



Distributors of Psytech International

Assessment Instrument and Software

# General Reasoning Test Battery (GRT2)

**South African User Guide and  
Research Reference**

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# General Reasoning Test Battery (GRT2)

## Introduction

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This guide is for users and potential users of the General Reasoning Test Battery (GRT2).

It should be used in conjunction with the Reasoning Tests Technical Manual published by Psytech International.

This guide does not replace the Technical Manual, but it is intended to provide the additional information on the GRT2 that South African users need.

This user guide will be updated regularly as new research evidence becomes available.

Psytech manuals are distributed on CD at a nominal cost, and extracts as well as updates are published on the company's website from time to time. It is recommended that users print the manuals and update sections as new studies become available.

## ***Structure of this manual***

The manual is divided into the following sections:

- **Introduction**
  - This section covers the background to the questionnaire, administration instructions and general advice on the use of the GRT2 in South Africa.
- **Norms**
  - This section contains descriptions of the various norm groups available for the various subtests of the GRT2 – the composition of the norm groups, basic statistics on GRT2 subtests and stanine tables.
- **Reliability**
  - This section contains reports on the reliability studies done on the GRT2 in South Africa – the composition of the groups, reliability coefficients and standard error of measurement where suitable data exists.
- **Validity**
  - This section contains reports on the validation studies done on the GRT2 in South Africa.
- **Differential item functioning**
  - This section reports on the differential item functioning for the subtests in the GRT2.

Studies will be added to the various sections as they are completed. The date when it was last updated appears on every study.

Every section has its own table of contents and introductory section.

## ***Classification status of the General Reasoning Test Battery***

The GRT2 was submitted to the Psychometrics Committee of the Health Professions Council of South Africa (HPCSA) in April 2001. The process of evaluation and classification is a lengthy one. Feedback reports received from the test reviewers indicate that the GRT2 meets the requirements for classification as a psychological test classification certificate was issued in August 2010 and the test battery is currently on the list of classified tests.

## ***Conditions of use and professional responsibilities***

The GRT2 must be used under the control of a registered Psychologist, Psychometrist (Independent Practice), or Registered Counsellor.

## **Purchasing General Reasoning Test Battery materials and scoring services**

When purchasing test materials or scoring services relating to the GRT2, the signature and registration number of a Psychologist, Psychometrist (Independent Practice) or Registered Counsellor is required.

## **Constructing of test batteries**

Only a Psychologist, Psychometrist (Independent Practice) or a Registered Counsellor may decide which tests or questionnaires to use for a particular purpose. Psychometrists registered for supervised practice or other role players such as HR Practitioners or line managers may not act independently of the psychology registered professional, and may not overrule their decisions in this regard.

## **Administration of the General Reasoning Test Battery**

- The tests may be administered by a Psychologist, Psychometrist (Supervised Practice), Psychometrist (Independent Practice), Registered Counsellor or Psychotechnician.
- Psychometrists (Supervised Practice) have to be supervised by a Psychologist.

## **Scoring of the General Reasoning Test Battery**

The General Reasoning Test Battery may be scored by

- A Psychologist,
- A Psychometrist (Independent Practice),
- A Psychometrist (Supervised Practice),
- A Registered Counsellor, or
- A Psychotechnician.

The scoring of the GRT2 is always done by computer. The act of scoring is pure data capture and no interpretation is involved.

Detailed instructions for scoring the GRT2 by computer can be found on the GeneSys Online platform, under tutorials. There are videos and downloadable PDFs. Special training in the use of the software is available and we strongly recommend attending this.

## **Reporting on the General Reasoning Test Battery**

### **The choice of which computerised report to use should be made by**

- A Psychologist, Psychometrist (Independent Practice) or a Registered Counsellor.

Psychometrists (Supervised Practice) and Psychotechnicians should consult with a Psychologist about the most suitable report to use.

### **The choice of which norm group to use should be made by**

- A Psychologist, Psychometrist (Independent Practice) or a Registered Counsellor.

Psychometrists (Supervised Practice) and Psychotechnicians should consult with a Psychologist about the most suitable norm group to use.

### **Feedback on General Reasoning Test Battery reports**

Feedback on the GRT2 reports may be done by Psychologists, Psychometrists (Independent Practice) or Registered Counsellors. Psychometrists registered for supervised practice may give feedback on the GRT2 within clearly circumscribed guidelines laid down by a Psychologist, and provided proper supervision, with regular consultation, is maintained.

## ***What the General Reasoning Test Battery measures***

The GRT2 consists of three tests that can be administered separately or together.

- **Verbal Reasoning (GRT2V)**

Measures basic vocabulary, verbal fluency and the ability to reason using words. This test is appropriate for all jobs which require a degree of verbal ability, such as sales and administrative positions or clerical jobs.

- **Numerical Reasoning (GRT2N)**

Measures the ability to use numbers in a logical, efficient way. This test is appropriate for all jobs which require a fair level of numerical ability, such as accounts clerks and technical roles.

- **Abstract Reasoning (GRT2A)**

Measures the ability to understand abstract logical problems and use new information outside the range of previous experience. This is the purest form of mental ability and is least affected by previous education and achievement. It is suitable for assessing individuals of various educational backgrounds and cultural groups.

For detailed information about the constructs measured by the GRT2, please consult the technical manual. The technical manual gives an overview of the theoretical basis for the constructs, as well as a more in-depth discussion regarding the development rationale and the relationship of the General Reasoning Test Battery to other measures of ability.

## ***Administration options for the General Reasoning Test Battery***

The subtests of the GRT2 can be administered separately or together, and may be combined with other measures, such as measures of personality, learning potential or technical ability, to form a customised battery. The table below should help with the planning of a test battery:

<b>Test</b>	<b>Time Limit</b>	<b>Pencil and Paper administration available</b>	<b>Computerised administration available</b>
General Verbal Reasoning	8 minutes	Yes	Yes
General Numerical Reasoning	10 minutes	Yes	Yes
General Abstract Reasoning	10 minutes	Yes	Yes

## ***Respondents for whom the General Reasoning Test Battery is suitable***

### **Level of Education**

The GRT2 is intended for respondents with educational levels ranging from high school through to graduate levels. It is important that suitable norm groups should be used, taking into account the educational levels of the respondents. It is not recommended that these batteries should be used on persons with an educational level below grade 9.

One must be sensitive to the fact that educational standards have differed considerably in South Africa. People from impoverished backgrounds are not likely to have had an education of the same standard as people from privileged backgrounds. The Psychology professional in charge of the assessment should evaluate the situation with care, taking into account the intended respondent's background, fluency in English and so forth. Every situation must be evaluated on its merits.

### **Proficiency in English**

It may be necessary to test for proficiency in English. Some standardised measures of English language skills are available, and users could avail themselves of these. The General Verbal Reasoning test (GRT2V) in itself gives an indication of a person's ability to use and reason in English.

Considering the socio-economic history of South Africa, it is reasonable to suppose that there are many people who should not be tested with group-administered structured tests, because they have not had sufficient exposure to formal testing situations or their language proficiency is inadequate. The Psychology professional should be realistic about this.

## ***A history of the General Reasoning Test Battery in South Africa***

The General Reasoning Test Battery was introduced in South Africa in 1995. Initially its use was limited to the financial sector, but since 1998 it has become widely used. As data become available and new norms get published, the use of the GRT2 has widely increased.

## ***The effect of affirmative action recruitment and selection practices on test statistics***

Many employers in South Africa are adopting affirmative action recruitment and selection practices. Because most of the data available to Psytech SA come from recruitment projects, this has an effect on the reported test statistics.

A very common strategy when recruiting candidates for affirmative action positions, is as follows:

- Seriously consider every applicant from a formerly disadvantaged background who may possibly meet the requirements of the position.
- Only consider applicants from formerly advantaged backgrounds once a quota of formerly disadvantaged individuals has been met, or when the supply of suitable disadvantaged applicants has been exhausted.

Assessing candidates with psychometric tests incurs a cost for the employer, and employers usually try to minimise costs. Thus testing occurs fairly late in the selection process. Frequently candidates are evaluated on application forms, CVs and interviews before they are tested. Often this means that the candidates from formerly advantaged backgrounds, who are tested, have been more rigorously pre-screened than the candidates from formerly disadvantaged backgrounds. This serves to aggravate the reported group differences on the tests, and can make a test appear more biased than it otherwise would be.

Users are advised to bear this in mind when evaluating the reported figures in this manual. Test users are also welcome to approach Psytech SA when large recruitment projects are being undertaken, so that the project can be planned in such a way as to render less distorted information about the tests. If necessary and justifiable in the interest of research, Psytech SA is willing to subsidise such projects.

### ***Some cautionary notes***

- No subtest of the GRT2 should be used on its own as a selection instrument. The tests should always form part of an assessment battery that includes other measures, and preferably some non-test information as well.
- It is strongly recommended that a validation/integration interview should follow any assessment by means of tests or questionnaires. The interviewer should use this opportunity to put the test results into perspective relative to the respondent's background and the purpose of the assessment.
- Users should pay attention to the reliability and validity data available relating to the population group on which they intend to use the questionnaire.
- Users should use norm groups that are appropriate for the test person being assessed, also bearing in mind the demands of the situation for which the person is being assessed.
- Bearing in mind that the GRT2 is very short, users should consider that it is not an in-depth measure, and therefore the GRT2 subtests should not be interpreted in isolation.

### ***Computer-assisted reports***

Psytech tests and questionnaires are all supported by computer-assisted reports. Some of the tests have a range of computer-assisted reports, allowing instant interpretation of the test results from a variety of perspectives. For the GRT2, a standard report and a feedback report are available, either as a battery of individually for each subtest. In addition, a results summary spreadsheet is available to generate which is particularly useful as a summarised version of the individual candidates scores, or scores of a group of candidates that have completed the GRT2. Computerised reports can also be created for specific batteries of measures, integrating the results of ability tests with personality and perhaps interests.

### **How do the computer-generated reports work?**

The reports represent an expert system, drawing on numerous built-in relationships between patterns of scores and human behaviour. It would normally take a user many years of experience to gain the knowledge and insight that are contained in this reporting system.

### **What are the advantages of computer-generated reports?**

Computer-generated reports ensure that the complete pattern of scores is interpreted every time. No score or combination of scores is overlooked. Everyone is treated in exactly the same way, irrespective of whether the person interpreting the results is having an 'off day' or is pressed for time. This helps to ensure fairness and consistency. Moreover, computer-generated reports save a lot of time, freeing the professional up to add value in the interview, integration of results from other sources and feedback processes.

### **Are computer-assisted reports open to abuse?**

Like any powerful tool, computer-assisted reports can be misused. They should not be used to substitute for professional expertise, but rather to supplement and support it.

One must remember that these reports are generic-the standard reports do not know anything about the requirements of the positions that the respondent may have applied for. They are also completely unaware of the respondent's background and personal circumstances. They can usually not stand on their own, but must be used as one source of information in the assessment process, and be integrated with other information. This integration

and interpretation is highly skilled professional work, and it should not be left to persons who have not had the required training.

*In some situations, handing out unaltered computer-generated reports to respondents or line managers without any counselling or explanation, could be considered abuse of these reports. We recommend that the technical appendix in a report, which gives a graphic summary of raw scores and profiles, not be given to untrained persons.*

### **What about competency-based reports?**

You need not be limited to the reports supplied with the GeneSys system. Special reports can be written for clients based on their own competency models, or based on the results of validation studies. Psytech SA undertakes to do these as consulting projects, and the cost is dependent on the length and complexity of the report that the client requires.

## ***Instructions for administering tests on computer***

All three tests in the GRT2 can be administered on computer.

For instructions on how to operate the platform for test administration, please refer to the GeneSys Online platform, under tutorials via <https://eu.genesysonline.net/>. There are videos and downloadable PDFs. Special training in the use of the software is available, which is strongly recommend. Do not attempt to use computer software for test administration if you are not completely comfortable with how the online platform works. Familiarise yourself with the process of setting up a testing session with the software, creating the data record and entering the respondent's biographical information into the system, or assisting the respondent in doing so themselves.

Make sure that the respondent is physically able to operate the keyboard and the mouse, and can see the screen clearly.

Welcome the respondents (you may use a standard introduction), set them at ease and ensure that every respondent has given informed consent for the assessment.

Provide respondents who are completing tests on computer, with blank notepaper and a pencil, in case they want to make a note of an item they might want to revise when they reach the end of the test. Respondents may also make some rough calculations during the test. **A calculator may not be used for the numerical subtest (GRT2N) and as such, blank notepaper and a pencil is essential for this subtest.**

Stay with the respondents while they start the test, and read through the instructions with them. If the respondents have any questions about the operation of the computer, or the example questions, answer those.

Once the respondent has completed the instruction section and started on the actual test items, do not provide any further help with the items, although you can assist if there are any actual computer problems (such as the mouse or the keyboard not responding correctly). Do not allow respondents to talk among themselves during testing.

Do not leave respondents to complete a battery of tests unsupervised. Remain in the room, and when the respondent reaches the end of the first test, provide support for the subsequent tests by reading through the instructions with them again.

At the end of the test battery, a screen will appear telling the respondent to call the test administrator. At this stage you need to enter the PIN you have chosen (when opening an account with Psytech SA) to exit the test administration program and save the responses. Do not allow the respondents to do this themselves.

## **General Reasoning Test Battery: Pencil and Paper Administration Instructions**

If this is the first or only test being administered give an introduction welcoming the respondents, setting them at ease and ensuring that every respondent has given informed consent for the assessment.

Continue by using the instructions **EXACTLY** as given. Say:

*"From now on, please do not talk among yourselves, but ask me if anything is not clear. We shall be doing three tests, verbal, numerical and abstract, each test takes 8, 10 and 10 minutes respectively. During the tests I shall be checking to make sure that you are not making any accidental mistakes when filling in the answer sheet. I will not be checking your responses to see if you are answering correctly or not."*

**WARNING:** It is most important that answer sheets and test booklets do not go astray. They should be counted out at the beginning of the test and counted in again at the end.

### **Distribute the answer sheets**

Then ask:

*"Has everyone got two sharp pencils, an eraser, some rough paper and an answer sheet?"*

Rectify any omissions, then say:

*"Print your last name and first name clearly on the line provided and indicate your title, sex and age by ticking the appropriate boxes. Please insert today's date which is [     ]."*

Walk round the room to check that the instructions are being followed.

### **Distribute the booklets with the instruction:**

*"Please do not open the booklet until instructed."*

Remembering to read slowly and clearly, go to the front of the group and say:

*"Please open the booklet at Page 2 and follow the instructions for this test as I read them aloud." (Pause to allow booklets to be opened).*

*This test is designed to assess your understanding of words and relationships between words. Each question has six possible answers. **One and only one** is correct in each case. Mark your answer, by filling in the appropriate box that corresponds to your choice, on your answer sheet. You now have a chance to complete the four example questions on Page 3 in order to make sure that you understand the test.*

*Please attempt the example questions now, marking your answers in boxes E1 to E4 (indicate where).*

While the candidates are doing the examples, walk around the room to check that everyone is clear about how to fill in the answer sheet. Make sure that no one is looking at the actual test items during the example session. When all have finished (allow a maximum of two minutes) give the answers as follows:

*"The answer to Example 1 is number 2, sick means the same as ill.*

*The answer to Example 2 is number 3, you drive a car and fly an aeroplane.*

*The answer to Example 3 is number 5, wood is the odd one out.*

*The answer to Example 4 is number 5, dark means the opposite of light.*

*Is everyone clear about the examples?"*

Then say:

**REMEMBER:**

*"Time is short, so when you begin the timed test, work as quickly and as accurately as you can.*

*If you want to change an answer, simply erase your first choice and fill in your new answer.*

*There are a total of 35 questions and you have 8 minutes in which to answer them.*

*If you reach the **end** before time is called you may review your answers if you wish.*

*If you have any questions please ask now, as you will not be able to ask questions once the test has started."*

Then say very clearly:

*"Is everyone clear about how to do this test?"*

Deal with any questions, appropriately, then, starting stop watch or setting a count-down timer say:

***"Please turn over the page and begin"***

Answer only questions relating to procedure at this stage, but keep a record of any other problems which occur. Walk around the room at appropriate intervals to check for potential problems.

At the end of the 8 minutes, say:

***"Stop now please and turn to Page 12"***

You should intervene if candidates continue after this point.

Then say:

*"We are now ready to start the next test. Has everyone still got two sharpened pencils, an eraser, and some unused rough paper?"*

If not, rectify, then say:

*"The next test follows on the same answer sheet, please locate the section now." (Indicate section)*

Check for understanding, then remembering to read slowly and clearly, go to the front of the group and say:

*"Please follow the instructions for this test as I read them aloud."*

*This test is designed to assess your ability to understand numbers and the relationship between numbers. Each question has six possible answers. **One and only one** is correct in each case. Mark your answers, by filling in the appropriate box that corresponds to your chosen answer, on your answer sheet. You now have*

*a chance to complete the four example questions on Page 13 in order to make sure that you understand the test.*

*Please attempt the example questions now, marking your answers in the example boxes.*

While the candidates are doing the examples, walk around the room to check that everyone is clear about how to fill in the answer sheet. Make sure that no-one is looking at the actual test items during the example session. When all have finished (allow a maximum of two minutes) give the answers as follows:

*"The answer to Example 1 is number 5, the sequence goes up in twos.*

*The answer to Example 2 is number 4, as all of the other fractions can be reduced further.*

*The answer to Example 3 is number 2, 100 is 10 times 10.*

*The answer to Example 4 is number 5, the journey will take 1 hour and 30 minutes.*

*Is everyone clear about the examples?"*

Then say:

### **REMEMBER**

*"Time is short so when you begin the timed test work as quickly and as accurately as you can.*

*If you want to change an answer, simply erase your first choice, and fill in your new answer.*

*There are a total of 25 questions and you have 10 minutes in which to attempt them.*

*If you reach the end before time is called you may review your answers to the numerical test if you wish, but do not go back to the verbal test.*

*If you have any questions please ask now, as you will not be able to ask questions once the test has started."*

Then say very clearly:

*"Is everyone clear about how to do this test?"*

Deal with any questions, appropriately, then, starting the stop watch or setting a count-down timer and say:

### ***"Please turn over the page and begin"***

Answer only questions relating to procedure at this stage, but enter in the Administrator's Test Record (i.e. this is for your qualitative notes on each candidate) any other problems which occur. Walk around the room at appropriate intervals to check for potential problems.

At the end of the 10 minutes, say:

### ***"Stop now please and turn to Page 20"***

You should intervene if candidates continue after this point.

Then say:

*"We are now ready to start the next test. Has everyone still got two sharpened pencils, an eraser, and some unused rough paper?"*

If not, rectify, then say:

*"The next test follows on the same answer sheet, please locate the section now." (Indicate section)*

Check for understanding, then remembering to read slowly and clearly, go to the front of the group and say:

*"Please follow the instructions for this test as I read them aloud."*

*In this test you will have to work out the relationship between shapes and figures.*

*Each question has six possible answers **one and only one** is correct in each case. Mark your answer, by filling in the appropriate box that corresponds to your chosen answer, on your answer sheet. You now have a chance to complete the three example questions on Page 21 in order to make sure that you understand the test.*

*Please attempt the example questions now, marking your answers in the example boxes. "*

While the candidates are doing the examples, walk around the room to check that everyone is clear about how to fill in the answer sheet. Make sure that no one is looking at the actual test items during the example session. When all have finished (allow a maximum of two minutes) give the answers as follows:

*"The answer to Example 1 is number 5 as the series alternates between 2 and 4 squares as does the direction of the two squares which return to their original position."*

*The answer to Example 2 is number 4, as all of the other options have an open side to one of the boxes.*

*The answer to Example 3 is number 6, as this is a mirror image of the pattern.*

*Is everyone clear about the examples?"*

Then say:

**REMEMBER:**

*"Time is short so when you begin the timed test work as quickly and as accurately as you can.*

*If you want to change an answer, simply erase your first choice, and fill in your new answer.*

*There are a total of 25 questions and you have 10 minutes in which to attempt them.*

*If you reach the **end** before time is called you may review your answers to the Abstract test if you wish, but do not go back to either the verbal or numerical tests.*

*If you have any questions please ask now, as you will not be able to ask questions once the test has started."*

Then say very clearly:

*"Is everyone clear about how to do this test?"*

Deal with any questions, appropriately, then, starting stop watch or setting a count-down timer and say:

***"Please turn over the page and begin"***

Answer only questions relating to procedure at this stage, but enter in the Administrator's Test Record any other problems which occur. Walk around the room at appropriate intervals to check for potential problems.

At the end of the 10 minutes, say:

***"Stop now please and close your booklet"***

You should intervene if candidates continue after this point.

**COLLECT THE ANSWER SHEETS AND THE TEST BOOKLETS, ENSURING THAT ALL MATERIALS ARE RETURNED (COUNT BOOKLETS AND ANSWER SHEETS)**

Then say:

*"Thank you for completing the General Reasoning Test Battery"*

# General Reasoning Test Battery

## Norms Introduction

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# South African Norms available for the General Reasoning Test Battery

## ***Different types of norms available***

There are two kinds of norms available for Psytech tests. Many of the norm groups are based on means and standard deviations obtained through research. These means and standard deviations are used by the GeneSys online system to calculate standard scores. In the case of the General Reasoning Test Battery (GRT2), stanines are used.

Users of the test do not need to look up raw scores to find the corresponding standard scores, because the software does it for them. For this manual, however, stanine tables have been specially calculated from means and standard deviations to facilitate comparison between norm groups, so that users can more easily choose which norm group is most suitable for a given situation. This allows users to make a more informed choice rather than simply relying on automatic choices made by the online platform.

The second type of norm is a frequency norm. In this case, more information is stored internally, and it is possible to add additional cases to the norm group as more data are collected. The GeneSys online system is able to create tables of standard scores for frequency norms. The tables of standard scores are provided for interest and information, which would assist when comparing one norm group with another. For the purpose of generating a report, the online system does the calculations internally, and doesn't refer to any tables.

## ***Biographical data***

The GeneSys online system offers the facility to collect comprehensive biographical information on respondents. Unfortunately, test users very seldom collect these data. Having this information incomplete poses a serious concern for us as Psytech SA obtains most of its information from clients who use the assessments.

Users are advised to make an effort to capture full biographical information on the respondents. This will help to enable them to adhere to best practice and compliance with legal requirements.

## ***SA Norms and international norms***

GeneSys online platform contains international norms on all Psytech tests, in addition to the South African norms that have been collected by Psytech South Africa.

Unless you have a very good reason to do otherwise, we recommend the use of South African norms rather than international norms. The South Africa norms are clearly marked with 'SA' in the heading. All other norms that do not include 'South Africa' or 'SA' in the heading are international norms. If you are assessing a person for placement overseas and you have a suitable international norm available, you could consider using the international norm in conjunction with a South African norm.

Outdated or unsuitable norms are subject to removal from the GeneSys online platform, but would still be reflected in the South African User Guide as it serves as a repository of all research that has been done to date.

## ***User-developed norms***

The GeneSys online platform offers users the facility to generate their own norms on the data they have collected - these are frequency norms. These norms will only appear on your online account and will not be available to other online accounts. Users must ensure that the data included in these in-house norms are “clean” – that they contain no dummy cases resulting from experimenting with the software, duplicates or other data that could interfere with the interpretation of the results. Psytech SA offers assistance in the creation of in-house norms for users who need it. If the norm group was generated on your own computer and not shared with Psytech SA, it will not appear in the documentation.

The norms we recommend and have calculated are based on standard deviations and means and are only added to the online system after they have done through an elaborate process of cleaning the data by removing duplicates, dummy and test cases and other data to make sure that users are using norms that were calculated on uncontaminated data (as far as is possible).

***Choose the comparison group with care. Bear in mind factors such as race, language, level of education and level of proficiency in English.***

## List of South African norm groups for the General Reasoning Test Battery (GRT2)

Description	Study number
SA Applicants to and incumbents in a tobacco manufacturing company	N1
SA Applicants admission to courses at a business school	N2
SA Managers and Professionals	N3
SA Applicants for training in the Information Technology industry	N4
SA Applicants to and incumbents in a construction company	N5
SA Industrial Psychology students	N6
SA Applicants to a bank	N7
SA White and Coloured applicants to a bank	N8
SA Vocational counseling clients	N9
SA Grade 7 pupils	N10
SA Grade 9 pupils	N11
SA General Population	N12
SA Prospective University Students	N13
SA Retail applicants and staff	N14
General Population updated 2008	N15
SA General Population 2010	N16
European 2011	N17
SA African 2011	N18
SA Coloured 2011	N19
SA Asian 2011	N20
SA English	N21
SA Afrikaans	N22
SA Indigenous 2011	N23
SA Aggregate Population 2016	N24
SA Afrikaans 2016	N25
SA English 2016	N26
SA Indigenous 2016	N27
SA isiXhosa 2016	N28
SA isiZulu 2016	N29
SA Sepedi 2016	N30
SA Sesotho 2016	N31
SA Setswana 2016	N32
SA siSwati 2016	N33
SA Tshivenda 2016	N34
SA Xitsonga 2016	N35

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Description	Study number
SA Applicants to and incumbents in a tobacco manufacturing company	N1
SA Applicants admission to courses at a business school	N2
SA Managers and Professionals	N3
SA Applicants for training in the Information Technology industry	N4
SA Applicants to and incumbents in a construction company	N5
SA Industrial Psychology students	N6
SA Applicants to a bank	N7
SA White and Coloured applicants to a bank	N8
SA Vocational counseling clients	N9
SA Grade 7 pupils	N10
SA Grade 9 pupils	N11
SA General Population	N12
SA Prospective University Students	N13
SA Retail applicants and staff	N14
General Population updated 2008	N15
SA General Population 2010	N16
European 2011	N17
SA African 2011	N18
SA Coloured 2011	N19
SA Asian 2011	N20
SA English	N21
SA Afrikaans	N22
SA Indigenous 2011	N23
SA Aggregate Population 2016	N24
SA Afrikaans 2016	N25
SA English 2016	N26
SA Indigenous 2016	N27
SA isiXhosa 2016	N28
SA isiZulu 2016	N29
SA Sepedi 2016	N30
SA Sesotho 2016	N31
SA Setswana 2016	N32
SA siSwati 2016	N33
SA Tshivenda 2016	N34
SA Xitsonga 2016	N35

## The context of the new Aggregate norm:

Previously, when selecting a norm group on the GeneSys online platform, there was a 'General Population' norm available. The name of this norm has been changed from 'General Population' to the 'Aggregate Population'. Due to the nature of the data, aggregate population is more appropriate.

### The technicalities:

When creating a norm, there are various ways of collecting data. In creating the updated norms, convenience sampling was done, which means that we used the data that were available to us. Specifically, the data from the GeneSys for Windows system were collated with the data from all our clients that have submitted data, for the period up to June 2015. The norm is best described as an aggregate norm when this sampling technique is utilised. This norm contains newer data, and represents a very substantial sample. To ensure the data were useful, the data were processed and 'cleaned' whereby duplicates and demonstration samples, and people who had not completed the entire assessment or subtest were removed, as well as all retests. Additionally, common names may have been removed in this process as we filtered data using Name, Surname, Sex, Age, Education, First Language and Race. In the initial process of merging data from all sources, (the GeneSys for Windows data merged with data from other GeneSys systems), duplicates were also set to be removed. This process has left us with a set of data that we are fairly confident about in terms of content and usefulness.

### How to select a norm:

When selecting a norm it is important to consider who the respondent will be compared to, and choose the appropriate norm accordingly.

#### 1. When to use the Aggregate Population norm (previously the General Population norm)

This norm consists of a large number of respondents and enables the individual's score to be compared to a representative average of this specific population. Using this norm enables the practitioner to know where the respondent lies in comparison to (in this context) the general population. Even when the norm is used in different situations, the basis for comparison stays the same. The requirements of the position should be borne in mind when interpreting the scores. It is much more defensible to use the same gauge and appropriately adjust your cut-offs as per various situations.

#### 2. When to use an Indigenous Language or Smaller language group norm

Preferential treatment, to allow fairness for smaller language groups. This norm can be used to avoid discriminating against speakers of indigenous/smaller language groups and allow for potential educational deficits (as may be the case with the Verbal and Numerical subtests), as well as language interference.

#### 3. Occupation Specific norms

These norms are used in specific contexts. They are useful for when the requirements of the job are unknown/assumed/ have not been examined, but the occupation group is known and there is access to a volume of data.

## Additional points

### Employment Equity

One of the legacies of apartheid is that South Africa is a country characterised by imbalances of distribution of opportunities and resources which permeates all spheres of society. The differences are mostly felt in educational and occupational environment and they still shape the wellbeing and future of the previously oppressed Black majority. One of the mechanisms put in place is Affirmative Action (AA) aimed at correcting the imbalances of the pasts by giving the Black majority an opportunity to advance and develop. However, the inferior quality of education and other factors that resulted from institutionalised discrimination makes it difficult for most Black candidates to meet the requirements. This extends to their ability to perform above the cut-off point on psychometric tests necessary for joining, promotions and attending high profile courses. The situation is aggravated by the bad reputation of psychometric tests in SA, making it difficult for some leaders to accept the result. Some perceive them as tools to frustrate processes such as AA, consequently suggesting the exclusion of psychometric tests in any selection processes.

If an organisation/employer wants to make a special effort to accommodate advancement of previously disadvantaged groups, one way of doing this would be to use a norm group tailored to the biographical background of the candidate. This would mean that you would be comparing English speakers with English speakers or speakers of Indigenous languages to other speakers of Indigenous language, for instance. It needs to be recognised that this may be seen as unfair by people who do not belong to the formerly disadvantaged

groups. It is, however, defensible in terms of the Employment Equity Act. When concessions of this nature are made, it would be advisable for them to be followed up with training and development.

The means and standard deviations for all the norms are available in the documentation for that norm group. In order to make an informed and fair decision, which is fair both to the candidate and to the employing organisation, practitioners are advised to compare the means for the different groups to the Aggregate Norm. To enable them to know how much of a concession they are making in the interest of Affirmative Action.

### Biographical data

When creating norms, biographical data is of the utmost importance. Not only is it vital to ensure adequate validity and reliability is present in all demographic groups in South Africa, but it aids in building specific norm groups too. More than simply generating an overall norm group, additional data adds to building other useful norms based around education level, occupation level and language groups. Without this vital information, less information is available for the creation of such norms, which means that less norms are available for use. While it may appear to be time-consuming to fill in biographical data, it is of extreme importance. This also assists in making fair and proper norm selection decisions, for a specific individual.

### Importance of using updated norms

Data can be obsolete if it is old enough to no longer reflect the population it is intended to represent. It is therefore in the best interest to use recently updated norms to ensure that candidates are compared to a representative group in order for results to be interpreted in a meaningful way.

Should an organisation want an in-house or specific norm, please feel free to contact us and we would be happy to help you in this regard.

## GRT2 Norm Group: Employees and applicants in a company manufacturing tobacco products

### Sample composition

Workers and applicants in a company making tobacco products.  
Data were collected in 2002-2003.

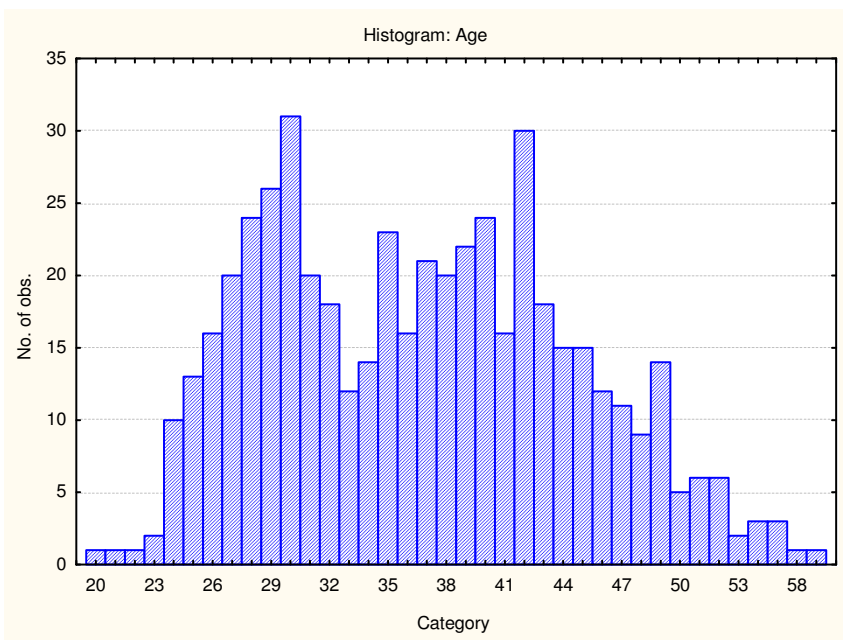
Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	491	491	97.80876	97.8088
F	11	502	2.19124	100.0000
Missing	0	502	0.00000	100.0000

Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Degree	11	11	2.19124	2.1912
Post Graduate National	1	12	0.19920	2.3904
Post Graduate Diploma	11	23	2.19124	4.5817
Vocational Training	10	33	1.99203	6.5737
Grade 12 - N2	1	34	0.19920	6.7729
Grade 10 or 11	35	69	6.97211	13.7450
University diploma	2	71	0.39841	14.1434
University entrance matri	3	74	0.59761	14.7410
Technikon	8	82	1.59363	16.3347
Std 7	36	118	7.17131	23.5060
Std 5	17	135	3.38645	26.8924
Grade 12	149	284	29.68127	56.5737
Std 6	46	330	9.16335	65.7371
Technikon (N2)	1	331	0.19920	65.9363
Std 8	63	394	12.54980	78.4861
Vocational Training - N2	4	398	0.79681	79.2829
Std 9	27	425	5.37849	84.6614
Technikon - N2	1	426	0.19920	84.8606
Technikon - N5	1	427	0.19920	85.0598
Grade 12 + N5 Fitter and	1	428	0.19920	85.2590
Vocational Training - N3	5	433	0.99602	86.2550
Grade 12 + ND in Fitting	1	434	0.19920	86.4542
Vocational Training - NTC	1	435	0.19920	86.6534
Grade 8	2	437	0.39841	87.0518
Grade 12 + Technikon Cert	1	438	0.19920	87.2510
Vocational Training - N4	5	443	0.99602	88.2470
Std 4	6	449	1.19522	89.4422

Category	Frequency table: First Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	33	33	6.57371	6.5737
Afrikaans	59	92	11.75299	18.3267
Sesotho	171	263	34.06375	52.3904
isiZulu	168	431	33.46614	85.8566
Setswana	5	436	0.99602	86.8526
Other	1	437	0.19920	87.0518
isiNdebele	5	442	0.99602	88.0478
Xitsonga	4	446	0.79681	88.8446
Sepedi	10	456	1.99203	90.8367
isiXhosa	16	472	3.18725	94.0239
siSwati	2	474	0.39841	94.4223
Missing	28	502	5.57769	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	21	21	4.18327	4.1833
European	54	75	10.75697	14.9402
African	387	462	77.09163	92.0319
Asian	6	468	1.19522	93.2271
Coloured	7	475	1.39442	94.6215
Missing	27	502	5.37849	100.0000

Variable	Descriptive Statistics AGE					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	36.69323	7.844898	20.00000	59.00000	502	0



## Descriptive statistics on GRT2 subtests

### Total Group

Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
GRT2A_AR2	502	7.472112	0.00	24.00000	7.472112
GRT2N_NR2	502	5.025896	0.00	24.00000	5.025896
GRT2V_VR2	502	8.766932	0.00	29.00000	8.766932

### Blacks

Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
GRT2A_AR2	387	6.155039	0.00	18.00000	3.940851
GRT2N_NR2	387	3.715762	0.00	12.00000	2.456214
GRT2V_VR2	387	7.338501	0.00	19.00000	3.683269

## Stanine tables

### Total Group N = 502

Scale	1	2	3	4	5	6	7	8	9
Verbal Reasoning	0-1	2-3	4	5-6	7-9	10-11	12-14	15-20	21-35
Numerical Reasoning	0	1		2-3	4	5-7	8-9	10-15	16-25
Abstract Reasoning	0	1	2-3	4-5	6-7	8-10	11-14	15-17	18-25

### Black group N = 387

Scale	1	2	3	4	5	6	7	8	9
Verbal Reasoning	0-1	2	3-4	5-6	7-8	9-10	11-12	13-14	15-35
Numerical Reasoning	0		1	2	3	4-5	6-7	8	9-25
Abstract Reasoning	0	1	2	3-4	5-6	7-9	10-11	12-14	15-25

## GRT2 Norm group: SA Applicants to a business school

Applicants to a university in the Western Cape for admission to courses at a graduate business school.  
Data were collected during 2002-2003.

### Sample composition

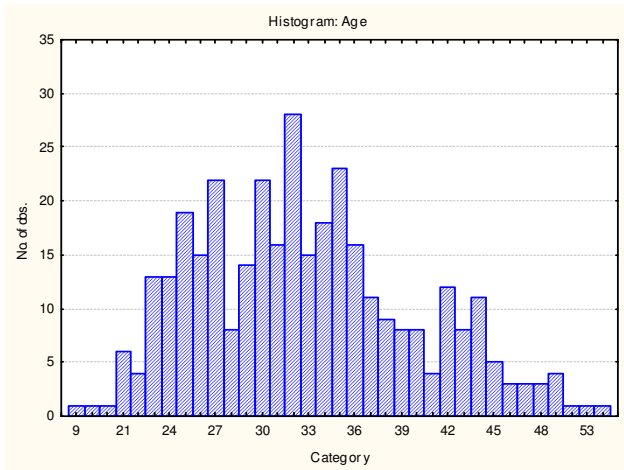
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	237	237	67.90831	67.9083
F	111	348	31.80516	99.7135
U	1	349	0.28653	100.0000
Missing	0	349	0.00000	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Degree	65	65	18.62464	18.6246
Grade 12	109	174	31.23209	49.8567
Grade 10 or 11	17	191	4.87106	54.7278
Technikon	34	225	9.74212	64.4699
Post Graduate	21	246	6.01719	70.4871
University diploma	17	263	4.87106	75.3582
Vocational Training	13	276	3.72493	79.0831
University entrance matric	1	277	0.28653	79.3696
University entrance matri	1	278	0.28653	79.6562
Missing	71	349	20.34384	100.0000

Category	Frequency table: First Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	135	135	38.68195	38.6819
Afrikaans	42	177	12.03438	50.7163
isiXhosa	45	222	12.89398	63.6103
Other	12	234	3.43840	67.0487
Setswana	1	235	0.28653	67.3352
isiNdebele	3	238	0.85960	68.1948
Sesotho	2	240	0.57307	68.7679
Missing	109	349	31.23209	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	162	162	46.41834	46.4183
African	91	253	26.07450	72.4928
Asian	24	277	6.87679	79.3696
European	9	286	2.57880	81.9484
Missing	63	349	18.05158	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	32.79251	7.115289	9.000000	54.000000	347	2



### Descriptive statistics on GRT2 subtests

Test	Sample Size	Mean	SD
General Verbal Reasoning	345	15.37	5.54
General Numerical Reasoning	345	10.76	5.69
General Abstract Reasoning	345	12.50	5.00

### Stanine table

Test	1	2	3	4	5	6	7	8	9
General Verbal Reasoning	0-5	6-8	9-11	12-13	14-16	17-19	20-22	23-25	26-35
General Numerical Reasoning	0-2	3-4	5	6-8	9-11	12-15	16-18	19-22	23-25
General Abstract Reasoning	0-3	4-5	6-8	9-10	11-13	14-16	17-19	20	21-25

## GRT2 Norms: SA Managerial-Professional candidates

### Sample composition

Candidates tested for development or selection purposes by a South African consultancy group. The company works mainly with managerial-professional groups. Minimum qualification was grade 12. Data were collected in 2001.

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	34.72876	7.197560	17.00000	58.00000	306	23

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
WC	305	305	92.70517	92.7052
A	3	308	0.91185	93.6170
B	21	329	6.38298	100.0000
Missing	0	329	0.00000	100.0000

Race information was coded on the basis of respondents' names. Whites and coloureds were coded as WC.

Category	Frequency table: Gender			
	Count	Cumulative Count	Percent	Cumulative Percent
M	118	118	35.86626	35.8663
F	209	327	63.52584	99.3921
U	2	329	0.60790	100.0000
Missing	0	329	0.00000	100.0000

### Descriptive statistics on GRT2 subtests

Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Verbal reasoning	329	14.45897	1.000000	22.00000	3.566313
Numerical reasoning	329	11.89362	1.000000	25.00000	5.446322
Abstract Reasoning	329	14.66869	1.000000	24.00000	5.105260

### Stanine table

	1	2	3	4	5	6	7	8	9
	S9 1	S9 2	S9 3	S9 4	S9 5	S9 6	S9 7	S9 8	S9 9
Verbal Reasoning	0-8	9-10	11-11	12-13	14-15	16-17	18-18	19-20	21-35
Numerical Reasoning	0-2	3-5	6-7	8-10	11-13	14-15	16-18	19-21	22-25
Abstract Reasoning	0-5	6-8	9-10	11-13	14-15	16-18	19-21	22-23	24-25

**Sten table**

	1	2	3	4	5	6	7	8	9	10
	S10 1	S10 2	S10 3	S10 4	S10 5	S10 6	S10 7	S10 8	S10 9	S10 10
Verbal Reasoning	0-7	8-9	10-10	11-12	13-14	15-16	17-18	19-19	20-21	22-35
Numerical Reasoning	0-1	2-3	4-6	7-9	10-11	12-14	15-17	18-20		
Abstract Reasoning	0-4	5-7	8-9	10-12	13-14	15-17	18-19	20-22	23-24	25-26

## GRT2 Norm group: SA Applicants to trainee positions in the Information Technology Industry

Respondents were tested by a training consultancy in Gauteng that specialises in placing persons from formerly disadvantaged groups in trainee positions within the Information Technology industry. All applicants had to have at least a grade 12 level of education.

Data were collected in 2000-2002

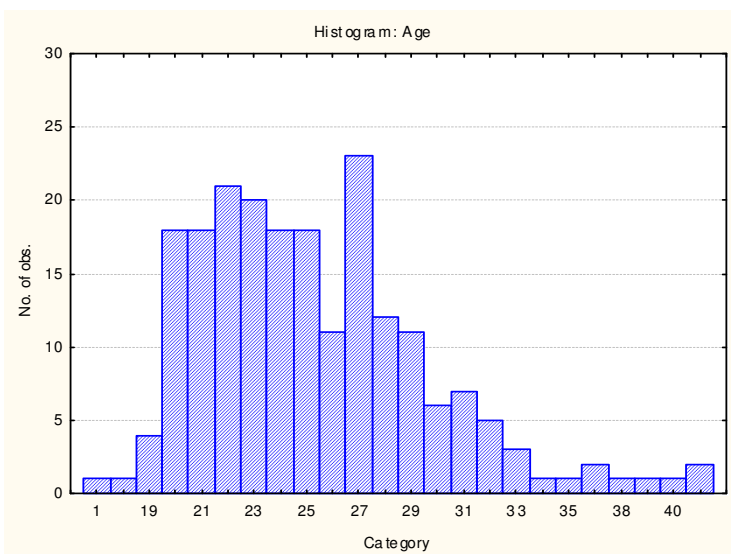
### Sample composition

Frequency table: Gender				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	148	148	71.84466	71.8447
F	44	192	21.35922	93.2039
Missing	14	206	6.79612	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
B	183	183	88.83495	88.8350
A	12	195	5.82524	94.6602
WC	8	203	3.88350	98.5437
Missing	3	206	1.45631	100.0000

Race information was not captured by the user – respondents' race was coded based on their names. The code WC was used for Whites or Coloureds.

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	25.27670	4.911524	1.000000	46.00000	206	0



**Descriptive statistics on GRT2 tests**

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Verbal Reasoning	15.11165	5.405703	0.00	31.00000	206	0
Numerical Reasoning	9.00000	4.280415	0.00	24.00000	206	0
Abstract Reasoning	13.48544	4.259541	0.00	24.00000	206	0

**Stanine table**

	1	2	3	4	5	6	7	8	9
	S9 1	S9 2	S9 3	S9 4	S9 5	S9 6	S9 7	S9 8	S9 9
Verbal Reasoning	0-5	6-8	9-11	12-13	14-16	17-19	20-21	22-24	25-35
Numerical Reasoning	0-1	2-3	4-5	6-7	8-10	11-12	13-14	15-16	17-20
Abstract Reasoning	0-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	21-26

**Sten table**

	1	2	3	4	5	6	7	8	9	10
	S10 1	S10 2	S10 3	S10 4	S10 5	S10 6	S10 7	S10 8	S10 9	S10 10
Verbal Reasoning	0-4	5-7	8-9	10-12	13-15	16-17	18-20	21-23	24-25	26-35
Numerical Reasoning	0-0	1-2	3-4	5-6	7-9	10-11	12-13	14-15	16-17	18-20
Abstract Reasoning	0-4	5-7	8-9	10-11	12-13	14-15	16-17	18-19	20-22	23-26

## GRT2 Norm group: SA Construction Workers

### Sample composition

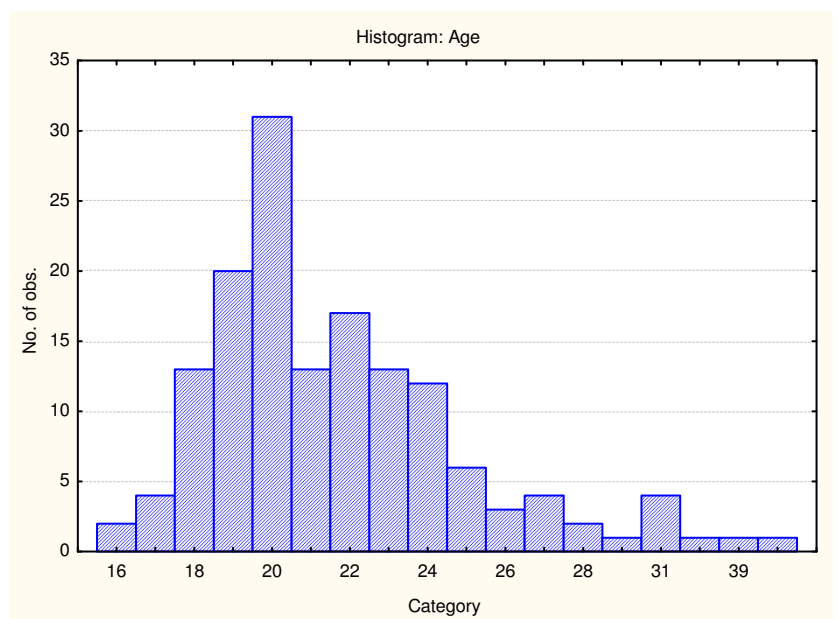
Workers and applicants tested by a South African construction company for employment and development purposes. Data were collected in 2002 and 2003. Minimum qualification was grade 10.

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	7	7	4.69799	4.6980
European	2	9	1.34228	6.0403
White	1	10	0.67114	6.7114
Asian	1	11	0.67114	7.3826
African	74	85	49.66443	57.0470
WC	64	149	42.95302	100.0000
Missing	0	149	0.00000	100.0000

Where race data were not captured, it was coded according to respondents' names. Where uncertainty existed, whites and coloureds were coded as WC.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	137	137	91.94631	91.9463
F	12	149	8.05369	100.0000
Missing	0	149	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	21.85135	4.103035	16.00000	47.00000	148	1



***Descriptive statistics on GRT2 Subtests***

<b>Test</b>	<b>Sample</b>	<b>Mean</b>	<b>SD</b>
<b>Verbal Reasoning</b>	<b>170</b>	<b>14.51</b>	<b>4.92</b>
<b>Numerical Reasoning</b>	<b>170</b>	<b>9.91</b>	<b>5.67</b>
<b>Abstract Reasoning</b>	<b>170</b>	<b>14.42</b>	<b>5.33</b>

***Stanine tables***

<b>Test</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>Verbal Reasoning</b>	0-6	7-8	9-10	11-12	13-15	16-18	19-21	22-23	24-35
<b>Numerical Reasoning</b>	0-2	3	4-5	6-7	8-10	11-13	14-18	19-22	23-25

<b>Dim</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>Abstract Reasoning</b>	0-4	5-7	8-10	11-13	14-16	17-19	20-21	22	<b>23-25</b>
<b>Abstract Reasoning Attempted</b>	0-14	15-16	17-18	19-21	22-24		25		

## GRT2 Norm group: SA Industrial Psychology students

### Sample Composition

Students in their third year at a university in Gauteng who completed the tests as part of their training in psychometrics. Data collected in 2003.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	80	80	85.10638	85.1064
M	14	94	14.89362	100.0000
Missing	0	94	0.00000	100.0000

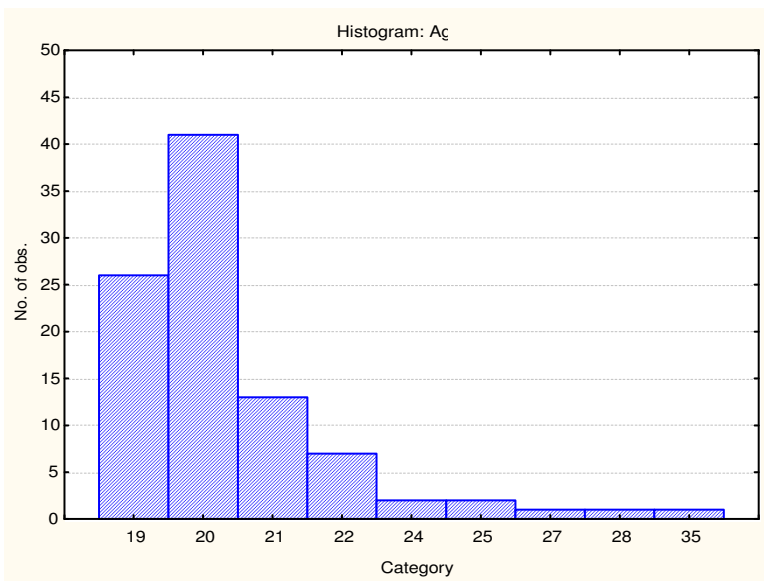
Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Degree	3	3	3.19149	3.1915
University entrance matri	88	91	93.61702	96.8085
Technikon	1	92	1.06383	97.8723
Grade 12	1	93	1.06383	98.9362
Post Graduate	1	94	1.06383	100.0000
Missing	0	94	0.00000	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
English	18	18	19.14894	19.1489
Afrikaans	59	77	62.76596	81.9149
isiZulu	3	80	3.19149	85.1064
Setswana	4	84	4.25532	89.3617
isiXhosa	2	86	2.12766	91.4894
Sepedi	1	87	1.06383	92.5532
Missing	7	94	7.44681	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Asian	6	6	6.38298	6.3830
European	72	78	76.59574	82.9787
African	14	92	14.89362	97.8723
Coloured	2	94	2.12766	100.0000
Missing	0	94	0.00000	100.0000

Frequency table: Educated in English				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Yes	36	36	38.29787	38.2979
No	57	93	60.63830	98.9362
Missing	1	94	1.06383	100.0000

Descriptive Statistics Age						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	20.52128	2.227534	19.00000	35.00000	94	0



### Descriptive statistics on GRT2 tests

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Verbal Reasoning	21.74468	5.030950	4.000000	32.00000	94	0
Numerical Reasoning	13.17021	4.344415	5.000000	25.00000	94	0
Abstract Reasoning	16.80851	4.153704	4.000000	24.00000	94	0

### Stanine table

	1	2	3	4	5	6	7	8	9
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
Verbal Reasoning	0-12	13-15	16-17	18-20	21-23	24-25	26-28	29-30	31-35
Numerical Reasoning	0-5	6-7	8-9	10-12	13-14	15-16	17-18	19-20	21-25
Abstract Reasoning	0-9	10-11	12-13	14-15	16-17	18-19	20-22	23-24	25-25

## GRT2 Norm group: SA Bank applicants all races

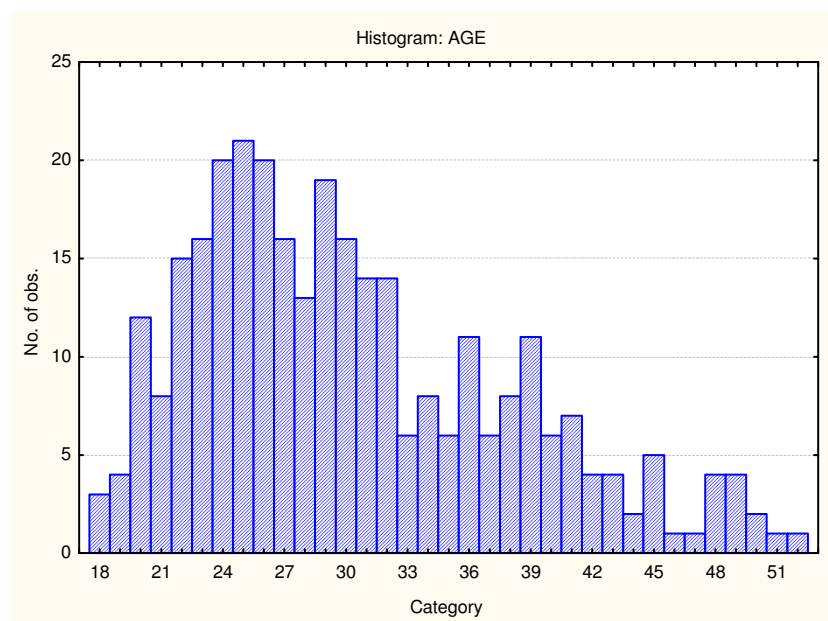
Applicants to various positions in a SA bank. A minimum qualification of grade 12 is required to apply. Data were collected between 1996 and 1999. Race information was not captured by the user. Race was coded based on respondents' names. Whites and Coloureds were coded as WC.

