attempts have been made to enhance the social integration of cultural groups. In South Africa, language plays an important role in group identification and integration. In this regard, the 1996 constitution of South Africa recognises 11 official languages, including two Germanic languages (Afrikaans and English) and nine Bantu languages (isiNdebele, isiXhosa, isiZulu, Sepedi, Sesotho, Setswana, siSwati, Xitsonga and Tshivenda). The Bantu languages, which are primarily spoken by Blacks as a first language (mother tongue), are used by 78% of the total population of South Africa. First-language speakers of Afrikaans (who are primarily Coloureds and a part of the White group) constitute 14% of the country's population. Finally, English is spoken as a first language by 10% of the South African population, spread across all four ethnic groups (Statistics South Africa, 2012; Williamson & Blench, 2000). Although English is the first language of only a small part of the population, it is commonly used and understood across groups, and functions as the *lingua franca.* The South African constitution stipulates that at least two of the official languages must be used by national and provincial government. English is also becoming increasingly popular as the preferred language for education and it is commonly used in business and organisational settings as well as in psychological assessment (Ferreira, 2016).

Nel et al. (2001) argued that language differences create specific environments, defined in terms of culture, race, ethnic grouping, values and attitudes, which make South Africa, with its 11 official languages, unique. Globalisation has also accelerated the rate of intercultural contact, guiding research attempts to inclusively describe the emerging cross-cultural dynamics (Van de Vijver & Leung, 2001). According to Van de Vijver and Leung (2001) cross-cultural psychology studies the relationships between the culture context and the individual's specific behaviour (i.e., similarities and differences in certain psychological constructs) in relation to that culture (Meiring, 2006, 2007). However, Leung and Bond (1989) argued that analysis at the individual level (Schwartz, 1992) varies from analysis at the cultural level (Hofstede, 1980). Schwartz (2011) also clearly demonstrated that there are distinct differences between analysis at the individual level and at the cultural level.

In accordance with this line of thinking, Leung and Bond (2004) highlighted that analyses at the individual-level and cultural-level have no rational relationships with each other (Leung, 1989). In addition, constructs analysed at the individual level differ from constructs analysed at the cultural level (Cheung, Leung, & Au, 2006). Schwartz (2011) further argued that analyses at the individual-level and cultural-level should not be seen as opposing views, but should rather be utilised together as complementary views in order to gain a better understanding of individual behaviour across cultures, notwithstanding the fact that researchers generally use individuals' responses to describe culture (Schwartz, 2014a). According to Chiu (2014), although culture is universally considered to be the most valuable construct in cross-cultural psychology, there is no all-encompassing view amongst researchers regarding individual-level and cultural-level analyses. However, regardless of whether researchers argue for or against the measurement of culture as a latent construct on the individual-level or cultural-level, cross-cultural research has continued to develop. This indicates the dynamic nature of culture and the role played by research in enriching our understanding of culture (Chiu, 2014; Schwartz, 2014b).

Cross-cultural research does not have to take place across different nations or countries, it can also take place within a single country or community, as culture differences are experienced within countries and communities (Scholtz, 2004). The value systems, attitudes and interactions of groups in these multi-cultural communities can differ, leading to cultural diversity (Brislin 1994; Triandis, 1994). South Africa has proven to be a valuable context for cross-cultural research because of the diversity of its population in relation to various factors, including language (Nel et al., 2001), level of education and rate of employment, (Rothmann & Cilliers, 2007). South Africa is characterised by inequality and a divided society due to the historical legacy of apartheid, which provided unequal opportunities to different racial groups (Habib & Bentley, 2008).

Values in relation to culture and social behaviour

Researchers have investigated the relationship between culture and values (e.g., Hofstede, 1980; Schwartz, 1992; Singelis et al., 2003) to the extent where culture is traditionally described in relation to values (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004). It thus comes as no surprise that, according to Leung and Bond (2009, p. 1), values are "widely used in conceptualizing national culture". Social scientists' attempts to include culturally unique values in calculations have provided a footprint for plotting the value universe (Bond, Leung, Au, Tong, Reimel de Carrasquel et al., 2004; Leung & Bond, 2004). This allows contrasting of the value profiles of individuals socialised into various cultures (Leung & Bond, 2004). Research also indicates that the theory of fundamental human values pertains to various cultures (Schwartz, 2001, 2011, 2012). According to Leung et al. (2002) and Bond, Leung, Au, Tong & Chemonges-Nielson (2004) the construct of value dimensions is the dominant framework for cross-cultural research. In addition, the classic work of Hofstede (1980) has highlighted value frameworks as the most influential paradigm in cross-cultural theorising (Leung & Bond, 2009, p. 1). Despite this popularity endeavours to predict behaviour based on an individual's values have frequently produced disappointing results (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung et al., 2007). However, despite their predictive weakness values are still frequently utilised to explain cross-cultural differences in behaviour (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004). Hence, Kurman and Ronen-Eilon (2004) argued that although values can guide understanding of a culture they seldom relate to everyday behaviour. In previous research the values perspective (as primary explanatory variable) has been prominent in defining ways that researchers conduct cultural comparisons and explain differences in social behaviour (e.g., Hofstede, 1980; Kluckhohn & Strodbeck, 1961; Lonner & Malpass, 1994; Rokeach, 1973; Schwartz, 1992, 1994). However, these results and interpretations relate to nations (i.e., national-cultural level) and not to individuals (Bond, Leung, Au, Tong, Reimel de Carrasquel, et al., 2004), although researchers commonly use the responses of individuals to describe cultures (Schwartz, 2014a).

Although values have been, and will continue to be, vital constructs (Leung & Bond, 2009) in identifying cultures and understand cultural variations, additional dimensions are needed to assist in describing and explaining the similarities and differences that are involved in cultural variations (Leung & Bond, 2009; Singelis et al., 2003). The similarity in structure between values and beliefs has led some researchers to suggest that values are simply evaluative beliefs (Leung & Bond, 2004; Leung et al., 2002). However, Leung and Bond (2009, p. 17) suggested that general beliefs may function as a supporting framework to values and argued that there is sufficient evidence that substantiates "the conclusion that beliefs and values are largely independent of each other". Kurman and Ronen-Eilon (2004) argued that values narrate endorsed endpoints (for example, the importance of basic rights) but not how to achieve these endpoints. In contrast, social beliefs provide the links between constructs that are needed to achieve these specific endpoints (for example, reciprocal esteem helps sustain rudimentary human rights) (Kurman & Ronen-Eilon, 2004). In addition, values "define the outcome desired by an individual, while beliefs define the likelihood with which a target object associates with a particular outcome" (Leung & Bond, 2009, p. 17). Values are therefore related to goals whilst beliefs are related to how these goals are achieved (Leung et al., 2007).

Beliefs in relation to individuals and social behaviour

Bem (1970, p. 4) provided the following classic definition of a belief: "If a man perceives some relationship between two things or between something and a characteristic of it, he is said to hold a belief". In a later study, Bar-Tal (1990, p. 14) defined a belief as: "A proposition to which a person attributes at least a minimal degree of confidence. A proposition, as a statement about an object(s) or relations between objects/or attributes, can be of any content". Leung and Bond (2009, p. 320) described a belief as "central to the human enterprise, be that enterprise the doing of science or the living of our individual lives". Many beliefs are social in nature and represent people's perception of how the world functions. These general beliefs are context-free and relate to various concepts and their characteristics (Barnard et al., 2008; Kurman, 2011). According to Leung and Bond (2009, p. 324) beliefs are

"essential to conducting our life in groups" and "are part of our collective being-in-the-world" (p. 325). They further stated that "we simply must believe in order to function" (Leung & Bond, 2009, p. 324).

According to Leung and Bond (2004) people's assumptions (or beliefs) regarding how their social world functions are implied or lay propositions. Various researchers have identified structures underlying lay beliefs (i.e., assumptions concerning how the social world functions) in specific domains (for example, medicine, psychiatry, psychology, economics, education, statistics and law) in which they are interested (Leung & Bond, 2004). Many beliefs are social in nature (for example, patriotism, security and siege) and are thus commonly shared within social groups and cultures (Leung & Bond, 2004). In addition, group "members reinforce our believing in certain ways" (Leung & Bond, 2009, p. 325). Beliefs are crucial components of attitudes and are extensively used to describe and forecast social behaviour. In this tradition, belief scales have been developed and their functionality demonstrated by notable relationships with various variables (Chen, Bond, & Cheung, 2006; Leung & Bond, 2009; Leung et al., 2012). However, there has not been an attempt to search for and develop a context-free, non-domain specific structure of lay beliefs (Leung & Bond, 2004). Unlike values, beliefs may vary in specificity (Leung et al., 2002). Some beliefs are classifiable as general in nature and these beliefs are sometimes considered to be context-free generalised expectations (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Kurman & Ronen-Eilon, 2004; Leung & Bond, 2009; Leung et al., 2002). General beliefs function similarly to axioms in mathematics in that these beliefs form the presuppositions that individuals endorse and rely on to direct their actions (Leung & Bond, 2004; Leung et al., 2002). However, "their content refers not to numerical entities, but to social ones" (Leung & Bond, 2009, p. 130). These beliefs, often labelled as social axioms, relate to the axiomatic nature of the beliefs based on the assumption of truth resulting from individual experience and socialisation (Leung & Bond, 2004; Singelis et al., 2003).

Social axioms in relation to values and beliefs

Social axioms have been advanced as a supplementary framework to enhance the values perspective (Leung et al., 2007; Singelis et al., 2003). Leung and Bond (2008, p. 198) defined social axioms as:

> Generalized beliefs about people, social groups, social institutions, the physical environment, or the spiritual world as well as about categories of events and phenomena in the social world. These generalized beliefs are encoded in the form of an assertion about the relationship between two entities or concepts.

A social axiom thus involves a basic supposition in which a relationship between two entities or concepts is established (Leung & Bond, 2008; Leung & Bond, 2009; Singelis et al., 2003). This relationship can be correlational or causal (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung & Bond, 2004; Leung & Bond, 2009; Leung et al., 2002). For example, the belief statement 'hard work leads to reward' indicates that a causal relationship exists between 'hard work' and 'reward' (Leung & Bond, 2004). According to Kurman (2011) a social axiom supplies the answer to a 'how' question (i.e., How will I get rewarded? I will get rewarded through working hard). The social axiom also constitutes a general statement, because there are numerous forms of 'hard work' and many forms of 'reward'. Lastly, the statement is neither an attitude nor a value, as the respondent is not assessing the desirability of either 'hard work' or 'reward' (Leung & Bond, 2004) or trying to supply the answer to the 'what' question, as in the case of a value (Kurman, 2011). In contrast to a social axiom (belief), "a value is concerned with the desirability and importance of a single conceptual entity" (Leung & Bond, 2009, p. 2). Thus beliefs differ from values in the sense that the evaluative element of a value is general, whilst the evaluative element of a belief is specific (Leung & Bond, 2004). When an evaluative belief becomes specific, the belief becomes a social axiom (Leung & Bond, 2004; Leung et al., 2002). Axioms are thus truth statements for an individual, but do not assess desired goals (Leung & Bond, 2004).

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Social axioms are a relatively new scientific construct, but have sparked considerable research interest. Although research on social axioms is still in the early stages it seems likely that the construct will justify its existence through extensive research (e.g., Leung & Bond, 2009). Social axioms provide an alternative understanding of general orientation that can add to the predictive power of values (Bond et al., 2004a) and other constructs such a personality.

Social axioms add additional predictive power to the predictive power provided by values. Social axioms thus provide an alternative means for researchers to study a variety of subjects within the boundaries of social psychology. In terms of social psychology research, values tap self-aware motivational systems, while social axioms utilise conceptions of the social context through which each individual must guide his or her behaviour in evaluating outcomes from the world (Bond et al., 2004a; Leung et al., 2007).

Pursuing the same functionalist approach as Schwartz's (1992) argument for a universal structure of values, Leung and Bond (2004) suggested that social axioms, like values, are instrumental for individuals in coping with various global problems related to survival and functioning. Social axioms support at least four very distinctive functions, namely: (i) value-expressiveness, which involves presenting one's values; (ii) knowledge, which involves people understand the social world; (iii) instrumentality, which involves assisting with the achievement of significant goals; and (iv) ego-defensiveness, which involves protecting one's self-worth (Leung & Bond, 2009; Leung et al., 2002). Social axioms provide general knowledge about the world and serve as:

> "governing principles for beliefs in different specific domains… [and] …
> a set of important psychological tools helping individuals to
> comprehend, relate to, and even maneuver in the social world … [as
> well as] … guiding principles steering progress towards the attainment

of important goals in life … [by having] … important implications for our self-worth and subjective well-being."

(Leung & Bond, 2009, p. 18).

The structure underlying social axioms is identifiable in various cultural groups with diverse backgrounds. The commonality of these basic problems faced by all human beings should lead to the emergence of a pan-cultural structure of social axioms (Leung & Bond, 2004). Thus, social axioms should relate to social behaviours across contexts, persons and time (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Cheung, Leung et al., 2006).

According to Schwartz and Bilsky (1990) theories that aspire to be universal (like the social axiom theory for example) must be tested in countless culturally diverse samples. However, logistics prevent any one individual from studying all cultures, and there are always groups that have not been studied (Schwartz, 1992; Schwartz & Bilsky, 1990). A pan-cultural factor analysis should include all the subjects measured, regardless of their culture of origin. To establish an authentic universal theory that takes into account the influence of culture observed cultural differences must be linked to specific dimensions of culture that are postulated to have produced the differences (Leung & Bond, 1989). The social axiom construct contributes to the general understanding of social functioning by capturing vital features of culture that are not reflected in values (Kurman & Ronen-Eilon, 2004; Leung et al., 2002). Social axioms also guide behaviour and therefore the ability to measure social axioms may prove to be useful in explaining and predicting cultural differences in social behaviour such as interpersonal communication and goal setting (Singelis et al., 2003). However, Leung et al. (2007) cautioned that research is only beginning to explain the complex relationships between values and social axioms (i.e., beliefs). More research and evaluation is required to fully understand these relationships. Leung et al. (2002) and Leung et al. (2012) thus proposed that the Social Axioms Survey (discussed below) be utilised as an additional framework to identify a general structure of beliefs and to create its own nomological network.

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Social Axioms Survey (SAS)

Based on qualitative research and Western literature on beliefs, Leung et al. (2002) identified a set of pan-cultural social axioms. This research led to the development of "the Social Axioms Survey (SAS) to identify universal dimensions of culturally related social beliefs" (Singelis et al., 2003, p. 269). The SAS is a 60-item (questionnaire) survey instrument. Leung et al.'s (2002) SAS focuses on the individual level and examines whether it is possible to identify a stable factor structure of beliefs between individuals in various cultural groups (Leung et al., 2002). The SAS exclusively measures beliefs, which distinguishes it from other measures. This exclusive focus may provide information on the comparative contributions of beliefs and values to behaviours (Singelis et al., 2003). The SAS is the first systematic attempt to develop a scale that is based solely on belief statements (Leung et al., 2002).

The SAS (60-item questionnaire) has a five-factor structure, with factors labelled Social Cynicism (18 items), Reward for Application (14 items), Social Complexity (12 items), Fate Control (eight items) and Religiosity (eight items) (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Bond, Leung, Au, Tong, Reimel de Carrasquel et al., 2004; Chen et al., 2006; Cheung, Leung et al., 2006; Leung & Bond, 2004; Leung & Bond, 2009; Leung et al., 2002; Leung et al., 2012). These factors represent general (context fee) beliefs (i.e., social axioms). The first factor, Social Cynicism, represents "a negative view of human nature, a bias against some social groups, a mistrust of social institutions, and a belief that people tend to ignore ethical means in pursuing their goals" (Leung & Bond, 2009, p. 3). An example of a Social Cynicism statement is "kind-hearted people usually suffer losses" (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004, p. 178). The second factor, Reward for Application, represents "a belief complex asserting that the investment of effort, knowledge, careful planning, and other resources will lead to positive outcomes" (Leung & Bond, 2009, p. 3). An example of a Reward for Application statement is "hard working people will achieve more in the end" (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004, p. 178). The third factor, Social Complexity, represents "a belief constellation holding that there are multiple ways to solve a problem, and

that people's behavior, indeed a given person's behavior, may vary across situations" (Leung & Bond, 2009, p. 3). An example of a Social Complexity statement is "one has to deal with matters according to the specific circumstances" (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004, p. 178). The fourth factor, Fate Control, represents "a belief complex claiming that life events are predetermined by various external forces, but that there are ways for people to influence the negative impact of these forces" (Leung & Bond, 2009, p. 3). An example of a Fate Control statement is "fate determines one's success and failures" (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004, p. 179). The fifth and last factor, Religiosity, represents a belief in "the existence of a supernatural being but also a number of beliefs about the beneficial social functions of religious institutions and practices" (Leung & Bond, 2009, p. 3). An example of a Religiosity statement is "religious people are more likely to maintain moral standards" (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004, p. 179).

Data collected from 41 participating national/cultural groups (South Africa was not one of the groups) provided powerful support for the general applicability of the SAS five-factor structure across cultures. The researchers aimed to identify dimensions of social axioms identifiable at the cultural-level by comparing these dimensions with culture-level values dimensions in order to assess their degree of overlap (Bond, Leung, Au, Tong, Reimel de Carrasquel et al., 2004). The statistical analysis consisted of several procedures addressing structural equivalence (investigating the extent to which the five SAS factors are comparable across all 41 participating cultural groups) and item bias (Leung & Bond, 2009). Results from a multilevel factor analysis (a stringent statistical procedure that considers the dual-level [individual and national-cultural] structure of the data) also supported the general applicability of the SAS five-factor structure (Cheung, Leung et al., 2006).

Subsequent research by Barnard et al. (2008) investigated the SAS's construct equivalence, item bias and reliability in the South African context using a sample drawn from the South African Police Service (SAPS). Barnard et al.'s (2008) study found only four interpretable factors consistent with Leung et al.'s (2002) model,

namely, Social Cynicism, Reward for Application, Fate Control and Religiosity. Social Complexity did not replicate, as it had low Cronbach's alpha values (<0.60). According to Hair, Anderson, Tatham and Black (1998) only alphas of 0.70 or above are considered acceptable, except in cases of exploratory research, where 0.60 may be acceptable. Item bias was not a vital disturbance in seven different African language groups (isiZulu, Sepedi, Sesotho, Setswana, siSwati, Xitsonga and Tshivenda). However, low reliability for three of the factors (Reward for Application, Fate Control and Religiosity) was reported for all the groups (Barnard et al., 2008). In more recent research in South Africa, Burgess (2011) used social axioms as a culture measure for business research and found that South Africans exhibit extreme social axiom scores that are similar to trends in other emerging markets. Burgess (2011, p. 16) argued that social axioms show "predictive value over and above sociodemographics, values and personality". In addition, the study found that the social axioms "theory provides a nomological net of relations by which the fundamental motivations of other constructs can be understood more fully" (Burgess, 2011, p. 5). Social axioms research also seeks to assess overlap with other constructs and to supplement the nomological network of social axioms (Burgess, 2011). It is thus important that efforts to refine social axioms research continue (Burgess, 2011).

New Social Axioms Survey (SASII)

Unlike the development of the SAS (Leung et al., 2002), which followed an inductive approach because there was no a priori structure of social axioms, the development of the new Social Axioms Survey (SASII) questionnaire followed a theory based culturally decentred approach. This development involved 11 countries (including South Africa) in creating pan-cultural items to measure the five social axiom factors (Leung et al., 2012; Social Axioms Project, 2011).

The weakness of an inductive approach, such as that followed in the development of the SAS (Leung et al., 2002), is that some aspects of a construct may not be sufficiently captured by the items included because the items are not optimally

worded to tap the construct. It was found in the studies across cultures that two of the SAS constructs, namely Fate Control and Social Complexity, have average Cronbach's alpha of below 0.60 (Leung et al., 2012). In exploratory research for newly developed scales it is quite acceptable for Cronbach's alpha to vary between 0.50 and 0.60 (Nunnally, 1967). In Barnard et al.'s (2008) study the SAS construct of Social Complexity also did not replicate. Hence these two scales (Fate Control and Social Complexity) needed to be improved (Leung et al., 2012).

According to Hair et al. (1998) there is a favourable relationship between Cronbach's alpha and the number of items in the scale. This means that increasing the number of items also increases the reliability value. Leung et al. (2012) followed a culturally decentred approach in item generation in an attempt to improve the reliability of the SAS (60 item instrument) and included more and better items (97 items) in the new Social Axioms Survey (SASII) long version (Leung et al, 2012).

The SASII, which is now based on a deductive approach because it is supported by adequate research on and theoretical comprehension of the social axiom constructs (e.g., Leung & Bond, 2009), includes more and improved items to tap the social axioms constructs (Leung et al., 2012). The primary goal of the SASII's development "is to improve the reliability of the five social axioms dimensions by generating new items based on the construct definitions of the axiom dimensions from diverse cultural perspectives" (Leung et al., 2012, p. 852). The SASII (Leung et al., 2012) supports the same five-factor structure as the SAS (Leung et al., 2002), namely Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity. However, two additional sub-factors of the Fate Control factor have also been identified, namely Fate Determinism and Fate Alterability (Leung et al., 2012). Leung et al. (2012, p. 834-835) defined the five axiom dimensions as follows:

> Social cynicism asserts that human nature and the social world yield
> negative outcomes; reward for application refers to the belief complex
> that people's use of effort, knowledge, careful planning and other
> resources will lead to positive outcomes; social complexity asserts that

people's behavior may vary across situations and that problems have multiple solutions; fate control refers to the belief complex that life events are pre-determined by fatalistic forces, but that people may be able to predict and alter the decree of fate by various means; finally, religiosity asserts the existence of a supernatural being and the beneficial functions of religious practice.

The data collected thus far from participating national/cultural groups has provided powerful support for the general applicability of the SASII five-factor structure (Leung et al., 2012). In addition, the results provided by the SASII support the original SAS five-factor structure (Leung et al., 2002) and have generated even higher reliability for the axiom dimensions. However, considerable research is still needed to establish the validity and reliability of the SASII (Leung et al., 2012).

Objectives and Hypotheses

The main objective of this study was to assess whether the new Social Axioms Survey model (SASII) fits the data collected in a South African context and whether the SASII measures the same social axiom constructs included in the SASII a priori social axiom five-factor model. The study was guided by the following question: Can generalised beliefs (i.e., social axioms) as measured by the SASII on the individual level be applied in a South African context as defined by the SASII instrument?

The following hypotheses were tested:

- Hypothesis 1: The measurement model implied by the scoring key of the SASII can closely reproduce the five factors from the items of the sub-scales;
- Hypothesis 2: The factor loadings of the items on their designated latent social axiom dimensions are statistically significant;
- Hypothesis 3: The latent social axiom dimensions correlate low to moderately with each other; and

- Hypothesis 4: The reliabilities of the latent social axioms were moderately high to high.

Method

Participants

An empirical study was conducted using primary, numeric (quantitative) data (Babbie & Mouton, 2001). The sample was a non-probability sample that was selected according to convenience, accessibility and cost effectiveness (Terre Blanche & Durrheim, 2002; Saunders, Lewis, & Thornhill, 2009). The sample consisted of university students ($N = 793$) and their family members and friends ($N = 645$). A cross-sectional survey design was used due to its ability to assess the interrelationships among factors within a population (Saunders et al., 2009), address the descriptive functions associated with the correlational design, contribute towards (social axiom) theory (Terre Blanche & Durrheim, 2002), explore the relationships between variables (Shaughnessy & Zechmeister, 1997) and expand knowledge (Saunders et al., 2009).

The study population ($N = 1567$) was drawn from a sample of university students ($N = 793$) and their family members and friends ($N = 645$) (129 missing values). In terms of race, the majority were white (66%; $N = 972$), 15% were black ($N = 237$), 6% were coloured ($N = 93$) and 5% were Indian ($N = 82$) (183 missing values). In terms of gender, the majority (59%; $N = 914$) were female and 41% ($N = 643$) were male (10 missing values). The ages of the participants varied from below 20 years to above 60 years with the majority (51%; $N = 830$) of respondents being between the ages of 21 and 30 years. Missing data was less than 6% and random. Table 1 shows the characteristics of the participants ($N = 1567$).

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Table 1

Characteristics of Participants (N = 1567)

Item	Category	Frequency	Percentage
Gender	Male	643	40.7%
	Female	914	58.9%
	Missing values	10	0.5%
Age	Below 20	305	22.5%
	21 – 30	830	51.0%
	31 – 40	99	4.0%
	41 – 50	127	9.1%
	51 – 60	117	8.4%
	Over 60	30	2.3%
	Missing values	59	2.8%
Race	White	972	66.4%
	Black	237	15.1%
	Coloured	93	5.9%
	Indian	82	5.2%
	Missing values	183	8.3%
Participant	University Student	793	55.8%
	Not University Student	645	38.3%
	Missing values	129	5.9%

Instrument

The SASII instrument developed by Leung et al. (2012) was used. The SASII consists of 97 social axiom items (Leung et al., 2012). The SASII requires respondents to rate (on a five-point Likert scale) the degree to which they believe each of the 97-items to be true. Response options range from 1 (strongly disbelieve) to 5 (strongly believe). Five social axiom factors are included: Social Cynicism (20-items), Social Complexity (23-items), Reward for Application (17-items), Religiosity (17-items) and Fate Control (20-items). Fate Control consists of two sub-factors, namely Fate Determinism (nine items) and Fate Alterability (11-items). The following Cronbach's alpha for each dimension were reported by Leung et al. (2012): Social Cynicism 0.70 (mean α = 0.79), Reward for Application 0.70 (mean α = 0.77), Social Complexity 0.65 (mean α = 0.68), Fate Control 0.65 (mean α = 0.68) and Religiosity 0.70 (mean α = 0.85).

Procedure

The sample of students from the University of Pretoria and volunteers (e.g., family members and friends) completed the SASII. The SASII survey questionnaire was formulated so that respondents participating in the research gave consent that the information from the survey could be used by the researcher for research purposes only. The questionnaire was accompanied by a covering letter explaining the purpose of the research with emphasis on the confidentiality of the research project. The data has not been used for any research before. Permission to use the data was obtained from the University of Pretoria's ethics committee. The completed raw data was converted to an SPSS dataset for use in Mplus 7.11.

Analysis

Analyses were conducted with Mplus Version 7.11 (Muthen & Muthen, 2012). A CFA was executed using Mplus (Marsh et al., 2010) to ascertain whether the five-factor

structure of the SASII (Leung et al., 2012) provides a good fit to the data (N = 1567) as per the substantive hypothesis (Khan, 2006).

The following Mplus fit indices were used to determine the SASII goodness of model fit to the data: (i) Chi-square statistic, Root Mean Square Error of Approximation (RMSEA) and Weighted Root Mean Square Residual (WRMR) as absolute fit indices; (ii) Tucker Lewis Index (TLI) as an incremental fit index; and (iii) Comparative Fit Index (CFI) (Hair et al., 2010). According to Van de Schoot, Lugtig and Hox (2012) a reasonable model fit has TLI and CFI values of higher than 0.90 and a RMSEA value of lower than 0.08. A good model fit has TLI and CFI values of higher than 0.95 and a RMSEA value of lower than 0.05 (Van de Schoot et al., 2012). According to Wang and Wang (2012) a WRMR value of 1.0 or lower is considered as a good fit of the model to the data.

First, a CFA was conducted using Mplus Version 7.11 to determine whether the a priori five-factor structure of the SASII (Leung et al., 2012) is a good fit to the data. Second, as an exploratory step, the study population data (N = 1567) was split into two random samples, creating sample 1 (N = 784) and sample 2 (N = 783). Third, model development was done on sample 1 to create a more parsimonious model. Finally, a CFA was conducted for the total sample (N = 1567) and the reliability coefficients were computed for each factor of the parsimonious SASII model.

Results

A CFA was conducted using Mplus Version 7.11 to determine whether the a priori five-factor structure of the SASII (Leung et al., 2012) is a good fit to the data by observing the variance-covariance matrix amongst SASII items (Khan, 2006). The SASII exhibited an unacceptable model fit. The fit indices for the SASII model were χ^2 20,552, N = 1,567, df = 4,549, p < 0.001, RMSEA = 0.047, WRMR 3.005, CFI = 0.71 and TLI = 0.70. All factor loadings were significant at the 0.05 level. The correlations among the five latent factors were low (r < 0.11). The RMSEA, which is

not sensitive to sample size but is sensitive to model complexity, suggested a good model fit to the population (Brown, 2006; Van de Schoot et al., 2012). However, the CFI and TLI produced values too low (< 0.90) for an adequate model fit (Van de Schoot et al., 2012). The results are reported in Table 2.

These initial findings indicated that the SASII model did not fit the data well. However, according to Wang and Wang (2012) this is a common result when specifying the model based on a priori theory and empirical findings and then attempting to (force) fit the model to the available data.

