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Date: 23 November 2017

# A Psychometric Evaluation of a Xhosa Translation of the SA-WASI Vocabulary Subtest

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# Glossary of Terms

| | |
|---|---|
| Normative data | Normative data refers to performance on a test by a defined group of people. The norms for a test (i.e., what is 'normal' or 'typical') are based on the distribution of the group's performance. A test score of an individual from the same defined group can then be interpreted relative to the performance of the normative sample (Kaplan & Saccuzzo, 2013; Wolfaardt, 2001). |
| Standardisation | Standardisation of a test occurs when a large number of individuals, from a variety of defined groups, are included in the normative sample to produce meaningful, stratified, normative data (Kline, 2000). |
| Construct validity | Construct validity refers to the extent to which a test measures the underlying theoretical construct/concept that it intends to measure. One way to determine the construct validity of a test is to correlate performance on that test with performance on another test that supposedly measures the same construct (Wolfaardt, 2001). |
| Criterion measure | A criterion measure is an established, reliable, and unbiased test against which scores on a new measure are compared to determine validity (Rust & Golombok, 1999; Wolfaardt, 2001). |
| Internal consistency reliability | Internal consistency reliability refers to how well items within a test correlate with each other. If a test measures a single construct, and all items that make up the test are equally good at measuring this construct, then the test is internally consistent (Kaplan & Saccuzzo, 2013). |
| Cronbach's alpha | Cronbach's alpha ($\alpha$) is a measure of internal consistency reliability. An alpha value of .7 is normally considered the minimum acceptable value for a test to be considered reliable (Loewenthal, 2001). |
| Item-total correlation | The correlation between the scores on a particular test item and the total test score. |
| Item difficulty | Item difficulty refers to how "difficult" an item on a test is, and is often determined by the number of people who get a particular item on a test correct. If most individuals within a sample get a particular item correct, then that item is deemed less difficult (Kaplan & Saccuzzo, 2013). |
| Abbreviations | |
| WAIS-III | Wechsler Adult Intelligence Scale, 3rd edition |
| WASI | Wechsler Abbreviated Scale of Intelligence |
| VIQ | Verbal Intelligence Quotient |
| PIQ | Performance Intelligence Quotient |
| FSIQ | Full Scale Intelligence Quotient |
| VCI | Verbal Comprehension Index |
| SA-WASI | South African-adapted Wechsler Abbreviated Scale of Intelligence |
| MAS | Marin Acculturation Scale |
| APM | Advanced Progressive Matrices |

## Abstract

Neuropsychological tests are used extensively in South African clinical and research settings to assess for the presence of cognitive impairment. Most commonly used tests were developed in the global north, and are designed for assessing individuals who are English-speaking, urbanised, and middle class. This is problematic for South African individuals, the majority of whom are not English home language speakers, urbanised, or middle class. Therefore, cognitive tests need to be adapted and translated appropriately for use in local settings. Adaptations and translations should then be validated to determine if they are psychometrically sound when used with their target population(s). This study aimed to (a) validate a Xhosa translation of the Vocabulary subtest of the South African-adapted Wechsler Abbreviated Scale of Intelligence (SA-WASI), (b) estimate the internal consistency reliability of the Xhosa SA-WASI Vocabulary subtest, and (c) develop a reliable abbreviated version of the Xhosa SA-WASI Vocabulary subtest for use as a cognitive screening tool in resource-limited clinical settings. To achieve these aims, I recruited 19 Xhosa home-language students who were formally educated in English from at least grade eight. Participants completed the Xhosa Vocabulary subtest, as well as two criterion measures: an abbreviated English SA-WASI Vocabulary subtest, and a non-verbal measure of general intellectual functioning, the Advanced Progressive Matrices (APM). Relative to the criterion measures, the Xhosa Vocabulary subtest did not have good construct validity. The Xhosa translation did, however, have moderate internal consistency reliability (Cronbach's $\alpha$ = .67). The item difficulty curve for the Xhosa translation deviated substantially from the ideal downward linear trend which reflects progression from easier to more difficult items. Further item analyses led to the proposal of a 10-item version of the Xhosa Vocabulary subtest for use as screening tool. This abbreviated form had good reliability ($\alpha$ = .77), and significantly predicted scores on the full version of the Xhosa Vocabulary subtest. This research makes a significant contribution to the development of fair and reliable cognitive measures for Xhosa home-language members of the South African population. The data also reveal important insights regarding problems associated with directly translating existing verbally-based cognitive measures, most of which have English forms only, into an African language.

# A Psychometric Evaluation of a Xhosa Translation of the SA-WASI Vocabulary Subtest

Neuropsychological tests are used extensively in South African clinical and research settings to assess for the presence of cognitive impairment (Cockcroft, Alloway, Copello, & Milligan, 2015; Grieve & van Eeden, 2010). However, because most such tests were developed in North America, their standardisation and normative data are based on, and designed for direct application to, a (generally) white, urbanised, middle-class, and English-speaking population (Gadd & Phipps, 2016). Hence, clinicians and researchers alike acknowledge that the use of these tests with individuals who are not white, urbanised, English-speaking, highly literate, or from at least middle-class backgrounds, is problematic. One important negative consequence of using culturally biased measures and inappropriate population norms is the risk of misdiagnosis in a clinical neuropsychological assessment (Shuttleworth-Edwards, 2016). While the risk of misdiagnosis is a concern in and of itself, it also carries serious implications for the provision of treatment, interventions, and disability grants. In resource-limited countries such as South Africa, where funds and services are scarce (Gilson et al., 2017; Schneider et al., 2016), a misdiagnosed patient may either be refused necessary treatment or receive unnecessary treatment.

The Wechsler family of tests are among the most frequently used measures of cognitive ability worldwide (Sparrow & Davis, 2000). In South Africa, mental health professionals use the Wechsler scales across a variety of clinical, educational, occupational, and research settings (Cockcroft et al., 2015; Shuttleworth-Edwards et al., 2004). The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), currently in its second edition (WASI-II; Wechsler, 2011), was created in response to calls by researchers and clinicians for a short and psychometrically sound intelligence measure suitable for individuals across a broad age range (Axelrod, 2002). The WASI is especially attractive to clinicians working in the time- and resource-limited South African context.

North American and Australian studies of the Wechsler intelligence scales report that, on verbally-based tests in particular, individuals whose home language does not match the language in which the test is written and administered (i.e., English) perform more poorly than those who do have such a match (Carstairs, Myors, Shores, & Fogarty, 2006; Razani, Murcia, Tabares, & Wong, 2006; Walker, Batchelor, Shores, & Jones, 2010). Such findings are particularly relevant for South African clinicians, given that most residents of this country do not have English as their home language (Statistics South Africa, 2011). Indeed, Foxcroft and Aston (2006) found that white English-speakers obtained significantly higher WAIS-III

(Wechsler, 1997) Verbal Comprehension Index (VCI) scores than white and coloured Afrikaans-speakers, who performed second- and third-best, respectively. Black African-language speakers obtained the lowest scores. These data suggest that the Wechsler tests are biased against individuals who do not speak English as a first language (Skuy, Taylor, O'Carroll, Fridjhon, & Rosenthal, 2000).

In South African research and clinical practice, the effects of language on test performance are almost inextricably linked to the effects of quality of education (Gaylard, 2005; Grieve & van Eeden, 2010; Pienaar, Shuttleworth-Edwards, Klopper, & Radloff, 2017; Shuttleworth-Edwards et al., 2004; Shuttleworth-Edwards & van der Merwe, 2016; van Wyhe, 2012). This association most likely arises due to the poor-quality education imposed on African language-speaking individuals during apartheid. Evidence for this argument emerges from studies showing that individuals with an African home language and good quality education perform as well on the WAIS-III as individuals with English as a home language, while individuals with an African home language and disadvantaged education obtain significantly lower scores (e.g., Gaylard, 2005; Shuttleworth-Edwards et al., 2004).

Other South African studies in this area have identified a number of additional sociodemographic factors that influence test performance. These factors include level of education (Skuy, Schutte, Fridjhon, & O'Carroll, 2001), language medium of formal education (Foxcroft, 1997; Nell, 1994), test-wiseness (i.e., the level of one's test-taking skills; Nell, 1999), extent of urbanisation/acculturation (Nell, 1999; Shuttleworth-Jordan, 1996), and socioeconomic status (van Wyhe, 2012). Taking these factors into account enables clinicians and researchers to interpret an individual's test performance more accurately and fairly, especially in the absence of published normative data for many groups of people in South Africa.

To obtain fairer, less biased estimates of IQ, researchers within and outside of South Africa have attempted, in recent years, to adapt and translate existing measures so that they may be more culturally and linguistically appropriate (e.g., Abu-Hilal, Al-Baili, Sartawi, Abdel-Fattah, & Al-Qaryouti, 2011; Caldas, Zunzunegui, Freire, & Guerra, 2012; Claassen, Krynauw, Paterson, & Wa Ga Mathe, 2001; Ferrett, Carey, et al., 2014; Renteria, Tinsley Li, & Pliskin, 2008). However, until psychometric equivalence with original measures and locally appropriate norms have been established, results should be interpreted with caution. Regarding the Wechsler family of tests, the WASI has been translated and adapted for use with Afrikaans- and Xhosa-speaking individuals (Ferrett, 2011; van Wyhe, 2012). However, the only South African-adapted WASI (SA-WASI) data emerges from studies involving

English- and Afrikaans-speaking white and coloured adolescents (Ferrett, 2011; van Wyhe, 2012). There are no published SA-WASI data for other language groups in South Africa. This is a significant gap in the research literature and is of clinical significance. For instance, in the Western Cape, almost a quarter of the population speaks Xhosa as a first language (Statistics South Africa, 2011), and there are no IQ tests especially well-suited for those individuals.

Furthermore, the psychometric properties of the SA-WASI Vocabulary subtest as a potentially shorter screening measure than the full SA-WASI have been studied for the English version only (Cawthra, 2016). The importance of developing abbreviated screening measures is illustrated by the number of research studies, conducted both overseas and in South Africa, describing the development and validation of brief tools that might quickly determine the presence of cognitive impairment (see, e.g., Joska et al., 2016; Nasreddine et al., 2005; Myer et al., 2008; Schwab et al., 2007). Although comprehensive neuropsychological test batteries may be more clinically informative, they are often time-consuming and may require trained professionals to administer, score, and interpret performance (McCrimmon & Smith, 2013; Sacktor et al., 2005). Brief screening tools that are easy to administer, score, and interpret are especially useful in low- and middle-income countries (LAMICs) where the burden of disease is high and resources are limited (Robbins et al., 2013; Singh, Sunpath, John, Eastham, & Gouden, 2008). In addition, brief assessment scales may allow more individuals to access further necessary treatment, effectively working to reduce the large treatment gap in South Africa (Myer et al., 2008; Petersen & Lund, 2011).

Although the WASI is already an abbreviated version of the original WAIS, it may still take approximately 30-40 minutes to administer (Axelrod, 2002). Reducing administration time even further, while still retaining strong psychometric properties, would be ideal. Studies have shown that the Wechsler Vocabulary subtest score often has the highest correlations with VIQ and FSIQ, and therefore is often considered to provide an acceptable indication of IQ (Abu-Hilal et al., 2011; Axelrod, 2002; van Wyhe, 2012). Abbreviating the Vocabulary subtest, then, might allow clinicians to estimate an individual's IQ quickly and efficiently.

Another locally relevant issue to consider is that, in South African public schools, many individuals are formally educated in a language different from their home language (Foxcroft et al., 2004). According to governmental research, although the majority (76%) of learners in the foundation phase years of school (grades 1-3) learn in their African home language, most (65%) South African learners in the intermediate phase (grades 4-6), regardless of home language, receive formal schooling in English (Department of Basic

Education, 2010). This phenomenon may be problematic when choosing a language of choice for cognitive tests, because, according to Nell (1994, 1999), certain concepts or knowledge may only be accessible to the test-taker in his or her home language, or conversely only in the language of his or her education. Therefore, there is some uncertainty as to whether an English or a translated cognitive test provides the most accurate estimate of such an individual's true IQ. Foxcroft (1997) suggests that, if a learner has been educated in an English-medium, westernised schooling system, taking the test in English (as he or she is probably accustomed to doing) may be a more familiar experience than taking the test in a language primarily used to communicate at home. On the other hand, Foxcroft cautions that non-English home-language speakers who were educated in English do not necessarily have similar English proficiency levels as their English home-language counterparts, even after they have completed their schooling. It appears, then, that a potential solution for the mismatch, in South African assessment settings, between a test-takers' home languages and the language of test administration may not be as simple as translating a test into the different languages spoken by all members of the population. There is currently no evidence suggesting an advantage of taking the test in one's home language over one's language of formal education, or vice-versa.

**Research Aims**

The present research comprised four major aims, which together provided an examination of the psychometric properties of a newly-developed Xhosa version of the SA-WASI Vocabulary subtest. Specifically, the study set out to:

(1) investigate which of the English or Xhosa SA-WASI Vocabulary subtests provides a more accurate estimate of the true IQ of home-language Xhosa speakers who have received formal education in English;

(2) investigate the construct validity of the Xhosa SA-WASI Vocabulary subtest in relation to the English SA-WASI Vocabulary subtest and a criterion measure of IQ;

(3) estimate the internal consistency reliability of the Xhosa SA-WASI Vocabulary subtest; and

(4) investigate how individual items on the Xhosa SA-WASI Vocabulary subtest influence the instrument's internal consistency, with the goal of abbreviating the subtest for use as a screening tool in clinical and research settings.