### Sample composition

Frequency table: RACE				
Category	Count	Cumulative Count	Percent	Cumulative Percent
WC	222	222	71.84466	71.8447
A	28	250	9.06149	80.9061
B	55	305	17.79935	98.7055
Missing	4	309	1.29450	100.0000

Frequency table: GENDER				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	184	184	59.54693	59.5469
M	124	308	40.12945	99.6764
U	1	309	0.32362	100.0000
Missing	0	309	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
AGE	30.32039	7.680571	18.00000	56.00000	309	0



### ***Descriptive statistics on GRT2 subtests***

<b>Dimension</b>	<b>Sample</b>	<b>Mea</b>	<b>SD</b>
<b>General Verbal Reasoning</b>	<b>309</b>	<b>19.17</b>	<b>5.53</b>
<b>General Numerical Reasoning</b>	<b>309</b>	<b>11.28</b>	<b>5.57</b>
<b>General Abstract Reasoning</b>	<b>309</b>	<b>13.96</b>	<b>4.99</b>

### ***Stanine table***

	1	2	3	4	5	6	7	8	9
	S9 1	S9 2	S9 3	S9 4	S9 5	S9 6	S9 7	S9 8	S9 9
Verbal Reasoning	0-9	10-12	13-15	16-17	18-20	21-23	24-26	27-28	29-35
Numerical Reasoning	0-1	2-4	5-7	8-9	10-12	13-15	16-18	19-21	22-25
Abstract Reasoning	0-5	6-7	8-10	11-12	13-15	16-17	18-20	21-22	23-25

### ***Sten table***

	1	2	3	4	5	6	7	8	9	10
	S10 1	S10 2	S10 3	S10 4	S10 5	S10 6	S10 7	S10 8	S10 9	S10 10
Verbal Reasoning	0-8	9-10	11-13	14-16	17-19	20-21	22-24	25-27	28-30	31-35
Numerical Reasoning	0-0	1-2	3-5	6-8	9-11	12-14	15-16	17-19	20-20	
Abstract Reasoning	0-3	4-6	7-8	9-11	12-13	14-16	17-18	19-21	22-23	24-26

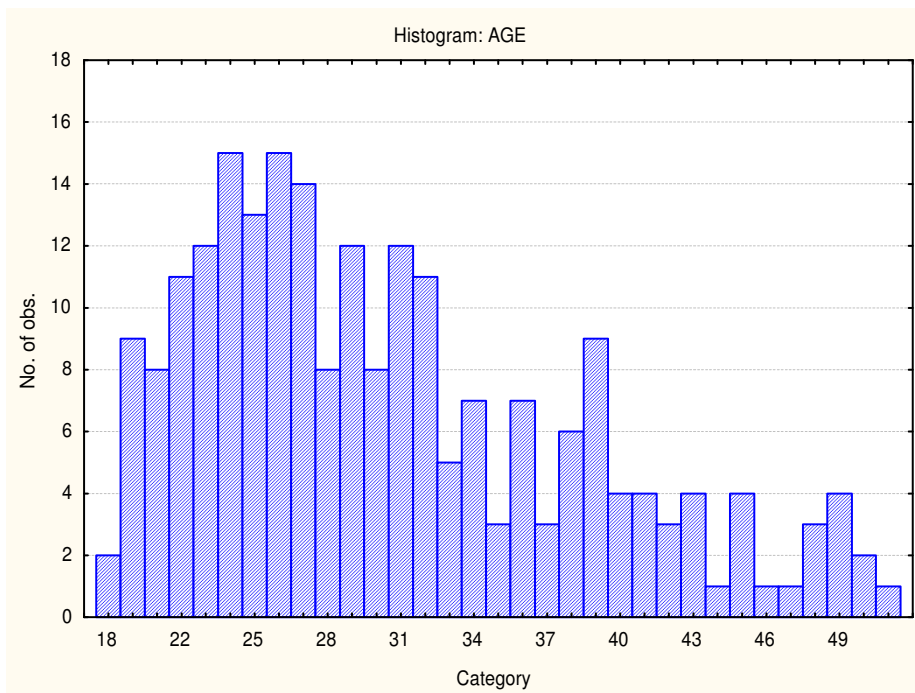
## GRT2 Norm Group: SA Bank Applicants Whites and Coloureds

This group is a subset of SA Bank Applicants all races. Applicants to various positions in a SA bank. A minimum qualification of grade 12 is required to apply. Data were collected between 1996 and 1999.

### Sample composition

Frequency table: GENDER				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	132	132	59.45946	59.4595
M	89	221	40.09009	99.5495
U	1	222	0.45045	100.0000
Missing	0	222	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
AGE	30.52252	7.864056	18.00000	56.00000	222	0



### ***Descriptive statistics on GRT2 subtests***

<b>Test</b>	<b>Sample</b>	<b>Mean</b>	<b>SD</b>
<b>General Verbal Reasoning</b>	<b>222</b>	<b>20.07</b>	<b>5.40</b>
<b>General Numerical Reasoning</b>	<b>222</b>	<b>12.08</b>	<b>5.69</b>
<b>General Abstract Reasoning</b>	<b>222</b>	<b>14.73</b>	<b>4.94</b>

### ***Stanine table***

	1	2	3	4	5	6	7	8	9
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
Verbal Reasoning	0-10	11-13	14-16	17-18	19-21	22-24	25-26	27-29	30-35
Numerical Reasoning	0-2	3-4	5-7	8-10	11-13	14-16	17-19	20-22	23-25
Abstract Reasoning	0-6	7-8	9-11	12-13	14-15	16-18	19-20	21-23	24-25

### ***Sten table***

	1	2	3	4	5	6	7	8	9	10
	S10_1	S10_2	S10_3	S10_4	S10_5	S10_6	S10_7	S10_8	S10_9	S10_10
Verbal Reasoning	0-9	10-11	12-14	15-17	18-20	21-22	23-25	26-28	29-30	31-35
Numerical Reasoning	0-0	1-3	4-6	7-9	10-12	13-14	15-17	18-20		
Abstract Reasoning	0-4	5-7	8-9	10-12	13-14	15-17	18-19	20-22	23-24	25-26

## GRT2 Norm group: SA Vocational Counselling Clients

Clients at a vocational counselling and career development centre at a historically white, English-medium university in Gauteng. Clients would have a minimum qualification of grade 11, and most would be either prospective students or current students contemplating a change in course or career direction. Persons who complete the GRT2 would not have a tertiary qualification.

### Sample composition

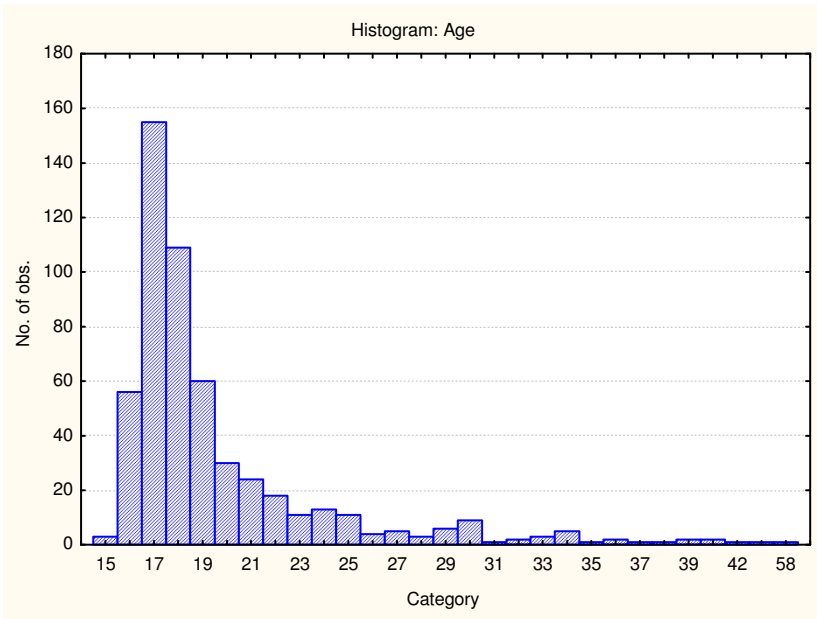
Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
WC	378	378	70.00000	70.0000
A	83	461	15.37037	85.3704
B	43	504	7.96296	93.3333
W	27	531	5.00000	98.3333
C	3	534	0.55556	98.8889
Missing	6	540	1.11111	100.0000

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	287	287	53.14815	53.1481
M	251	538	46.48148	99.6296
U	2	540	0.37037	100.0000
Missing	0	540	0.00000	100.0000

Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
University entrance matric	15	15	2.77778	2.7778
Grade 12	52	67	9.62963	12.4074
Degree	4	71	0.74074	13.1481
Grade 10 or 11	12	83	2.22222	15.3704
Missing	457	540	84.62963	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
English	71	71	13.14815	13.1481
Other	4	75	0.74074	13.8889
Afrikaans	3	78	0.55556	14.4444
isiZulu	2	80	0.37037	14.8148
Setswana	3	83	0.55556	15.3704
Missing	457	540	84.62963	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	19.70185	4.921461	15.00000	58.00000	540	0



**Descriptive statistics on GRT2 subtests**

Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Verbal Reasoning	540	23.08519	0.000000	34.00000	5.437805
Numerical Reasoning	540	14.78519	0.000000	25.00000	5.442068
Abstract Reasoning	540	18.01296	1.000000	25.00000	4.549238

**Stanine table**

	1	2	3	4	5	6	7	8	9
	S9 1	S9 2	S9 3	S9 4	S9 5	S9 6	S9 7	S9 8	S9 9
Verbal Reasoning	0-13	14-16	17-19	20-21	22-24	25-27	28-29	30-32	33-35
Numerical Reasoning	0-5	6-7	8-10	11-13	14-16	17-18	19-21	22-24	25-25
Abstract Reasoning	0-10	11-12	13-14	15-16	17-19	20-21	22-23	24-25	

## GRT2 Norm group: SA Grade 7 pupils

Pupils at an English medium school in Gauteng, tested for vocational guidance purposes. Data were collected in 2001.

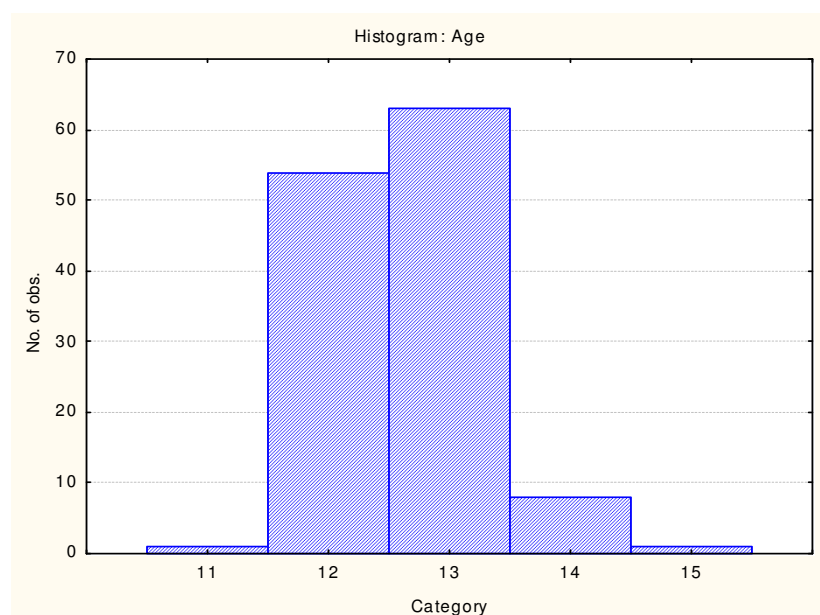
### Sample composition

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
A	17	17	13.38583	13.3858
WC	23	40	18.11024	31.4961
B	20	60	15.74803	47.2441
C	2	62	1.57480	48.8189
Missing	65	127	51.18110	100.0000

Race data was not captured consistently by the user – race was coded based on respondents' names. When doubt existed about whether an applicant was White or Coloured, the person was coded as WC.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	62	62	48.81890	48.8189
M	65	127	51.18110	100.0000
Missing	0	127	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	12.63780	0.650632	11.00000	15.00000	127	0



### **Descriptive statistics on GRT2 subtests**

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Verbal Reasoning	15.92126	4.240033	7.000000	27.00000	127	0
Numerical Reasoning	8.13386	4.239576	0.000000	22.00000	127	0
Abstract Reasoning	10.40157	4.852196	0.000000	22.00000	127	0

### **Stanine table**

	1	2	3	4	5	6	7	8	9
	S9 1	S9 2	S9 3	S9 4	S9 5	S9 6	S9 7	S9 8	S9 9
Verbal Reasoning	0-8	9-10	11-12	13-14	15-16	17-19	20-21	22-23	24-35
Numerical Reasoning	0-0	1-2	3-4	5-7	8-9	10-11	12-13	14-15	16-25
Abstract Reasoning	0-1	2-4	5-6	7-9	10-11	12-14	15-16	17-18	19-25

## GRT2 Norm group: SA Grade 9 pupils

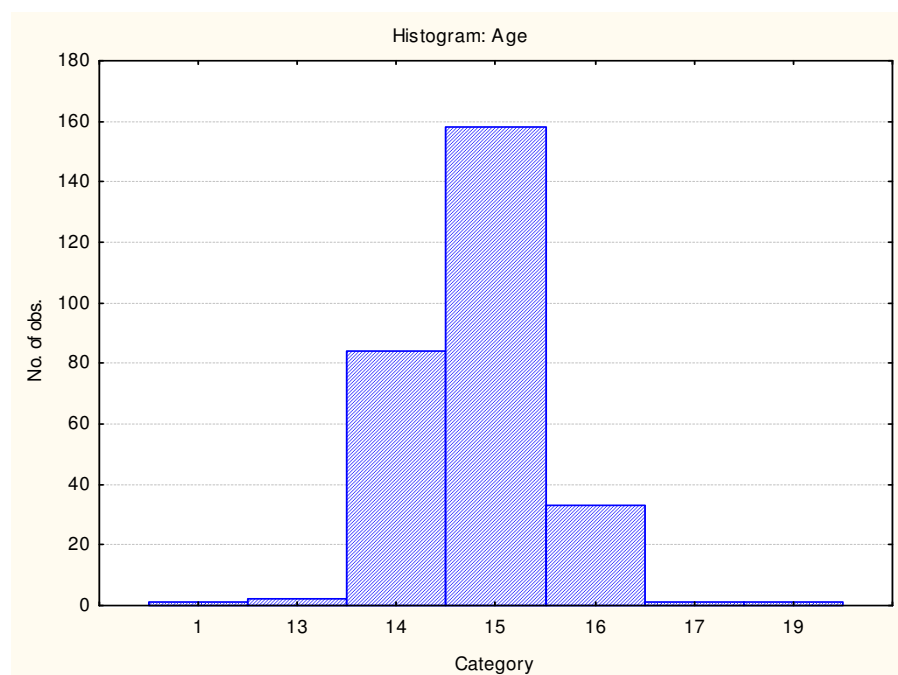
South African scholars tested for vocational guidance purposes. Language of education is English. Respondents were tested at various schools in Gauteng. Data were collected in 2001.

### Sample composition

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
WC	201	201	71.78571	71.7857
A	15	216	5.35714	77.1429
B	64	280	22.85714	100.0000
Missing	0	280	0.00000	100.0000

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	142	142	50.71429	50.7143
M	138	280	49.28571	100.0000
Missing	0	280	0.00000	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	14.77500	1.082320	1.000000	19.00000	280	0



### ***Descriptive statistics on GRT2 subtests***

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Verbal Reasoning	17.61071	5.542462	0.00	29.00000	280	0
Numerical Reasoning	10.56071	5.222974	0.00	25.00000	280	0
Abstract Reasoning	12.30357	5.107166	0.00	24.00000	280	0

### ***Stanine table***

	1	2	3	4	5	6	7	8	9
	S9 1	S9 2	S9 3	S9 4	S9 5	S9 6	S9 7	S9 8	S9 9
Verbal Reasoning	0-7	8-10	11-13	14-16	17-18	19-21	22-24	25-27	28-35
Numerical Reasoning	0-1	2-4	5-6	7-9	10-11	12-14	15-17	18-19	20-20
Abstract Reasoning	0-3	4-5	6-8	9-11	12-13	14-16	17-18	19-21	22-26

## GRT2 Norm Group: SA General Population

These norms were calculated from data submitted by various clients of Psytech South Africa prior to the release of version 3 of the GeneSys software in 2002. It was a convenience sample – all submitted cases were included.

### *Sample composition*

Age			
Mean	Min	Max	Missing
30.30	14	60	82

Sex		
Male	Female	Missing
1104	1066	8

Education		
Grade 10 or 11	15	
Grade 12	50	
University entrance matric	0	
Vocational Training	3	
Technikon	1	
University diploma	0	
Degree	33	
Post Graduate	4	
Missing	1763	

Educated In English		
Yes	39	
No	0	
Missing	2139	

<b>First Language</b>		
<b>isiZulu</b>	<b>12</b>	
<b>isiXhosa</b>	<b>5</b>	
<b>Afrikaans</b>	<b>26</b>	
<b>Sepedi</b>	<b>7</b>	
<b>English</b>	<b>23</b>	
<b>Setswana</b>	<b>5</b>	
<b>Sesotho</b>	<b>4</b>	
<b>Xitsonga</b>	<b>2</b>	
<b>siSwati</b>	<b>1</b>	
<b>isiNdebele</b>	<b>0</b>	
<b>Tshivenda</b>	<b>0</b>	
<b>Other</b>	<b>0</b>	
<b>Missing</b>	<b>1829</b>	

<b>Race</b>		
<b>Asian</b>	<b>3</b>	
<b>African</b>	<b>42</b>	
<b>Coloured</b>	<b>15</b>	
<b>European</b>	<b>43</b>	
<b>Other</b>	<b>0</b>	
<b>Missing</b>	<b>1789</b>	

<b>Applicant/Non-Applicant</b>		
<b>Applicant</b>	<b>Non-Applicant</b>	<b>Missing</b>
96	281	1801

***Descriptive statistics on GRT2 subtests***

Test	Sample Size	Mean	SD
Verbal Reasoning	2178	17.52	7.42
Numerical Reasoning	2179	10.58	5.92
Abstract Reasoning	2178	14.23	5.27

***Stanine tables***

Test	1	2	3	4	5	6	7	8	9
Verbal Reasoning	0	1-8	9-12	13-16	17-19	20-23	24-26	27-29	30-35
Numerical Reasoning	0-1	2-3	4-5	6-8	9-11	12-14	15-19	20-22	23-25
Abstract Reasoning	0-4	5-7	8-9	10-12	13-15	16-18	19-21	22	23-25

***Sten tables***

Test	1	2	3	4	5	6	7	8	9	10
Verbal Reasoning		0-2	3-10	11-14	15-18	19-21	22-24	25-27	28-30	31-35
Numerical Reasoning	0	1-2	3-4	5-6	7-9	10-13	14-16	17-20	21-23	24-25
Abstract Reasoning	0-3	4-6	7-8	9-11	12-14	15-17	18-19	20-21	22-23	24-25

## GRT2 Norm Group: SA Prospective University students

Prospective university students tested for vocational guidance purposes at an English-medium university in Gauteng. Detailed biographical information was not captured. Data were collected during 2001-2002.

### *Sample characteristics*

Age			
Mean	Min	Max	Missing
17.10	15	18	0

Sex		
Male	Female	Missing
56	64	3

### *Descriptive statistics on GRT2 subtests*

Dim	Sample Size	Mean	SD
Verbal Reasoning	123	22.85	6.87
Numerical Reasoning	123	14.89	6.20
Abstract Reasoning	123	18.33	5.70

### *Stanine table*

Test	1	2	3	4	5	6	7	8	9
Verbal Reasoning	0	1-15	16-20	21-22	23-25	26-27	28-29	30-31	32-35
Numerical Reasoning	0	1-7	8-10	11-13	14-16	17-19	20-23	24	25
Abstract Reasoning	0	1-12	13-15	16-18	19-20	21-22	23	24	25

***Sten table***

Test	1	2	3	4	5	6	7	8	9	10
Verbal Reasoning		0-13	14-18	19-21	22-24	25-26	27-28	29-30	31-32	33-35
Numerical Reasoning		0-5	6-8	9-11	12-15	16-18	19-21	22-23	24	25
Abstract Reasoning		0-9	10-14	15-17	18-19	20-21	22-23	24		25

## GRT2 Norm Group: SA Retail applicants and staff

Applicants and incumbents to positions at head office at a major South African retail organisation. Data were collected during 1999-2001.

### Sample characteristics

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
C	23	23	4.98915	4.9892
WC	330	353	71.58351	76.5727
A	24	377	5.20607	81.7787
B	80	457	17.35358	99.1323
W	4	461	0.86768	100.0000
Missing	0	461	0.00000	100.0000

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	287	287	62.25597	62.2560
M	172	459	37.31020	99.5662
U	2	461	0.43384	100.0000
Missing	0	461	0.00000	100.0000

### Descriptive statistics on GRT2 subtests

Variable	Descriptive Statistics on General Reasoning Subtests					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning	20.63557	5.864554	1.000000	34.00000	461	0
General Numerical Reasoning	8.99132	6.408548	0.000000	25.00000	461	0
General Abstract Reasoning	15.21475	4.863292	0.000000	25.00000	461	0

### Stanine table

	Stanine table								
	1 S9_1	2 S9_2	3 S9_3	4 S9_4	5 S9_5	6 S9_6	7 S9_7	8 S9_8	9 S9_9
Verbal Reasoning	0-10	11-13	14-16	17-19	20-22	23-25	26-27	28-30	31-35
Numerical Reasoning	0--1	0-0	1-4	5-7	8-10	11-13	14-17	18-20	
Abstract Reasoning	0-6	7-9	10-11	12-13	14-16	17-18	19-21	22-23	24-26

**Sten table**

	Sten table									
	1 S10_1	2 S10_2	3 S10_3	4 S10_4	5 S10_5	6 S10_6	7 S10_7	8 S10_8	9 S10_9	10 S10_10
<b>Verbal Reasoning</b>	0-8	9-11	12-14	15-17	18-20	21-23	24-26	27-29	30-32	33-35
<b>Numerical Reasoning</b>	0--1	0-0	1-2	3-5	6-8	9-12	13-15	16-18	19-20	
<b>Abstract Reasoning</b>	0-5	6-7	8-10	11-12	13-15	16-17	18-20	21-22	23-24	25-26

## GRT2 Norm Group: SA Retail applicants and staff

The sample consisted of respondents tested by Psytech SA collaborators and Psytech SA during the period 2001 to 2008. Not all respondents completed all the tests, therefore the biographical characteristics are reported separately for the three subtests.

### Sample characteristics: General Abstract Reasoning (GRT2A)

Category	Frequency table: Sex			
	Count	Cumulative	Percent	Cumulative
F	4804	4804	36.10401	36.1040
M	8454	13258	63.53525	99.6393
U	48	13306	0.36074	100.0000
Missing	0	13306	0.00000	100.0000

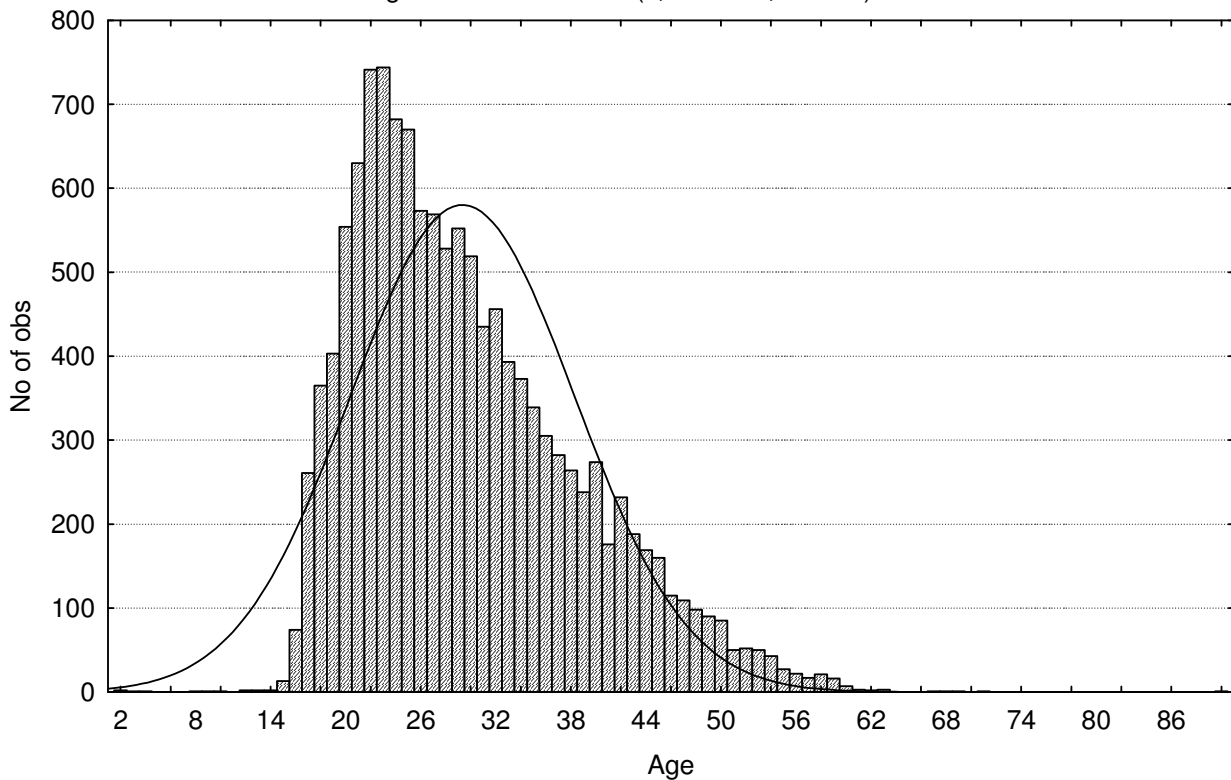
Category	Frequency table: Education			
	Count	Cumulative	Percent	Cumulative
Grade 12	3937	3937	29.58816	29.5882
Technikon	1222	5159	9.18383	38.7720
Vocational Training	302	5461	2.26965	41.0416
Grade 10 or 11	768	6229	5.77183	46.8135
Degree	886	7115	6.65865	53.4721
University Diploma	338	7453	2.54021	56.0123
Post Graduate	566	8019	4.25372	60.2660
Grade 9	65	8084	0.48850	60.7545
Diploma	26	8110	0.19540	60.9499
Grade 7	20	8130	0.15031	61.1003
Grade 8	57	8187	0.42838	61.5286
Vocational	1	8188	0.00752	61.5361
Grade 10	1	8189	0.00752	61.5437
Missing	5117	13306	38.45634	100.0000

Category	Frequency table: Language			
	Count	Cumulative	Percent	Cumulative
English	3116	3116	23.41801	23.4180
isiZulu	1688	4804	12.68601	36.1040
Afrikaans	1549	6353	11.64136	47.7454
isiXhosa	798	7151	5.99729	53.7427
Sesotho	567	7718	4.26124	58.0039
Tshivenda	59	7777	0.44341	58.4473
Xitsonga	116	7893	0.87179	59.3191
siSwati	47	7940	0.35322	59.6723
Setswana	360	8300	2.70555	62.3779

Category	Frequency table: Language			
	Count	Cumulative	Percent	Cumulative
Sepedi	177	8477	1.33023	63.7081
isiNdebele	29	8506	0.21795	63.9260
Other	199	8705	1.49557	65.4216
Missing	4601	13306	34.57839	100.0000

Category	Frequency table: Race			
	Count	Cumulative	Percent	Cumulative
Coloured	1119	1119	8.40974	8.4097
African	4395	5514	33.03021	41.4400
European	2322	7836	17.45077	58.8907
Asian	1117	8953	8.39471	67.2854
Other	53	9006	0.39832	67.6838
Missing	4300	13306	32.31625	100.0000

Histogram of Age  
GRT2 Norms update 2008 scored.sta 111v\*13596c  
Include condition: GRT2A\_AR2 > 0  
Age = 12990\*1\*normal(x, 29.6934, 8.9319)



### Sample characteristics General Numerical Reasoning (GRT2N)

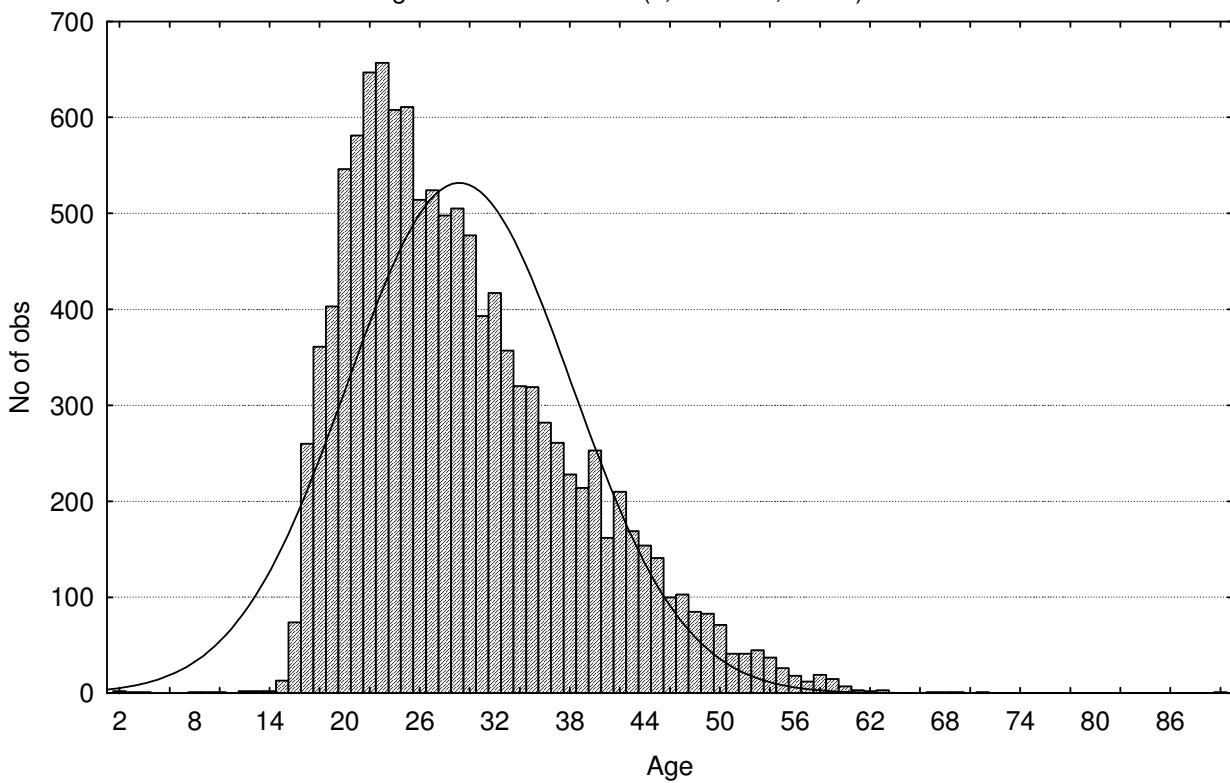
Category	Frequency table: Sex			
	Count	Cumulative	Percent	Cumulative
F	4588	4588	37.70236	37.7024
M	7537	12125	61.93607	99.6384
U	44	12169	0.36157	100.0000
Missing	0	12169	0.00000	100.0000

Category	Frequency table: Education			
	Count	Cumulative	Percent	Cumulative
Grade 12	3749	3749	30.80779	30.8078
Technikon	963	4712	7.91355	38.7213
Vocational Training	281	4993	2.30915	41.0305
Grade 10 or 11	735	5728	6.03994	47.0704
Degree	714	6442	5.86737	52.9378
University Diploma	287	6729	2.35845	55.2962
Post Graduate	383	7112	3.14734	58.4436
Grade 9	64	7176	0.52593	58.9695
Diploma	25	7201	0.20544	59.1750
Grade 7	16	7217	0.13148	59.3064
Grade 8	56	7273	0.46019	59.7666
Vocational	1	7274	0.00822	59.7748
Grade 10	1	7275	0.00822	59.7831
Missing	4894	12169	40.21694	100.0000

Category	Frequency table: Language			
	Count	Cumulative	Percent	Cumulative
English	2588	2588	21.26715	21.2672
isiZulu	1509	4097	12.40036	33.6675
Afrikaans	1477	5574	12.13740	45.8049
isiXhosa	694	6268	5.70302	51.5079
Sesotho	520	6788	4.27315	55.7811
Tshivenda	54	6842	0.44375	56.2248
Xitsonga	99	6941	0.81354	57.0384
siSwati	41	6982	0.33692	57.3753
Setswana	330	7312	2.71181	60.0871
Sepedi	166	7478	1.36412	61.4512
isiNdebele	28	7506	0.23009	61.6813
Other	177	7683	1.45452	63.1358
Missing	4486	12169	36.86416	100.0000

Category	Frequency table: Race			
	Count	Cumulative	Percent	Cumulative
Coloured	1071	1071	8.80105	8.8011
African	3962	5033	32.55814	41.3592
European	2061	7094	16.93648	58.2957
Asian	833	7927	6.84526	65.1409
Other	52	7979	0.42732	65.5682
Missing	4190	12169	34.43175	100.0000

Histogram of Age  
 GRT2 Norms update 2008 scored.sta 111v\*13596c  
 Include condition: GRT2N\_NR2 > 0  
 Age = 11888\*1\*normal(x, 29.5331, 8.918)



### Sample characteristics General Verbal Reasoning (GRT2V)

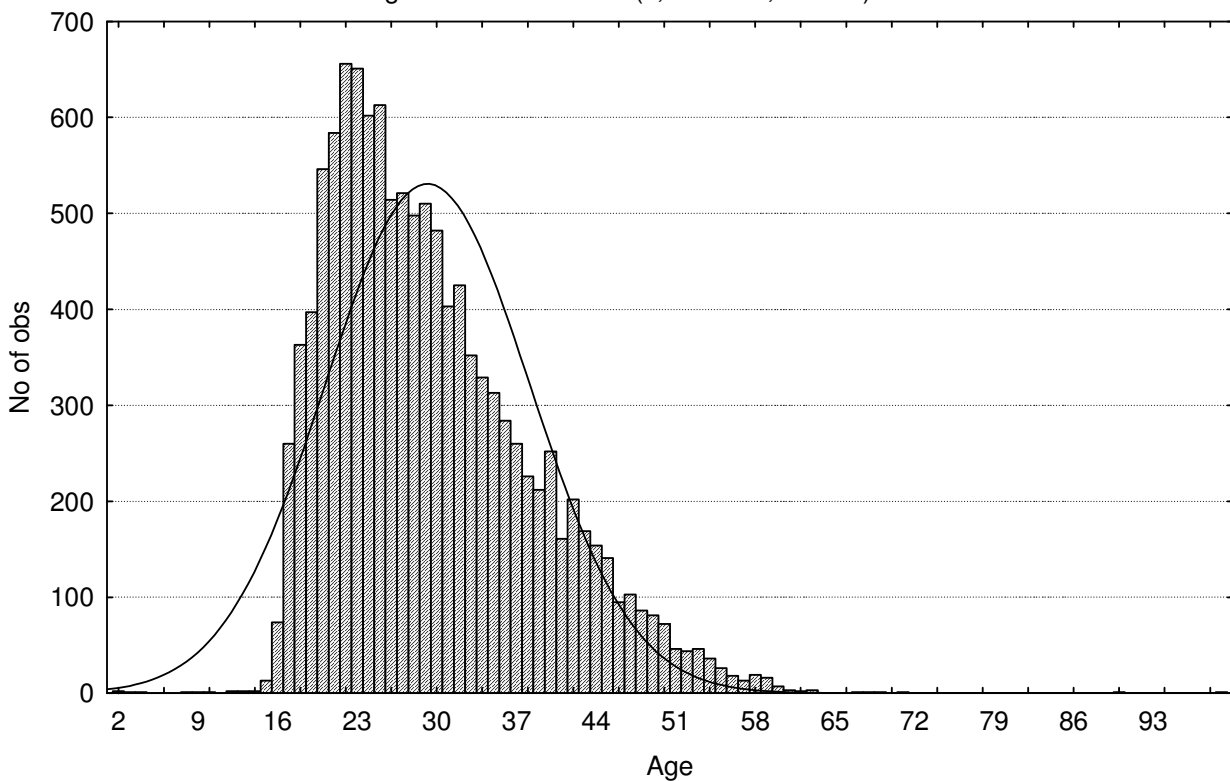
Category	Frequency table: Sex			
	Count	Cumulative	Percent	Cumulative
F	4592	4592	37.71044	37.7104
M	7544	12136	61.95286	99.6633
U	41	12177	0.33670	100.0000
Missing	0	12177	0.00000	100.0000

Category	Frequency table: Education			
	Count	Cumulative	Percent	Cumulative
Grade 12	3728	3728	30.61509	30.6151
Technikon	971	4699	7.97405	38.5891
Vocational Training	288	4987	2.36511	40.9543
Grade 10 or 11	752	5739	6.17558	47.1298
Degree	723	6462	5.93742	53.0673
University Diploma	291	6753	2.38975	55.4570
Post Graduate	393	7146	3.22740	58.6844
Grade 9	63	7209	0.51737	59.2018
Diploma	26	7235	0.21352	59.4153
Grade 7	21	7256	0.17246	59.5877
Grade 8	56	7312	0.45988	60.0476
Vocational	1	7313	0.00821	60.0558
Grade 10	1	7314	0.00821	60.0641
Missing	4863	12177	39.93594	100.0000

Category	Frequency table: Language			
	Count	Cumulative	Percent	Cumulative
English	2590	2590	21.26961	21.2696
isiZulu	1548	4138	12.71249	33.9821
Afrikaans	1460	5598	11.98982	45.9719
isiXhosa	698	6296	5.73212	51.7040
Sesotho	528	6824	4.33604	56.0401
Tshivenda	55	6879	0.45167	56.4917
Xitsonga	100	6979	0.82122	57.3130
siSwati	42	7021	0.34491	57.6579
Setswana	332	7353	2.72645	60.3843
Sepedi	168	7521	1.37965	61.7640
isiNdebele	28	7549	0.22994	61.9939
Other	186	7735	1.52747	63.5214
Missing	4442	12177	36.47861	100.0000

Category	Frequency table: Race			
	Count	Cumulative	Percent	Cumulative
Coloured	1064	1064	8.73778	8.7378
African	4030	5094	33.09518	41.8330
European	2046	7140	16.80217	58.6351
Asian	839	7979	6.89004	65.5252
Other	52	8031	0.42703	65.9522
Missing	4146	12177	34.04780	100.0000

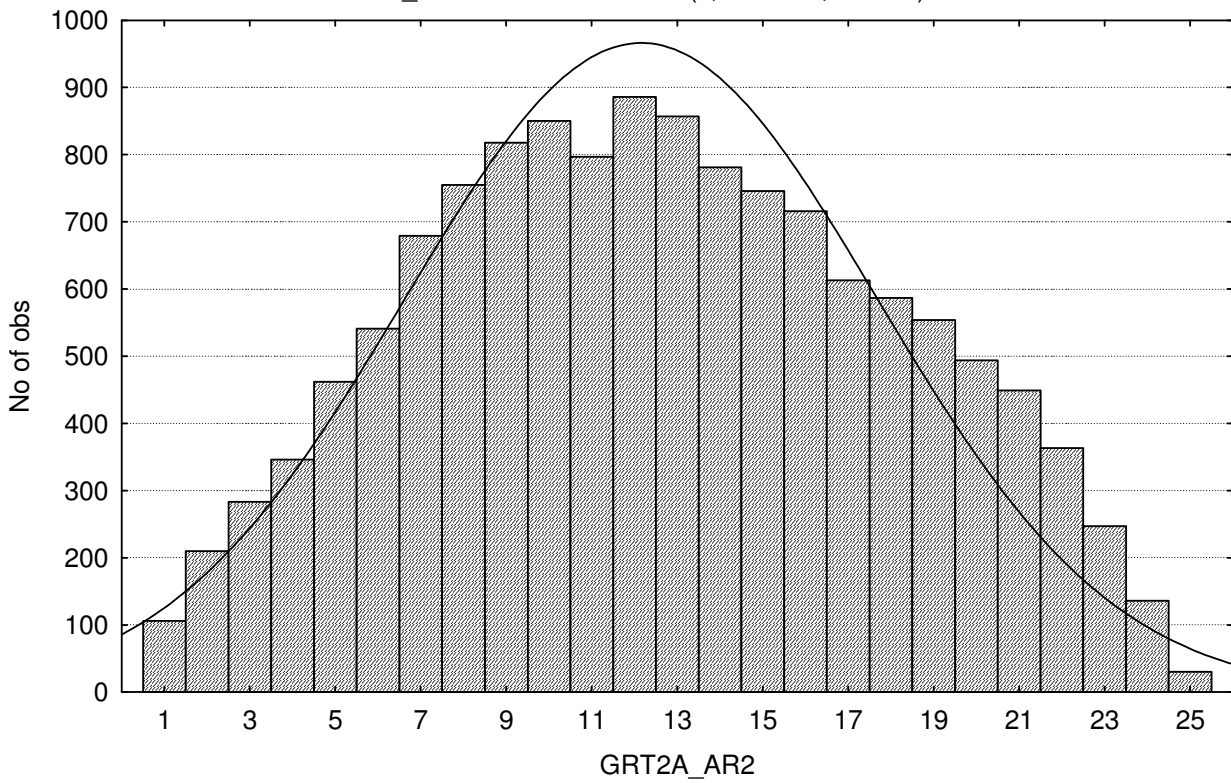
Histogram of Age  
GRT2 Norms update 2008 scored.sta 111v\*13596c  
Include condition: GRT2V\_VR2 > 0  
Age = 11902\*1\*normal(x, 29.5422, 8.9457)



**Descriptive statistics on GRT2 subtests**

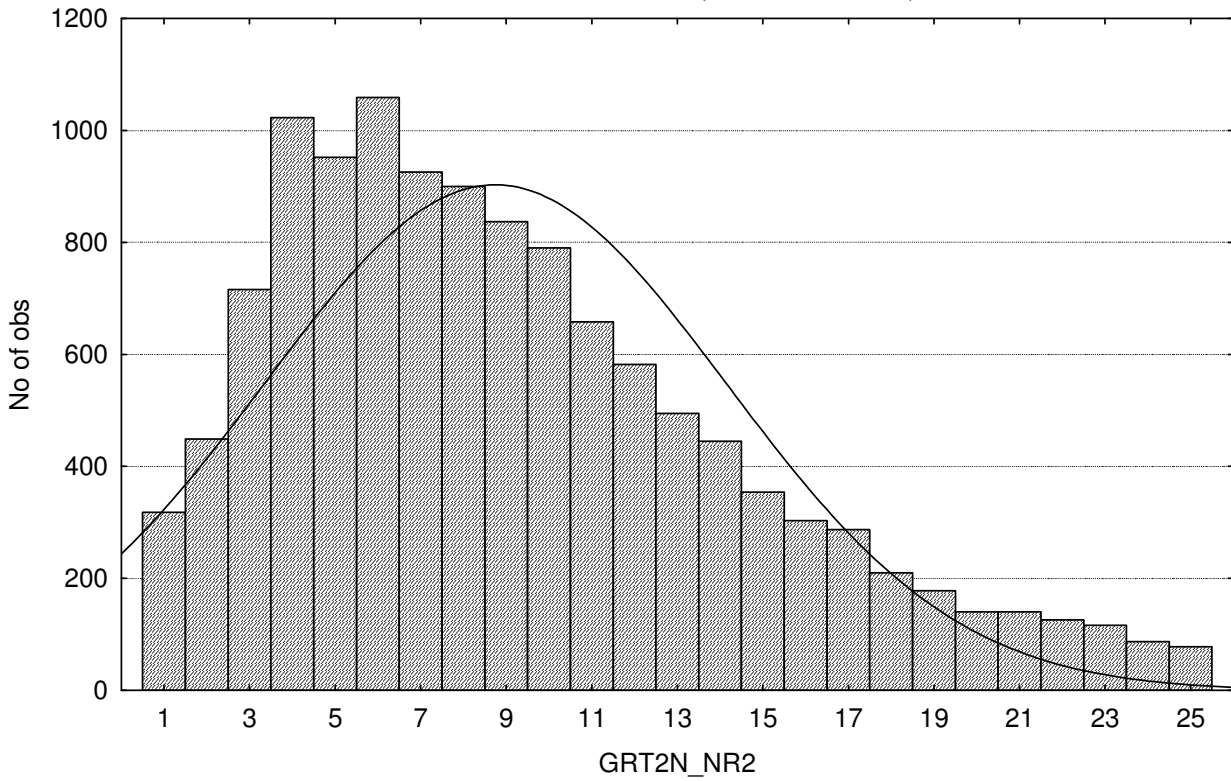
Variable	Descriptive statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Abstract reasoning	13306	12.59530	1.000000	25.00000	5.493227

Histogram of GRT2A\_AR2  
 GRT2 Norms update 2008 scored.sta 111v\*13596c  
 Include condition: GRT2A\_AR2 > 0  
 GRT2A\_AR2 = 13306\*1\*normal(x, 12.5953, 5.4932)



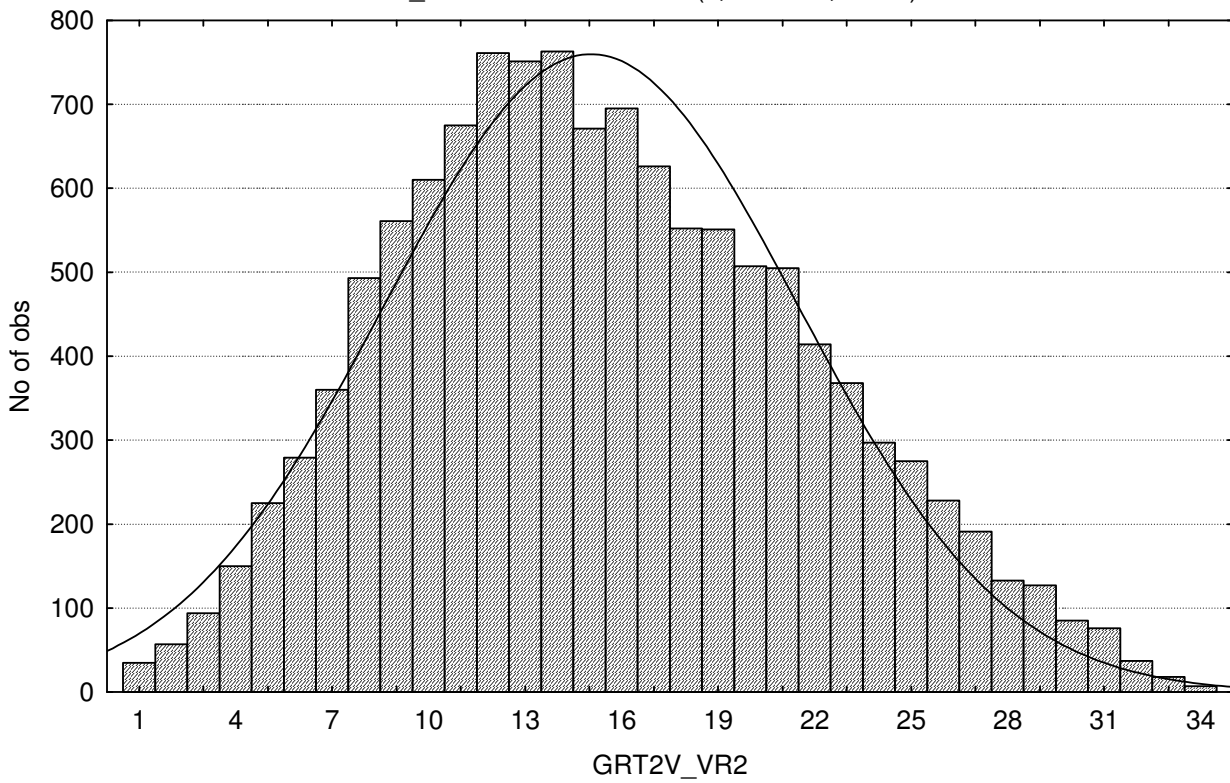
Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Numerical Reasoning	12169	9.202810	1.000000	25.00000	5.376348

Histogram of GRT2N\_NR2  
GRT2 Norms update 2008 scored.sta 111v\*13596c  
Include condition: GRT2N\_NR2 > 0  
GRT2N\_NR2 = 12169\*1\*normal(x, 9.2028, 5.3763)



Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Verbal Reasoning	12177	15.47269	1.000000	34.00000	6.394956

Histogram of GRT2V\_VR2  
GRT2 Norms update 2008 scored.sta 111v\*13596c  
Include condition: GRT2V\_VR2 > 0  
GRT2V\_VR2 = 12177\*1\*normal(x, 15.4727, 6.395)



**Stanine table**

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
<b>Abstract Reasoning</b>	0-2	3-5	6-8	9-11	12-13	14-16	17-19	20-22	23-25
<b>Numerical Reasoning</b>	0-1	0-2	3-5	6-7	8-10	11-13	14-15	16-18	19-25
<b>Verbal Reasoning</b>	0-4	5-7	8-10	11-13	14-17	18-20	21-23	24-26	27-35



# GRT2 Norm Table: South African General Population, updated 2010

## Sample composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery in the period up to February 2010. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

## General Verbal Reasoning test: biographical composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	6310	6310	36.67112	36.6711
M	10838	17148	62.98599	99.6571
Missing	59	17207	0.34288	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1871	1871	10.87348	10.8735
Grade 12	4094	5965	23.79264	34.6661
University Diploma	340	6305	1.97594	36.6421
Degree	880	7185	5.11420	41.7563
Vocational Training	336	7521	1.95269	43.7090
Grade 10 or 11	902	8423	5.24205	48.9510
Grade 8	57	8480	0.33126	49.2823
Grade 9	64	8544	0.37194	49.6542
Grade 7	23	8567	0.13367	49.7879
Post Graduate	426	8993	2.47574	52.2636
Missing	8214	17207	47.73639	100.0000