Table 2

Item description and CFA loading of 97-item SASII a priori model

Item nr	**Social Cynicism**	Item loading
91	The only way to get ahead is to take advantage of others	**0.67**
49	It is rare to see a happy ending in real life	**0.60**
74	Praise is just a sweet way for people to get what they want from others	**0.59**
69	Kind-hearted people usually suffer losses	**0.55**
96	Young people are impulsive and unreliable	**0.53**
70	Opportunities for people to get wealthy promote dishonesty	**0.51**
66	People who become rich and successful forget the people who helped them along the way	**0.50**
34	To care about societal affairs only brings trouble for yourself	**0.50**
28	Old people are usually stubborn and biased	**0.49**
86	Good connections with people in power are more important than hard work	**0.48**
29	People create hurdles to prevent others from succeeding	**0.46**
93	People always expect something in return for a favor	**0.46**
32	People dislike others who succeed in life	**0.44**
44	People deeply in love are usually blind	**0.42**
16	People enjoy watching others fight among themselves	**0.42**
36	Powerful people tend to exploit others	**0.41**
58	Power and status make people arrogant	**0.39**
79	Kind-hearted people are easily bullied	**0.39**
47	The various social institutions in society are biased towards the rich	**0.34**
1	People will stop working hard after they secure a comfortable life	**0.30**
Item nr	**Reward for Application**	Item loading
83	Endurance and determination are key to achieving goals	**0.72**
67	Difficult problems can be overcome by hard work and persistence	**0.63**
75	Hard working people will achieve more in the end	**0.63**
27	Failures can make people wise	**0.62**
30	Building the way step by step leads to success	**0.57**
15	Success requires strong willpower	**0.57**
7	One gets from life as much as one puts into it	**0.53**
84	Hard-working people are well rewarded	**0.53**
40	Knowledge is necessary for success	**0.48**
2	One will succeed if he/she really tries	**0.42**
53	Competition brings about progress	**0.41**
14	Every problem has a solution	**0.39**
4	Adversity can be overcome by effort	**0.37**
55	Caution helps avoid mistakes	**0.37**
59	Failure is the beginning of success	**0.30**
25	Opportunities only present themselves to those who are seeking them	0.27
81	One who does not know how to plan his or her future will eventually fail	0.05

Item nr	Social Complexity	Item loading
56	Every person is unique	**0.64**
42	A person's behavior is influenced by many factors	**0.62**
37	There is usually more than one good way to handle a situation	**0.55**
11	A situation can change drastically in an unexpected direction	**0.52**
13	There is usually only one way to solve a problem (R)	**0.51**
82	People may have opposite behaviors on different occasions	**0.50**
97	One has to deal with matters according to the specific circumstances	**0.50**
87	A bad situation can suddenly change for the better	**0.48**
26	There are many equally good ways to deal with a problem	**0.46**
23	People may behave unpredictably	**0.46**
20	Human behavior changes with the social context	**0.45**
94	A person is either good or evil, and circumstances have nothing to do with it (R)	**0.41**
61	Many issues appear far more complicated than they really are	**0.39**
71	Flexibility has nothing to do with success (R)	**0.37**
31	People can suddenly lose everything they have	**0.36**
77	People with different opinions can all be correct	**0.35**
19	One's behaviors may be contrary to his or her true feelings	**0.31**
68	A person changes little over the course of his or her life (R)	**0.31**
92	A person can change drastically in a short time	0.27
8	People act more or less the same way regardless of the people they interact with (R)	0.24
90	Being flexible in life is the key to happiness	0.23
3	Current losses are not necessarily bad for one's long-term future	0.21
43	Different versions of the same reality can all be true	0.17

Item nr	Fate Control	Item loading
48	Individual characteristics, such as appearance and birthday, can reveal one's fate	**0.74**
12	Fate determines a person's success in life	**0.71**
78	Fate determines one's successes and failures	**0.66**
33	There are ways for people to find out about their fate	**0.66**
35	Major events in people's life can be predicted	**0.64**
21	Matters of life and death are determined by fate	**0.64**
46	The people whom a person will love in his or her life is determined by fate	**0.63**
5	People's wealth is determined by fate	**0.63**
18	There are many ways for people to predict what will happen in the future	**0.58**
89	Some people are born lucky	**0.58**
22	There are certain ways to help us improve our luck and avoid unlucky things	**0.57**
17	Good luck follows if one survives a disaster	**0.57**
51	Luck can be enhanced by certain tactics	**0.57**
10	Individual characteristics, such as appearance and birthday, affect one's fate	**0.54**
62	Most disasters can be predicted	**0.52**
88	Fortune comes when you least expect it	0.29
50	There are certain ways for people to improve their destiny	0.27
9	Major events in life have nothing to do with fate (R)	0.23
60	Fate has nothing to do with the tragedies of life (R)	0.18

39	It is impossible to read one's destiny (R)	0.07
Item nr	**Religiosity**	Item loading
72	Only weak people need religion (R)	**0.75**
63	Religion slows down human progress (R)	**0.71**
57	Religious practice makes it harder for people to think independently (R)	**0.62**
38	Religious faith contributes to good mental health	**0.61**
73	Religion makes people happier	**0.61**
85	Religion helps people make good choices for their lives	**0.61**
52	Practicing a religion unites people with others	**0.56**
45	Ignorance leads people to believe in a supreme being (R)	**0.56**
24	Religion makes people escape from reality (R)	**0.54**
80	Religious beliefs lead to unscientific thinking (R)	**0.54**
6	Belief in a religion helps one understand the meaning of life	**0.54**
65	There is a supreme being controlling the universe	**0.50**
95	Evidence of a supreme being is everywhere for those who seek its signs	**0.48**
54	Religious people are more likely to maintain moral standards	**0.47**
64	Religion makes people healthier	**0.44**
41	Religion contradicts science (R)	**0.41**
76	Belief in a religion makes people good citizens	**0.34**

Note: Reversed items are indicated by (R) and are recoded so that all loadings are positive in direction

Model development

Given these initial poor CFA fit statistics, as an exploratory step the study population (N = 1567) data was split into two random samples using the SPSS package (SPSS Inc., 2015) creating sample 1 (N = 784) and sample 2 (N = 783). The chi-square test was conducted and indicated no significant differences between sample 1 and sample 2.

Exploring further to determine whether a five-factor model would provide a fit to the data, an exploratory factor analysis (EFA) using sample 1 (N = 784) and specifying a "Model: F1-F5" (exploring a five-factor model structure) was conducted using Mplus Version 7.11 with WLSMV estimator and default settings. A five-factor structure emerged from the data that was comparable to the five-factor structure of the a priori SASII model, thus providing face validity for the structure. An analysis of the EFA results highlighted improved factor fit indices compared to the fit indices for the CFA. The EFA fit indices, which closely resembled reasonable factor fit indices, were χ^2 6,420, N = 784, df = 4,181, p < 0.001, RMSEA = 0.025, WRMR 1.221, CFI = 0.90 and TLI = 0.89.

As a second exploratory step, all items with loadings lower than 0.30 (items 3, 4, 8, 13, 19, 43, 55, 68, 71 and 77) in the EFA were excluded from an adjusted EFA. In terms of the SASII factors, two of the removed items were from the factor Reward for Application (items 4 and 55) and eight items were from the factor Social Complexity (items 3, 8, 13, 19, 43, 68, 71 and 77). The revised scale, containing 87-items (all of which had loadings higher than 0.30 in the second step described above), was subjected to the adjusted EFA. The adjusted EFA exhibited improved, and reasonably good, factor fit indices. The adjusted EFA fit indices were χ^2 5,255, N = 764, df =3,235, p < 0.001, RMSEA = 0.027, WRMR 1.205, CFI = 0.91 and TLI = 0.90.

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Based on these fit indices, the adjusted EFA model extracted five factors from sample 1. In addition, 74 of the 87 items included had loadings higher than 0.30 and loaded on the relevant a priori SASII factor. The original five-factor structure thus emerged; especially with regard to the factors Fate Control, which extracted 18 items (out of 20 items) with loadings > 0.30, and Religiosity, which extracted 15 items (out of 17 items) with loadings > 0.30. Although Social Cynicism extracted 25 items, six items (items 41, 45, 57, 63, 72 and 80) had cross-loadings with Religiosity, one item (item 81) had a cross-loading with Reward for Application and one item (item 94) had a cross-loading with Social Complexity, leaving 17 items (out of 19 items) with loadings > 0.30 on the a priori factor. Reward for Application extracted 22 items, however, eight items (items 11, 26, 37, 42, 56, 82, 87 and 90) had cross-loadings with Social Complexity, leaving 14 items (out of 15 items) with loadings > 0.30 on the a priori factor. Social Complexity extracted 15 items, of which four items (items 29, 32, 36 and 58) had cross-loadings with Social Cynicism and one item (item 72) had a cross-loading with Religiosity, leaving ten items (out of 15 items) with loadings of > 0.30 on the a priori factor.

As a third exploratory step, and only using items with loadings > 0.40 of each of the individual factors from the aforementioned step, a more parsimonious CFA model was formed (Wang & Wang, 2012). A CFA was conducted on sample 2 ($N = 783$) using Mplus Version 7.11 to test the model's fit to the data. By following the steps described above to create a more parsimonious CFA model (i.e., as an exploratory step, using only the most reliable items of each individual factor), the SASII exhibited a vastly improved model fit. The fit indices for the improved CFA model were χ^2 3,221, $N = 783$; $df = 1,420$, p < 0.001, RMSEA = 0.038, WRMR 1.654, CFI = 0.89 and TLI = 0.89. All factor loadings were significant at the 0.05 level. These findings mimicked previous research findings reported by Leung et al. (2012), who found a CFI = 0.89 and argued that this should be considered a reasonably good fit, taking into account the complexity of the SASII model. However, these findings clearly indicated that the model fit could be improved further (CFI and TLI < 0.90).

Modification indices (MI) of 3.84 or greater is considered significant and big enough to cause a substantial change in a model's χ^2 fit index (Wang & Wang, 2012). Thus, as a final step in creating the parsimonious SASII model, taking into consideration the improved CFA fit indices in the third exploratory step, item 96 ("Young people are impulsive and unreliable") was excluded because it had high MI values for factor 2 (MI = 85.17), factor 3 (MI = 90.13) and factor 5 (MI = 42.60). An error of covariance was also allowed between items 65 ("There is a supreme being controlling the universe") and 95 ("Evidence of a supreme being is everywhere for those who seek its signs") of the factor Religiosity. The CFA fit indices for the parsimonious SASII model were χ^2 3,015, N = 783; df =1,431, p < 0.001, RMSEA = 0.037, WRMR 1.612, CFI = 0.90 and TLI = 0.90. The parsimonious SASII model presented a reasonable model fit (Van de Schoot et al., 2012) and is reported in Table 3. Social Cynicism had 13 items (originally 20 items), Reward for Application had 10 items (originally 17 items), Social Complexity had eight items (originally 23 items), Fate Control had 14 items (originally 20 items) and Religiosity had nine items (originally 17 items) with loadings of > 0.40. Thus 54 items were retained from the SASII model's a priori 97 items to create a parsimonious SASII model. It is noted that Leung et al. (2012) also used a shortened 40-item version of the SASII in their study. According to Wang and Wang (2012) a smaller number of items per factor sometimes results in better model fit. Thus, the more parsimonious the model, the better fitting the solutions will be (as found in this study), as measured by RMSEA, CFI and χ^2 test (Wang & Wang, 2012).

Table 3

Item description and CFA loading of the 54-item parsimonious SASII model

Item nr	**Social Cynicism**	Item loading
69	Kind-hearted people usually suffer losses	**0.62**
74	Praise is just a sweet way for people to get what they want from others	**0.59**
70	Opportunities for people to get wealthy promote dishonesty	**0.58**
66	People who become rich and successful forget the people who helped them along the way	**0.56**
28	Old people are usually stubborn and biased	**0.52**
29	People create hurdles to prevent others from succeeding	**0.52**
32	People dislike others who succeed in life	**0.50**
93	People always expect something in return for a favor	**0.50**
86	Good connections with people in power are more important than hard work	**0.49**
36	Powerful people tend to exploit others	**0.48**
79	Kind-hearted people are easily bullied	**0.46**
44	People deeply in love are usually blind	**0.44**
34	To care about societal affairs only brings trouble for yourself	**0.42**

Item nr	**Reward for Application**	Item loading
83	Endurance and determination are key to achieving goals	**0.68**
67	Difficult problems can be overcome by hard work and persistence	**0.62**
75	Hard working people will achieve more in the end	**0.61**
27	Failures can make people wise	**0.58**
30	Building the way step by step leads to success	**0.55**
15	Success requires strong willpower	**0.54**
7	One gets from life as much as one puts into it	**0.47**
84	Hard-working people are well rewarded	**0.47**
40	Knowledge is necessary for success	**0.45**
53	Competition brings about progress	**0.41**

Item nr	**Social Complexity**	Item loading
56	Every person is unique	**0.65**
42	A person's behavior is influenced by many factors	**0.62**
23	People may behave unpredictably	**0.54**
11	A situation can change drastically in an unexpected direction	**0.52**
87	A bad situation can suddenly change for the better	**0.46**
20	Human behavior changes with the social context	**0.45**
31	People can suddenly lose everything they have	**0.45**
82	People may have opposite behaviors on different occasions	**0.44**

Item nr	**Fate Control**	Item loading
48	Individual characteristics, such as appearance and birthday, can reveal one's fate	**0.76**
12	Fate determines a person's success in life	**0.68**
78	Fate determines one's successes and failures	**0.66**

21	Matters of life and death are determined by fate	0.66
33	There are ways for people to find out about their fate	0.63
46	The people whom a person will love in his or her life is determined by fate	0.62
5	People's wealth is determined by fate	0.62
35	Major events in people's life can be predicted	0.61
22	There are certain ways to help us improve our luck and avoid unlucky things	0.59
51	Luck can be enhanced by certain tactics	0.58
89	Some people are born lucky	0.58
17	Good luck follows if one survives a disaster	0.58
18	There are many ways for people to predict what will happen in the future	0.58
10	Individual characteristics, such as appearance and birthday, affect one's fate	0.53

Item nr	**Religiosity**	Item loading
85	Religion helps people make good choices for their lives	0.77
38	Religious faith contributes to good mental health	0.74
73	Religion makes people happier	0.71
52	Practicing a religion unites people with others	0.70
54	Religious people are more likely to maintain moral standards	0.65
6	Belief in a religion helps one understand the meaning of life	0.61
64	Religion makes people healthier	0.60
65	There is a supreme being controlling the universe	0.46
95	Evidence of a supreme being is everywhere for those who seek its signs	0.43

As a final step, and to test the parsimonious SASII model, a CFA was conducted for the total sample ($N = 1567$). The fit indices for the parsimonious SASII model for the total sample were χ^2 5,011, $N = 1567$; $df = 1,431$, $p < 0.001$, RMSEA = 0.040, WRMR 2.068, CFI = 0.90 and TLI = 0.90. All factor loadings were significant at the 0.05 level. These findings indicated a reasonably good fit (Van de Schoot et al., 2012). Hence, hypotheses 1 to 3 are accepted. The reliability coefficients were also computed for each factor of the parsimonious SASII model, using Mplus Version 7.11 and specifying maximum likelihood estimation with robust standard errors (MLR) as estimator (Raykov, 2009). The following reliability coefficients were estimated for the parsimonious SASII model: (i) Social Cynicism: $\rho = 0.78$ (0.76, 0.81); (ii) Reward for Application: $\rho = 0.72$ (0.69, 0.75); (iii) Social Complexity: $\rho = 0.66$ (0.62, 0.70); (iv) Fate Control: $\rho = 0.86$ (0.84, 0.87); and (v) Religiosity: $\rho = 0.81$ (0.78, 0.83). Thus, all the social axiom factors of the parsimonious model have fair reliability coefficients (Raykov, 2009). Hypothesis 4 is thus accepted.

Discussion

The new Social Axioms Survey (SASII), developed by Leung et al. (2012), is rooted in qualitative research and Western literature on beliefs (Leung et al., 2002) and, like most other psychological scales, started its development in the West for later application in other cultures (e.g., Cheung, Cheung, Wada, & Zhang, 2003; Costa & McCrae, 1992; Fetvadjiev & Van de Vijver, 2015; Hough & Ones, 2002; Katigbak, Church, Guanzon-Lapeña, Carlota, & Del Pilar, 2002; McCrae et al., 2005; Nel, Valchev, Rothmann, Van de Vijver, Meiring, & De Bruin, 2012). There are two problems with this importation strategy. One, while the definitions of specific constructs are seen as appropriate in the original culture they may not be appropriate in another culture. Two, this may result in certain items inadequately tapping the specific construct in contexts where the instrument is later applied (Cheung, 2004). In this regard, the International Test Commission (2016) provides guidelines for test adaptation and the analyses of adapted tests to allow matches of variables across language and cultural groups. For example, the guidelines suggest that problematic items be improved by utilising content experts from different language backgrounds.

The main objective of this study was therefore to evaluate the validity and reliability of the SASII, as developed by Leung et al. (2012), in South Africa. As part of this objective, the study investigated whether the SASII measures identical social axioms constructs (beliefs) to those contained in the a priori social axiom five-factor structure, on the individual level, in the South African context. South African legislation, such as the Employment Equity Act (No. 47 of 2013), places a direct emphasis on the cultural appropriateness of psychological tests used in South Africa (Paterson & Uys, 2005). Taking into consideration South Africa's multi-cultural population, as well as the emphasis that the Employment Equity Act (No. 47 of 2013) places on the fair and equitable use of tests, it is clear that increased research concerning the cross-cultural applicability of tests is required. According to Paterson and Uys (2005), in order for tests to be cross-culturally applicable the test scores need to be comparable across groups. This indicates that the construct that the test

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intends to measure does not differ across groups. This objective supported the primary goal of the research as presented by Leung et al. (2012).

The sample was a non-probability sample that was selected according to convenience, accessibility and cost effectiveness (Saunders et al., 2009; Terre Blanche & Durrheim, 2002). Limitations were therefore generalisability about the study population (Saunders et al., 2009) and bias (Terre Blanche & Durrheim, 2002). Although the study sample included four African language groups (isiNdebele, isiXhosa, isiZulu and Sepedi) from all of the 11 official South African languages (excluding Afrikaans and English), no groupings were done in the analysis due to the small sample sizes (Kline, 2011).

The initial CFA findings of the SASII exhibited an unacceptable model fit (CFI and TLI < 0.90). According to Wang and Wang (2012), this is not an uncommon result when specifying the model based on a priori theory and empirical findings and then attempting to fit the model to the available data. Considering that South Africa has 11 official languages and measurement instruments are often developed for English speaking groups (Claassen, 1997), Laher (2010) indicated that it is possible that certain item loadings could be ascribed more to the specifics of South African life and culture than to the actual factor being measured. Nine (isiNdebele, isiXhosa, isiZulu, Sepedi, Sesotho, Setswana, siSwati, Xitsonga and Tshivenda) of the 11 official South African languages (excluding Afrikaans and English) are part of the 1 436 Bantu languages spoken in Africa. In South Africa, approximately 78% of the total population speaks a Bantu language as their mother tongue (Williamson & Blench, 2000). It is laborious to translate certain native African (collective) terminology to Eurocentric (individualistic) terminology, as languages are culturally and epistemologically encumbered. There is a definite link between language and cultural values and beliefs (Fasold, 1990). In addition, certain African languages have restricted lexicon to describe emotions (Brand, 2004). According to Meiring et al. (2005), a participant's English language proficiency definitely influences their understanding of specific words and the interrelationships between words, the context, the comprehension of phrases and grammatical expressions, duplicate

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meanings and qualifying words. Certain words, concepts, phrases or terms could be unfamiliar to participants who speak a Bantu language as their mother tongue. In addition, some words may have different meanings in different languages and could thus be wrongly interpreted. Finally, the lack of applicable terms in the Bantu language groups may make interpretation of items difficult (Nel, 2008). It is therefore possible that the English language proficiency of the South African participants in this study could be one of the reasons why specific SASII items had loadings lower than 0.30. This should be considered in future research in South Africa. This notion is supported by Leung et al. (2012), who stated that scales developed in the West and applied in other cultural contexts may be problematic as far as the definition of the construct is concerned. Although the definition may be suitable in the original culture, it could be inappropriate in another culture, causing certain items to not be able to adequately tap the relevant construct (Cheung, 2004). Accordingly, Daouk-Öyry, Zeinoun, Choueiri and Van de Vijver (2016) argued that the general paradigm applied with the design of cross-cultural comparability and psychometric strictness, has made inferences which may not be relevant to less studied cultures. Thus, taking into consideration the unacceptable CFA findings, and that it is quite common when specifying the model based on a priori theory and empirical findings, and then attempting to fit the model to the available data using CFA, and the impact of language on items, the SASII model was redefined to create a more parsimonious model (Wang & Wang, 2012).

Given that certain items may not perform adequately in all cultures (Leung et al., 2012), the arguments above regarding language, as well as the complexity of the five-factor structure of the SASII model an EFA was conducted as an exploratory step. The EFA was conducted using only the items of each of the individual factors with an item loading > 0.30 to obtain acceptable fit indices (CFI = 0.91 and TLI = 0.90). According to Wang and Wang (2012) including fewer items per factor can sometimes lead to a better model fit. This was the case in this study as the CFA fit indices exhibited an improved model fit (TLI and CFI = 0.89), considering the complexity of the SASII model. Lastly, by improving on the CFA to form a more parsimonious SASII model (Wang & Wang, 2012), item 96 ("Young people are impulsive and unreliable") was excluded because it had high modification indices

(MI) values for factor 2 (MI = 85.17), factor 3 (MI = 90.13) and factor 5 (MI = 42.60). In addition, an error of co-variance was also allowed between item 65 ("There is a supreme being controlling the universe") and item 95 ("Evidence of a supreme being is everywhere for those who seek its signs") of the factor Religiosity. This last step in formulating the parsimonious SASII model was considered justified as the impact caused by the participants' English language proficiency and their understanding of specific words and the interrelationships between words, the context, the understanding of phrases and double meanings and qualifying words could not be ignored (Meiring, et al., 2005). For example, participants may have been unable to distinguish between the implied existence of a supreme being found in item 65 and the actual evidence of a supreme being found in item 95. In conclusion, a reasonable model fit (TLI and CFI = 0.90) was achieved, contributing towards previous research findings reported by Leung et al. (2012). These authors argued that, considering the complexity of the SASII model, a CFI = 0.89 is considered a reasonably good fit.

It was taken for granted that the a priori model of the SASII is theoretically sound, but also similar enough to the exploratory parsimonious SASII model that was obtained in this study (Wang & Wang, 2012).Given the complexity of the SASII model, the CFA results suggested a reasonably good fit (Van de Schoot et al., 2012) for the parsimonious SASII model. Thus this study provided support for the new version of the SASII as developed by Leung et al. (2012) in a South African sample.

Limitations of the Study

Several limitations were identified in this study. The first limitation was that the sample consists of university students, their family members and friends and this restricts the generalisability of the findings. An assumption of English language proficiency of these third year English medium university students and their family members and friends was also made. The second limitation was that the SASII questionnaire is a self-report measure, and this could have caused ordinary method variance (Richardson, Simmering, & Sturman, 2009). However, according to Doty and Glick (1998) and Johnson, Rosen, and Djurdjevic (2011), ordinary method

variance is seldom sufficient reason to invalidate results. The third limitation was that the data collection technique could have caused ordinary method bias. Method bias refers to the exaggerated relations when research participants respond to questionnaires that have been confirmed by previous research, raising concerns over artificially increased relations (Avey, Luthans, & Jensen, 2009). The fourth limitation in this study was that the research design did not permit any interpretations of causal relations between the variables. Lastly, data can be analysed in multiple ways, each of which could yield legitimate answers using programs such as SAS, Stata and SPSS. All analyses have been executed with Mplus, which allows for sophisticated analyses of the internal structure and allows for sophisticated analyses of measurement equivalence. However, it is this very strength of Mplus that can sometimes be viewed as a weakness.

Conclusion

The results of this study support the new version of the SASII (Leung et al., 2012) for use in the South African context. There are, however, limitations found in this study that should be addressed in future research. First, future research should include a larger number of black South Africans in the sample to address the generalisability of the results and to allow language grouping (i.e., Bantu language groups). Second, future research should focus on structural and scalar equivalence by testing for full measurement invariance (MI) of the SASII related to configural, weak (metric) and strong (scalar) measurement invariance. Future research must also assess the variance between and within groups. Furthermore, the empirical and theoretical support for the new version of the Social Axioms Survey needs to be validated through differentiated relationships with other models such as, for example, the Big-Five personality factors (FFM), to explore the nomological network of the SASII model. Third, individual item descriptions of each factor with low factor loadings (< 0.30), need to be rephrased in an attempt to capture more adequately the relevant construct. Fourth, problematic items, such as item 96 ("Young people are impulsive and unreliable") with high modification indices and items with error of covariance, such as item 65 ("There is a supreme being controlling the universe") and item 95

("Evidence of a supreme being is everywhere for those who seek its signs") need to be rephrased to form new items. These items should have improved descriptions to tap the relevant construct more adequately. Finally, these findings are indications for the path of future research on social axioms and support the findings of Singelis et al. (2009, p. 90) on the SAS who stated that "those wishing to use this instrument may wish to explore the possibility of adding additional items in a given cultural setting to bolster the internal consistency of the belief dimensions measured".

References

Avey, J. B., Luthans, F., & Jensen, S. (2009). Psychological capital: A positive resource for combating stress and turnover. *Human Resource Management, 48*, 677-693. doi: 10.1002/hrm.20294.

Babbie, E., & Mouton, J. (2009). *The practise of social research*. Cape Town, SA: Oxford University Press.

Barnard, A., Meiring, D., & Rothman, S. (2008). The cross-cultural application of the Social Axioms Survey in the South African Police Service. *South African Journal of Industrial Psychology, 34(2)*, 1-9.

Bar-Tal, D. (1990). *Group beliefs: A conception for analysing group structure, processes, and behavior*. New York, NY: Springer-Verlag.

Bem, D. J. (1970). *Beliefs, attitudes, and human affairs*. Belmont, CA: Brooks/Cole.

Bond, M. H., Leung, K., Au, A., Tong, K., & Chemonges-Nielson, Z. (2004). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18(3)*, 177-191. doi: 10.1002/per.509.

Bond, M. H., Leung, K., Au, A., Tong, K., Reimel de Carrasquel, S., Murakami, F., … Lewis, J. R. (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology, 35(5)*, 548-570. doi: 10.1177/002202210426838.

Brand, G. W. (2004). 'English only'? Creating linguistic space for African indigenous knowledge systems in higher education. *South African Journal of Higher Education, 18(3)*, 27-39.

Brislin, R. W. (1994). *Improving intercultural interaction: Modules for cross-cultural training programs*. Thousand Oaks, CA: Sage.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NHY: The Guilford Press.

Burgess, S. M. (2011). Social axioms: A new culture measure for South African business research. *South African Journal of Business Management 42(3)*, 1-21.

Chen, S. X., Bond, M. H., & Cheung, F. M. (2006). Personality correlates of social axioms: Are beliefs nested within personality? *Personality and Individual Differences, 40*, 509-519. doi: org/10.1016/j.paid.2005.04.016.

Cheung, F. M. (2004). Use of Western and indigenously developed personality tests in Asia. *Applied Psychology: An International Review, 53(*2), 173-191. doi: 10.1111/j.1464-0597.2004.00167.x.

Cheung, F. M., Cheung, S. F., Wada, S., & Zhang, J. (2003). Indigenous measures of personality assessment in Asian countries: A review. *Psychological Assessment, 15(3)*, 280–289. doi: org/10.1037/1040-3590.15.3.280.

Cheung, M. W. L., Leung, K., & Au, K. (2006). Evaluating multilevel models in cross-cultural research: An illustration with social axioms. *Journal of Cross-Cultural Psychology, 37*, 522-541. doi: 10.1177/0022022106290476.

Chiu, C. (2014). What culture could be? *Journal of Cross-Cultural Psychology, 45*(1), 3-4.

Claassen, N. C. W. (1997). Culture differences, politics and test bias in South Africa. *European Review of Applied Psychology 47*, 297-307.

Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

Daouk-Öyry, L., Zeinoun, P., Choueiri, L., & Van de Vijver, F. J. R. (2016). Integrating global and local perspectives in psycholexical studies: A GloCal approach. *Journal of Research in Personality 62, 19–28*. doi: org/10.1016/j.jrp.2016.02.008.

Doty, D. H., & Glick, W. H. (1998). Common method bias: Does common method bias variance really bias results? *Organizational Research Methods, 1*, 374-406. doi: 10.1177/109442819814002.

Employment Equity Act (2013). *Employment Equity Act, No. 47 of 2013*. Republic of South Africa. http://www.labour.gov.za/docs/legislation/eea/act98-055.html. Accessed on 28 September 2014.

Fasold, R. (1990). *The sociolinguistics of language*. Oxford, UK: Basil Blackwell.

_____

Ferreira, R. (Ed). (2016). *Psychological assessment: Thinking innovatively in contexts of diversity*. Cape Town, SA: Juta.

Fetvadjiev, V. H., & Van de Vijver, F. J. R. (2015). Universality of the five factor model of personality. In J. D. Wright (Ed.), *International encyclopaedia of the social & behavioural sciences* (2nd ed, vol 9; pp. 249-253). Oxford, UK: Elsevier.

Habib, A., & Bentley, K. (Eds). (2008). *Racial redress and citizenship in South Africa*. Cape Town, SA: HSRC Press South Africa.

Hair, J. F. Jnr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis (5th ed.)*. Englewood Cliffs, NJ: Prentice-Hall.

Hair, J. F., Black, W. C., Babin, B.J., & Anderson, R. E. (2010). *Multivariate data analysis (7th ed.)*. Upper Saddle River, NJ: Prentice-Hall.

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.

Hough, L. M., & Ones, D. S. (2002). The structure, measurement, validity, and use of personality variables in industrial work, and organizational psychology. In N. Anderson, D. Ones, H. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work & organizational psychology: Vol. 1* (pp. 233–277). London, UK: Sage.

International Test Commission. (2016). *The ITC guidelines for translating and adapting tests (2nd ed).* [www.InTestCom.org]. Accessed on 28 September 2016.

Johnson, R. E., Rosen, C. C., & Djurdjevic, E. (2011). Assessing the impact of common method variance on higher-order multidimensional constructs. *Journal of Applied Psychology, 96(4)*, 744-761. doi: org/10.1037/a0021504.

Katigbak, M. S., Church, A. T., Guanzon-Lapeña, M. A., Carlota, A. J., & Del Pilar, G. H. (2002). Are indigenous dimensions culture-specific? Philippine inventories and the five-factor model. *Journal of Personality and Social Psychology, 82(1)*, 89-101. doi: org/10.1037/0022-3514.82.1.89.