# Methods

## Design and Setting

The study utilised a correlational design, as it determined the nature of the association between the scores, within a single sample, on the Xhosa SA-WASI Vocabulary subtest, an abbreviated English SA-WASI Vocabulary subtest, and a criterion measure of IQ. Data collection took place in the Department of Psychology at the University of Cape Town (UCT).

## Participants

I invited all undergraduate students in the UCT Department of Psychology to participate via the Student Research Participation Programme (SRPP) website (see Appendix A). After obtaining approval from the Department of Student Affairs (DSA) at UCT, I also invited participation from students taking an undergraduate Organisational Psychology course by publishing an advertisement on their course website. Moreover, I requested that recruitment posters be placed in a university residence as another means to invite students to participate.

All participants had to be university students between the ages of 18 and 24 years, inclusive. This age range is consistent with the reference range for Wechsler scales' normative data (Wechsler, 1997). Participants also had to be home-language Xhosa speakers. The South African Department of Basic Education (2010) defines *home language* as the language a learner speaks most frequently at home. Finally, participants were required to have attended an English-medium school from at least grade 8. Individuals with a history of neurological, psychological, or psychiatric illness, as well as those with a currently diagnosed learning disability, or those currently using psychoactive medication, were excluded from participation.

Using these recruitment means and applying these eligibility criteria strictly, I obtained a sample of $N = 19$ (17 women, 2 men, age $M = 20.21 \pm 1.65$ years). A power analysis using G*Power 3.0.10 software indicated that a sample size of 19, with an alpha level of .05, and a medium effect size of Cohen's $f = .30$, generates statistical power of .37 (Faul, Erdfelder, Lang, & Buchner, 2007).

## Measures

**Sociodemographic questionnaire.** This study-specific self-report questionnaire (see Appendix B) collected general biographical information about the participants (e.g., age, languages in which they were fluent, level of educational attainment, parental level of educational attainment and occupation, and name and location of high school).

**Health Index.** This study-specific self-report questionnaire (see Appendix C) screened participants for health-related exclusion criteria (e.g., neurological problems, mental illness, and medication use), as these conditions may affect scores on cognitive tests (Donders & Strong, 2015; Gorlyn et al., 2006).

**Marin Acculturation Scale (MAS).** This self-report scale measures respondents' language preferences. It was developed for use with Hispanic individuals in the United States (Marin, Sabogal, Vanoss Marin, Otero-Sabogal, & Perez-Stable, 1987), and has subsequently been translated into Arabic, Chinese, and Korean, and has been validated for use with Jordanian adolescents, and with Chinese and Korean immigrants in North America (Choi & Reed, 2011; Gupta & Yick, 2001; Wirtz & Madanat, 2013). The MAS has also been adapted for use in South Africa with English-, Afrikaans-, and Xhosa-speaking individuals (van Wyhe, 2012). Regarding psychometric properties, Marin and colleagues found the original scale to possess excellent reliability (Cronbach's $\alpha$ = .92) The above-mentioned adapted and translated versions demonstrated similarly excellent levels of internal consistency and good construct validity.

The MAS's 12 items allow respondents to use a five-point Likert-type scale to indicate, for instance, which language they use generally and in social interactions, and their language of preference for media consumption. For this study, the Likert scale points were: 1 = *only Xhosa*, 2 = *more Xhosa than English*, 3 = *both Xhosa and English equally*, 4 = *more English than Xhosa*, and 5 = *only English* (see Appendix D). Individual item scores were summed and averaged to provide an overall MAS score. Hence, higher scores reflect a dominance for English, whereas lower scores reflect a dominance for Xhosa.

**12-Item SA-WASI Vocabulary subtest.** The original WASI comprises four subtests. Together, scores on the Vocabulary and Similarities subtests provide an estimate of Verbal IQ (VIQ). Similarly, scores on the Block Design and Matrix Reasoning subtests can be summed to provide an estimate of Performance IQ (PIQ). Combining scores from all four subtests allows one to estimate a Full Scale IQ score (FSIQ; Wechsler, 1999).

Ferrett (2011) adapted the verbal subtests of the original WASI so they might be more culturally and linguistically appropriate for administration to English-, Afrikaans-, and

Xhosa-speaking residents of the Western Cape. Outside of those adaptations, the SA-WASI is identical to the original WASI. Hence, the full SA-WASI Vocabulary subtest consists of 42 items (words), with graded levels of difficulty (easier words at first, more difficult words later). The test-taker is asked to give the meaning of each word (e.g., *bird*, the ninth item in the subtest, which is the starting point for individuals aged 9-89 years). Responses are scored either 0 (incorrect answer; e.g., 'it could be a pet'), 1 (partially correct answer; 'it flies'), or 2 (correct answer; 'a feathered animal that can fly'). In the event of five consecutive scores of 0, scoring is discontinued.

Cawthra (2016) developed a 12-item short form of the English version of the SA-adapted Vocabulary subtest, reporting good internal consistency (Cronbach's $\alpha$ = .82) and good construct validity in estimating SA-WASI VIQ and FSIQ. I used this short form in the present study (see Appendix E).

Ferrett (2011) also translated the verbal components, as well as the administration instructions, of the SA-WASI into Xhosa. The present study used that Xhosa translation of the SA-WASI Vocabulary subtest (see Appendix F).

**Raven's Advanced Progressive Matrices (APM).** The APM is a non-verbal test of abstract reasoning that is often used to provide an estimate of IQ (Raven, 1981). The Raven tests are used extensively because they are suitable for a wide age range (i.e., individuals aged 6 years and older), and because they provide a measure of intelligence that is relatively free of cultural and linguistic biases (Owen, 1992; Raven, 2000; Rushton, Skuy, & Bons, 2004). Both the APM and the Standard Progressive Matrices (SPM) have been used to assess general intellectual functioning in South Africa (Rushton et al., 2004; Rushton, Skuy, & Fridjhon, 2003). I chose to use the APM in the current study because it is designed to differentiate between individuals of higher-than-average intellectual ability, and because previous studies of South African undergraduates that have used the SPM have found significant ceiling effects (Raven, Raven, & Court, 1998; Rushton & Skuy, 2000).

The APM is divided into Set I (12 problems) and Set II (36 problems). Each problem takes the form of a pattern, displayed on a single page within the test booklet, with a segment missing. For each pattern, the participant selects the missing piece from a selection of eight options presented below it. Although the test may take 40-60 minutes to complete in its entirety, it can be administered with a time limit (Raven et al., 1998). Hamel and Schmittmann (2006) found that scores on a 20-minute timed version of the APM predicted scores on the untimed version ($r$ = .75). Hence, in order to reduce participant burden, I used a 20-min time limit in the present study.

Regarding psychometric properties, Rushton and colleagues (2004) found the APM to have a Cronbach's alpha value of .86 when administered to a sample of Black African university students in South Africa. The sample's scores ranged from 3-35 ($M = 23 \pm 6.1$). That study also suggested that the APM has construct validity when administered to South African university students.

**Procedure**

This research adhered to UCT's Code for Research Involving Human Subjects. The study obtained ethical approval from the Department of Psychology's Research Ethics Committee (reference number: PSY2017-029; see Appendix G for a copy of the ethical approval letter). The study was also approved by the UCT DSA (see Appendix H).

Participants signed up for a test slot via email or SRPP mechanisms. I tested each participant individually. At the appointed time, I met the participant in a quiet and private test venue within the UCT Department of Psychology, and presented an informed consent document for reading and signature (Appendix I). This document outlined the general study purpose, and included information about voluntary participation, withdrawal, confidentiality/anonymity, and potential risks and benefits. After consent processes were complete, the participant filled in the sociodemographic questionnaire, the Health Index, and the MAS. If it was obvious from these preliminary measures that a participant was not a Xhosa home-language speaker, testing was terminated, and the participant was compensated with one SRPP point (in the case of Psychology students) or R10 (all others) for their time. I terminated testing with one individual whose home language was Sotho.

I then proceeded to administer the short form of the English SA-WASI Vocabulary subtest, the Xhosa SA-WASI Vocabulary subtest, and the APM. I counterbalanced the order of administration of the two Vocabulary tests, and sandwiched them around the APM administration. So, if the English Vocabulary test = A, the Xhosa Vocabulary subtest = B, and the APM = C, then the possible orders of administration are either ACB or BCA. I randomly assigned participants to an order. The purpose of this counterbalancing was to rule out the possibility of practice effects (i.e., the possibility that participants would perform better on the second test simply because they had learnt from the first test). This step was especially important for this study because the Xhosa version of the SA-WASI Vocabulary subtest is a direct translation of the original English SA-WASI subtest. Counterbalancing also helped rule out potential fatigue effects from the long testing session (i.e., participants may have felt more tired during the second test and therefore may have performed more poorly).

After testing, I thanked the participants, give a short debriefing session, asked if there were any questions, and then dismissed them. The entire protocol was completed within 70 minutes. Participants received three SRPP points (for Psychology students) or R50 (others) for completing the full study. I sent each participant a debriefing and thank-you email (Appendix J) after the session had terminated.

**Data Management and Statistical Analyses**

I administered and scored the tests according to the standard procedures outlined in their respective manuals. I also audio recorded the Xhosa SA-WASI Vocabulary subtest. As I am not fluent in Xhosa, the audio recording was taken to a fluent speaker of the language to aid in translation and scoring, in the event of any uncertainties.

I used SPSS (version 24.0) and Microsoft Excel to store, clean, display, and analyse the data. I calculated a full set of descriptive statistics for key sociodemographic variables (e.g., age, sex, socioeconomic status, level of education), and for each primary outcome variable (viz., Xhosa SA-WASI Vocabulary score, 12-item English SA-WASI Vocabulary score, and APM score).

**Research Aims 1 and 2.** The first aim was to investigate which of the English or Xhosa SA-WASI Vocabulary subtests provides a more accurate estimate of the true IQ of home-language Xhosa speakers who have received formal education in English. The second aim concerned the construct validity of the Xhosa translation. I pursued both aims using a series of bivariate correlational analyses (using Pearson's *r* correlation coefficient). First, scores on 12-item English SA-WASI Vocabulary subtest and the Xhosa SA-WASI Vocabulary subtests were correlated with APM scores to determine which of the two provided a better estimate of the participants' general intellectual functioning. Second, scores on the Xhosa SA-WASI Vocabulary subtest were correlated with those on the English SA-WASI Vocabulary subtest to determine construct validity of the newly-translated instrument.

**Research Aims 3 and 4.** The third aim was to determine the internal consistency reliability of the Xhosa translation of the SA-WASI Vocabulary subtest. The fourth aim was to suggest an abbreviated Xhosa Vocabulary test with good psychometric properties for use as a screening tool. I determined the internal consistency of the Xhosa SA-WASI Vocabulary subtest using Cronbach's alpha statistic. I also performed and analysed item-total correlations for each subtest item to determine which item scores correlated well or poorly with the overall test score. I then looked at how the internal consistency of the subtest changed if I removed the poorly correlated items, so that an abbreviated form would retain the strongest possible psychometric properties.

# Results and Discussion

## Sample Characteristics

Table 1 presents the sociodemographic characteristics of the present sample. Because the sample comprised 17 women and 2 men, I did not test for between-sex differences on any of the screening or outcome variables. Order of administration did not affect participants' scores on the Xhosa SA-WASI Vocabulary subtest, $t(17) = -1.09$, $p = .292$, Cohen's $d = 0.50$, or on the 12-item English SA-WASI Vocabulary test, $t(10.60) = 1.17$ , $p = .267$, Cohen's $d = 0.56$.

The sample size was too small to perform any regression analyses examining the influence of sociodemographic variables (age, sex, education, etc.) on test performance.

Table 1
*Sample Sociodemographic Characteristics (N = 19)*

| Variable | Range | Frequency (Percentage) | *M (SD)* |
|---|---|---|---|
| Age (years) | 18-24 | | 20.21 (1.65) |
| Number of languages spoken fluently | | | |
| Two (Xhosa and English) | | 12 (62.30) | |
| Three (Xhosa, English, and another language) | | 7 (36.80) | |
| Education (years) | 13-17 | | 14.26 (0.93) |
| Years of English-medium education | 6-17 | | 12.26 (3.05) |
| High school status | | | |
| Public | | 13 (68.40) | |
| Private | | 6 (31.60) | |
| Quality of education[a] | 0-110850 | | 3750.00[b] (33208.75) |
| Socioeconomic status[c] | 3-30 | | 11.47 (1.14) |
| MAS[d] | 1.75-3.50 | | 2.74 (0.52) |

*Note.* MAS = Marin Acculturation Scale.
[a]*Quality of education* is represented as annual tuition fees (in rands) for Grade 12. [b]This is the median tuition fee for the sample (with the interquartile range presented in parentheses). One participant's high school was not able to provide information on tuition fees; therefore, the range, median and interquartile range for this variable reflect the data from $N = 18$.
[c]*Socioeconomic status* (SES) reflects a participant's total score on the Hollingshead Four-Factor Index of Socioeconomic Status. Parental educational level (mother and father) is rated on a 7-point scale, and parental occupation (mother and father) is rated on a 9-point scale. The four scores are summed to calculate a total SES. An SES score can range from 0–32. [d]The possible range for MAS scores is 0-5.

**Performance on Outcome Variables**

Table 2 presents descriptive statistics for performance on the three outcome measures.