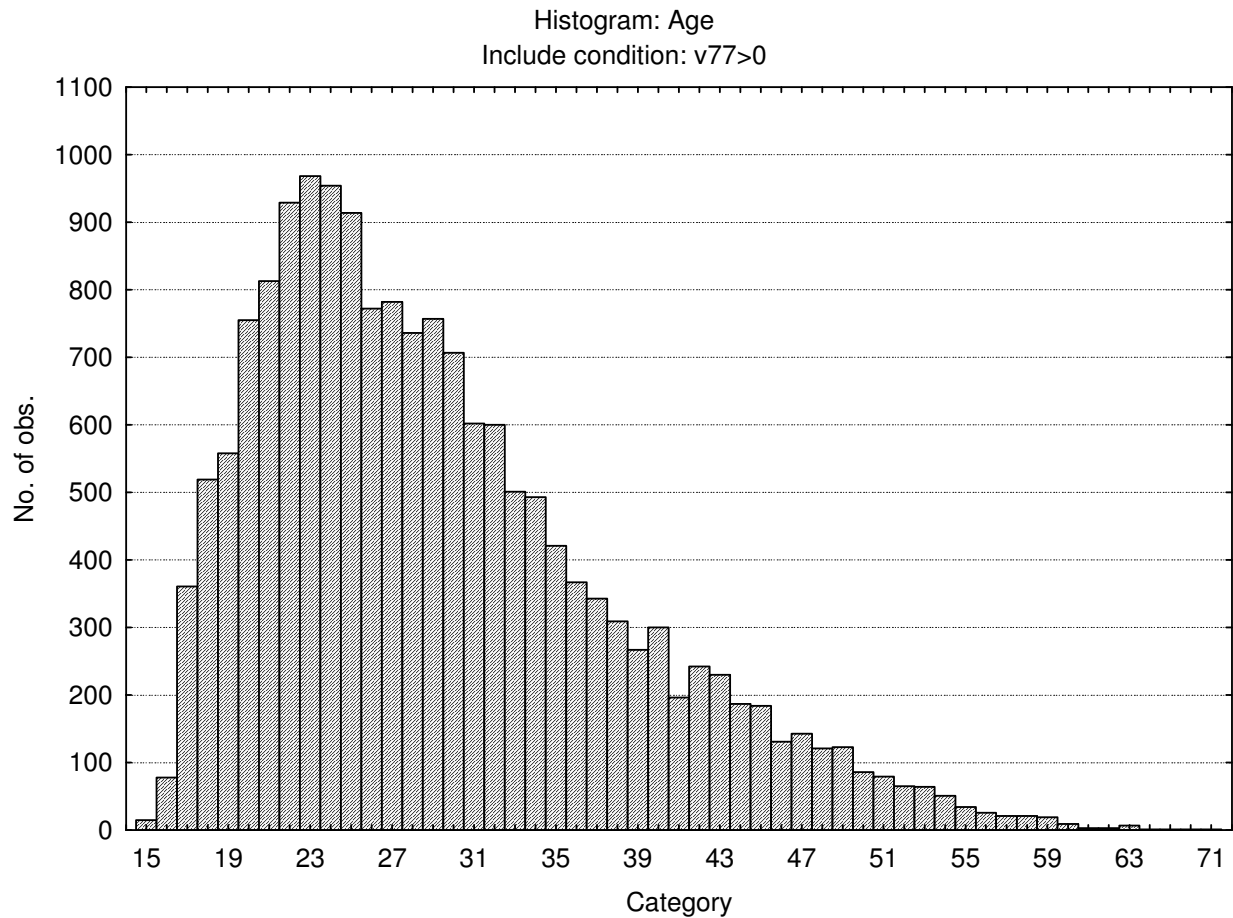
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1901	1901	11.04783	11.0478
English	2714	4615	15.77265	26.8205
Afrikaans	1880	6495	10.92579	37.7463
Setswana	558	7053	3.24287	40.9891
Sesotho	873	7926	5.07352	46.0626
Sepedi	229	8155	1.33085	47.3935
Xitsonga	121	8276	0.70320	48.0967
Tshivenda	66	8342	0.38356	48.4803
siSwati	58	8400	0.33707	48.8173

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiNdebele	32	8432	0.18597	49.0033
isiXhosa	1109	9541	6.44505	55.4484
Missing	7666	17207	44.55164	100.0000

Category	Frequency table: Language group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2714	2714	15.77265	15.7727
Afrikaans	1880	4594	10.92579	26.6984
Indigenous	5032	9626	29.24391	55.9423
Missing	7581	17207	44.05765	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5526	5526	32.11484	32.1148
European	2291	7817	13.31435	45.4292
Coloured	1248	9065	7.25286	52.6820
Asian	891	9956	5.17813	57.8602
Missing	7251	17207	42.13983	100.0000

Variable	Descriptive statistics: age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.31855	8.718063	15.00000	71.00000	16870	337



### General Numerical Reasoning Test: biographical composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	6015	6015	35.84625	35.8462
M	10705	16720	63.79619	99.6424
Missing	60	16780	0.35757	100.0000

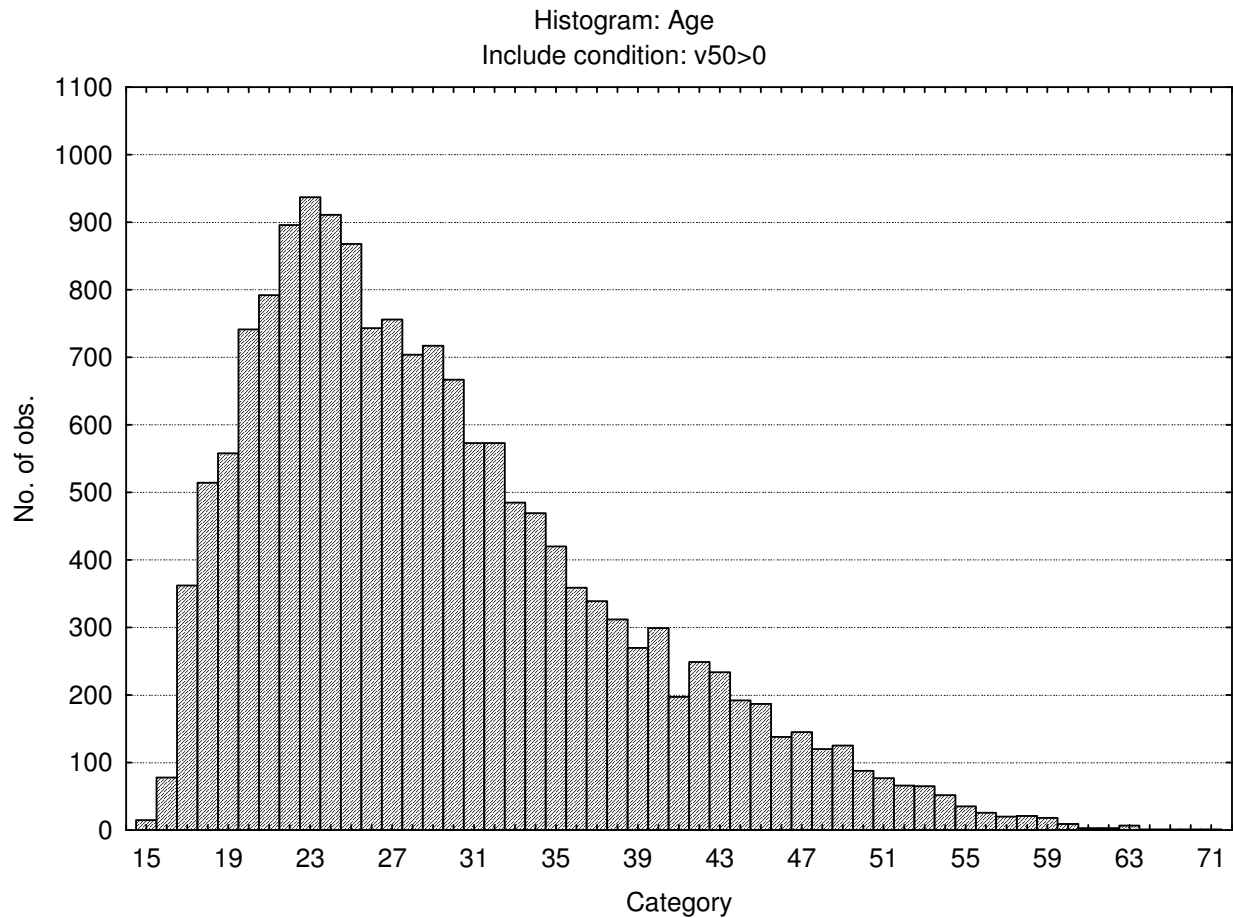
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1863	1863	11.10250	11.1025
Grade 12	4133	5996	24.63051	35.7330
University Diploma	339	6335	2.02026	37.7533
Degree	873	7208	5.20262	42.9559
Vocational Training	331	7539	1.97259	44.9285
Grade 10 or 11	910	8449	5.42312	50.3516
Grade 8	60	8509	0.35757	50.7092

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 9	65	8574	0.38737	51.0965
Grade 7	25	8599	0.14899	51.2455
Post Graduate	415	9014	2.47318	53.7187
Missing	7766	16780	46.28129	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1902	1902	11.33492	11.3349
English	2719	4621	16.20381	27.5387
Afrikaans	1897	6518	11.30513	38.8439
Setswana	560	7078	3.33731	42.1812
Sesotho	874	7952	5.20858	47.3897
Sepedi	229	8181	1.36472	48.7545
Xitsonga	120	8301	0.71514	49.4696
Tshivenda	66	8367	0.39333	49.8629
siSwati	58	8425	0.34565	50.2086
isiNdebele	32	8457	0.19070	50.3993
isiXhosa	1108	9565	6.60310	57.0024
Missing	7215	16780	42.99762	100.0000

Category	Frequency table: Language group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2719	2719	16.20381	16.2038
Afrikaans	1897	4616	11.30513	27.5089
Indigenous	5034	9650	30.00000	57.5089
Missing	7130	16780	42.49106	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5523	5523	32.91418	32.9142
European	2308	7831	13.75447	46.6687
Coloured	1257	9088	7.49106	54.1597
Asian	888	9976	5.29201	59.4517
Missing	6804	16780	40.54827	100.0000



### General Abstract Reasoning Test: biographical composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	6256	6256	34.90682	34.9068
M	11604	17860	64.74724	99.6541
Missing	62	17922	0.34594	100.0000

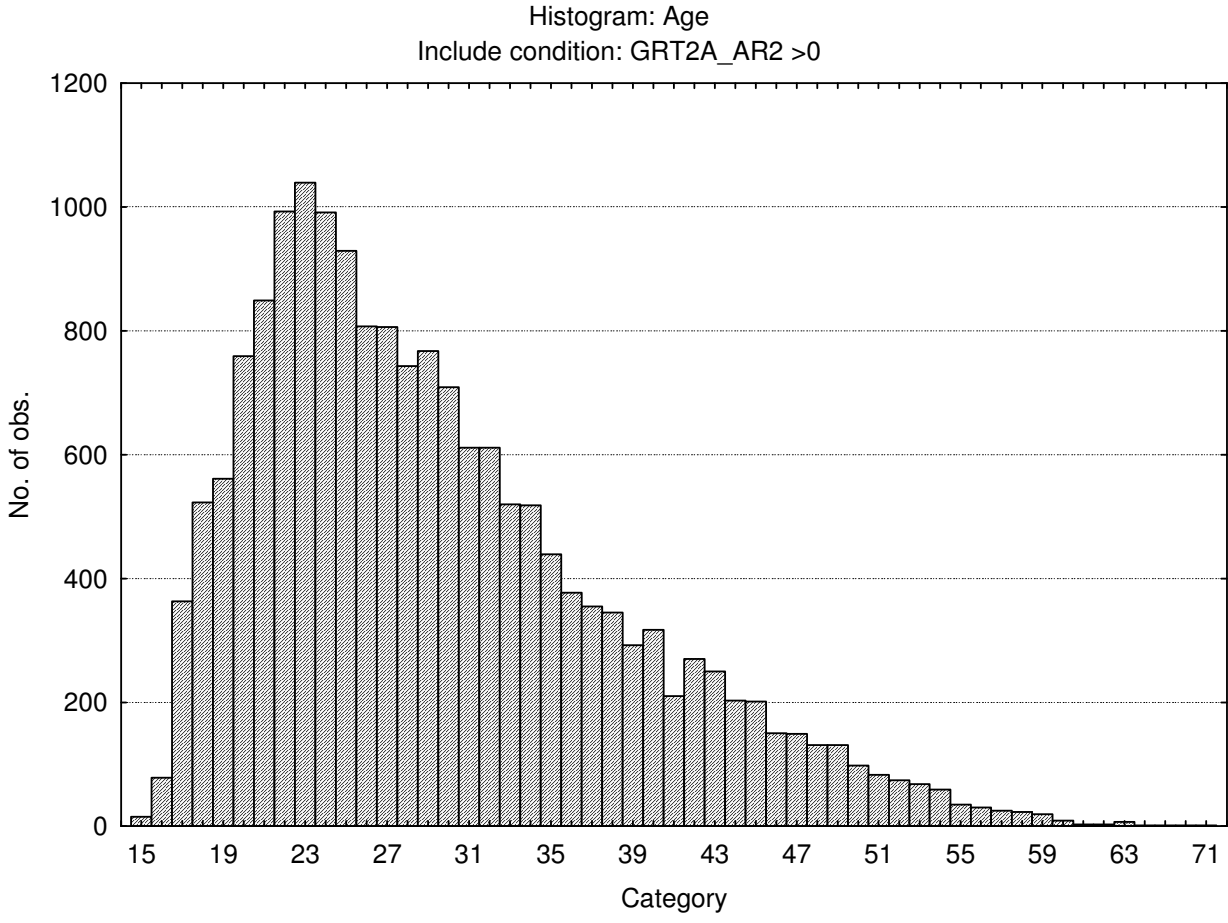
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	2095	2095	11.68954	11.6895
Grade 12	4312	6407	24.05981	35.7494
University Diploma	384	6791	2.14262	37.8920
Degree	1043	7834	5.81966	43.7116
Vocational Training	351	8185	1.95849	45.6701
Grade 10 or 11	919	9104	5.12778	50.7979
Grade 8	59	9163	0.32920	51.1271
Grade 9	66	9229	0.36826	51.4954
Grade 7	22	9251	0.12275	51.6181

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Post Graduate	592	9843	3.30320	54.9213
Missing	8079	17922	45.07867	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2047	2047	11.42172	11.4217
English	3234	5281	18.04486	29.4666
Afrikaans	1972	7253	11.00324	40.4698
Setswana	586	7839	3.26972	43.7395
Sesotho	916	8755	5.11104	48.8506
Sepedi	238	8993	1.32798	50.1786
Xitsonga	136	9129	0.75884	50.9374
Tshivenda	70	9199	0.39058	51.3280
siSwati	63	9262	0.35152	51.6795
isiNdebele	33	9295	0.18413	51.8636
isiXhosa	1176	10471	6.56177	58.4254
Missing	7451	17922	41.57460	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3234	3234	18.04486	18.0449
Afrikaans	1972	5206	11.00324	29.0481
Indigenous	5350	10556	29.85158	58.8997
Missing	7366	17922	41.10032	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5868	5868	32.74188	32.7419
European	2566	8434	14.31760	47.0595
Coloured	1302	9736	7.26481	54.3243
Asian	1166	10902	6.50597	60.8303
Missing	7020	17922	39.16974	100.0000



**Descriptive statistics on General Reasoning Test Battery subtests:**

Variable	Descriptive statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning	15.11263	6.131638	1.000000	34.00000	17207	0
General Verbal Reasoning items attempted	27.41442	6.739536	1.000000	35.00000	17207	0
General Numerical Reasoning	8.98518	5.209826	1.000000	25.00000	16667	113
General Numerical Reasoning items attempted	15.75089	5.402445	1.000000	25.00000	16780	0
General Abstract Reasoning	12.54832	5.406198	1.000000	25.00000	17922	0
General Abstract Reasoning items attempted	21.10350	4.317236	2.000000	25.00000	17922	0

**Stanine table**

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	1-4	5-7	8-10	11-13	14-16	17-19	20-22	23-25	26-34
General Verbal Items Attempted	1-15	16-18	19-22	23-25	26-29	30-32	33-35		
General Numerical Reasoning	1-0	1-2	3-5	6-7	8-10	11-12	13-15	16-18	19-25
General Numerical Items Attempted	1-6	7-8	9-11	12-14	15-17	18-19	20-22	23-25	
General Abstract Reasoning	1-3	4-5	6-8	9-11	12-13	14-16	17-19	20-22	23-25
General Abstract Items Attempted	2-13	14-15	16-17	18-20	21-22	23-24	25-25		

# General Reasoning Test Battery Norm Group: South Africans, race European, updated 2011

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## Characteristics of the sample

The sample consisted of South Africans of European race, tested by Psytech SA and collaborators in the period up to February 2011. Biographical particulars are reported separately for the different subtests of the GRT2, since not all respondents completed the entire battery.

## Biographical Characteristics: respondents who completed the Verbal Reasoning Test

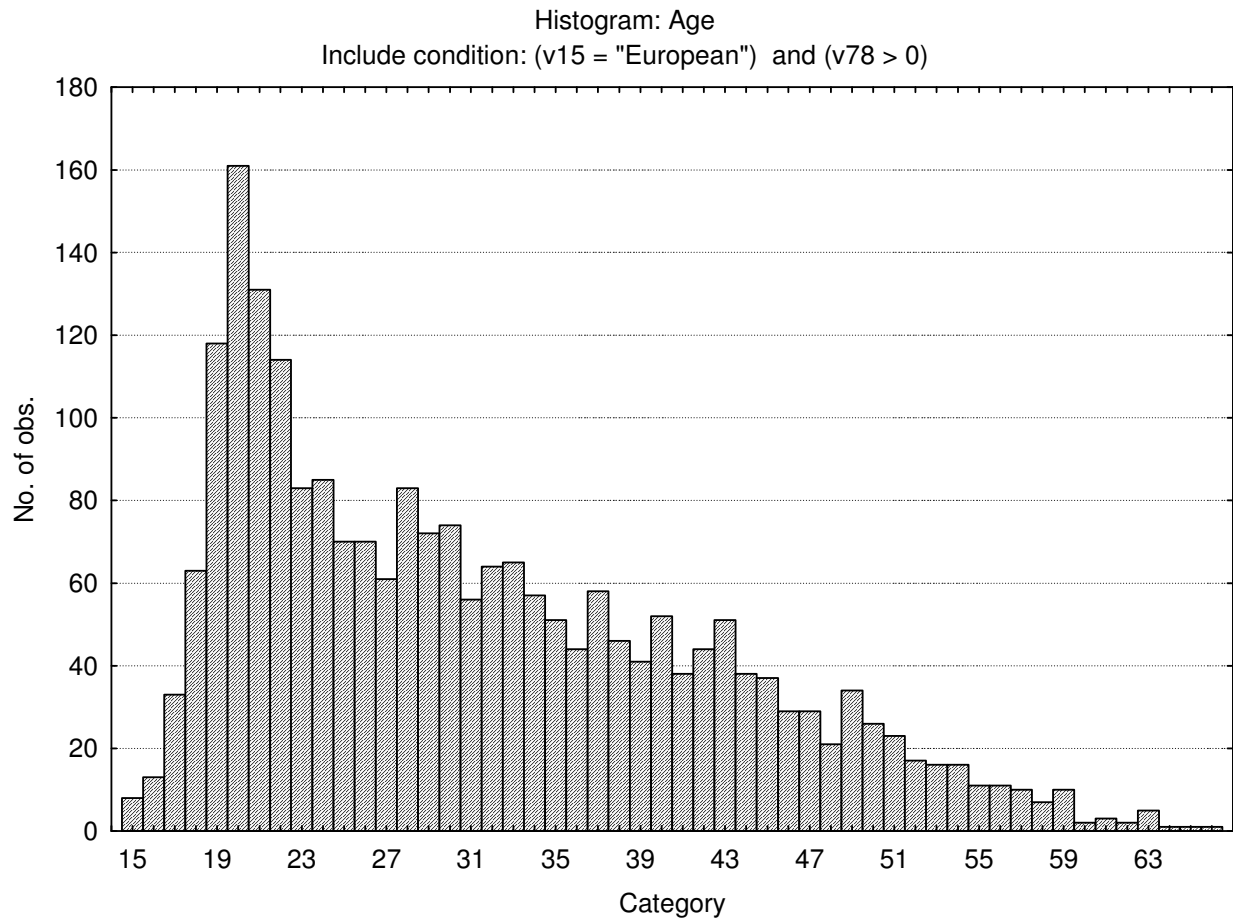
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	837	837	36.53426	36.5343
M	1447	2284	63.16019	99.6945
Missing	7	2291	0.30554	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	302	302	13.18202	13.1820
Grade 12	1033	1335	45.08948	58.2715
University Diploma	88	1423	3.84112	62.1126
Degree	179	1602	7.81318	69.9258
Vocational Training	66	1668	2.88084	72.8066
Grade 10 or 11	132	1800	5.76168	78.5683
Grade 8	2	1802	0.08730	78.6556
Grade 9	6	1808	0.26189	78.9175
Post Graduate	89	1897	3.88477	82.8023
Missing	394	2291	17.19773	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2	2	0.08730	0.0873
English	870	872	37.97468	38.0620
Afrikaans	1305	2177	56.96203	95.0240
Setswana	1	2178	0.04365	95.0677
Sesotho	1	2179	0.04365	95.1113
Sepedi	3	2182	0.13095	95.2423
isiXhosa	5	2187	0.21825	95.4605
Missing	104	2291	4.53950	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	870	870	37.97468	37.9747
Afrikaans	1305	2175	56.96203	94.9367
Indigenous	12	2187	0.52379	95.4605
Missing	104	2291	4.53950	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.23316	10.79142	15.00000	71.00000	2256	35



### Biographical characteristics: respondents who completed the Numerical Reasoning Test

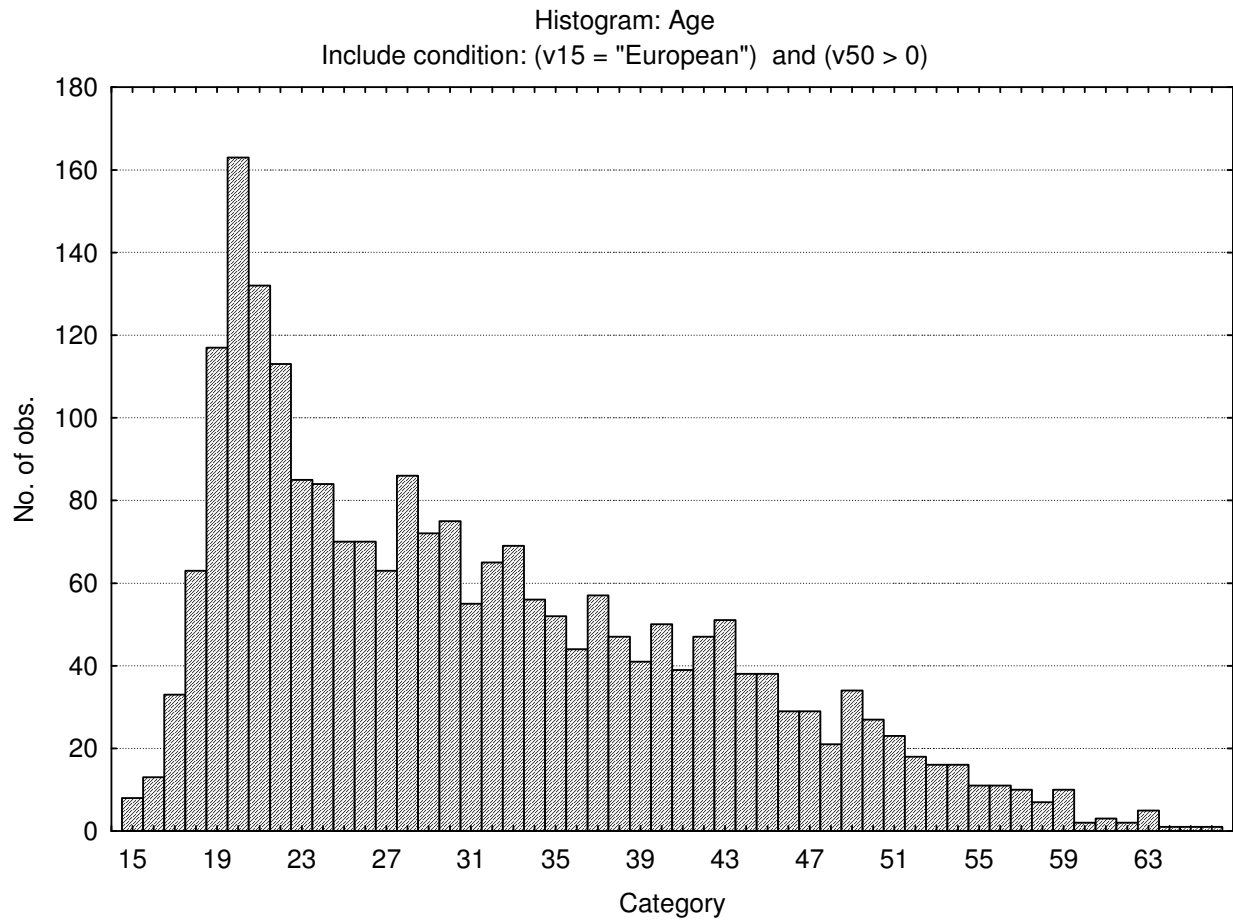
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	842	842	36.48180	36.4818
M	1459	2301	63.21490	99.6967
Missing	7	2308	0.30329	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	302	302	13.08492	13.0849
Grade 12	1045	1347	45.27730	58.3622
University Diploma	89	1436	3.85615	62.2184
Degree	178	1614	7.71231	69.9307
Vocational Training	66	1680	2.85962	72.7903
Grade 10 or 11	133	1813	5.76256	78.5529
Grade 8	2	1815	0.08666	78.6395
Grade 9	6	1821	0.25997	78.8995
Post Graduate	86	1907	3.72617	82.6256
Missing	401	2308	17.37435	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2	2	0.08666	0.0867
English	879	881	38.08492	38.1716
Afrikaans	1308	2189	56.67244	94.8440
Setswana	1	2190	0.04333	94.8873
Sesotho	1	2191	0.04333	94.9307
Sepedi	3	2194	0.12998	95.0607
isiXhosa	5	2199	0.21664	95.2773
Missing	109	2308	4.72270	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	879	879	38.08492	38.0849
Afrikaans	1308	2187	56.67244	94.7574
Indigenous	12	2199	0.51993	95.2773
Missing	109	2308	4.72270	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.25429	10.78301	15.00000	71.00000	2273	35



### Biographical characteristics: Respondents who completed the Abstract Reasoning Test

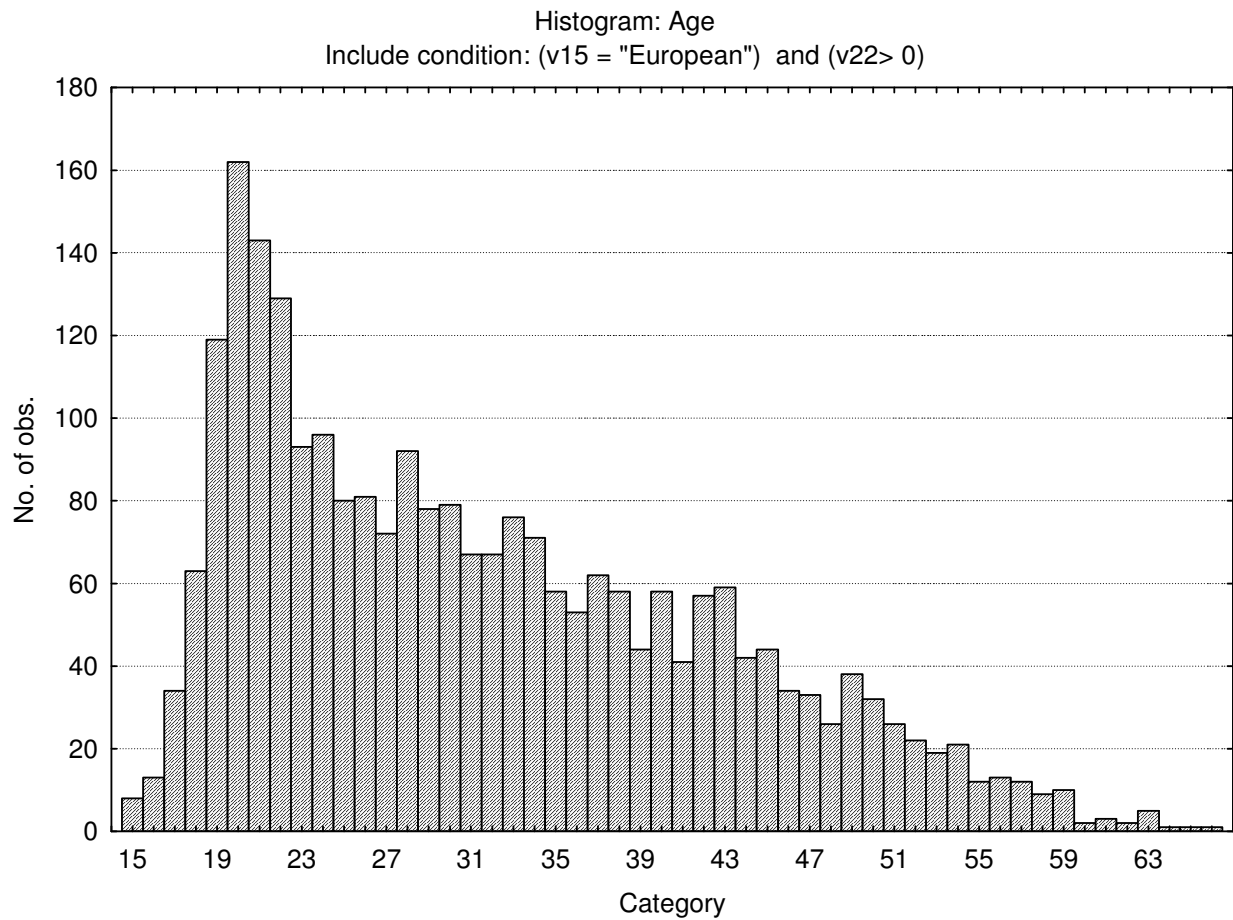
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	892	892	34.73520	34.7352
M	1668	2560	64.95327	99.6885
Missing	8	2568	0.31153	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	346	346	13.47352	13.4735
Grade 12	1107	1453	43.10748	56.5810
University Diploma	99	1552	3.85514	60.4361
Degree	225	1777	8.76168	69.1978
Vocational Training	67	1844	2.60903	71.8069
Grade 10 or 11	142	1986	5.52960	77.3364
Grade 8	2	1988	0.07788	77.4143
Grade 9	7	1995	0.27259	77.6869
Post Graduate	132	2127	5.14019	82.8271
Missing	441	2568	17.17290	100.0000

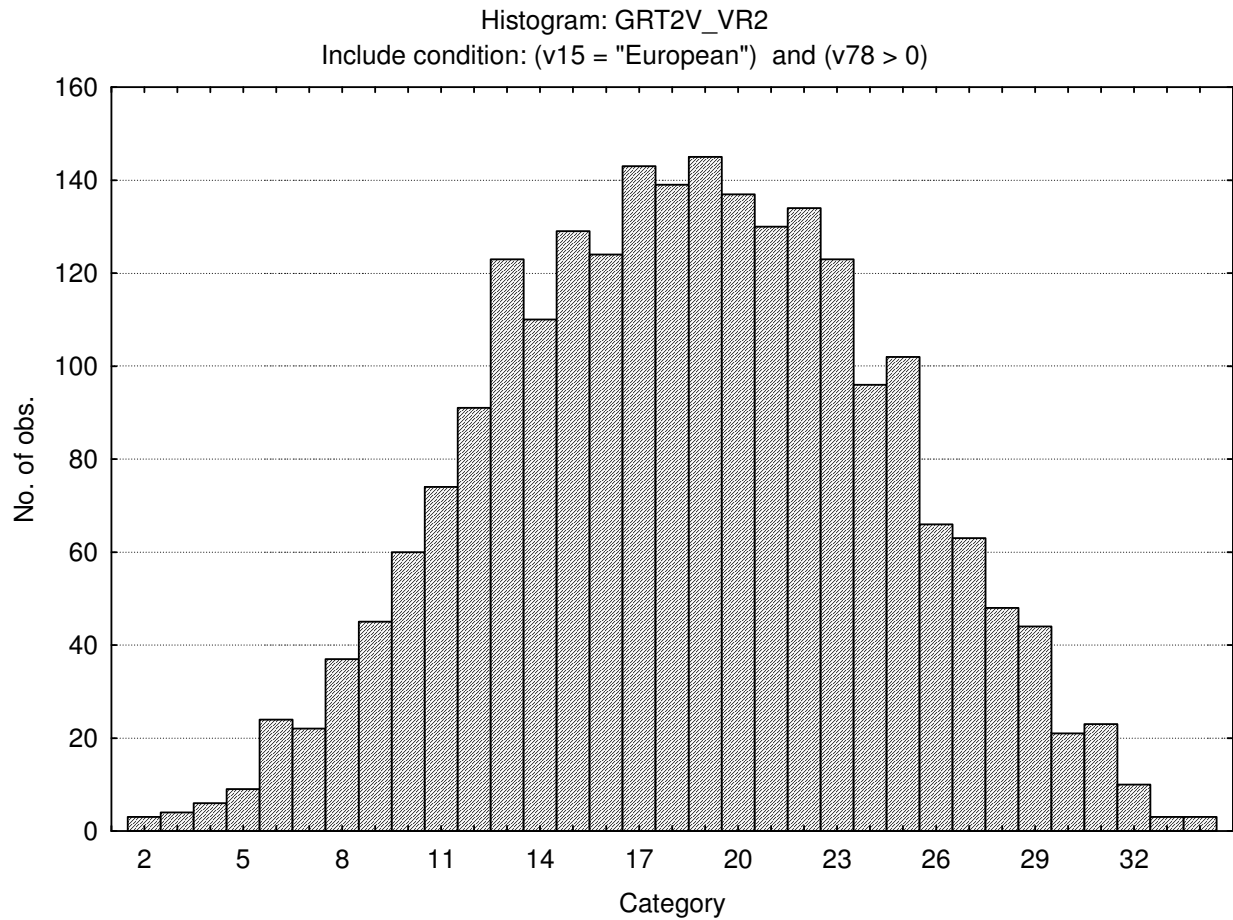
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2	2	0.07788	0.0779
English	1061	1063	41.31620	41.3941
Afrikaans	1382	2445	53.81620	95.2103
Setswana	1	2446	0.03894	95.2492
Sesotho	2	2448	0.07788	95.3271
Sepedi	4	2452	0.15576	95.4829
siSwati	1	2453	0.03894	95.5218
isiXhosa	6	2459	0.23364	95.7555
Missing	109	2568	4.24455	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	1061	1061	41.31620	41.3162
Afrikaans	1382	2443	53.81620	95.1324
Indigenous	16	2459	0.62305	95.7555
Missing	109	2568	4.24455	100.0000

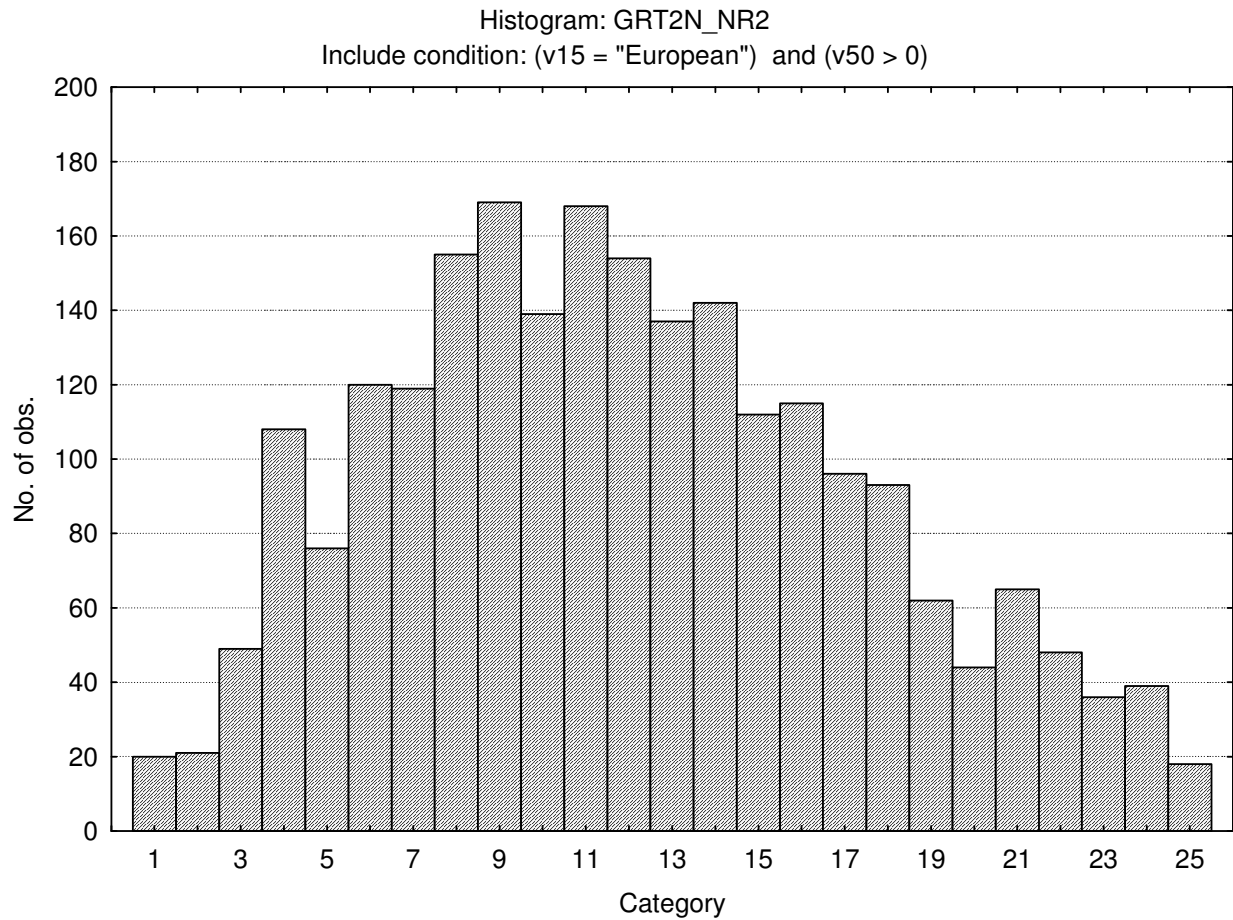
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.61682	10.78160	15.00000	71.00000	2521	47



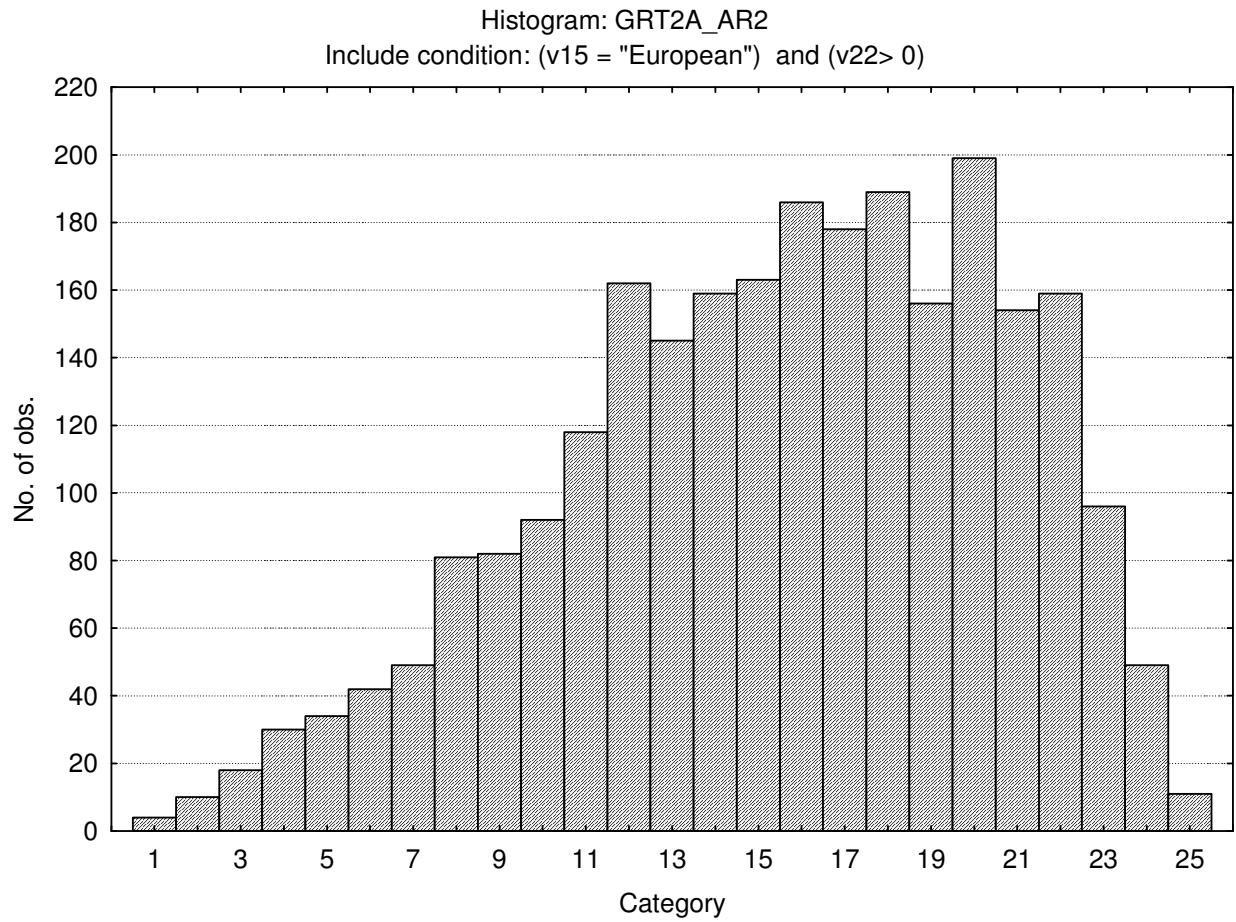
Variable	Descriptive Statistics: General Verbal Reasoning Test					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning	18.48101	5.909652	2.00000	34.00000	2291	0
Number of items attempted	29.27979	5.573787	10.00000	35.00000	2291	0



Variable	Descriptive Statistics: General Numerical Reasoning Test					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning	12.02126	5.487437	1.000000	25.00000	2305	3
Number of items attempted	17.56716	4.930404	1.000000	25.00000	2308	0



Variable	Descriptive Statistics : General Abstract Reasoning Test					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	15.51286	5.068078	1.000000	25.00000	2566	2
Number of items attempted	22.39369	3.616554	4.000000	25.00000	2568	0



## Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	2-8	9-11	12-14	15-17	18-19	20-22	23-25	26-28	29-34
General Verbal Items Attempted	10-19	20-22	23-25	26-27	28-30	31-33	34-35		
General Numerical Reasoning	1-2	3-5	6-7	8-10	11-13	14-16	17-18	19-21	22-25
General Numerical Items Attempted	1-8	9-11	12-13	14-16	17-18	19-21	22-23	24-25	
General Abstract Reasoning	1-6	7-9	10-11	12-14	15-16	17-19	20-21	22-24	25-25
General Abstract Items Attempted	4-16	17-17	18-19	20-21	22-23	24-25			

# General Reasoning Test Battery Norm group: South Africans, race African, updated 2011

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## Sample composition

The sample consisted of South Africans of African race who were tested by Psytech South Africa and collaborators during the period up to February 2011. Since not all respondents completed all the subtests of the General Reasoning Test Battery, the biographical characteristics are reported separately for the Verbal, Numerical and Abstract Reasoning tests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1608	1608	29.02527	29.0253
M	3914	5522	70.64982	99.6751
Missing	18	5540	0.32491	100.0000

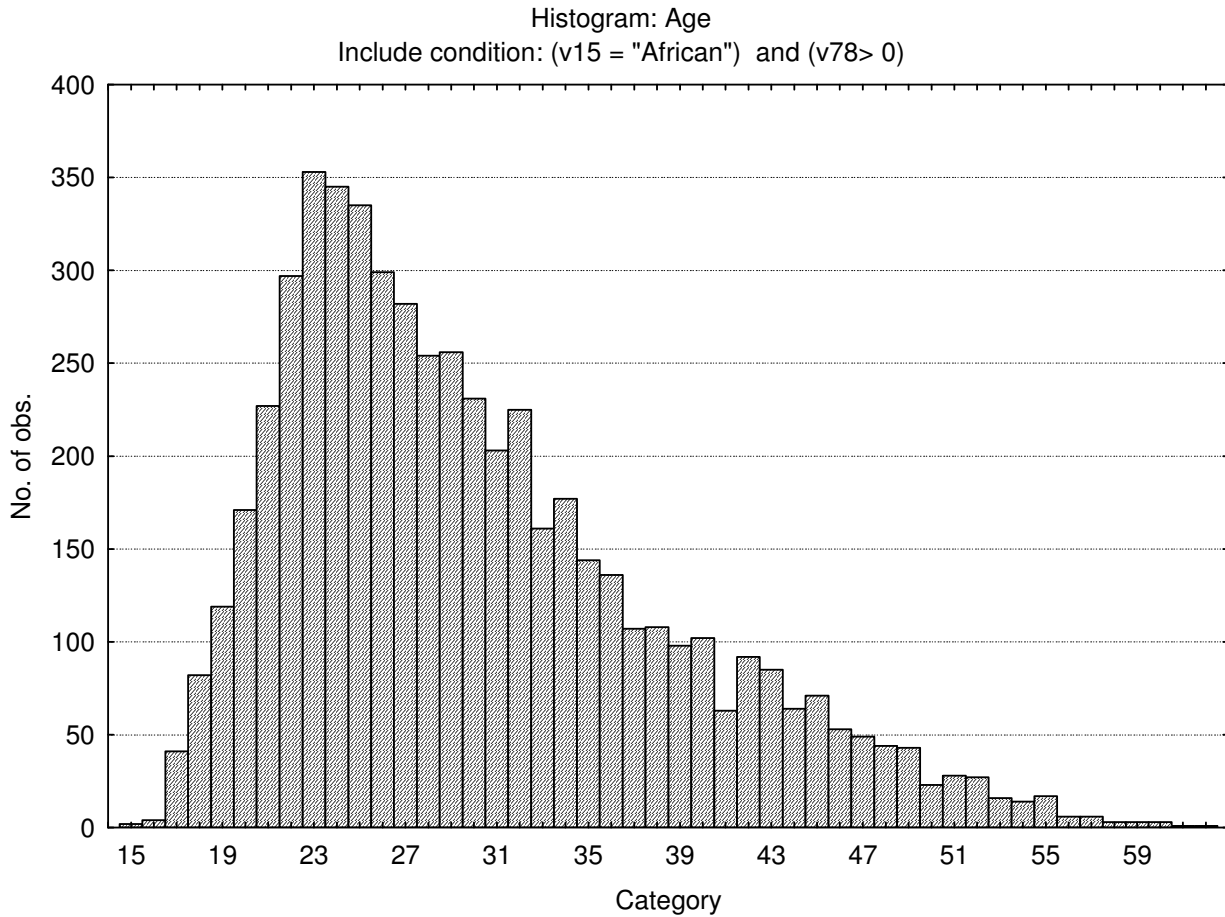
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1227	1227	22.14801	22.1480
Grade 12	1866	3093	33.68231	55.8303
University Diploma	182	3275	3.28520	59.1155
Degree	433	3708	7.81588	66.9314
Vocational Training	177	3885	3.19495	70.1264
Grade 10 or 11	546	4431	9.85560	79.9819
Grade 8	52	4483	0.93863	80.9206
Grade 9	48	4531	0.86643	81.7870
Grade 7	22	4553	0.39711	82.1841
Post Graduate	205	4758	3.70036	85.8845
Missing	782	5540	14.11552	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1883	1883	33.98917	33.9892
English	235	2118	4.24188	38.2310
Afrikaans	63	2181	1.13718	39.3682
Setswana	547	2728	9.87365	49.2419
Sesotho	870	3598	15.70397	64.9458
Sepedi	224	3822	4.04332	68.9892
Xitsonga	121	3943	2.18412	71.1733
Tshivenda	66	4009	1.19134	72.3646
siSwati	57	4066	1.02888	73.3935
isiNdebele	31	4097	0.55957	73.9531
isiXhosa	1080	5177	19.49458	93.4477
Missing	363	5540	6.55235	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	235	235	4.24188	4.2419
Afrikaans	63	298	1.13718	5.3791
Indigenous	4921	5219	88.82671	94.2058
Missing	321	5540	5.79422	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5540	5540	100.0000	100.0000
Missing	0	5540	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.07439	8.349547	15.00000	69.00000	5471	69



**Sample composition: General Numerical Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1589	1589	28.77060	28.7706
M	3917	5506	70.92160	99.6922
Missing	17	5523	0.30780	100.0000

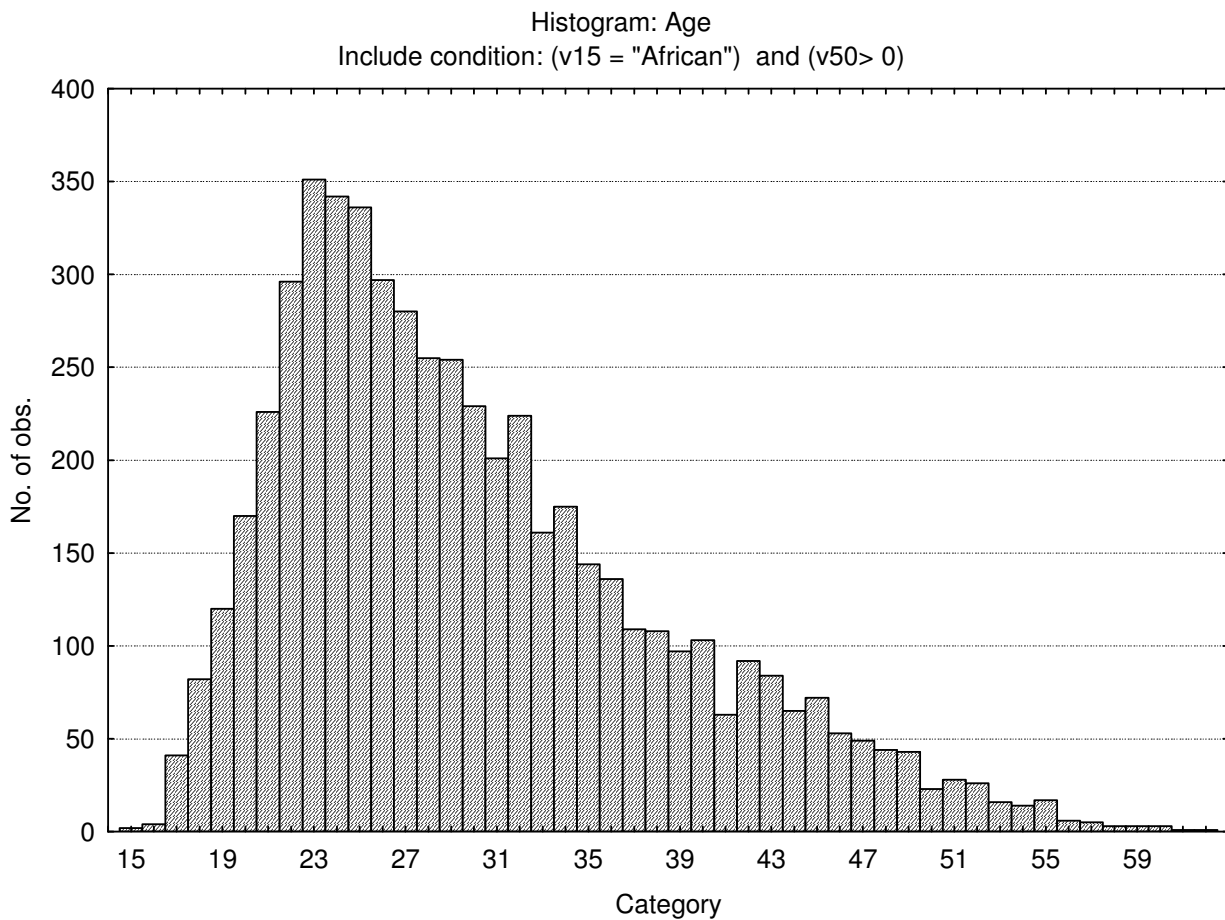
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1218	1218	22.05323	22.0532
Grade 12	1865	3083	33.76788	55.8211
University Diploma	180	3263	3.25910	59.0802
Degree	431	3694	7.80373	66.8839
Vocational Training	173	3867	3.13236	70.0163
Grade 10 or 11	549	4416	9.94025	79.9565
Grade 8	52	4468	0.94152	80.8981
Grade 9	49	4517	0.88720	81.7853
Grade 7	23	4540	0.41644	82.2017
Post Graduate	200	4740	3.62122	85.8229
Missing	783	5523	14.17708	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1878	1878	34.00326	34.0033
English	234	2112	4.23683	38.2401
Afrikaans	62	2174	1.12258	39.3627
Setswana	548	2722	9.92214	49.2848
Sesotho	867	3589	15.69799	64.9828
Sepedi	224	3813	4.05577	69.0386
Xitsonga	120	3933	2.17273	71.2113
Tshivenda	65	3998	1.17690	72.3882
siSwati	57	4055	1.03205	73.4202
isiNdebele	31	4086	0.56129	73.9815
isiXhosa	1076	5162	19.48217	93.4637
Missing	361	5523	6.53630	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	234	234	4.23683	4.2368
Afrikaans	62	296	1.12258	5.3594
Indigenous	4908	5204	88.86475	94.2242
Missing	319	5523	5.77585	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5523	5523	100.0000	100.0000
Missing	0	5523	0.0000	100.0000