Khan, J. H. (2006). Factor analysis in counselling psychology research, training and practice: Principles, advances and applications. *The Counselling Psychologist, 34(5)*, 684-718. doi: 10.1177/0011000006286347.

_____

Kline, R. B. (2011). *Principles and practice of structural equation modeling (3rd ed.).* New York, NY: The Guilford Press.

Kluckhohn, F., & Strodtbeck, F. (1961). *Variation in value orientations.* Evanston, IL: Row, Peterson.

Kurman, J. (2011). What I do and what I think they would do: Social axioms and behaviour. *European Journal of Personality, 25*, 410-423. doi: 10.1002/per.8.

Kurman, J., & Ronen-Eilon, C. (2004). Lack of knowledge of a culture's social axioms and adaptation difficulties among immigrants. *Journal of Cross-Cultural Psychology, 35(2)*, 192-208. doi: 10.1177/0022022103262244.

Laher, S. (2010). Using exploratory factor analysis in personality research: Best-practice recommendations. *South African Journal of Industrial Psychology, 36(1)*, 1-7.

Leung, K. (1989). Cross-cultural differences: Individual-level vs. culture-level analysis. *International Journal of Psychology, 24*, 703-719. doi: 10.1080/00207598908247840.

Leung, K., Au, A., Huang, X., Kurman, K., Niit, T., & Niit, K. (2007). Social axioms and values: A cross-cultural examination. *European Journal of Personality, 21(2)*, 91-111. doi: 10.1002/per.615.

Leung, K., & Bond, M. H. (1989). On the empirical identification of dimensions for cross-cultural comparisons. *Journal of Cross-Cultural Psychology, 20*, 192-208. doi: 10.1177/0022022189202002.

Leung, K., & Bond, M. H. (2004). Social axioms: A model of social beliefs in multi-cultural perspective. *Advances in experimental social psychology, 36,* 119-197. San Diego, CA: Elsevier Academic Press. doi: org/10.1016/S0065-2601(04)36003-X.

Leung, K., & Bond, M. H. (2008). Psycho-logic and eco-logic: Insights from social axiom dimensions. In F. van de Vijver, D. van Hemert, & Y. P. Poortinga (Eds.), *Individuals and cultures in multilevel analysis* (pp. 197-219). Mahwah, NJ: Erlbaum.

Leung, K., & Bond, M. H. (Eds). (2009). *Psychological aspects of social axioms: Understanding global belief systems.* New York, NY: Springer.

_____

Leung, K., Bond, M. H., Reimel de Carrasquel, S., Munoz, C., Hernandez, M., Murakami, F., … Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33(3)*, 286-302. doi: 10.1177/0022022102033003005.

Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., Gornick, L. J., Amponsah, B., … Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the five factor model of personality. *Journal of Cross-Cultural Psychology, 43(5)*, 833-857. doi: 10.1177/0022022111416361.

Lonner, W. J., & Malpass, R. S. (1994). *Psychology and culture.* Boston, MA: Allyn & Bacon.

Marsh, H. W., Muthen, B., Asparouhov, T., Ludtke, O., Robitzsch, A., Morin, A. J. S., & Trautwein, U. (2009). Exploratory structural equation modeling, Integrating CFA and EFA: Application to students' evaluations of university teaching. *Structural Equation Modeling, 16*, 439-476. doi: 10.1080/10705510903008220.

Marsh, H. W., Muthen, B, Morin, A. J. S., Ludtke, O., Asparouhov, T., Trautwein, U., & Nagengast, B. (2010). A new look at the big 5 structure through exploratory structural equation modeling. *Psychological Assessment 22(3)*, 471-491. doi: org/10.1037/a0019227.

McCrae, R. R., Terracciano, A., & Members of the Personality Profiles of Cultures Project. (2005). Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology, 88(3)*, 547-561. doi: org/10.1037/0022-3514.88.3.547.

Meiring, D. (2006). *The development of a Situational Judgement Test (SJT) for the South African Police Service.* Paper presented at the 26th Annual Conference of the Assessment Centre Study Group, Spier Convention Centre, March 22-23, Stellenbosch, South Africa.

Meiring, D. (2007). *Bias and equivalence of psychological measures in South Africa.* Unpublished doctoral thesis, University of Tilburg, Tilburg, The Netherlands.

Meiring, D., Van de Vijver, F. J. R., Rothmann, S., & Barrick, M. R. (2005). Construct, item, and method bias of cognitive and personality tests in South

Africa. *South African Journal of Industrial Psychology, 31(1)*, 1-8. doi: 10.4102/sajip.v31i1.182.

Muthen, L. K., & Muthen, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthen & Muthen.

Nel, J. A. (2008). *Uncovering personality dimensions in eleven different language groups in South Africa: An exploratory study.* Unpublished doctoral thesis, North West University, Potchefstroom, South Africa.

Nel, P. S., Gerber, P. D., Van Dyk, P. S., Haasbroek, G. D., Schultz, H. B., Soho, T., & Werner, A. (2001). *Human resources management* (5th ed.). Cape Town, SA: Oxford University Press Southern Africa.

Nel, J. A., Valchev, V. H., Rothmann, S., Van de Vijver, F. J. R., Meiring, D., & De Bruin, G. P. (2012). Exploring the personality structure in the 11 languages of South Africa. *Journal of Personality, 80(4)*, 915-948. doi: 10.1111/j.1467-6494.2011.00751.x.

Nunnally, J. C. (1967). *Psychometric theory*. New York, NY: McGraw Hill.

Paterson, H. & Uys, K. (2005). Critical issues in psychological test use in the South African workplace. *South African Journal of Industrial Psychology, 31(3)*, 12-22.

Raykov, T. (2009). Evaluation of scale reliability for unidimensional measures using latent variable modeling. *Measurement and Evaluation in Counseling and Development, 42*, 223‑232. doi: 10.1177/0748175609344096.

Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three paradigms: Examining post hoc statistical corrections for common method variance from three divergent perspectives. *Organizational Research Methods, 12*, 687-694. doi: 10.1177/1094428109332834.

Rokeach, M. (1973). *The nature of human values*. New York, NY: Free Press.

Rothmann, S., & Cilliers, F. V. N. (2007). Present challenges and some critical issues for research in industrial/organisational psychology in South Africa. *South African Journal of Industrial Psychology, 33(1)*, 8–17.

Saunders, L., Lewis, P., & Thornhill, A. (2009). *Research methods for business students (5th ed.)*. Harlow, UK: Pearson Education.

_____

Scholtz, L. (2004). *Waardes, houdings, identiteitsbelewenisse en stres in die Suid-Afrikaanse Film- en Dramabedryf* [Values, attitudes, identity experiences and stress in the South African film and drama industry]. Unpublished Doctoral Thesis, North West University, Potchefstroom, South Africa.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology, 25,* 1–65. New York, NY: Academic Press. doi: org/10.1016/S0065-2601(08)60281-6.

Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of Human Values? *Journal of Social Issues, 50*, 19-45. doi: 10.1111/j.1540-4560.1994.tb01196.x.

Schwartz, S. H. (2011). Values: Individual and cultural. In S. M. Breugelmans, A. Chasiotis, & F. J. R. van de Vijver (Eds.). *Fundamental questions in cross-cultural psychology* (pp. 463-493).Cambridge, UK: Cambridge University Press.

Schwartz, S. H. (2012). Toward refining the theory of basic human values. In S. Salzborn, E. Davidov & J. Reinecke (Eds.), *Methods, Theories, and Empirical Applications in the Social Sciences* (pp. 39-46). Wiesbaden: Springer Fachmedien. doi:10.1007/978-3-531-18898-0_6.

Schwartz, S. H. (2014a). Rethinking the concept of societal culture in light of empirical findings. *Journal of Cross-Cultural Psychology, 45(1)*, 5-13. doi: 10.1177/0022022113490830.

Schwartz, S. H. (2014b). Societal value culture: Latent and dynamic. *Journal of Cross-Cultural Psychology, 45(1)*, 42-46. doi: 10.1177/0022022113513404.

Schwartz, S. H., & Bilsky, W. (1990). Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology, 58*, 878–891. doi: org/10.1037/0022-3514.58.5.878.

Schwartz, S. H., Melech, G., Lehmann, A., Burgess, S., Harris, M., & Owens, V. (2001). Extending the cross-cultural validity of the theory of basic human values with a different method of measure. *Journal of Cross-Cultural Psychology, 32*, 519-542. doi: 10.1177/0022022101032005001.

Shaughnesssy, J. J., & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York, NY: McGraw-Hill.

Singelis, T. M., Bhawuk, D. P. S., Gabrenya, W. K. Jnr, Gelfand, M., Harwood, J., Her, P., … Vandello, J. (2009). Exploring ethnic group and geographic differences in social axioms in the USA. In K. Leung, & M. H. Bond (Eds), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 81–93). New York, NY: Springer.

Singelis, T. M., Hubbard, C., Her, S., & An, S. (2003). Convergent validation of the social axioms survey. *Personality and Individual Differences, 34(2)*, 269-282. doi:10.1016/S0191-8869(02)00043-0.

Social Axioms Project. Social Axioms Survey II. Retrieved April 9, 2011, from: http://personal.cityu.edu.hk/~mgkleung/sa.htm#Download.

SPSS 23.0 [Computer software] (2015). Chicago, IL: SPSS Incorporated.

Statistics South Africa. (2012). *Census 2011*. Pretoria, SA: Statistics South Africa.

Terre Blanche, M., & Durrheim, K. (2002). *Research in practice: Applied methods for the social sciences*. Cape Town, South Africa: University of Cape Town Press.

Triandis, H. C. (1994). *Cultural and social behaviour*. New York, NY: McGraw-Hill.

Van de Schoot, R., Lugtig, P., & Hox. J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9(4)*, 486-492. doi: org/10.1080/17405629.2012.686740.

Van de Vijver, A. J. R., & Leung, K. (2001). Personality in cultural context: Methodological issues. *Journal of Personality, 69*, 1007–1031. doi: 10.1111/1467-6494.696173.

Wang, J., & Wang, X. (2012). *Structural Equation Modeling. Applications using Mplus*. West Sussex, UK: John Wiley & Sons.

Williamson, K., & Blench, R. (2000). Niger-Congo. In B. Heine, & D. Nurse (Eds.), *African languages: An introduction* (pp. 11-42). Cambridge, UK: Cambridge University Press.

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CHAPTER 3:

3.1 MANUSCRIPT 2

Measurement Invariance of Social Axioms in South Africa

Abstract

Testing for measurement invariance (MI) is a precondition for conducting cross-cultural or cross-group estimations and is necessary to inform improved development of culturally relevant measuring instruments. The objective of this study was to test for MI of the five-factor structure of social axioms as measured by the SASII parsimonious model across male and female groups in a South African sample (N=1567). Results indicated that the SASII parsimonious model, as baseline configural model, achieved an acceptable fit, thus indicating that the number of factors and the factor structure of the SASII are the same across groups. However, only partial metric invariance was obtained and scalar invariance could not be achieved. Results indicated that male and female respondents did not have the same understanding of certain latent constructs and that some items did not have the same meaning for male and female groups. Males and females also differed significantly in terms of their levels of trust on the SASII's Social Cynicism, Social Complexity and Religiosity scales. Such evidence is noteworthy considering the stringent and rigorous testing and the complexity of the SASII five-factor model. Areas of improvement of the SASII parsimonious model are noted to achieve better fit for invariance testing.

Keywords: social axioms, measurement invariance, configural invariance, metric invariance, scalar invariance, validation

Multi-item surveys are often used to examine scores on latent factors such as values, attitudes and behaviour. These studies frequently include comparisons between groups or countries (Van de Schoot, Schmidt, & De Beuckelaer, 2015). Thus, checking for measurement invariance (MI) is an important prerequisite for conducting cross-cultural or cross-group juxtapositions. In addition, it is important for directing the development of improved culturally appropriate measuring instruments (Van de Schoot, Lugtig, & Hox, 2012; Vandenberg & Lance, 2000) as propagated by the guidelines for test adaptation of studies and the subsequent analyses of these studies to allow comparisons across language and cultural groups (International Test Commission, 2016).

Although the initial goal of this study was to test the MI of social axioms as measured by the parsimonious Social Axioms Survey (SASII) model (Barnard, Meiring, Rothman, & Zondervan-Zwijnenburg, manuscript in preparation) across cultural groups in a South African sample, the convenience samples obtained for black, coloured and Indian groups (see Table 1) were considered too small for multiple group analyses (e.g., Kline, 2011; Wang & Wang, 2012). Thus, the main goal of this study is to test the SASII for MI across gender (male and female) groups. The secondary goal is to contribute towards existing research (e.g., Malham & Saucier, 2014) by reporting on the configural invariance related to the five-factor structure of social axioms across male and female groups (Vandenberg & Lance, 2000). Third, the study aims to report on the metric invariance as indicated by the factor loadings on the five social axiom latent factors across male and female groups (e.g., Spini, 2003). Fourth, by reporting on the scalar invariance (structural invariance) that imposed equality constraints on the intercept of each of the respective indicators across male and female groups, the study aims to allow comparisons of the social axioms' five factors' means between male and female groups by indicating whether the five social axiom factors have matching scales of origin (Fischer & Lun, 2008). Lastly, by reporting on the full invariance, which imposed equality constraints on the error variance of each of the respective indicators across male and female groups, the study aims to determine whether male and female group dissimilarities are related to the differences on the five latent social axiom factors (Chen, 2007).

Testing for MI involves running various increasingly constrained structural equation models to test whether there are statistically significant differences between these models (Van de Schoot et al., 2012).

According to Van de Schoot et al. (2015), a large number of studies examining the MI of survey scales have demonstrated that it is very difficult to achieve strict MI, where measurement parameters are precisely equivalent (i.e., enforced to zero tolerance related to deviations) across groups. Researchers frequently intentionally disregard MI and make comparisons of latent factor means between groups despite the fact that the psychometric properties to conduct such comparisons were not found (i.e., MI was not achieved). However, if MI is not demonstrated this means that respondents did not have the same understanding of the survey items. Consequently, no valid comparisons between latent factor means are possible (Van de Schoot et al., 2015).

When conducting comparisons between groups through MI studies, an absence of bias is assumed for valid group comparisons (Kankaraš & Moors, 2010). According to Van de Vijver and Leung (1997b), bias refers to all nuisance factors that can cause invalid cross-cultural comparisons. It is essential that appropriate actions are taken to control for bias as an important first step in investigating cultural group comparisons. In this regard, the potential bias caused by not demonstrating MI hinders valid comparisons of latent factor means (Van de Schoot et al., 2015).

To estimate MI in a multi-group measurement model, the researcher looks for the fit between the data obtained from two or more samples to be equal across groups through three steps. Step one, no parameters are constrained to be equal across groups. Step two, equality constraints are imposed on some of the parameters. Step three, all parameters are constrained. If the observed measurements are directly comparable between the different groups, full or complete MI has been achieved (Dunbar, Theron, & Spangenberg, 2011).

Cieciuch, Davidov, Vecchione, Beierlein, and Schwartz (2014) tested for MI in values to direct the development of the Portrait Values Questionnaire's fifth experimental version (PVQ-5X) measuring instrument and provided some support for MI. According to Malham and Saucier (2014), studies on values have provided positive ways to improve the Social Axioms Survey (SAS). Considering that social axioms add predictive power to the power provided by values (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung, Au, Huang, Kurman, Niit, & Niit, 2007) and that they contributed towards the understanding of social functioning by capturing important aspects of culture not reflected in values, as well as the fact that the structure underlying social axioms has been recognised in various cultural groups with different backgrounds (Kurman & Ronen-Eilon, 2004; Leung et al., 2002), Malham and Saucier (2014) tested for MI in social axioms to direct the culturally appropriate development of a shortened (30 items) version of the SAS (Leung et al., 2012).

The five social axiom factors have been described by Malham and Saucier (2014, p. 1046) as follows:

> *Social cynicism* refers to a negative view of human nature, a bias against some social groups, general distrust towards social institutions, and the beliefs that power is corrosive to moral standards and that people are unscrupulous in the pursuit of their goals. *Social complexity* refers to the belief that there are many ways to solve a problem and that people change their behavior to adapt to situations and circumstances. *Reward for application* (RA) refers to the belief that hard work and careful planning are rewarded with positive outcomes. *Religiosity/spirituality* (RE) refers to a belief in the existence of supernatural entities and a belief that traditional religiousness has a positive effect on society. *Fate control* (FC) is the belief that fate influences life outcomes but that it, in turn, can be predicted and influenced.

Data collected since 2002 (Leung et al., 2002) from participating national/cultural groups addressing structural equivalence and item bias across cultural groups provides compelling support for the general applicability of the five-factor structure of social axioms (e.g., Bond, Leung, Au, Tong, Reimel de Carrasquel et al., 2004; Leung & Bond, 2009) as measured by the SAS. The data also provides evidence for the general applicability of the SAS across cultures (Leung et al., 2012; Social Axioms Project, 2011). In 2014 Malham and Saucier investigated the measurement invariance of social axioms in 23 countries and obtained only conservative proof for factorial invariance that supported a five-factor model of social axioms. Their findings indicated that although some general cross-cultural applicability for the five-factor structure of social axioms exists, only modest loadings could be achieved and there is thus a need for further development and refinement of the SAS (Malham & Saucier, 2014). Barnard et al. (manuscript in preparation) developed a parsimonious model for the Social Axioms Survey, referred to as the SASII, and reported reasonable fit indices in a South African sample considering the complexity of the social axioms' five-factor structure. Thus, to contribute towards the growing body of literature on social axioms and the cross-cultural applicability of the construct, the goal of this study is to test the SASII model (Barnard et al., manuscript in preparation) for MI across male and female groups in a South African sample.

Bias

When groups are compared in multi-group research, it is assumed that there is no bias present for the group comparisons to be valid (Kankaraš & Moors, 2010). Hence, controlling for bias is an important prerequisite for investigating cultural groups (Meiring, 2007). According to Van de Vijver and Poortinga (1997) bias does not occur as a result of the intrinsic properties of the measuring instrument, but rather occurs as a result of the characteristics and traits of the respondents from different ethnic backgrounds who complete the specific instrument.

The three main types of bias that can materialise are construct bias, method bias and item bias. Construct bias occurs when the construct that is being measured is

found to not be equal across groups. Method bias occurs when cultural factors influence most or all of the items in the instrument. Item bias is caused by specific items' idiosyncrasies in the questionnaire (Byrne & Watkins, 2003; Meiring, 2007; Van de Vijver & Leung, 1997a; Van de Vijver & Poortinga, 1997; Van de Vijver & Tanzer, 2004). When testing for MI it is important to note that method and item bias can influence both metric and scalar invariance (Van de Vijver & Leung, 1997a).

Measurement invariance

Horn and McArdle (1992, p. 117) defined measurement invariance as "whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attribute". Testing of MI related to multi-group confirmatory factor analysis (MGCFA) has gained momentum over the last decade (Meade & Bauer, 2007) and numerous articles have been published (Van de Schoot et al., 2015). In addition, MGCFA (e.g., Bollen, 1989; Jöreskog, 1971) is commonly used as a method to investigate MI and mainly involves the setting of cross-group constraints and thereafter juxtaposing the more restricted models with the less restricted models (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998). According to Van de Vijver and Leung (1997a), the three primary levels of MI that are of interest in cross-cultural research are configural, metric, and scalar invariance.

Configural invariance is the most basic level of invariance testing and is also a requirement for all following levels of MI tests (Malham & Saucier, 2014; Thomas, Abts, & Vander Weyden, 2014). Configural invariance indicates that the number of factors are the same and that the various models have the same factor structure across groups (Horn & McCardle, 1992; Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000). Configural invariance (also known as factorial invariance), therefore requires that factor loadings of indicators on their respective latent factors are equal (i.e., have the same pattern of salient and non-salient factor loadings) across groups (e.g., Cieciuch, et al., 2014; Spini, 2003). If configural invariance is achieved this means that the same latent factors are being measured

by the relevant indicators across groups and that the content of the latent factors is well matched (Malham & Saucier, 2014). Thus, the factor measures the same constructs in each group (Thomas et al., 2014).

Metric invariance indicates that the factor loadings are constrained to be equal across groups and is a prerequisite for comparing factor covariance or unstandardized regression coefficients across groups (Cieciuch et al., 2014; Thomas et al., 2014). It tests whether respondents from different groups have the same understanding of the latent construct being studied (Van de Schoot et al., 2012). If metric invariance is present it indicates that a construct has the same metric as well as meaning across groups (Cieciuch et al., 2014; Thomas, et al., 2014), taking cognisance of the fact that it can be influenced by both method and item bias (Van de Vijver & Leung, 1997a).

Scalar invariance imposes equality constraints on the intercept of each indicator (i.e., indicator intercepts are constrained to be equal) across groups (Cieciuch et al., 2014). It allows for comparisons of construct means across groups and indicates that factors have the same scale as well as the same origin (Fischer & Lun, 2008). Scalar invariance also indicates that the scales are being used in a similar way in each of the groups (Cieciuch et al., 2014; Thomas, et al., 2014). Scalar invariance can be affected by both method and item bias (Van de Vijver & Leung, 1997a).

Full invariance (metric and scalar) imposes equality constraints on the error variance of each indicator across groups and is achieved when the parameters of all appropriate indicators are constrained to be equal across groups (i.e., metric loadings and loadings plus intercepts at the scalar level of measurement) is acceptable (Cieciuch, et al., 2014; Malham & Saucier, 2014). Full invariance is also an indication of group differences that can be ascribed to differences on the latent factors (Chen, 2007). However, some researchers (e.g., Byrne et al., 1989; Steenkamp & Baumgartner, 1998) have argued that it is possible to make meaningful comparisons between groups if only partial scalar invariance (metric and scalar) is achieved. Hence, partial invariance is achieved when the parameters of not

less than two of the indicators (i.e., metric loadings and loadings plus intercepts at the scalar level of measurement) are constrained to be equal across groups (Cieciuch, et al., 2014).

According to Van de Schoot et al. (2012), self-report questionnaires such as the SASII are frequently utilised in research within the social and behavioural sciences to measure and explain various aspects of human behaviour. These questionnaires invariably consist of items that are conceptualised as measuring an underlying latent construct with the aim of conducting longitudinal studies or comparing groups (Van de Schoot et al., 2012). Consequently this study aims to evaluate measurement invariance and measurement equivalence according to a MGCFA framework by investigating the measurement invariance (configural, metric, and scalar invariance) of social axioms as measured by the SASII parsimonious model (Barnard et al., manuscript in preparation) across male and female groups in a South African sample.

Aim and Hypotheses

The purpose of this study is to contribute towards previous research efforts (e.g., Malham & Saucier, 2014) by testing the measurement invariance of the SASII parsimonious model (Barnard, et al., manuscript in preparation) across male and female groups in a South African sample.

Following the analytical strategy and based on the literature review, the following hypotheses were tested in this study:

- Hypothesis 1: The configural invariance test on the SASII parsimonious model has an acceptable fit, indicating that the number of factors are the same and the scale has the same factor structure across male and female groups;
- Hypothesis 2: The metric invariance test on the SASII parsimonious model indicates that respondents from male and female groups have the same understanding of the latent construct being studied;

- Hypothesis 3: The scalar invariance test on the SASII parsimonious model has an acceptable fit allowing for comparisons of construct means across male and female groups; and

- Hypothesis 4: The full invariance (metric and scalar) test on the SASII parsimonious model indicates that differences between male and female groups can be ascribed to differences on the SASII latent factors.

Method

Research Design

A cross-sectional survey design was used to achieve the research objectives. The design made use of a survey questionnaire, the parsimonious SASII model (Barnard et al., manuscript in preparation), to collect the data. This data was then analysed using descriptive and inferential statistics (Saunders, Lewis, & Thornhill, 2009). A cross-sectional survey designs was selected due to its ability to assess the interrelationships between factors in a population (Saunders et al., 2009) and to address the descriptive and predictive functions associated with the correlational design and the examination of links between variables (Shaughnessy & Zechmeister, 1997).

An empirical study was conducted using primary quantitative data (Babbie & Mouton, 2001). Basic research with the purpose of expanding knowledge (Saunders et al., 2009) of social axioms, as measured by parsimonious SASII model (Barnard et al., manuscript in preparation), was undertaken on the individual level within the South African context to contribute towards the development of social axiom theory (Terre Blanche & Durrheim, 2002). Configural invariance (Vandenberg & Lance, 2000), metric invariance (e.g., Spini, 2003), scalar invariance (structural invariance; Fischer & Lun, 2008), and full invariance (Chen, 2007) analyses were conducted.

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Sampling consisted of non-probability samples that were selected according to convenience, accessibility and cost effectiveness (Terre Blanche & Durrheim, 2002; Saunders et al., 2009).

Participants

The study population ($N = 1567$) was drawn from a sample of university students ($N = 793$) and their family members and friends ($N = 645$) (129 missing values). In terms of race, the majority were white (66%; $N = 972$), 15% were black ($N = 237$), 6% were coloured ($N = 93$) and 5% were Indian ($N = 82$) (183 missing values). In terms of gender, the majority were female (59%; $N = 914$) and 41% ($N = 643$) were male (10 missing values). The ages of the participants varied from below 20 years to above 60 years with the majority (51%; $N = 830$) of respondents being between the ages of 21 and 30 years. Missing data was less than 6% and random. Table 1 shows the characteristics of the participants ($N = 1567$).

Table 1

Characteristics of Participants (N = 1567)

Item	Category	Frequency	Percentage
Gender	Male	643	40.7%
	Female	914	58.9%
	Missing values	10	0.5%
Age	Below 20	305	22.5%
	21 – 30	830	51.0%
	31 – 40	99	4.0%
	41 – 50	127	9.1%
	51 – 60	117	8.4%
	Over 60	30	2.3%
	Missing values	59	2.8%
Race	White	972	66.4%
	Black	237	15.1%
	Coloured	93	5.9%
	Indian	82	5.2%
	Missing values	183	8.3%
Participant	University Student	793	55.8%
	Not University Student	645	38.3%
	Missing values	129	5.9%

Measuring instrument

The parsimonious SASII model as developed by Barnard et al. (manuscript in preparation) was used in this study. The parsimonious SASII model (Barnard et al., manuscript in preparation) required respondents to rate on a five-point Likert scale the degree to which they believe each of the items to be true. The scale ranged from 1 (*strongly disbelieve*) to 5 (*strongly believe*). Five social axiom factors were included. The scale consisted of 17 Social Cynicism items, 9 Reward for Application items, 6 Social Complexity items, 15 Fate Control items, and 9 Religiosity items. All of the items had loadings higher than 0.40 on the relevant factors (Barnard et al., manuscript in preparation, Table 3). The fit indices reported by Barnard et al. (manuscript in preparation) for the SASII parsimonious model were: χ^2 5,011, N = 1567; df =1,431, p < 0.001, RMSEA = 0.040, WRMR 2.068, CFI = 0.90 and TLI = 0.90. All factor loadings were significant at the 0.05 level (Barnard et al., manuscript in preparation). The following reliability coefficients were reported by Barnard et al. (manuscript in preparation) for the parsimonious SASII model: (i) Social Cynicism: ρ = 0.78 (0.76, 0.81); (ii) Reward for Application: ρ = 0.72 (0.69, 0.75); (iii) Social Complexity: ρ = 0.66 (0.62, 0.70); (iv) Fate Control: ρ = 0.86 (0.84, 0.87); and (v) Religiosity: ρ = 0.81 (0.78, 0.83).

Research procedure

The sample of students from the University of Pretoria and volunteers (e.g., family members and friends) completed the SASII, which the students used as part of a third year module for BDO 372 psychometric testing at the University of Pretoria. This formed part of the practical training for students to familiarise themselves with questionnaires and questionnaire administration. The SASII survey questionnaire was formulated so that respondents participating in the research gave consent that the information from the survey could be used by the researcher for research purposes only. The questionnaire was accompanied by a covering letter explaining the purpose of the research with emphasis on the confidentiality of the research project. The total sample included 1567 participants. The data that was collected has

not previously been used for research. Permission to use the data was obtained from the University of Pretoria's ethics committee. The completed raw data was converted to an SPSS dataset for use in Mplus 7.11.

Data Analysis

Confirmatory factor analyses (CFAs) were performed through latent variable modelling methods to test factor loadings and indicator thresholds by considering measurement error and determining measurement error variances related to each indicator directly using Mplus, version 7.11 (Muthen & Muthen, 2012). Mplus v.7.11 also provided a convenient shortcut for conducting a sequence of increasingly restrictive invariance tests. A robust weighted least squares mean- and variance-adjusted estimator (WLSMV) applying a diagonal (full) weight matrix (Muthen & Muthen, 2012) was used because it is considered superior for modelling categorical variables (Brown, 2006; Wang & Wang, 2012), which is relevant in this study. WLSMV also allows for missing data to be related to the observed covariates (Wang & Wang, 2012) and provides mean- and variance adjusted chi-square (χ^2) test statistics (Muthen & Muthen, 2012). However, the chi-square model difference test statistics cannot be utilised for direct model χ^2 comparisons (Muthen & Muthen, 2012). Instead, nested model comparisons were conducted using the DIFFTEST procedure in Mplus, which provides a two-step approach (for full details see *DIFFTEST* option on the *SAVEDATA* command option in Muthen & Muthen, 2012) to conduct model comparisons (Wang & Wang, 2012). Mplus further allows for two different approaches towards MGCFA specification, namely delta parameterization (which is the default setting) and theta parameterization. In the default setting (delta parameterization), scale factors are allowed to be parameters in the specified model, but residual variances for latent response variables of observed categorical dependent variables are not. Conversely, specifying the theta parameterization, residual variances (unexplained variance in the observed indicators of factors) for latent response variables are allowed to be parameters in the specified model but scale factors are not (Muthen & Muthen, 2012). Behavioural and social scientists are typically interested in error variances and not scale factors for across group factor

comparisons and this requires that thresholds and loadings are invariant to a sufficient degree. Thus, a probit link and the theta parameterization was used to estimate all models. When the theta parameterization is specified, the residual variances for the latent response variables of the observed categorical dependent variables are set at one in the first group and are free to be computed in subsequent groups as the default. When a threshold and a factor loading for a categorical factor indicator are free across groups, the residual variance for the variable is set at one in these groups for computing purposes (Muthen & Muthen, 2012).