Table 2
*Descriptive Statistics: Performance on outcome measures (N = 19)*

| Test | Possible score range | Range | *M (SD)* |
|---|---|---|---|
| 12-item English SA-WASI Vocabulary | 0-24 | 4-11 | 6.95 (2.09) |
| Xhosa SA-WASI Vocabulary | 0-68 | 21-47 | 38.32 (7.58) |
| APM | 0-48 | 9-28 | 17.89 (5.61) |

*Note.* SA-WASI = South African-adapted Wechsler Abbreviated Scale of Intelligence; APM = Advanced Progressive Matrices.

The distribution of scores for the Xhosa SA-WASI Vocabulary subtest was negatively skewed, indicating a build-up of higher scores, skewness = -.86, *SE* = .52 (see Figure 1). This pattern of data indicates that participants performed relatively well on this measure. However, scores for the 12-item English SA-WASI Vocabulary subtest were positively skewed, skewness = .61, *SE* = .52. This statistic points to an abundance of lower scores within the distribution, suggesting relatively poor performance on this measure (see Figure 2). In fact, 18 of the 19 participants scored 0 on the final five items of this test (see Figure 3). An interpretation of these analyses will follow later in the discussion.

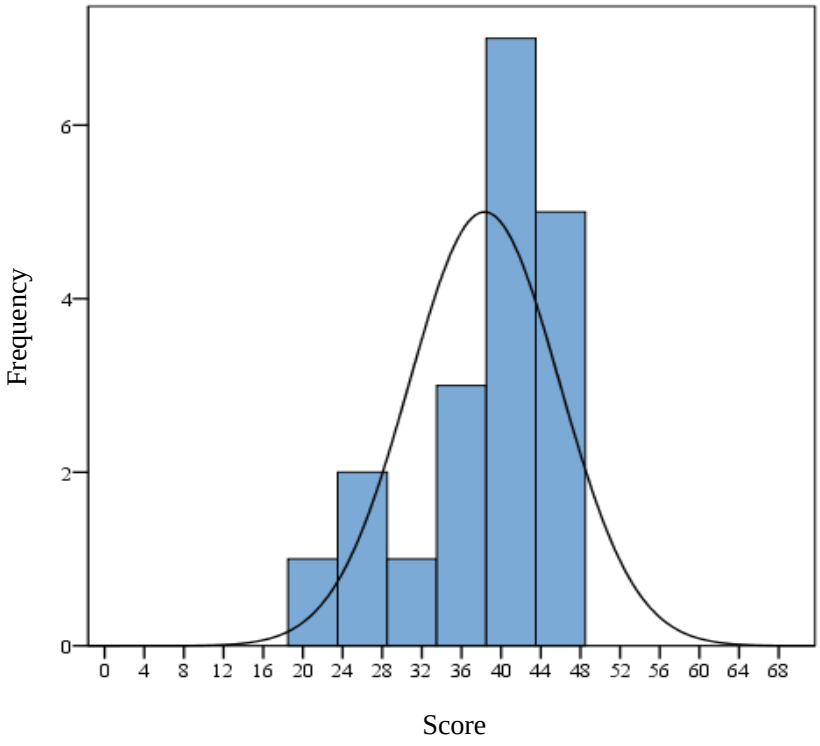


*Figure 1.* Distribution of scores for the Xhosa SA-WASI Vocabulary subtest (*N* = 19).

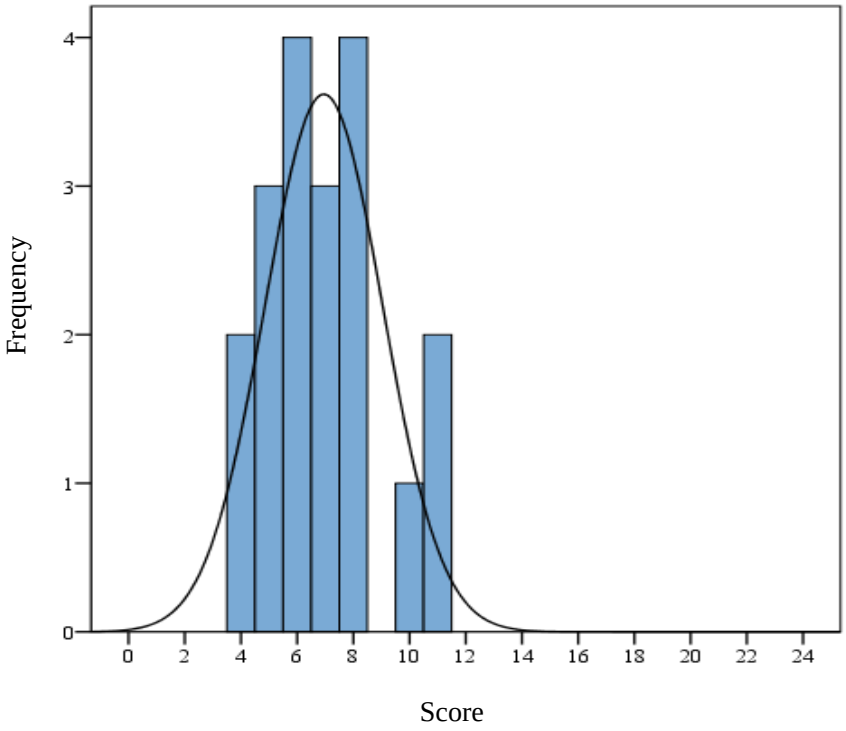


*Figure 2.* Distribution of scores for the 12-item English SA-WASI Vocabulary subtest (*N* = 19).

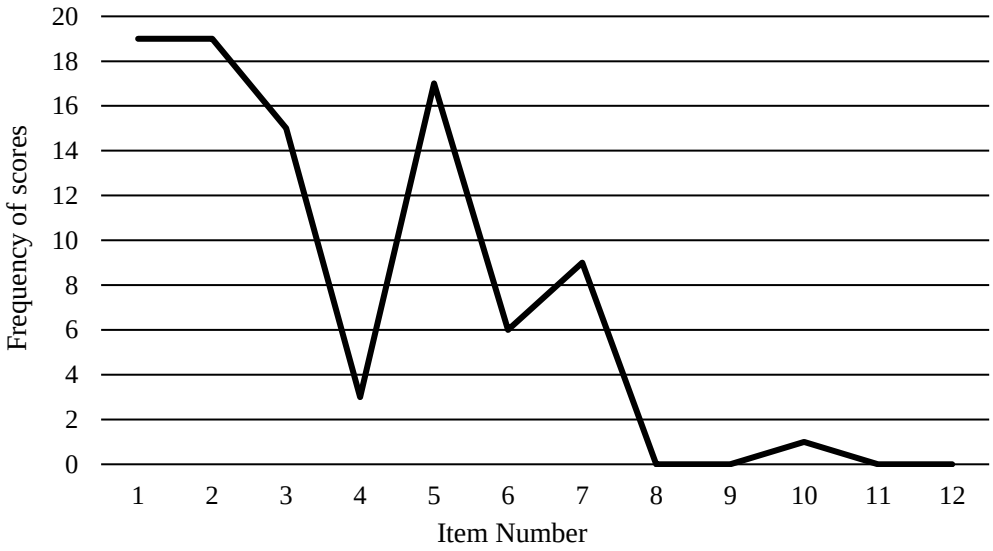


*Figure 3*. Frequency of partially correct (1-point) or correct (2-point) scores for the 12-item English SA-WASI Vocabulary subtest (*N* = 19).

The distribution of APM scores was normal, skewness = .001, *SE* = .52 (a skewness value of zero represents a perfectly normal distribution of scores). However, the mean number of correct responses for the APM was 17.89 ± 5.61, which corresponds to an average percentage test score of 37.27%. That mean score is substantially lower than that reported by Rushton and colleagues (2004), who found *M* = 23 for a similar sample, but with a 30-minute time limit. Hence, it is possible that participants in the current study found the test more difficult than did those in that previous study.

This impression is confirmed by an examination of individual performance patterns. Only 4 of the 19 participants completed the full test within the 20-minute time limit. On average, participants completed 36.53 (*SD* = 7.01) of the 48 items.

Of further interest is that there was a negative correlation between the number of items attempted and the number of items answered correctly, $r = -.33$, $p = .17$. A possible explanation for this pattern of data is that participants were influenced by the pressure associated with having a time limit, resulting in them spending less time working out each answer, and thereby being more prone to either making errors or to guessing.

In summary, these findings suggest that the APM was an extremely challenging task for the present participants. The time limit imposed may have further biased test results, thus compromising the measure's ability to provide an accurate estimate of IQ. These biases are interpreted with reference to the results below.

**Research Aims 1 and 2**

The correlation between scores on the Xhosa SA-WASI Vocabulary subtest and the APM was small, negative, and not statistically significant, $r = -.11$, $p = .65$. The correlation between scores on the 12-item SA-WASI English Vocabulary test and the APM was positive and slightly larger, but still not statistically significant, $r = .37$, $p = .12$. There was a small, negative, and non-significant correlation between scores on the Xhosa Vocabulary subtest and scores on the 12-item English Vocabulary subtest, $r = -.30$, $p = .22$.

The larger correlation between the 12-item English SA-WASI Vocabulary subtest and the APM suggests, at face value, that the 12-item English SA-WASI Vocabulary subtest would provide a more accurate estimate of IQ than the Xhosa SA-WASI Vocabulary subtest for Xhosa home language individuals who have received formal education in English. Furthermore, negative correlations between scores on the Xhosa SA-WASI Vocabulary subtest and those on the two other outcome measures suggest that the translated instrument does not have good construct validity. However, as shown above, individuals performed relatively poorly on both the 12-item English SA-WASI Vocabulary subtest and the APM,

whereas scores on the Xhosa SA-WASI Vocabulary subtest were relatively high. Therefore, from a purely statistical perspective, it makes sense that one would see a negative correlation between those measures (i.e., a measure on which individuals performed relatively poorly, and a measure on which individuals performed relatively well). It is also not surprising that there is a positive correlation between two measures on which the scores were generally low.

The correlational analyses that I employed to achieve these first two research aims should therefore be interpreted with caution. If, as the above analyses suggest, the biases associated with the APM (i.e., the difficulty of the test and the pressurising aspect of the time limit) and the 12-item English SA-WASI Vocabulary subtest (i.e., the difficulty of the test and the build-up of lower scores), affected participants' test performance, then the APM and the 12-item English SA-WASI Vocabulary subtest cannot be used as a reliable criterion measures of IQ. These measures, therefore, should not be used to determine construct validity of the Xhosa SA-WASI Vocabulary subtest. It is worth noting that at least one of these biases, that is, the skewed distributions of scores evident in both the full Xhosa and 12-item English SA-WASI Vocabulary subtests, may also have been a consequence of having a very small sample size.

**Research Aims 3 and 4**

Internal consistency reliability of the Xhosa SA-WASI Vocabulary subtest was moderate, Cronbach's $\alpha$ = .67.

Figure 4 presents the item difficulty curve for all items on that subtest. A detailed inspection of performance indicates that the entire sample scored 2-point responses for item 13 (*ibrekfasti*, 'breakfast'), and 0-point responses for item 27 (*inkulungwane*, 'century'). The overall pattern of the curve deviates significantly from the smooth downward linear trend that is expected for a test on which easier items (with expected higher average scores) appear earlier in the test, while more difficult items (corresponding to lower average scores) are administered later.

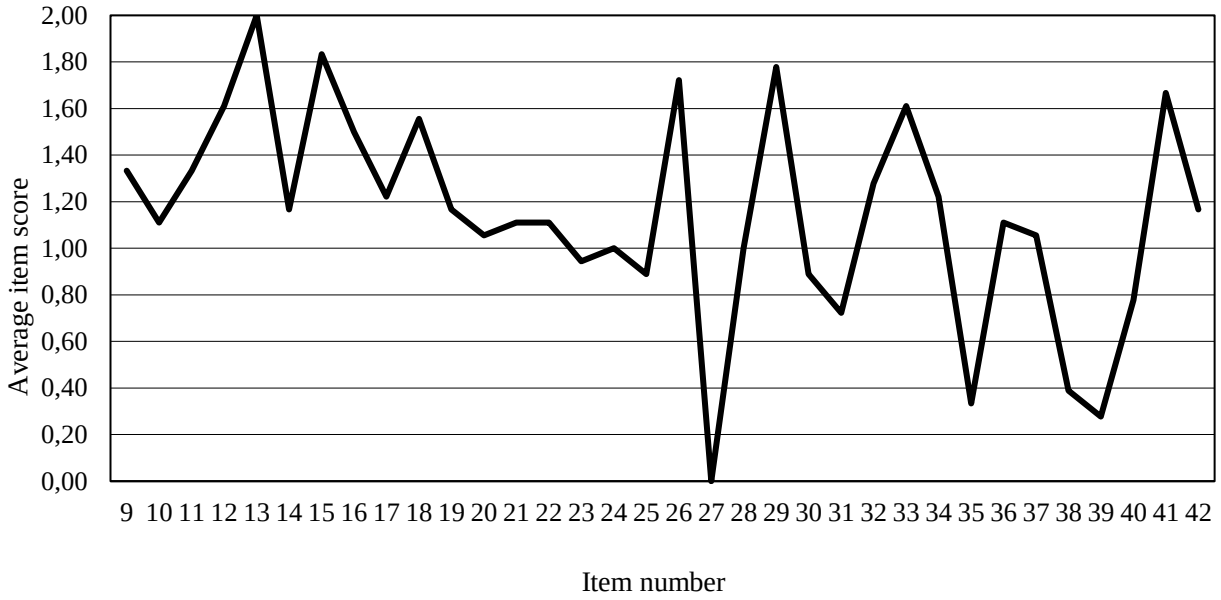


*Figure 4.* Relative item difficulty for the Xhosa SA-WASI Vocabulary subtest (*N* = 19).