Variable	Descriptive Statistics: Age					N	No. cases Missing
	Mean	Std.Dev	Minimum	Maximum			
Age	30.07957	8.348953	15.00000	69.00000		5454	69



### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1685	1685	28.60295	28.6030
M	4188	5873	71.09150	99.6944
Missing	18	5891	0.30555	100.0000



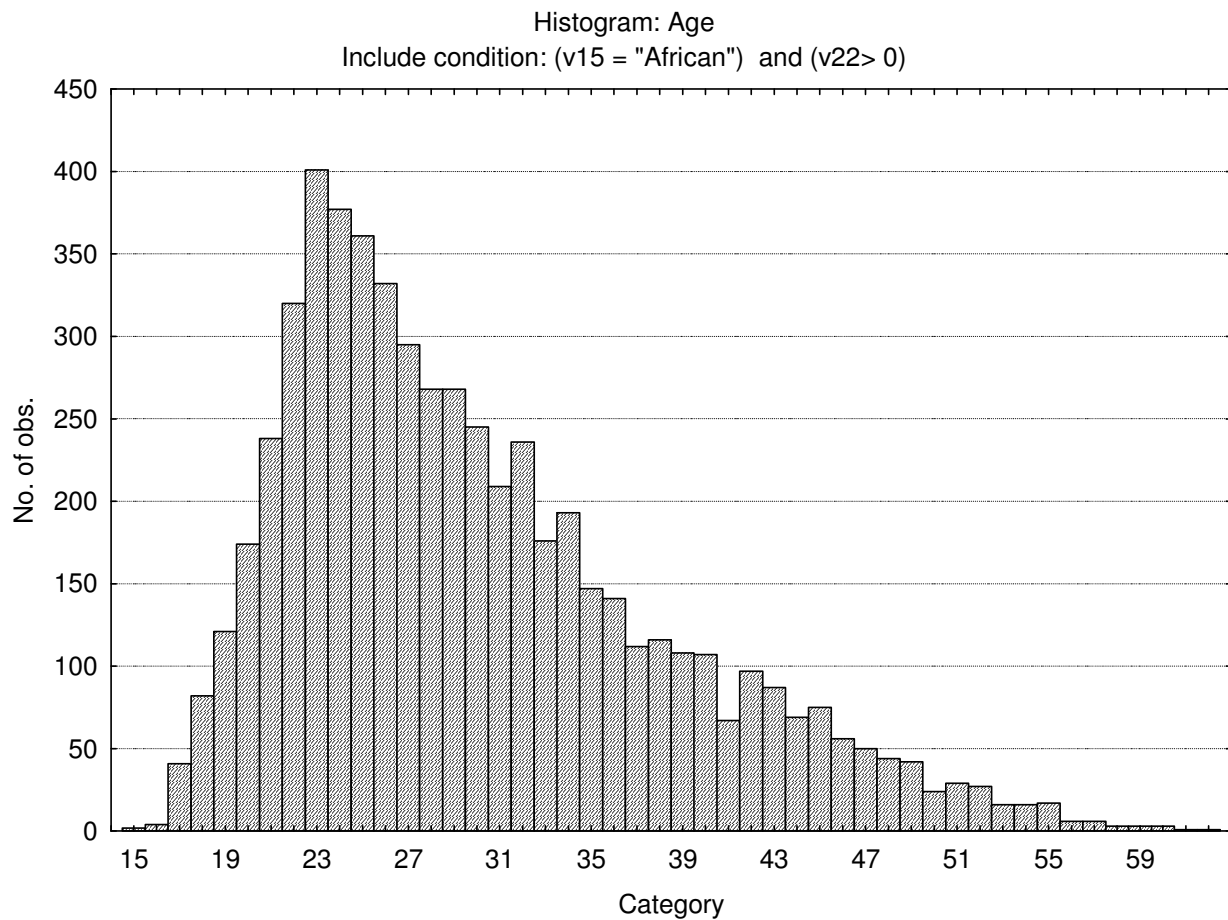
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1346	1346	22.84841	22.8484
Grade 12	1931	3277	32.77882	55.6272
University Diploma	206	3483	3.49686	59.1241
Degree	476	3959	8.08012	67.2042
Vocational Training	189	4148	3.20828	70.4125
Grade 10 or 11	554	4702	9.40418	79.8167
Grade 8	53	4755	0.89968	80.7163
Grade 9	50	4805	0.84875	81.5651
Grade 7	23	4828	0.39043	81.9555
Post Graduate	260	5088	4.41351	86.3690
Missing	803	5891	13.63096	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2037	2037	34.57817	34.5782
English	252	2289	4.27771	38.8559
Afrikaans	65	2354	1.10338	39.9593
Setswana	574	2928	9.74368	49.7029
Sesotho	912	3840	15.48124	65.1842
Sepedi	232	4072	3.93821	69.1224
Xitsonga	137	4209	2.32558	71.4480
Tshivenda	70	4279	1.18825	72.6362
siSwati	60	4339	1.01850	73.6547
isiNdebele	32	4371	0.54320	74.1979
isiXhosa	1143	5514	19.40248	93.6004
Missing	377	5891	6.39959	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	252	252	4.27771	4.2777
Afrikaans	65	317	1.10338	5.3811
Indigenous	5239	5556	88.93227	94.3134
Missing	335	5891	5.68664	100.0000

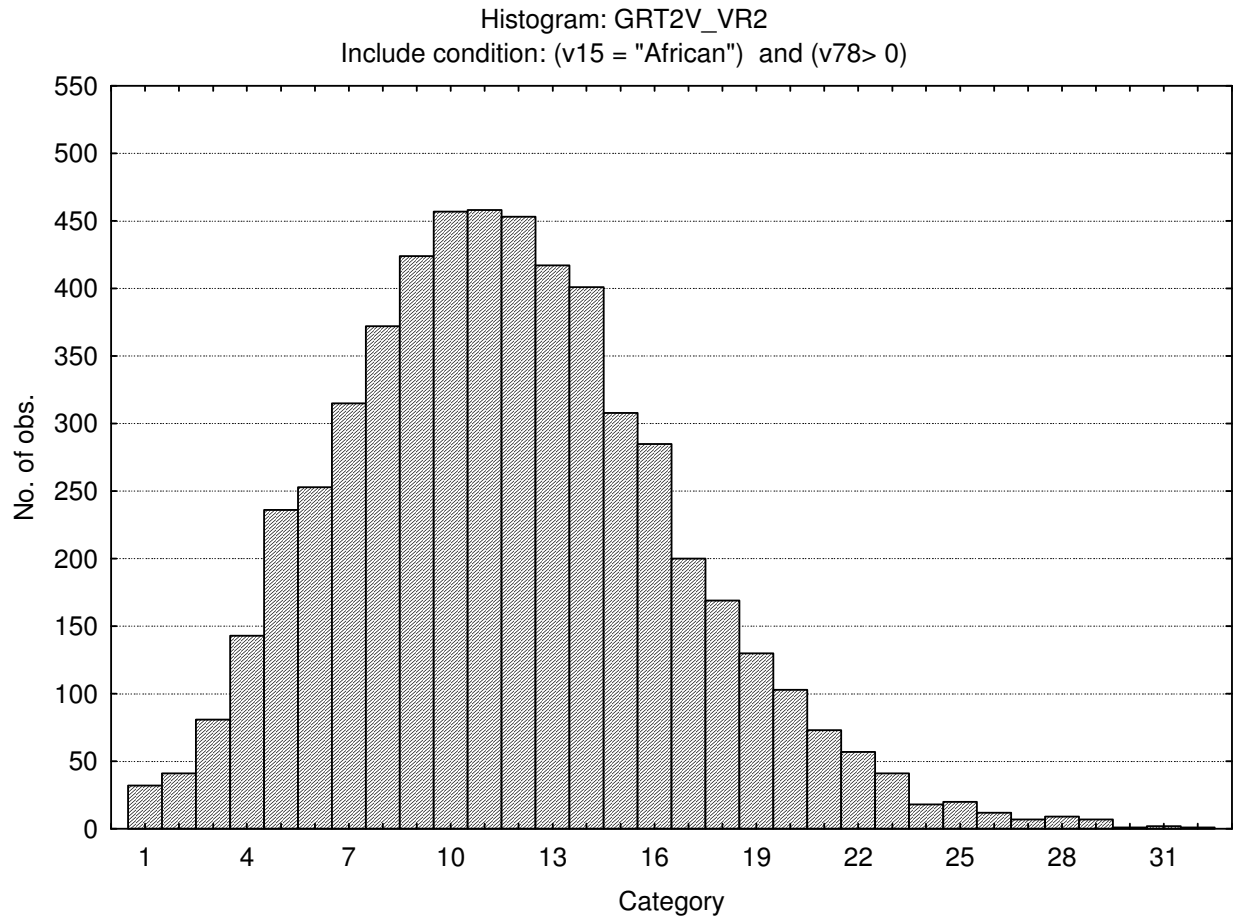
Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5891	5891	100.0000	100.0000
Missing	0	5891	0.0000	100.0000

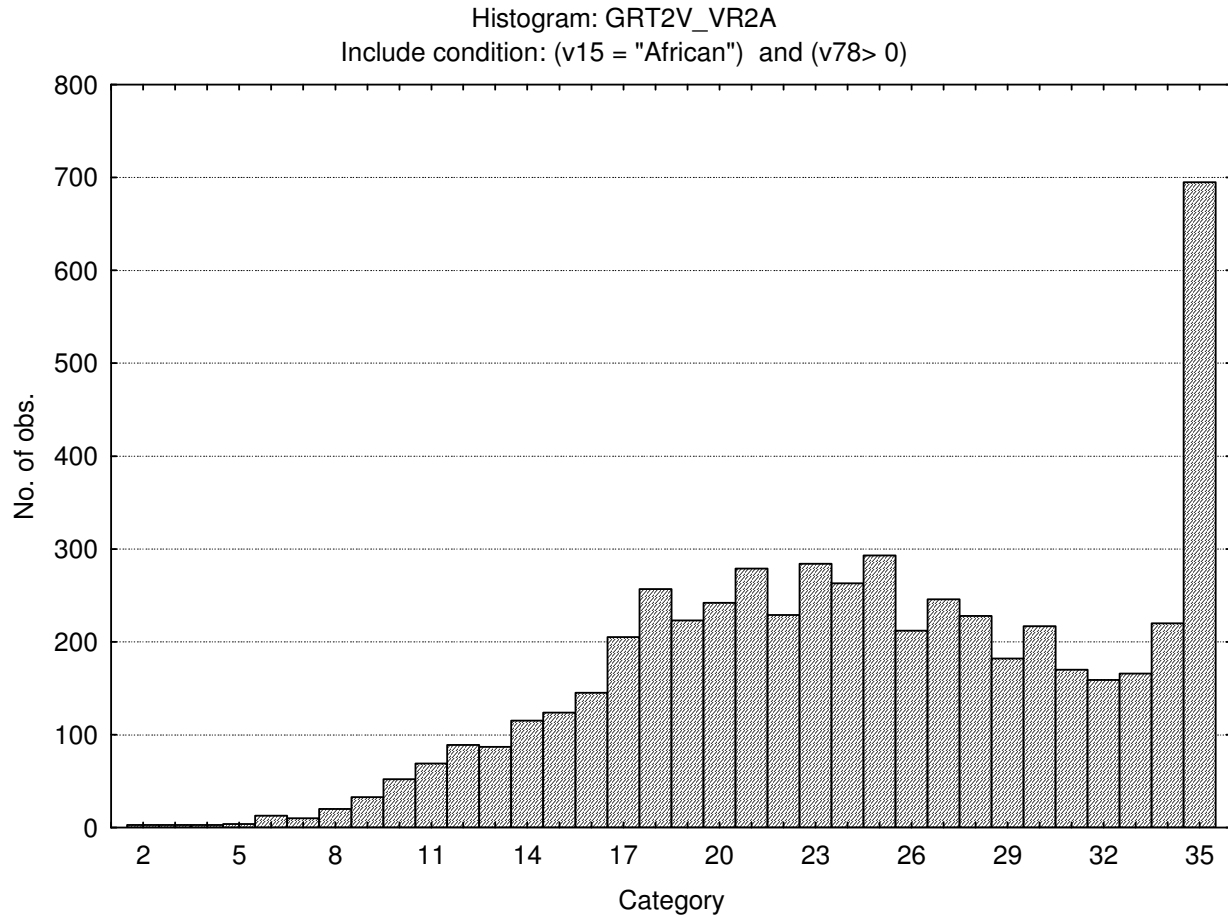
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.00327	8.275381	15.00000	69.00000	5813	78



### Descriptive statistics and frequency distribution: Verbal Reasoning Test

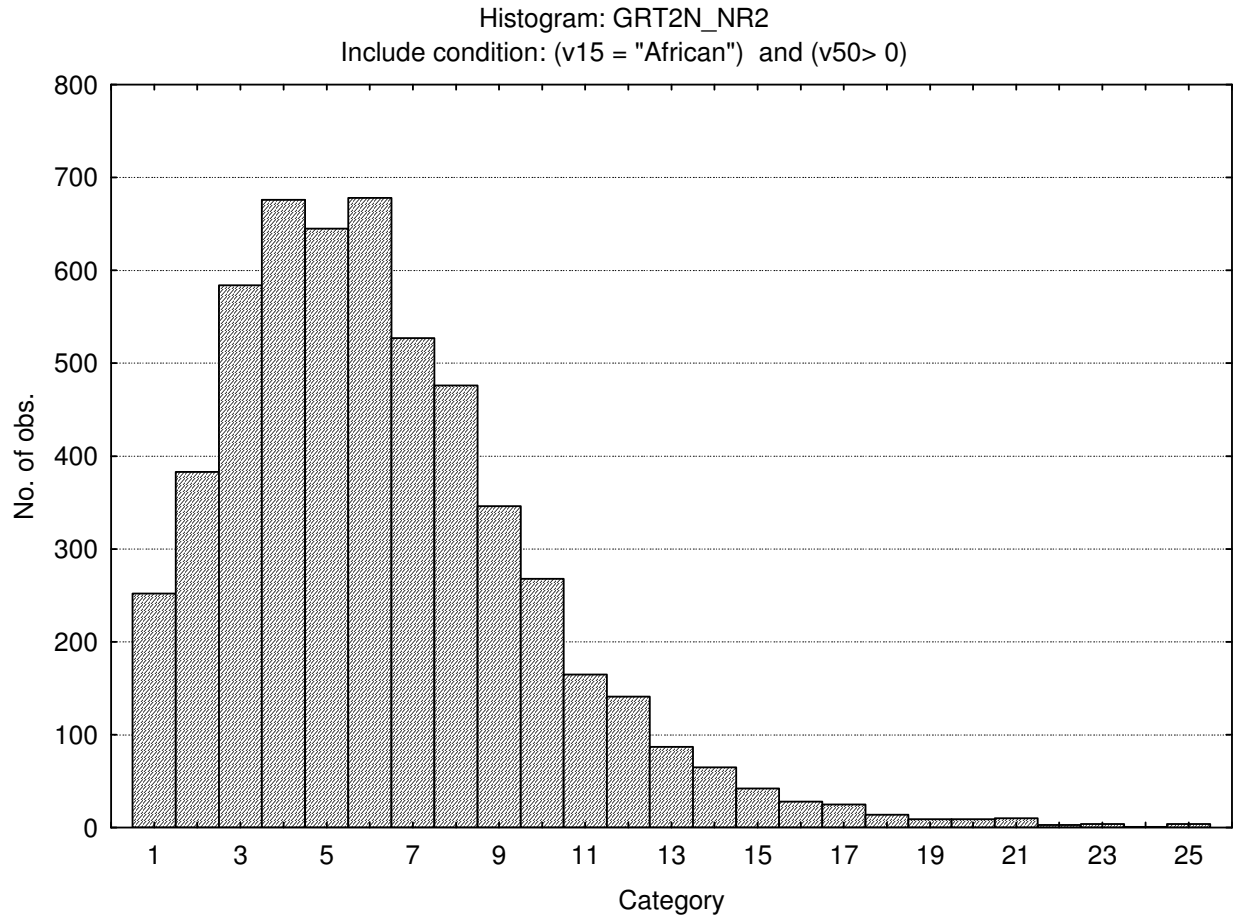
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Verbal Reasoning	11.68983	4.840260	1.000000	33.00000	5526
General Verbal Reasoning Items Attempted	24.57419	7.224841	2.000000	35.00000	5540

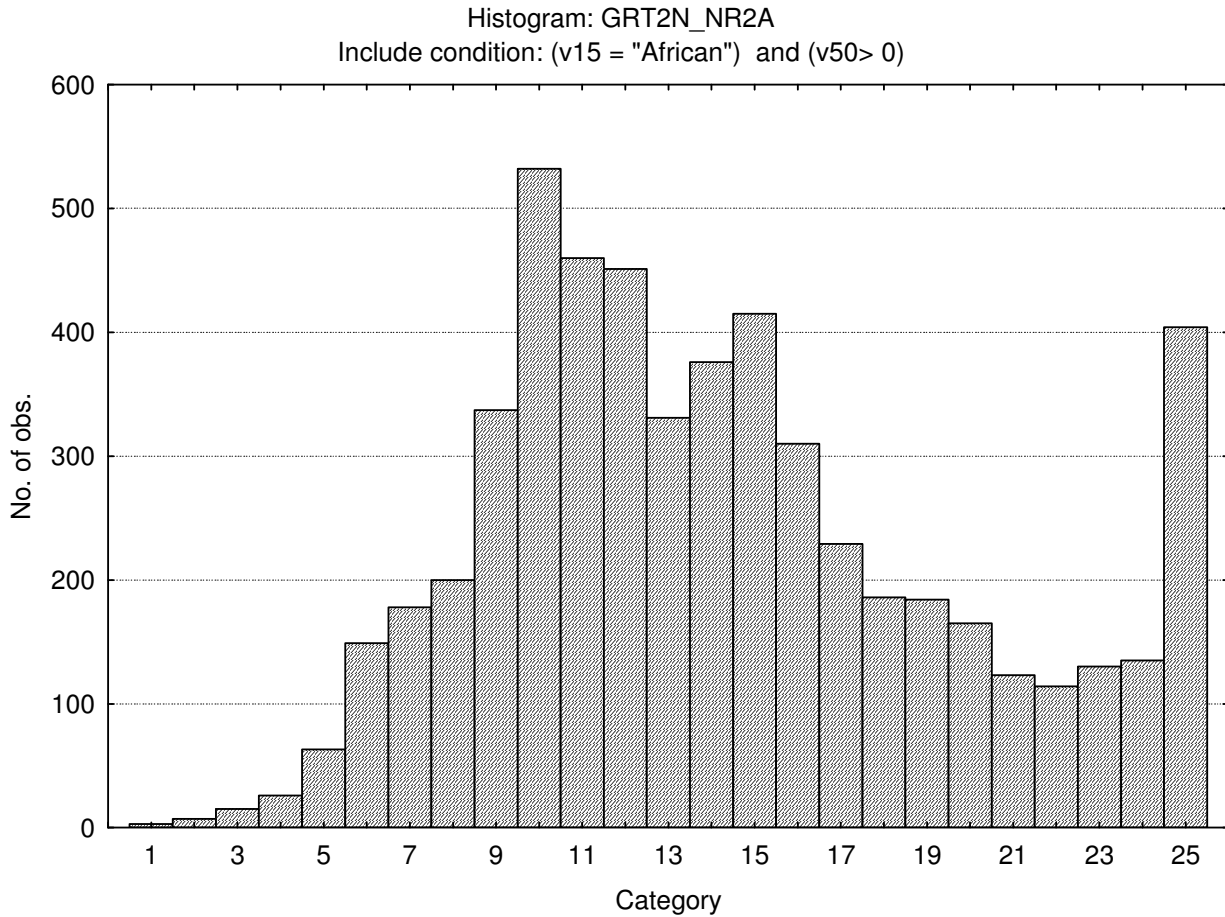




### Descriptive statistics and frequency distribution: General Numerical Reasoning Test

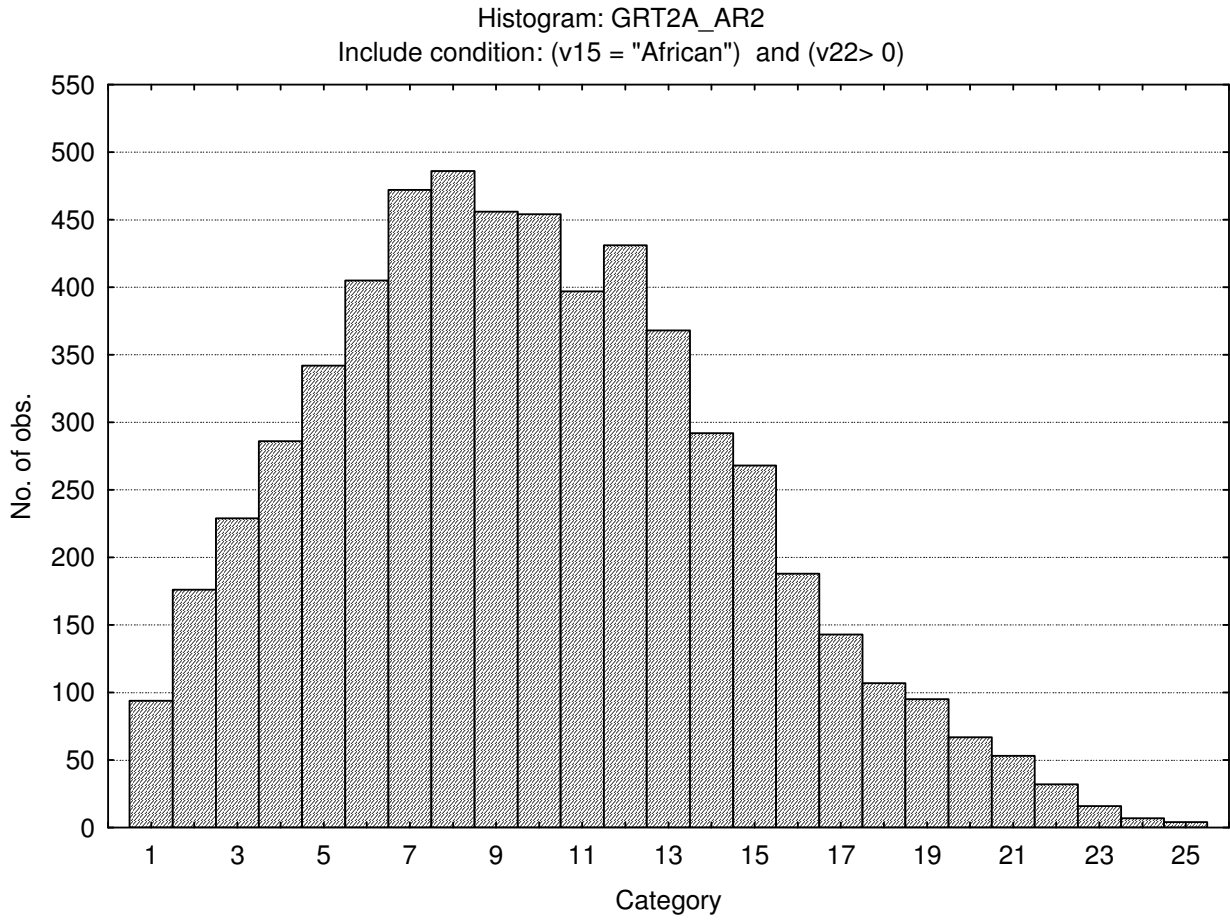
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Numerical Reasoning	6.28519	3.548633	1.000000	25.00000	5442
General Numerical Reasoning Items Attempted	14.35017	5.424647	1.000000	25.00000	5523

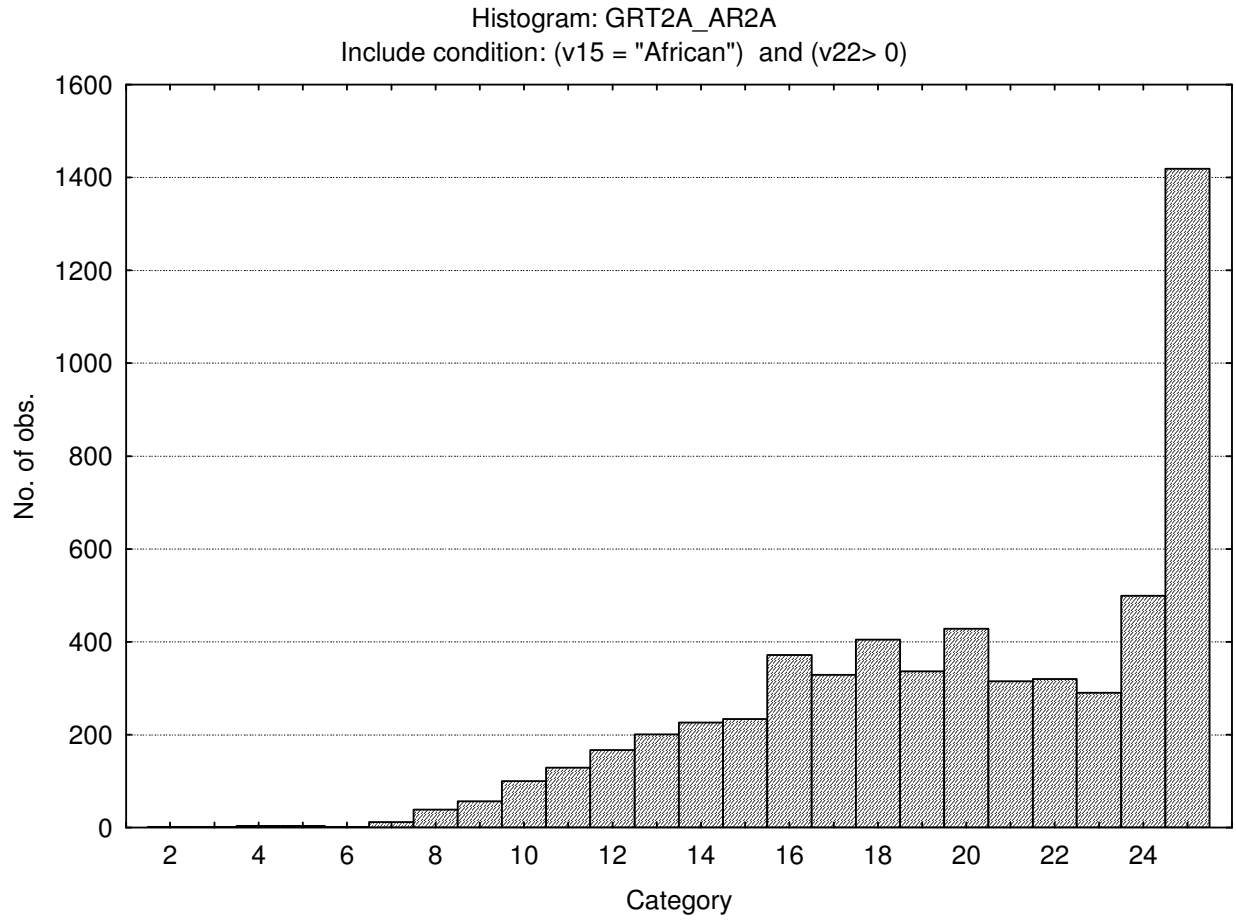




### Descriptive statistics and frequency distribution: General Abstract Reasoning Test

Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Abstract Reasoning Test	9.82396	4.701978	1.000000	25.00000	5868
General Abstract Reasoning Items Attempted	19.73213	4.710306	2.000000	25.00000	5891





## Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	1-3	4-5	6-8	9-10	11-12	13-15	16-17	18-20	21-33
General Verbal Items Attempted	2-11	12-15	16-19	20-22	23-26	27-29	30-33	34-35	
General Numerical Reasoning	1-0	1-1	2-3	4-5	6-7	8-8	9-10	11-12	13-25
General Numerical Items Attempted	1-4	5-7	8-10	11-12	13-15	16-18	19-21	22-23	24-25
General Abstract Reasoning	1-1	2-3	4-6	7-8	9-10	11-13	14-15	16-18	19-25
General Abstract Items Attempted	2-11	12-13	14-16	17-18	19-20	21-23	24-25		

# General Reasoning Test Battery Norm Group: South Africans, race Coloured, updated 2011

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## Sample composition

The sample consisted of South Africans belonging to the Coloured race group, tested by Psytech South Africa and collaborators during the period leading up to February 2011. Since not all the respondents completed all the subtests in the General Reasoning Test Battery, the sample composition is reported separately for the three subtests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	401	401	32.13141	32.1314
M	845	1246	67.70833	99.8397
Missing	2	1248	0.16026	100.0000

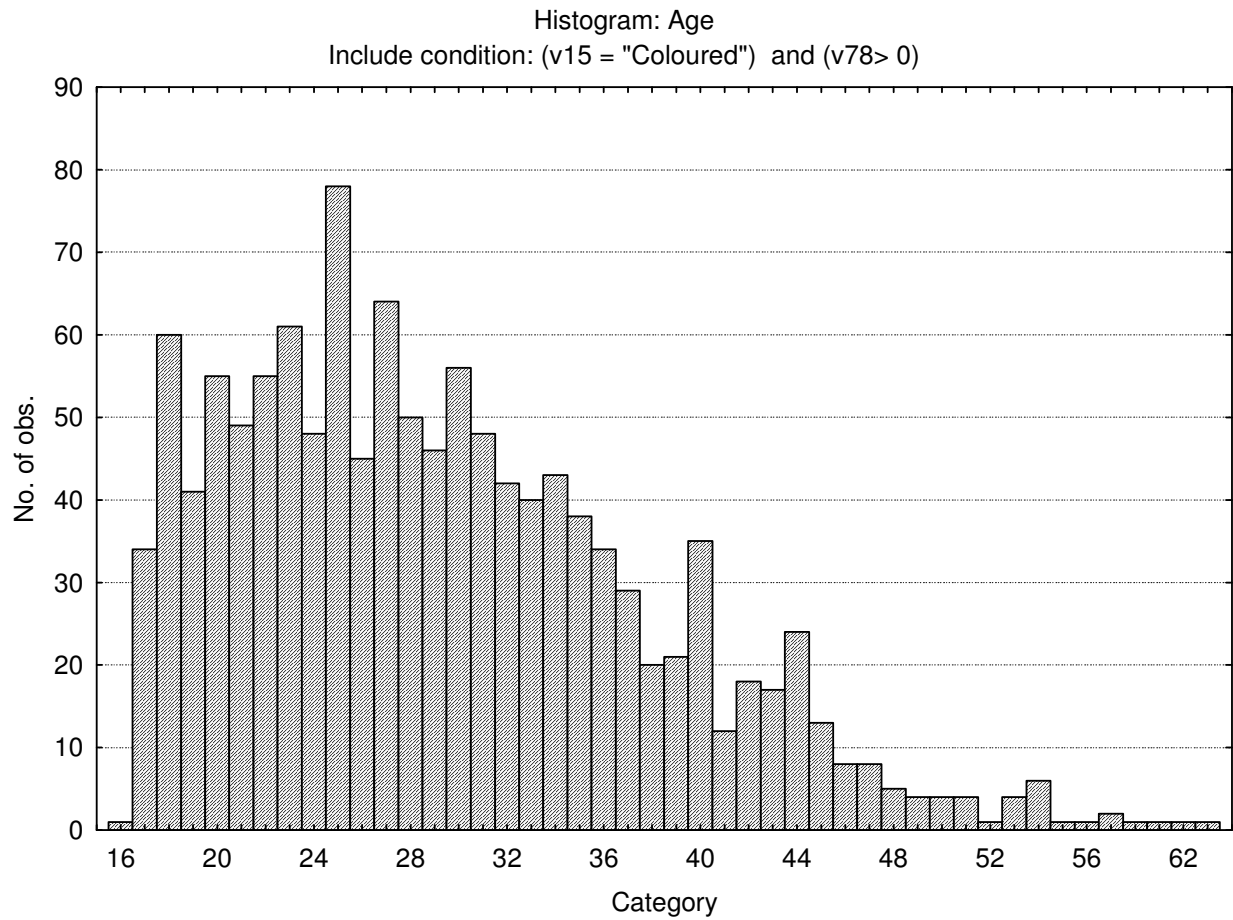
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	179	179	14.34295	14.3429
Grade 12	557	736	44.63141	58.9744
University Diploma	39	775	3.12500	62.0994
Degree	92	867	7.37179	69.4712
Vocational Training	45	912	3.60577	73.0769
Grade 10 or 11	135	1047	10.81731	83.8942
Grade 8	1	1048	0.08013	83.9744
Grade 9	5	1053	0.40064	84.3750
Grade 7	2	1055	0.16026	84.5353
Post Graduate	43	1098	3.44551	87.9808
Missing	150	1248	12.01923	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	4	4	0.32051	0.3205
English	715	719	57.29167	57.6122
Afrikaans	454	1173	36.37821	93.9904
Setswana	3	1176	0.24038	94.2308
Sesotho	1	1177	0.08013	94.3109
isiXhosa	9	1186	0.72115	95.0321
Missing	62	1248	4.96795	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	715	715	57.29167	57.2917
Afrikaans	454	1169	36.37821	93.6699
Indigenous	17	1186	1.36218	95.0321
Missing	62	1248	4.96795	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	1248	1248	100.0000	100.0000
Missing	0	1248	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.36697	8.546743	16.00000	63.00000	1229	19



**Sample composition: General Numerical Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	401	401	31.90135	31.9014
M	854	1255	67.93954	99.8409
Missing	2	1257	0.15911	100.0000

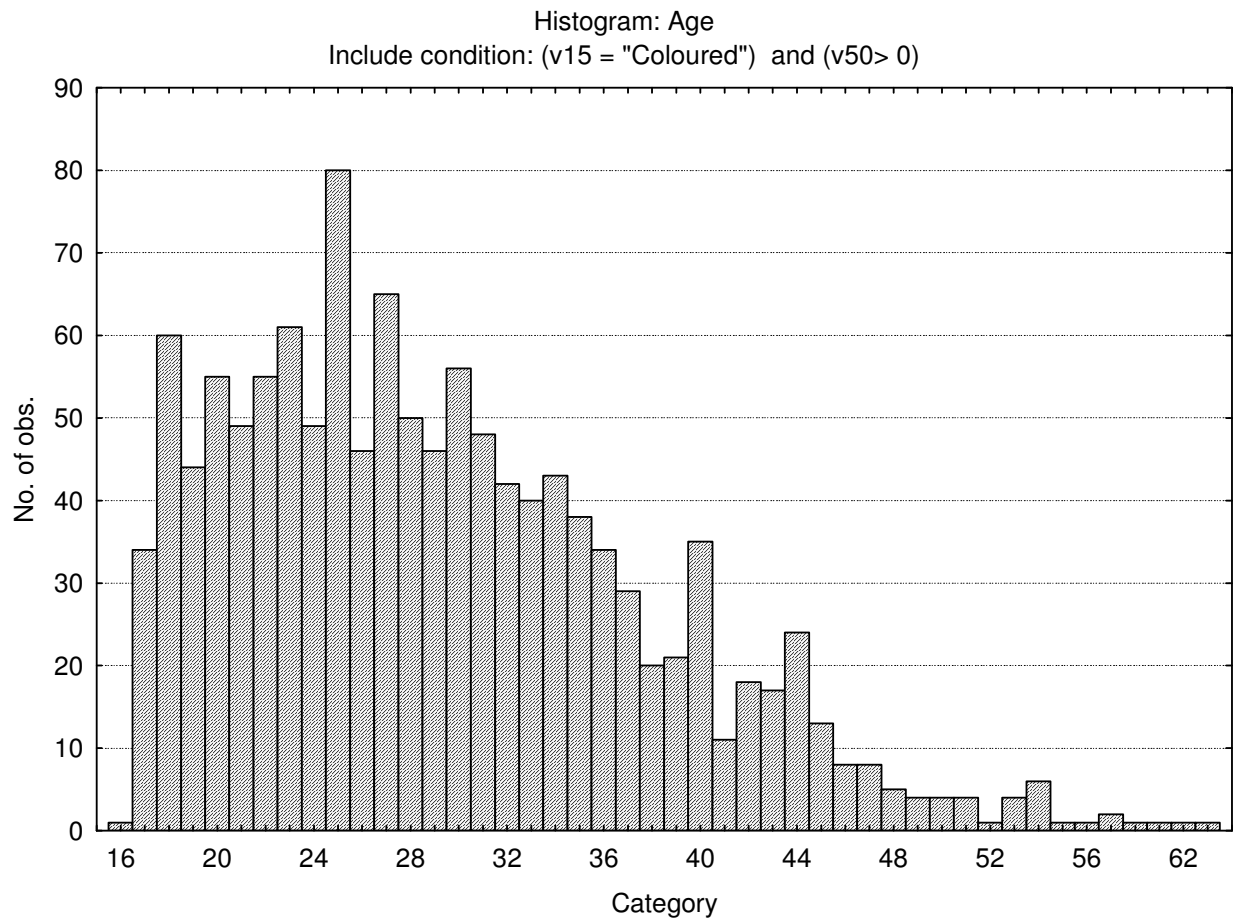
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	179	179	14.24025	14.2403
Grade 12	567	746	45.10740	59.3477
University Diploma	39	785	3.10263	62.4503
Degree	92	877	7.31901	69.7693
Vocational Training	44	921	3.50040	73.2697
Grade 10 or 11	135	1056	10.73986	84.0095
Grade 8	1	1057	0.07955	84.0891
Grade 9	5	1062	0.39777	84.4869
Grade 7	2	1064	0.15911	84.6460
Post Graduate	43	1107	3.42084	88.0668
Missing	150	1257	11.93317	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	4	4	0.31822	0.3182
English	716	720	56.96102	57.2792
Afrikaans	463	1183	36.83373	94.1130
Setswana	3	1186	0.23866	94.3516
Sesotho	1	1187	0.07955	94.4312
isiXhosa	9	1196	0.71599	95.1472
Missing	61	1257	4.85282	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	716	716	56.96102	56.9610
Afrikaans	463	1179	36.83373	93.7947
Indigenous	17	1196	1.35243	95.1472
Missing	61	1257	4.85282	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	1257	1257	100.0000	100.0000
Missing	0	1257	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.31634	8.535200	16.00000	63.00000	1236	21



## Sample composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	421	421	32.33487	32.3349
M	879	1300	67.51152	99.8464
Missing	2	1302	0.15361	100.0000

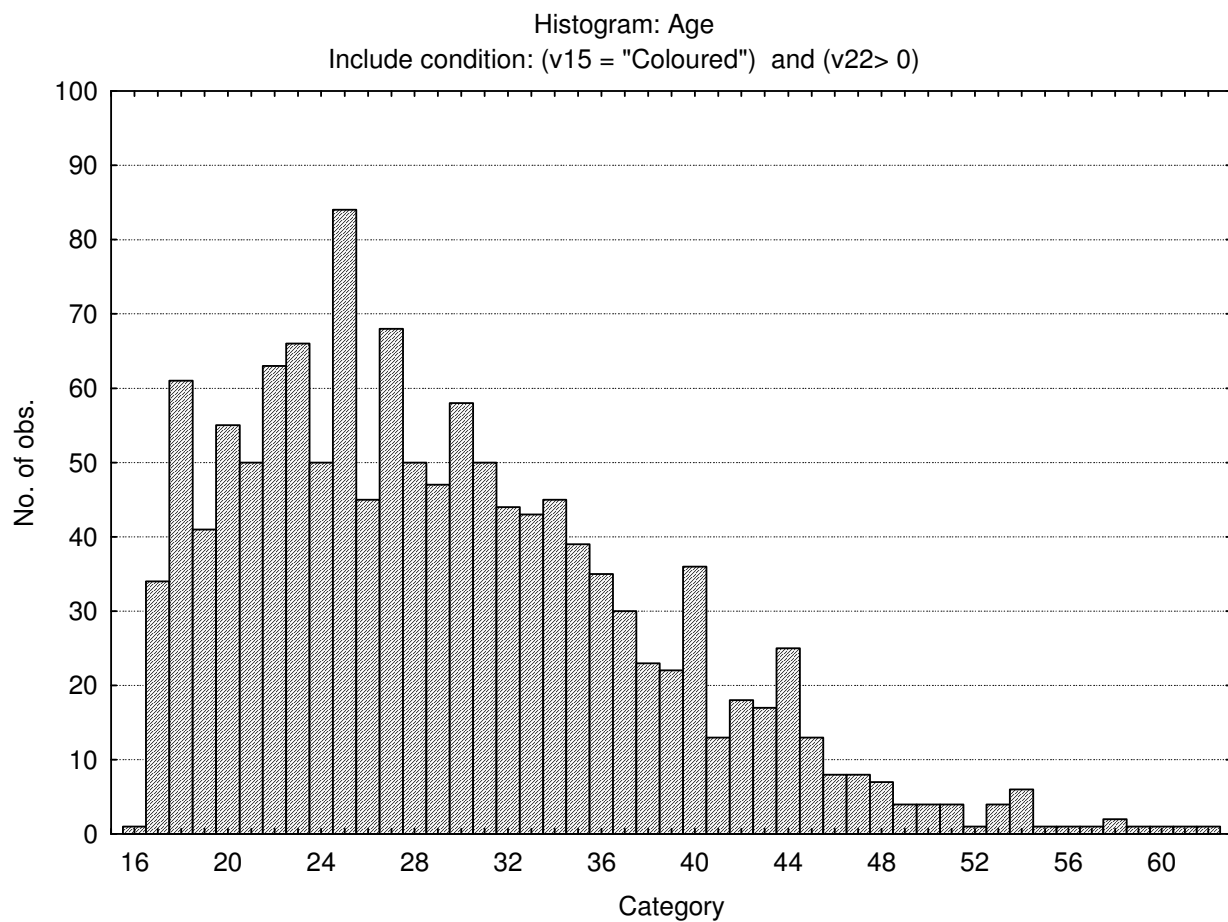
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	191	191	14.66974	14.6697
Grade 12	573	764	44.00922	58.6790
University Diploma	41	805	3.14900	61.8280
Degree	102	907	7.83410	69.6621
Vocational Training	46	953	3.53303	73.1951
Grade 10 or 11	135	1088	10.36866	83.5637
Grade 8	1	1089	0.07680	83.6406
Grade 9	6	1095	0.46083	84.1014
Grade 7	2	1097	0.15361	84.2550
Post Graduate	51	1148	3.91705	88.1720
Missing	154	1302	11.82796	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	4	4	0.30722	0.3072
English	756	760	58.06452	58.3717
Afrikaans	466	1226	35.79109	94.1628
Setswana	3	1229	0.23041	94.3932
Sesotho	1	1230	0.07680	94.4700
isiXhosa	9	1239	0.69124	95.1613
Missing	63	1302	4.83871	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	756	756	58.06452	58.0645
Afrikaans	466	1222	35.79109	93.8556
Indigenous	17	1239	1.30568	95.1613
Missing	63	1302	4.83871	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	1302	1302	100.0000	100.0000
Missing	0	1302	0.0000	100.0000

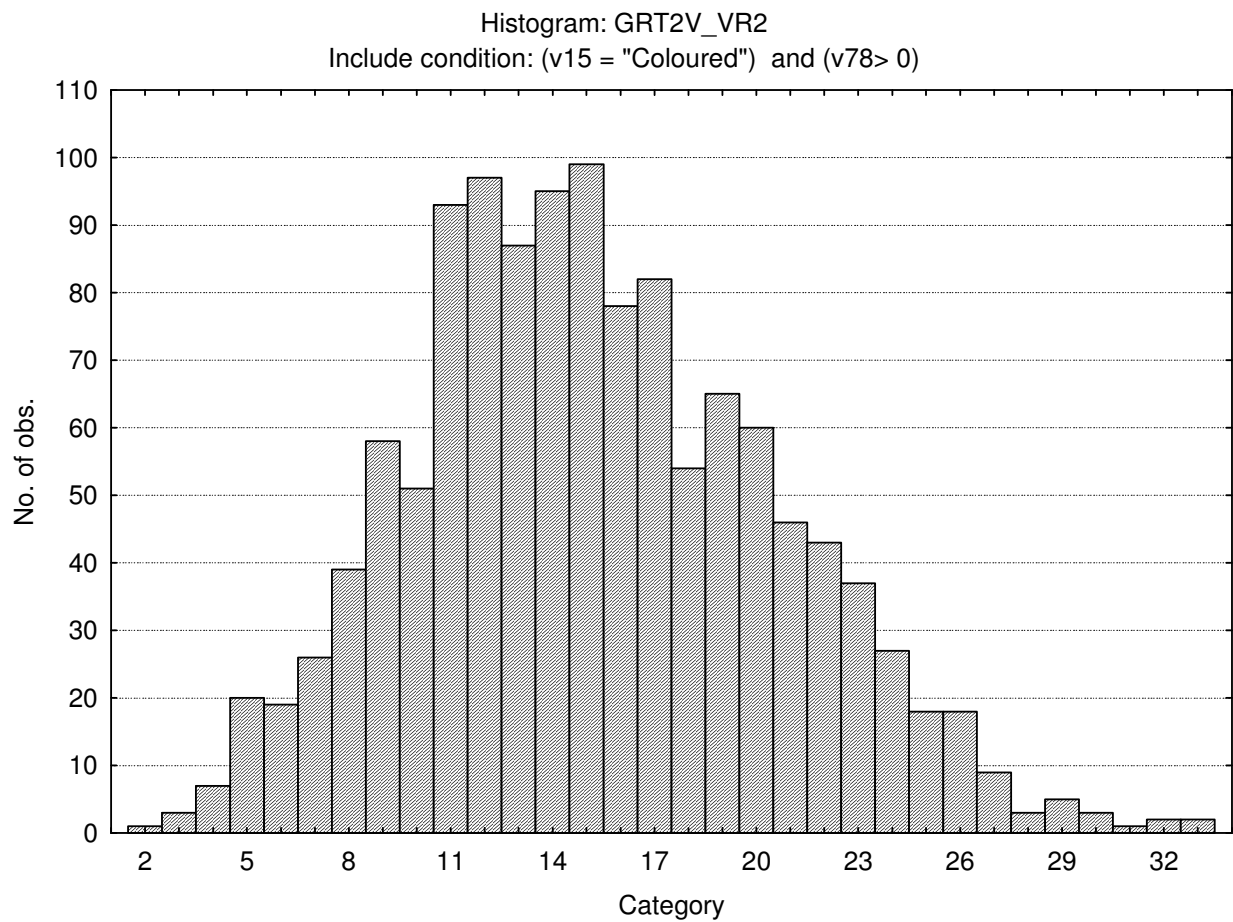
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.39032	8.533246	16.00000	63.00000	1281	21

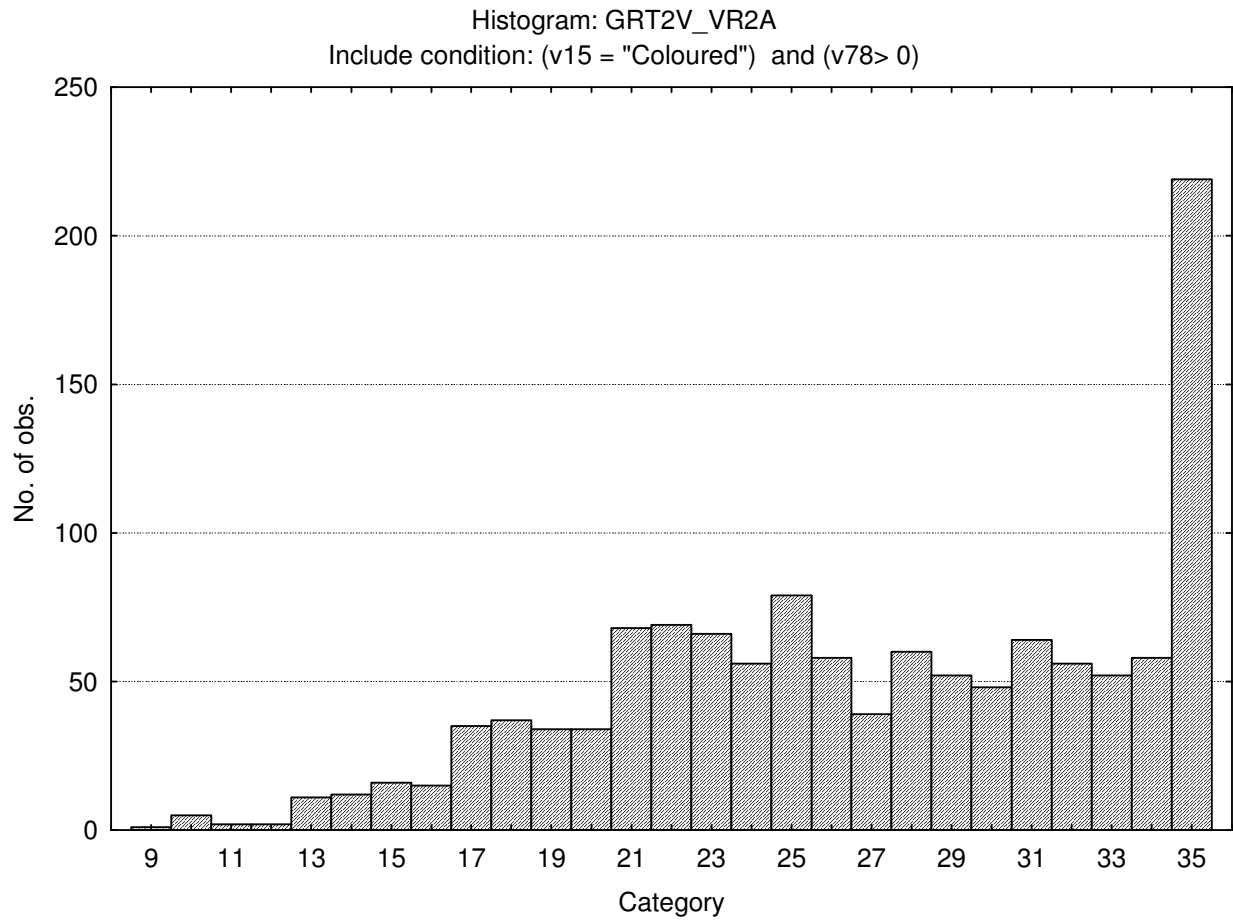


## Descriptive statistics and Frequency Distributions for General Reasoning Test Battery Subtests

### General Verbal Reasoning Test

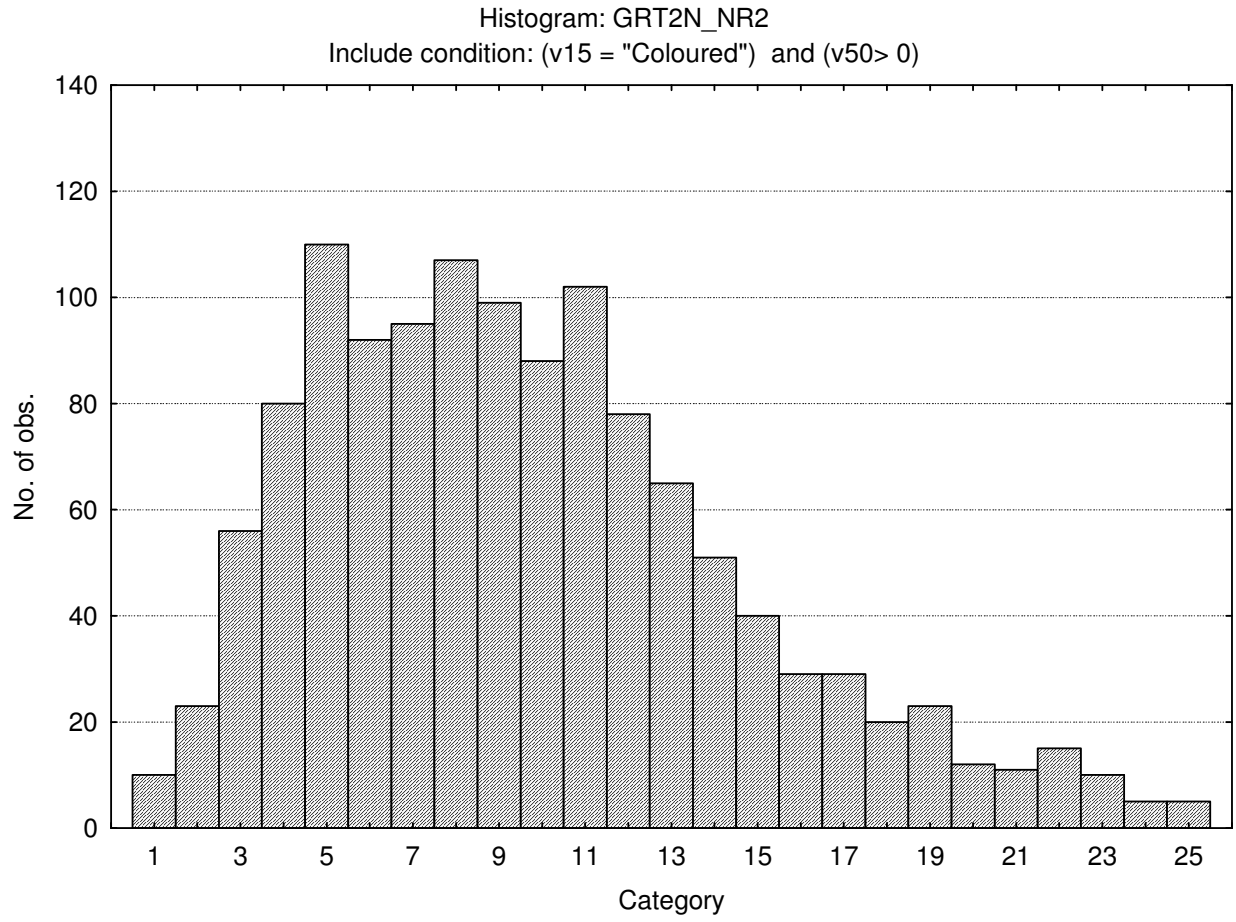
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Verbal Reasoning	15.23478	5.322646	2.000000	33.000000	1248
General Verbal Reasoning Items Attempted	26.91026	6.289204	9.000000	35.000000	1248