The following indices produced by Mplus were used in this study to test for MI (configural, metric, and scalar invariance): (i) Absolute fit indices, such as the chi-square (χ^2) statistic, Root Mean Square Error of Approximation (RMSEA) and Weighted Root Mean Square Residual (WRMR); (ii) Incremental fit indices, which included the Tucker Lewis Index (TLI); and (iii) and the Comparative Fit Index (CFI) (West, Taylor, & Wu, 2012). The CFI takes sample size into account when comparing the hypothesised and independent models. The TLI is ideally suited for the evaluation of factor models and is a relative measure of co-variation as explained by the hypothesised model. Critical values for acceptable model fit for the CFI and TLI should be higher than the 0.90 level (Van de Schoot et al., 2012; Wang & Wang, 2012) although a cut-off value of 0.95 is recommended by Hu and Bentler (1999). The RMSEA provides an indication of the total amount of error in the hypothesised model-data fit in relation to the complexity (number of estimated parameters) in the model. The suggested acceptable levels for the RMSEA are 0.05 or ideally less, and the cut-off value should not exceed 0.08 (Van de Schoot et al., 2012). According to Wang and Wang (2012) a WRMR value of 1.0 or lower is considered a good fit between the model and the data.

As a first step towards testing the SASII for MI, the total sample (N = 1567) was divided according to gender (10 missing values) to evaluate whether the hypothesised five-factor structure of the parsimonious SASII model (Barnard et al., manuscript in preparation) has a good fit to the data. This was done by conducting separate CFAs for the sub-groups, namely: Group 1 = males (N = 643); Group 2 =

females (N = 914). Second, a convenient shortcut using Mplus v.7.11 for computing MGCFA, which allows the researcher to simultaneously run and compare chi-square (χ^2) results for configural, metric and scalar models all in one analysis, was conducted to assess MI (configural, metric, and scalar invariance) across the male ($N = 643$) and female ($N = 914$) groups (10 missing values). Third, measurement invariance was tested in a sequence of three hierarchical steps, namely, configural, weak (metric), and strong (scalar) measurement invariance. A MGCFA was conducted without any constraints to assess configural invariance. Fourth, metric invariance was tested. However, given the initial poor findings of the hypothesised model, model development was done to improve the fit of the model. Thus, in all subsequent MGCFAs possible misspecifications, as indicated by the modification indices, were identified. The analyses then proceeded by re-specifying the model by applying parameter constraints to restrict all successive models necessary to examine potential decreases in fit to the data for each more stringent level of measurement invariance. If measurement invariance was not established at any given level, then the constraints of the parameters that appeared to have caused the misspecification were identified and released. An insignificant change in the chi-square (χ^2) statistic was taken as proof of invariance between the more restrictive and the comparison model, considering that the CFI, TLI and RMSEA indicated acceptable model fit. Fifth, scalar invariances were assessed. Finally, full invariance (metric and scalar) was discussed.

Results

Testing the SASII model for MI

First, the total sample (N = 1567) was divided into male and female groups (10 missing values) with Group 1 = males (N = 643) and Group 2 = females (N = 914). Separate CFAs were conducted on the groups using Mplus v.7.11 with WLSMV estimator to determine whether the parsimonious SASII model (Barnard et al., manuscript in preparation) has a good fit to the data by observing the variance-covariance matrix amongst SASII items for the two groups (Khan, 2006). Thus, a

baseline CFA for each group, which formed the parsimonious model, was computed (Wang & Wang, 2012). The items and descriptions used in testing the parsimonious SASII model for MI are presented in Table 2. The original item numbers of the social axiom statements (Leung et al., 2012) were retained.

Table 2

Items and descriptions of parsimonious SASII model for MGCFA

Item nr	Social Cynicism
28	Old people are usually stubborn and biased
29	People create hurdles to prevent others from succeeding
32	People dislike others who succeed in life
36	Powerful people tend to exploit others
44	People deeply in love are usually blind
66	People who become rich and successful forget the people who helped them along the way
69	Kind-hearted people usually suffer losses
70	Opportunities for people to get wealthy promote dishonesty
79	Kind-hearted people are easily bullied
93	People always expect something in return for a favor
Item nr	**Reward for Application**
7	One gets from life as much as one puts into it
15	Success requires strong willpower
27	Failures can make people wise
30	Building the way step by step leads to success
40	Knowledge is necessary for success
53	Competition brings about progress
67	Difficult problems can be overcome by hard work and persistence
75	Hard working people will achieve more in the end
83	Endurance and determination are key to achieving goals
84	Hard-working people are well rewarded
Item nr	**Social Complexity**
11	A situation can change drastically in an unexpected direction
20	Human behavior changes with the social context
23	People may behave unpredictably
31	People can suddenly lose everything they have
42	A person's behavior is influenced by many factors
56	Every person is unique
82	People may have opposite behaviors on different occasions
87	A bad situation can suddenly change for the better
Item nr	**Fate Control**
5	People's wealth is determined by fate

10	Individual characteristics, such as appearance and birthday, affect one's fate
12	Fate determines a person's success in life
17	Good luck follows if one survives a disaster
18	There are many ways for people to predict what will happen in the future
21	Matters of life and death are determined by fate
22	There are certain ways to help us improve our luck and avoid unlucky things
33	There are ways for people to find out about their fate
35	Major events in people's life can be predicted
46	The people whom a person will love in his or her life is determined by fate
48	Individual characteristics, such as appearance and birthday, can reveal one's fate
51	Luck can be enhanced by certain tactics
78	Fate determines one's successes and failures
89	Some people are born lucky
Item nr	**Religiosity**
6	Belief in a religion helps one understand the meaning of life
38	Religious faith contributes to good mental health
52	Practicing a religion unites people with others
54	Religious people are more likely to maintain moral standards
64	Religion makes people healthier
65	There is a supreme being controlling the universe
73	Religion makes people happier
85	Religion helps people make good choices for their lives
95	Evidence of a supreme being is everywhere for those who seek its signs

The fit indices for Group 1 (males) were: χ^2 15,940, N = 643, df = 1,275, p < 0.000, RMSEA = 0.039, WRMR 1.497, CFI = 0.92 and TLI = 0.92. The fit indices for Group 2 (females) were: χ^2 18,767, N = 914, df = 1,275, p < 0.000, RMSEA = 0.039, WRMR 1.651, CFI = 0.90 and TLI = 0.90. Factor loadings for both groups were significant at the 0.05 level. The RMSEA for both groups suggested good model fit in the population (Brown, 2006; Van de Schoot et al., 2012) and CFA results for both groups suggested reasonably good fit (Van de Schoot et al., 2012).

Second, considering the reasonably good CFAs results obtained in step one above, an all in one shortcut analysis in Mplus v.7.11 (for full details see *MODEL* options, i.e., *MODEL = CONFIGURAL METRIC SCALAR* and *PARAMETERIZATION = THETA* command in Muthen & Muthen, 2012) with WLSMV estimator was used to compare the chi-square (χ^2) results for a configural, metric and scalar models. With the shortcut, Mplus v.7.11 specifies the configural model as having loadings and thresholds free in both groups except for the loading for the referent indicator, which

is set at one in both groups. The factor means in both groups are set at zero while their variances are free to vary. Residual variances are set at one in both groups. The metric model is specified as having loadings constrained across groups except for the loading for the first indicator of a factor, which is set at one in both groups. Thresholds are allowed to vary across groups, but some thresholds have to be constrained in order for the model to be identified. Thus, the first two thresholds of the referent indicator are constrained to be equal across groups, and the first threshold of each other indicator on a factor is constrained to be equal. The mean of the first factor is set at zero and other factor means and factor variances are free to vary (Muthen & Muthen, 2012). The outcome of this analysis (see Table 3) shows that by constraining the factor loadings, the chi-square (χ^2) results for the "metric against configural" model comparison indicated that the model fit worsened (i.e., the p-value of χ^2 change was < 0.05). Furthermore, by constraining the thresholds across groups, the chi-square (χ^2) results for the "scalar against metric" model comparison also indicated that the model fit worsened (i.e., the p-value of χ^2 change was < 0.05). Thus, it can be concluded that the SASII model does not have scalar invariance (i.e., factors do not have the same scale and origin) across male and female groups. The results are reported in Table 3.

Table 3

Model fit information for configural, metric and scalar invariance testing

Model	Number of Parameters	Chi-square (χ^2)	Degrees of Freedom (*df*)	P-value
Configural	532	5392.97	2426	0.000
Metric	486	5400.01	2472	0.000
Scalar	338	5550.28	2620	0.000
Models Compared		Chi-square (χ^2)	Degrees of Freedom (*df*)	P-value
Metric against Configural		72.74	46	0.007
Scalar against Configural		314.63	194	0.000
Scalar against Metric		261.87	148	0.000

Third, based on the results in the previous step, which indicated that the "metric against configural" model and the "scalar against metric" model comparisons resulted in worse model fit (i.e., the metric model differed from the configural model

and the scalar model differed from the metric model), a nested model approach was followed. This nested model approach used the DIFFTEST procedure in Mplus v.7.11 with WLSMV estimator, a probit link and the theta parameterization (as well as with all subsequent models) to estimate a configural invariance model in which five factors were estimated simultaneously in male and female groups. The factor variance was fixed at one and the factor mean was fixed at zero in both groups for identification. All factor loadings (one per item) and thresholds (four per item given five response options) were then estimated. The residual variances were not uniquely identified in the configural invariance model and thus were set at one in both groups. The configural model fit indices were: χ^2 2,370 (contribution from the male group), $N = 643$, and χ^2 2,882 (contribution from the female group), $N = 914$, $df = 2,550$, p < 0.000, RMSEA = 0.039, WRMR 2.229, CFI = 0.91 and TLI = 0.91. Factor loadings for both groups were significant at the 0.05 level. The RMSEA for male and female groups suggested good model fit in the population (Brown, 2006; Van de Schoot et al., 2012). The CFA results for both groups suggested reasonably good fit (Van de Schoot et al., 2012). Thus, the configural invariance test on the SASII parsimonious model (i.e., baseline configural model) was statistically significant, indicating that the number of factors are the same and have the same factor structure across male and female groups. Hypothesis 1 was thus accepted.

Fourth, because configural invariance was demonstrated across male and female groups in step three, it was possible to perform further increasingly restrictive multi-group analyses. The equality of the unstandardized item factor loadings between the groups was then estimated in a metric invariance model. The factor mean was set at zero for both groups and factor variance was set at one for males for identification but was freely estimated in females. All factor loadings were set equal across groups, item thresholds were estimated, and all residual variances were set at one across groups. The metric invariance model's fit to the data worsened significantly compared to the configural invariance model's fit to the data in step three above, and therefore the so-called modification indices were examined for possible points of localised misspecifications of the constrained loadings. All non-invariant parameters were then released in a step-by-step order to improve the fit of the specified metric's model to the data, which was considered to be unacceptable (i.e., large modification

indices). All subsequent metric model developments were done by beginning to identify the largest modification indices and then re-specifying a new metric model by freeing a non-invariant parameter from a constraint in an attempt to improve the metric model's fit to the data (Wang & Wang, 2012). The results are reported in Table 4.

Table 4

Model fit information for metric invariance testing across male and female groups

Metric Model	Chi-square (χ^2)	Degrees of Freedom (*df*)	χ^2/*df ratio*	P-value
Model 1	106.72	46	2.32	0.0000
Model 2	88.69	45	1.97	0.0001
Model 3	77.89	44	1.77	0.0012
Model 4	71.86	43	1.67	0.0038
Model 5	65.14	42	1.55	0.0126
Model 6	60.41	41	1.47	0.0258
Model 7	54.63	40	1.37	**0.0615**

Releasing the non-invariant parameters as indicated by the largest modification indices to improve the specified metric's model fit to the data resulted in seven metric invariance models' chi-square (χ^2) statistics and associated degrees of freedom (df) to be estimated. A decrease in the model χ^2 statistic associated with one degree of freedom (df) reflected an improvement of the model fit. A significant change in the χ^2 statistic was considered as proof for invariance between the more restrictive and the preceding model, considering that the CFI, TLI, RMSEA, and WRMR displayed acceptable overall model fit in all seven models. According to Carmines and McIver (1981), if the ratio (χ^2/df) of the chi-square (χ^2) statistic to the degrees of freedom (df) is less than three, this indicates an acceptable fit. According to Wang and Wang (2012), a decrease in χ^2 of 3.84 with one df indicates a significant model fit improvement.

Metric Model 1 had an unacceptable fit ($\Delta\chi^2$ = 106.72, Δdf = 46, χ^2/df ratio = 2.32, p < 0.001) to the data. Inspection of the modification indices' values showed that the fit

to the data could be improved, by freeing the parameter from the constraint as indicated by the modification indices' error variance (MI = 33.30) of item 95 ("Evidence of a supreme being is everywhere for those who seek its signs") on the Religiosity factor (sub-scale five). After freeing this parameter from its constraint, the revised metric Model 2 showed an improved fit to the data ($\Delta\chi^2$ = 88.69, Δdf = 45, χ^2/df ratio = 1.97, p < 0.001); however, the fit was still considered as unacceptable. Further inspection of the modification indices' values revealed that the fit to the data could be improved, by freeing the parameter from the constraint as indicated by the modification indices' error variance (MI = 20.78) of item 67 ("Difficult problems can be overcome by hard work and persistence") on the Reward for Application factor (sub-scale two). After freeing this parameter from its constraint, the revised metric Model 3 showed an improved fit to the data ($\Delta\chi^2$ = 77.89, Δdf = 44, χ^2/df ratio = 1.77, p > 0.001); however, the fit remained unacceptable. A search for modification indices' values that could improve the fit to the data, by freeing the parameter from the constraint was indicated by the modification indices' error variance (MI = 11.08) of item 66 ("People who become rich and successful forget the people who helped them along the way") on the Social Cynicism factor (sub-scale one). After freeing this parameter from its constraint, the revised metric Model 4 showed an improved fit to the data ($\Delta\chi^2$ = 71.86, Δdf = 43, χ^2/df ratio = 1.67, p > 0.003); however, this fit was still considered unacceptable. A continued search for modification indices' values that by freeing the parameter from the constraint could improve the fit to the data, indicated to the modification indices' error variance (MI = 10.94) of item 54 ("Religious people are more likely to maintain moral standards") on the Religiosity factor (sub-scale five). After freeing this parameter from its constraint, the revised metric Model 5 showed an improved fit to the data ($\Delta\chi^2$ = 65.14, Δdf = 42, χ^2/df ratio = 1.55, p > 0.01); however, the fit was still considered unacceptable. The continued search for modification indices' values that could improve the fit to the data, by freeing the parameter from the constraint pointed towards the modification indices' error variance (MI = 8.35) of item 32 ("People dislike others who succeed in life") on the Social Cynicism factor (sub-scale one). After freeing this parameter from its constraint, the revised metric Model 6 showed an improved fit to the data ($\Delta\chi^2$ = 60.41, Δdf = 41, χ^2/df ratio = 1.47, p > 0.02). However, the fit remained unacceptable. Further inspection of the modification indices' values indicated that the

fit to the data could possibly still be improved, by freeing the parameter from the constraint as indicated by the modification indices' error variance (MI = 10.63) of item 18 ("There are many ways for people to predict what will happen in the future") on the Fate Control factor (sub-scale four). After freeing this parameter from its constraint, the revised metric Model 7 revealed that the fit to the data could not be improved further ($\Delta\chi^2$ = 54.63, Δdf = 40, χ^2/df ratio = 1.37, p > 0.05) because the model was no longer statistically significant, as indicated by the p-value (i.e., p > 0.05).

Thus, only partial metric (weak) invariance could be achieved, as full metric invariance did not hold and further model modification through freeing additional parameters may have resulted in the model no longer being theoretically sound (Wang & Wang, 2012). This suggests that the factor loadings on the five social axiom latent factors are not equal across male and female groups (Spini, 2003) and that the factor covariance across groups could not be compared (Cieciuch et al., 2014; Thomas et al., 2014). It also suggests that male and female respondents did not have the same understanding of the latent construct (i.e.., Fate Control, Social Cynicism, Religiosity and Reward for Application) being studied (Van de Schoot et al., 2012) as indicated by items 18, 32, 54, 66, 67 and 95, which did not have the same meaning (i.e., these items of the SASII was not interpreted as measuring the same constructs) across male and female groups (Cieciuch et al., 2014; Thomas et al., 2014). Hence, only partial support could be found for Hypothesis 2.

Fifth, the equality of the unstandardized item thresholds across groups was estimated in a scalar invariance model. The factor variance and mean were set at one and zero for both groups. In males this was done for identification; however, the factor variance and mean were then estimated for females. All factor loadings and item thresholds were constrained to be equal across male and female groups and all variances were constrained equal and set at one for both groups. Because the scalar invariance model's fit ($\Delta\chi^2$ = 436.30, Δdf = 204, χ^2/df ratio = 2.14, p < 0.001) worsened significantly compared to the metric invariance model's fit to the data in step four above, the modification indices were once again examined. All subsequent

model developments were done by beginning to identify the largest modification indices indicated by a specific threshold as a source of possible misfit to the model, and then freed in a re-specified, new, scalar model in each subsequent scalar model development in an attempt to improve the scalar model's fit to the data (Wang & Wang, 2012). The results are reported in Table 5.

Table 5

Model fit information for scalar invariance testing across male and female groups

Scalar Model	Chi-square (χ^2)	Degrees of Freedom (*df*)	χ^2/*df ratio*	P-value
Model 1	436.30	204	2.14	0.0000
Model 2	423.69	203	2.09	0.0000
Model 3	411.95	202	2.04	0.0000
Model 4	402.29	201	2.00	0.0000
Model 5	394.12	200	1.97	0.0000

Scalar Model 1 revealed an unacceptable fit ($\Delta\chi^2$ = 106.72, Δdf = 46, χ^2/df ratio = 2.32, p < 0.001) to the data. Modification indices suggested that threshold 4 of item 85 ("Religion helps people make good choices for their lives") on the Religiosity factor (sub-scale five) was the largest misfit (MI = 13.88) and should thus be freed to improve the scalar's model fit to the data. After freeing this threshold from its constraint, the revised Scalar Model 2 showed an improved fit to the data ($\Delta\chi^2$ = 423.69, Δdf = 203, χ^2/df ratio = 2.09, p < 0.001), although fit was still unacceptable. Further inspection of the modification indices revealed that threshold 3 of item 70 ("Opportunities for people to get wealthy promote dishonesty") on the Social Cynicism factor (sub-scale one) was the largest misfit (MI = 9.95) and should be freed to improve the fit to the data. After freeing this threshold from its constraint, the revised Scalar Model 3 showed an improved fit to the data ($\Delta\chi^2$ = 411.95, Δdf = 202, χ^2/df ratio = 2.04, p < 0.001). However, fit was still considered unacceptable. Further examination of the modification indices showed that threshold 2 of item 70 was the largest misfit (MI = 8.91) and should be freed to improve the fit to the data. After freeing this threshold from its constraint, the revised Scalar Model 4 showed an improved fit to the data ($\Delta\chi^2$ = 402.29, Δdf = 201, χ^2/df ratio = 2.00, p < 0.001), but

remained unacceptable. Further inspection of the modification indices indicated that the fit to the data could be improved, as indicated by the modification indices (MI = 7.83), by freeing threshold 4 of item 82 ("People may have opposite behaviors on different occasions") on the Social Complexity factor (sub-scale three). After freeing this threshold from its constraint, the revised Scalar Model 5 indicated that the fit to the data could not be meaningfully improved ($\Delta \chi^2$ = 394.12, Δ df = 200, χ^2/df ratio = 1.97, p < 0.001). Thus, scalar invariance could not be achieved.

Examining the modification indices revealed that there were no more meaningful sources of misfit remaining. Although further model modification through freeing additional thresholds could result in model fit improvements, these improvements would most likely result in insignificant improvements to the scalar model's fit to the data (Wang & Wang, 2012). Comparisons of the social axioms' five factors' means across male and female groups could therefore not be computed, indicating that the five social axiom factors do not have the same scale of origin (Fischer & Lun, 2008), as equality constraints of the item thresholds for items 70, 82 and 85 could not be achieved across male and female groups. Hence, these findings indicated that males and females differ significantly in their levels of trust in the SASII parsimonious model's scales on Social Cynicism (e.g., "Opportunities for people to get wealthy promote dishonesty"), Social Complexity (e.g., "People may have opposite behaviors on different occasions") and Religiosity (e.g., "Religion helps people make good choices for their lives"). Hypothesis 3 is rejected.

Finally, because full invariance (metric and scalar) could not be achieved the means across male and female groups could not be computed. The differences between male and female groups could therefore not be ascribed to differences on the SASII parsimonious model's latent factors (Chen, 2007). Hypothesis 4 is rejected.

Discussion

The main objective of this study was to compute measurement invariance as a prerequisite for conducting cross-group (male and female) comparisons and to direct the development of the SASII instrument (e.g., Van de Schoot et al., 2012; Vandenberg & Lance, 2000). The second objective was to contribute towards previous research (e.g., Malham & Saucier, 2014) by reporting on configural, metric and scalar invariance across male and female groups in relation to the five latent social axiom factors (e.g., Chen, 2007; Fischer & Lun, 2008; Spini, 2003; Vandenberg & Lance, 2000). The third objective related to establishing the SASII's cross-cultural applicability. South African legislation, such as the Employment Equity Act (No. 47 of 2013), emphasises the cultural appropriateness of psychological tests used in South Africa (Paterson & Uys, 2005) and demands that tests are used in a fair and equitable manner. According to Paterson and Uys (2005), in order for tests to be cross-culturally applicable, the test scores need to be comparable across groups, indicating that the construct that the test intends to measure does not differ across groups. This third objective supported the primary goal of this research as well as the research presented by Malham and Saucier (2014).

The findings of this study indicated that testing for configural invariance of the SASII parsimonious model provided proof for a baseline configural model that was statistically significant. This is an indication that the number of SASII factors is the same and the SASII has the same factor structure across male and female groups. However, only partial metric invariance could be achieved, because the fit could not be improved further once a point of statistical insignificance was reached. This indicates that the factor loadings on the five social axiom latent factors cannot be considered equal across groups (Spini, 2003). Findings further indicated that factor covariance across groups could not be compared (Cieciuch et al., 2014; Thomas et al., 2014). This indicates that male and female respondents did not have the same understanding of the latent construct (i.e., Fate Control, Social Cynicism, Religiosity and Reward for Application) being studied (Van de Schoot et al., 2012). In particular, items 18, 32, 54, 66, 67 and 95 did not have the same meaning (i.e., these items

were not interpreted as measuring the same constructs) across groups (Cieciuch et al., 2014; Thomas et al., 2014). However, this does not necessarily indicate that the problem resides in the items (i.e., items 18, 32, 54, 66, 67 and 95) or that the items are not "good", but rather that the latent factors are not well defined. Thus, improvements would typically focus on redefining the content that the latent factor domain (e.g., Fate Control) is intended to cover (e.g., Malham & Saucier, 2014; Singelis et al., 2009). In this regard, the International Test Commission (2016) proposed that content experts be used from different language backgrounds, for example, to make improvements to the existing content in order for the latent factor domain to measure what it was intended to measure.

Findings also indicated that scalar invariance could not be achieved. Comparisons of the social axioms' five factors' means across groups could thus not be examined. This was an indication that the SASII's five social axiom factors do not have the same scale of origin (Fischer & Lun, 2008). Hence, these findings indicate that males and females differ significantly regarding their levels of trust in the SASII parsimonious model's scales on Social Cynicism (e.g., "Opportunities for people to get wealthy promote dishonesty"), Social Complexity (e.g., "People may have opposite behaviors on different occasions") and Religiosity (e.g., "Religion helps people make good choices for their lives"). This is in accordance with previous research findings, which have also found the Social Complexity scale to be problematic (e.g., Leung et al., 2012; Malham & Saucier, 2014).

Nevertheless, the fact that configural invariance and partial metric invariance could be achieved in this study is relatively impressive (e.g., Malham & Saucier, 2014) considering the complexity of the SASII model. These findings suggest that South African university students and their family members and friends use the same factors in their generalised beliefs. According to Malham and Saucier (2014) the requirements of measurement invariance using MGCFA are stringent, and even more so when single items are used as indicators. In this regard, the SASII performed better across male and female groups than several frequently used

measures of personality have performed in single groups (e.g., Hopwood & Donnellan, 2010).

Limitations of the Study

This study had several limitations. Firstly, the SASII questionnaires used in this study were based on self-report measures. Research suggests that self-report measures can possibility cause ordinary method variance (Richardson, Simmering, & Sturman, 2009). However, according to Doty and Glick (1998) and Johnson, Rosen, and Djurdjevic (2011), method variance is seldom a strong enough reason for findings to be invalid. In addition, the method used to collect data could have influenced method bias, which could have inflated the relations when research participants are responding to questionnaire instruments that have been validated by previous research, raising concerns over artificially increased relations (Avey, Luthans, & Jensen, 2009). Secondly, measurement invariance across cross-cultural (black, coloured and Indian) groups could not be computed because the samples obtained for the cross-cultural groups were considered too small for multiple group analyses (e.g., Kline, 2011; Wang & Wang, 2012).

Given that only configural and partial metric invariance could be achieved in this study, with scalar and full measurement invariance still to be established for the parsimonious SASII (Barnard et al., manuscript in preparation), the SASII cannot currently be endorsed for the interpretation of cross-group (male and female) differences in means. Even partial metric invariance was difficult to achieve and several items (i.e., items 18, 32, 54, 66, 67, 70, 82, 85 and 95 85) were identified that contributed to misfit due to having different levels of endorsement across male and female groups. However, the levels of invariance achieved in this study are informative (Malham & Saucier, 2014). The findings also support Singelis et al.'s (2009) call for exploring the possibility of adding or redefining items to improve the internal consistency of the social axiom factors being measured. These findings also indicate the need for SASII adaptation according to the International Test Commission's (2016) guidelines.

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Conclusion

Support was found for factorial (configural) invariance of a five-factor model of social axioms. Findings also indicated cross-group (male and female) generalisability for the SASII structure. Some evidence was found for metric invariance (partial metric invariance) where the same meaning and interpretation of constructs was achieved across male and female groups. This study supports the research on measurement invariance of social axioms published by Malham and Saucier (2014), who used a 30-item version of the SAS. Fate Control and Social Complexity were also found to be problematic in previous studies (e.g., Leung et al., 2012; Malham & Saucier, 2014). The findings of this study confirm that Social Complexity is problematic. Thus, future research should focus on redefining the content which the latent factor domain (e.g., Social Complexity) is intended to cover and consider including items related to a specific cultural setting to improve the internal consistency of the social axiom dimensions (Malham & Saucier, 2014; Singelis et al., 2009).

References

Avey, J. B., Luthans, F., & Jensen, S. (2009). Psychological capital: A positive resource for combating stress and turnover. *Human Resource Management, 48*, 677-693. doi: 10.1002/hrm.20294.

Babbie, E., & Mouton, J. (2009). *The practise of social research.* Cape Town, SA: Oxford University Press.

Barnard, A., Meiring, D., Rothman, S, & Zondervan-Zwijnenburg, M. (manuscript in preparation). *The factor structure of the Social Axioms Survey II (SASII) in the South African context.*

Bollen, K. A. (1989). *Structural equations with latent variables.* New York, NY: Wiley.

Bond, M. H., Leung, K., Au, A., Tong, K., & Chemonges-Nielson, Z. (2004). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18(3)*, 177-191. doi: 10.1002/per.509.

Bond, M. H., Leung, K., Au, A., Tong, K., Reimel de Carrasquel, S., Murakami, F., … Lewis, J. R. (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology, 35(5)*, 548-570. doi: 10.1177/002202210426838.

Brown, T. (2006). *Confirmatory factor analysis for applied research.* New York, NY: Guildford.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*, 456-466. doi: 10.1207/s15328007sem1102_8.

Byrne, B. M., & Watkins, D. (2003). The issue of measurement invariance revisited. *Journal of Cross-Cultural Psychology, 34(2)*, 155-175. doi: 10.1177/0022022102250225.

Carmines, E. G., & McIver, J. P. (1981). Analyzing models with unobserved variables: Analysis of covariance structures. In G. W. Bohmstedt & E. F. Borgatta (Eds.), *Social measurement* (pp. 65-115). Beverly Hills, CA: SAGE.

Chen, F. F. (2007). Sensitivity of goodness of fit indices to lack of measurement invariance. *Structural Equation Modeling, 14(3)*, 464-504. doi: org/10.1080/10705510701301834.

Cieciuch, J., Davidov, E., Vecchione, M., Beierlein, C., & Schwartz, S. H. (2014). The cross-national invariance of a new scale to measure 19 basic values: A test across eight countries. *Journal of Cross-Cultural Psychology, 45(5)*, 764-776. doi: 10.1177/0022022114527348.

Doty, D. H., & Glick, W. H. (1998). Common method bias: Does common method bias variance really bias results? *Organizational Research Methods, 1*, 374-406.

Dunbar, H., Theron, C., & Spangenberg, H. (2011). A cross-validation study of the Performance Index. *Management Dynamics 20(3)*, 2-24.

Employment Equity Act (2013). *Employment Equity Act, No. 47 of 2013*. Republic of South Africa. http://www.labour.gov.za/docs/legislation/eea/act98-055.html. Accessed on 28 September 2014.