Item-total correlations for the Xhosa SA-WASI Vocabulary subtest ranged considerably, with the lowest correlation being *r* = -.05 (item 18, *bonakalisa*, 'reveal') and the highest being *r* = .72 (item 28, *uvelwano*, 'compassion'). The average item-total correlation was .31. I removed all items on the test with an item-total correlation below this average to see how their removal affected the Cronbach alpha statistic. The result was a 19-item scale with a higher Cronbach's alpha (.74). I removed a further 9 items with relatively lower item-total correlations. A scale comprising the remaining 10 items (items 15, 22, 25, 28, 32, 33, 34, 35, 36, and 39) had adequate internal consistency, $\alpha$ = .77.

In the current sample, the range of scores for this 10-item scale was 1-18 (*M* = 10.53, *SD* = 4.14; highest possible score = 20). Performance on the 10-item scale correlated significantly with performance on the full subtest, *r* = .73, *p* < .001. However, there was no significant correlation between scores on the 10-item scale and those on the 12-item English SA-WASI Vocabulary subtest, *r* = -.30, *p* = .21, or on the APM, *r* = -.04, *p* = .86.

The linear trend of relative item difficulty for the proposed 10-item scale is still not ideal (see Figure 5). Whereas the first three items appear to follow a downward trend (depicting increased item difficulty), individuals obtain, on average, increasingly higher scores on the next three items in the scale. Moving towards the last four items on the scale, it appears that, on average, individuals tend to perform increasingly poorly, with the exception of the penultimate item (item 36), which appears to be somewhat easier than the two preceding it. I therefore reordered the test items, based on the averages from the present

sample. Figure 6 shows the proposed rearranged item order for the 10-item scale. Appendix K presents the reordered 10 items chosen for the potential screening tool with a revised scoring guideline.

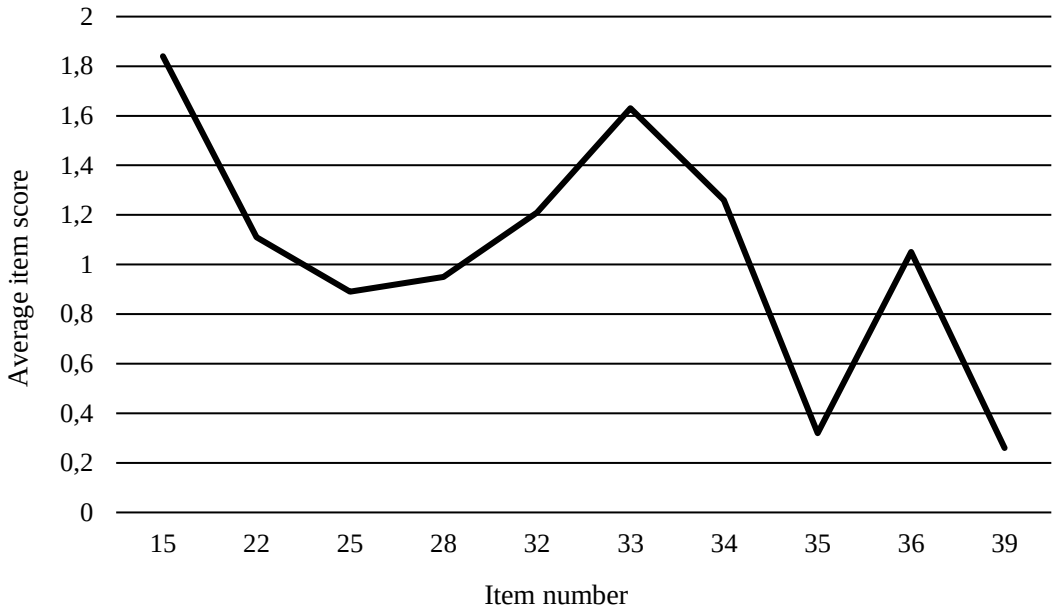


*Figure 5.* Relative item difficulty for the original version of the proposed 10-item Xhosa SA-WASI Vocabulary subtest ($N$ = 19).

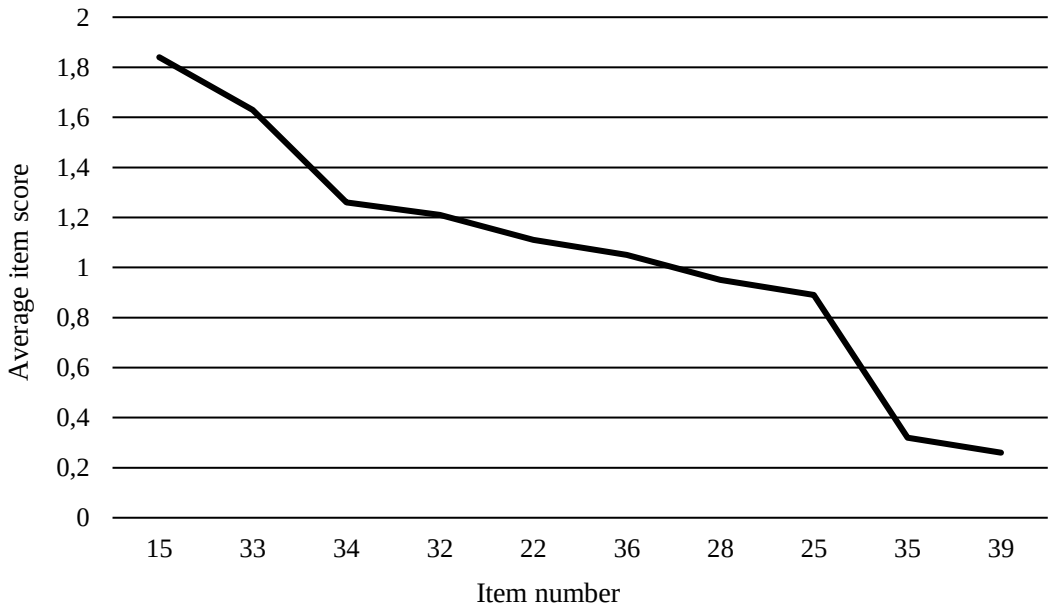


*Figure 6.* Relative item difficulty for the re-ordered version of the proposed 10-item Xhosa SA-WASI Vocabulary subtest ($N$ = 19).

The jagged item difficulty curve for the (full and abbreviated) Xhosa translation of the SA-WASI Vocabulary subtest has direct implications for scoring. The discontinuation rule dictates that scoring/administration stops after five consecutive scores of 0. If the more difficult items are administered in the middle of the test, and easier items towards the end, a test-taker's final score may be affected. Their partially correct or correct responses towards the end of the test may not be scored, or those items might not be administered at all. This is problematic, as the test may then not be an accurate reflection of an individual's IQ, compromising its validity and reliability. In this sample, this was the case for three participants (16% of the sample), who lost an average of 4 points on the full Xhosa SA-WASI Vocabulary subtest.

Regarding cross-language difficulty, words in Xhosa, or any language for that matter, do not necessarily have the same difficulty level as their equivalents in English. For example, the final (and supposedly most difficult) item on the12-item English Vocabulary subtest is the word 'tirade'. The Xhosa translation is the word '*ukungxolisa',* which comes from the root word '*ukungxola*', a frequently used word which means, 'to make a noise' (de Schryver & Reynolds, 2014). This supposition was supported by the data: All participants scored 0 for the word 'tirade' on the 12-item English Vocabulary subtest, but all participants obtained at least a 1-point (*n*= 16) or a 2-point (*n = 3*) score for this item on the Xhosa translation.

**Evaluating items: Beyond the statistics**

Translating English items into other languages is a challenging task, and may present test adapters and translators with a number of distinct problems (Kanjee, 2001). For example, it may be difficult to find an exact translation for an English word in the target language, or the direct translation of the English word might have several distinct meanings in the target language. Some of these problems were illustrated in the present data set.

For instance, I identified 10 translated words that have another meaning, or meanings, in addition to the original English meanings (de Schryver & Reynolds, 2014). The word *ukulungisa* (item 16), which is the translation of the English word *repair*, can also mean to 'put something(s) in order', or to 'make something orderly/organised'. Similarly, the word *guquka* (item 18), which is the translation of the English word *transform*, also refers to the action of turning one's body from one side to the other, especially while lying down. The word *sola* (item 21) means 'blame' in addition to 'regret', which is the original English item. The translation for the word English word *enthusiastic* is the Xhosa word *nomdla* (item 30), which literally means 'with interest'. However, a test-taker who responds to this item by describing what it means to 'have interest' would receive only 1 point for a partially correct

response, as per the official scoring guide. Moreover, while the word *ukulangazelela* (item 32) is the given translation for the English world *impulse*, this Xhosa word is better defined as 'having a strong desire to/for', 'to long (very much) for', or 'to be greedy for'. The word *oyikeka* (*formidable*; item 40), in addition to meaning 'terrible' or 'horrendous', which would be scored as a correct 2-point response, also means 'scary' or 'frightening' (the root word '*oyika*' means 'be scared of'), which would only be scored as a 1-point response. The word *onwabisa* (item 24), which is the translation for the English word *entertain,* also means 'to cause to be happy' or 'to make happy'. Here, the word *onwaba*, 'to be happy', is simply suffixed with the causative extension *isa*. In the scoring guidelines, however, the response 'to make people happy' is deemed partially correct. Lastly, the word *ikoloni* (*colony*; item 38) has a dual meaning. In addition to its intended meaning in the test, the word *ikoloni* is also used in Xhosa to describe South Africa's provinces. For example, the Eastern Cape is called *Impuma koloni*. The scoring guidelines do not account for these multiple meanings, and should be revised to include them as correct responses.

Other translated items were somewhat ambiguous in their meanings. The word *ngokusileyo* (item 37), the given Xhosa translation of the English word *impertinent*, is a particularly interesting case. *Ngoku* is an adverbial prefix, and is added to verbs and adjectives to denote, "in the way of…". The *yo* at the end of the word is a suffix. This leaves two possible root words: *sile*, which means 'be naughty' (the intended translation), or *sa* which has at least three possible meanings (de Schryver & Reynolds, 2014). So, while some participants described *ngokusileyo* as intended, others employed two alternative meanings of *sa* ('to be dawn/daybreak', and 'to become clear'). A common response from the participants was 'the way that it has dawned/become clear, or 'now that it has dawned/become clear' (with some confusion in relation to the prefix *ngoku*, which also, on its own, means 'now'). Overall, I think this was a poor choice of translation; not only is it an obscure form of the given root words, but it leaves too much room for misunderstanding and confusion. Perhaps a better word for the translation could be *-krwada,* a relative adjective commonly used to describe a rude person, or *ukugeza,* a verb meaning 'to be naughty/cheeky'.

It is also interesting to note that some of the translated Xhosa words have slightly different connotations to the original English words. One noteworthy example is the English word *trend* (item 34), which was translated as *ifashoni* (a borrowing from the English 'fashion'). While the English words 'fashion' and 'trend' may be used interchangeably in various instances, the former word implies a style of clothing that is popular within a given time period, whereas the latter refers to the more general 'pattern that happens over time' (a

2-point response for this item). While 'popular style' and 'fashion' are considered partially correct responses, it may be worthwhile to take this nuance into account in a revised scoring guideline. Another item with a slightly different nuance is the word *inqwelo* (*cart*; item 20). *Inqwelo* is often used as a base word to describe different types of transport. For example, *inqwelo-moya*, literally translated as 'transport of the air', is a Xhosa word for an aeroplane. *Inqwelo-mafutha* (literally, 'oil transport'), on the other hand, is a word used to describe any form of transport that runs on petrol (oil), usually a motor vehicle. All participants understood the item in this way, which, once again, suggests a revision of the scoring guideline.

I also noted a few grammatical problems and inconsistencies in the Xhosa scoring rubrics. First, there was one spelling mistake – item 33, *ukugxama*, the translation of the English word *haste*, is actually spelled '*ukungxama*' (de Schryver & Reynolds, 2014). Second, translations of items that were verbs were inconsistent in their form. This is contrast to the original English verb items, which are all presented in the same basic format. For example, some verbs were presented with the infinitive prefix *uku*, which is translated as 'to' in English (e.g., item 16, *ukulungisa*, which translates to '*to* repair'), while others were presented without the infinitive prefix (e.g., item 29, *vuya*, which simply means 'rejoice'). In the interests of standardisation, perhaps the verb items on the Xhosa translation should be re-examined to ensure consistency in form. Third, some translated words were a different part of speech to the original English word. For example, the English word *impulse* (item 32) is a noun, but its Xhosa translation is a verb, *ukulangazelela*, which means 'to desire'. Another example is the final item on the test, *tirade*, which is a noun in English. The Xhosa translation, *ukungxolisa*, meaning 'to shout angrily/scold', is a verb. It is possible, however, that these verb forms were the best available translations of the English words, as there may have been no true equivalent word in English. This is, of course, understandable and sometimes necessary when translating English items into different languages.