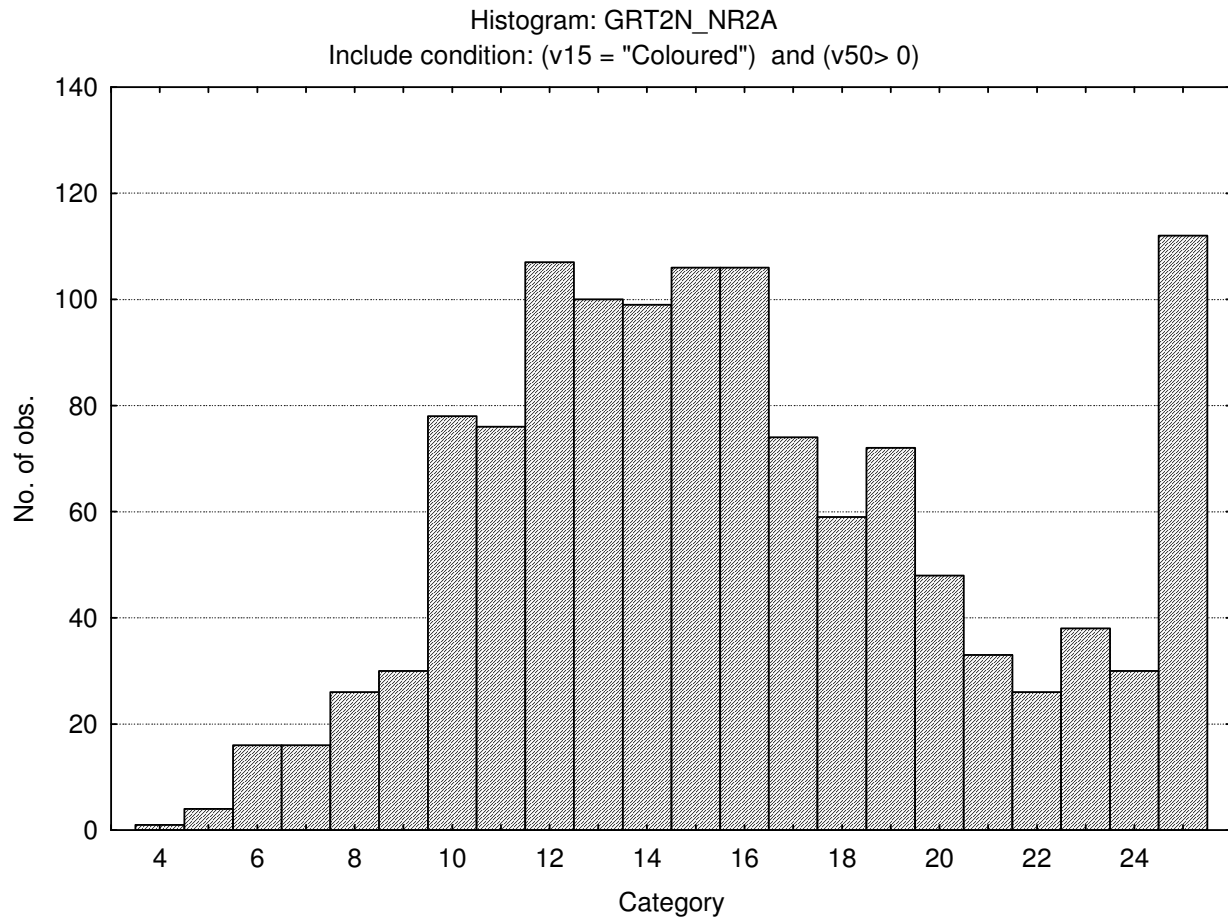




### General Numerical Reasoning Test

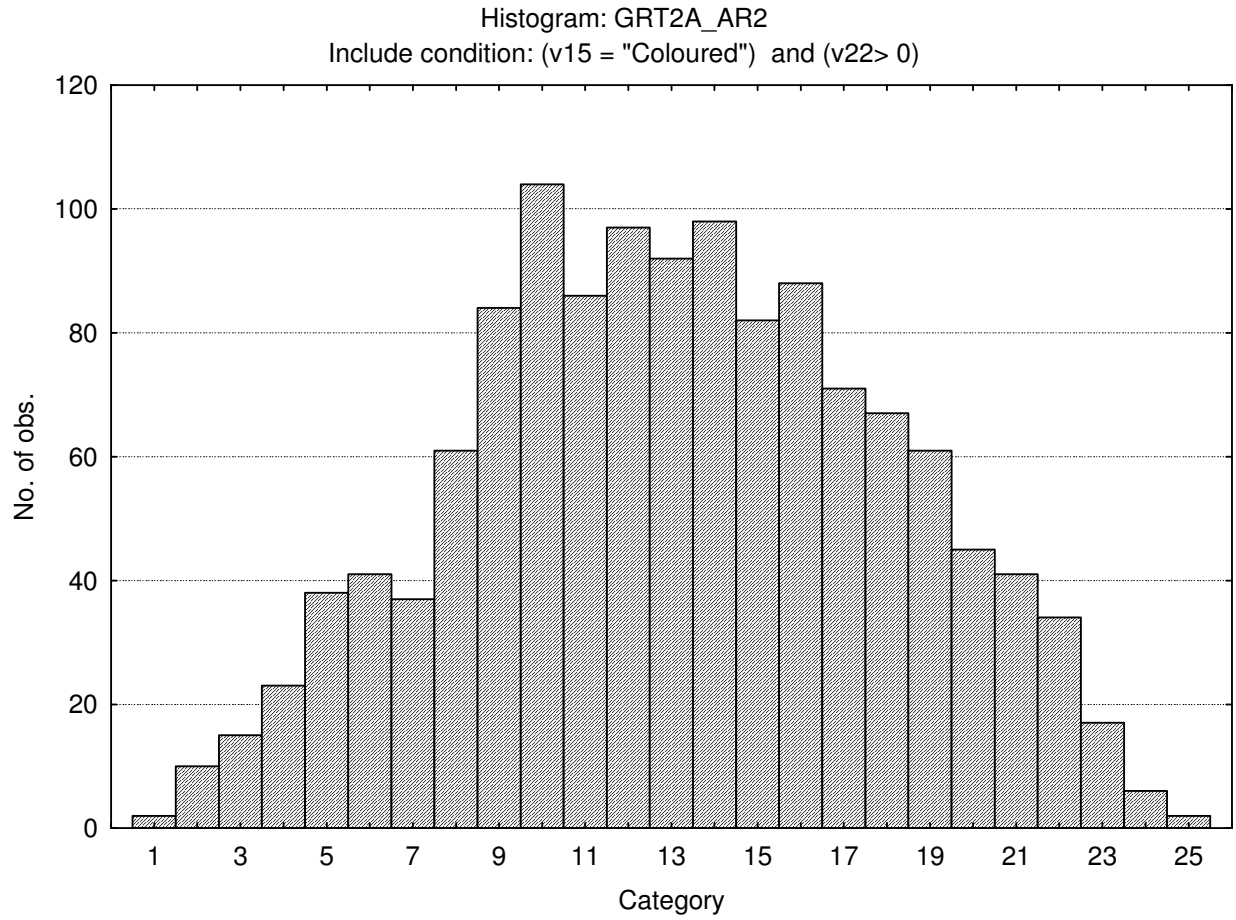
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Numerical Reasoning	9.70916	4.916597	1.000000	25.00000	1255
General Numerical Reasoning Items Attempted	15.82259	4.950506	4.000000	25.00000	1257

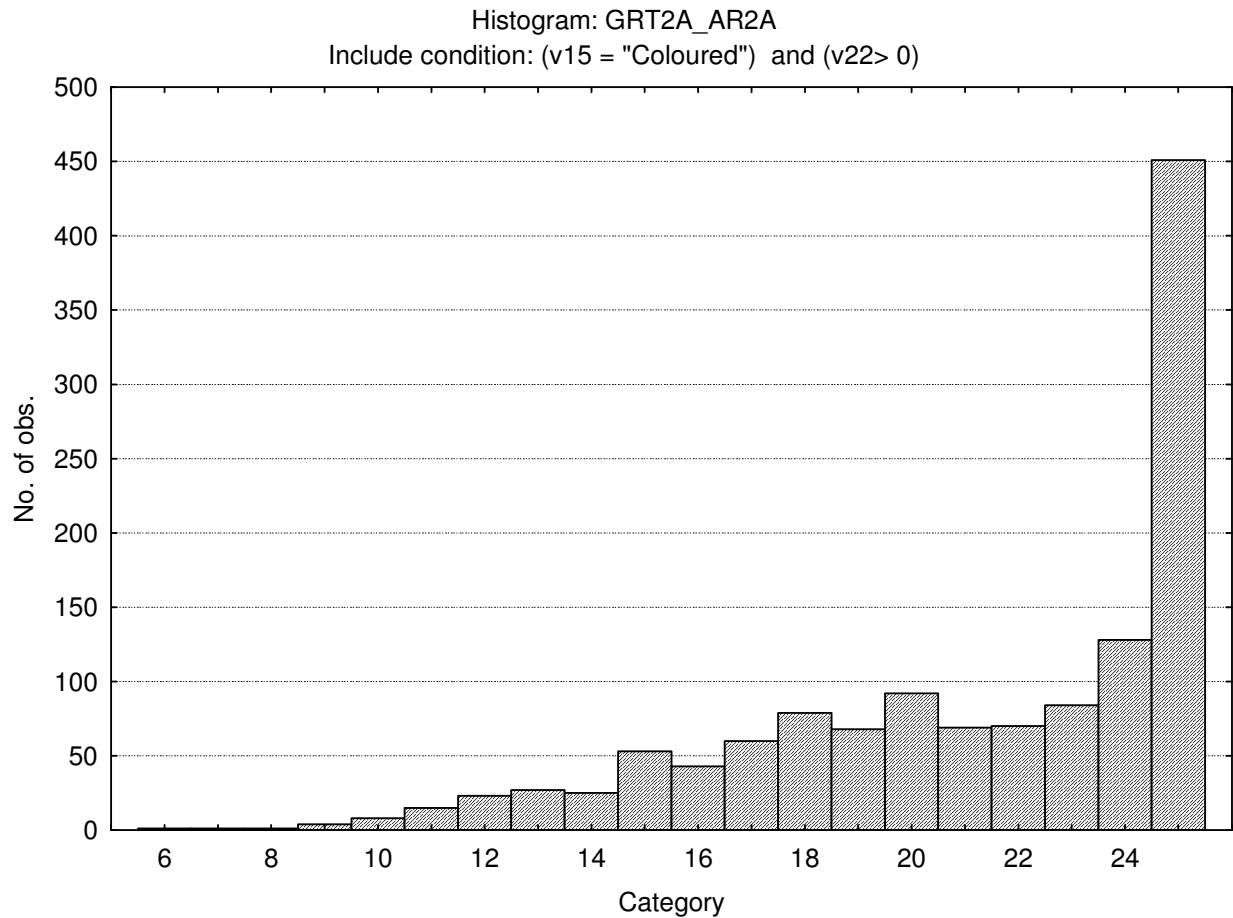




**General Abstract Reasoning Test**

Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Abstract Reasoning	13.14900	4.910662	1.000000	25.00000	1302
General Abstract Reasoning Items Attempted	21.20123	4.129837	6.000000	25.00000	1302





### Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	2-5	6-8	9-11	12-13	14-16	17-19	20-21	22-24	25-33
General Verbal Items Attempted	9-15	16-19	20-22	23-25	26-28	29-31	32-34	35-35	
General Numerical Reasoning	1-1	2-3	4-6	7-8	9-10	11-13	14-15	16-18	19-25
General Numerical Items Attempted	4-7	8-9	10-12	13-14	15-17	18-19	20-22	23-24	25-25
General Abstract Reasoning	1-4	5-7	8-9	10-11	12-14	15-16	17-19	20-21	22-25
General Abstract Items Attempted	6-13	14-16	17-18	19-20	21-22	23-24	25-25		

# General Reasoning Test Battery Norm Group: South Africans, race Asian, updated 2011

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## Sample composition

The sample consisted of South Africans belonging to the Asian race group, who were tested by Psytech South Africa and collaborators during the period leading up to February 2011. Since not all the respondents completed the full General Reasoning Test Battery, the sample compositions for the subtests are reported separately.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	294	294	32.99663	32.9966
M	596	890	66.89113	99.8878
Missing	1	891	0.11223	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	138	138	15.48822	15.4882
Grade 12	333	471	37.37374	52.8620
University Diploma	25	496	2.80584	55.6678
Degree	95	591	10.66218	66.3300
Vocational Training	42	633	4.71380	71.0438
Grade 10 or 11	66	699	7.40741	78.4512
Grade 8	5	704	0.56117	79.0123
Grade 9	5	709	0.56117	79.5735
Post Graduate	68	777	7.63187	87.2054
Missing	114	891	12.79461	100.0000

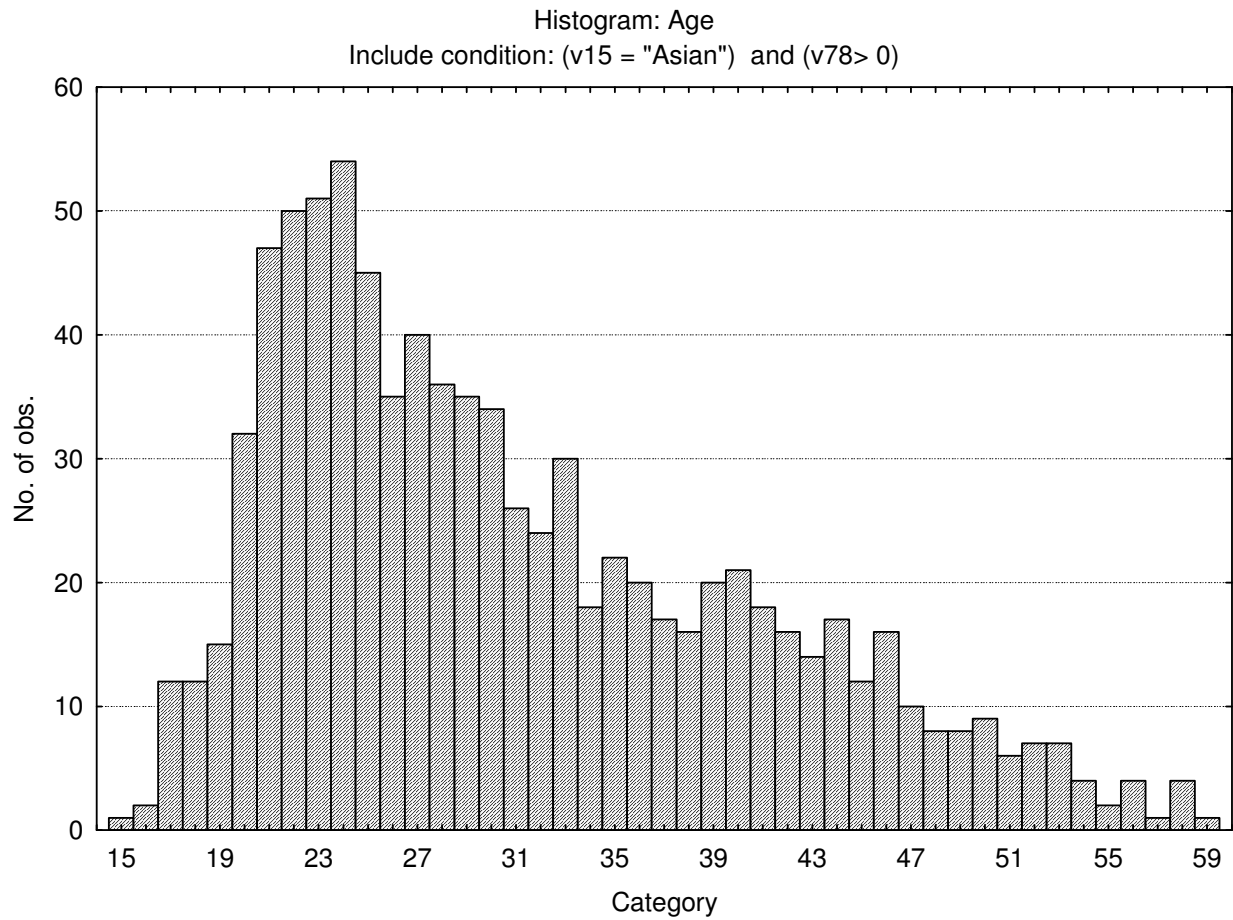
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	8	8	0.89787	0.8979
English	806	814	90.46016	91.3580

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1	815	0.11223	91.4703
Setswana	2	817	0.22447	91.6947
Sepedi	1	818	0.11223	91.8070
Tshivenda	1	819	0.11223	91.9192
isiXhosa	2	821	0.22447	92.1437
Missing	70	891	7.85634	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	806	806	90.46016	90.4602
Afrikaans	1	807	0.11223	90.5724
Indigenous	15	822	1.68350	92.2559
Missing	69	891	7.74411	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Asian	891	891	100.0000	100.0000
Missing	0	891	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.05802	9.500752	15.00000	59.00000	879	12



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	293	293	32.99550	32.9955
M	594	887	66.89189	99.8874
Missing	1	888	0.11261	100.0000

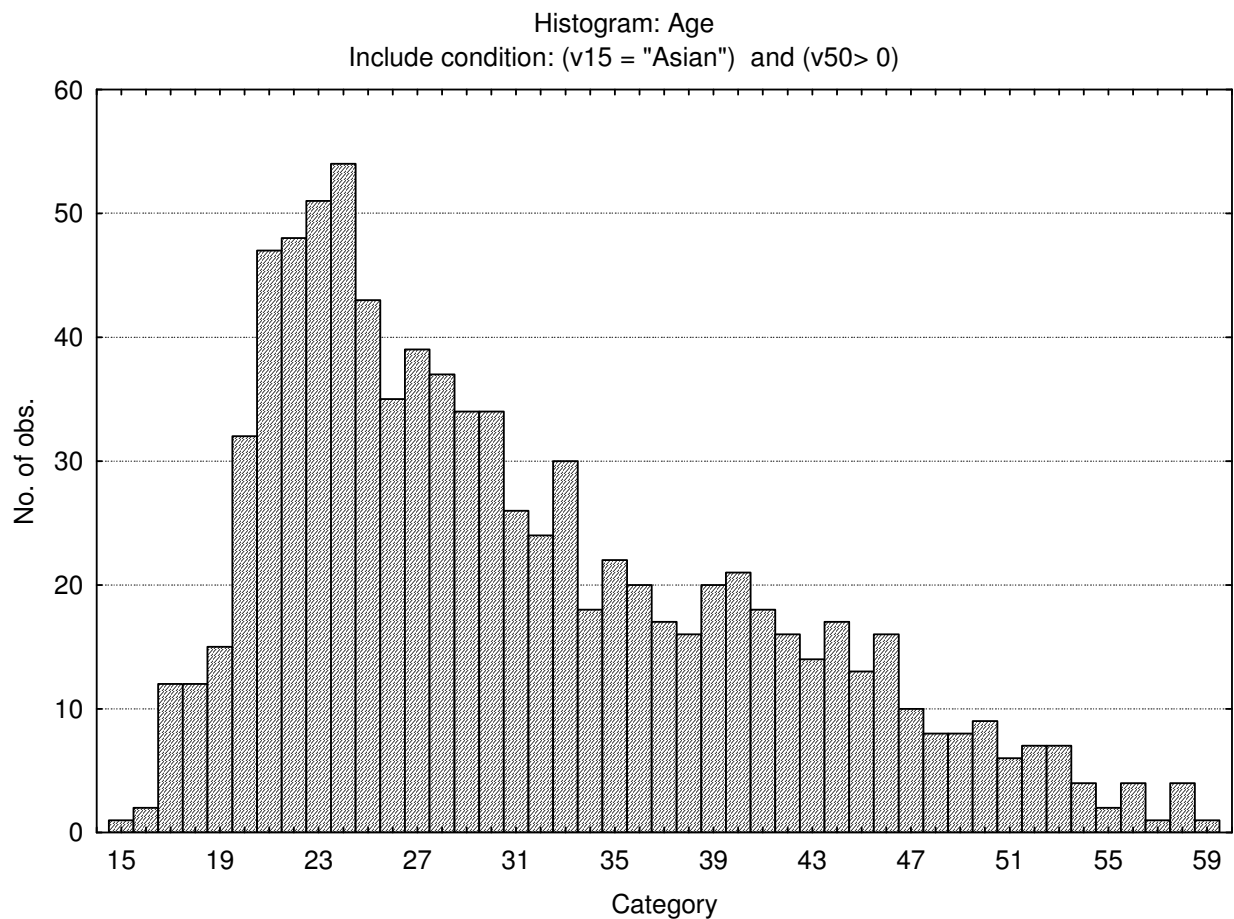
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	139	139	15.65315	15.6532
Grade 12	335	474	37.72523	53.3784
University Diploma	25	499	2.81532	56.1937
Degree	91	590	10.24775	66.4414
Vocational Training	42	632	4.72973	71.1712
Grade 10 or 11	66	698	7.43243	78.6036
Grade 8	5	703	0.56306	79.1667
Grade 9	5	708	0.56306	79.7297
Post Graduate	65	773	7.31982	87.0495
Missing	115	888	12.95045	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	8	8	0.90090	0.9009
English	801	809	90.20270	91.1036
Afrikaans	1	810	0.11261	91.2162
Setswana	2	812	0.22523	91.4414
Sepedi	1	813	0.11261	91.5541
Tshivenda	1	814	0.11261	91.6667
isiXhosa	2	816	0.22523	91.8919
Missing	72	888	8.10811	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	801	801	90.20270	90.2027
Afrikaans	1	802	0.11261	90.3153
Indigenous	15	817	1.68919	92.0045
Missing	71	888	7.99550	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Asian	888	888	100.0000	100.0000
Missing	0	888	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.11200	9.519042	15.00000	59.00000	875	13



### Sample composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	330	330	28.27763	28.2776
M	835	1165	71.55099	99.8286
Missing	2	1167	0.17138	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	186	186	15.93830	15.9383
Grade 12	396	582	33.93316	49.8715
University Diploma	32	614	2.74207	52.6135
Degree	158	772	13.53899	66.1525
Vocational Training	43	815	3.68466	69.8372
Grade 10 or 11	70	885	5.99829	75.8355
Grade 8	5	890	0.42845	76.2639
Grade 9	5	895	0.42845	76.6924
Post Graduate	126	1021	10.79692	87.4893
Missing	146	1167	12.51071	100.0000

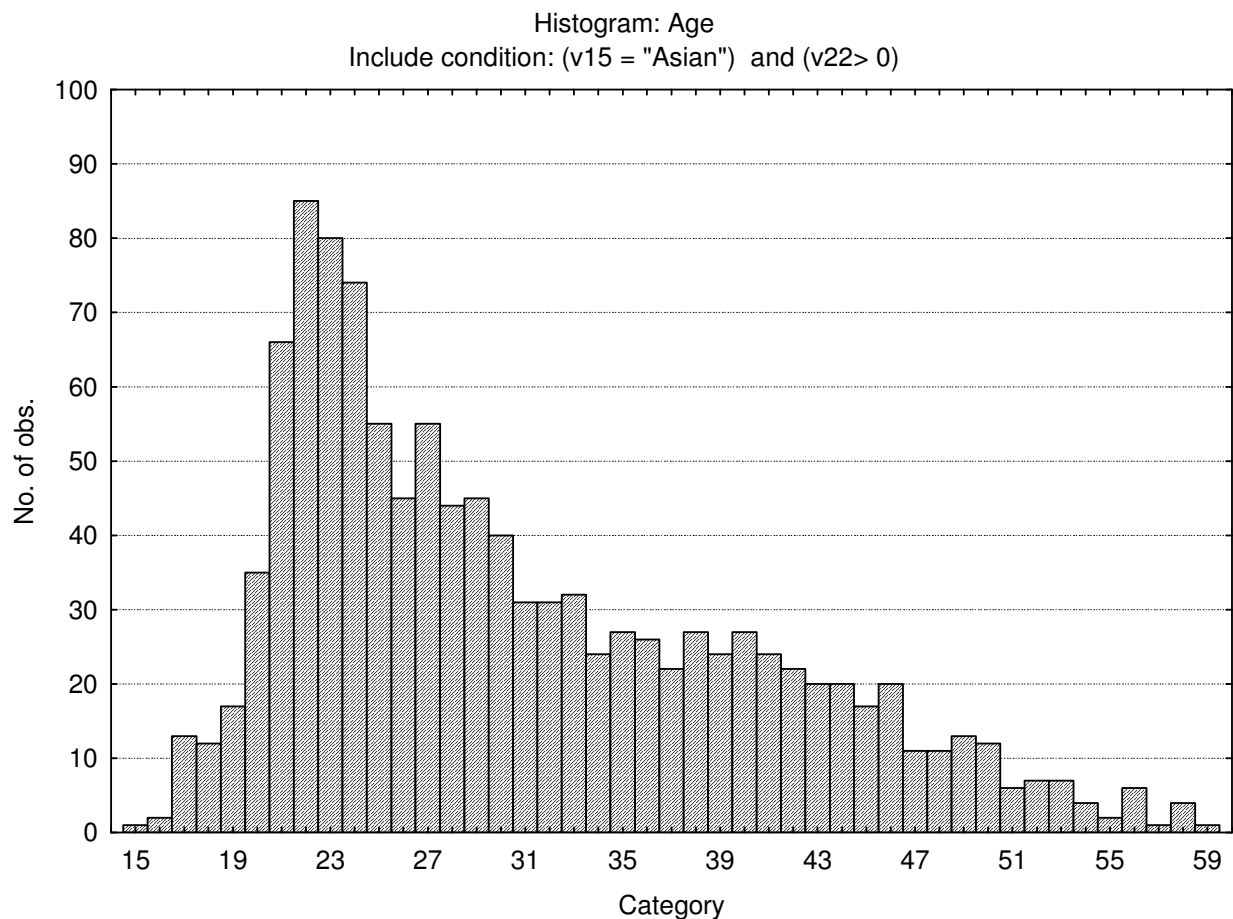
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	10	10	0.85690	0.8569
English	1076	1086	92.20223	93.0591
Afrikaans	1	1087	0.08569	93.1448
Setswana	2	1089	0.17138	93.3162
Sesotho	1	1090	0.08569	93.4019
Sepedi	1	1091	0.08569	93.4876
Tshivenda	1	1092	0.08569	93.5733
siSwati	1	1093	0.08569	93.6590
isiXhosa	3	1096	0.25707	93.9160
Missing	71	1167	6.08398	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	1076	1076	92.20223	92.2022
Afrikaans	1	1077	0.08569	92.2879
Indigenous	20	1097	1.71380	94.0017
Missing	70	1167	5.99829	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Asian	1167	1167	100.0000	100.0000
Missing	0	1167	0.0000	100.0000

Variable	Descriptive Statistics: Age
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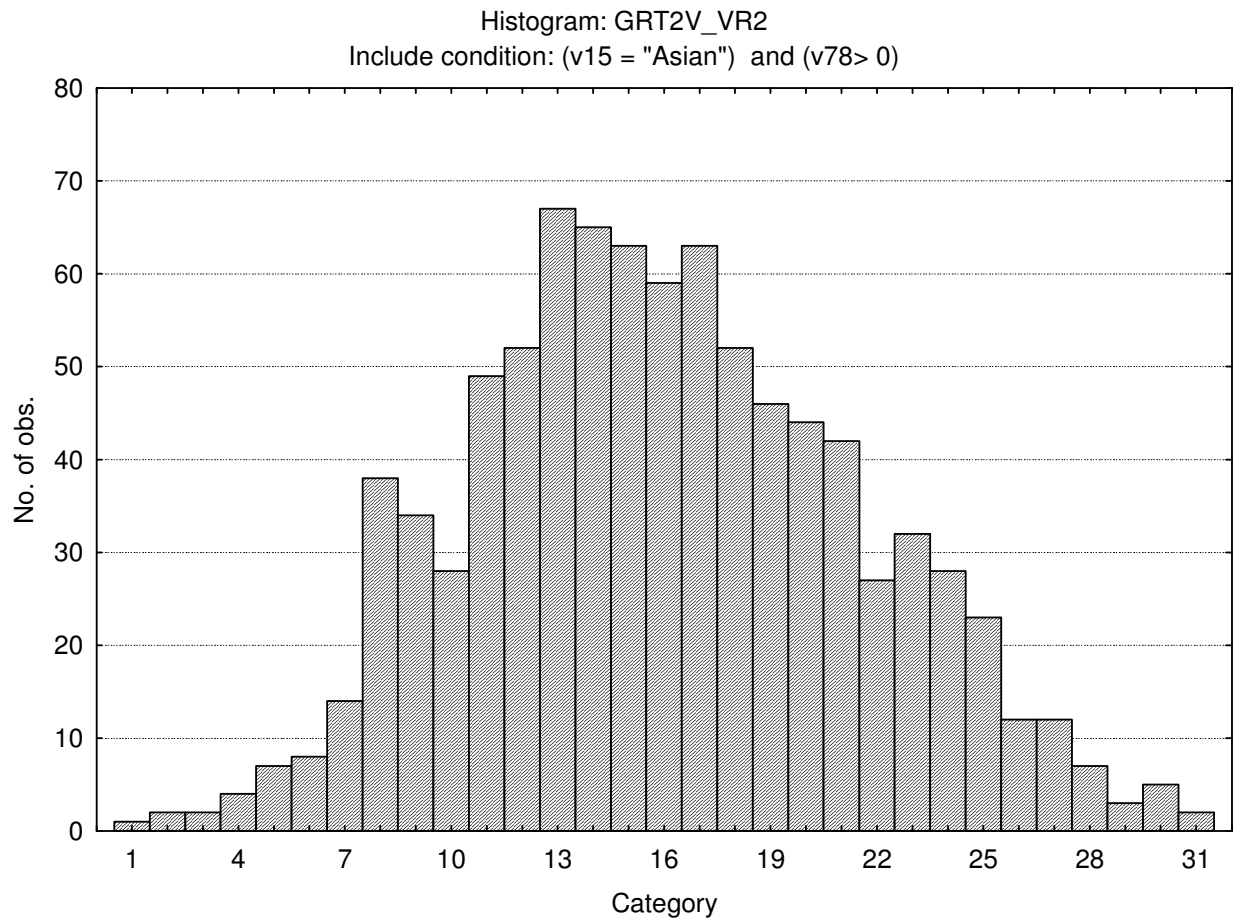
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.81359	9.337894	15.00000	59.00000	1148	19

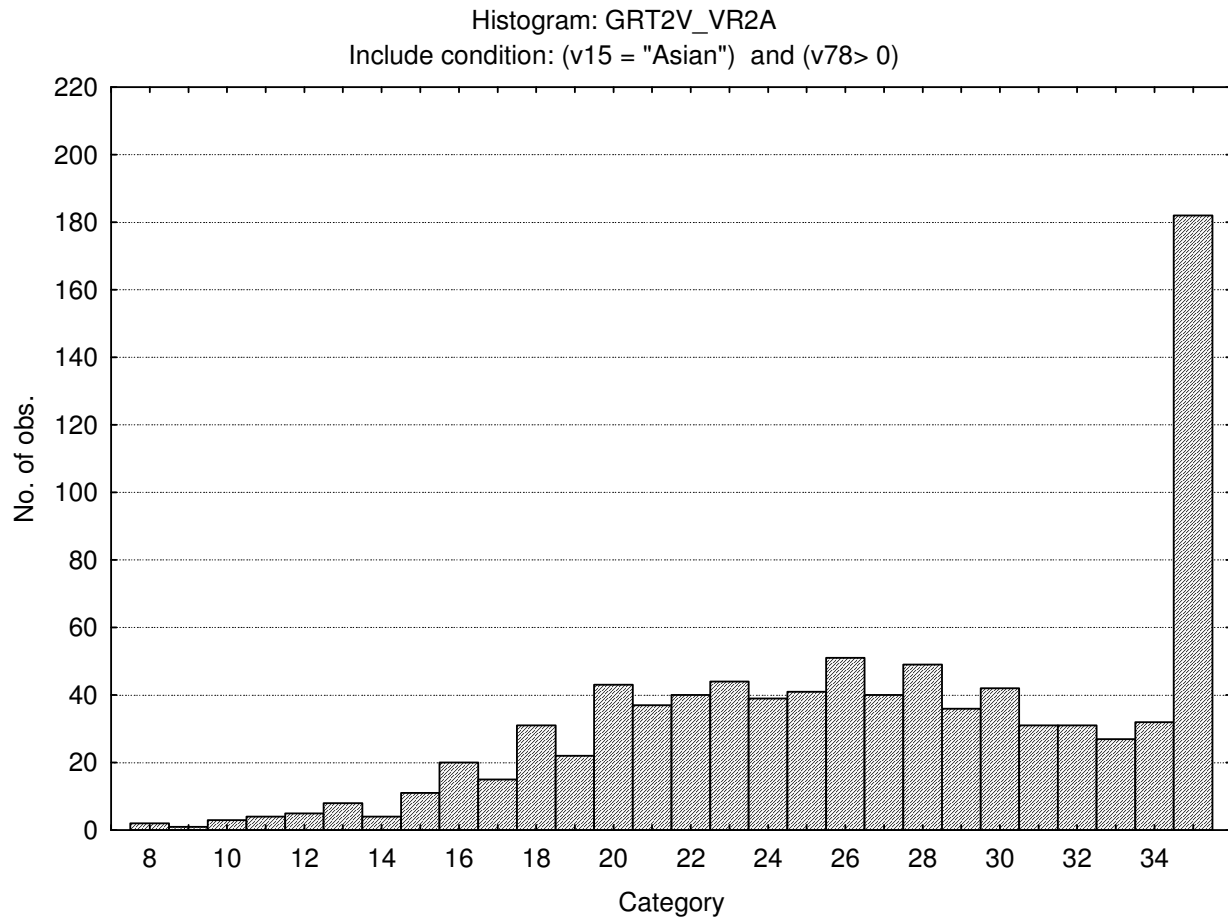


## Descriptive statistics and Frequency distributions

### General Verbal Reasoning Test

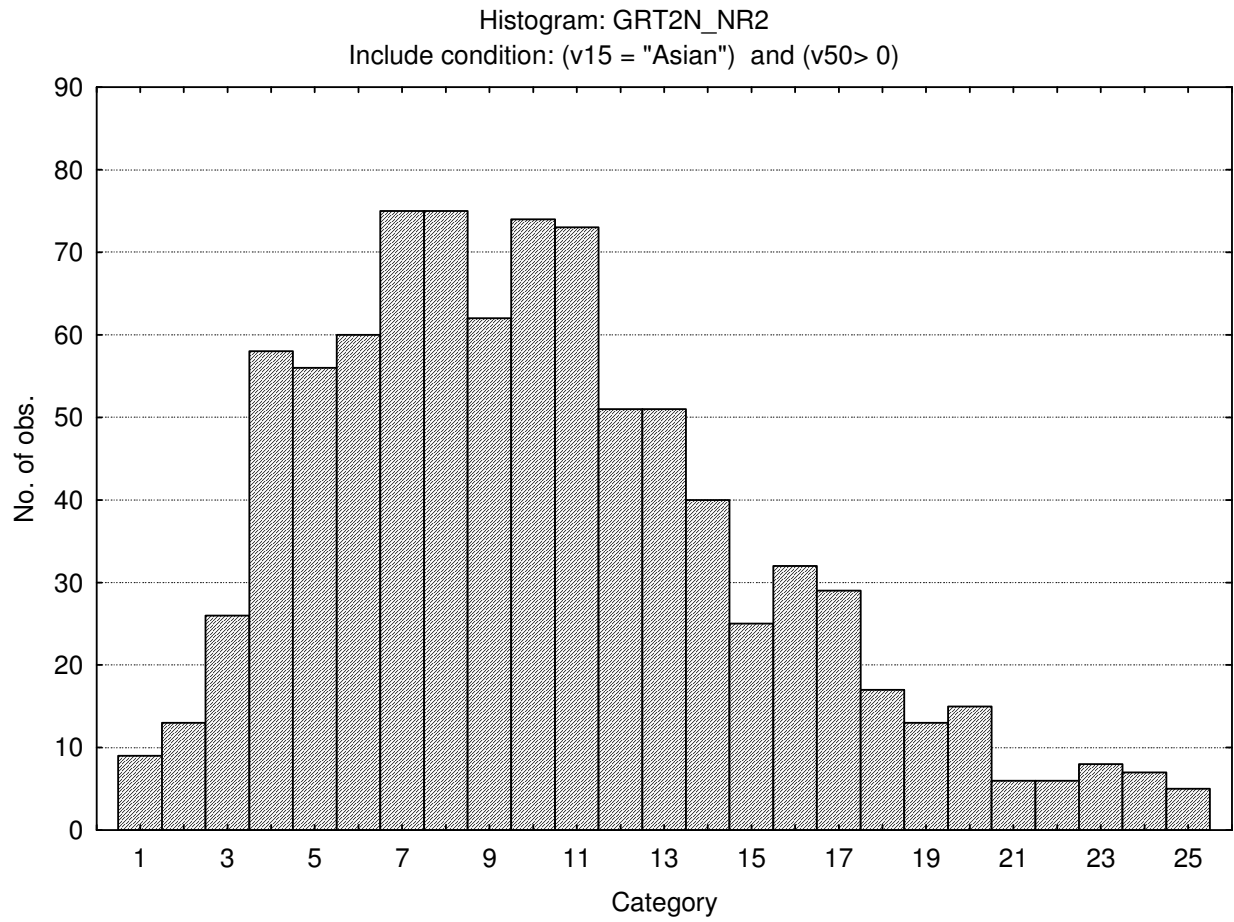
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Verbal Reasoning	16.02918	5.470168	1.000000	31.00000	891
General Verbal Reasoning Items Attempted	26.83389	6.486236	8.000000	35.00000	891

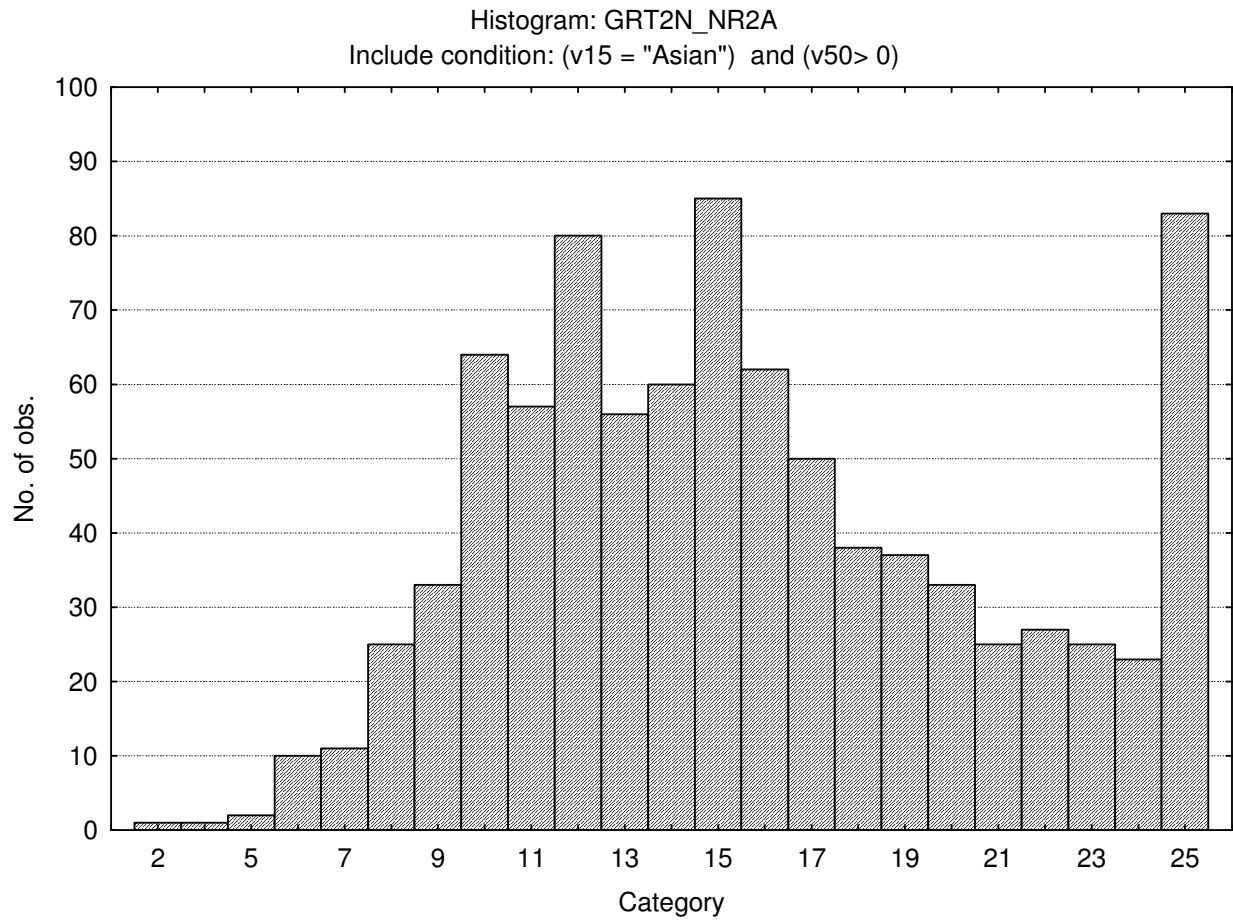




## General Numerical Reasoning

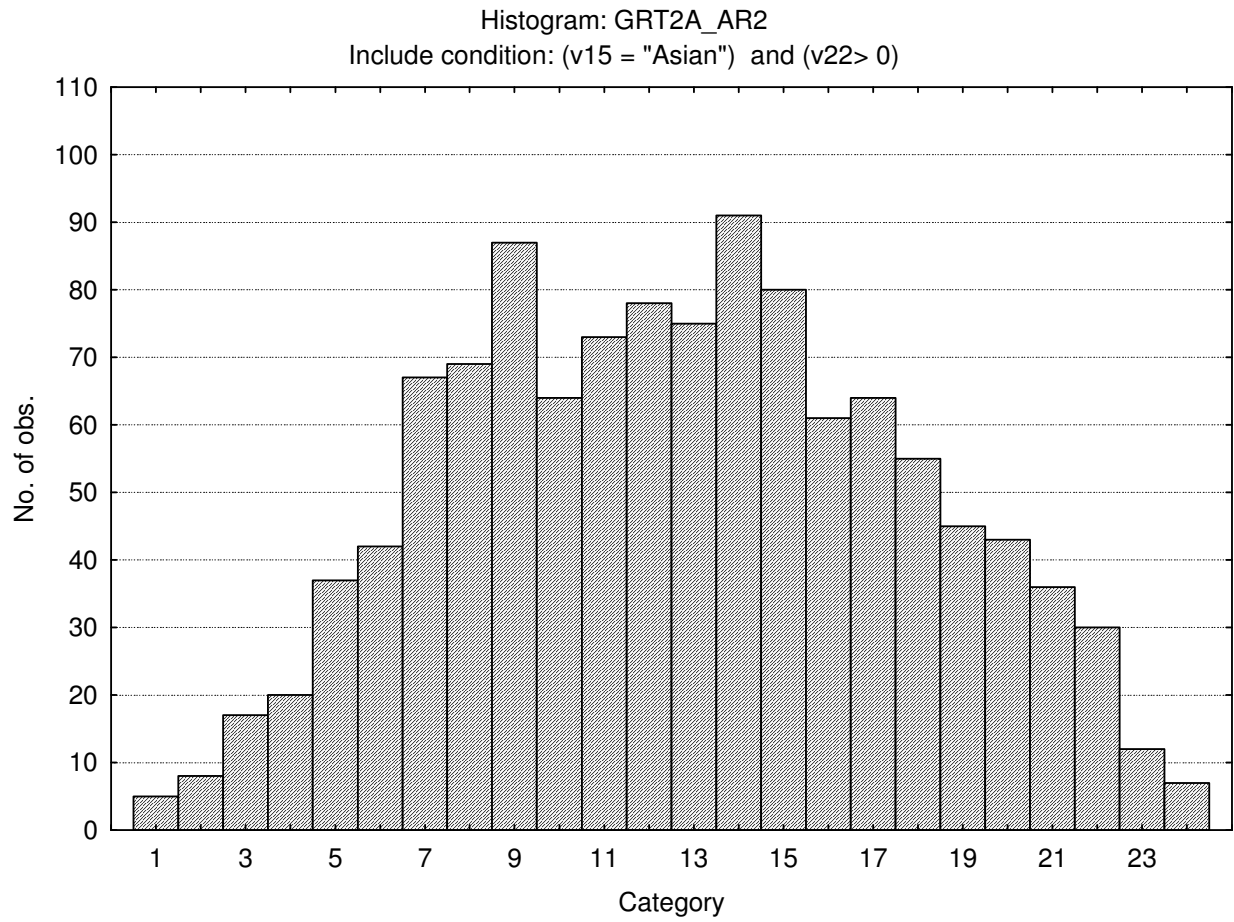
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Numerical Reasoning	10.17381	4.979873	1.000000	25.00000	886
General Numerical Reasoning Items Attempted	15.68694	5.149509	2.000000	25.00000	888

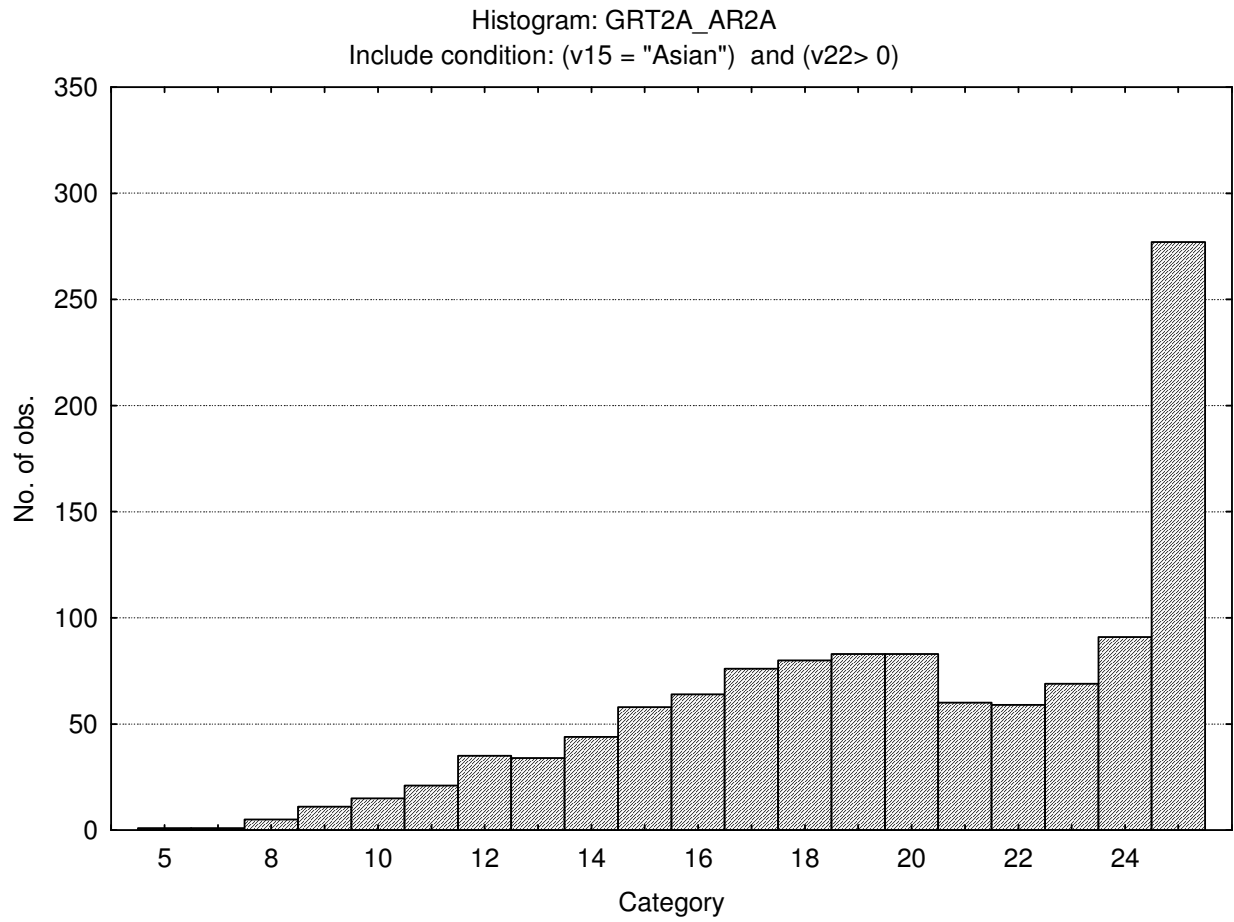




### General Abstract Reasoning

Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Abstract Reasoning	12.73585	5.048659	1.000000	24.00000	1166
General Abstract Reasoning Items Attempted	19.81662	4.535240	5.000000	25.00000	1167





## Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	1-6	7-9	10-11	12-14	15-17	18-20	21-22	23-25	26-31
General Verbal Items Attempted	8-15	16-18	19-21	22-25	26-28	29-31	32-34	35-35	
General Numerical Reasoning	1-1	2-3	4-6	7-8	9-11	12-13	14-16	17-18	19-25
General Numerical Items Attempted	2-6	7-9	10-11	12-14	15-16	17-19	20-22	23-24	25-25
General Abstract Reasoning	1-3	4-6	7-8	9-11	12-13	14-16	17-19	20-21	22-24
General Abstract Items Attempted	5-11	12-14	15-16	17-18	19-20	21-23	24-25		

# General Reasoning Test Battery Norm group: South Africans, English speaking, updated 2011

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## Sample composition

The sample consisted of South Africans tested by Psytech South Africa and collaborators during the period up to February 2011. Since not all respondents completed all the subtests of the General Reasoning Test Battery, biographical characteristics are reported separately for the different subtests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1013	1013	37.32498	37.3250
M	1698	2711	62.56448	99.8895
Missing	3	2714	0.11054	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	372	372	13.70671	13.7067
Grade 12	1127	1499	41.52542	55.2321
University Diploma	98	1597	3.61091	58.8430
Degree	280	1877	10.31688	69.1599
Vocational Training	102	1979	3.75829	72.9182
Grade 10 or 11	196	2175	7.22181	80.1400
Grade 8	7	2182	0.25792	80.3979
Grade 9	13	2195	0.47900	80.8769
Grade 7	1	2196	0.03685	80.9138
Post Graduate	168	2364	6.19013	87.1039
Missing	350	2714	12.89609	100.0000

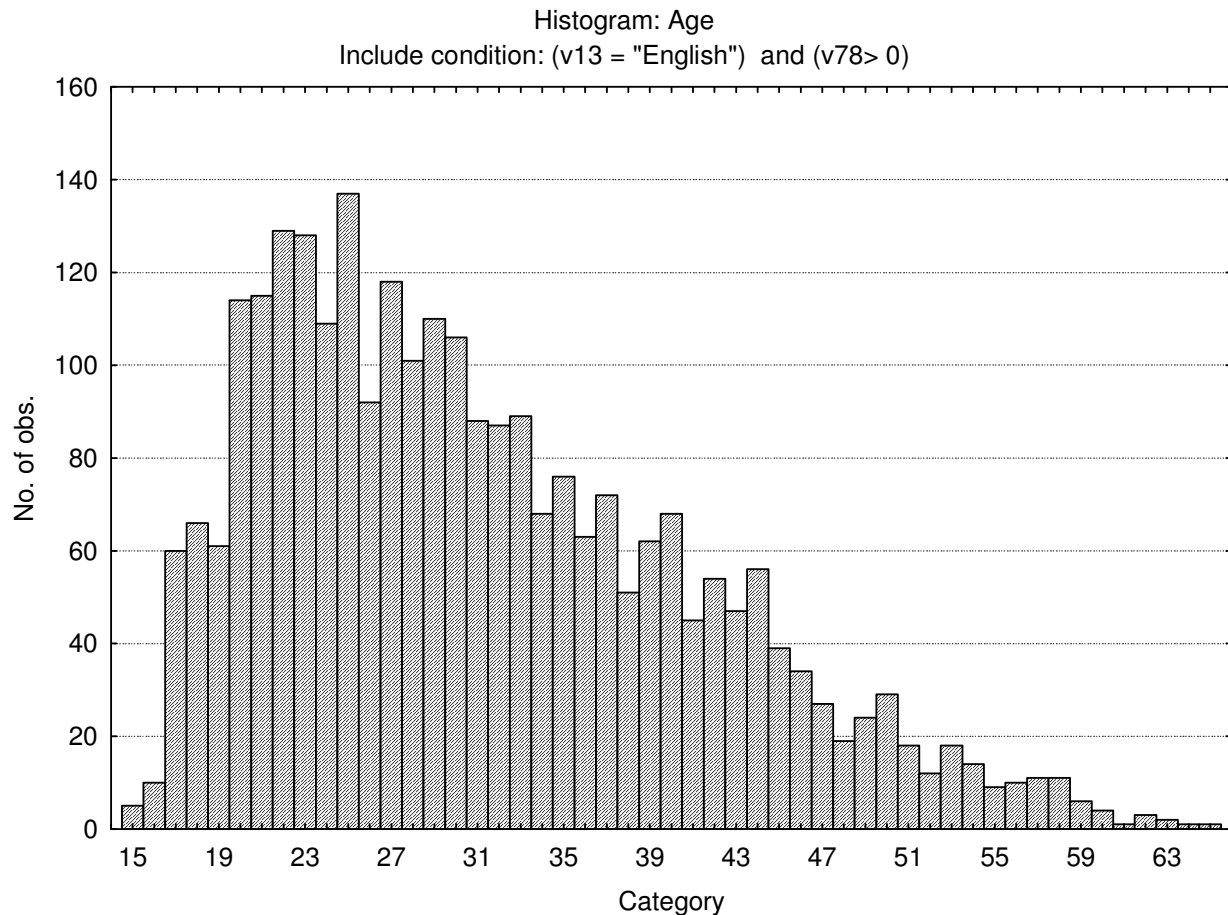
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2714	2714	100.0000	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Missing	0	2714	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2714	2714	100.0000	100.0000
Missing	0	2714	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	235	235	8.65881	8.6588
European	870	1105	32.05601	40.7148
Coloured	715	1820	26.34488	67.0597
Asian	806	2626	29.69786	96.7576
Missing	88	2714	3.24245	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.23993	9.825060	15.00000	68.00000	2680	34



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1012	1012	37.21957	37.2196
M	1704	2716	62.67010	99.8897
Missing	3	2719	0.11033	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	375	375	13.79184	13.7918
Grade 12	1137	1512	41.81684	55.6087
University Diploma	99	1611	3.64104	59.2497
Degree	275	1886	10.11401	69.3637
Vocational Training	102	1988	3.75138	73.1151
Grade 10 or 11	197	2185	7.24531	80.3604
Grade 8	7	2192	0.25745	80.6179

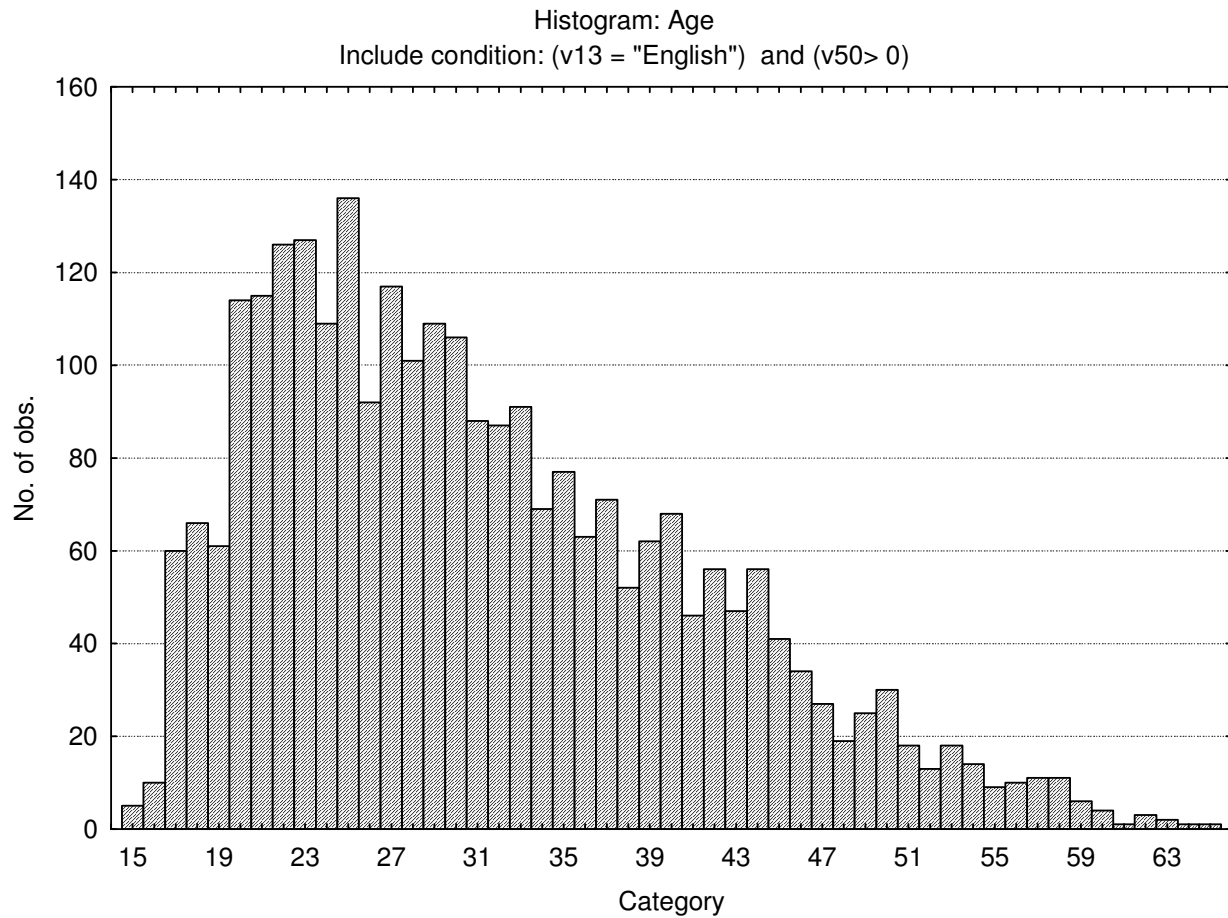
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 9	13	2205	0.47812	81.0960
Grade 7	1	2206	0.03678	81.1328
Post Graduate	163	2369	5.99485	87.1276
Missing	350	2719	12.87238	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2719	2719	100.0000	100.0000
Missing	0	2719	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2719	2719	100.0000	100.0000
Missing	0	2719	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	234	234	8.60611	8.6061
European	879	1113	32.32806	40.9342
Coloured	716	1829	26.33321	67.2674
Asian	801	2630	29.45936	96.7267
Missing	89	2719	3.27326	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.30540	9.843325	15.00000	68.00000	2685	34



### Sample composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1103	1103	34.07476	34.0748
M	2130	3233	65.80167	99.8764
Missing	4	3237	0.12357	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	468	468	14.45783	14.4578
Grade 12	1240	1708	38.30707	52.7649
University Diploma	117	1825	3.61446	56.3794
Degree	381	2206	11.77016	68.1495
Vocational Training	104	2310	3.21285	71.3624
Grade 10 or 11	211	2521	6.51838	77.8808
Grade 8	7	2528	0.21625	78.0970

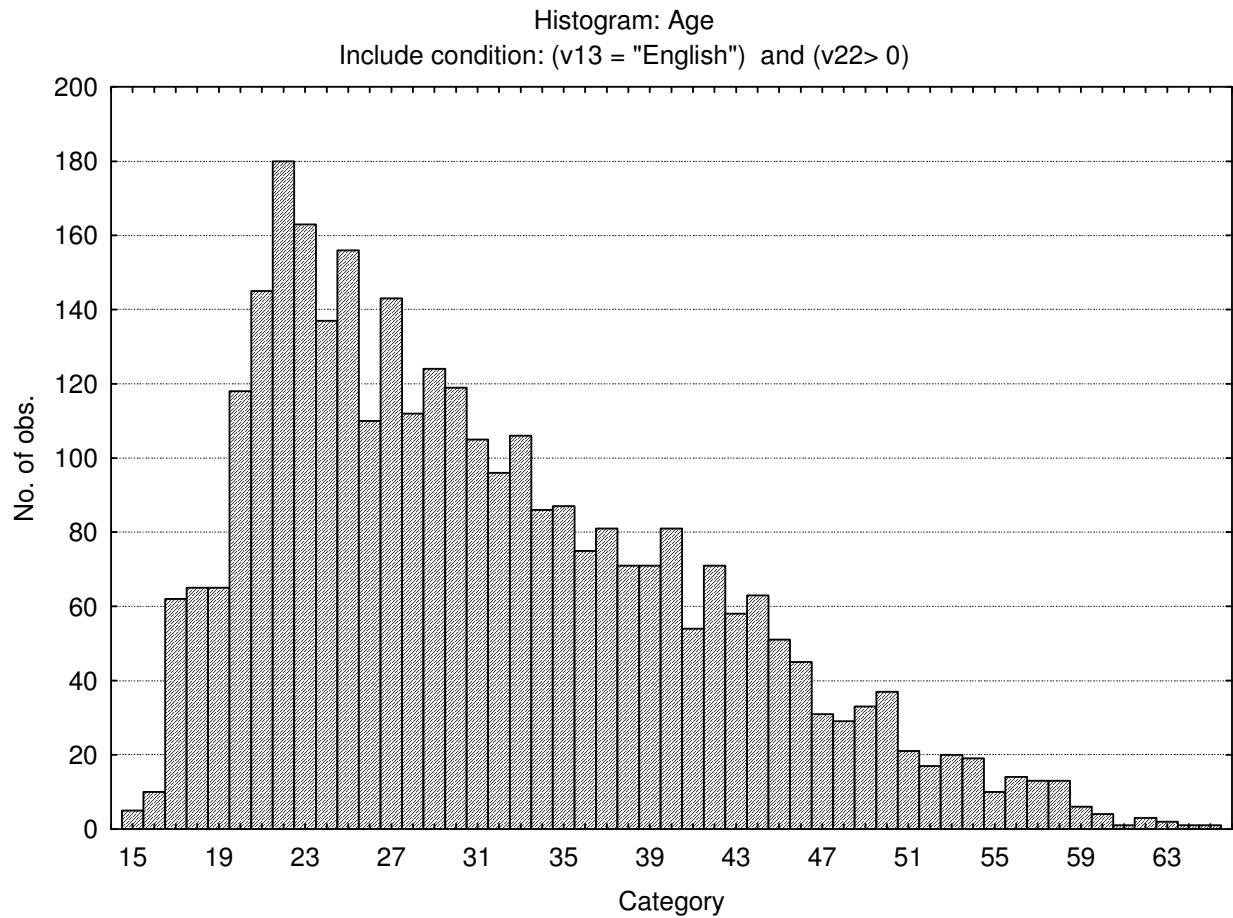
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 9	15	2543	0.46339	78.5604
Grade 7	1	2544	0.03089	78.5913
Post Graduate	265	2809	8.18659	86.7779
Missing	428	3237	13.22212	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3237	3237	100.0000	100.0000
Missing	0	3237	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3237	3237	100.0000	100.0000
Missing	0	3237	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	252	252	7.78499	7.7850
European	1061	1313	32.77726	40.5622
Coloured	756	2069	23.35496	63.9172
Asian	1076	3145	33.24065	97.1579
Missing	92	3237	2.84214	100.0000

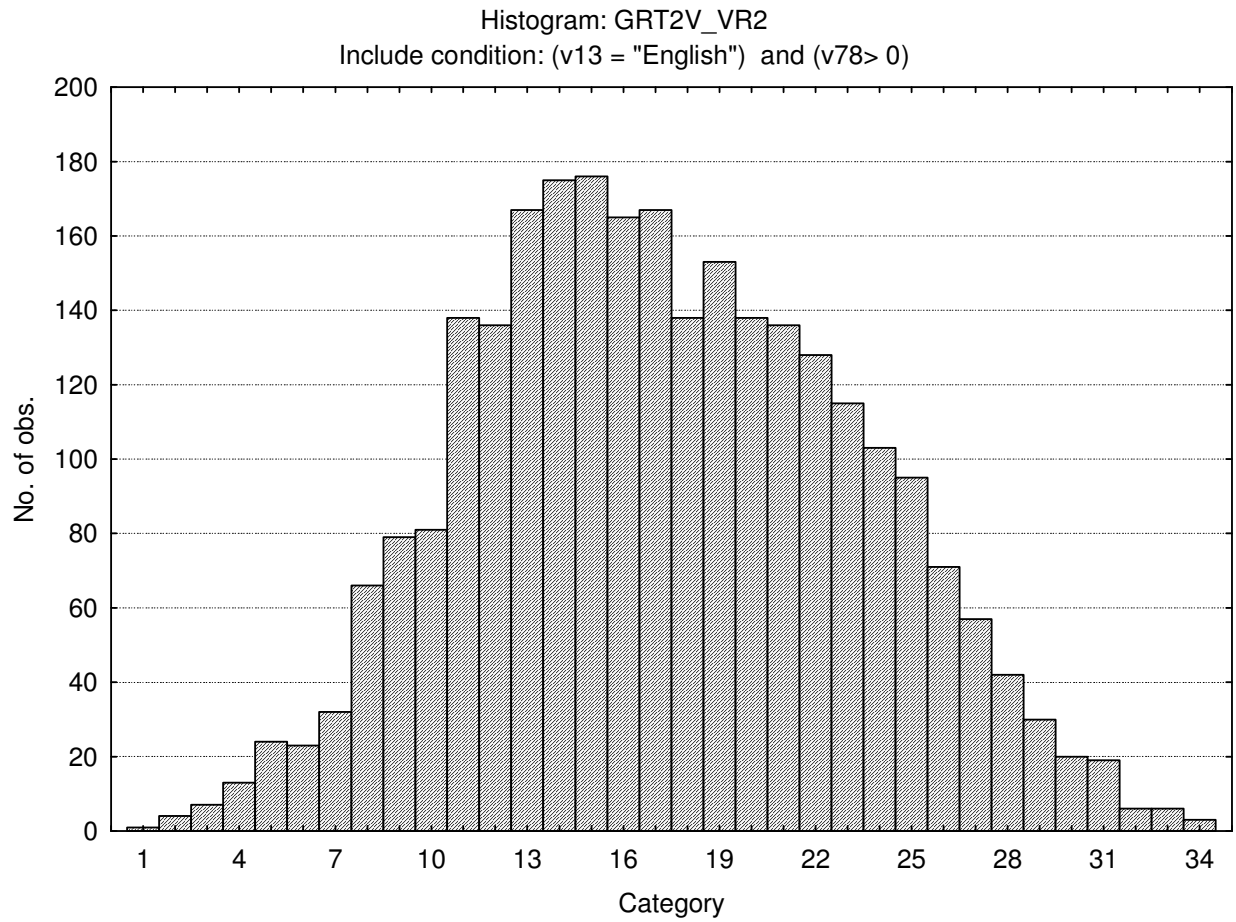
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.45204	9.838141	15.00000	68.00000	3190	47

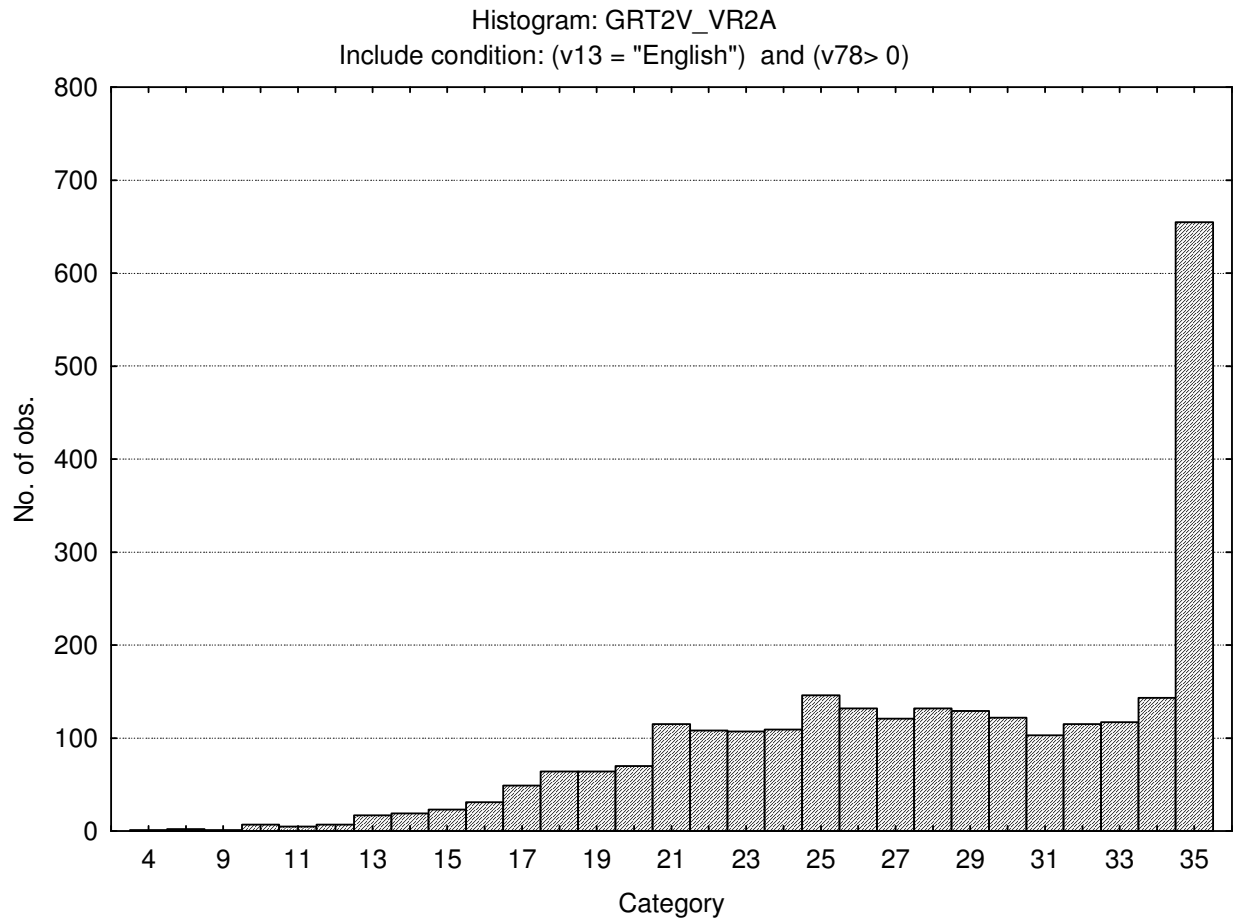


## Descriptive statistics and frequency distributions on General Reasoning Test Battery subtests

### General Verbal Reasoning Test

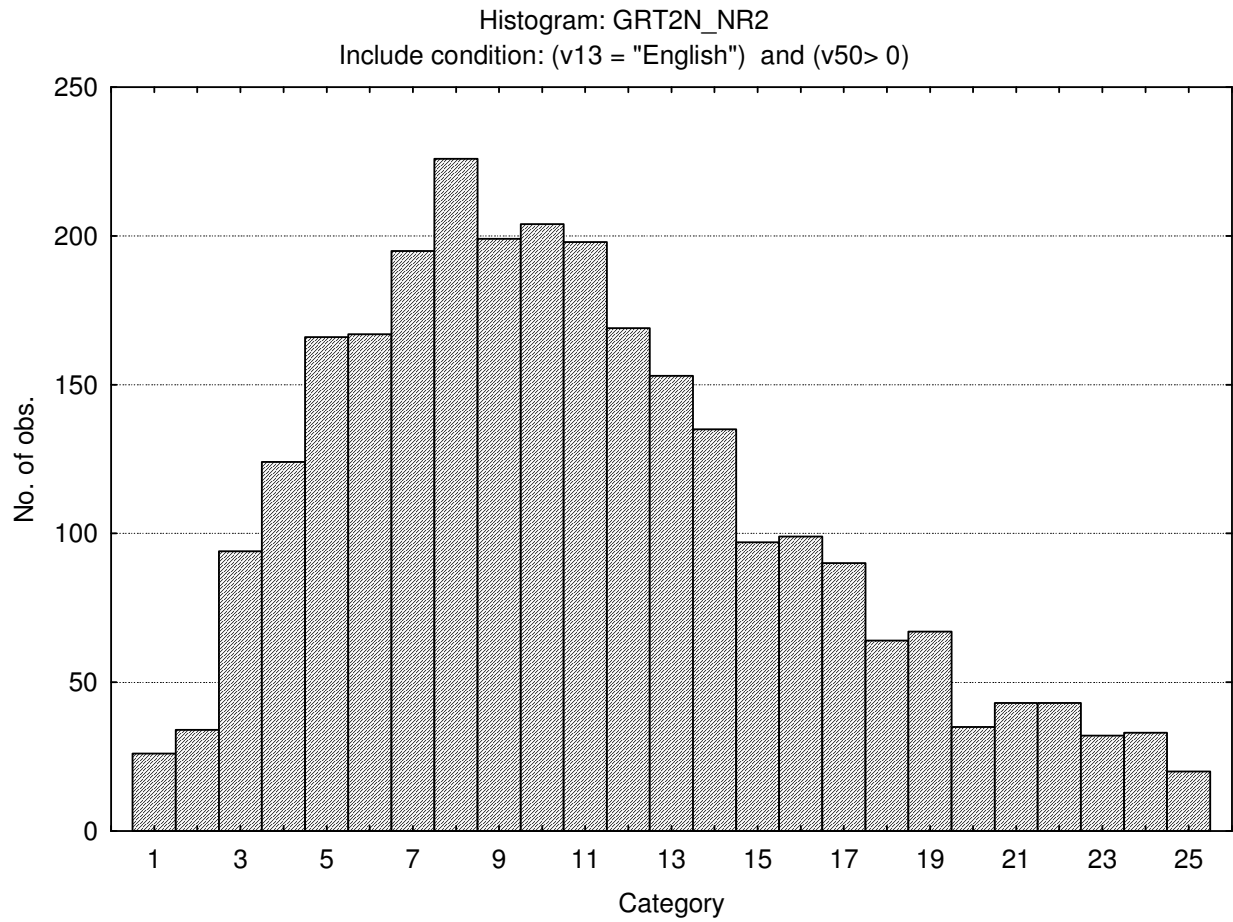
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Verbal Reasoning Test	17.29182	5.952660	1.000000	34.00000	2714
General Verbal Reasoning Items attempted	28.00368	6.209037	4.000000	35.00000	2714

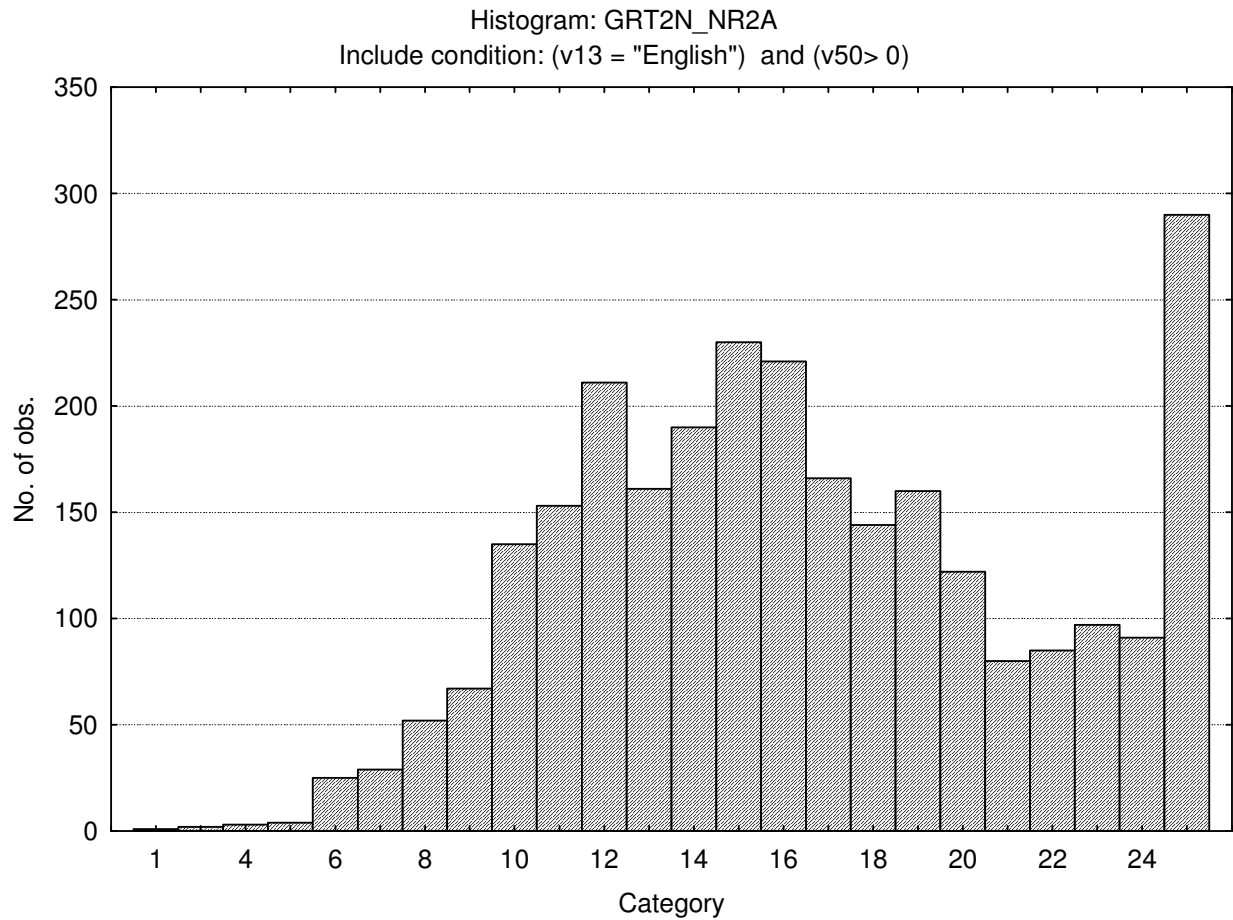




## General Numerical Reasoning Test

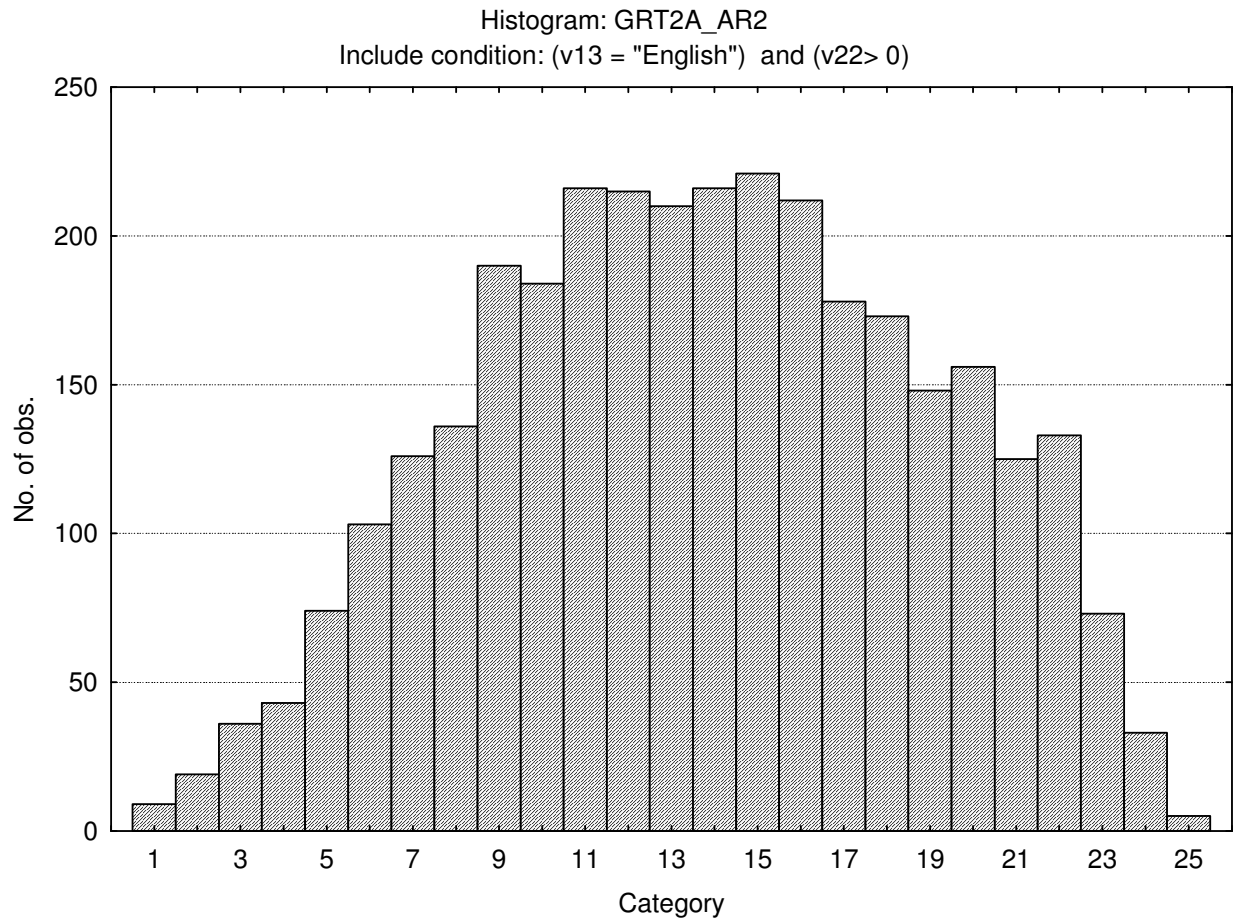
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Numerical Reasoning Test	10.82344	5.321397	1.000000	25.00000	2713
General Numerical Reasoning Items Attempted	16.48474	5.079034	1.000000	25.00000	2719

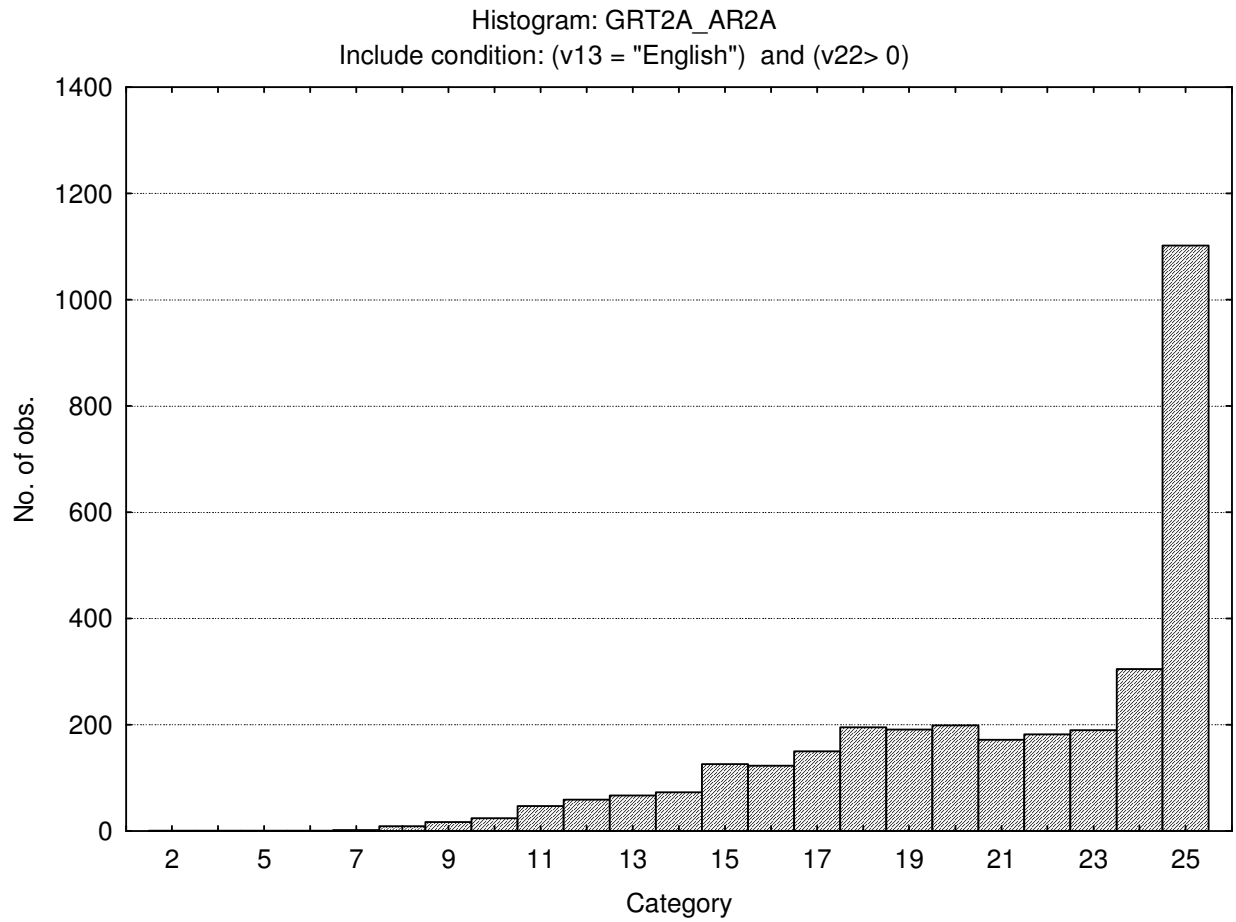




## General Abstract Reasoning Test

Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Abstract Reasoning Test	13.75108	5.166172	1.000000	25.00000	3234
General Abstract Reasoning Items Attempted	21.00618	4.298355	2.000000	25.00000	3237





## Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	1-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-34
General Verbal Items Attempted	4-17	18-20	21-23	24-26	27-29	30-32	33-35		
General Numerical Reasoning	1-1	2-4	5-6	7-9	10-12	13-14	15-17	18-20	21-25
General Numerical Items Attempted	1-7	8-10	11-12	13-15	16-17	18-20	21-22	23-25	
General Abstract Reasoning	1-4	5-7	8-9	10-12	13-15	16-17	18-20	21-22	23-25
General Abstract Items Attempted	2-13	14-15	16-17	18-19	20-22	23-24	25-25		

# General Reasoning Test Battery norm group: South Africans, Afrikaans speaking, updated 2011

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## Sample composition

The sample consisted of South Africans with Afrikaans as home language, tested by Psytech SA and collaborators in the period up to February 2011. Because not all respondents completed the whole General Reasoning Test Battery, biographical information is reported separately for the different subtests.

## Sample composition – General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	561	561	29.84043	29.8404
M	1313	1874	69.84043	99.6809
Missing	6	1880	0.31915	100.0000

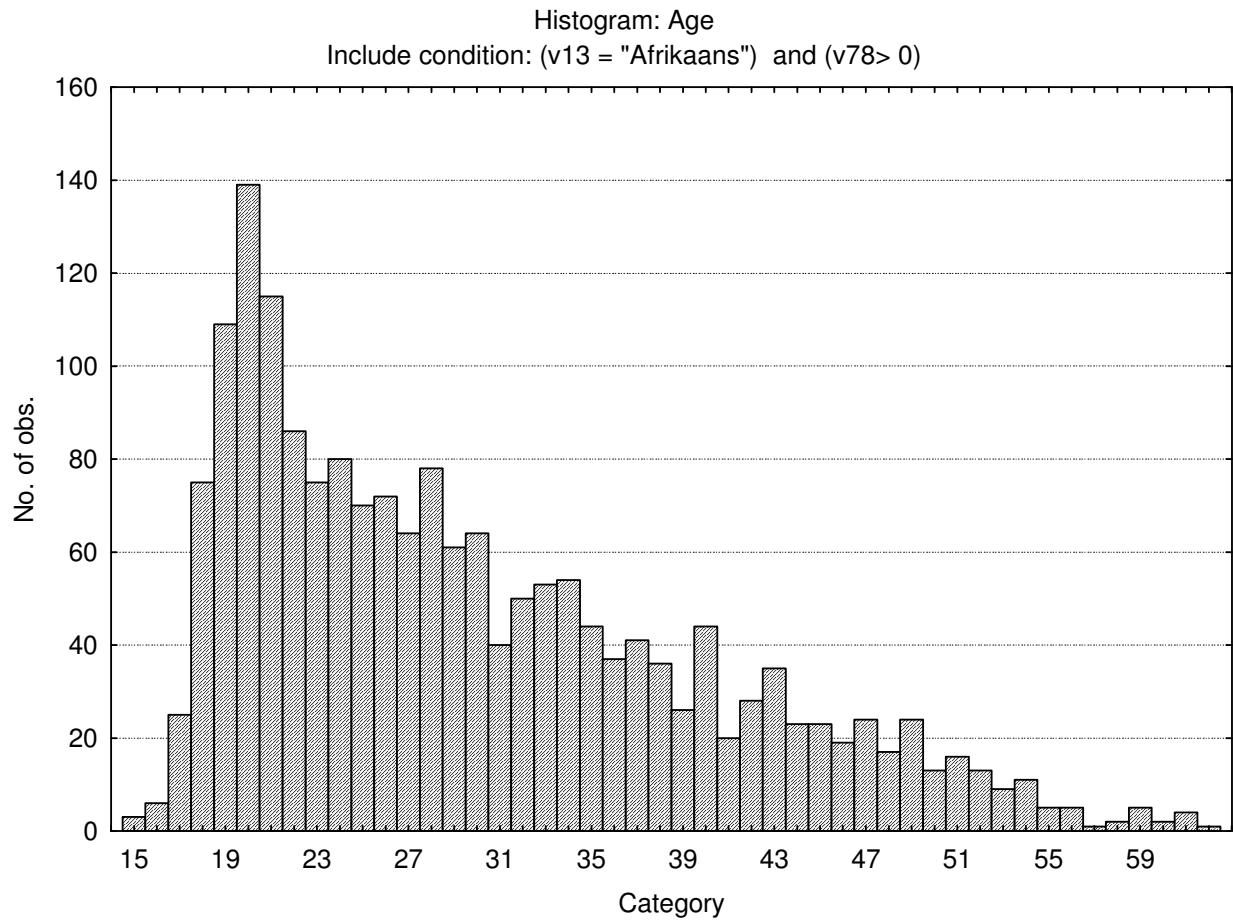
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	277	277	14.73404	14.7340
Grade 12	854	1131	45.42553	60.1596
University Diploma	57	1188	3.03191	63.1915
Degree	113	1301	6.01064	69.2021
Vocational Training	51	1352	2.71277	71.9149
Grade 10 or 11	146	1498	7.76596	79.6809
Grade 8	1	1499	0.05319	79.7340
Grade 9	3	1502	0.15957	79.8936
Post Graduate	57	1559	3.03191	82.9255
Missing	321	1880	17.07447	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1880	1880	100.0000	100.0000
Missing	0	1880	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1880	1880	100.0000	100.0000
Missing	0	1880	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	63	63	3.35106	3.3511
European	1305	1368	69.41489	72.7660
Coloured	454	1822	24.14894	96.9149
Asian	1	1823	0.05319	96.9681
Missing	57	1880	3.03191	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.84353	9.945948	15.00000	71.00000	1847	33



**Sample composition: General Numerical Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	564	564	29.73115	29.7312
M	1327	1891	69.95256	99.6837
Missing	6	1897	0.31629	100.0000

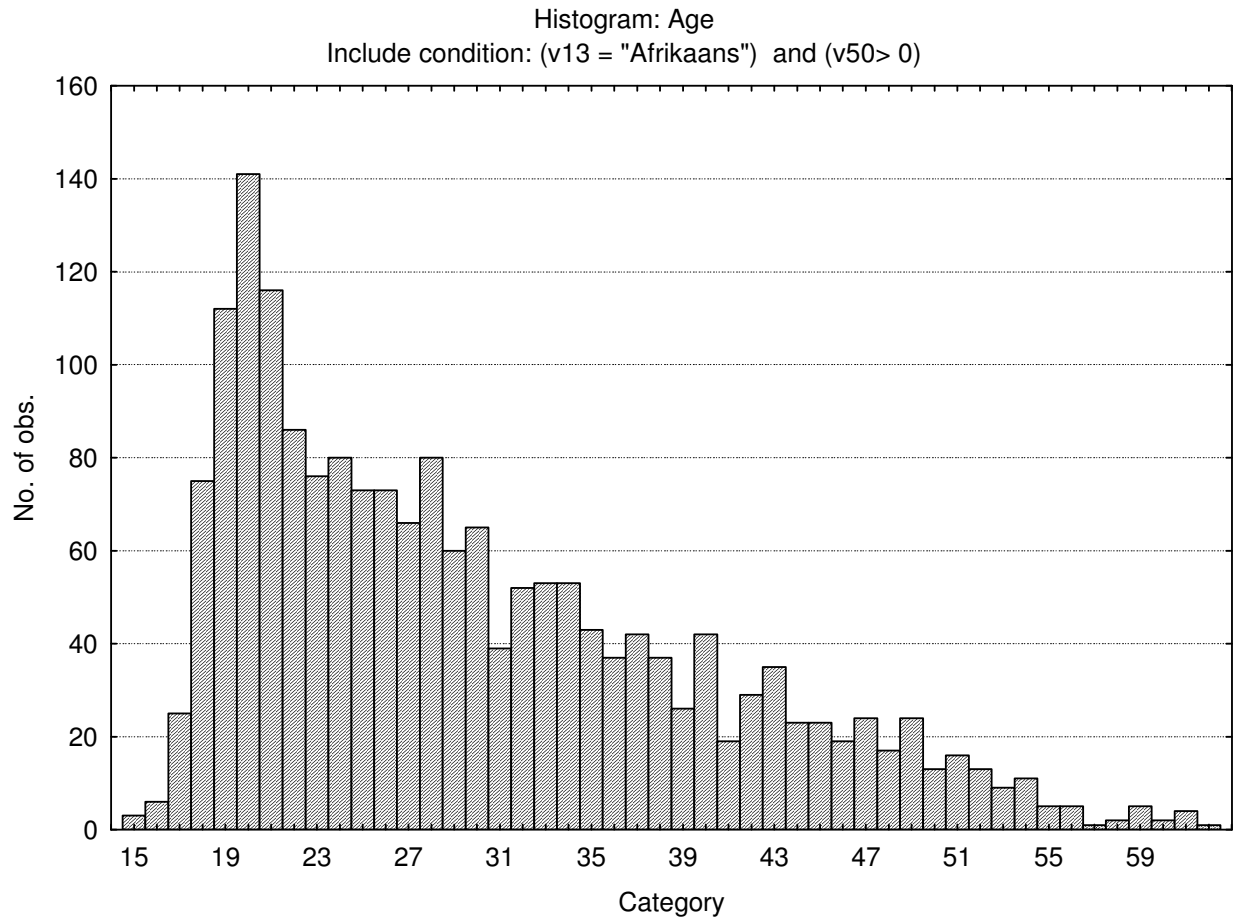
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	275	275	14.49657	14.4966
Grade 12	872	1147	45.96732	60.4639
University Diploma	57	1204	3.00474	63.4686
Degree	113	1317	5.95677	69.4254
Vocational Training	50	1367	2.63574	72.0611
Grade 10 or 11	146	1513	7.69636	79.7575
Grade 8	1	1514	0.05271	79.8102
Grade 9	3	1517	0.15814	79.9684
Post Graduate	57	1574	3.00474	82.9731
Missing	323	1897	17.02688	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1897	1897	100.0000	100.0000
Missing	0	1897	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1897	1897	100.0000	100.0000
Missing	0	1897	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	62	62	3.26832	3.2683
European	1308	1370	68.95098	72.2193
Coloured	463	1833	24.40696	96.6263
Asian	1	1834	0.05271	96.6790
Missing	63	1897	3.32103	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.78721	9.926659	15.00000	71.00000	1861	36



## Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	587	587	29.76673	29.7667
M	1378	1965	69.87830	99.6450
Missing	7	1972	0.35497	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	287	287	14.55375	14.5538
Grade 12	894	1181	45.33469	59.8884
University Diploma	60	1241	3.04260	62.9310
Degree	133	1374	6.74442	69.6755
Vocational Training	51	1425	2.58621	72.2617
Grade 10 or 11	147	1572	7.45436	79.7160
Grade 8	1	1573	0.05071	79.7667
Grade 9	3	1576	0.15213	79.9189
Post Graduate	71	1647	3.60041	83.5193
Missing	325	1972	16.48073	100.0000

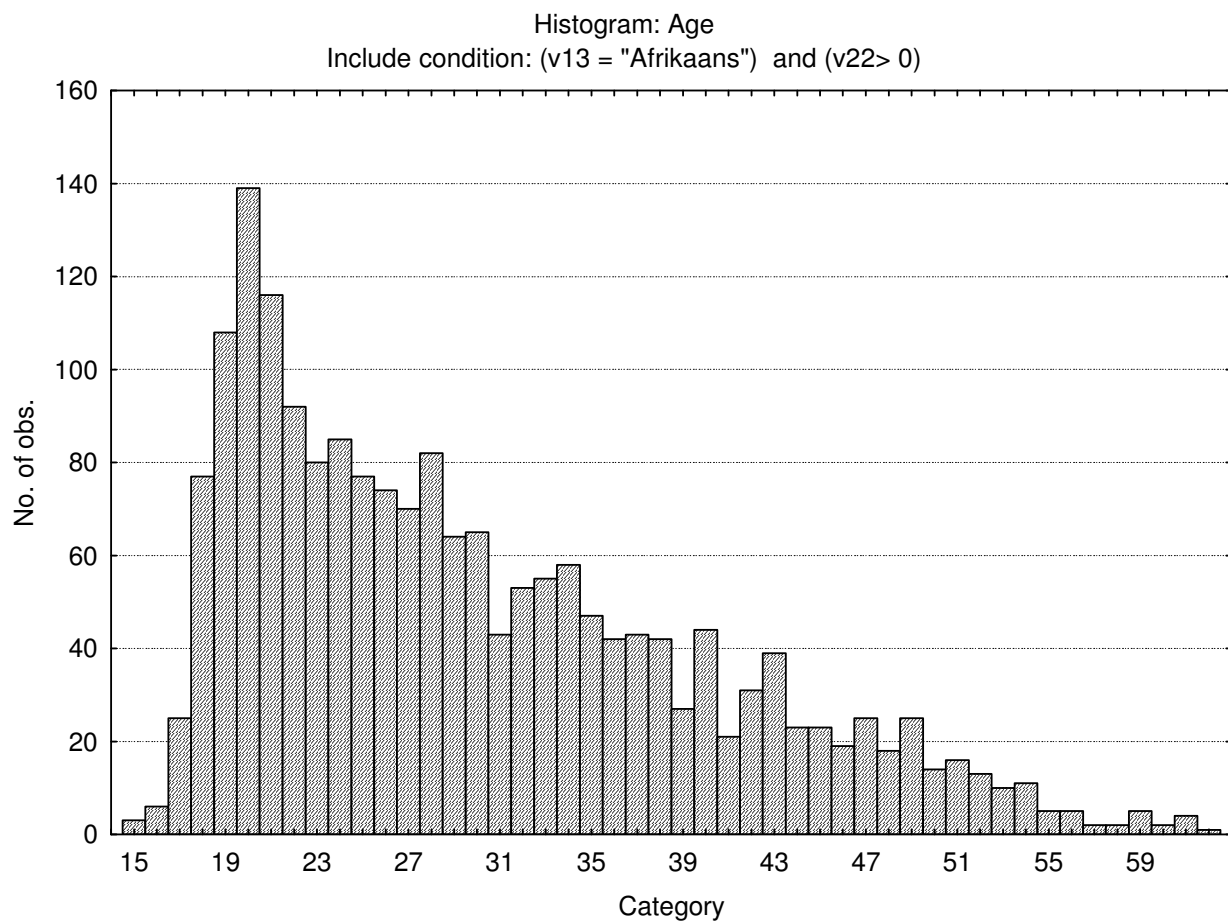
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1972	1972	100.0000	100.0000
Missing	0	1972	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1972	1972	100.0000	100.0000
Missing	0	1972	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	65	65	3.29615	3.2961
European	1382	1447	70.08114	73.3773
Coloured	466	1913	23.63083	97.0081
Asian	1	1914	0.05071	97.0588

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Missing	58	1972	2.94118	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.93475	9.889540	15.00000	71.00000	1931	41