Fischer, R., & Lun, V. M. (2008). Measuring cognition and motivation across cultural groups. In R. M. Sorrentino & S. Yamaguchi (Eds.), *Handbook of motivation and cognition across cultures* (pp. 567-590). New York, NY: Academic Press.

Hopwood, C. J., & Donnellan, M. B. (2010). How should the internal structure of personality inventories be evaluated? *Personality and Social Psychology Review, 14(3)*, 332-346. doi: 10.1177/1088868310361240.

Horn, J., & McArdle, J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental Aging Research, 18(3)*, 117-144. doi: org/10.1080/03610739208253916.

Hu, L. T., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*, 1‑55.

International Test Commission. (2016). *The ITC guidelines for translating and adapting tests (2nd ed).* [www.InTestCom.org]. Accessed on 28 September 2016.

Johnson, R. E., Rosen, C. C., & Djurdjevic, E. (2011). Assessing the impact of common method variance on higher-order multidimensional constructs. *Journal of Applied Psychology, 96(4)*, 744-761. doi: org/10.1037/a0021504.

Jöreskog, K. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36*, 409-426. doi:10.1007/BF02291366.

Kankaraš, M., & Moors, G. (2011). Measurement equivalence and extreme response bias in the comparison of attitudes across Europe. A multigroup latent-class factor approch. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences, 7(2),* 68-80. doi:10.1027/1614-2241/a000024.

Khan, J. H. (2006). Factor analysis in counselling psychology research, training and practice: Principles, advances and applications. *The Counselling Psychologist, 34(5)*, 684-718.

Kline, R. B. (2011). *Principles and practice of structural equation modeling (3rd ed.).* New York, NY: The Guilford Press.

Kurman, J., & Ronen-Eilon, C. (2004). Lack of knowledge of a culture's social axioms and adaptation difficulties among immigrants. *Journal of Cross-Cultural Psychology, 35(2),* 192-208. doi: 10.1177/0022022103262244.

Leung, K., Au, A., Huang, X., Kurman, K., Niit, T., & Niit, K. (2007). Social axioms and values: A cross-cultural examination. *European Journal of Personality, 21(2)*, 91-111. doi: 10.1002/per.615.

Leung, K., & Bond, M. H. (Eds). (2009). *Psychological aspects of social axioms: Understanding global belief systems.* New York, NY: Springer.

Leung, K., Bond, M. H., Reimel de Carrasquel, S., Munoz, C., Hernandez, M., Murakami, F., … Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33(3)*, 286-302. doi: 10.1177/0022022102033003005.

Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., Gornick, L. J., Amponsah, B., … Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the five factor model of personality. *Journal of Cross-Cultural Psychology, 43(5)*, 833-857. doi: 10.1177/0022022111416361.

Malham, P. B., & Saucier, G. (2014). Measurement invariance of social axioms in 23 countries. *Journal of Cross-Cultural Psychology, 45(7),* 1046-1060. doi: 10.1177/0022022114534771.

Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cut-off values for fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings. *Structural Equation Modeling, 11*, 320-341. doi:10.1207/s15328007sem1103_2.

Meade, A. W., & Bauer, D. J. (2007). Power and precision in confirmatory factor analytic tests of measurement invariance. *Structural Equation Modeling, 14(4)*, 611–635. doi: org/10.1080/10705510701575461.

Meiring, D. (2007). *Bias and equivalence of psychological measures in South Africa*. Unpublished doctoral thesis, University of Tilburg, Tilburg, The Netherlands.

Muthen, L. K., & Muthen, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthen & Muthen.

Paterson, H., & Uys, K. (2005). Critical issues in psychological test use in the South African workplace. *South African Journal of Industrial Psychology, 31(3)*, 12-22.

Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three paradigms: Examining post hoc statistical corrections for common method variance from three divergent perspectives. *Organizational Research Methods, 12*, 687-694. doi: 10.1177/1094428109332834.

Saunders, L., Lewis, P., & Thornhill, A. (2009). *Research methods for business students (*5th ed.). Harlow, UK: Pearson Education.

Shaughnesssy, J. J., & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York, NY: McGraw-Hill.

Singelis, T. M., Bhawuk, D. P. S., Gabrenya, W. K. Jnr, Gelfand, M., Harwood, J., Her, P., … Vandello, J. (2009). Exploring ethnic group and geographic differences in social axioms in the USA. In K. Leung, & M. H. Bond (Eds), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 81–93). New York, NY: Springer.

Social Axioms Project. Social Axioms Survey II. Retrieved April 9, 2011, from: http://personal.cityu.edu.hk/~mgkleung/sa.htm#Download.

Spini, D. (2003). Measurement equivalence of 10 value types from the Schwartz Value Survey across 21 countries. *Journal of Cross-Cultural Psychology, 34(1)*, 3-23. doi: 10.1177/0022022102239152.

Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research, 25,* 78-90. doi: 10.1086/209528.

Terre Blanche, M., & Durrheim, K. (2002). *Research in practice: Applied methods for the social sciences*. Cape Town, South Africa: University of Cape Town Press.

Thomas, T. D., Abts, K., & Vander Weyden, P. (2014). Measurement invariance response styles, and rural-urban measurement comparability. *Journal of Cross-Cultural Psychology, 45(7),* 1011-1027. doi: 10.1177/0022022114532359.

Van de Schoot, R., Lugtig, P., & Hox. J. (2012). A checklist for testing measurement invariance*. European Journal of Developmental Psychology, 9(4)*, 486-492. doi: org/10.1080/17405629.2012.686740.

Van de Schoot, R., Schmidt, P., & De Beuckelaer, A. (Eds). (2015). *Measurement invariance*. Lausanne, Switzerland: Frontiers Media. doi: 10.3389/978-2-88919-650-0.

Van de Vijver, F. J. R., & Leung, K. (1997a). Methods and data analysis for cross-cultural research. In W. J. Lonner & J. W. Berry (Eds.), *Cross-cultural psychology series* (pp. 1-185). Thousand Oaks, CA: Sage.

Van de Vijver, F. J. R., & Leung, K. (1997b). *Methods and data analysis for cross-cultural research*. Newbury Park, CA: Sage.

Van de Vijver, F. J. R., & Poortinga, Y. H. (1997). Towards an integrated analysis of bias in cross-cultural assessment. *European Journal of Psychological Assessment, 13(1)*, 29-37. doi: org/10.1027/1015-5759.13.1.29.

Van de Vijver, F. J. R., & Tanzer, N. K. (1997). Bias and equivalence in cross-cultural assessment: An overview. *European Review of Applied Psychology, 47(4)*, 263–279.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organisational research. *Organization Research Methods, 3,* 4-70. doi: 10.1177/109442810031002.

Wang, J., & Wang, X. (2012). *Structural Equation Modeling. Applications using Mplus*. West Sussex, UK: John Wiley & Sons.

West, S. G., Taylor, A. B., & Wu, W. (2012). Model fit and model selection in structural equation modeling. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 209‑231). New York, NY: The Guilford Press.

CHAPTER 4:

4.1 MANUSCRIPT 3

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Exploring the Nomological Network between Social Axioms and the Five Factor Model of Personality in South Africa

Abstract

Although the social axiom factors, which represent generalised beliefs, have consistently been proved to be distinctive they have predictably low correlations with values and personality. This study focused on testing the relationships between social axioms and personality using the Five-Factor Model of personality. Meaningful associations were found for four of the social axioms factors and the five factors of personality. No significant correlation could be found between the social axiom factor Fate Control and any of the five personality factors. These findings supported previous research results by Leung et al. (2012) and indicate that social axioms have foreseeable but low correlations with personality dimensions. This study also provided insight into social axioms' ability to predict personality and behaviour across different cultures. Social axioms had a small effect in predicting Extraversion, a large effect in predicting Agreeableness, and medium effects in predicting Conscientiousness, Neuroticism and Intellect. The five-factor structure of social axioms was supported.

Keywords: Personality, values, beliefs, social axioms, equivalence, item bias

The purpose of this study is to expand on existing research (e.g., Leung & Bond, 2009; Leung et al., 2012) by systematically examining the nomological network of social axioms (e.g., Burgess, 2011), as measured by the new Social Axioms Survey (SASII) (Leung et al., 2012) and the five factors of personality, as measured by the Mini-International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006) on the individual level. In addition, the study aims to access the generalisability of social axioms in the South African context.

Researchers generally use the responses of individuals to describe culture (Schwartz, 2014a). According to Chiu (2014), although culture is the most important construct in cross-cultural psychology it is also an elusive construct, as researchers' do not fully understand the meaning and significance of culture. Thus, arguments both for and against the measurement of culture as a latent construct have not diminished developments in cross-cultural research, but have instead pointed towards the dynamic nature of culture and enriched our understanding of the construct (Chiu, 2014; Schwartz, 2014b). Cheung, Van de Vijver and Leong (2011) highlighted the long history of exploring the linkages between personality and cultural context. According to Chen, Fok, Bond and Matsumoto (2006) most trait measures of personality consist of a combination of values, attitudes, beliefs and behavioural reports. However, Chen, Bond and Cheung (2006) found only a passable relationship between personality factors and social axioms, thus indicating that personality and beliefs represent two distinct constructs. According to Fischer and Boer (2015), values and personality are distinct but related constructs. Although support has been found for systematic linkages, these relationships are influenced by contextual (i.e., economic, ecological and social) factors. Thus, more research is required that uses identical value and personality instruments in diverse cultures (Fischer & Boer, 2015).

Values and personality represent self-views, while social axioms may be regarded as worldviews. Social axioms constructs can thus not be explained away or reduced to personality traits, making social axioms a useful addition in cross-cultural research.

In addition, social axioms are conceptually closely related to social attitudes and norms (Stankov & Saucier, 2015). According to Stankov and Saucier (2015), the next vital step in future research involves establishing the relationship between social axioms and the constructs of personality and values. Thus, given that beliefs, values and personality are psychological attributes of individuals that influence behaviour and underpin culture, the objective of this study is to follow a culturally decentred approach by using items generated in a parsimonious SASII model (Barnard et al., manuscript in preparation) and relying on personality factors to assist in contributing towards validating the SASII and its nomological network in a South African context.

New Social Axioms Survey (SASII)

In previous qualitative research based on Western literature on beliefs, Leung et al. (2002) proposed a five-factor model of general beliefs that they labelled social axioms. This name was selected due to the axiomatic nature of these beliefs (Leung & Bond, 2004; Singelis, Hubbard, Her, & An, 2003). Although these authors acknowledged the importance of the value frameworks for explaining human behaviour and cultural differences, they argued for the need for new constructs to stimulate future cross-cultural values based research and findings (Leung et al., 2002). Leung et al. (2002) thus proposed an alternative construct, namely social axioms or general beliefs, as a complementary framework for explaining social behaviour. Despite social axioms' short history, since its inception in 2002 it has sparked the interests of researchers across the globe (e.g., Leung & Bond, 2009). Leung and Bond (2008) defined social axioms as generalised beliefs concerning oneself, the social, physical and spiritual worlds that are presented as a relationship or an assertion of a relationship between two concepts or entities.

Social axioms emanated from natural-language constructs (Leung et al., 2002) and the five factors, namely Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity (Leung & Bond, 2004), were developed through qualitative research based on Western literature on beliefs. Pursuing the same functionalist logic as Schwartz's (1992) argument for a global structure of values,

Leung and Bond (2004) initiated a global research project to explore social axiom constructs using the Social Axioms Survey (SAS). The SAS was applied to individuals, groups, organisations and nations in a search for the emergence of a pan-cultural structure of social axioms. Simultaneously, possible relations between social axioms and other psychological phenomena, for example values and personality, were evaluated. In addition, the SAS's ability to explain behaviours across cultures and contexts was examined in an attempt to establish social axioms' nomological network (e.g., Leung & Bond, 2009).

The global research program on social axioms was designed to evaluate the universality and meaning of the structure of beliefs, and made use of the SAS developed by Leung et al. (2002). This research program involved an international survey that aimed to itemise factors across cultures (Leung & Bond, 2009). Initially an inductive approach was followed in developing the SAS as no a priori research existed (Leung et al., 2012; Social Axioms Project, 2011). Hence, more research was needed to verify and validate the proposed universality of the SAS (Kurman & Ronen-Eilon, 2004). Data collected since 2002 from participating national/cultural groups provides strong support for the generalisability of the SAS five-factor structure across cultures (Leung et al., 2012). Since the inception of social axioms research Leung and Bond (2009) have provided substantial research that suggests that the concept is theoretically sound to now allow for a deductive approach (Leung et al., 2012). The five social axiom dimensions have been defined by Leung et al. (2012) as: (i) Social Cynicism, which represents a negative belief regarding human nature; (ii) Reward for Application, which represents a positive belief in controlling the outcomes of situations; (iii) Social Complexity, which portrays a positive belief in solutions to problems; (iv) Fate Control, which represents a negative belief in the control of life events and (v) Religiosity, which represents a positive belief in a supernatural being.

Social Axioms in South Africa

Research using "the Social Axioms Survey (SAS) to identify universal dimensions of culturally related social beliefs" (Singelis et al., 2003, p. 269) included data from 41 participating national groups, but did not include South Africa. This research provided compelling initial support for the general applicability of the SAS five-factor structure (Bond, Leung, Au, Tong, Reimel de Carrasquel et al. 2004), and statistical analysis addressed structural equivalence and item bias across all 41 participating cultural groups (Leung & Bond, 2009). Researchers have continuously attempted to validate the universality of the SAS (e.g., Kurman & Ronen-Eilon, 2004; Leung & Bond, 2009). In 2008 Barnard, Meiring and Rothmann attempted to replicate the SAS five-factor structure in the South African context and found support for only four factors (the Social Complexity factor did not replicate). Research by Leung et al. (2012) to expand on the nomological network of social axioms and to improve the measurement of the SAS resulted in the inclusion of additional items (increased items from 60 items to 97 items) as well as improvement in the quality of the items. These items form the new Social Axioms Survey II (SASII). In addition, the factor Fate Control has been sub-divided into two sub-factors, namely Fate Determinism and Fate Alterability (Leung et al., 2012). Findings by Leung et al. (2012) indicated that the SASII has increased reliability. However, considerable research is still required to establish the validity of SASII as the internal consistency for two of the axiom dimensions remained low, namely Social Complexity (four alphas below 0.65 and mean α = 0.68) and Fate Control (four alphas below 0.65 and mean α = 0.68) (Leung et al., 2012). In more recent research in South Africa, Burgess (2011) used social axioms as a culture measure for business research and found that South Africans exhibit extreme social axiom scores (see Burgess, 2011, figure 2, p. 13) that are comparable to trends in other emerging markets.

To contribute towards existing research on the nomological network of social axioms in South Africa (e.g., Burgess, 2011) and the more recent research efforts of Leung et al. (2012) in validating the SASII, Barnard, Meiring, Rothmann and Zondervan-Zwijnenburg (manuscript in preparation) assessed the new SASII (Leung et al.,

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2012) in a South African context by conducting a confirmatory factor analysis (CFA) to determine whether it measured the social axiom constructs of the SASII's a priori five-factor structure. However, Barnard et al.'s (manuscript in preparation) initial findings indicated an unacceptable model fit. Barnard et al. (manuscript in preparation) concluded that English language proficiency (i.e., understanding of specific words and the inter-relationships between words, the context, the comprehension of phrases and idiomatic expressions, duplicate meanings and qualifying words, as used in test items) of the South African participants could have been one of the reasons why specific SASII items exhibited poor psychometric properties (i.e., item loadings < 0.30). In this regard, Leung et al. (2012) also cautioned that scales developed in the West and applied in other cultural contexts may be problematic with regards to the definition of the construct. This is because an item that is seen as appropriate in the original culture may not be seen as appropriate in another culture, and therefore certain items may not adequately tap the specific construct (Cheung, 2004). However, by creating a more parsimonious model (Wang & Wang, 2012) of the SASII, and by using only the most reliable items for each of the individual factors, Barnard et al. (manuscript in preparation) reported a reasonably good fit (CFI and TLI = 0.90) for the SASII model. This supports the previous research findings reported by Leung et al. (2012) and provided evidence for the validity of SASII in the South African context.

Burgess (2011) argued that social axioms show "predictive value over and above sociodemographics, values and personality" (Burgess, 2011, p. 16) and that the social axioms "theory provides a nomological net of relations by which the fundamental motivations of other constructs can be understood more fully" (Burgess, 2011, p. 5). Social axioms research also seeks to access overlap with other constructs and to supplement its own nomological network (Burgess, 2011). Efforts to refine social axioms research should thus continue (Burgess, 2011). An edited volume on social axioms, compiled by Leung and Bond (2009), provides support for the notion that social axioms has their own nomological network and that there is now substantial research to support a good theoretical understanding to allow a deductive approach towards social axiom constructs.

SASII and Personality

The Five-Factor Model (FFM) of personality, often referred to as the Big Five model, emanated from natural-language constructs and has proven to be robust and generalisable across cultures (Fetvadjiev & Van de Vijver, 2015; Hough & Ones, 2002). The terms Five-Factor Model and Big Five are frequently used interchangeably. The FFM was the result of a parsimonious account of personality descriptions in the English language (Fetvadjiev & Van de Vijver, 2015). However, for the purposes of this study the terms are used as synonymous. According to Ispas, Iliescu, Ilie and Johnson (2014), the FFM is one of the most established and validated models of personality. The FFM's five factors, namely Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to experience, provide a comprehensive mapping of personality traits (Ispas et al., 2014). Each factor includes positive and the negative item statements to describe the specific personality trait (see Table 2). For example, the factor Extraversion includes a positive item statement related to being talkative and a negative item statement related to being reserved, Agreeableness includes the concepts of friendly and cruel, Conscientiousness includes ideas related to being orderly and messy, Neuroticism includes items related to calm and fearful and Openness includes being both perceptive and ignorant (Fetvadjiev & Van de Vijver, 2015). Personality variables are able to predict and explain individual, group and organisational behaviour and performance (e.g., Barrick & Mount, 1991; Hough & Ones, 2002; Ispas et al., 2014; Van Aarde, Meiring, & Wiernik, 2016, in review).

Assessment of personality across cultures usually uses models and instruments of Western origin (Cheung, Cheung, Wada, & Zhang, 2003). Researchers have examined personality extensively and have provided impressive evidence for the replicability of universal personality models such as the FFM (e.g., Nel et al., 2012), which is the most widely used theory of personality structure in mainstream psychology (Cheung et al., 2011). For example, research in the Philippines identified native personality notions that were validated with the FFM; with the results indicating that the FFM acceptably covered the native concepts (Katigbak, Church,

Guanzon-Lapeña, Carlota, & Del Pilar, 2002). Similar findings were also obtained for Mexican native personality notions (Ortiz et al., 2007).

Although the five factors generally tend to replicate, and more so in Western than in non-Western cultures, several limitations related to the replicability of the FFM have been found in cross-cultural studies (Fetvadjiev & Van de Vijver, 2015). The factors Neuroticism, Extraversion, Agreeableness and Conscientiousness usually tend to be well replicated. However, the fifth factor, Openness, has not been identified in an earlier study in China and was also found to be problematic in studies in Africa (congruence coefficients < 0.84) and South and Southeast Asia (coefficients < 0.90) (Fetvadjiev & Van de Vijver, 2015). Thus, only the factors Extraversion, Agreeableness and Conscientiousness tend to replicate across languages and seem be the three largest factors in lexical research. Researchers in both the Philippines and Mexico found that cultural differences may not always be conveyed in the clear identification of dimensions beyond the FFM, but rather in the salience and make-up of components that are included in the five factors (Fetvadjiev & Van de Vijver, 2015). According to Fetvadjiev and Van de Vijver (2015) although there is no generally accepted theory of the FFM that accounts for the global occurrence of the five factors or their causal role in behaviour, research has produced indispensable data and a deep understanding of the patterns of similarities and differences in personality across cultures.

In a continued effort to expand the nomological network of social axioms, Leung et al. (2012) relied on the five personality factors, Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to experience, as measured by the Mini-International Personality Item Pool (Mini-IPIP), to validate the SASII by correlating social axiom factors with personality dimensions. Leung et al. (2012) reported a reasonably good fit between social axioms and personality, indicating that the five-factor structure of social axioms is supported. More specifically, Leung et al. (2012) reported that Social Cynicism was positively related to Neuroticism, but negatively related to Agreeableness and Extraversion, while Reward for Application was positively related to Agreeableness and Conscientiousness and Religiosity was

positively correlated with Agreeableness. However, there were no correlations between Fate Control and any of the personality factors (Leung et al., 2012). Leung et al. (2012) also reported that Reward for Application and Social Complexity had mixed support. They ascribed these findings to the limited construct breath of the shortened IPIP version used in the study. The findings reported by Leung et al. (2012) were consistent with the earlier research by Chen, Fok et al. (2006). Despite these findings, Leung et al. (2012) argued that the five factor structure of social axioms is distinct from the Big-Five personality dimensions with minimal overlap. However, they also indicted that considerable research is still required to establish the validity of SASII (Leung et al., 2012).

Contributing towards the expansion of the nomological network of social axioms, Chen, Fok et al. (2006) investigated the relationship between personality and beliefs. Many researchers consider personality to include constructs such as values and beliefs. Chen, Fok et al. (2006) thus used two personality measures in their research, namely the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992), which was selected due to its entrenched reliability and validity, and the Sino-American Person Perception Scale (SAPPS; Yik & Bond, 1993), an indigenous personality inventory. The NEO-FFI measures the personality factors of Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to experience. The NEO-FFI represented the etic or global components of personality, and the SAPPS represented the emic or culture-specific components. The study thus incorporated both universal and culture-specific factors of personality dimensions (Chen, Fok et al., 2006). Chen, Fok et al. (2006) reported that Social Cynicism was negatively associated with Agreeableness, but positively associated with Neuroticism. Social Complexity was significantly related to Openness to experience, and Reward for Application exhibited a positive correlation with Conscientiousness. Chen, Fok et al. (2006) also found that the correlations between social axioms and the SAPPS were weak. However, the correlation between Social Cynicism and Helpfulness was supported, and Social Cynicism was negatively related to Extraversion, whilst Social Complexity was negatively associated with Emotional Stability (Chen, Fok et al., 2006). Chen, Fok et al. (2006) found no significant relationships for the other three social axiom factors (Reward for Application, Fate

Control and Religiosity). Overall, correlational findings indicated that there was only weak overlap between personality dimensions, both imported and indigenous, and social axioms (Chen, Fok et al., 2006). The findings of Chen, Fok et al. (2006) were consistent with the findings reported by Chen, Bond et al. (2006), who found only moderate correlations between social axiom factors and personality constructs. These findings imply that beliefs and personality are actually two separate constructs (Chen, Bond et al., 2006).

Cross-cultural personality assessment in South Africa

Personality research in South Africa has gained momentum in the past 10 years (Meiring, Van de Vijver, Rothmann, & Barrick, 2005; Taylor, 2000; Visser & Viviers, 2010) and personality tests are the most frequently used psychometric tests in South Africa (Laher, 2010). The five-factor structure, namely Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness, of the FFM has been largely replicated in the multi-cultural South African context (Laher, 2010). The personality dimension of Openness has been difficult to replicate (e.g., Cheung, et al., 2001; Fetvadjiev & Van de Vijver, 2015) and this factor remains problematic in comparison to Western targets (Laher, 2010). However, many of these findings may be due to issues of data quality rather than model applicability (McCrae et al., 2005).

Heuchert, Parker, Strumf, and Myburg (2000) investigated the structure of the FFM across different cultures, and used the NEO-Personality Inventory-Revised (NEO-PI-R) to measure the Big Five in a sample of South African university students. They found that the structure of the five-factor model was remarkably similar across ethnic groups, with differences found only in the Openness to experience dimension, with specific reference to the Openness to feelings facet. They speculated that these differences were the result of social, economic and cultural differences between the ethnic groups. In addition, research in South Africa on the South African Personality Inventory (SAPI) project has identified nine clusters (Conscientiousness, Emotional Stability, Extraversion, Facilitating, Integrity, Intellect, Openness, Relationship Harmony and Softheartedness) of personality concepts obtained from free

personality descriptions, and these clusters include recognizable factors of at least four (Extraversion, Agreeableness, Conscientiousness and Openness to experience) of the Big Five factors. This finding is consistent with findings from lexical and other native studies, where Agreeableness-related terms generally form the largest factor (Nel et al., 2012).

The etic and the emic are two different approaches frequently used to assess personality across cultures. According to Fetvadjiev and Van de Vijver (2015, p. 249), etic "refers to research that studies cross-cultural differences from a comparative perspective", whilst emic "refers to research that examines a specific culture in more detail" without necessarily a "cross-cultural focus". The etic, or cross-cultural approach, thus focuses mainly on the transferability of models and instruments, mostly of Western origin, across different cultures. Previous research in the etic tradition has successfully replicated the FFM's five personality factors (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness) across cultures. This replication has included replication of various measuring instruments, such as the NEO PI-R (McCrae, 2013), the Big Five Inventory (Schmitt et al., 2007) and the International Personality Item Pool (IPIP; Ehrhart, Roesch, Ehrhart, & Kilian, 2008). However, the duplication of some factors, such as Openness, has remained problematic in certain cultural regions such as Africa. According to Hough and Ones (2002), although Openness is important it remains an elusive construct that needs more refining through research.

Hough and Ones (2002) argued for the use of a taxonomy that emerges through clustering of personality variables based on their own nomological network and their relationship with other psychological constructs. This approach involves bootstrapping over time and across studies until a refined taxonomy has been established. It embodies the emic, or native approach, and focuses mainly on evaluating psychological constructs that are important in particular, mostly non-Western, cultural contexts. Previous research in this regard has investigated concepts such as amae, or sweet indulgence, found in Japan; the selfless self, found in India (Cheung et al., 2006); and Ubuntu (being a person through others) found in

South Africa (Louw, 2002). In particular, in a study (the SAPI project) using a lexical approach, the concept of Ubuntu (Mbigi & Maree, 1995) has been found to be important in an indigenous investigation of personality across the 11 official South African languages (Hill, Nel, Van de Vijver, Meiring, & Valchev, 2013).

Researchers have recently started focusing on the integration of both the emic and etic perspectives, resulting in an emic–etic approach (Cheung et al., 2011). According to Cheung et al. (2011), the etic and emic approaches should be combined in order to supplement the current conceptualisation of global personality factors. It is hoped that this will bridge the void between mainstream and indigenous psychology and will set boundaries for both global and culturally specific aspects of psychological constructs. According to the emic-etic approach a test of a relatively global construct, such as personality, can be constructed in a specific culture and native researchers from another culture can then develop culture specific versions based on the outcomes of equivalence studies (Cheung et al., 2011; Fetvadjiev & Van de Vijver, 2015).

A good example of the emic-etic approach is the development of the Chinese Personality Assessment Inventory (CPAII later the CPAI-2), which is an indigenous measure that includes unique dimensions of personality (Cheung, 2004) which was developed by using a culturally relevant multidimensional personality measure in following the scientific methodology of conventional psychology (Cheung et al., 2011). The CPAI is one of the largest and most important native personality measures currently in use. It was developed with the aim of, firstly, creating a culturally appropriate and multi-dimensional personality measure and, secondly, examining the universality of Western personality theories (Cheung, 2004). The CPAI has been compared to the NEO-PI-R (Cheung et al., 2001). According to Cheung et al. (2011) the CPAI indigenous Interpersonal Relatedness (IR) factor, which includes harmony and reciprocity in a collectivistic culture, does not load on the NEO Five-Factor Inventory (NEO-FFI). This finding suggests that the Chinese view the social-perceptual world differently to Western cultures (Meiring, 2007). Cheung et al.'s (2011) findings were consistent with earlier findings (Cheung et al.,

2001) that identified IR as a personality dimension that was empirically distinct from the FFM. Although the CPAI and later the CPAI-2 were developed in a Chinese cultural context, the relevance of the emic constructs was tested in an emic-etic approach by assessing the indigenously derived scales cross-culturally. These scales were found to be cross-culturally appropriate and the CPAI-2 was then renamed the Cross-Cultural Personality Assessment Inventory (CCPAI) (Cheung et al., 2011).

Based on the same trend as the development of the CPAI and later the CPAI-2, personality researchers from South Africa and the Netherlands initiated the SAPI project ten years ago (SAPI; Meiring, Van de Vijver & Rothmann, 2006; Nel et al., 2012; Valchev et al., 2011; Valchev et al., 2012). The SAPI project began by probing native conceptions of personality across the 11 official South African languages, following a modified version of the lexical approach (i.e., this involved deriving personality descriptors during a qualitative phase related to content-representative responses that were transformed into items instead of using South African dictionaries for the 11 official languages; Hill et al., 2013). The project initially used an emic or culture-specific approach and identified nine overall personality clusters, namely Extraversion, Soft-heartedness, Conscientiousness, Emotional Stability, Intellect, Openness, Integrity, Relationship Harmony, and Facilitating. A three-tier (hierarchical) personality structure was derived consisting of nine personality clusters, 37 sub-clusters and 190 personality facets. The SAPI's identified personality clusters matched three of the FFM's factors of personality, namely Extraversion, Conscientiousness and Emotional Stability (see John & Srivastava, 1999). Two of the SAPI personality clusters resembled two of the FFM's factors of personality, namely Openness to experience and Intellect, and one of the SAPI's clusters was similar to the Honesty factor in Ashton and Lee's (2007) HEXACO model of Integrity. Three of the SAPI personality clusters were found to be unique, namely Soft-Heartedness, Integrity, Relationship Harmony and Facilitating, although some elements of the FFM's Agreeableness factor were present in these unique factors. Thus, by using an emic-etic approach, the SAPI provided a more comprehensive theory of a universal personality by connecting indigenous and mainstream psychology (Cheung et al., 2011; Nel et al., 2012). More recently,

Daouk-Öyry, Zeinoun, Choueiri and Van de Vijver (2016) argued for a global-local approach, which allows researchers to identify shared and unique components of personality across cultures, whilst ensuring that the lexicon used is relevant to the specific culture, as well as increasing the ecological validity of stimulus materials in personality inventories.