On a positive note, the choice of Xhosa words for the translation reflected current trends in the language. One such trend that was evident in this translation was that of lexical borrowing, which refers to the increasing tendency of Xhosa speakers to borrow words from the English language and incorporate them into the Xhosa lexicon (Dowling, 2011). Examples of borrowed words in the test translation include *ikhalenda* (item 10), *inamba* (item 11), *ibell* (item 12), *ibrekfasti* (item 13), *ipolisa* (item 14), *iholideyi* (item 15), *ibhaloni* (item 17), *icrocodile* (item 19), and *ifashoni* (item 34). Interestingly, quite a few participants mentioned the 'pure' Xhosa word for certain items, such as *inani*, *intsimbi*, and *uxam* (the proper Xhosa words for number, bell, and crocodile, respectively), suggesting that at least

some of these words are still used in their pure form. However, given this trend of lexical borrowing from English, it is certainly advisable to use borrowed words where appropriate. Future research should look at whether this lexical borrowing trend is evident in older populations, who may be more likely to use the original, pure Xhosa words. Such a difference between age cohorts may affect the reliability and validity of the test for older populations, and should be taken into account when adapting and translating a cognitive test.

**Limitations and Directions for Future Research**

There were three major limitations to this study. The first was the very small sample size, which meant the study was underpowered and may have lowered the probability of finding statistically significant results. The small sample size also limits the generalisability of the findings. It also meant that I could not investigate the effects of key sociodemographic variables (e.g., quality of education and socioeconomic status) on test performance, as suggested by previous research (e.g., Shuttleworth-Edwards et al., 2004). One of the primary goals in the field of cross-cultural neuropsychological testing is to standardise, and provide appropriate norms for, translated measures. To accomplish this goal, future studies need to recruit larger samples, preferably from a variety of age groups, and from diverse socioeconomic and educational backgrounds.

A second limitation of the study concerns the measures that were used. As described earlier, it is possible that the APM and the 12-item English SA-WASI Vocabulary subtest were inappropriate for the current sample, as demonstrated by their skewness statistics, possible biases, and generally low scores. This, in turn, limited the study's ability to make claims about the construct validity of the Xhosa SA-WASI Vocabulary subtest. However, these test-related biases may also be another consequence of the study's very small sample size (e.g., unusually low scores by one or two participants may have distorted the data distributions).

A third limitation is that, as of yet, Xhosa is the only African language into which the WASI Vocabulary subtest has been translated. Although Xhosa is the main African language spoken in the Western Cape, more people in South Africa are home-language Zulu speakers (Statistics South Africa, 2011). Researchers should therefore look into translating (and validating) the Vocabulary subtest into Zulu, and other African languages, so as to create fair cognitive assessment scales for all South Africans.

## Summary and Conclusion

Informal or unstandardized translations of neuropsychological tests, including this Xhosa translation of the SA-WASI Vocabulary subtest, are used frequently in South African

clinical and research settings. The psychometric properties of these translations are, for the most part, unknown, and psychometric equivalence of the translations to their original versions is often not established prior to usage. The overall aim of this study was to determine the construct validity and internal consistency reliability of a Xhosa translation of the SA-WASI Vocabulary subtest (Ferrett, 2011). While the construct validity of the subtest remains questionable, internally consistency was moderate. Additionally, inspection of the data suggested a reliable 10-item version of the Xhosa SA-WASI Vocabulary subtest. By pursuing these aims, the study made three significant contributions. First, it showed that this Xhosa translation is moderately reliable, thereby helping South African clinical psychologists, educational psychologists, and neuropsychologists be more confident in one of the key measures they use to assess patients. Second, it proposed a 10-item instrument that will be useful for clinicians working in resource-limited conditions, who need a short, psychometrically sound measure to estimate general intellectual functioning in Xhosa home-language patients. Third, the study (a) highlighted potential problems associated with directly translating existing verbally-based cognitive measures, most of which have English forms only, into an African language, and (b) described some of the implications of those problems for interpretation and scoring of responses. Perhaps most importantly, the study demonstrated the importance of validating translations of the widely used Wechsler Vocabulary subtest, and of evaluating the items both statistically and from a qualitative perspective.

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## APPENDIX A

## SRPP Email Invitation

Hi everyone

I am running a study through the Department of Psychology. The study aims to explore the psychometric properties of the Xhosa translation of the South African adaptation of the Wechsler Abbreviated Scale of Intelligence (SA-WASI).

In order to participate in this study, you need:

1. To be a home-language Xhosa speaker (NOT other Nguni/other African languages)
2. To have attended an English-medium school in South Africa from AT LEAST grade 8 (an English medium school is a school where the language of learning and teaching is English)
3. To be between the ages of 18 and 25 years (inclusive)
4. NOT have a history of psychological, psychiatric or neurological disorders, head injuries, or learning disabilities
5. NOT currently be taking any psychoactive medication

If you meet the criteria, and if you would like to participate in the study, you can sign up for a time slot using the Sign-up tab. Please check the date and time of the session before signing up.

When you arrive, you will complete three questionnaires and a series of cognitive measures. Participation in the full study will take approximately 70-80 minutes, for which you will receive 3 SRPP points.

If you have any further questions with regards to this study, please email me (the researcher) on xhosawasi2017@gmail.com.

Regards

Michal Zieff

*Disclaimer:*

*It is generally accepted that the decision to include or exclude individuals from participating in a study depends on the focus, objective, nature of research and context in which the research is conducted. Some research may be focused on a certain individual (such as in a person's life history), or a group of individuals who share a specific characteristic (e.g., an identifiable group of asthma sufferers who happen to be all of one sex; a religious order that is restricted to one sex). Other examples include research that is focused on specific cultural traditions or languages, or on one age group (e.g., a study of posture corrections in adolescents). These are regarded as appropriate forms of inclusion and exclusion of individuals or groups in research studies - so long as the selection criteria for those to be included in the research are relevant to answering the research question.*

## APPENDIX B

## Sociodemographic Questionnaire

A. DEMOGRAPHICS

□ Female □ Male □ Other (tick one)

Age: _____ Date of birth: _____

Language spoken most frequently at home: _____

Language you consider your first (home) language: _____

Other languages in which you are fluent: _____

Please specify in which contexts/situations you use other languages?

_____

B. EDUCATION

In what languages were you educated?

a. Primary school – foundation phase (Grades 1-3) _____
b. Primary school – intermediate phase (Grades 4-6) _____
c. High school (grades 7-12) _____

What was the name of your high school? [Also give location – please include **city** and **province**]

_____

Was this school a public or a private school? □ Public □ Private (tick one)

What year of university study are you currently in? (e.g. 1st, 2nd) _____

How many years of education have you completed (from grade 1, including university)? _____

How many years of education have you completed **in an English medium** (from Grade 1, including university)?

_____

C. GENERAL INFORMATION

What area (also include province and city) did you live in while attending high school?

_____

What is your mother's highest level of education? _____

What is your father's highest level of education? _____

What is your mother's occupation? _____

What is your father's occupation? _____

## APPENDIX C

## Health Index

1. Have you ever experienced a serious head injury (e.g., being hit on the head with an object and losing consciousness as a result)?

   □ YES □ NO

   If yes, please give details of the injury:

_____

2. Do you now, or have you ever, experienced any of the following conditions:

a. Epilepsy (i.e., seizures or fits) □ YES □ NO

b. Neurological problems (i.e., Parkinson's, Huntington's, stroke, etc.)

□ YES □ NO

If yes, please specify:

_____

c. Depression □ YES □ NO

d. Memory problems □ YES □ NO

If yes, please specify:

_____

e. Learning difficulties (dyslexia, ADD/ADHD) □ YES □ NO

If yes, please specify:

_____

f. Problems with your vision □ YES □ NO

If yes, please specify:

_____

g. Problems with your hearing □ YES □ NO

If yes, please specify:

_____

h. Are you currently taking any prescription medication(s)?

□ YES □ NO

If yes, please specify:

_____

## APPENDIX D

## Adapted Marin Acculturation Scale

For items 1-8, please indicate which language you prefer in each of the situations described. For items 9-12, please indicate which social grouping you prefer in each of the situations described.

| | Only Xhosa | More Xhosa than English | Both equally | More English than Xhosa | Only English |
|---|---|---|---|---|---|
| 1. In general, what language(s) do you read and speak? | 1 | 2 | 3 | 4 | 5 |
| 2. What was the language (s) you used as a child? | 1 | 2 | 3 | 4 | 5 |
| 3. What language(s) do you usually speak at home? | 1 | 2 | 3 | 4 | 5 |
| 4. In which language(s) do you usually think? | 1 | 2 | 3 | 4 | 5 |
| 5. What language(s) do you usually speak with your friends? | 1 | 2 | 3 | 4 | 5 |
| 6. In what language(s) are the TV programmes you usually watch? | 1 | 2 | 3 | 4 | 5 |
| 7. In what language(s) are the radio programmes you usually listen to? | 1 | 2 | 3 | 4 | 5 |
| 8. In what language(s) are the movies, TV and radio progammes you *prefer* to watch/listen to? | 1 | 2 | 3 | 4 | 5 |

| | Only Xhosa | More Xhosa than English | Both equally | More English than Xhosa | Only English |
|---|---|---|---|---|---|
| 9. Your close friends are? | 1 | 2 | 3 | 4 | 5 |
| 10. You prefer going to social gatherings/parties at which people are? | 1 | 2 | 3 | 4 | 5 |
| 11. The persons you visit or who visit you are? | 1 | 2 | 3 | 4 | 5 |
| 12. If you could choose your children's friends, you would prefer them to be? | 1 | 2 | 3 | 4 | 5 |

# APPENDIX E

## 12-item English SA-WASI Vocabulary subtest

SOUTH AFRICAN-ADAPTED WECHSLER ABBREVIATED SCALE OF INTELLIGENCE

12-ITEM VOCABULARY SUBTEST

Scoring Manual

**Instructions:**

Scoring: Score items up to discontinuance point (i.e., 5 consecutive scores of zero).

| Item | Response | Score |
|---|---|---|
| 1. Bird | It could be a pet **Q** It lives in a tree **Q** It's pretty | 0 |
| | It flies Mammal that flies (sings, has wings) It has wings (feathers, a beak) **Q** It sings (in the spring) It makes nests Chicken Hawk Parakeet Cardinal etc. | 1 |
| | A feathered creature that flies An animal (that can fly) A winged animal that has feathers on its body Fowl | 2 |
| 2. Calendar | Can carry one with you Wall calendar Made of paper It tells you what time it is **Q** | 0 |
| | Schedule Appointment book It helps you plan (your time or schedule) It shows which days are holidays It has the days (months, years) **Q** | 1 |
| | It tells you what day and month it is Something that tells you the date An orderly list of the days of the week and months of the year | 2 |
| 3. Complicated | Can't get it right / solve it Can't explain it Don't understand it Not understandable Problematic Struggle to do | 0 |
| | Not straight-forward Hard / not easy Complex Tricky Not clear Confusing / made up of different parts Mixed-up / not well defined | 1 |
| | Something that is made up of intricate parts or aspects that are difficult to understand or analyse Not easily comprehended or understood Not simple (Very) involved Not as easy as it seems Not easily worked out/resolved Difficult to analyse or explain Not easy to find an answer Not easy to explain Hard to explain (Very) difficult Intricate | 2 |
| 4. Haste | Wasting time Haste makes waste | 0 |
| | Carelessness Do something without care (thinking) Quickly Fast Quick | 1 |
| | Hurry Rashness Rush Swiftness Quickness Rash action Done quickly Speed Rapidity of motion Moving rapidly In a hurry Do something fast | 2 |
| 5. Entertain | To have fun **Q** Take care of | 0 |

| | | |
|---|---|---|
| | To perform To keep someone (you) busy **Q** Putting on a show A comedian, TV, or radio can entertain you Activity to provide amusement Enjoyment A person who amuses others To make people laugh (happy) **Q** Play a musical instrument (Sing, Dance, Tell jokes) **Q** | 1 |
| | Amuse Contemplate Consider To provide diversion To show a good time To keep occupied (hold the attention of) To perform (sing, dance) for others' enjoyment To make others laugh with your actions To think about (consider) something To host a party (social event) To extend hospitality toward | 2 |
| 6. Impulse | Wanting to do something **Q** You did it automatically **Q** Sudden **Q** I did it on impulse **Q** | 0 |
| | Spontaneity **Q** Urge; Drive; Momentum **Q** Spur of the moment **Q** To act (do something) on a whim (on the spur of the moment, without thinking) **Q** A quick moment of decision making **Q** Impetuous; Spontaneous **Q** An instinctive (involuntary, immediate) response or reaction; Reaction Response | 1 |
| | Impetus An urge for sudden action Sudden urge An inner drive that makes you do something on the spur of the moment (without thinking) A feeling which compels you to do something Stimulus transmitted in a muscle or nerve fibre | 2 |
| 7. Cart | A horse pulls it **Q** For transportation **Q** You push (pull) it **Q** | 0 |
| | Something you drive around in when you play golf Something you put (carry) things in (when shopping) You load things in it and use it to carry things around Something you push that holds things Haul Carry A box with wheels Grocery basket Way of transporting goods A container that holds stuff **Q** | 1 |
| | Small-wheeled vehicle used to store or carry things Something that has wheels and carries things Wheeled vehicle drawn by a horse (pony, dog) Wagon Buggy Wheelbarrow | 2 |
| 8. Ruminate | To talk about something **Q** To remember something I ruminate about my taxes **Q** | 0 |
| | Something to do with thinking **Q** To lament about past events To think about **Q** To worry excessively (about things that aren't there) **Q** To dwell on something **Q** An animal that eats grass (that has more than one stomach) Digest **Q** | 1 |
| | Reflect Ponder Cogitate Muse Contemplate To chew (the cud) To thoroughly consider To go over in the mind repeatedly Mull (think) over | 2 |
| 9. Intermittent | It occurs on a regular sequence Intermittent showers A pause A break **Q** Something comes between other things **Q** In between In the middle **Q** Scattered **Q** | 0 |
| | Put time between **Q** Unpredictable occurrence of some action **Q** Like your windshield wipers are going at different times | 1 |
| | Periodic Occasional Spasmodic Sporadic Every now and then Coming and going at intervals To happen in an irregular pattern Something that starts then stops Not continuous With interruptions Without synchronicity On-again, off-again, not steady Erratic Inconstant Irregular | 2 |
| 10. Formidable | Worthy opponent **Q;** Worthy; Great **Q;** A formidable intellect | 0 |
| | Difficult; Hard; Tough; Scary **Q** Overwhelming; Challenging **Q;** Competitive; Strong **Q** Strenuous; Laborious; Toilsome **Q** Powerful **Q** Something to be respected; An opponent with superior abilities to yourself **Q** | 1 |
| | Daunting Awesome Awful Appalling Dreadful Horrible Horrifying Terrible Intimidating Threatening Ominous Difficult to defeat or overcome Presents a difficult , challenging or overwhelming obstacle Imposing Gives the impression of | 2 |