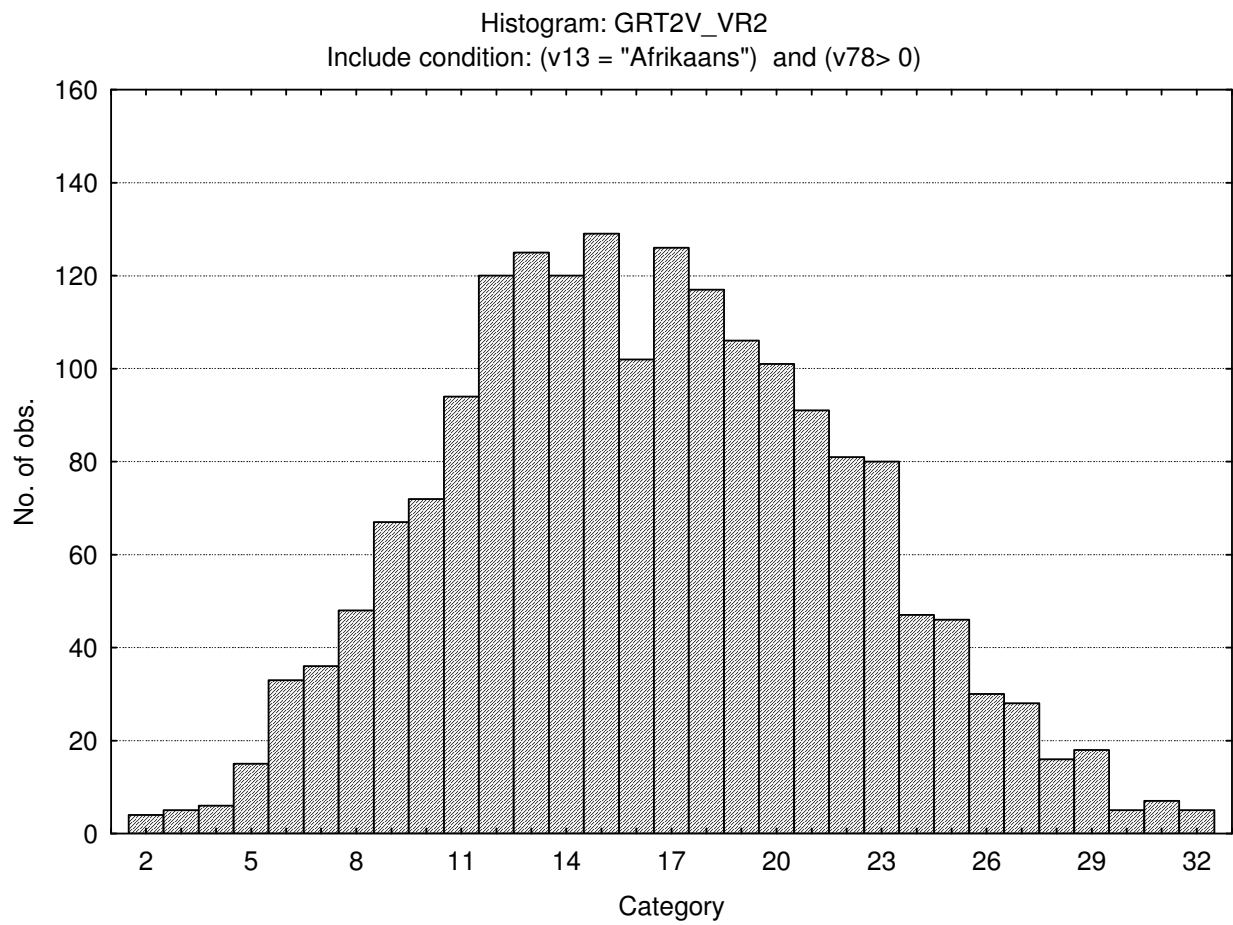


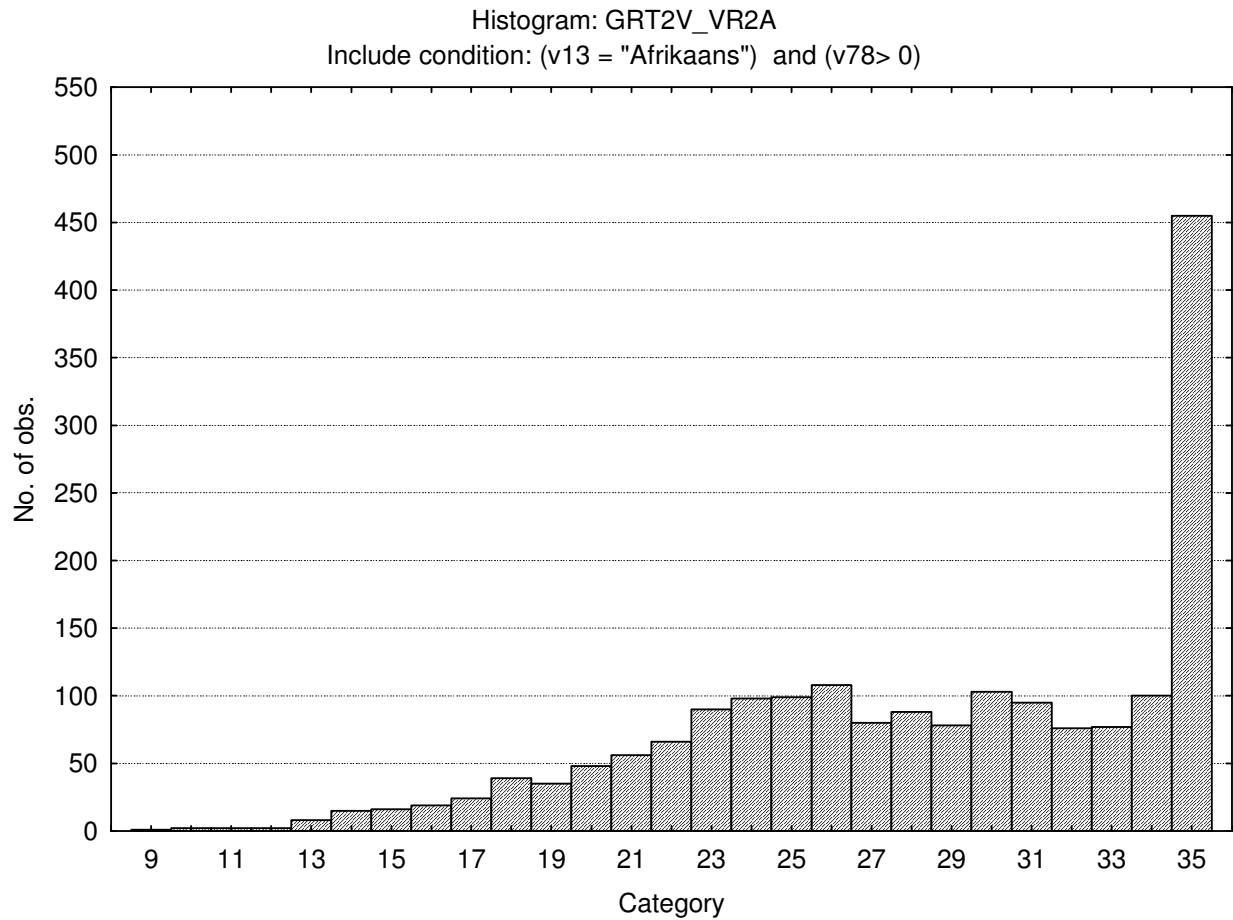
## Descriptive statistics and frequency distributions for General Reasoning Test Battery subtests

### General Verbal Reasoning Test

	Descriptive Statistics
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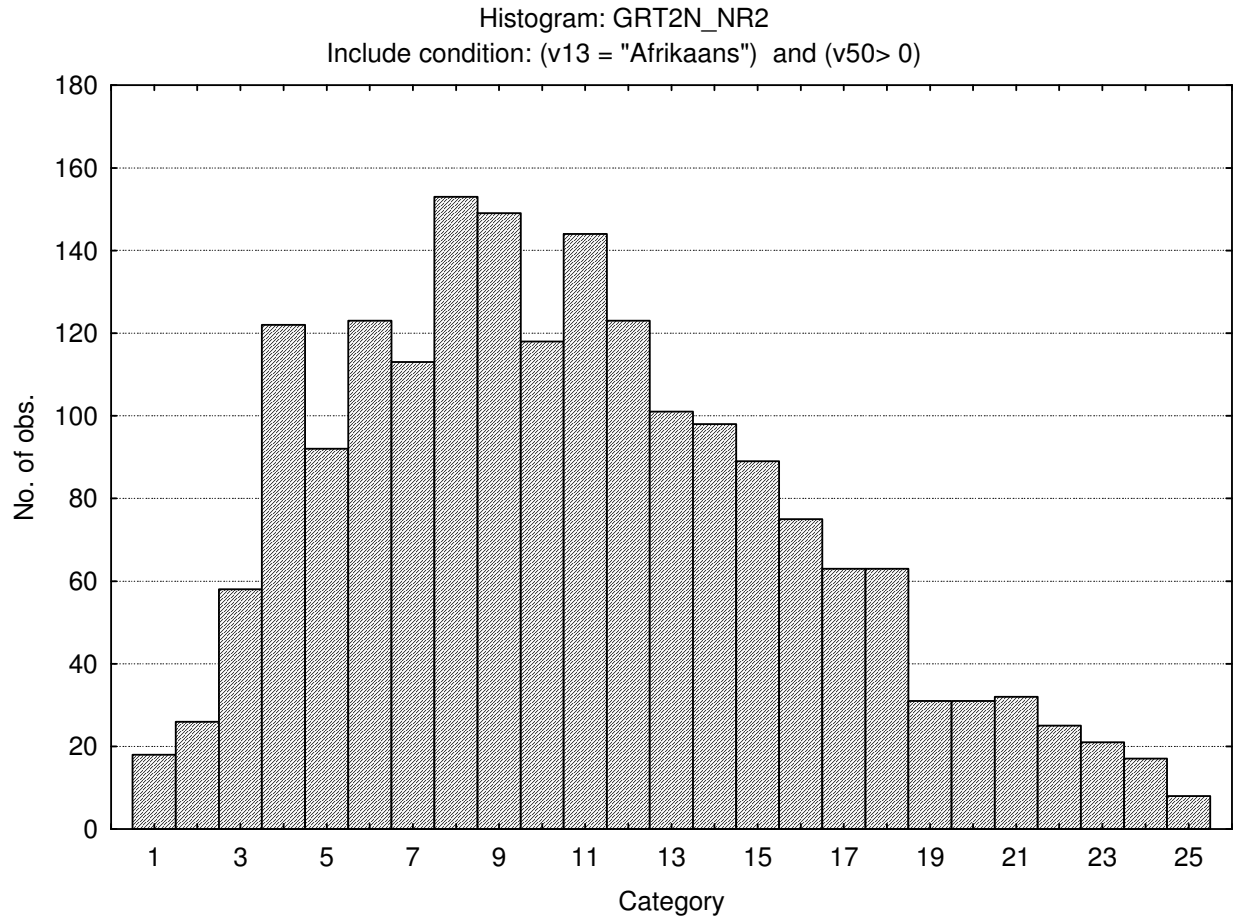
Variable	Mean	Std.Dev	Minimum	Maximum	N
General Verbal Reasoning	16.35691	5.642041	2.000000	32.000000	1880
General Verbal Reasoning items attempted	28.30851	5.905638	9.000000	35.000000	1880

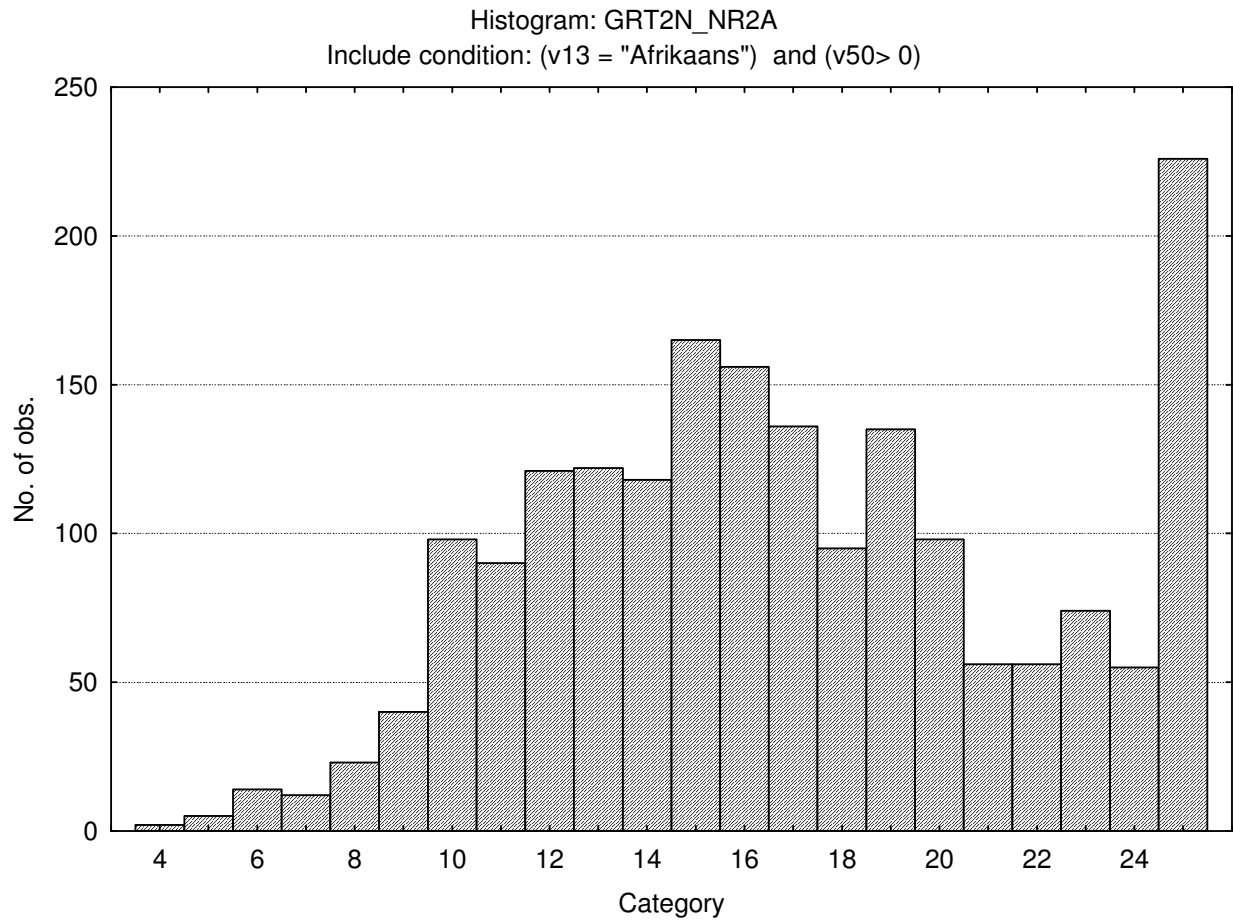




## General Numerical Reasoning Test

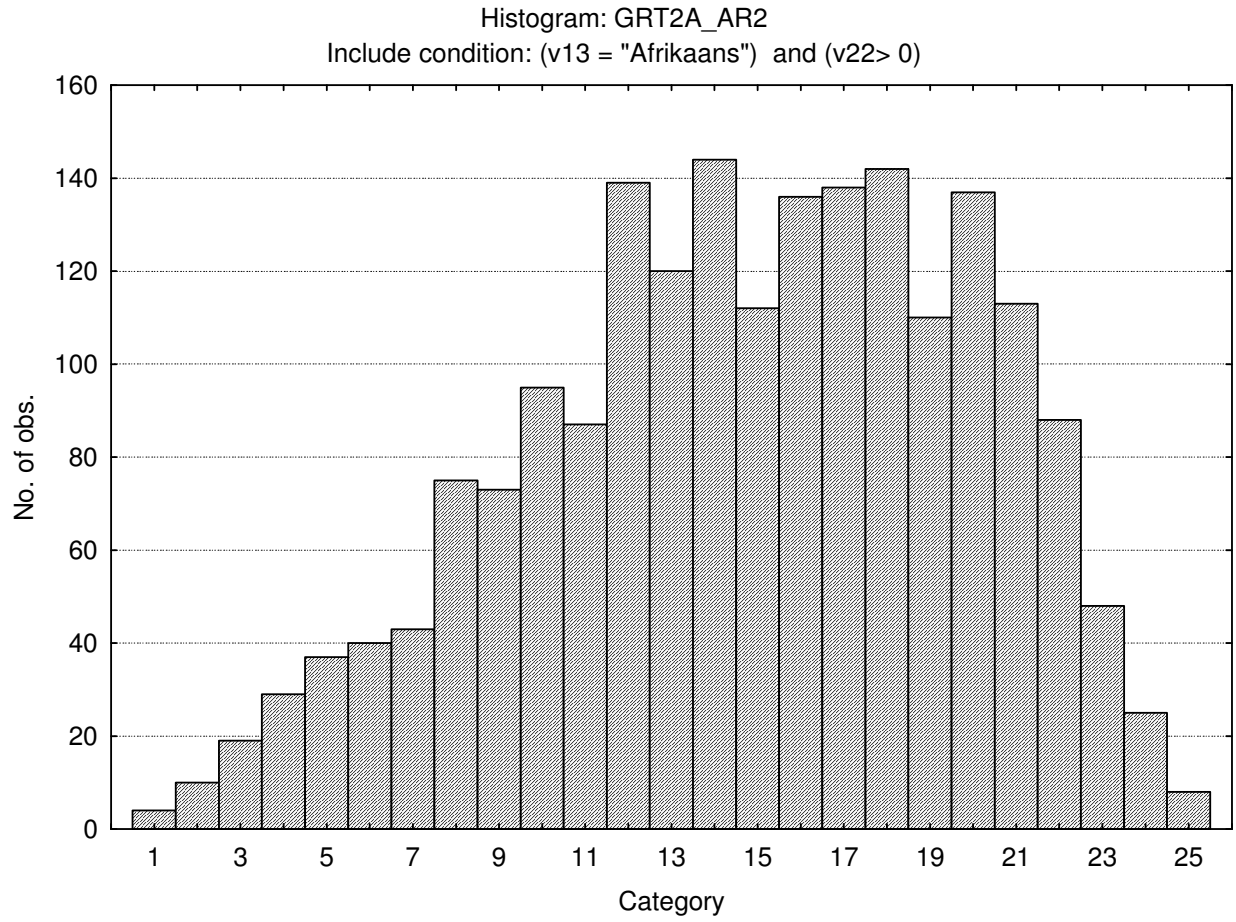
Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Numerical Reasoning	10.81511	5.245822	1.000000	25.00000	1893
General Numerical Reasoning items attempted	16.87032	4.972291	4.000000	25.00000	1897

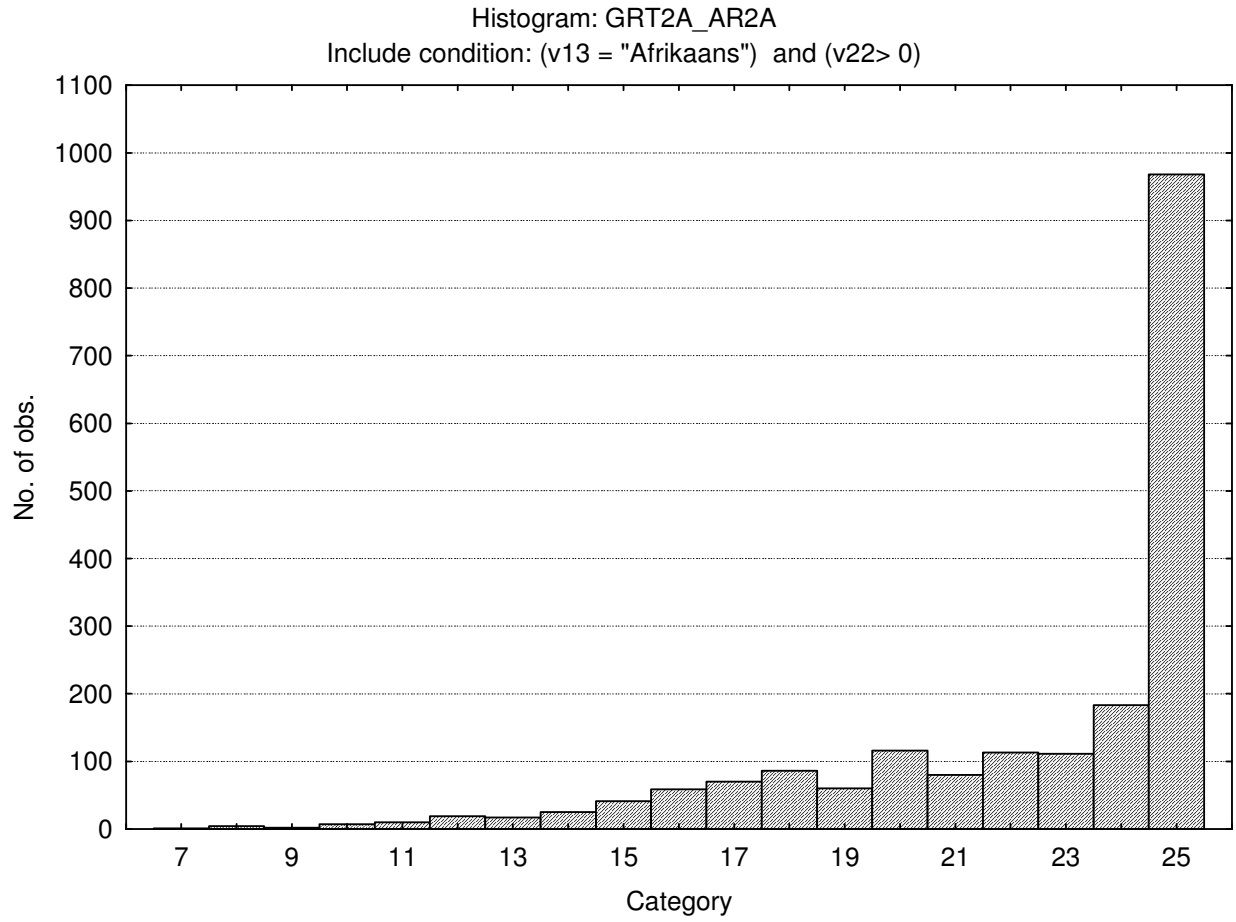




## General Abstract Reasoning Test

Variable	Descriptive Statistics				
	Mean	Std.Dev	Minimum	Maximum	N
General Abstract Reasoning	14.77282	5.120676	1.000000	25.00000	1972
General Abstract Reasoning Items Attempted	22.36511	3.637362	7.000000	25.00000	1972





## Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	2-6	7-9	10-12	13-14	15-17	18-20	21-23	24-26	27-32
General Verbal Items Attempted	9-17	18-20	21-23	24-26	27-29	30-32	33-35		
General Numerical Reasoning	1-1	2-4	5-6	7-9	10-12	13-14	15-17	18-19	20-25
General Numerical Items Attempted	4-8	9-10	11-13	14-15	16-18	19-20	21-23	24-25	
General Abstract Reasoning	1-5	6-8	9-10	11-13	14-16	17-18	19-21	22-23	24-25
General Abstract Items Attempted	7-15	16-17	18-19	20-21	22-23	24-25			

# General Reasoning Test Battery norm group: South Africans, speaking indigenous languages, updated 2011

## Sample composition

The sample consisted of South Africans speaking an indigenous language as their first language, tested by Psytech SA and collaborators during the period up to February 2011. Since not all respondents completed all the subtests of the General Reasoning Test Battery, biographical particulars are reported separately for the different subtests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1451	1451	28.75545	28.7554
M	3579	5030	70.92747	99.6829
Missing	16	5046	0.31708	100.0000

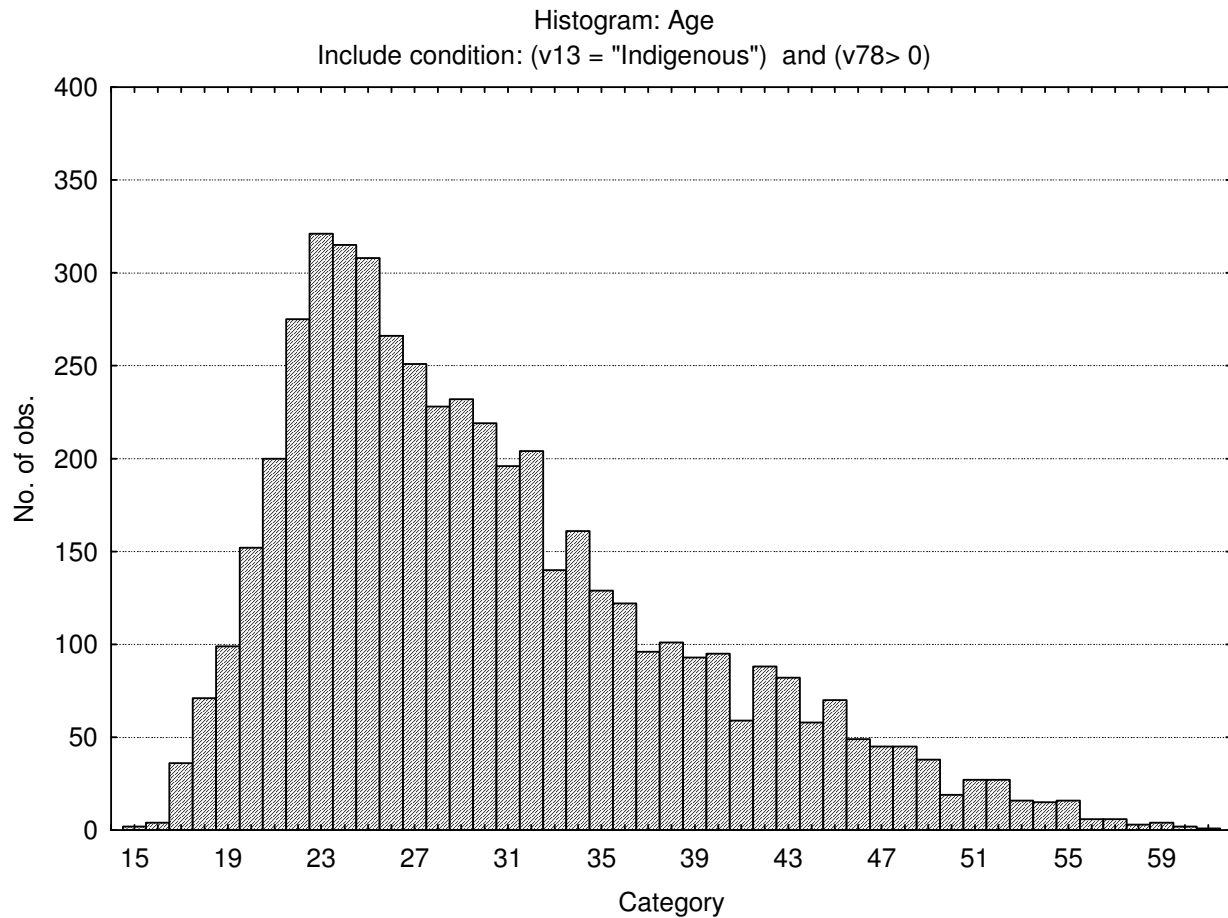
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1120	1120	22.19580	22.1958
Grade 12	1714	2834	33.96750	56.1633
University Diploma	154	2988	3.05192	59.2152
Degree	372	3360	7.37218	66.5874
Vocational Training	165	3525	3.26992	69.8573
Grade 10 or 11	527	4052	10.44392	80.3012
Grade 8	52	4104	1.03052	81.3317
Grade 9	47	4151	0.93143	82.2632
Grade 7	23	4174	0.45581	82.7190
Post Graduate	168	4342	3.32937	86.0484
Missing	704	5046	13.95164	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1907	1907	37.79231	37.7923
Setswana	559	2466	11.07808	48.8704
Sesotho	877	3343	17.38010	66.2505
Sepedi	229	3572	4.53825	70.7887
Xitsonga	121	3693	2.39794	73.1867
Tshivenda	67	3760	1.32778	74.5145
siSwati	58	3818	1.14943	75.6639
isiNdebele	32	3850	0.63417	76.2981
isiXhosa	1111	4961	22.01744	98.3155
Missing	85	5046	1.68450	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	5046	5046	100.0000	100.0000
Missing	0	5046	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	4921	4921	97.52279	97.5228
European	12	4933	0.23781	97.7606
Coloured	17	4950	0.33690	98.0975
Asian	15	4965	0.29727	98.3948
Missing	81	5046	1.60523	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.22216	8.406577	15.00000	63.00000	4992	54



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1437	1437	28.54589	28.5459
M	3582	5019	71.15614	99.7020
Missing	15	5034	0.29797	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1113	1113	22.10965	22.1097
Grade 12	1714	2827	34.04847	56.1581
University Diploma	152	2979	3.01947	59.1776
Degree	373	3352	7.40961	66.5872
Vocational Training	161	3513	3.19825	69.7855
Grade 10 or 11	527	4040	10.46881	80.2543
Grade 8	52	4092	1.03298	81.2872

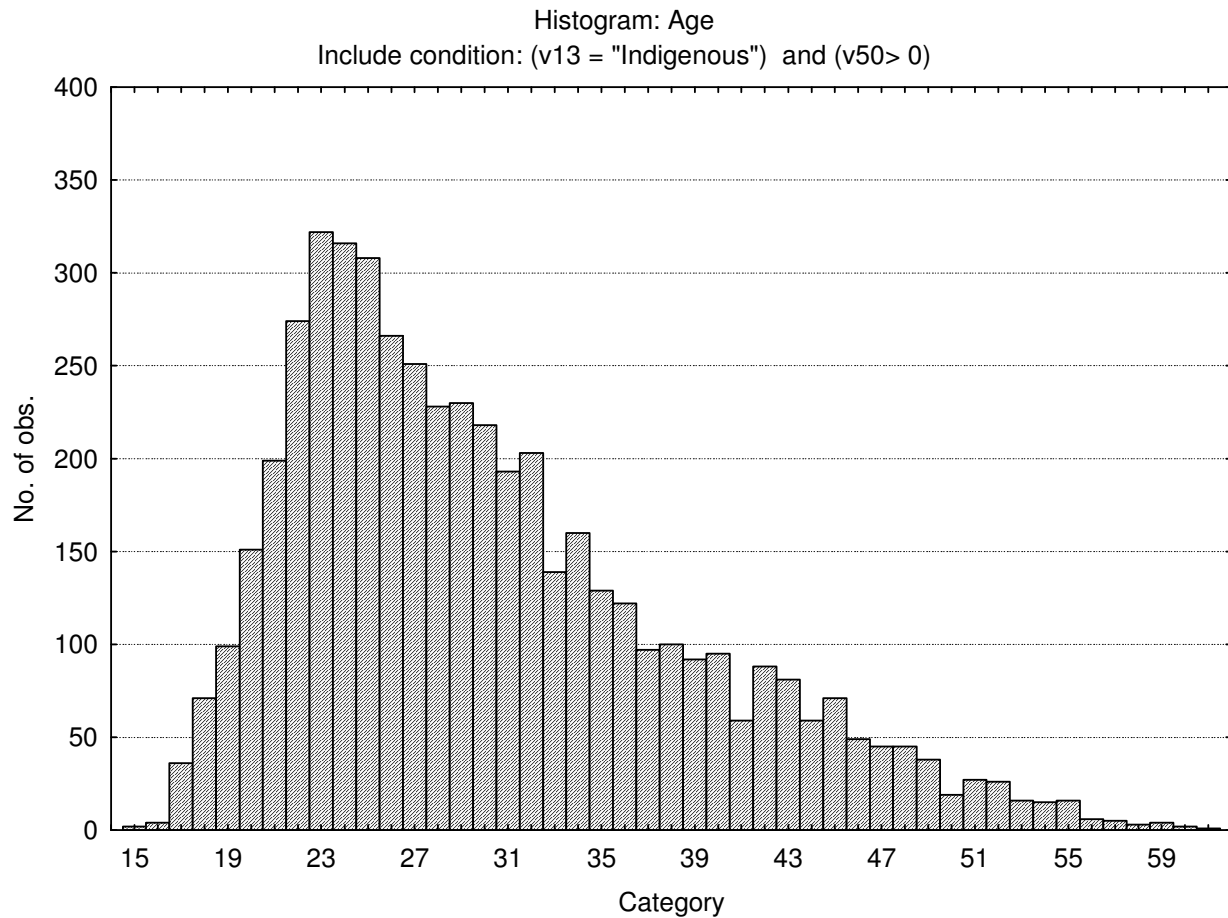
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 9	48	4140	0.95352	82.2408
Grade 7	24	4164	0.47676	82.7175
Post Graduate	166	4330	3.29758	86.0151
Missing	704	5034	13.98490	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1902	1902	37.78308	37.7831
Setswana	560	2462	11.12435	48.9074
Sesotho	874	3336	17.36194	66.2694
Sepedi	229	3565	4.54907	70.8184
Xitsonga	120	3685	2.38379	73.2022
Tshivenda	66	3751	1.31108	74.5133
siSwati	58	3809	1.15217	75.6655
isiNdebele	32	3841	0.63568	76.3012
isiXhosa	1108	4949	22.01033	98.3115
Missing	85	5034	1.68852	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	5034	5034	100.0000	100.0000
Missing	0	5034	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	4908	4908	97.49702	97.4970
European	12	4920	0.23838	97.7354
Coloured	17	4937	0.33770	98.0731
Asian	15	4952	0.29797	98.3711
Missing	82	5034	1.62892	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.21486	8.401959	15.00000	63.00000	4980	54



### Sample composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1517	1517	28.23376	28.2338
M	3840	5357	71.46845	99.7022
Missing	16	5373	0.29779	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1236	1236	23.00391	23.0039
Grade 12	1778	3014	33.09138	56.0953
University Diploma	173	3187	3.21980	59.3151
Degree	409	3596	7.61213	66.9272
Vocational Training	178	3774	3.31286	70.2401
Grade 10 or 11	533	4307	9.91997	80.1601
Grade 8	53	4360	0.98641	81.1465

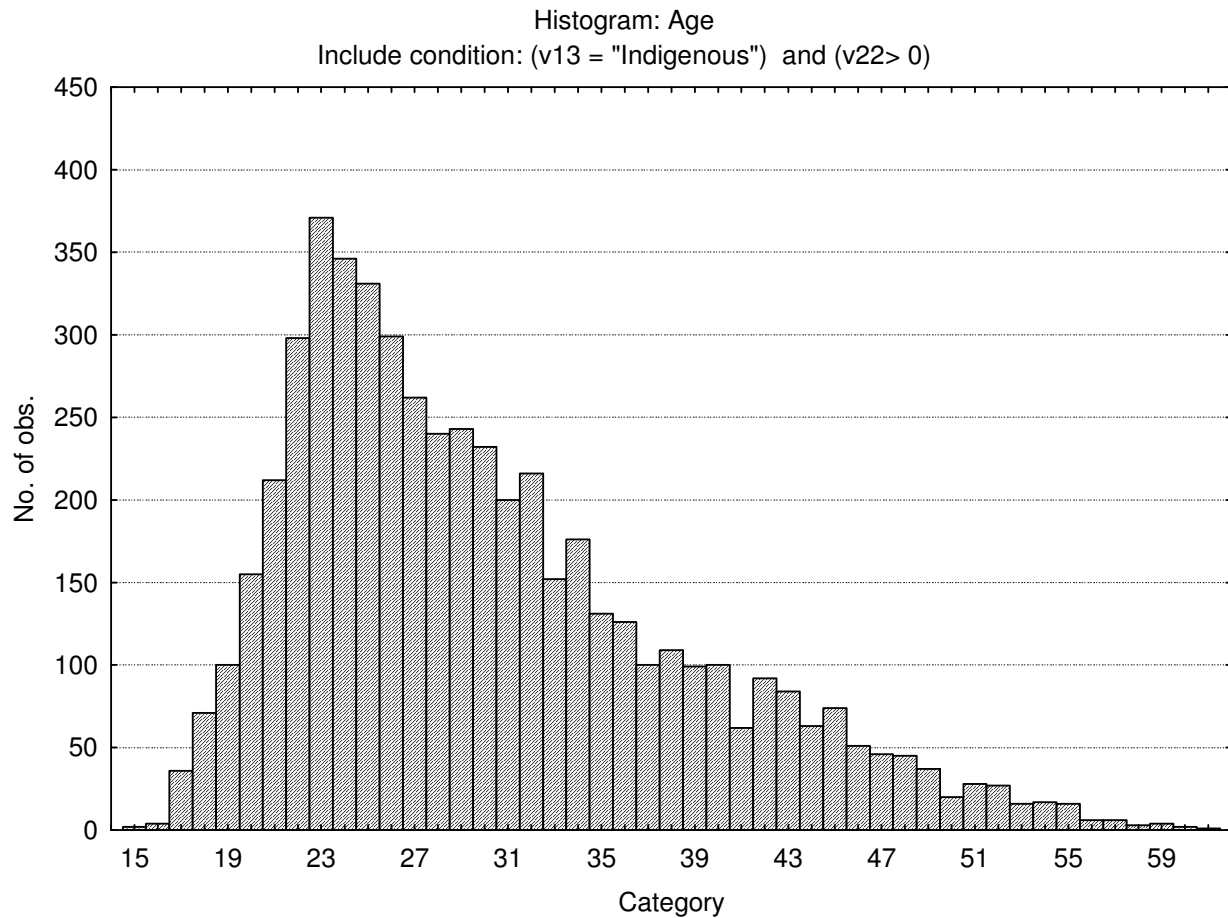
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 9	49	4409	0.91197	82.0584
Grade 7	24	4433	0.44668	82.5051
Post Graduate	220	4653	4.09455	86.5997
Missing	720	5373	13.40034	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2063	2063	38.39568	38.3957
Setswana	586	2649	10.90638	49.3021
Sesotho	921	3570	17.14126	66.4433
Sepedi	238	3808	4.42956	70.8729
Xitsonga	137	3945	2.54979	73.4227
Tshivenda	71	4016	1.32142	74.7441
siSwati	63	4079	1.17253	75.9166
isiNdebele	33	4112	0.61418	76.5308
isiXhosa	1176	5288	21.88721	98.4180
Missing	85	5373	1.58198	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	5373	5373	100.0000	100.0000
Missing	0	5373	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5239	5239	97.50605	97.5060
European	16	5255	0.29779	97.8038
Coloured	17	5272	0.31640	98.1202
Asian	20	5292	0.37223	98.4925
Missing	81	5373	1.50754	100.0000

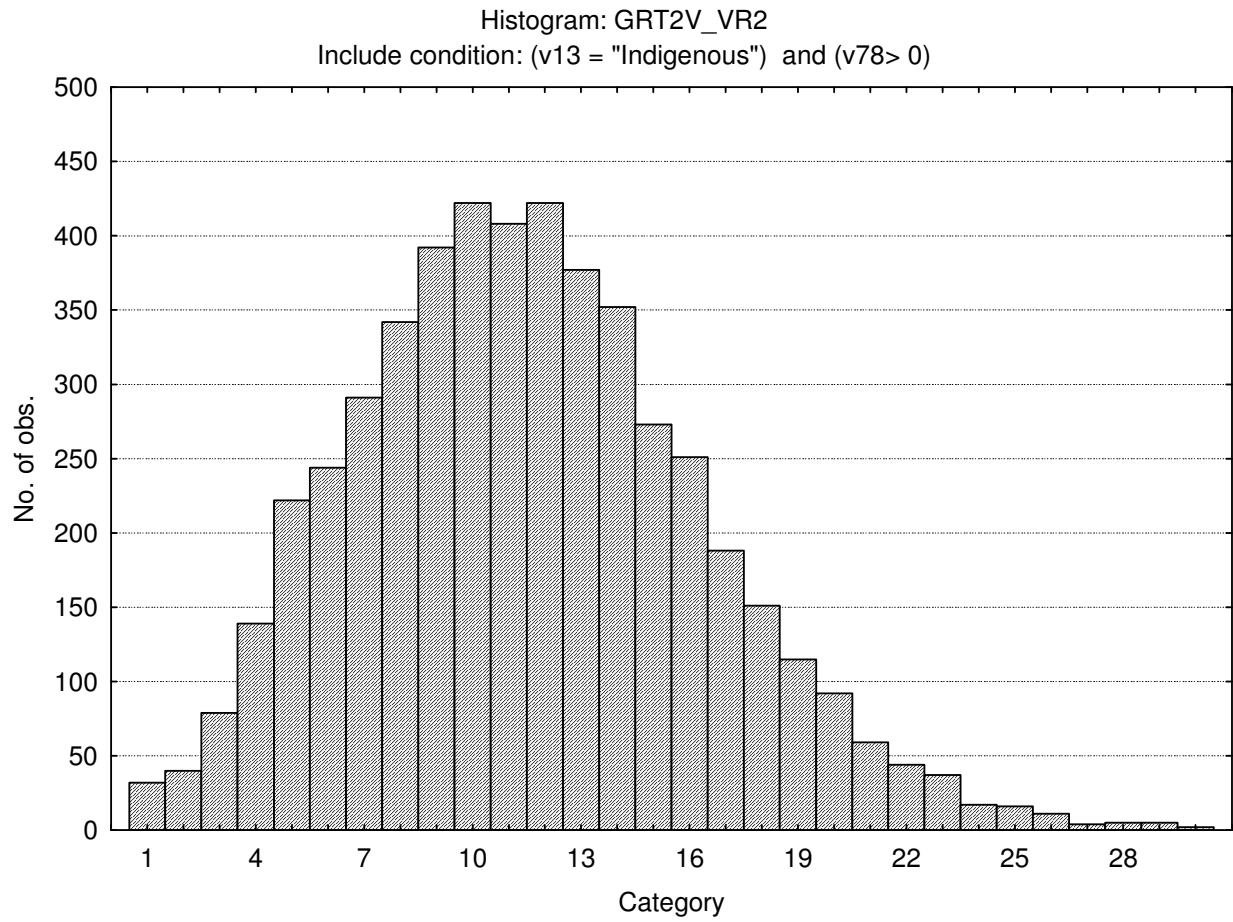
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.11956	8.330023	15.00000	63.00000	5311	62

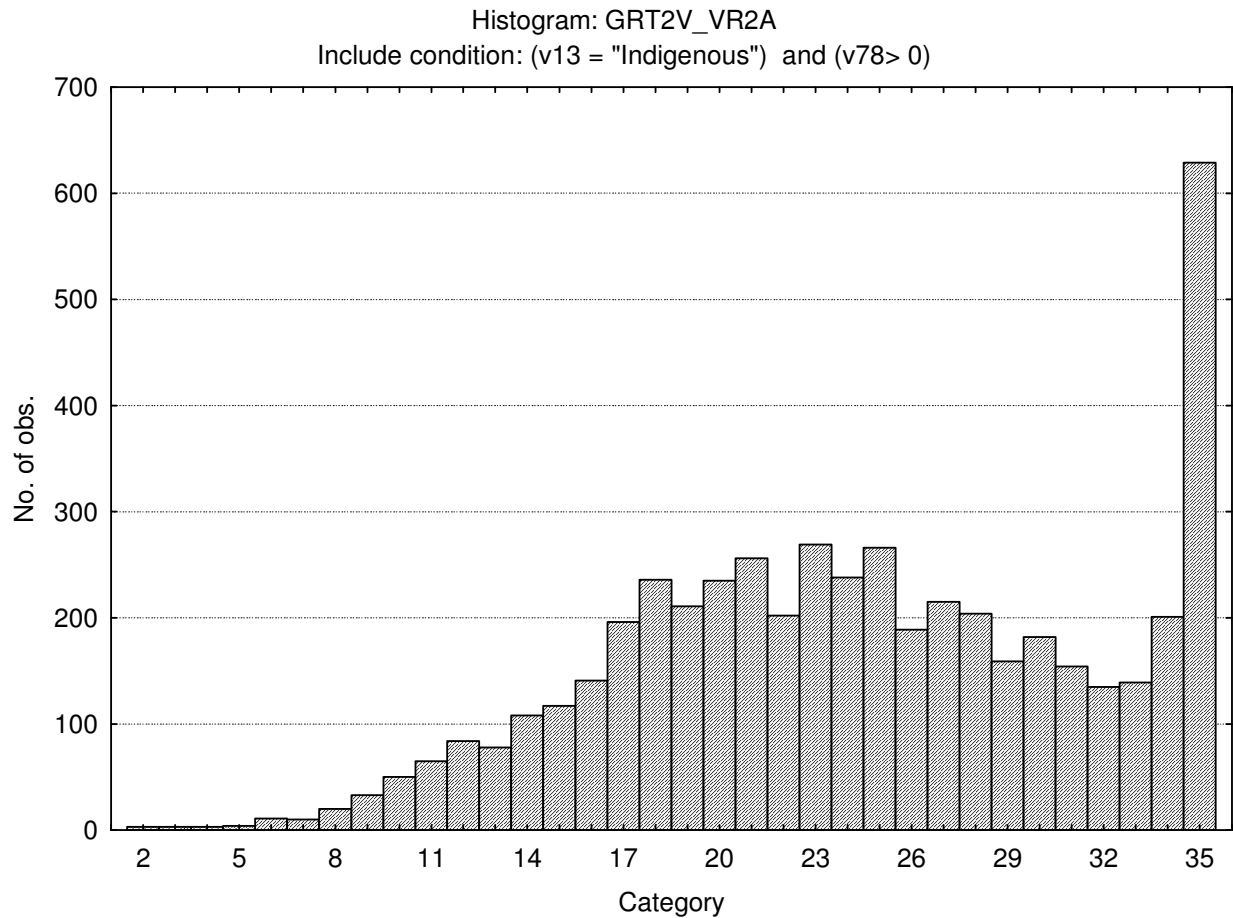


## Descriptive Statistics and frequency distributions on General Reasoning Test Battery subtests

### General Verbal Reasoning Test

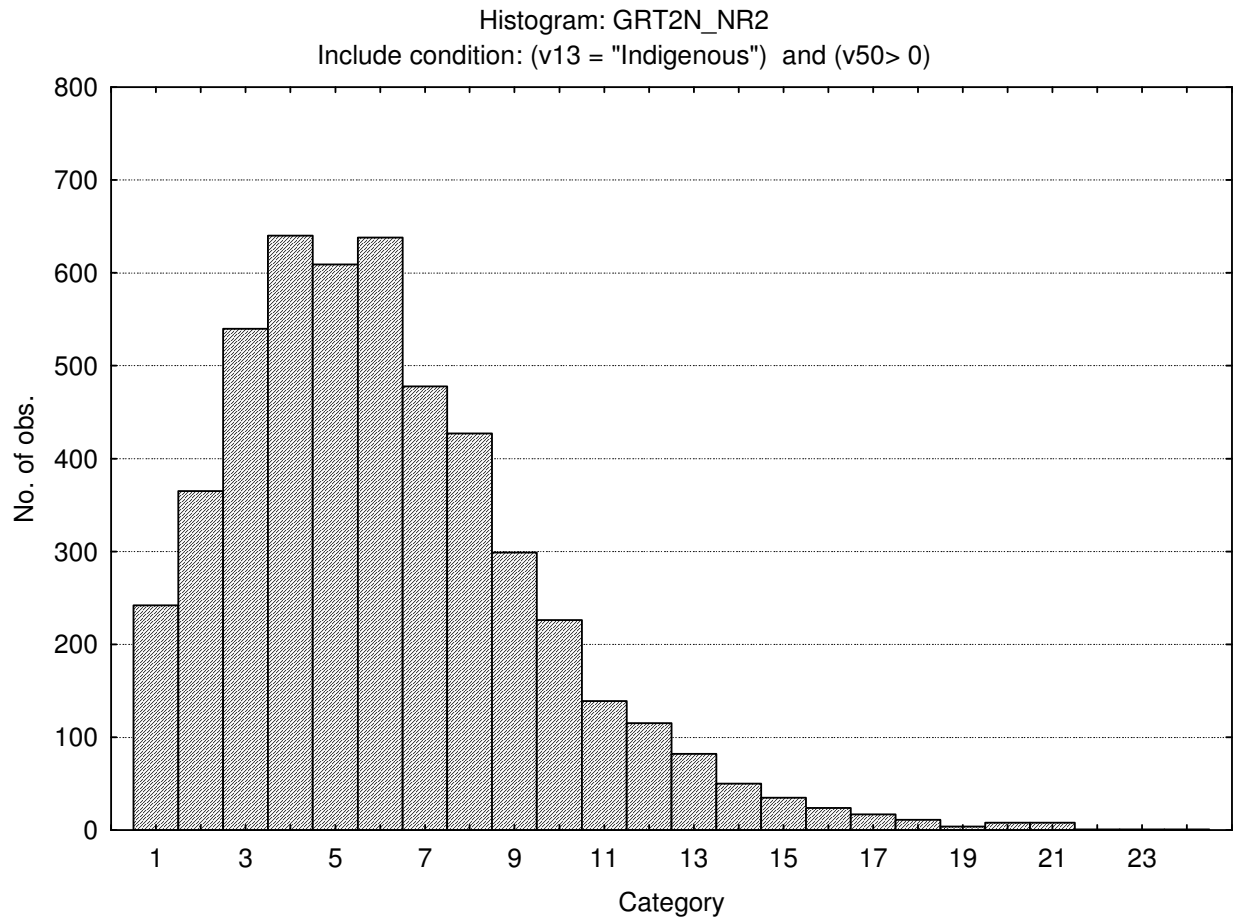
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	11.53378	4.787976	1.000000	31.00000	5032	14
General Verbal Reasoning Items Attempted	24.39358	7.263610	2.000000	35.00000	5046	0