In this study, the relationships between social axioms (as measured by the parsimonious SASII model; Barnard et al., manuscript in preparation) and personality (as measured by the Mini-IPIP) were explored following an etic approach as the emic, or native approach, is outside the scope of this study.

Aim and Hypotheses

The aim of this study is to contribute towards previous research efforts (e.g., Chen, Fok et al., 2006; Leung et al., 2012) to establish social axioms' nomological network (e.g., Leung & Bond, 2009) by relying on personality factors, as measured by the Mini-IPIP (Donnellan et al., 2006). This will also contribute to validating social axioms (as measured by the parsimonious SASII model; Barnard et al., manuscript in preparation) in the South African context.

The first substantive aim of this study is to test the linkages between generalised beliefs (i.e., social axioms; as measured by the SASII instrument) by exploring the correlations of social axiom factors (Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity) with the Big-Five personality factors (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to experience), as measured by the Mini-International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006). The second aim of the study was to explore social axioms' ability to predict personality.

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Following the analytical strategy and based on the literature review, the following hypotheses were tested in this study:

- Hypothesis 1: Social Cynicism has a significant positive correlation with Neuroticism;
- Hypothesis 2: Social Cynicism has a significant negative association with Agreeableness;
- Hypothesis 3: Social Complexity has a significant negative correlation with Extraversion;
- Hypothesis 4: Social Complexity has a significant positive correlation with Neuroticism;
- Hypothesis 5: Fate Control has a significant negative correlation with Extraversion;
- Hypothesis 6: Religiosity has a significant positive correlation with Agreeableness;
- Hypothesis 7: Reward for Application has a significant positive correlation with Conscientiousness; and
- Hypothesis 8: Social axioms have the ability to predict personality characteristics related to Extraversion (small effect), Conscientiousness (medium effect), Intellect (medium effect), Neuroticism (medium effect) and Agreeableness (large effect).

Method

Research Design

A cross-sectional survey design was used to achieve the research objectives. Survey questionnaires consisting of the parsimonious SASII model (Barnard et al., manuscript in preparation) and Mini-IPIP (Donnellan et al., 2006) were used to collect the data. Data was analysed using descriptive and inferential statistics (Saunders, Lewis, & Thornhill, 2009). A cross-sectional survey design was used due to its ability to assess the interrelationships among factors within a population

(Saunders et al., 2009) and to address the descriptive and predictive functions associated with the correlational design and the examination of relationships between variables (Shaughnessy & Zechmeister, 1997). An empirical study was conducted using primary, numeric (quantitative) data (Babbie & Mouton, 2001) collected from a non-probability sample that was selected according to convenience, accessibility and cost effectiveness (Saunders et al., 2009; Terre Blanche & Durrheim, 2002).

Participants

The study population ($N = 1567$) was drawn from a sample of university students ($N = 793$) and their family members and friends ($N = 645$) (129 missing values). In terms of race, the majority (66%; $N = 972$) were white, 15% were black ($N = 237$), 6% were coloured ($N = 93$) and 5% were Indian ($N = 82$) (183 missing values). In terms of gender, the majority (59%; $N = 914$) were female and 41% ($N = 643$) were male (10 missing values). The ages of the participants varied from below 20 years to above 60 years with the majority (51%; $N = 830$) of respondents being between the ages of 21 and 30 years. Missing data was less than 6% and random. Table 1 shows the characteristics of the participants ($N = 1567$).

Table 1

Characteristics of Participants (N = 1567)

Item	Category	Frequency	Percentage
Gender	Male	643	40.7%
	Female	914	58.9%
	Missing values	10	0.5%
Age	Below 20	305	22.5%
	21 – 30	830	51.0%
	31 – 40	99	4.0%
	41 – 50	127	9.1%
	51 – 60	117	8.4%
	Over 60	30	2.3%
	Missing values	59	2.8%
Race	White	972	66.4%
	Black	237	15.1%
	Coloured	93	5.9%
	Indian	82	5.2%
	Missing values	183	8.3%
Participant	University Student	793	55.8%
	Not University Student	645	38.3%
	Missing values	129	5.9%

Measuring instruments

Parsimonious SASII

The parsimonious SASII model, which consists of 54 social axiom statements (see Addendum A: Table A. 3), as developed by Barnard et al. (manuscript in preparation) was used in this study. The parsimonious SASII model (Barnard et al., manuscript in preparation) required respondents to rate on a five-point Likert scale the degree to which they believe each of the items to be true, ranging from 1 (*strongly disbelieve*) to 5 (*strongly believe*). Five social axiom factors were included, namely Social Cynicism (13 items), Reward for Application (10 items), Social Complexity (eight items), Fate Control (14 items) and Religiosity (nine items). The following reliability coefficients were reported by Barnard et al. (manuscript in preparation) for the parsimonious SASII model: (i) Social Cynicism: ρ = 0.78 (0.76, 0.81); (ii) Reward for Application: ρ = 0.72 (0.69, 0.75); (iii) Social Complexity: ρ = 0.66 (0.62, 0.70); (iv) Fate Control: ρ = 0.86 (0.84, 0.87); and (v) Religiosity: ρ = 0.81 (0.78, 0.83).

Mini-IPIP

The Mini-International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006), consisting of 20 items to measure the five-factor structure of personality, namely Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness, developed from the 50-item IPIP (Goldberg, 1999) was used in this study. Each personality factor is measured by four items, and respondents rated each statement related to personality on a 5-point Likert scale indicating the degree of "How well does this statement describes you?" ranging from 1 (does not describe me at all) to 5 (describes me very well). Taking into account that there are only four items per factor, Donnellan et al. (2006) reported acceptable alpha coefficients of 0.66 (Extraversion), 0.62 (Agreeableness), 0.65 (Conscientiousness), 0.61 (Neuroticism) and 0.62 (Openness).

Procedure

The sample of students from the University of Pretoria and volunteers (e.g., family members and friends) completed the SASII and Mini-IPIP survey questionnaires, which the students used as part of a third year module for BDO 372 psychometric testing at the University of Pretoria. This formed part of the practical training and allowed students to familiarise themselves with the questionnaires and their administration. The SASII and Mini-IPIP survey questionnaires were formulated in such a manner that participants gave consent that the information from the surveys could be used by the researcher for research purposes only. The questionnaires were accompanied by covering letters explaining the purpose of the research with emphasis on the confidentiality of the research project. A total of 1567 surveys were completed and the sample includes students and their family members and friends. The data that has been collected has not previously been used for research. Permission to use the data was obtained from the University of Pretoria's ethics committee. The completed raw data was converted to an SPSS dataset for use in Mplus 7.11.

Analysis

Analyses were conducted with Mplus Version 7.11 (Muthen & Muthen, 2012). A traditional confirmatory factor analysis (CFA) was executed using Mplus weighted least squares means and variances adjusted (WLSMV) with standard errors and tests for model fit (Marsh et al., 2010). This CFA aimed to determine whether the five-factor structure of the Mini-International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006) provides a good fit to the data, as per the substantive hypothesis (Khan, 2006). According to Wang and Wang (2012) CFA is used when factors are theoretically defined and factors' indicators of measurement items specified, confirming the factorial structure of the a priori developed measuring instrument (i.e., Mini-IPIP) applied to a target population.

The following Mplus fit indices were used in this study to determine the Mini-International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006) goodness of model fit: Absolute fit indices, such as the Chi-square statistic (to test the absolute fit of the Mini-IPIP): Root Mean Square Error of Approximation (RMSEA) and Weighted Root Mean Square Residual (WRMR); incremental fit indices, which included the Tucker Lewis Index (TLI); and the Comparative Fit Index (CFI) (Hair, Black, Babin, & Anderson, 2010). According to Van de Schoot, Lugtig and Hox (2012), a reasonable model fit has TLI and CFI values of higher than 0.90 and a RMSEA of lower than 0.08. A good model fit has TLI and CFI values of higher than 0.95 and a RMSEA of lower than 0.05 (Van de Schoot et al., 2012). According to Wang and Wang (2012) a WRMR value of 1.0 or lower is considered a good fit between the model and the data.

First, CFAs were performed through latent variable modelling, testing five hypothesised measurement models. Second, bivariate correlations were computed for each factor of the SASII (Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity) and Mini-IPIP (Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to experience) to examine the hypothesised linkages between social axioms and personality factors. Last, a regression analysis was computed to estimate the relationships among the latent variables of beliefs and personality.

Results

Fator analysis of Mini-IPIP

As a first step in establishing the five-factor model of the Mini-IPIP (Mini-IPIP; Donnellan et al., 2006), a confirmatory factor analysis (CFA) was carried out on the data using Mplus Version 7.11 to determine whether the model is a good fit to the data by observing the variance-covariance matrix amongst Mini-IPIP items (Khan, 2006).

The results are reported in Table 2. Extraversion had four items (out of 4 items) with loadings of > 0.30, Agreeableness had four items (out of 4 items) with loadings of > 0.30, Conscientiousness had four items (out of 4 items) with loadings of > 0.30, Neuroticism had two items (out of 4 items) with loadings of > 0.30 (items 14 and 19 had loadings of < 0.30). Item 19 (I seldom feel blue) of the factor Neuroticism was problematic and statistically not significant (< 0.08). Hence, item 19 was excluded from all subsequent analysis. Lastly, Intellect had four items (out of 4 items) with loadings of > 0.30.

Table 2

Item description and CFA loadings of the 20-item Mini-IPIP

Item nr	**Extraversion**	Item loadings
11	I talk to a lot of different people at parties	**0.70**
16	I keep in the background	**0.68**
1	I am the life of the party	**0.62**
6	I don't talk a lot	**0.59**
Item nr	**Agreeableness**	Item loadings
17	I am not really interested in others (R)	**0.69**
7	I am not interested in other people's problems (R)	**0.63**
2	I sympathize with other's feelings	**0.61**
12	I feel others' emotions	**0.59**
Item nr	**Conscientiousness**	Item loadings
8	I often forget to put things back in their proper place (R)	**0.65**
3	I get chores done right away	**0.62**
13	I like order	**0.61**
18	I make a mess of things (R)	**0.57**
Item nr	**Neuroticism**	Item loadings
4	I have frequent mood swings	**0.83**
14	I get upset easily	**0.64**
9	I am relaxed most of the time (R)	0.29
19	I seldom feel blue (R)	0.08
Item nr	**Intellect**	Item loadings
15	I have difficulty understanding abstract ideas	**0.63**
10	I am not interested in abstract ideas (R)	**0.57**
20	I do not have a good imagination (R)	**0.55**
5	I have a vivid imagination	**0.43**

Note: Reversed items are indicated by (R), and they are recoded so that all loadings are positive in direction

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The fit indices used to determine the model's (Mini-IPIP; Donnellan et al., 2006) goodness of model fit were the TLI, CFI, RMSEA and WRMR. According to Van de Schoot et al. (2012) a reasonable model fit has TLI and CFI values of > 0.90 and a RMSEA of < 0.08. A good model fit has TLI and CFI values of > 0.95 and a RMSEA of < 0.05 (Van de Schoot et al., 2012). According to Wang and Wang (2012) a WRMR value of 1.0 or lower is considered a good fit. With respect to the model fit of the Mini-IPIP (Donnellan et al., 2006) within the South African context, the Mini-IPIP exhibited a moderate model fit when conducting CFA. The fit indices for the Mini-IPIP model were χ^2 1,066, N = 1,567; *df* = 160, p < 0.001, RMSEA = 0.066, WRMR 1.995, CFI = 0.85 and TLI = 0.82. All factor loadings were significant at the 0.05 level. The RMSEA, which is not sensitive to sample size but is sensitive to model complexity, suggested a reasonable model fit in the population (Brown, 2006; Van de Schoot et al., 2012). However, the CFI and TLI produced values too low (< 0.90) for an adequate model fit (Van de Schoot et al., 2012). It is noted that Donnellan et al. (2006) reported a CFI of 0.88 when testing the structure of the Mini-IPIP by conducting a CFA. In the study conducted by Leung et al. (2012) a CFA of the Mini-IPIP was conducted and a CFI of 0.88 was considered an acceptable fit.

As a second step, an EFA was conducted using Mplus Version 7.11 and specifying a "Model: F1-F5" (exploring a five-factor model structure). Reasonable factor fit indices were exhibited for the EFA, compared to the fit indices for the CFA. The EFA fit indices were χ^2 529, N = 1,567; *df* = 100, p < 0.001, RMSEA = 0.056, SRMR 0.033, CFI = 0.93 and TLI = 0.86. These findings support the suggestion of Donnellan et al. (2006), who argued that it might not be possible to obtain a good model fit (> 0.90) for the Mini-IPIP by conducting a CFA, because many of the items tend to have relationships with more than one personality factor, thus contributing towards CFA model misfit.

Testing the measurement model

CFAs were performed through latent variable modelling methods using Mplus Version 7.11 (Muthen & Muthen, 2012). Universal assessments of model fit were based on various goodness-of-fit-statistics (e.g., Chi-square, CFI, TLI, RMSEA and WRMR).

Hypothesised models

In the below hypothesised models each of the observed variables loaded only on a single latent factor. The observed variables in the model were regarded as categorical variables. Errors of measurement associated with observed variables were not correlated, whilst latent variables were allowed to correlate.

The following measurement models were tested:

- Model 1: A model consisting of ten latent variables of beliefs and personality. Beliefs consisted of five first-order latent factors of social axioms, namely Social Cynicism (11 items), Reward for Application (9 items), Social Complexity (8 items), Fate Control (13 items) and Religiosity (9 items). Personality consisted of five first-order latent factors of personality, namely Extraversion (3 items), Agreeableness (4 items), Conscientiousness (4 items), Neuroticism (3 items) and Intellect (4 items).

- Model 2: A model consisting of six latent variables of beliefs and personality. Personality consisted of one first-order latent factor of personality (18 items) and beliefs, a second-order factor, consisted of five first-order latent factors of social axioms, namely Social Cynicism (11 items), Reward for Application (9 items), Social Complexity (8 items), Fate Control (13 items) and Religiosity (9 items).

- Model 3: A model consisting of six latent variables of beliefs and personality. Beliefs consisted of one first-order latent factor of social axioms (50 items) and personality, a second-order factor, consisted of five first-order latent factors of personality, namely Extraversion (3 items), Agreeableness (4 items), Conscientiousness (4 items), Neuroticism (3 items) and Intellect (4 items).

- Model 4: A model consisting of two latent variables of beliefs and personality. Beliefs consisted of one first-order latent factor of social axioms (50 items) and personality consisted of one first-order latent factor of personality (18 items).
- Model 5: A model consisting of one first-order latent variable of beliefs and personality items (68 items).

Table 3 presents the fit statistics for the tests of the various measurement models.

Table 3

Model fit statistics for the measurement models

Model	χ²	*df*	p	CFI	TLI	RMSEA [90% CI] *pclose test (> 0.05)	WRMR
Model 1	5734	2161	0.00	0.90	0.90	*0,03 [0.03; 0.03]	1.776
Model 2	9248	2539	0.00	0.83	0.83	*0.04 [0.04; 0.04]	2.302
Model 3	22016	2539	0.00	0.51	0.49	0.07 [0.07; 0.07]	3.821
Model 4	23622	2553	0.00	0.47	0.45	0.07 [0.06; 0.07]	3.988

df: degrees of freedom; CI: confidence interval; CFI: Comparative Fit Index; TLI: Tucker–Lewis Index; RMSEA: root mean square error of approximation; WRMR: weighted root mean square residual

Model 5 could not be computed and the standard errors of the model parameter could not be estimated (Muthen & Muthen, 2012).

Testing the structural model

Bivariate correlations were computed for each factor of the SASII and Mini-IPIP to examine the hypothesised relationships between social axioms and personality factors. The results are reported in Table 4.

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Hypotheses 1 and 2

Social Cynicism was positively and significantly correlated with Neuroticism; and negatively and significantly correlated with Agreeableness. These findings are consistent with the findings of Leung et al. (2012). Hypotheses 1 and 2 are accepted.

Hypotheses 3 and 4

Social Complexity was negatively correlated with Extraversion, but this was not significant. Hypothesis 3 is rejected. Social Complexity was positively and significantly correlated with Agreeableness, but not with Neuroticism. Hypothesis 4 is rejected. Social Complexity was also positively and moderately correlated with Intellect. These finding are consistent with the findings of Leung et al. (2012).

Hypothesis 5

No significant linkages between Fate Control and any of the personality factors were found. This finding is consistent with previous research findings of both Chen, Fok et al. (2006) and Leung et al. (2012). Hypothesis 5 is rejected.

Hypothesis 6

Religiosity was positively and significantly correlated with Agreeableness. Although Chen, Fok et al. (2006) did not find a significant positive correlation, this finding is consistent with the later findings of Leung et al. (2012). Hypothesis 6 is accepted.

Hypothesis 7

Reward for Application was positively and significantly correlated with Conscientiousness. This finding is consistent with the findings of Leung et al. (2012). Hypothesis 7 is accepted. Leung et al. (2012) also found a positive and significant correlation between Reward for Application and Agreeableness. Although a positive correlation between Reward for Application and Agreeableness was found in this study, it was not significant.

Similarly to the results reported by Leung et al. (2012), the relationships between social axioms and personality factors ranged from statistically insignificant to statistically significant with correlations between social axioms and personality factors rarely being higher than 0.40. The only exception was the correlation between Social Complexity and Agreeableness, which had a correlation of 0.45 in the current study. It is noted that neither Chen, Fok et al. (2006) nor Leung et al. (2012) made any findings regarding a significantly positive relationship between Social Complexity and Agreeableness. Table 4 presents the fit statistics for the bivariate correlations between social axioms and personality factors.

Table 4

Bivariate correlations between social axioms and personality factors

	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Intellect
Social Cynicism	0.125	**-0.370**	-0.213	**0.321**	-0.094
Reward for Application	-0.163	0.249	**0.332**	0.005	0.252
Social Complexity	-0.202	**0.451**	0.095	0.114	0.297
Fate Control	0.116	-0.254	-0.162	0.175	-0.224
Religiosity	-0.117	**0.313**	0.231	-0.035	0.055

In addition, a regression analysis was computed to estimate the relationships among the latent variables of beliefs and personality. The relationships between the dependent variable (i.e., personality) and the independent variables (i.e. social axioms) were examined (Saunders et al., 2009). The results are reported in Table 5.

Table 5

Regression analysis of the latent variables beliefs (social axioms) and personality

Extraversion	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
Social Cynicism	0.13	0.06	2.28	0.02
Reward for Application	0.01	0.09	0.14	0.89
Social Complexity	-0.20	0.09	-2.24	0.03
Fate Control	-0.01	0.06	-0.22	0.83
Religiosity	-0.03	0.05	-0.69	0.49
Agreeableness				
Social Cynicism	**-0.48**	0.06	-8.64	***0.00**
Reward for Application	**-0.36**	0.09	-4.03	***0.00**
Social Complexity	**0.70**	0.09	7.44	***0.00**
Fate Control	0.15	0.06	2.66	0.01
Religiosity	0.16	0.05	3.63	***0.00**
Conscientiousness				
Social Cynicism	-0.09	0.06	-1.58	0.12
Reward for Application	**0.53**	0.08	6.37	***0.00**
Social Complexity	**-0.39**	0.09	-4.44	***0.00**
Fate Control	-0.11	0.06	-2.05	0.04
Religiosity	0.15	0.05	3.27	***0.00**
Neuroticism				
Social Cynicism	0.27	0.06	4.81	***0.00**
Reward for Application	-0.10	0.08	-1.30	0.19
Social Complexity	0.23	0.09	2.65	0.01
Fate Control	0.06	0.05	1.11	0.27
Religiosity	-0.06	0.04	-1.51	0.13
Intellect				
Social Cynicism	-0.01	0.06	-0.14	0.89
Reward for Application	0.01	0.09	1.04	0.30
Social Complexity	0.22	0.01	2.26	0.02
Fate Control	-0.15	0.06	-2.49	0.01
Religiosity	-0.08	0.05	-1.74	0.08

*$p < 0.01$ indicates statistical significance

Statistical significant relationships were found between (i) the social axiom factor Social Cynicism and the personality factors Agreeableness and Neuroticism; (ii) the social axiom factor Reward for Application and the personality factors Agreeableness and Conscientiousness; (iii) the social axiom factor Social Complexity and the

personality factors Agreeableness and Conscientiousness; and (iv) the social axiom factor Religiosity and the personality factors Agreeableness and Conscientiousness.

According to Cohen (1988), 5.8% of variance explains a small effect, 9.0% to 24.9% of variance explains a medium effect and 25% or more of variance explains a large effect. In this regard, it was noted by the R-squared values of the latent variables estimates that social axioms (as independent variables) predicted 5.8% of the variance in Extraversion (small effect), 41.6% of the variance in Agreeableness (large effect), 21.0% of the variance in Conscientiousness (medium effect), 12.6% of the variance in Neuroticism (medium effect) and 11.8% of the variance in Intellect (medium effect). Hypothesis 8 is accepted.

Discussion

The goal of this study was to contribute towards previous research findings in establishing social axioms' nomological network (e.g., Burgess, 2011; Chen, Fok et al., 2006; Leung & Bond, 2009; Leung et al., 2012) by relying on the five-factor model of personality (e.g., Fetvadjiev & Van de Vijver, 2015; Hough & Ones, 2002). Achieving this goal would also contribute towards validating social axioms in a South African context. In previous research social axioms have been found to show foreseeable but low correlations with values (e.g., Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004; Leung et al., 2007) as well as personality (e.g., Chen, Bond & Cheung, 2006; Chen, Fok et al., 2006; Leung et al., 2012), complementing these established individual difference constructs in providing insight into predicting behaviour across different cultures.

The findings of this study indicate that the five-factor structure of social axioms is supported. As predicted and hypothesised, Social Cynicism, which is a negative view of human nature and social events, related positively to Neuroticism, but negatively to Agreeableness. This finding was expected because an individual's negative perception of the social world is expected to be related to anxiety and defensiveness

in handling social interventions. Furthermore, individuals who are high on Reward for Application place emphasis on effort, and it was hypothesised that this should correlate positively with Conscientiousness, which relates to diligent self-application. Individuals who are high on Social Complexity believe in the uncertainty of events and believe that there are multiple solutions to problems. Hence, it is likely that such individuals foster unconventional ideas and are willing to explore their world intellectually, supporting a positive correlation between Social Complexity and Intellect. An unexpected finding was that Fate Control, which is a deterministic view of social events, had no significant relations to any of the personality dimensions. Leung et al. (2012) reported a significant positive relationship between Fate Control and Extraversion; however, this correlation was only present in three samples (Malaysia, Hong Kong and the United States) and was not consistent in the other countries' sample groups, which may have been a reason for this finding. Religiosity, which relates to the belief in the existence of a supreme being and the positive consequences of religious belief, is related to an orientation of getting along with others and the need to nurture and help fellow humans, and was thus predicted to correlate positively with Agreeableness. This study thus provided insight into social axioms' ability to predict personality across cultures.

Limitations of the Study

Several limitations were identified in this study. First, the sample consisted only of university students, their family members and friends and this may limit the generalisability of the study findings. Second, the SASII and Mini-IPIP questionnaires are self-report measures and this may have created ordinary method variance (Richardson, Simmering, & Sturman, 2009). However, according to Doty and Glick (1998) and Johnson, Rosen, and Djurdjevic (2011), common method variance should not be a sufficient reason for findings to be invalid. Third, the very method used to collect the data may have caused common method bias. According to Avey, Luthans and Jensen (2009), method bias refers to the inflated relations that occur when research participants responds to questionnaires that have been validated by previous research, raising concerns over artificially increased relations. Fourth, the

research design did not allow for any interpretations of causal relations between the variables.

Conclusion

The results of this study provide evidence for the validity of social axioms' five-factor structure in a South African context and contribute towards existing research findings (e.g., Burgess, 2011; Chen, Fok et al., 2006; Leung & Bond, 2009; Leung et al., 2012) in establishing social axioms' nomological network. These findings also expand on previous research by indicating social axioms' ability to predict personality across cultures. However, there are limitations that should be addressed in future research. These include the need for larger samples to fully represent the multilingual, multicultural South African population in order to allow for the generalisability of results. Furthermore, future research should focus on structural and scalar equivalence by testing for full measurement invariance (MI) of the SASII related to configural, weak (metric) and strong (scalar) measurement invariance. Future research should also assess the variance between and within groups. Lastly, the SASII could also be utilised in conjunction with the SAPI (Meiring et al., 2006; Nel et al., 2012; Valchev et al., 2011; Valchev et al., 2012) to, in a similar fashion as investigating personality, investigate indigenous conceptions of generalised beliefs (i.e., social axioms) across the 11 official South African languages.

References

Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review, 11,* 150-166. doi.org/10.1177/1088868306294907.

Avey, J. B., Luthans, F., & Jensen, S. (2009). Psychological capital: A positive resource for combating stress and turnover. *Human Resource Management, 48*, 677-693. doi: 10.1002/hrm.20294.

Babbie, E., & Mouton, J. (2009). *The practise of social research*. Cape Town, South Africa: Oxford University Press.

Barnard, A., Meiring, D., & Rothman, S. (2008). The cross-cultural application of the social axioms survey in the South-African Police Service. *South African Journal of Industrial Psychology, 34(2)*, 1-9.

Barnard, A., Meiring, D., Rothman, S, & Zondervan-Zwijnenburg, M. (manuscript in preparation). *The factor structure of the Social Axioms Survey II (SASII) in the South African context*.

Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology, 44*, 1–26.

Bond, M. H., Leung, K., Au, A., Tong, K., & Chemonges-Nielson, Z. (2004). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18(3)*, 177-191. doi: 10.1002/per.509.

Bond, M. H., Leung, K., Au, A., Tong, K., Reimel de Carrasquel, S., Murakami, F., … Lewis, J. R. (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology, 35(5)*, 548-570. doi: 10.1177/002202210426838.

Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York, NHY: The Guilford Press.

Burgess, S. M. (2011). Social axioms: A new culture measure for South African business research. *South African Journal of Business Management 42(3)*, 1-21.

Chen, S. X., Bond, M. H., & Cheung, F. M. (2006). Personality correlates of social axioms: Are beliefs nested within personality? *Personality and Individual Differences, 40*, 509-519. doi: org/10.1016/j.paid.2005.04.016.

Chen, S. X., Fok, H. K., Bond, M. H., & Matsumoto, D. (2006). Personality and beliefs about the world revisited: Expanding the nomological network of social axioms. *Personality and Individual Differences, 41*, 201-211. doi: org/10.1016/j.paid.2006.01.009.

Cheung, F. M. (2004). Use of Western and indigenously developed personality tests in Asia. *Applied Psychology: An International Review, 53(*2), 173-191. doi: 10.1111/j.1464-0597.2004.00167.x.

Cheung, F. M., Cheung, S. F., Wada, S., & Zhang, J. (2003). Indigenous measures of personality assessment in Asian countries: A review. *Psychological Assessment, 15(3)*, 280–289. doi: org/10.1037/1040-3590.15.3.280.

Cheung, F. M., Leung, K., Zhang, J. X., Sun, H. F., Gan, Y. G., Song, W. Z., & Xie, D. (2001). Indigenous Chinese personality constructs: Is the Five-Factor Model complete? *Journal of Cross-Cultural Psychology, 32(4)*, 407-433. doi: 10.1177/0022022101032004003.

Cheung, F. M., van de Vijver, F. J. R., & Leong, F. T. L. (2011). Toward a new approach to the study of personality in culture. *American Psychologist, 66*, 593–603. http://dx.doi.org/10.1037/a0022389.

Chiu, C. (2014). What culture could be? *Journal of Cross-Cultural Psychology, 45*(1), 3-4. doi: 10.1177/0022022113513403.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Costa, P. T., Jnr., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

Daouk-Öyry, L., Zeinoun, P., Choueiri, L., & Van de Vijver, F. J. R. (2016). Integrating global and local perspectives in psycholexical studies: A GloCal approach. *Journal of Research in Personality 62, 19–28*. doi: org/10.1016/j.jrp.2016.02.008.

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the big five factors of personality. *Journal of Applied Psychology, 86(6)*, 1270-1279. doi:10.1037/1040-3590.18.2.192.

Doty, D. H., & Glick, W. H. (1998). Common method bias: Does common method bias variance really bias results? *Organizational Research Methods, 1*, 374-406. doi: 10.1177/109442819814002.

Ehrhart, K. H., Roesch, S. C., Ehrhart, M. G., & Kilian, B. (2008). A test of the factor structure equivalence of the 50-Item IPIP Five-Factor Model measure across gender and ethnic groups. *Journal of Personality Assessment, 90(5)*, 507-516. doi: org/10.1080/00223890802248869.

Fetvadjiev, V. H., & Van de Vijver, F. J. R. (2015). Universality of the five factor model of personality. In J. D. Wright (Ed.), *International encyclopaedia of the social & behavioural sciences. Vol 9.* (2nd ed; pp. 249-253). Oxford, United Kingdom: Elsevier.

Fisher, R., & Boer, D. (2015). Motivational basis of personality traits: A meta-analysis of value-personality correlations. *Journal of Personality, 83(5)*, 491-510. doi: 10.1111/jopy.12125.

Goldberg, L. R. (1999). The curious experiences survey, a revised version of the dissociative experiences scale: Factor structure, reliability, and relations to demographic and personality variables. *Psychological Assessment, 11(2)*, 134-145. doi: org/10.1037/1040-3590.11.2.134.

Hair, J. F., Black, W. C., Babin, B.J., & Anderson, R. E. (2010). *Multivariate data analysis (7th ed.)*. Upper Saddle River, NJ: Prentice-Hall.

Heuchert, J. W. P., Parker, W. D., Stumpf, H., & Myburg, C. P. H. (2000). The five-factor model of personality in South African college students. *American Behavioural Scientist, 44*, 112-125.