| | | |
|---|---|---|
| | having great strength and authority | |
| 11. Impertinent | Foolish Pretentious **Q** Cocky Smart | 0 |
| | Obnoxious; Disobedient **Q** Unessential; Insignificant; Unimportant **Q** Intrusive; Meddlesome **Q** Not necessary **Q** Not pertaining to the current subject Someone that gets on people's nerves Annoying **Q** Not a very nice person **Q** Sarcastic and smart-alecky Not to the point **Q** Fresh | 1 |
| | Irrelevant Impudent Brazen Saucy Sassy Pert Insolent Rude Disrespectful Flippant Lack of etiquette Out of line and disrespectful Something that is not appropriate | 2 |
| 12. Tirade | A tantrum A temper tantrum A fit of anger Lose one's temper Outburst **Q** A fit of inner feeling Rampage A commotion Associated with violence and anger, letting go of human or natural control Upheaval Raising Cain To be forceful and angry Bossy person **Q** | 0 |
| | Verbal fuss Yelling To yell A scolding Argument Flood of words A speech A long speech | 1 |
| | A long emotional speech marked by anger or censure Ranting and raving Laying into somebody verbally Verbal tantrum Verbal browbeating Volume of rapid language, generally some quality, such as punishment, about it An angry speech A harangue Hostile flow of words Cussing somebody out, having a go at them | 2 |

# APPENDIX F

## Xhosa translation of the SA-WASI Vocabular subtest

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 9. **intaka / *bird* / voël:** | |
| A feathered creature that flies An animal (that can fly)<br>A winged animal that has feathers on its body Fowl | **2** |
| It flies Mammal that flies (sings, has wings) It has wings (feathers, a beak) **Q**<br>It sings (in the spring) It makes nests Chicken Hawk Parakeet Cardinal etc. | **1** |
| It could be a pet **Q** It lives in a tree **Q** It's pretty | **0** |
| 10. **ikhalenda / *calendar* / kalender:**: | |
| It tells you what day and month it is Something that tells you the date<br>An orderly list of the days of the week and months of the year | **2** |
| Schedule Appointment book It helps you plan (your time or schedule)<br>It shows which days are holidays It has the days (months, years) **Q** | **1** |
| Can carry one with you Wall calendar<br>Made of paper It tells you what time it is **Q** | **0** |
| 11. **inamba / *number* / nommer:** | |
| Digit Figure Numeral Amount Quantity Sum Integer<br>Calculate Count Enumerate Tally A number is used to count with<br>Numeric value (sign) A counting device A mathematical unit (symbol)<br>Tells the quantity (how much, how many) of something Something you count | **2** |
| Something to help you learn math A symbol **Q** You write it in your math answer<br>Used to addition (multiplication, subtraction, division) Something that has value<br>Signifies placement (order, sequence) **Q** Measurement **Q** 1, 2, 3 [or any other no.] **Q** | **1** |
| You tell your age with it **Q**<br>Something for writing down your phone number (address) **Q** | **0** |
| 12. **ibell / *bell* / klokkie:** | |
| A device to sound an alarm (demand attention, signal for something)<br>An (musical) instrument Instrument that rings Something that makes music<br>Ring it **Q** – like a call for dinner | **2** |
| Something you can ring **Q** A dome shape with a little thing inside **Q**<br>It rings (jingles, makes a ding sound, goes ding-dong) **Q** Ringer | **1** |
| Something that makes a noise **Q** For church (school) **Q** | **0** |

**Start at Item 1 and administer all items up to age-appropriate cutoff points.**
**Age 8: stop after item 30; Age 9-11: stop after item 34**
**Age 12-16: stop after item 38; Age 17 and above: administer all items**
**Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).**

| | |
|---|---|
| 13. **ibrekfasti / *breakfast* / ontbyt:** | |
| The first meal of the day — Early (first, morning) meal<br>Food eaten at the first meal of the day — Eating in the morning | **2** |
| A meal — To eat — What we eat<br>Eggs (bacon, coffee) **Q** — Food **Q** — The most important meal of the day **Q** | **1** |
| To break the fast **Q** | **0** |
| 14. **ipolisa / *police* / polisie:** | |
| People who maintain public order and safety of citizens — To enforce the laws<br>Someone who serves the public and arrests criminals — Cop — Peace officer<br>Law enforcement agents (agency) — Law enforcer<br>To prevent or detect violations of rules and regulations | **2** |
| A group of people who control (regulate, maintain order) — You report crime to them **Q**<br>Keep people protected (safe) — A group of armed people — A peace keeper<br>Somebody who helps you (arrest people, takes you to jail) — Security **Q**<br>Search for evidence when there is a crime (robbery, murder) — A law person **Q** | **1** |
| Give out speeding tickets — People who provide justice **Q** — Authority figure **Q**<br>People who wear a blue uniform (suit) and have a badge **Q** — Catch bad people **Q**<br>People who drive a car that has red and blue lights **Q** | **0** |
| 15. **iholideyi / *vacation* / vakansie:** | |
| A respite — A period of time planned for enjoyment (recreation) — Leisure time<br>Break from work (school, normal routine) when you can rest (do whatever you want)<br>A period of resting (relaxation) — Trip taken for fun (to relax)<br>Holidays (break, time off) from work (school) | **2** |
| A place where you go to relax — When you go to Disneyland [or other vacation spot]<br>An activity different from your normal day-to-day routine — To get away<br>Time spent with family away from home — When it's time to take off **Q**<br>When you go out of town to visit family (friends) — Trip; Getaway; Day off **Q**<br>You go away (from home for a while, on a trip) | **1** |
| Escape **Q** — Somewhere you go **Q**<br>[give names of holiday months] **Q** — Something you go on | **0** |
| 16. **ukulungisa / *repair* / herstel:** | |
| To fix or correct something that has been damaged — To make usable again<br>To rebuild — To fix — Fixing — To mend — Make better if broken<br>To restore (to original condition) — To re-establish operational condition | **2** |
| Something that was damaged and fixed — To finish or remodel something<br>To fix a chair (car) **Q** — Something is broken, you have to repair it **Q** | **1** |
| Work on shoes or home — Repair a chair — When something is broken **Q** | **0** |

**Start at Item 1 and administer all items up to age-appropriate cutoff points.**
**Age 8: stop after item 30; Age 9-11: stop after item 34**
**Age 12-16: stop after item 38; Age 17 and above: administer all items**
**Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).**

| | |
|---|---|
| 17. **ibhaloni / *balloon* / ballon:** | |
| Rubber (plastic, elastic, latex) that you can blow up (fill with air, gas, helium)<br>Toy consisting of an inflatable rubber bag A ball you put helium in that floats<br>A toy you blow up that can fly Blimp Airship A type of aircraft | 2 |
| Used for decorations A party favor that holds air A means of transportation<br>Something that flies in the sky and is all kinds of colors Expand To swell or puff out<br>You blow it up (fill it with air, play with it) **Q** A toy **Q** Has air in it and flies | 1 |
| It floats **Q** It can be made into different things **Q**<br>Something that pops **Q** For special occasions (birthdays) **Q** | 0 |
| 18. **guquka / *transform* / omskep:** | |
| Change Convert Metamorphose Mutate Modify<br>To change in composition (structure, appearance, shape)<br>To change (turn) into something else (from one thing to another)<br>To turn into a different shape (form) To undergo metamorphosis (mutation) | 2 |
| Something that turns into something else To become different **Q**<br>The process of changing from one form to another Remake **Q**<br>Turn into something **Q** Like a caterpillar turns into a butterfly **Q** | 1 |
| Fix something Like you go into something **Q** | 0 |
| 19. **icrocodile / *crocodile* / krokodil:** | |
| A reptile Alligator An amphibian<br>An animal **Q** – that lives in swamps and has rough skin (swims in the water; lays eggs) | 2 |
| A cold-blooded (mean, man-eating, green, scaled) animal **Q** An animal **Q**<br>It has sharp teeth (four legs, a long snout) **Q** A big lizard **Q**<br>An animal that can live on water or land (in a swamp) **Q**<br>Mammal that lives in water (has scaly skin, bites) Carnivore | 1 |
| Lives in water **Q** Something that is dangerous **Q** | 0 |
| 20. **inqwelo / *cart* / waentjie:** | |
| Small-wheeled vehicle used to store or carry things Wagon<br>Something that has wheels and carries things Buggy<br>Wheeled vehicle drawn by a horse (pony, dog) Wheelbarrow | 2 |
| Something you drive around in when you play golf Carry A box with wheels<br>Something you put (carry) things in (when shopping) Grocery basket<br>You load things in it and use it to carry things around Way of transporting goods<br>Something you push that holds things Haul A container that holds stuff **Q** | 1 |
| A horse pulls it **Q** For transportation **Q** You push (pull) it **Q** | 0 |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 21. **sola / *blame* / blaam:** | |
| Accusation Reprehension Accuse Fault Charge To put guilt on others<br>To find fault with To point the finger at Transfer responsibility to someone else<br>To use someone as a scapegoat for something bad that happened To lay fault on<br>To hold someone responsible (for something that's gone wrong) To pass the buck | **2** |
| Attribute **Q** To say someone else did it (when you really did it)<br>I blame you for something I did **Q** Responsibility | **1** |
| To tell on somebody **Q** She did it **Q** To put upon someone else **Q**<br>If you get into trouble but didn't do it **Q** | **0** |
| 22. **umdaniso / *dance* / dans:** | |
| A form of body movement for recreation (artistic purposes, to express yourself)<br>To move to music (a rhythm, a song) Caper Frolic Boogie Rhythmic movement<br>Moves put together to form a routine (typically performed to music) Art form<br>A ritual performed by one or more people to represent their heritage | **2** |
| Something you do for pleasure (exercise) **Q** Shindig Hop Ball Prom<br>Jitterbug Polka Rumba Tango Shimmy The Twist Ballet etc.<br>Form of expression **Q** Something you do to music Body movement<br>To jump around; to wiggle your body **Q** Move fast Move your feet | **1** |
| To perform **Q** A party you have with friends **Q** | **0** |
| 23. **injongo / *purpose* / doelwit:** | |
| Reason Intention Function Objective Goal Aim Mission<br>What something is used for Why something exists Why you're doing something | **2** |
| Cause; Plan; Proposal **Q** Desire to accomplish something **Q** Not an accident **Q**<br>The meaning of (for) something **Q** Deliberately I did it on purpose **Q**<br>The purpose of scissors is to cut paper When you want to do something **Q** | **1** |
| A statement The end result of something | **0** |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.**<br>**Age 8: stop after item 30; Age 9-11: stop after item 34**<br>**Age 12-16: stop after item 38; Age 17 and above: administer all items**<br>**Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 24. **onwabisa / *entertain* / vermaak:** | |
| Amuse Contemplate Consider To provide diversion To show a good time<br>To keep occupied (hold the attention of) To think about (consider) something<br>To perform (sing, dance) for others' enjoyment To host a party (social event)<br>To make others laugh with your actions To extend hospitality toward | **2** |
| To perform To keep someone (you) busy **Q** Putting on a show<br>A comedian, TV, or radio can entertain you Activity to provide amusement<br>Enjoyment A person who amuses others To make people laugh (happy) **Q**<br>Play a musical instrument (Sing, Dance, Tell jokes) **Q** | **1** |
| To have fun **Q** Take care of | **0** |
| 25. **dumileyo / *famous* / beroemd:** | |
| Well-known Widely known Renowned Celebrated Recognized Celebrity<br>Notorious People who are extraordinary (set apart)<br>Someone (something) that a lot of people know about<br>Person that has done something outstanding or heroic | **2** |
| Known **Q** Notable Important Popular People want your autograph<br>A person like a great singer such as Elvis or Sinatra<br>Someone who's loved by a lot of people (in the media, in the limelight) | **1** |
| Someone who has fame **Q** You're a star **Q** Everyone watches you on TV<br>Great **Q** Someone who lives in Hollywood and has a big house | **0** |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 26. **bonakalisa / *reveal* / onthul:** | |
| Expose Display Manifest Exhibit Disclose Divulge Uncover Unveil<br>Unmask To show (something, yourself) To show something that is hidden<br>To bring something out into the open To tell something that has been kept a secret | **2** |
| Discover; Open **Q** To let someone else know something **Q** To tell something **Q**<br>To find out something (the truth) Like reveal a secret, you are telling the truth | **1** |
| To go over something To see something that happened in the past | **0** |
| 27. **inkulungwane / *century* / eeu:** | |
| Way to define when 100 years have passed A period of 100 years | **2** |
| Hundred **Q** Group of years **Q** Certain number of years **Q** Amount (period) of time **Q** | **1** |
| Age **Q** A different decade A generation Decades ago **Q**<br>25 [any other increment than 100] years | **0** |
| 28. **isithethe / *tradition* / tradisie:** | |
| Custom A way of doing things that is passed down from generation to generation<br>A set of values that is rooted in the past Something you do for many generations<br>An inherited (established, customary) pattern of thought (action, behavior, belief)<br>A time-honored ritual A certain them or celebration that is on a regular basis<br>Like a cultural ritual, something you do because your family did it or the nation does it | **2** |
| Habit Ritual Do the same thing year after year Something you do once a year<br>Something you do over and over again **Q** An old (familiar) way of doing things **Q**<br>Something that has been passed on from generations **Q** Values **Q**<br>It's been done before; Something that's always been done **Q** | **1** |
| Something you celebrate **Q** Like a holiday **Q** Something fixed Legend<br>Something you do with your family **Q** Family tradition<br>Hanukkah; Christmas; Ramadaan etc. | **0** |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 29. **vuya / *rejoice* / jubel:** | |
| Gladden Exult To be (very) happy To be delighted<br>To show extreme happiness To experience joy over a happy event or occasion | **2** |
| Enjoy Celebrate Joy Delight Celebration Happiness<br>Glad; Joyful; Excited **Q** You rejoice in your success **Q** | **1** |
| Sing out **Q** Have a party | **0** |
| 30. **–nomdla / *enthusiastic* / entoesiasties:** | |
| To wholeheartedly throw yourself into a project With anticipation and excitement<br>Excited and eager about doing something Zealous Fervent Avid<br>To be motivated and excited (eager, energetic, pumped up) Exuberant Gung-ho | **2** |
| Interested Attracted Ecstatic Joyful Excited Eager<br>To be energetic (full of spirit) Excited about something Excitement<br>You can be enthusiastic about your job (hobby) **Q** | **1** |
| To be into the mood **Q** Very active **Q** Looking forward to it **Q**<br>To be really happy **Q** Outgoing | **0** |

# STOP POINT for 8 year olds

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.**<br>**Age 8: stop after item 30; Age 9-11: stop after item 34**<br>**Age 12-16: stop after item 38; Age 17 and above: administer all items**<br>**Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 31. **–ntsonkothileyo / *complicated* / gekompliseerd:** | |
| Something that is made up of intricate parts or aspects that are difficult to understand or analyse Not easily comprehended or understood Not simple (Very) involved Not as easy as it seems Not easily worked out/resolved Difficult to analyse or explain Not easy to find an answer Not easy to explain Hard to explain (Very) difficult Intricate | **2** |
| Not straight-forward Hard / not easy Complex Tricky Not clear Confusing / made up of different parts Mixed-up / not well defined | **1** |
| Can't get it right / solve it Can't explain it Don't understand it Not understandable Problematic Struggle to do | **0** |
| 32. **ukulangazelela / *impulse* / impuls:** | |
| Impetus An urge for sudden action Sudden urge An inner drive that makes you do something on the spur of the moment (without thinking) A feeling which compels you to do something Stimulus transmitted in a muscle or nerve fiber | **2** |
| Spontaneity **Q** Urge; Drive; Momentum **Q** Spur of the moment **Q** To act (do something) on a whim (on the spur of the moment, without thinking) **Q** A quick moment of decision making **Q** Impetuous; Spontaneous **Q** An instinctive (involuntary, immediate) response or reaction Reaction Response | **1** |
| Wanting to do something **Q** You did it automatically **Q** Sudden **Q** I did it on impulse **Q** | **0** |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 33. **ukugxama / *haste* / haastigheid:** | |
| Hurry Rashness Rush Swiftness Quickness Rash action Done quickly<br>Speed Rapidity of motion Moving rapidly In a hurry Do something fast | **2** |
| Carelessness Do something without care (thinking) Quickly Fast Quick | **1** |
| Wasting time Haste makes waste | **0** |
| 34. **ifashoni / *trend* / tendens:** | |
| A pattern that happens over time Something that follows a general pattern<br>A line of general direction or pattern Direction things are headed Course<br>Something that is growing in popularity Contemporary movement<br>A movement toward a new (or different) way of doing things Tendency Inclination | **2** |
| Style that everyone is following **Q** Something everybody's doing Mode<br>Trend means like the current fashions (the latest "in" thing) Pattern; Phase **Q**<br>Something that is temporary and popular at the time Popular style Fad Fashion | **1** |
| What is happening **Q** To follow a crowd **Q** Popular **Q** Fashion trend<br>A period of time What is usually done for a while **Q** | **0** |

# STOP POINT for 9-11 year olds

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 35. **nqapha-nqapha / *intermittent* / onderbroke:** | |
| Periodic Occasional Spasmodic Sporadic Every now and then<br>Coming and going at intervals Not continuous With interruptions Erratic<br>To happen in an irregular pattern Without synchronicity Inconstant<br>Something that starts then stops On-again, off-again, not steady Irregular | **2** |
| Put time between **Q** Unpredictable occurrence of some action **Q**<br>Like your windshield wipers are going at different times | **1** |
| It occurs on a regular sequence Intermittent showers A pause; A break **Q**<br>Something comes between other things **Q** In between; In the middle **Q** Scattered **Q** | **0** |
| 36. **uvelwano / *compassion* / deernis:** | |
| Pity Empathy Sympathy, allying one's feeling with another Having mercy<br>Sorrow or pity aroused by the distress of another Feeling sorrow with a person<br>Feeling of sorrow for a person Loving concern **Q** – charity in its broadest sense | **2** |
| Feel /feeling for (another person, someone) [without indication of sorrow concern]<br>Sorry Sorrow Caring Caring sentiment Concern Understanding<br>Tenderness **Q** – sort of like a maternal feeling Forgiveness To console | **1** |
| Thoughtfulness **Q** Care for someone **Q** A feeling **Q** Kindness **Q**<br>Emotion / heartfelt, great emotion **Q** Deep feeling of wanting to love<br>Tolerance Love Passionate | **0** |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 37. **ngokusileyo / *impertinent* / parmantig:** | |
| Irrelevant Impudent Brazen Saucy Sassy Pert Insolent Rude<br>Disrespectful Flippant Lack of etiquette Out of line and disrespectful<br>Something that is not appropriate | **2** |
| Obnoxious; Disobedient **Q** Unessential; Insignificant; Unimportant **Q**<br>Intrusive; Meddlesome **Q** Not necessary **Q** Not pertaining to the current subject<br>Someone that gets on people's nerves Annoying **Q** Not a very nice person **Q**<br>Sarcastic and smart-alecky Not to the point **Q** Fresh | **1** |
| Foolish Pretentious **Q** Cocky Smart | **0** |
| 38. **ikoloni / *colony* / kolonie:** | |
| A country belonging to another country Territory subject to another government<br>Settlement of people in a new world or place<br>Group of people banded together for a common goal or purpose<br>Settlement for a group of animals or humans who have the same social structure | **2** |
| A group of almost anything – ants, bees **Q** – that live together<br>A group of people who have the same interest **Q**<br>A (territory, settlement, community) where people live A territory settled | **1** |
| A small town Village Neighbourhood A commune **Q**<br>A group of (people, animals, ants or bees) **Q** The property of another country **Q** | **0** |

# STOP POINT for 12-16 year olds

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 39. **–ligagu / *presumptuous* / voorbarig:** | |
| Impertinent Insolent Impudent Excessively forward or confident<br>Overstepping bounds or boundaries Taking liberties Too bold or forward | **2** |
| Assuming; To assume **Q** Uppity; Pompous; Know-it-all **Q** Haughty Arrogant<br>Having preconceived ideas about something Jumping to conclusions<br>Taking something for granted To presume; Making quick guesses **Q**<br>Someone who is trying to be something he/she is not **Q** | **1** |
| Anxious **Q** Demanding **Q** Daring **Q** A snob **Q** | **0** |
| 40. **–oyikeka / *formidable* / formidabel:** | |
| Daunting Awesome Awful Appalling Dreadful Horrible Horrifying<br>Terrible Intimidating Threatening Ominous Difficult to defeat or overcome<br>Presents a difficult , challenging or overwhelming obstacle<br>Imposing Gives the impression of having great strength and authority | **2** |
| Difficult; Hard; Tough; Scary **Q** Strenuous; Laborious; Toilsome **Q**<br>Overwhelming; Challenging **Q** Powerful **Q** Something to be respected<br>Competitive; Strong **Q** An opponent with superior abilities to yourself **Q** | **1** |
| Worthy opponent **Q** Worthy; Great **Q** A formidable intellect | **0** |

| **Start at Item 1 and administer all items up to age-appropriate cutoff points.<br>Age 8: stop after item 30; Age 9-11: stop after item 34<br>Age 12-16: stop after item 38; Age 17 and above: administer all items<br>Scoring: Score items up to discontinuance point (i.e. 5 consecutive scores of 0).** | |
|---|---|
| 41. **cingisisa / *ruminate* / peins:** | |
| Reflect Ponder Cogitate Muse Contemplate To chew (the cud)<br>To thoroughly consider To go over in the mind repeatedly Mull (think) over | **2** |
| Something to do with thinking **Q** To lament about past events To think about **Q**<br>To worry excessively (about things that aren't there) **Q** To dwell on something **Q**<br>An animal that eats grass (that has more than one stomach) Digest **Q** | **1** |
| To talk about something **Q** To remember something I ruminate about my taxes **Q** | **0** |
| 42. **ukungxolisa / *tirade* / tirade:** | |
| A long emotional speech marked by anger or censure Ranting and raving<br>Laying into somebody verbalily Verbal tantrum Verbal browbeating<br>Volume of rapid language, generally some quality, such as punishment, about it<br>An angry speech A harangue Hostile flow of words<br>Cussing somebody out, having a go at them | **2** |
| Verbal fuss Yelling To yell A scolding Argument<br>Flood of words A speech A long speech | **1** |
| A tantrum A temper tantrum A fit of anger Lose one's temper<br>Outburst **Q** A fit of inner feeling Rampage A commotion<br>Associated with violence and anger, letting go of human or natural control<br>Upheaval Raising Cain To be forceful and angry Bossy person **Q** | **0** |

| | | |
|---|---|---|
| **Total Score** | **/80** | T-score: |
| **Number of Correct Items Beyond Discontinuance Point** | **/37** | |
| **Number of Correct Points Beyond Discontinuance Point** | **/74** | |
| **Total Score for Age 8 (Items 1 to 30)** | **/56** | |
| **Number of Correct Items Beyond Age 8 Cutoff Point** | **/12** | |
| **Number of Points Beyond Age 8 Cutoff Point** | **/24** | |
| **Total Score for Ages 9 to 11 (Items 1 to 34)** | **/64** | |
| **Number of Correct Items Beyond Age 9 to 11 Cutoff Point** | **/8** | |
| **Number of Points Beyond Age 9 to 11 Cutoff Point** | **/16** | |
| **Total Score for Ages 12 to 16 (Items 1 to 38)** | **/72** | |
| **Number of Correct Items Beyond Age 12 to 16 Cutoff Point** | **/4** | |
| **Number of Points Beyond Age 12 to 16 Cutoff Point** | **/8** | |
| **Total Score for Ages 17 and above (Items 1 to 42)** | **/80** | |

**APPENDIX G**

**Department of Psychology Ethical Approval Letter**

UNIVERSITY OF CAPE TOWN

Department of Psychology

University of Cape Town Rondebosch 7701 South Africa
Telephone (021) 650 3417
Fax No. (021) 650 4104

20 July 2017

Michal Zieff
Department of Psychology
University of Cape Town
Rondebosch 7701

*Dear Michal*

*I am pleased to inform* you that ethical clearance has been given by an Ethics Review Committee of the Faculty of Humanities for your study, *evaluating the Psychometric Properties of a Xhosa Translation of the WASI.* The reference number is PSY2017-029.

I wish you all the best for your study.