Hill, C., Nel, J. A., Van de Vijver, F. J. R., Meiring, D., & Valchev, V. (2013). Developing and testing items for the South African Personality Inventory. *South African Journal of Industrial Psychology, 39(1)*, 1-13.

Hough, L. M., & Ones, D. S. (2002). The structure, measurement, validity, and use of personality variables in industrial work, and organizational psychology. In N.

Anderson, D. Ones, H. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work & organizational psychology: Vol. 1* (pp. 233–277). London, United Kingdom: Sage.

Ispas, D., Iliescu, D., Ilie, A., & Johnson, R., E. (2014). Exploring the cross-cultural generalizability of the five-factor model of personality: The Romanian NEO PI-R. *Journal of Cross-Cultural Psychology, 45(7)*, 1074-1088. doi: 10.1177/0022022114534769.

John, O. P., & Srivastava, S. (1999). The Big Five Trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (pp.102-138). New York, NY: Guilford Press.

Johnson, R. E., Rosen, C. C., & Djurdjevic, E. (2011). Assessing the impact of common method variance on higher-order multidimensional constructs. *Journal of Applied Psychology, 96(4)*, 744-761. doi: org/10.1037/a0021504.

Katigbak, M. S., Church, A. T., Guanzon-Lapeña, M. A., Carlota, A. J., & Del Pilar, G. H. (2002). Are indigenous dimensions culture-specific? Philippine inventories and the five-factor model. *Journal of Personality and Social Psychology, 82(1)*, 89-101. doi: org/10.1037/0022-3514.82.1.89.

Khan, J. H. (2006). Factor analysis in counselling psychology research, training and practice: Principles, advances and applications. *The Counselling Psychologist, 34(5)*, 684-718.

Kurman, J., & Ronen-Eilon, C. (2004). Lack of knowledge of a culture's social axioms and adaptation difficulties among immigrants. *Journal of Cross-Cultural Psychology, 35(2)*, 192-208. doi: 10.1177/0022022103262244.

Laher, S. (2010). Using exploratory factor analysis in personality research: Best-practice recommendations. *South African Journal of Industrial Psychology, 36(1)*, 1-7.

Leung, K., Au, A., Huang, X., Kurman, K., Niit, T., & Niit, K. (2007). Social axioms and values: A cross-cultural examination. *European Journal of Personality, 21(2)*, 91-111. doi: 10.1002/per.615.

_____

Leung, K., & Bond, M. H. (2004). Social axioms: A model of social beliefs in multi-cultural perspective. *Advances in experimental social psychology* (*Vol. 36*; pp. 119-197). San Diego, CA: Elsevier Academic Press.

Leung, K., & Bond, M. H. (2008). Psycho-logic and eco-logic: Insights from social axiom dimensions. In F. van de Vijver, D.van Hemert, & Y. P. Poortinga (Eds.), *Individuals and cultures in multilevel analysis* (pp. 197-219). Mahwah, NJ: Erlbaum.

Leung, K., & Bond, M. H. (Eds). (2009). *Psychological aspects of social axioms: Understanding global belief systems*. New York, NY: Springer.

Leung, K., Bond, M. H., Reimel de Carrasquel, S., Munoz, C., Hernandez, M., Murakami, F., … Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33(3)*, 286-302. doi: 10.1177/0022022102033003005.

Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., Gornick, L. J., Amponsah, B., … Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the five factor model of personality. *Journal of Cross-Cultural Psychology, 43(5)*, 833-857. doi: 10.1177/0022022111416361.

Louw, D. J. (2002). *Ubuntu: An African assessment of the religious other.* Polokwane, South Africa: University of the North.

Marsh, H. W., Muthen, B, Morin, A. J. S., Ludtke, O., Asparouhov, T., Trautwein, U., & Nagengast, B. (2010). A new look at the big 5 structure through exploratory structural equation modeling. *Psychological Assessment 22(3)*, 471-491. doi: org/10.1037/a0019227.

Mbigi, L., & Maree, J. (1995). *Ubuntu: The spirit of African transformation management*. Johannesburg, South Africa: Knowledge Resource.

McCrae, R. R. (2013). Exploring trait assessment of samples, persons, and cultures. *Journal of Personality Assessment, 95(6)*, 556-570. doi: org/10.1080/00223891.2013.821075.

McCrae, R. R., Terracciano, A., & Members of the Personality Profiles of Cultures Project. (2005). Universal features of personality traits from the observer's

perspective: Data from 50 cultures. *Journal of Personality and Social Psychology, 88(3)*, 547-561. doi: org/10.1037/0022-3514.88.3.547.

Meiring, D. (2006). *The development of a situational judgement test (SJT) for the South African Police Service*. Paper presented at the 26th Annual Conference of the Assessment Centre Study Group, Spier Convention Centre, March 22-23, Stellenbosch, South Africa.

Meiring, D. (2007). *Bias and equivalence of psychological measures in South Africa*. Unpublished doctoral thesis, University of Tilburg, Tilburg, The Netherlands.

Meiring, D., Van De Vijver, F. J. R., & Rothmann, S. (2006). Bias in the adapted version of the 15 FQ+ questionnaire in South Africa. *South African Journal for Psychology, 36(2)*, 340-356.

Meiring, D., Van de Vijver, F. J. R.., Rothmann, S. & Barrick, M. R. (2005). Construct, item, and method bias of cognitive and personality tests in South Africa. *South African Journal of Industrial Psychology, 31(1)*, 1-8. doi: 10.4102/sajip.v31i1.182.

Muthen, L. K., & Muthen, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthen & Muthen.

Nel, J. A., Valchev, V. H., Rothmann, S., Van de Vijver, F. J. R., Meiring, D., & De Bruin, G. P. (2012). Exploring the personality structure in the 11 languages of South Africa. *Journal of Personality, 80(4)*, 915-948. doi: 10.1111/j.1467-6494.2011.00751.x.

Ortiz, F. A., Church, A. T., Vargas-Flores, J. J., Ibáñez-Reyes, J., Flores-Galaz, M., Iuit-Briceño, J. I., & Escamilla, J. M. (2007). Are indigenous personality dimensions culture-specific? Mexican inventories and the Five-Factor Model. *Journal of Research in Personality, 41(3)*, 618-649. doi: org/10.1016/j.jrp.2006.07.002.

Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three paradigms: Examining post hoc statistical corrections for common method variance from three divergent perspectives. *Organizational Research Methods, 12(4)*, 687-694. doi: 10.1177/1094428109332834.

_____

Saunders, L., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow, Essex: Pearson Education.

Schmitt, D. P., Allik, J., McCrae, R. R., Benet-Martínez, V., Pontificia, L. A., Ault, A., … Zupanèiè. A. (2007). The geographic distribution of Big Five personality traits: Patterns and profiles of human self-description across 56 nations. *Journal of Cross-Cultural Psychology, 38(2)*, 173-212. doi: 10.1177/0022022106297299.

Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology* (*Vol. 25*; pp. 1–65). New York, NY: Academic Press.

Schwartz, S. H., (2014a). Rethinking the concept of societal culture in light of empirical findings. *Journal of Cross-Cultural Psychology, 45(1)*, 5-13.

Schwartz, S. H., (2014b). Societal value culture: Latent and dynamic. *Journal of Cross-Cultural Psychology, 45(1)*, 42-46.

Shaughnesssy, J. J., & Zechmeister, E. B. (1997*). Research methods in psychology* (4th ed.). New York, NY: McGraw-Hill.

Singelis, T. M., Hubbard, C., Her, S., & An, S. (2003). Convergent validation of the social axioms survey. *Personality and Individual Differences, 34(2)*, 269-282. doi:10.1016/S0191-8869(02)00043-0.

Social Axioms Project. *Social Axioms Survey II*. Retrieved April 9, 2011, from: http://personal.cityu.edu.hk/~mgkleung/sa.htm#Download.

Stankov, L., & Saucier, G. (2015). Social axioms in 33 countries: Good replicability at the individual level but less so at the country level. *Journal of Cross-Cultural Psychology, 46(2)*, 296-315. doi: 10.1177/0022022114558333.

Taylor, I. A. (2000). *The construct comparability of the NEO-PI-R questionnaire for black and white employees.* Unpublished doctoral thesis, University of the Free State, Bloemfontein, South Africa.

Terre Blanche, M., & Durrheim, K. (2002). *Research in practice: Applied methods for the social sciences*. Cape Town, South Africa: University of Cape Town Press.

Valchev, V. H., Nel, A., Van de Vijver, A. J. R., Meiring, D., De Bruin, G., & Rothmann, S. (2012). Similarities and differences in implicit personality concepts

_____

across ethnocultural groups in South Africa. *Journal of Cross-Cultural Psychology, 44(3)*, 365-388. doi: 10.1177/0022022112443856.

Valchev, V. H., Van de Vijver, F. J. R., Nel, J. A., Rothmann, S., Meiring, D., & De Bruin, G. P. (2011). Implicit personality conceptions of the Nguni cultural-linguistic groups of South Africa. *Cross-cultural Research, 45*(3), 235-266. doi.org/10.1177/1069397111402462.

Van Aarde, N., Meiring, D. & Wiernik, B.M. (2016, in review). The validity of the Big Five personality traits for job performance: Meta-analyses of South African studies. *Special Issue: Career Development International*.

Van de Schoot, R., Lugtig, P., & Hox. J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9(4)*, 486-492. doi: org/10.1080/17405629.2012.686740.

Visser, D., & Viviers, R. (2010). Construct equivalence of the OPQ32n for Black and White people in South Africa. *SA Journal of Industrial Psychology*/SA Tydskrif vir Bedryfsielkunde, *36(1)*, Art. #748, 11 pages. DOI: 10.4102/sajip.v36i1.748.

Wang, J., & Wang, X. (2012). *Structural Equation Modeling. Applications using Mplus*. West Sussex, UK: John Wiley & Sons.

Yik, M. S. M., & Bond, M. H. (1993). Exploring the dimensions of Chinese person perception with indigenous and imported constructs: Creating a culturally balanced scale. *International Journal of Psychology, 28(1)*, 75–95. doi: org/10.1080/00207599308246919.

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CHAPTER 5:   DISCUSSIONS, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

Discussion and Conclusion

The current study paid homage to Kwok Leung (1958 – 2015) by presenting three empirical studies that are positioned at the interchange of cross-cultural and personality psychology. This final chapter integrates the findings of these studies along the lines of Leung and Bond's (2009) collection of social axiom articles on psychological aspects of social axioms and understanding global belief systems that was discussed in the introductory Chapter 1. It also addresses the four specific objectives that were raised in the introduction. Finally, the limitations of the empirical studies are presented and some prospective directions for future research are offered.

5.1 INTRODUCTION

This chapter contains the general discussions, conclusions, limitations and recommendations from the three manuscripts that constitute this study. The chapter also reflects on the aim of the research and draws conclusions from the study. The limitations of the research are discussed and recommendations are made regarding social axioms' generalisability, measurement, factor structure, measurement invariance and nomological network. Finally, suggestions for future research are made and the study's contribution to academic study in Industrial and Organisational Psychology is highlighted.

5.2 RESEARCH AIM RECONSIDERED

The aim of this study was to investigate the five-factor structure of social axioms and the generalisability of social axioms in the South African context. This general aim was address by three sub-aims that resulted in the following three manuscripts:

- Manuscript 1: The factor structure of the Social Axioms Survey II (SASII) in the South African context.
- Manuscript 2: Measurement invariance of social axioms in South Africa.
- Manuscript 3: Exploring the nomological network between social axioms and the five-factor model of personality in South Africa.

5.3 CONCLUSIONS EMANATING FROM THE STUDY

Various conclusions can be drawn based on the findings of the study.

5.3.1 Manuscript 1: The factor structure of the Social Axioms Survey II (SASII) in the South African context

The first aim of this study was to investigate beliefs on the individual level in a South African sample and to assess the generalisability of the five-factor model of social axioms as measured by the new Social Axioms Survey (Leung et al., 2012). Beliefs are considered to be central to human functioning (Leung & Bond 2009). Beliefs are also social in nature and represent peoples' general beliefs and perceptions about the world. These general beliefs are necessary for social functioning (Leung & Bond, 2009).

In 2002 Leung and colleagues developed the first scale to measure general beliefs, which they labelled the Social Axioms Survey (SAS). The SAS exclusively measured beliefs, distinguishing it from other measures that provided information on values and behaviours (Singelis, Hubbard, Her, & An, 2003). The SAS consisted of five factors, labelled Social Cynicism, Reward for Application, Social Complexity, Fate Control and Religiosity (Leung et al., 2002). Social Cynicism refers to "a negative view of human nature … and a belief that people tend to ignore ethical means in pursuing their goals" (Leung & Bond, 2009, p. 3). Reward for Application refers to "a belief complex asserting that the investment of effort, knowledge, careful planning, and other resources will lead to positive outcomes" (Leung & Bond, 2009, p. 3). Social Complexity refers to "a belief constellation holding that there are multiple ways to solve a problem, and that people's behavior … may vary across situations" (Leung & Bond, 2009, p. 3). Fate Control refers to "a belief complex claiming that life events are predetermined by various external forces" (Leung & Bond, 2009, p. 3). Finally, Religiosity refers to a belief in "the existence of a supernatural being" (Leung & Bond, 2009, p. 3).

Although social axioms is a fairly new scientific construct, its importance is being justified through substantial research (e.g., Leung & Bond, 2009). Social axioms add to the predictive power of values (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004) and are a valuable instrument in examining cultures (Kurman & Ronen-Eilon,

2004). This suggests that social axioms have their own nomological networks (Leung & Bond, 2009) associating them with constructs such as values and personality (Kurman & Ronen-Eilon, 2004).

In 2012 Leung and colleagues introduced a new 97-item (see Addendum A: Table A. 2) Social Axioms Survey (SASII) after following a deductive approach to improve the item reliability of the five social axioms dimensions. Evidence collected thus far indicates that even higher reliabilities were achieved for the social axiom factors, thus providing strong support for the general applicability of the SASII five-factor structure. However, the development of the SASII was rooted in qualitative research and Western literature on beliefs, and the instrument was development in the West for subsequent application to other cultures (e.g., Cheung, Cheung, Wada, & Zhang, 2003; Costa & McCrae, 1992; Fetvadjiev & Van de Vijver, 2015; Hough & Ones, 2002; Katigbak, Church, Guanzon-Lapeña, Carlota, & Del Pilar, 2002; McCrae et al., 2005; Nel et al., 2012). This importation strategy creates two problematic areas. First, while the definitions of specific constructs are seen as appropriate in the original culture, they may not be as appropriate in another culture. Second, this might cause specific items to not be adequate in tapping the relevant construct in contexts where the instrument is later applied (Cheung, 2004). In this regard, South African legislation, such as the Employment Equity Act (No. 47 of 2013), places a direct emphasis on the cultural appropriateness of psychological tests used in South Africa to be applied in a fair and equitable manner (Paterson & Uys, 2005). This also supports the International Test Commission's (2016) findings, which provide guidelines for test adaptation to allow comparisons across language and cultural groups.

The results of this study indicated that the SASII exhibited an unacceptable model fit when conducting a confirmatory factor analysis (CFA) with the original 97 items (items 3, 4, 8, 13, 19, 43, 55, 68, 71 and 77 had loadings smaller than 0.30). However, this is a common result when specifying the model based on a priori theory and empirical findings, and then attempting to fit the model to the available data (Wang & Wang, 2012). However, research clearly indicates that factors such as

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language and cultural values and beliefs (Fasold, 1990), diversity in educational levels and unemployment rates (Rothmann & Cilliers, 2007), inequality (Habib & Bentley, 2008) and a respondent's English language proficiency influence respondents' understanding of specific test items (Meiring, Van de Vijver, Rothmann, & Barrick, 2005). All of these factors could have been at play in the current sample, and therefore the SASII model was redefined to create a more parsimonious model (Wang & Wang, 2012).

An exploratory factor analysis (EFA) was conducted using only the items of each of the individual factors with acceptable fit indices (i.e., using only the 87 items of original 97 items that had loadings larger than 0.30). The EFA model extracted 74 items that had loadings > 0.30 on the a priori factor. Then, using only the items with loadings > 0.40 a CFA was executed to create a parsimonious SASII model (Wang & Wang, 2012). The CFA was then further improved by multiple iterations involving eliminating ambiguous items, such as item 96 from the factor Social Cynicism, which stated "Young people are impulsive and unreliable". This item was eliminated because it loaded on more than one factor and this indicated that it needed refinement. In addition, two items from the Religiosity factor, item 65 "There is a supreme being controlling the universe" and item 95 "Evidence of a supreme being is everywhere for those who seek its signs", were eliminated because it indicated that it needed refinement and could possibly become one item. Finally, 54 items were retained from the original 97-item SASII to create a parsimonious SASII model. According to Wang and Wang (2012), a smaller number of items per factor may lead to a better model fit, which was the case in this study. Thus, the more parsimonious the model, the better the fitting solutions will be (Wang & Wang, 2012). The use of these steps in formulating a parsimonious SASII model (see Addendum A: Table A. 3) was considered justified because the impact of the respondents' English language proficiency and their understanding of specific items could not be ignored (Meiring et al., 2005). A reasonable model fit was thus achieved for the SASII, contributing towards previous research findings reported by Leung et al. (2012).

5.3.2 Manuscript 2: Measurement invariance of social axioms in South Africa

The second aim of this study was to test for measurement invariance (MI) as measured by the parsimonious Social Axioms Survey (SASII) model (Barnard, Meiring, Rothmann, & Zondervan-Zwijnenburg, manuscript in preparation) across cultural (black, coloured and Indian) groups in a South African sample. However, the samples obtained (see Addendum A: Table A. 1) were considered too small for multiple group analyses (e.g., Kline, 2011; Wang & Wang, 2012). Thus, MI was investigated across male and female (gender) groups by reporting on the configural, metric, and scalar invariance.

MI is defined as whether or not the same statistical property of measurement is observed across groups (Horn & McArdle, 1992). Multi-group confirmatory factor analysis (MGCFA) is the most common method used to test for MI (e.g., Bollen, 1989; Jöreskog, 1971). MGCFA mainly consists of testing increasingly constrained structural equation models (Van de Schoot, Lugtig, & Hox, 2012) and comparing the more restricted models with the less restricted models (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998) for statistically significant differences (Van de Schoot et al., 2012).

Thus, to estimate MI in a multi-group measurement model, configural, metric, and scalar invariance were tested in three progressively more restricted hierarchical steps. In step one, to test for configural invariance, the assumption was made that the number of SASII factors and factor structure will be the same in both male and female groups, thus the parameters were estimated to be equal across groups in analysing the data. In step two, testing for metric invariance, the assumption was made that the factor loadings on the five social axiom latent factors are equal across male and female groups (Spini, 2003), indicating that male and female respondents have the same understanding of the latent construct (i.e., Fate Control, Social Cynicism, Religiosity, Social Complexity and Reward for Application) being examined (Van de Schoot et al., 2012). This suggests that items have the same meaning and are interpreted the same by both males and females (Cieciuch,

Davidov, Vecchione, Beierlein, & Schwartz, 2014; Thomas, Abts, & Vander Weyden, 2014). In step three, to test for scalar invariance, the assumption was made that the SASII five social axiom factors have the same scale of origin (Fischer & Lun, 2008) for both males and females, indicating that males and females have the same levels of trust in the SASII model's measurement scales.

Self-report questionnaires such as the SASII are often used to measure and explain various aspects of human behaviour. Such questionnaires invariably consist of items that are conceptualised as measuring an underlying latent construct. The questionnaires are then used to achieve certain goals, such as comparing groups (Van de Schoot et al., 2012). Consequently, this study examined the SASII for MI (configural, metric, and scalar invariance) across male and female groups in a South African sample.

Configural invariance, which is the most basic level of invariance testing, is a prerequisite for all subsequent levels of MI tests (Malham & Saucier, 2014; Thomas et al., 2014). If achieved, configural invariance indicates that the number of factors (loadings of indicators on their respective latent factors) are the same and have the same factor structure across the groups being compared (Horn & McCardle, 1992; Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000). Thus, configural invariance indicates that the same construct is being measured in each group (Thomas et al., 2014). Proof for metric invariance (factor loadings are set to be equal across groups) indicates that respondents from different groups have equal understanding (same meaning across groups) of the latent construct being studied (Cieciuch et al., 2014; Thomas, et al., 2014; Van de Schoot et al., 2012). Scalar invariance imposes equality constraints (i.e., set to be equal) on the intercept of each indicator across groups (Cieciuch et al., 2014), which allows comparisons of construct means across groups. If achieved, it indicates that factors have an equal scale, origin and are similarly used across groups (Cieciuch et al., 2014; Fischer & Lun, 2008; Thomas et al., 2014).Full invariance (metric and scalar) is achieved when parameters of all suitable indicators are set to be the same across groups (i.e., metric loadings and loadings plus intercepts at the scalar level of measurement) and

found to be acceptable (Cieciuch, et al., 2014; Malham & Saucier, 2014). However, according to Van de Schoot, Schmidt and De Beuckelaer (2015), numerous studies examining the MI of survey scales have demonstrated that it is very difficult to achieve full MI.

The results of this study provided proof for configural invariance of the SASII parsimonious model. The study thus found a baseline configural model that was statistically significant. It can be deduced that the number of SASII factors are the same and have the same factor structure across male and female groups.

However, only partial metric invariance was achieved in this study. This indicates that the factor loadings on the five social axiom latent factors could not be considered equal across male and female groups (Spini, 2003). These findings indicate that male and female respondents did not have the same understanding of the latent construct being studied (Van de Schoot et al., 2012). This was indicated by item 95 ("Evidence of a supreme being is everywhere for those who seek its signs") of the Religiosity factor; item 67 ("Difficult problems can be overcome by hard work and persistence") of the Reward for Application factor; item 66 ("People who become rich and successful forget the people who helped them along the way") of the Social Cynicism factor; item 54 ("Religious people are more likely to maintain moral standards") of the Religiosity factor; item 32 ("People dislike others who succeed in life") of the Social Cynicism factor; and, item 18 ("There are many ways for people to predict what will happen in the future") of the Fate Control factor (see Addendum A: Table A. 3). However, according to Malham and Saucier (2014) this finding does not necessarily indicate that the problem resides with the items or that items are not 'good' but rather that the latent factors are not well defined.

Scalar invariance could not be achieved in this study. Hence, the social axioms five factors' means across male and female groups could not be compared. This finding indicates that the SASII's five social axiom factors do not have an equal scale of origin (Fischer & Lun, 2008). In addition, the finding indicates that males and females differ significantly with regards to their levels of trust in the SASII parsimonious

model's Social Cynicism (i.e., item 70, "Opportunities for people to get wealthy promote dishonesty"), Social Complexity (i.e., item 82, "People may have opposite behaviors on different occasions") and Religiosity (i.e., item 85, "Religion helps people make good choices for their lives") scales. A study by Malham and Saucier (2014) also found the Social Complexity scale to be problematic.

The fact that proof for configural invariance and partial metric invariance was obtained in this study can be seen as relatively impressive (e.g., Malham & Saucier, 2014) considering the complexity of the SASII model. The findings of this study thus indicate that respondents were using the same factors in their generalised beliefs. The requirements for measurement invariance using MGCFA are stringent, and even more so when utilising single items as indicators (Malham & Saucier, 2014). The SASII also performed better across male and female groups than several frequently used measures of personality perform in a single group (e.g., Hopwood & Donnellan, 2010).

5.3.3   Manuscript 3: Exploring the nomological network between social axioms and the five-factor model of personality in South Africa

The third component of this study involved investigating the relationships between generalised beliefs, as measured by the parsimonious SASII (Barnard et al., manuscript in preparation), and the five factors of personality, as measured by the Mini-International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006) on the individual level. The main goal of this component was to expand on the nomological network of social axioms (e.g., Burgess, 2011; Leung & Bond, 2009).

In 2004 a global research program on social axioms was launched by Leung and Bond (2004). The goal of this program was to evaluate the universality and meaning of the structure of beliefs represented by five social axiom factors: (i) Social Cynicism (a negative belief in human nature); (ii) Reward for Application (a positive belief in

controlling the outcomes of situations); (iii) Social Complexity (a positive belief in solutions to problems); (iv) Fate Control (a negative belief in the control of life events) and (v) Religiosity (a positive belief in a supernatural being). In attempting to establish social axioms' nomological network, researchers explored causal relationships between values, personality and social axioms (e.g., Leung & Bond, 2009).

According to Cheung, van de Vijver and Leong (2011), the Five-Factor Model (FFM) of personality or Big Five has provided impressive proof for the universality of the five factors of personality (e.g., Nel et al., 2012). The five factors, namely Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to experience, have been established and validated and provide a comprehensive map of personality characteristics (Ispas, Iliescu, Ilie, & Johnson, 2014).

According to Chen, Fok, Bond and Matsumoto (2006) personality characteristics are a combination of values, attitudes, beliefs and behaviour. However, their correlational findings indicate that the scope of the overlap between personality characteristics and social axioms is insignificant (Chen, Fok et al., 2006). These findings are consistent with findings reported by Chen, Bond and Cheung (2006), who could only find a moderate relationship between personality traits and beliefs (i.e., social axioms), indicating that personality and beliefs constitute two individual constructs. Accordingly, Stankov and Saucier (2015) argued that social axioms cannot be reduced to personality characteristics. This suggests that social axioms have a useful role to play in cross-cultural research.

Barnard, Meiring and Rothmann (2008) investigated social axioms' five-factor structure in a South African sample and found support for only four factors; the Social Complexity factor was not supported. According to Burgess (2011), studies show that social axiom investigations seek to explore social axioms' common ground with other constructs and to expand their nomological network. In this regard, Leung and Bond (2009) compiled an edited volume on social axioms, which provides support for the view that social axioms have their own nomological network.

In their efforts to supplement the nomological network of social axioms, Leung et al. (2012) relied on the FFM of personality, as measured by the Mini-IPIP, to validate the SASII by correlating the five social axiom factors with the five personality factors. Leung et al. (2012) argued that the five-factor structure of social axioms is distinct from the FFM of personality with minimal overlap. Their findings were consistent with the findings of Chen, Fok et al. (2006) and showed that the fit between social axioms and personality is fairly good, supporting the five-factor structure of social axioms (Leung et al., 2012).

Personality tests are the most commonly used psychometric tests in South Africa, and the FFM has been found to hold in a multi-cultural South African context (Laher, 2010). Heuchert, Parker, Strumf, and Myburg (2000) explored the structure of the FFM across cultures in a South African sample of university students and found that the structure of the FFM was exceptionally alike across ethnic groups. Consequently, the current study explored the relationships between social axiom factors, as measured by the parsimonious SASII model (Barnard et al., manuscript in preparation), and personality characteristics, as measured by the Mini-IPIP.

The results of this study support the findings of Leung et al. (2012). The following notable findings were recorded. (i) Social Cynicism was positively correlated with Neuroticism (significantly) and negatively correlated with Agreeableness (significantly). (ii) Social Complexity was negatively correlated with Extraversion (insignificantly), positively correlated with Agreeableness (significantly) and positively correlated with Intellect (moderately). (iii) No significant relationships were found between Fate Control and any of the FFM personality characteristics, supporting the findings of both Chen, Fok et al. (2006) and Leung et al. (2012). (iv) Religiosity was positively correlated with Agreeableness (significantly), and although Chen, Fok et al. (2006) did not find a significant positive correlation, this finding supports the findings of Leung et al. (2012). (v) Reward for Application was positively correlated with Conscientiousness (significantly), supporting the findings of Leung et al. (2012). (vi) Reward for Application was positively correlated with Agreeableness

(insignificantly), in contrast with the finding reported by Leung et al. (2012), who found a significant positive correlation. (vii) A positive relationship was found between Social Complexity and Agreeableness (significant), in contrast with both Chen, Fok et al. (2006) and Leung et al. (2012), who did not report any findings in this regard.

Regression analysis findings provided proof of statistical significant relationships between: (i) Social Cynicism and Agreeableness; (ii) Social Cynicism and Neuroticism; (iii) Reward for Application and Agreeableness; (iv) Reward for Application and Conscientiousness; (v) Social Complexity and Agreeableness; (vi) Social Complexity and Conscientiousness; (vii) Religiosity and Agreeableness; and (viii) Religiosity and Conscientiousness.

Statistically significant findings indicated that social axioms predicted personality characteristics as follows: (i) Extraversion (small effect); (ii) Conscientiousness, Intellect and Neuroticism (medium effect); and (iii) Agreeableness (large effect) (Cohen, 1988).

5.4   LIMITATIONS

This study provided evidence that enhanced current understandings of generalised beliefs by supporting the underlying five factor structure of social axioms. In addition, it provided evidence supporting the usefulness of social axioms across gender groups. Finally, it provided evidence relating to predicting personality characteristics in expanding the nomological network of social axioms. However, these significant contributions need to be viewed in light of certain limitations, which are discussed below.

First, the data collection for this study involved a cross-sectional survey design using a self-report questionnaire. Thus, the possibility that common method variance could

have been caused cannot be excluded (Richardson, Simmering, & Sturman, 2009). However, Doty and Glick (1998) and Johnson, Rosen, and Djurdjevic (2011) argued that ordinary method variance is seldom a sufficient reason for findings to be invalid. Future studies can therefore consider in-depth interviews to improve items through objective ratings.

Second, the method used to collect data could possibly have caused method bias. According to Avey, Luthans and Jensen (2009), method bias points towards the possible exaggerated relations when research participants respond to questionnaires that have been validated by previous research, which raises concerns for artificially increased relations. Multi-method studies using different methods and instruments to measure research participants on multiple constructs should thus be considered for future studies.

Third, the research design used in this study prohibited any interpretations of causal relations between different variables. Although the study provided proof for various relationships between variables, it did not imply causal interference between different variables. Thus, the possibility of alternative hypotheses cannot be ignored.

Fourth, the non-probability sample, which consisted of university students, their family members and friends, limits the generalisability of the findings to the South African population.