Yours sincerely

Lauren Wild (PhD)
Associate Professor
Chair: Ethics Review Committee

# APPENDIX H

## Department of Student Affairs Ethical Approval

| | RESEARCH ACCESS TO STUDENTS | DSA 100 |
|---|---|---|

**NOTES**

1. This form must be **FULLY** completed by all applicants who want to access UCT students for the purpose of research or surveys.
2. Return the fully completed **(a) DSA 100** application form **by email,** in **the same word format,** together with **your: (b) research proposal inclusive of your survey, (c) copy of your ethics approval letter / proof (d) informed consent letter** to: Moonira.Khan@uct.ac.za. You application will be attended to by the Executive Director, Department of Student Affairs (DSA), UCT.
3. The turnaround time for a reply is **approximately 10 working days.**
4. NB: It is the responsibility of the researcher/s to apply for and to obtain **ethics approval and to comply with amendments that may be requested;** as well as **to obtain** approval to access UCT staff and/or UCT students, from the following, at UCT, respectively: (a) **Ethics:** Chairperson, Faculty Research Ethics Committee' (FREC) for ethics approval, (b) **Staff access:** Executive Director: HR for approval to access UCT staff, and (c) **Student access:** Executive Director: Student Affairs for approval to access UCT students.
5. **Note:** UCT Senate Research Protocols requires compliance to the above, **even if prior approval has been obtained from any other institution/agency. UCT's research protocol requirements applies to *all* persons, institutions and agencies from UCT and external to UCT who want to conduct research on human subjects for academic, marketing or service related reasons at UCT.**
6. **Should approval be granted to access UCT students for this research study, such approval is effective for a period of one year from the date of approval (as stated in Section D of this form), and the approval expires automatically on the last day.**
7. **The approving authority reserves the right to revoke an approval based on reasonable grounds and/or new information.**

**SECTION A: RESEARCH APPLICANT/S DETAILS**

| Position | Staff / Student No | Title and Name | Contact Details (Email / Cell / land line) |
|---|---|---|---|
| A.1 Student Number | ZFFMIC001 | Ms Michal Zieff | Michal.zieff@gmail.com |
| A.2 Academic / PASS Staff No. | | | |
| A.3 Visitor/ Researcher ID No. | | | |
| A.4 University at which a student or employee | UCT | Address if *not* UCT: | |
| A.5 Faculty/ Department/School | Department of Psychology, Faculty of Humanities | | |
| A.6 APPLICANTS DETAILS If different from above | Title and Name | Tel. | Email |
| | | | |

**SECTION B: RESEARCHER/S SUPERVISOR/S DETAILS**

| Position | Title and Name | Tel. | Email |
|---|---|---|---|
| B.1 Supervisor | A/Prof Kevin Thomas | | Kevin.thomas@uct.ac.za |
| B.2 Co-Supervisor/s | | | |

**SECTION C: APPLICANT'S RESEARCH STUDY FIELD AND APPROVAL STATUS**

| | |
|---|---|
| C.1 Degree – if applicable | Honours in Psychology |
| C.2 Research Project Title | Evaluating the psychometric properties of a Xhosa translation of the WASI |
| C.3 Research Proposal | Attached: Yes ■ No ☐ |
| C.4 Target population | Undergraduate population |
| C.5 Lead Researcher details | If different from applicant: |
| C6. Will use research assistant/s | Yes ☐ No ■<br>If yes- provide a list of names, contact details and ID no. |
| C.7 Research Methodology and Informed consent: | Research methodology: Quantitative methods, individual sessions<br>Informed consent: Yes – informed consent document |
| C.8 Ethics clearance status from UCT's Faculty Ethics in Research Committee /Chair (EiRC) | Approved by the UCT EiRC: Yes ■ With amendments: Yes ☐ No ■<br>(a) Attach copy of your UCT ethics approval. Attached: Yes ■ No ☐<br>(b) State date / Ref. No / Faculty of your UCT ethics approval: 20 /07/2017 Ref. /Faculty.: PSY2017-029 |

**SECTION D: APPLICANT/S APPROVAL STATUS FOR ACCESS TO STUDENTS FOR RESEARCH PURPOSE**

*(To be completed by the UCT - ED, DSA or Nominee)*

| | Approved / With Terms / Not | * Conditional approval with terms | Applicant/s Ref. No.: |
|---|---|---|---|
| D.1 APPROVAL STATUS | (i) Approved ■<br>~~(ii) With terms~~<br>~~(iii) Not approved~~ | (a) Access to students for this research study must only be undertaken after written ethics approval has been obtained.<br>(b) In event any ethics conditions are attached, these must be complied with before access to students. | ZFFMIC001/ Ms Michal Zieff |

| | Designation | Name | Signature | Date of Approval |
|---|---|---|---|---|
| D.2 APPROVED BY: | Executive Director<br>Deoartment of Student Affairs | *Dr Moonira Khan* | | *8 October 2017* |

# APPENDIX I

## Informed Consent Document

INFORMED CONSENT

**Evaluating the Psychometric Properties of a Xhosa Translation of the WASI**

This form gives you information about the study before you agree to take part. Please read the document and ask the researcher (Michal Zieff) about anything that you do not understand. The data collected in this study will be used for an Honours project in the Department of Psychology at the University of Cape Town.

**Study Purpose**

This research looks at the Xhosa translation of a commonly used cognitive measure in South Africa.

**Participation Tasks and Benefits of Participation**

If you agree to participate in this study, you will be asked to fill in three questionnaires which gather some general information. I will then administer a series of cognitive measures. The session will also be audio recorded. The recording will be used if there is any uncertainty with scoring. The full study will take approximately 70-80 minutes of your time. If you participate in the full study, you will receive 3 SRPP points.

**Voluntary Participation, Withdrawal, Confidentiality and Risks**

Participation in this study is voluntary. You may withdraw from the study at any time without any consequences. This consent form with your name will be kept separately to your questionnaires and cognitive measure scores. Your name will only be used to award you SRPP points for participating in the study. You will be given a participant number, which I will use throughout the study and analysis. This means that your name will not be linked to your data, both on paper and audio-recordings. All forms, questionnaires and measures will be under the researcher's supervision at all times. All data, including audio files, will be password protected on a device. As soon as any scoring questions have been sorted out, the audio files will be destroyed. Your questionnaires and audio files will not be seen/listened to by anyone other than the researcher and supervisors, if necessary. There are no foreseeable risks involved in this study.

I (full name), _____, give my informed consent to participate in this study.

Signature: _____ Date: _____

I, _____, give consent for my session to be audio recorded for the purposes stated above.

Signature: _____ Date: _____

Preferred email address: _____ (to send a debrief and thank you email).

SRPP points course code: _____

Researcher's Signature: _____

If you have any further questions or concerns about the study, you may contact the researcher (Michal Zieff) on michal.zieff@gmail.com or supervisor Dr Kevin Thomas on kevin.thomas@uct.ac.za. You may also contact the course secretary Ms Rosalind Adams with any concerns on rosalind.adams@uct.ac.za.

**APPENDIX J**

**Thank you and Debrief Email**

Subject: Thank you – Xhosa WASI Study

Dear (Participant name)

Thank you, once again, for participating in the Xhosa WASI study.

The purpose of this research is to determine the psychometric properties (validity and reliability) of the Xhosa-translated WASI, a commonly used cognitive measure in South African clinical, educational, and research settings. The study aims to validate the Xhosa-WASI so that it can be used as a fair and accurate cognitive measure for Xhosa-speaking individuals.

A reminder that if you have any questions about the research, please feel free to contact me on xhosawasi2017@gmail.com, or my supervisor on Kevin.Thomas@uct.ac.za.

My project will (hopefully) appear on the UCT Department of Psychology website (www.psychology.uct.ac.za) by December 2017, if you would like to see what I found.

Regards
Michal Zieff

ACSENT Laboratory
Department of Psychology
University of Cape Town

# APPENDIX K

## 10-item Xhosa Vocabulary Subtest Scoring Manual

### Scoring Instructions

Score items up to discontinuance point (i.e., 5 consecutive scores of zero).

*(Note: Suggested revisions to the scoring guideline for the Xhosa Vocabulary subtest only are bolded)*

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|---|---|---|
| 1. iholideyi (holiday) | A respite A period of time planned for enjoyment (recreation) Leisure time Break from work (school, normal routine) when you can rest (do whatever you want) A period of resting (relaxation) Trip taken for fun (to relax) Holidays (break, time off) from work (school) | 2 |
| | A place where you go to relax When you go to Disneyland [or other vacation spot] An activity different from your normal day-to-day routine To get away Time spent with family away from home When it's time to take off Q When you go out of town to visit family (friends) Trip; Getaway; Day off **Q** You go away (from home for a while, on a trip) | 1 |
| | Escape **Q** Somewhere you go **Q** [give names of holiday months] **Q** Something you go on | 0 |
| 2. ukungxama (haste) | Hurry Rashness Rush Swiftness Quickness Rash action Done quickly Speed Rapidity of motion Moving rapidly In a hurry Do something fast | 2 |
| | Carelessness Do something without care (thinking) Quickly Fast Quick | 1 |
| | Wasting time Haste makes waste | 0 |
| 3. ifashoni (trend) | A pattern that happens over time Something that follows a general pattern A line of general direction or pattern Direction things are headed Course Something that is growing in popularity Contemporary movement A movement toward a new (or different) way of doing things Tendency Inclination **The style/type of clothing people wear during a particular time period A way that people dress during a particular time period** | 2 |
| | Style that everyone is following **Q** Something everybody's doing Mode Trend means like the current fashions (the latest "in" thing) Pattern; Phase Q Something that is temporary and popular at the time Popular style Fad Fashion | 1 |

| | | |
|---|---|---|
| | What is happening **Q** To follow a crowd **Q** Popular **Q** Fashion trend A period of time What is usually done for a while **Q** | 0 |
| 4. ukulangazelela (impulse) | Impetus An urge for sudden action Sudden urge An inner drive that makes you do something on the spur of the moment (without thinking) A feeling which compels you to do something Stimulus transmitted in a muscle or nerve fiber **To want something, or to do something (very much) To desire (strongly) To be greedy for something** | 2 |
| | Spontaneity **Q** Urge; Drive; Momentum **Q** Spur of the moment **Q** To act (do something) on a whim (on the spur of the moment, without thinking) **Q** A quick moment of decision making **Q** Impetuous; Spontaneous **Q** An instinctive (involuntary, immediate) response or reaction Reaction Response | 1 |
| | You did it automatically **Q** Sudden **Q** I did it on impulse **Q** | 0 |
| 5. umdaniso (dance) | A form of body movement for recreation (artistic purposes, to express yourself) To move to music (a rhythm, a song) Caper Frolic Boogie Rhythmic movement Moves put together to form a routine (typically performed to music) Art form A ritual performed by one or more people to represent their heritage | 2 |
| | Something you do for pleasure (exercise) **Q** Shindig Hop Ball Prom Jitterbug Polka Rumba Tango Shimmy The Twist Ballet etc. Form of expression **Q** Something you do to music Body movement To jump around; to wiggle your body **Q** Move fast Move your feet | 1 |
| | To perform **Q** A party you have with friends **Q** | 0 |
| 6. uvelwano (compassion) | Pity Empathy Sympathy, allying one's feeling with another Having mercy Sorrow or pity aroused by the distress of another Feeling sorrow with a person Feeling of sorrow for a person Loving concern **Q** – charity in its broadest sense | 2 |
| | Feel /feeling for (another person, someone) [without indication of sorrow concern] Sorry Sorrow Caring Caring sentiment Concern Understanding Tenderness **Q** – sort of like a maternal feeling Forgiveness To console | 1 |
| | Thoughtfulness **Q** Care for someone **Q** A feeling **Q** Kindness **Q** Emotion / heartfelt, great emotion **Q** Deep feeling of wanting to love Tolerance Love Passionate | 0 |
| 7. isithethe (tradition) | Custom A way of doing things that is passed down from generation to generation A set of values that is rooted in the past Something you do for many generations An inherited (established, customary) pattern of thought (action, behavior, belief) A time-honored ritual A certain them or celebration | 2 |

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| | that is on a regular basis Like a cultural ritual, something you do because your family did it or the nation does it | |
| | Habit Ritual Do the same thing year after year Something you do once a year Something you do over and over again **Q** An old (familiar) way of doing things **Q** Something that has been passed on from generations **Q** Values **Q** It's been done before; Something that's always been done Q | 1 |
| | Something you celebrate **Q** Like a holiday **Q** Something fixed Legend Something you do with your family **Q** Family tradition Hanukkah; Christmas; Ramadaan etc. | 0 |
| 8. dumileyo (famous) | Well-known Widely known Renowned Celebrated Recognized Celebrity Notorious People who are extraordinary (set apart) Someone (something) that a lot of people know about Person that has done something outstanding or heroic | 2 |
| | Known Q Notable Important Popular People want your autograph A person like a great singer such as Elvis or Sinatra Someone who's loved by a lot of people (in the media, in the limelight) | 1 |
| | Someone who has fame **Q** You're a star **Q** Everyone watches you on TV Great **Q** Someone who lives in Hollywood and has a big house | 0 |
| 9. nqapha-nqapha (intermittent) | Periodic Occasional Spasmodic Sporadic Every now and then Coming and going at intervals Not continuous With interruptions Erratic To happen in an irregular pattern Without synchronicity Inconstant Something that starts then stops On-again, off-again, not steady Irregular | 2 |
| | Put time between **Q** Unpredictable occurrence of some action **Q** Like your windshield wipers are going at different times | 1 |
| | It occurs on a regular sequence Intermittent showers A pause; A break **Q** Something comes between other things **Q** In between; In the middle **Q** Scattered **Q** | 0 |
| 10. ligagu (presumptuous) | Impertinent Insolent Impudent Excessively forward or confident Overstepping bounds or boundaries Taking liberties Too bold or forward | 2 |
| | Assuming; To assume **Q** Uppity; Pompous; Know-it-all **Q** Haughty Arrogant Having preconceived ideas about something Jumping to conclusions Taking something for granted To presume; Making quick guesses Q Someone who is trying to be something he/she is not **Q** | 1 |
| | Anxious **Q** Demanding **Q** Daring **Q** A snob **Q** | 0 |