Fifth, the sample size (specifically in relation to samples of black, coloured and Indian groups) obtained for the cross-cultural groups was considered too small for multiple group analyses (e.g., Kline, 2011; Wang & Wang, 2012).

The limitations listed here, however, are not considered sufficient to invalidate the overall findings of the study.

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5.5 RECOMMENDATIONS

5.5.1 Recommendations to address the research problems

To address the research problems of improving the validity and expanding the nomological network of social axioms, the following recommendations are made:

- The study confirmed the five-factor structure of generalised beliefs (social axioms) and results supported a parsimonious version of the new SASII (Leung et al., 2012), which was initially developed in the West and was later applied in other cultures (e.g., Cheung et al., 2003; Costa & McCrae, 1992; Fetvadjiev & Van de Vijver, 2015; Hough & Ones, 2002; Katigbak et al., 2002; McCrae et al., 2005; Nel et al., 2012). Thus, while the definition of constructs could be appropriate in the original culture, they may not be appropriate in another culture. Therefore, certain items may not be adequate in tapping the construct when the instrument is later applied in another context (Cheung, 2004). When considering South Africa's multi-cultural population as well as the focus that the Employment Equity Act (No. 47 of 2013) places on the fair and equitable manner in which tests are used, it is evident that more research investigating the cross-cultural applicability of tests is required. For tests to be cross-culturally applicable (fair and equitable) the test scores need to be comparable across groups, indicating that the construct that the test intends to measure does not differ across groups (Paterson & Uys, 2005). Thus, research needs to include larger samples of black, coloured, white and Indian groups to address the generalisability of the results.

- Multi-item surveys are often used to investigate latent factors (Van de Schoot et al., 2015). Proving MI is an essential prerequisite for conducting cross-cultural or cross-group comparisons and for directing the development of improved culturally appropriate measuring instruments (e.g., Van de Schoot et al., 2012; Vandenberg & Lance, 2000). Cieciuch et al. (2014) tested for MI in values to direct the development of the PVQ-5X

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measuring instrument and provided some support for MI. In this regard, Malham and Saucier (2014) argued that research on values has provided positive methods that can be used to improve the Social Axioms Survey (SAS).

- Social axioms have been shown to correlate with values (e.g., Bond et al., 2004; Leung et al., 2007) and personality (e.g., Chen, Bond, & Cheung, 2006; Chen, Fok et al., 2006; Leung et al., 2012). Burgess (2011) used social axioms as a culture measure for business research. Thus, research needs to explore social axioms' overlap with other constructs in contributing towards its own nomological network (Leung & Bond, 2009).

5.5.2 Recommendations for future research

The following recommendations are made for future research:

- The results of this study provided support for a parsimonious version of the SASII. Although results were statistically significant the generalisability of social axioms remain problematic, considering that South Africa has 11 official languages and measurement instruments are usually developed for English speaking groups (Claassen, 1997). The impact of a respondent's English language proficiency on the results of an assessment cannot be ignored (Meiring et al., 2005). Thus, more research is needed to include larger samples of black, coloured and Indian groups to address the generalisability of the results. These samples also need to include respondents who speak various languages to allow for language grouping (i.e., isiNdebele, isiXhosa, isiZulu, Sepedi, Sesotho, Setswana, siSwati, Xitsonga and Tshivenda).
- There is a need to conduct more research on social axioms focusing specifically on redefining the content of the latent factor domains Fate Control and Social Complexity.
- A better understanding of social axiom constructs within South Africa should be facilitated. Items that were shown to be problematic in this study

need to be improved or redefined to cover cross-cultural settings more effectively. In this regard, Daouk-Öyry, Zeinoun, Choueiri and Van de Vijver (2016) argued for a global-local approach. This approach allows researchers to ascertain shared and distinctive elements of personality across cultures, whilst safeguarding the lexicon being used as relevant to the particular culture being studied, as well as expanding the ecological validity of stimulus materials in inventories.

- There is also a need to establish metric, scalar and full measurement invariance for social axioms, considering that only configural and partial metric invariance could be achieved for the parsimonious SASII in this study. Studies on social axioms have just started exploring MI (Malham & Saucier, 2014) and more research is required to improve items that contribute to misfit.

5.6 CONTRIBUTION OF THE STUDY TO KNOWLEDGE IN INDUSTRIAL AND ORGANISATIONAL PSYCHOLOGY

This study contributes towards knowledge in Industrial and Organisational Psychology as follows:

5.6.1 Theoretical contribution of the study

This is the first study that investigated the validity and reliability of a new Social Axioms Survey (Leung et al., 2012) on the individual level in a South African sample. The study responded to the need expressed by Leung et al. (2012) for more research to establish the validity and reliability of the SASII. The study confirmed the five-factor structure of generalised beliefs (social axioms). In addition, the results support the findings of Singelis et al. (2009), who suggested that items should be supplemented or redefined for specific cultures to improve the internal consistency of the social axiom factor being measured.

Although initial CFA findings of the SASII exhibited an unacceptable model fit, such findings are common when specifying the model (SASII) based on a priori theory (social axioms) and empirical findings and then attempting to fit the model to the available (South African) data (Wang & Wang, 2012). Considering that specific items may not perform adequately in all cultures, as well as the complexity of the five-factor structure of the SASII model, this study was the first to attempt to create a parsimonious SASII model (Wang & Wang, 2012) for use in a South African sample. This attempt resulted in the creation of a reasonable model fit that contributed towards previous research findings (Leung et al., 2012). This study also contributed towards the requirements of the Employment Equity Act (No. 47 of 2013), which places a high priority on the fair and equitable use of tests in South Africa. This study supports a GloCal approach for attaining shared and distinctive elements across cultures, whilst safeguarding the lexicon being used as relevant to the particular culture being studied (Daouk-Öyry et al., 2016).

Multi-item surveys are often utilised to examine differences between groups (Van de Schoot, et al., 2015). The Employment Equity Act (No. 47 of 2013) requires fair and equitable tests for cross-cultural applicability. Proving MI is an essential first step towards making across group comparisons (Van de Schoot et al., 2012; Vandenberg & Lance, 2000). This study contributed towards previous research (e.g., Malham & Saucier, 2014) by reporting on the configural, metric, and scalar invariance of the SASII across gender groups. Proof for configural and partial metric invariance was found, but scalar invariance could not be achieved. Specific items were identified that contributed towards misfit across gender groups, indicating the direction for the development and improvement of a more culturally relevant SASII measuring instrument (Van de Schoot et al., 2012; Vandenberg & Lance, 2000). The levels of invariance achieved in this study supported previous research findings (Malham & Saucier, 2014). Findings also supported the call for exploring the possibility of adding or redefining items to improve the internal consistency of the social axiom factor being measured (Singelis et al., 2009).

Burgess (2011) expressed the need for future research on social axioms to explore their overlap with other constructs to expand their nomological network. This study addressed this call by investigating the relationships between social axiom factors and the FFM of personality constructs. This study contributed towards previous research findings in establishing social axioms' nomological network (e.g., Burgess, 2011; Chen, Fok et al., 2006; Leung & Bond, 2009; Leung et al., 2012) by relying on the FFM of personality (e.g., Fetvadjiev & Van de Vijver, 2015; Hough & Ones, 2002), which contributed towards validating social axioms in a South African context. The findings of this study also expanded on previous research and contributed towards an understanding of social axioms' ability to predict personality characteristics, specifically Extraversion (small effect), Conscientiousness, Intellect and Neuroticism (all medium effects) and Agreeableness (large effect) (Cohen, 1988).

5.6.2 Statistical contribution of the study

This study made a statistical contribution by providing a SASII parsimonious model for use in a South African context and by computing reliability coefficients using Mplus Version 7.11 (Muthen & Muthen, 2012) specifying maximum likelihood estimation with robust standard errors (MLR) as estimator (Raykov, 2009) instead of the traditional Cronbach's alpha (Cronbach, 1951). The reliability coefficients estimated for the parsimonious SASII model showed improvement over the Cronbach's alpha reported by Leung et al. (2012) as follows: (i) Social Cynicism: ρ = 0.78 (0.76, 0.81) versus 0.70 (mean α = 0.79); (ii) Reward for Application: ρ = 0.72 (0.69, 0.75) versus 0.70 (mean α = 0.77); (iii) Social Complexity: ρ = 0.66 (0.62, 0.70) versus 0.65 (mean α = 0.68); (iv) Fate Control: ρ = 0.86 (0.84, 0.87) versus 0.65 (mean α = 0.68); and (v) Religiosity: ρ = 0.81 (0.78, 0.83) versus 0.70 (mean α = 0.85). Thus, all the social axiom factors of the parsimonious SASII model had fair reliability coefficients (Raykov, 2009).

The study also responded to the call by Malham and Saucier (2014) to improve specific areas of the social axioms survey for a better measurement invariance fit. To

counter for weaknesses identified in previous studies two steps were taken in conducting statistical analyses. First, Mplus Version 7.11 (Muthen & Muthen, 2012) with robust weighted least squares mean- and variance-adjusted estimator (WLSMV), which allows for missing data to be related to the observed covariates (Wang & Wang, 2012), was used in this study as it is considered superior for modelling categorical variables (Brown, 2006; Wang & Wang, 2012). Second, MGCFA specifying theta parameterization, which allows residual variances of latent response variables to be parameters in the specified model but not scale factors (Muthen & Muthen, 2012), was used for across group factor comparisons.

This study also contributed towards the body of research on social axioms by following the unusual path of investigating social axioms on the individual level (most studies have been conducted on country/cultural level e.g., Cieciuch et al., 2014; Leung et al., 2012; Malham & Saucier, 2014) in a South African sample by conducting statistical analyses with Mplus Version 7.11 (Muthen & Muthen, 2012) with WLSMV estimator for superior modelling of categorical variables and specifying theta parameterization (Brown, 2006; Wang & Wang, 2012) for MGCFA (very few studies have followed this route, e.g., Van de Schoot et al., 2015), for across gender group comparisons.

5.7   CONCLUSION

This study found support for the new version of the SASII on the individual level in a South African sample. The study confirmed the five-factor structure of generalised beliefs (social axioms). Support was found for factorial (configural) invariance of the SASII. Findings also indicated cross-group (male and female) generalisability for the SASII structure. Some evidence was found for metric invariance (partial metric invariance) where the same meaning and interpretation of constructs was achieved across male and female groups. Scalar invariance could not be achieved and comparisons of the social axioms' five factors' means across groups could thus not be examined. The results of this study provided evidence for the validity of social axioms' five-factor structure and contributed towards existing research findings in

establishing social axioms' nomological network. The findings also expanded on previous research by indicating social axioms' ability to predict personality across cultures.

References

Avey, J. B., Luthans, F., & Jensen, S. (2009). Psychological capital: A positive resource for combating stress and turnover. *Human Resource Management, 48*, 677-693. doi: 10.1002/hrm.20294.

Barnard, A., Meiring, D., & Rothman, S. (2008). The cross-cultural application of the Social Axioms Survey in the South African Police Service. *South African Journal of Industrial Psychology, 34(2)*, 1-9.

Barnard, A., Meiring, D., Rothman, S, & Zondervan-Zwijnenburg, M. (manuscript in preparation). *The factor structure of the Social Axioms Survey II (SASII) in the South African context*.

Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: Wiley.

Bond, M. H., Leung, K., Au, A., Tong, K., & Chemonges-Nielson, Z. (2004). Combining social axioms with values in predicting social behaviours. *European Journal of Personality, 18(3)*, 177-191. doi: 10.1002/per.509.

Brown, T. (2006). *Confirmatory factor analysis for applied research*. New York, NY: Guildford.

Burgess, S. M. (2011). Social axioms: A new culture measure for South African business research. *South African Journal of Business Management 42(3)*, 1-21.

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*, 456-466. doi: 10.1207/s15328007sem1102_8.

Chen, S. X., Bond, M. H., & Cheung, F. M. (2006). Personality correlates of social axioms: Are beliefs nested within personality? *Personality and Individual Differences, 40*, 509-519. doi: org/10.1016/j.paid.2005.04.016.

Chen, S. X., Fok, H. K., Bond, M. H., & Matsumoto, D. (2006). Personality and beliefs about the world revisited: Expanding the nomological network of social axioms. *Personality and Individual Differences, 41*, 201-211. doi: org/10.1016/j.paid.2006.01.009.

Cheung, F. M. (2004). Use of Western and indigenously developed personality tests in Asia. *Applied Psychology: An International Review, 53(*2), 173-191. doi: 10.1111/j.1464-0597.2004.00167.x.

Cheung, F. M., Cheung, S. F., Wada, S., & Zhang, J. (2003). Indigenous measures of personality assessment in Asian countries: A review. *Psychological Assessment, 15(3)*, 280–289. doi: org/10.1037/1040-3590.15.3.280.

Cheung, F. M., van de Vijver, F. J. R., & Leong, F. T. L. (2011). Toward a new approach to the study of personality in culture. *American Psychologist, 66*, 593–603. http://dx.doi.org/10.1037/a0022389.

Cieciuch, J., Davidov, E., Vecchione, M., Beierlein, C., & Schwartz, S. H. (2014). The cross-national invariance of a new scale to measure 19 basic values: A test across eight countries. *Journal of Cross-Cultural Psychology, 45*(5), 764-776. doi: 10.1177/0022022114527348.

Claassen, N. C. W. (1997). Culture differences, politics and test bias in South Africa. *European Review of Applied Psychology, 47*, 297-307.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Costa, P. T., Jnr., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of a test. *Psychometrika, 16*, 297‑334.

Daouk-Öyry, L., Zeinoun, P., Choueiri, L., & Van de Vijver, F. J. R. (2016). Integrating global and local perspectives in psycholexical studies: A GloCal approach. *Journal of Research in Personality 62, 19–28*. doi: org/10.1016/j.jrp.2016.02.008.

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the big five factors of personality. *Journal of Applied Psychology, 86(6)*, 1270-1279. doi:10.1037/1040-3590.18.2.192.

Doty, D. H., & Glick, W. H. (1998). Common method bias: Does common method bias variance really bias results? *Organizational Research Methods, 1*, 374-406. doi: 10.1177/109442819814002.

Employment Equity Act (2013). *Employment Equity Act, No. 47 of 2013*. Republic of South Africa. http://www.labour.gov.za/docs/legislation/eea/act98-055.html. Accessed on 28 September 2014.

Fasold, R. (1990). *The sociolinguistics of language*. Oxford, United Kingdom: Basil Blackwell.

Fetvadjiev, V. H., & Van de Vijver, F. J. R. (2015). Universality of the five factor model of personality. In J. D. Wright (Ed.), *International encyclopaedia of the social & behavioural sciences. Vol 9.* (2nd ed; pp. 249-253). Oxford, United Kingdom: Elsevier.

Fischer, R., & Lun, V. M. (2008). Measuring cognition and motivation across cultural groups. In R. M. Sorrentino & S. Yamaguchi (Eds.), *Handbook of motivation and cognition across cultures* (pp. 567-590). New York, NY: Academic Press.

Habib, A., & Bentley, K. (Eds). (2008). *Racial redress and citizenship in South Africa*. Cape Town, South Africa: HSRC Press South Africa.

Heuchert, J. W. P., Parker, W. D., Stumpf, H., & Myburg, C. P. H. (2000). The five-factor model of personality in South African college students. *American Behavioural Scientist, 44*, 112-125.

Hopwood, C. J., & Donnellan, M. B. (2010). How should the internal structure of personality inventories be evaluated? *Personality and Social Psychology Review, 14(3)*, 332-346. doi: 10.1177/1088868310361240.

Horn, J., & McArdle, J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental Aging Research, 18(3)*, 117-144. doi: org/10.1080/03610739208253916.

Hough, L. M., & Ones, D. S. (2002). The structure, measurement, validity, and use of personality variables in industrial work, and organizational psychology. In N. Anderson, D. Ones, H. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work & organizational psychology: Vol. 1* (pp. 233–277). London, United Kingdom: Sage.

International Test Commission. (2016). *The ITC guidelines for translating and adapting tests (2nd ed).* [www.InTestCom.org]. Accessed on 28 September 2016.

Ispas, D., Iliescu, D., Ilie, A., & Johnson, R., E. (2014). Exploring the cross-cultural generalizability of the five-factor model of personality: The Romanian NEO PI-R. *Journal of Cross-Cultural Psychology, 45(7),* 1074-1088. doi: 10.1177/0022022114534769.

Jöreskog, K. (1971). Simultaneous factor analysis in several populations. *Psychometrika, 36,* 409-426. doi:10.1007/BF02291366.

Katigbak, M. S., Church, A. T., Guanzon-Lapeña, M. A., Carlota, A. J., & Del Pilar, G. H. (2002). Are indigenous dimensions culture-specific? Philippine inventories and the five-factor model. *Journal of Personality and Social Psychology, 82(1),* 89-101. doi: org/10.1037/0022-3514.82.1.89.

Kline, R. B. (2011). *Principles and practice of structural equation modeling (3rd ed.).* New York, NY: The Guilford Press.

Kurman, J., & Ronen-Eilon, C. (2004). Lack of knowledge of a culture's social axioms and adaptation difficulties among immigrants. *Journal of Cross-Cultural Psychology, 35(2),* 192-208. doi: 10.1177/0022022103262244.

Laher, S. (2010). Using exploratory factor analysis in personality research: Best-practice recommendations. *South African Journal of Industrial Psychology, 36(1),* 1-7.

Leung, K., Au, A., Huang, X., Kurman, K., Niit, T., & Niit, K. (2007). Social axioms and values: A cross-cultural examination. *European Journal of Personality, 21(2),* 91-111. doi: 10.1002/per.615.

Leung, K., & Bond, M. H. (2004). Social axioms: A model of social beliefs in multi-cultural perspective. *Advances in Experimental Social Psychology* (*Vol. 36,* pp. 119-197). San Diego, CA: Elsevier Academic Press.

Leung, K., & Bond, M. H. (Eds). (2009). *Psychological aspects of social axioms: Understanding global belief systems.* New York, NY: Springer.

Leung, K., Bond, M. H., Reimel de Carrasquel, S., Munoz, C., Hernandez, M., Murakami, F., … Singelis, T. M. (2002). Social axioms: The search for universal

dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology, 33(3)*, 286-302. doi: 10.1177/0022022102033003005.

Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G., Gornick, L. J., Amponsah, B., … Zhou, F. (2012). Developing and evaluating the Social Axioms Survey in eleven countries: Its relationship with the five factor model of personality. *Journal of Cross-Cultural Psychology, 43(5)*, 833-857. doi: 10.1177/0022022111416361.

Malham, P. B., & Saucier, G. (2014). Measurement invariance of social axioms in 23 countries. *Journal of Cross-Cultural Psychology, 45(7)*, 1046-1060. doi: 10.1177/0022022114534771.

McCrae, R. R., Terracciano, A., & Members of the Personality Profiles of Cultures Project. (2005). Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology, 88(3)*, 547-561. doi: org/10.1037/0022-3514.88.3.547.

Meiring, D., Van de Vijver, F. J. R.., Rothmann, S. & Barrick, M. R. (2005). Construct, item, and method bias of cognitive and personality tests in South Africa. *South African Journal of Industrial Psychology, 31(1)*, 1-8. doi: 10.4102/sajip.v31i1.182.

Muthen, L. K., & Muthen, B. O. (2012). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthen & Muthen.

Nel, J. A., Valchev, V. H., Rothmann, S., Van de Vijver, F. J. R., Meiring, D., & De Bruin, G. P. (2012). Exploring the personality structure in the 11 languages of South Africa. *Journal of Personality, 80(4)*, 915-948. doi: 10.1111/j.1467-6494.2011.00751.x.

Paterson, H., & Uys, K. (2005). Critical issues in psychological test use in the South African workplace. *South African Journal of Industrial Psychology, 31(3)*, 12-22.

Raykov, T. (2009). Evaluation of scale reliability for unidimensional measures using latent variable modeling. *Measurement and Evaluation in Counseling and Development, 42*, 223‒232. doi: 10.1177/0748175609344096.

Richardson, H. A., Simmering, M. J., & Sturman, M. C. (2009). A tale of three paradigms: Examining post hoc statistical corrections for common method variance from three divergent perspectives. *Organizational Research Methods, 12*, 687-694. doi: 10.1177/1094428109332834.

Rothmann, S., & Cilliers, F. V. N. (2007). Present challenges and some critical issues for research in industrial/organisational psychology in South Africa. *South African Journal of Industrial Psychology, 33(1)*, 8–17.

Singelis, T. M., Bhawuk, D. P. S., Gabrenya, W. K. Jnr, Gelfand, M., Harwood, J., Her, P., … Vandello, J. (2009). Exploring ethnic group and geographic differences in social axioms in the USA. In K. Leung, & M. H. Bond (Eds), *Psychological aspects of social axioms: Understanding global belief systems* (pp. 81–93). New York, NY: Springer.

Singelis, T. M., Hubbard, C., Her, S., & An, S. (2003). Convergent validation of the social axioms survey. *Personality and Individual Differences, 34(2)*, 269-282. doi:10.1016/S0191-8869(02)00043-0.

Spini, D. (2003). Measurement equivalence of 10 value types from the Schwartz Value Survey across 21 countries. *Journal of Cross-Cultural Psychology, 34(1)*, 3-23. doi: 10.1177/0022022102239152.

Stankov, L., & Saucier, G. (2015). Social axioms in 33 countries: Good replicability at the individual level but less so at the country level. *Journal of Cross-Cultural Psychology, 46(2)*, 296-315. doi: 10.1177/0022022114558333.

Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research, 25*, 78-90. doi:10.1086/209528.

Thomas, T. D., Abts, K., & Vander Weyden, P. (2014). Measurement invariance response styles, and rural-urban measurement comparability. *Journal of Cross-Cultural Psychology, 45(7),* 1011-1027.

Van de Schoot, R., Lugtig, P., & Hox. J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9(4)*, 486-492. doi: org/10.1080/17405629.2012.686740.

_____

Van de Schoot, R., Schmidt, P., & De Beuckelaer, A. (Eds). (2015). *Measurement invariance*. Lausanne, Switzerland: Frontiers Media. doi: 10.3389/978-2-88919-650-0.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organisational research. *Organization Research Methods, 3,* 4-70. doi: 10.1177/109442810031002.

Wang, J., & Wang, X. (2012). *Structural Equation Modeling. Applications using Mplus.* West Sussex, UK: John Wiley & Sons.

ADDENDUM A: CROSS-CULTURAL APPLICATION OF SASII IN SA

Table A.1: Characteristics of Participants (N = 1567)

Item	Category	Frequency	Percentage
Gender	Male	643	40.7%
	Female	914	58.9%
	Missing values	10	0.5%
Age	Below 20	305	22.5%
	21 – 30	830	51.0%
	31 – 40	99	4.0%
	41 – 50	127	9.1%
	51 – 60	117	8.4%
	Over 60	30	2.3%
	Missing values	59	2.8%
Race	White	972	66.4%
	Black	237	15.1%
	Coloured	93	5.9%
	Indian	82	5.2%
	Missing values	183	8.3%
Participant	University Student	793	55.8%
	Not University Student	645	38.3%
	Missing values	129	5.9%

Table A.2: Item numbers and descriptions of the 97-item SASII

Item nr	Social Cynicism
91	The only way to get ahead is to take advantage of others
49	It is rare to see a happy ending in real life
74	Praise is just a sweet way for people to get what they want from others
69	Kind-hearted people usually suffer losses
96	Young people are impulsive and unreliable
70	Opportunities for people to get wealthy promote dishonesty
66	People who become rich and successful forget the people who helped them along the way
34	To care about societal affairs only brings trouble for yourself
28	Old people are usually stubborn and biased
86	Good connections with people in power are more important than hard work
29	People create hurdles to prevent others from succeeding
93	People always expect something in return for a favor
32	People dislike others who succeed in life
44	People deeply in love are usually blind
16	People enjoy watching others fight among themselves
36	Powerful people tend to exploit others
58	Power and status make people arrogant
79	Kind-hearted people are easily bullied
47	The various social institutions in society are biased towards the rich
1	People will stop working hard after they secure a comfortable life

Item nr	Reward for Application
83	Endurance and determination are key to achieving goals
67	Difficult problems can be overcome by hard work and persistence
75	Hard working people will achieve more in the end
27	Failures can make people wise
30	Building the way step by step leads to success
15	Success requires strong willpower
7	One gets from life as much as one puts into it
84	Hard-working people are well rewarded
40	Knowledge is necessary for success
2	One will succeed if he/she really tries
53	Competition brings about progress
14	Every problem has a solution
4	Adversity can be overcome by effort
55	Caution helps avoid mistakes
59	Failure is the beginning of success
25	Opportunities only present themselves to those who are seeking them
81	One who does not know how to plan his or her future will eventually fail

Item nr	Social Complexity
56	Every person is unique

42	A person's behavior is influenced by many factors
37	There is usually more than one good way to handle a situation
11	A situation can change drastically in an unexpected direction
13	There is usually only one way to solve a problem (R)
82	People may have opposite behaviors on different occasions
97	One has to deal with matters according to the specific circumstances
87	A bad situation can suddenly change for the better
26	There are many equally good ways to deal with a problem
23	People may behave unpredictably
20	Human behavior changes with the social context
94	A person is either good or evil, and circumstances have nothing to do with it (R)
61	Many issues appear far more complicated than they really are
71	Flexibility has nothing to do with success (R)
31	People can suddenly lose everything they have
77	People with different opinions can all be correct
19	One's behaviors may be contrary to his or her true feelings
68	A person changes little over the course of his or her life (R)
92	A person can change drastically in a short time
8	People act more or less the same way regardless of the people they interact with (R)
90	Being flexible in life is the key to happiness
3	Current losses are not necessarily bad for one's long-term future
43	Different versions of the same reality can all be true

Item nr	**Fate Control**
48	Individual characteristics, such as appearance and birthday, can reveal one's fate
12	Fate determines a person's success in life
78	Fate determines one's successes and failures
33	There are ways for people to find out about their fate
35	Major events in people's life can be predicted
21	Matters of life and death are determined by fate
46	The people whom a person will love in his or her life is determined by fate
5	People's wealth is determined by fate
18	There are many ways for people to predict what will happen in the future
89	Some people are born lucky
22	There are certain ways to help us improve our luck and avoid unlucky things
17	Good luck follows if one survives a disaster
51	Luck can be enhanced by certain tactics
10	Individual characteristics, such as appearance and birthday, affect one's fate
62	Most disasters can be predicted
88	Fortune comes when you least expect it
50	There are certain ways for people to improve their destiny
9	Major events in life have nothing to do with fate (R)
60	Fate has nothing to do with the tragedies of life (R)
39	It is impossible to read one's destiny (R)

Item nr	**Religiosity**
72	Only weak people need religion (R)

63	Religion slows down human progress (R)
57	Religious practice makes it harder for people to think independently (R)
38	Religious faith contributes to good mental health
73	Religion makes people happier
85	Religion helps people make good choices for their lives
52	Practicing a religion unites people with others
45	Ignorance leads people to believe in a supreme being (R)
24	Religion makes people escape from reality (R)
80	Religious beliefs lead to unscientific thinking (R)
6	Belief in a religion helps one understand the meaning of life
65	There is a supreme being controlling the universe
95	Evidence of a supreme being is everywhere for those who seek its signs
54	Religious people are more likely to maintain moral standards
64	Religion makes people healthier
41	Religion contradicts science (R)
76	Belief in a religion makes people good citizens

Table A.3: Item numbers and description of the parsimonious SASII

Item nr	Social Cynicism
69	Kind-hearted people usually suffer losses
74	Praise is just a sweet way for people to get what they want from others
70	Opportunities for people to get wealthy promote dishonesty
66	People who become rich and successful forget the people who helped them along the way
28	Old people are usually stubborn and biased
29	People create hurdles to prevent others from succeeding
32	People dislike others who succeed in life
93	People always expect something in return for a favor
86	Good connections with people in power are more important than hard work
36	Powerful people tend to exploit others
79	Kind-hearted people are easily bullied
44	People deeply in love are usually blind
34	To care about societal affairs only brings trouble for yourself

Item nr	Reward for Application
83	Endurance and determination are key to achieving goals
67	Difficult problems can be overcome by hard work and persistence
75	Hard working people will achieve more in the end
27	Failures can make people wise
30	Building the way step by step leads to success
15	Success requires strong willpower
7	One gets from life as much as one puts into it
84	Hard-working people are well rewarded
40	Knowledge is necessary for success
53	Competition brings about progress

Item nr	Social Complexity
56	Every person is unique
42	A person's behavior is influenced by many factors
23	People may behave unpredictably
11	A situation can change drastically in an unexpected direction
87	A bad situation can suddenly change for the better
20	Human behavior changes with the social context
31	People can suddenly lose everything they have
82	People may have opposite behaviors on different occasions

Item nr	Fate Control
48	Individual characteristics, such as appearance and birthday, can reveal one's fate
12	Fate determines a person's success in life
78	Fate determines one's successes and failures
21	Matters of life and death are determined by fate
33	There are ways for people to find out about their fate
46	The people whom a person will love in his or her life is determined by fate
5	People's wealth is determined by fate
35	Major events in people's life can be predicted

22	There are certain ways to help us improve our luck and avoid unlucky things
51	Luck can be enhanced by certain tactics
89	Some people are born lucky
17	Good luck follows if one survives a disaster
18	There are many ways for people to predict what will happen in the future
10	Individual characteristics, such as appearance and birthday, affect one's fate
Item nr	**Religiosity**
85	Religion helps people make good choices for their lives
38	Religious faith contributes to good mental health
73	Religion makes people happier
52	Practicing a religion unites people with others
54	Religious people are more likely to maintain moral standards
6	Belief in a religion helps one understand the meaning of life
64	Religion makes people healthier
65	There is a supreme being controlling the universe
95	Evidence of a supreme being is everywhere for those who seek its signs