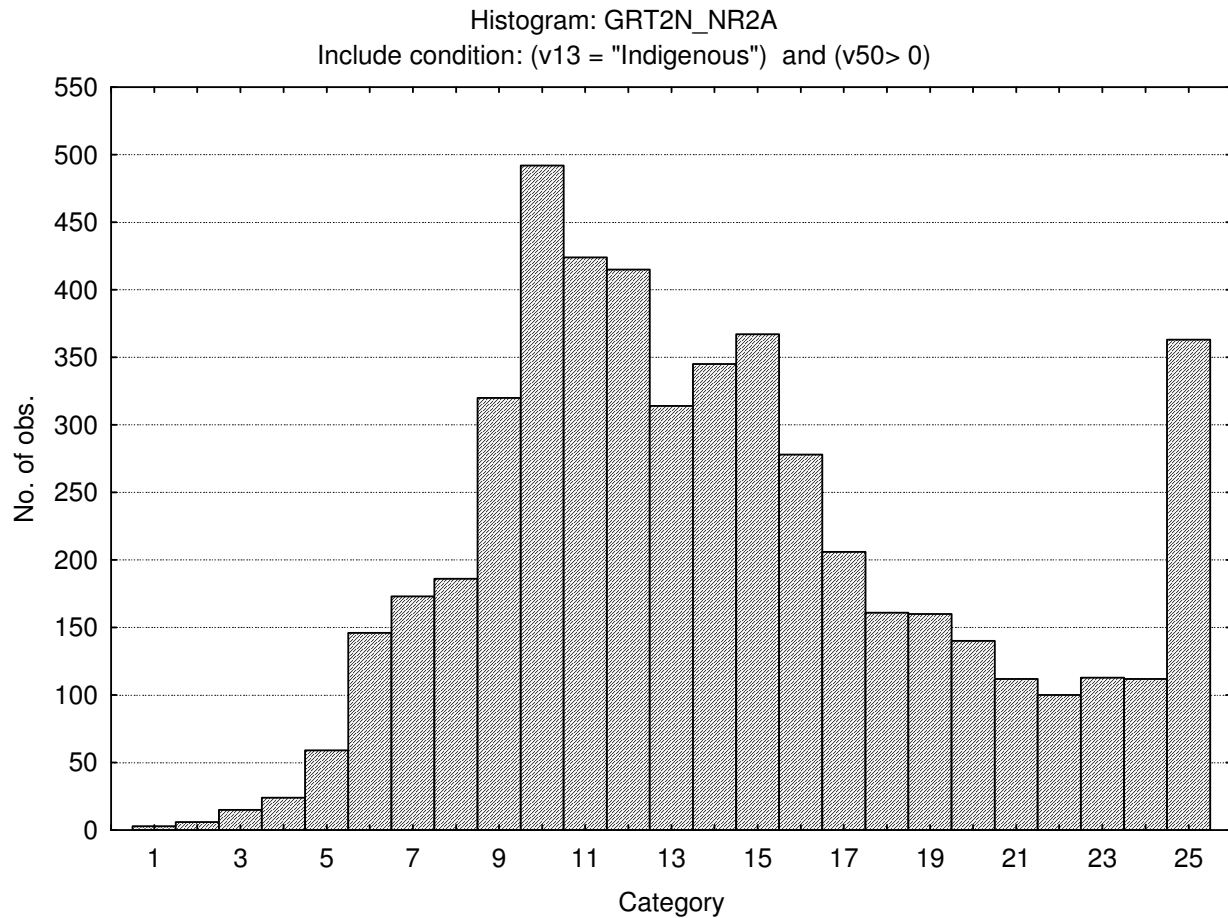




### General Numerical Reasoning Test

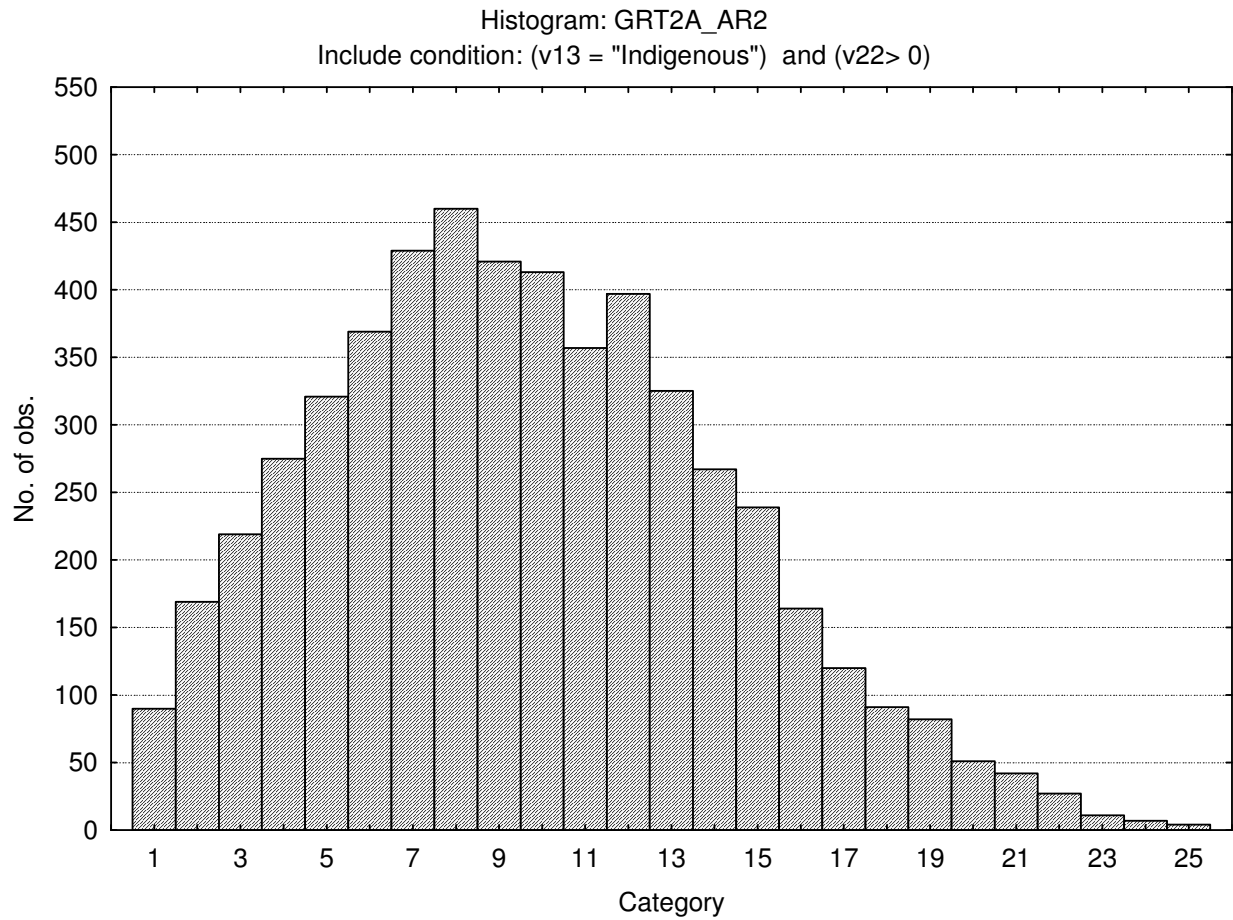
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning	6.10524	3.389695	1.000000	24.00000	4960	74
General Numerical Reasoning items attempted	14.20123	5.412695	1.000000	25.00000	5034	0

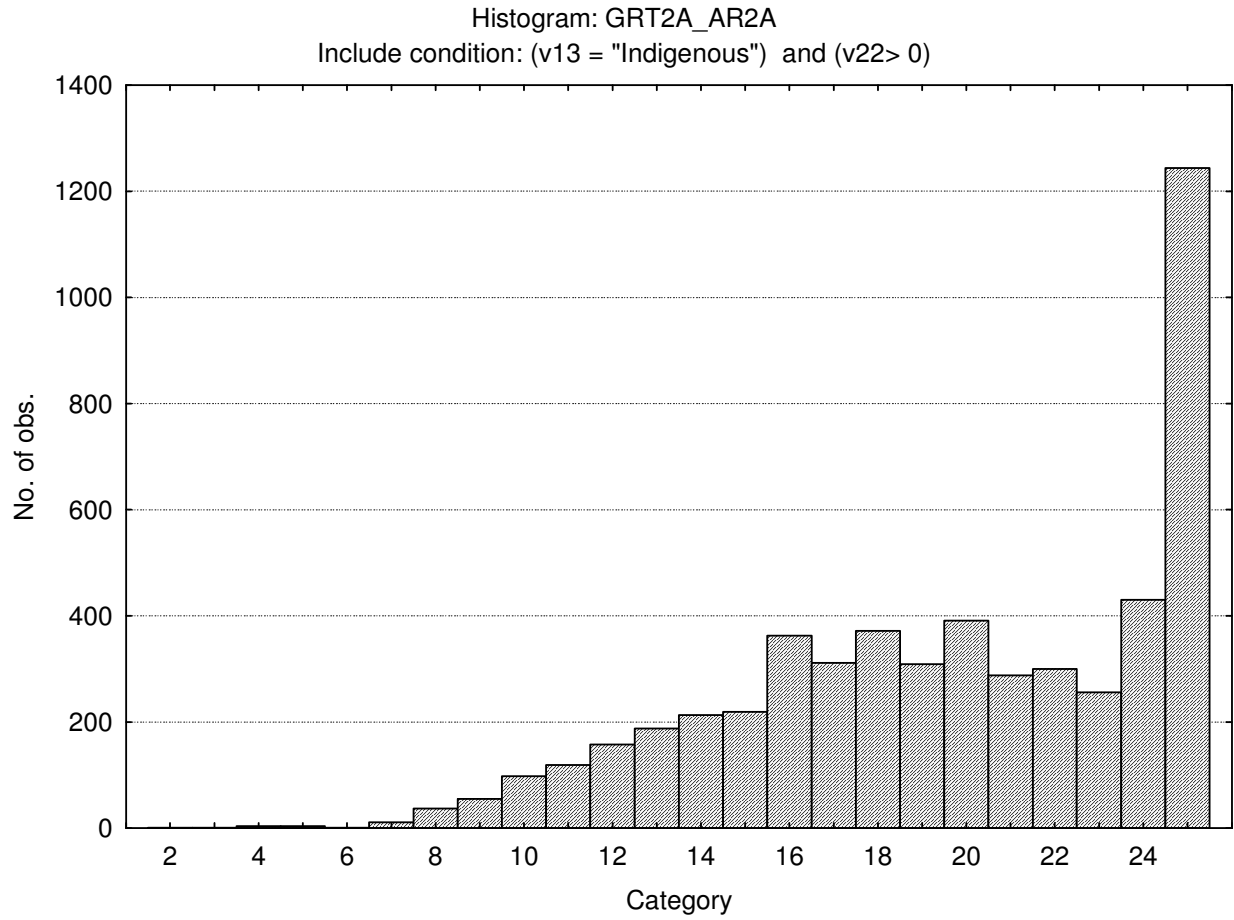




## General Abstract Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning	9.66766	4.652137	1.000000	25.00000	5350	23
General Abstract Reasoning Items Attempted	19.58850	4.721333	2.000000	25.00000	5373	0





## Stanine table

	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Verbal Reasoning	1-3	4-5	6-7	8-10	11-12	13-15	16-17	18-19	20-31
General Verbal Items Attempted	2-11	12-15	16-18	19-22	23-26	27-29	30-33	34-35	
General Numerical Reasoning	1-0	1-1	2-3	4-5	6-6	7-8	9-10	11-12	13-24
General Numerical Items Attempted	1-4	5-7	8-10	11-12	13-15	16-18	19-20	21-23	24-25
General Abstract Reasoning	1-1	2-3	4-6	7-8	9-10	11-13	14-15	16-17	18-25
General Abstract Items Attempted	2-11	12-13	14-16	17-18	19-20	21-23	24-25		

# General Reasoning Test (GRT2)

## Norm Table: South African Aggregate Population, Updated 2016

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### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test (GRT2) battery in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### General Abstract Reasoning Test: Biographical Composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	9953	9953	57,04379	57,0438
F	7401	17354	42,41747	99,4613
U	94	17448	0,53874	100,0000
Missing	0	17448	0,00000	100,0000

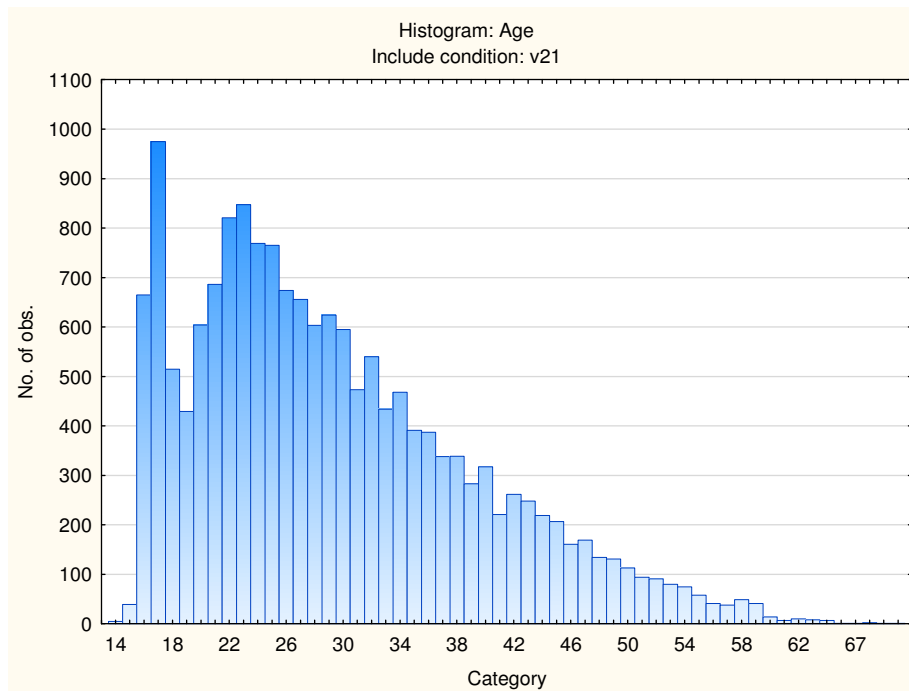
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	5524	5524	31,65979	31,6598
Post Graduate	733	6257	4,20105	35,8608
Unknown	147	6404	0,84250	36,7033
Tertiary	3718	10122	21,30903	58,0124
< Matric	2394	12516	13,72077	71,7331
Missing	4932	17448	28,26685	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	779	779	4,46470	4,4647
English	3655	4434	20,94796	25,4127
isiZulu	2250	6684	12,89546	38,3081
Afrikaans	1902	8586	10,90096	49,2091
isiXhosa	1197	9783	6,86039	56,0695
Sesotho	926	10709	5,30720	61,3767
Sepedi	913	11622	5,23269	66,6094
Setswana	796	12418	4,56213	71,1715
Xitsonga	272	12690	1,55892	72,7304
Tshivenda	162	12852	0,92847	73,6589
siSwati	220	13072	1,26089	74,9198
isiNdebele	79	13151	0,45277	75,3725
Missing	4297	17448	24,62746	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6815	6815	39,05892	39,0589
Afrikaans	1902	8717	10,90096	49,9599
English	3655	12372	20,94796	70,9078
Other	779	13151	4,46470	75,3725
Missing	4297	17448	24,62746	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	7798	7798	44,69280	44,6928
Asian	1300	9098	7,45071	52,1435
Coloured	1275	10373	7,30743	59,4509
European	2700	13073	15,47455	74,9255
Indian	6	13079	0,03439	74,9599
Unknown	188	13267	1,07749	76,0374
Missing	4181	17448	23,96263	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,37774	9,915655	14,00000	71,00000	16726	722



### General Numerical Reasoning Test: Biographical Composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	9151	9151	55,76818	55,7682
F	7167	16318	43,67725	99,4454
U	91	16409	0,55457	100,0000
Missing	0	16409	0,00000	100,0000

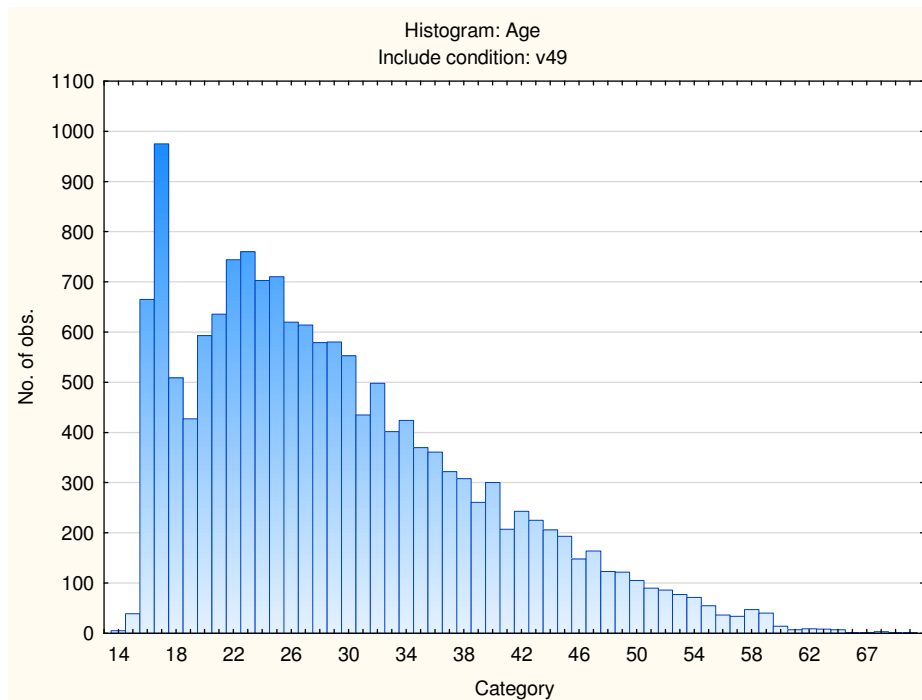
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	5368	5368	32,71375	32,7138
Post Graduate	560	5928	3,41276	36,1265
Unknown	147	6075	0,89585	37,0224
Tertiary	3226	9301	19,65994	56,6823
< Matric	2371	11672	14,44939	71,1317
Missing	4737	16409	28,86830	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	764	764	4,65598	4,6560
English	3182	3946	19,39180	24,0478
isiZulu	2106	6052	12,83442	36,8822
Afrikaans	1849	7901	11,26821	48,1504
isiXhosa	1103	9004	6,72192	54,8723
Sesotho	880	9884	5,36291	60,2352
Sepedi	895	10779	5,45432	65,6896
Setswana	765	11544	4,66208	70,3516
Xitsonga	249	11793	1,51746	71,8691
Tshivenda	154	11947	0,93851	72,8076
siSwati	212	12159	1,29197	74,0996
isiNdebele	74	12233	0,45097	74,5506
Missing	4176	16409	25,44945	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6438	6438	39,23457	39,2346
Afrikaans	1849	8287	11,26821	50,5028
English	3182	11469	19,39180	69,8946
Other	764	12233	4,65598	74,5506
Missing	4176	16409	25,44945	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	7396	7396	45,07283	45,0728
Asian	1038	8434	6,32580	51,3986
Coloured	1245	9679	7,58730	58,9859
European	2476	12155	15,08928	74,0752
Indian	6	12161	0,03657	74,1118
Unknown	188	12349	1,14571	75,2575
Missing	4060	16409	24,74252	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,27130	9,982204	14,00000	71,00000	15717	692



### General Verbal Reasoning Test: Biographical Composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	9118	9118	55,59756	55,5976
F	7192	16310	43,85366	99,4512
U	90	16400	0,54878	100,0000
Missing	0	16400	0,00000	100,0000

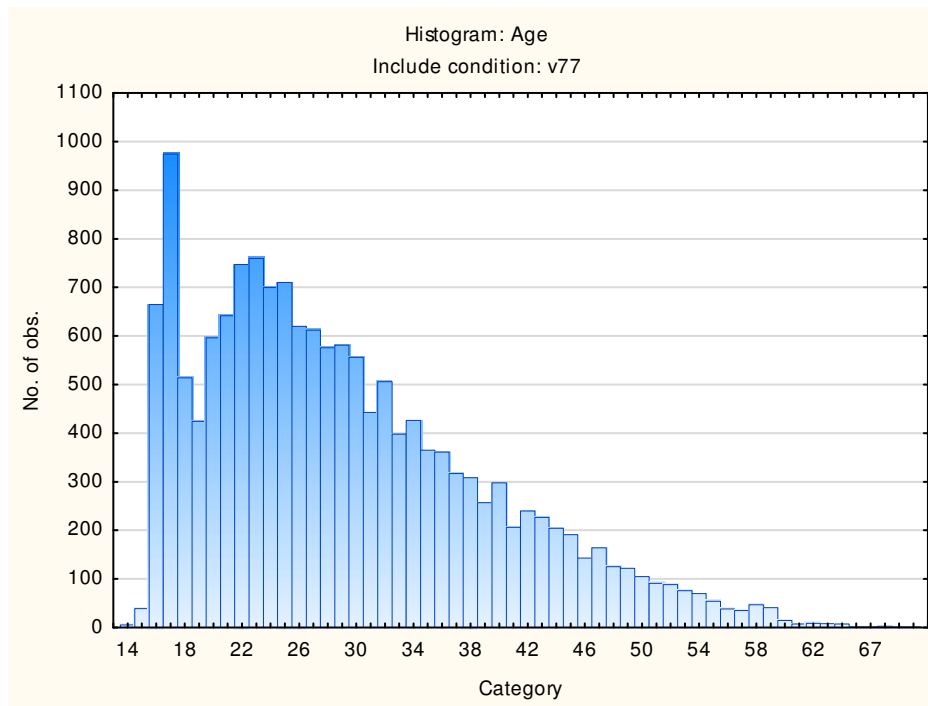
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	5326	5326	32,47561	32,4756
Post Graduate	568	5894	3,46341	35,9390
Unknown	147	6041	0,89634	36,8354
Tertiary	3247	9288	19,79878	56,6341
< Matric	2367	11655	14,43293	71,0671
Missing	4745	16400	28,93293	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	769	769	4,68902	4,6890
English	3180	3949	19,39024	24,0793
isiZulu	2111	6060	12,87195	36,9512
Afrikaans	1832	7892	11,17073	48,1220
isiXhosa	1100	8992	6,70732	54,8293
Sesotho	880	9872	5,36585	60,1951
Sepedi	897	10769	5,46951	65,6646
Setswana	760	11529	4,63415	70,2988
Xitsonga	252	11781	1,53659	71,8354
Tshivenda	158	11939	0,96341	72,7988
siSwati	214	12153	1,30488	74,1037
isiNdebele	75	12228	0,45732	74,5610
Missing	4172	16400	25,43902	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6447	6447	39,31098	39,3110
Afrikaans	1832	8279	11,17073	50,4817
English	3180	11459	19,39024	69,8720
Other	769	12228	4,68902	74,5610
Missing	4172	16400	25,43902	100,0000

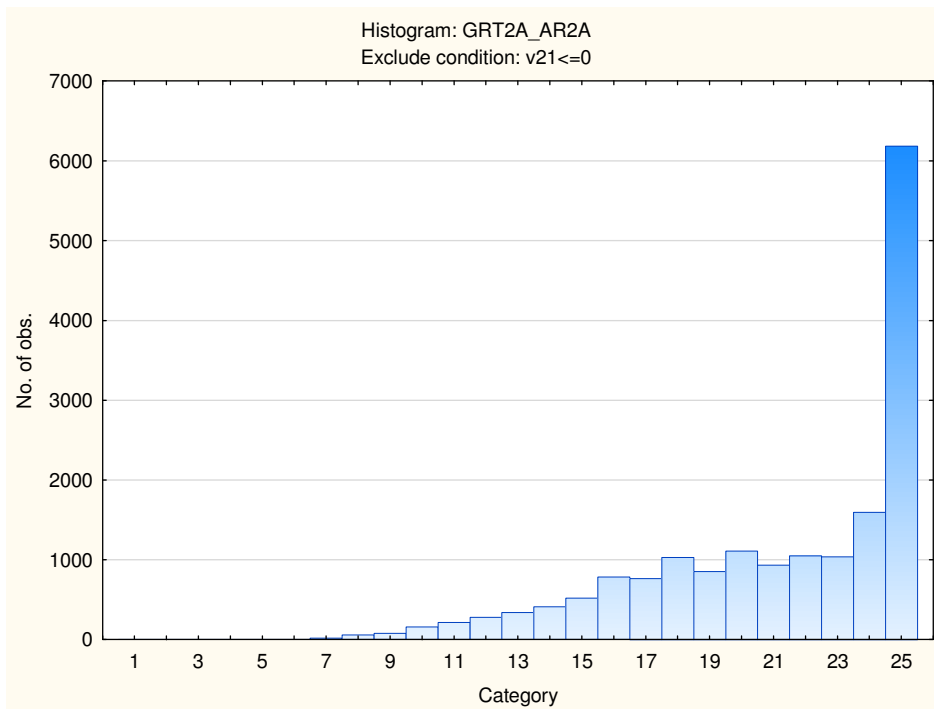
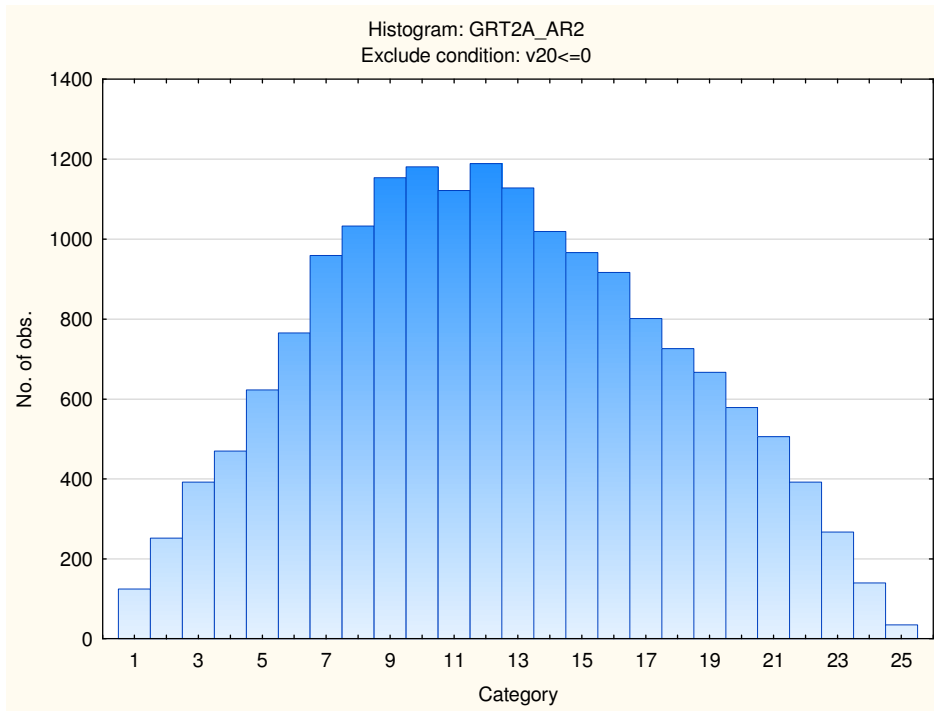
Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	7406	7406	45,15854	45,1585
Asian	1042	8448	6,35366	51,5122
Coloured	1232	9680	7,51220	59,0244
European	2466	12146	15,03659	74,0610
Indian	6	12152	0,03659	74,0976
Unknown	188	12340	1,14634	75,2439
Missing	4060	16400	24,75610	100,0000

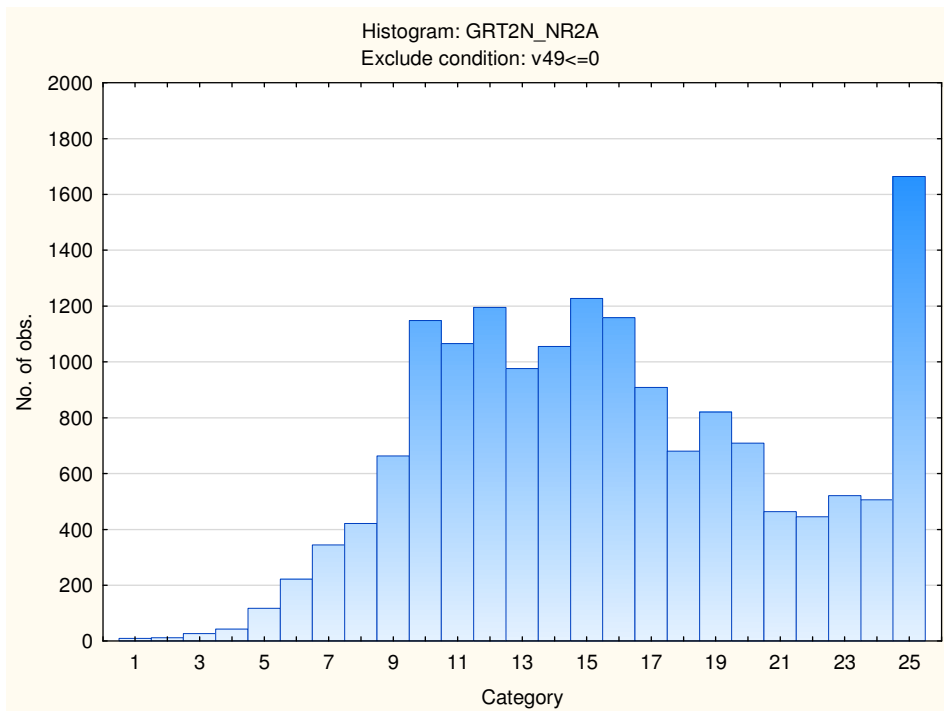
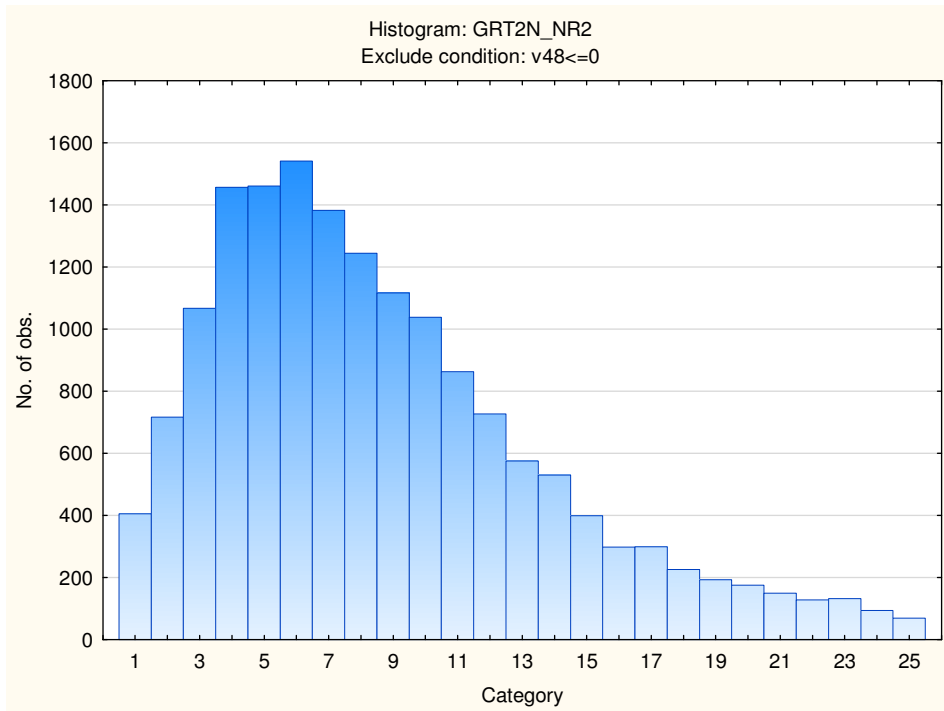
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,25797	9,984034	14,00000	71,00000	15719	681

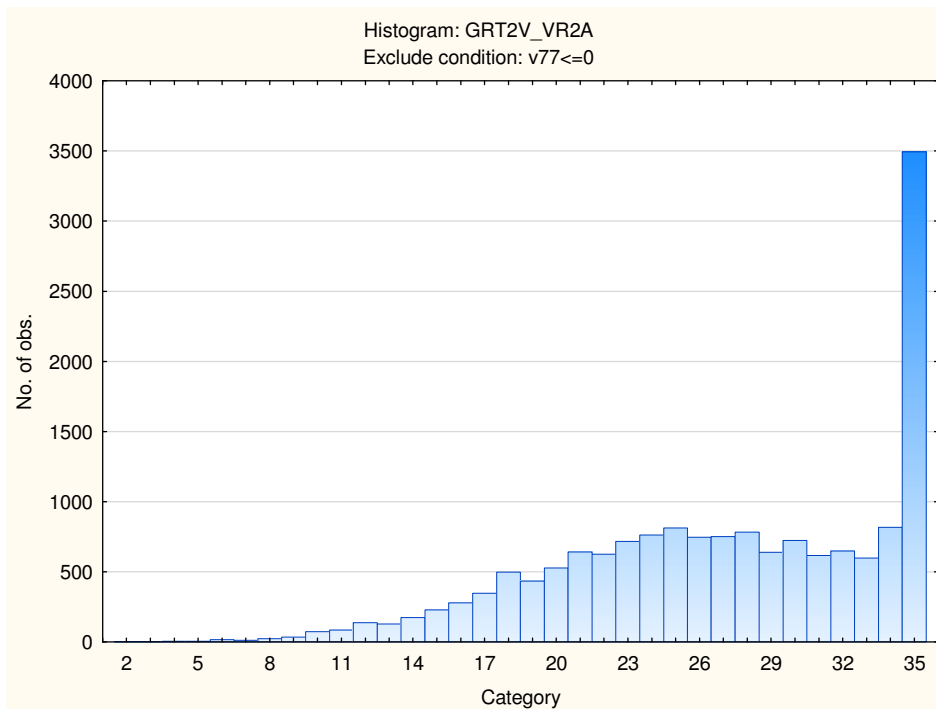
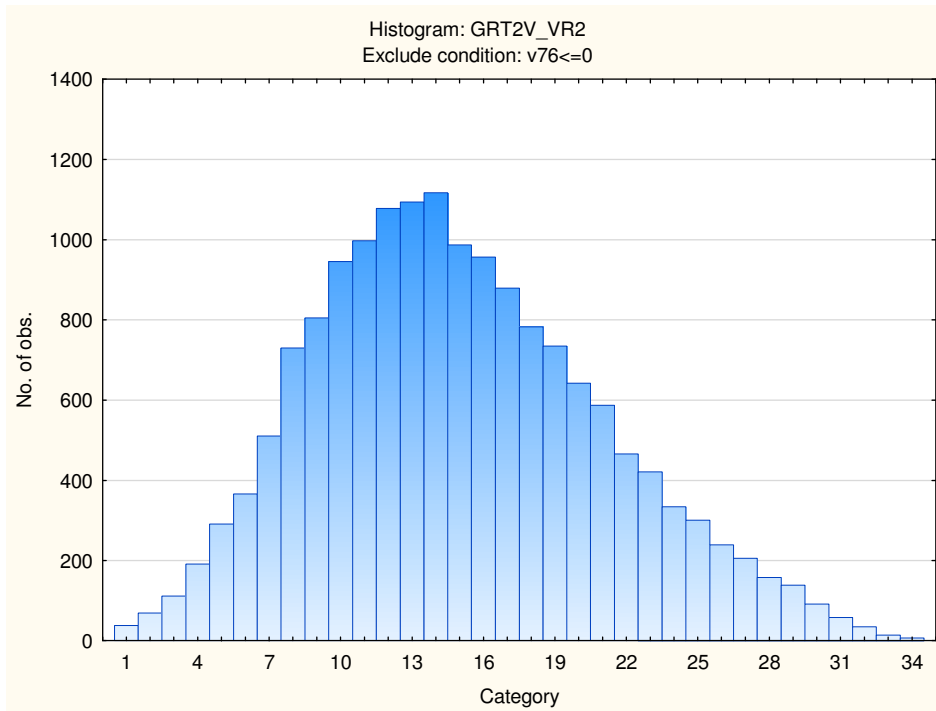


### Descriptive Statistics on General Reasoning Test Battery Subtests:

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning	12,25522	5,378016	0,000000	25,00000	17448	0
General Abstract Reasoning items attempted	21,13285	4,272782	1,000000	25,00000	17448	0
General Numerical Reasoning	8,57115	5,147526	0,000000	25,00000	16409	0
General Numerical Reasoning items attempted	15,76604	5,421601	1,000000	25,00000	16409	0
General Verbal Reasoning	14,95018	6,075567	0,000000	34,00000	16400	0
General Verbal Reasoning Items Attempted	27,06335	6,743663	2,000000	35,00000	16400	0







## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-2	3-5	6-8	9-10	11-13	14-16	17-18	19-21	22-25
General Abstract Items Attempted	1-13	14-15	16-17	18-20	21-22	23-24	25-25		
General Numerical Reasoning	0-1	1-2	3-4	5-7	8-9	10-12	13-15	16-17	18-25
General Numerical Items Attempted	1-6	7-8	9-11	12-14	15-17	18-19	20-22	23-25	
General Verbal Reasoning	0-4	5-7	8-10	11-13	14-16	17-19	20-22	23-25	26-34
General Verbal Items Attempted	2-15	16-18	19-22	23-25	26-28	29-32	33-35		

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Afrikaans Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with Afrikaans as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition – General Abstract Reasoning Test

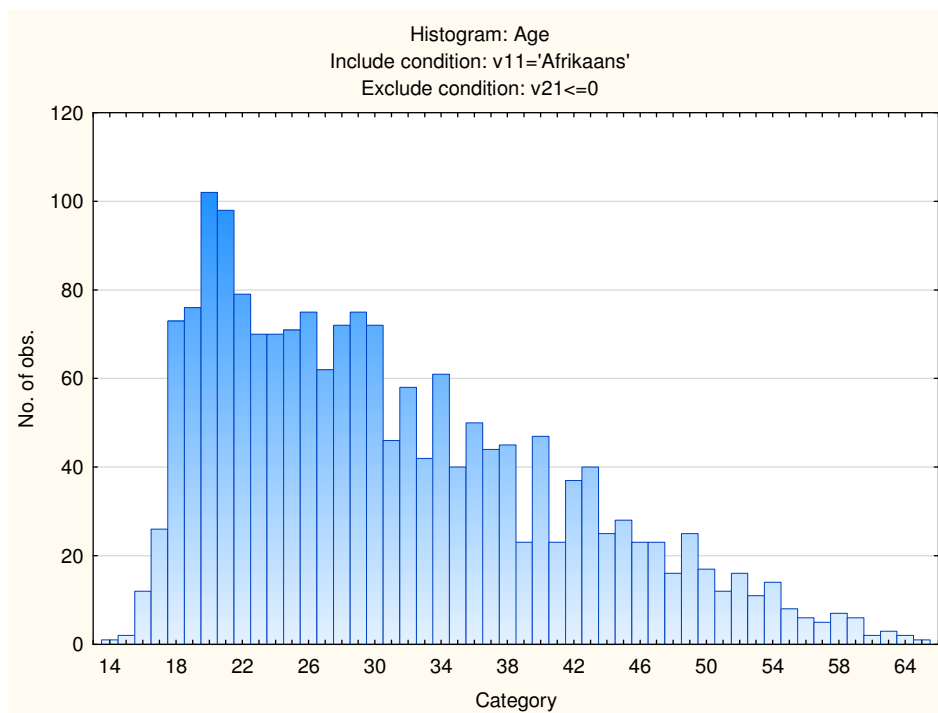
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1148	1148	60,35752	60,3575
F	748	1896	39,32702	99,6845
U	6	1902	0,31546	100,0000
Missing	0	1902	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	962	962	50,57834	50,5783
Post Graduate	91	1053	4,78444	55,3628
Unknown	10	1063	0,52576	55,8885
Tertiary	489	1552	25,70978	81,5983
< Matric	141	1693	7,41325	89,0116
Missing	209	1902	10,98843	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1902	1902	100,0000	100,0000
Missing	0	1902	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	47	47	2,47108	2,4711
Asian	1	48	0,05258	2,5237
Coloured	378	426	19,87382	22,3975
European	1422	1848	74,76341	97,1609
Missing	54	1902	2,83912	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,96634	10,24788	14,00000	71,00000	1842	60



## Sample Composition: General Numerical Reasoning Test

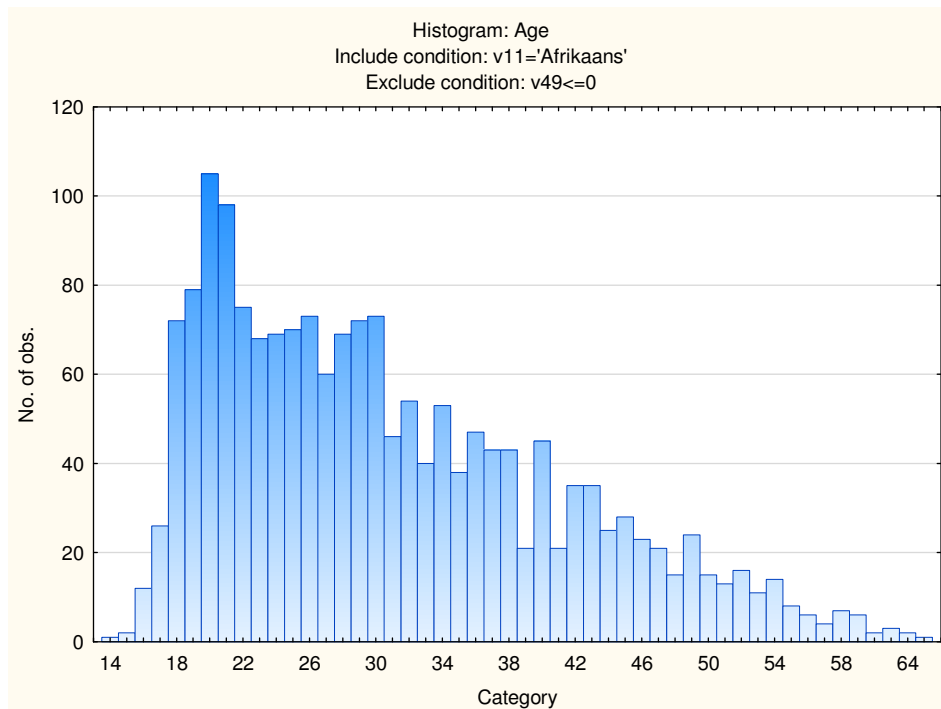
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1107	1107	59,87020	59,8702
F	736	1843	39,80530	99,6755
U	6	1849	0,32450	100,0000
Missing	0	1849	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	950	950	51,37912	51,3791
Post Graduate	76	1026	4,11033	55,4895
Unknown	10	1036	0,54083	56,0303
Tertiary	459	1495	24,82423	80,8545
< Matric	139	1634	7,51758	88,3721
Missing	215	1849	11,62791	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1849	1849	100,0000	100,0000
Missing	0	1849	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	47	47	2,54191	2,5419
Asian	1	48	0,05408	2,5960
Coloured	380	428	20,55165	23,1476
European	1363	1791	73,71552	96,8632
Missing	58	1849	3,13683	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,80827	10,29066	14,00000	71,00000	1789	60



### Sample Composition: General Verbal Reasoning Test

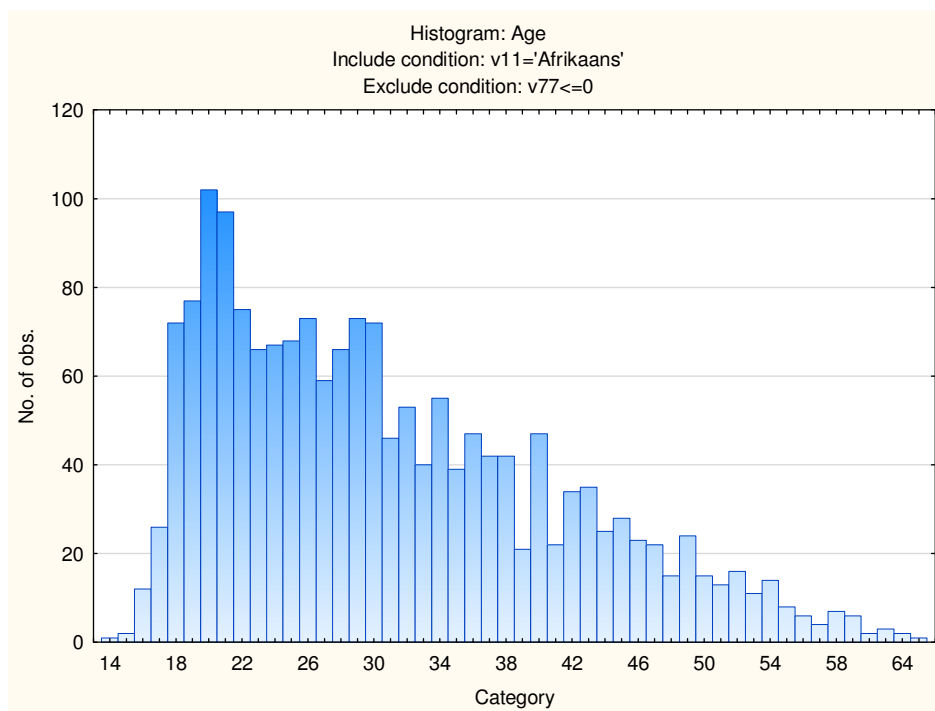
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1088	1088	59,38865	59,3886
F	738	1826	40,28384	99,6725
U	6	1832	0,32751	100,0000
Missing	0	1832	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	934	934	50,98253	50,9825
Post Graduate	76	1010	4,14847	55,1310
Unknown	10	1020	0,54585	55,6769
Tertiary	459	1479	25,05459	80,7314
< Matric	139	1618	7,58734	88,3188
Missing	214	1832	11,68122	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1832	1832	100,0000	100,0000
Missing	0	1832	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	46	46	2,51092	2,5109
Asian	1	47	0,05459	2,5655
Coloured	369	416	20,14192	22,7074
European	1362	1778	74,34498	97,0524
Missing	54	1832	2,94760	100,0000

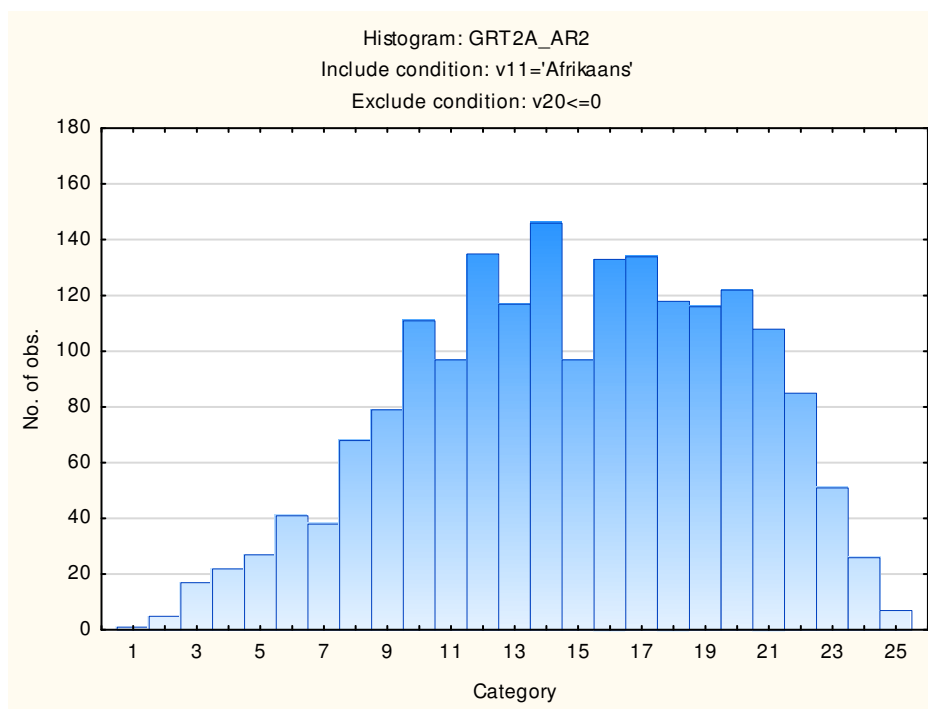
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,89133	10,30919	14,00000	71,00000	1776	56

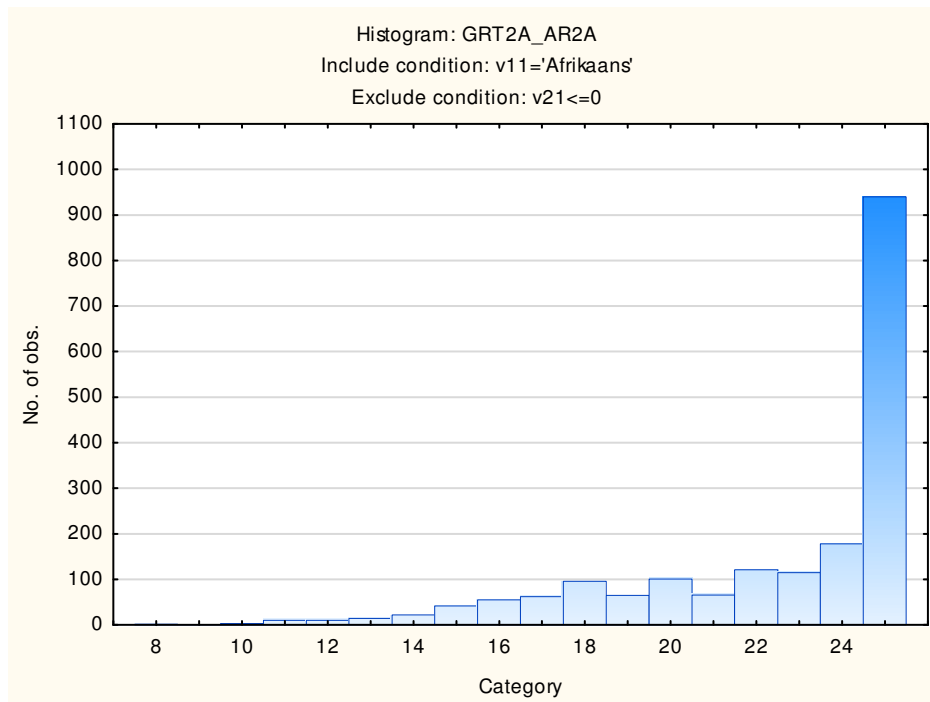


## Descriptive Statistics and Frequency Distributions for General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

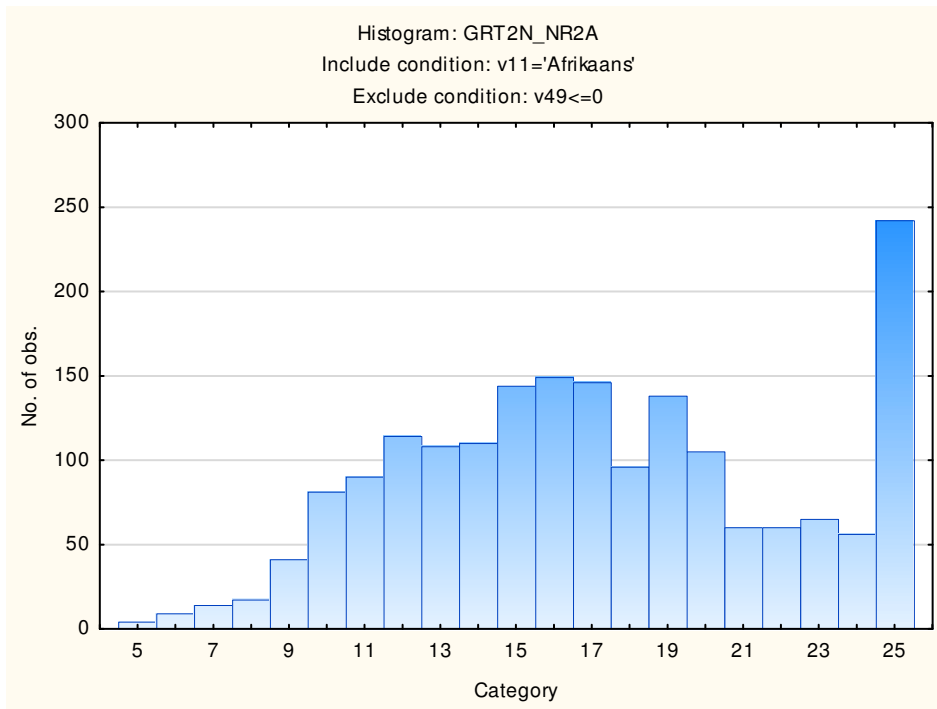
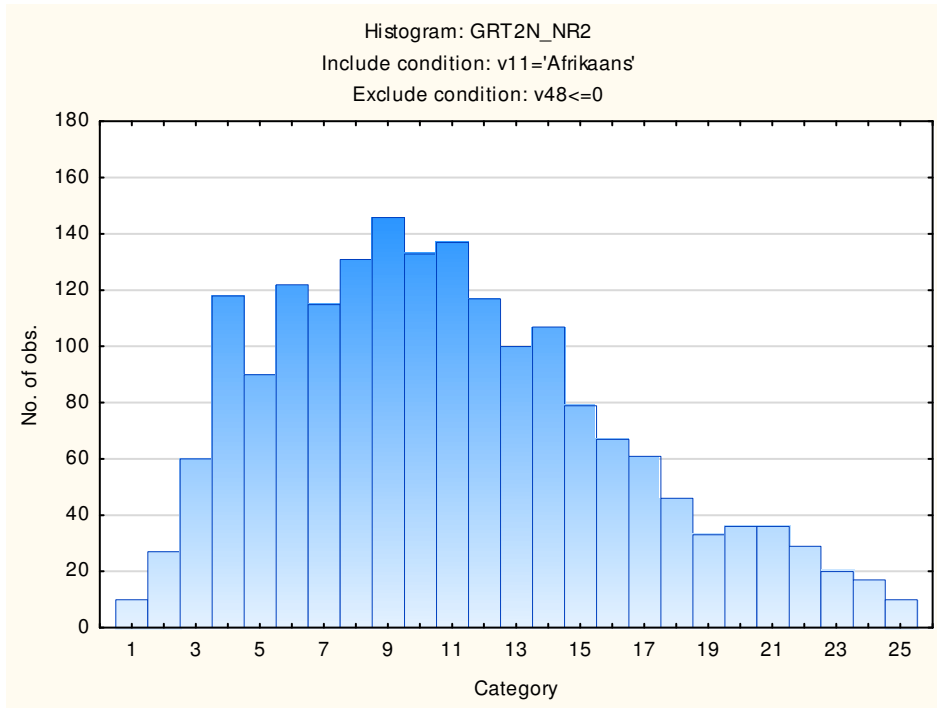
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning	14,80179	5,016872	0,000000	25,00000	1902	0
General Abstract Reasoning Items Attempted	22,48265	3,460070	8,000000	25,00000	1902	0





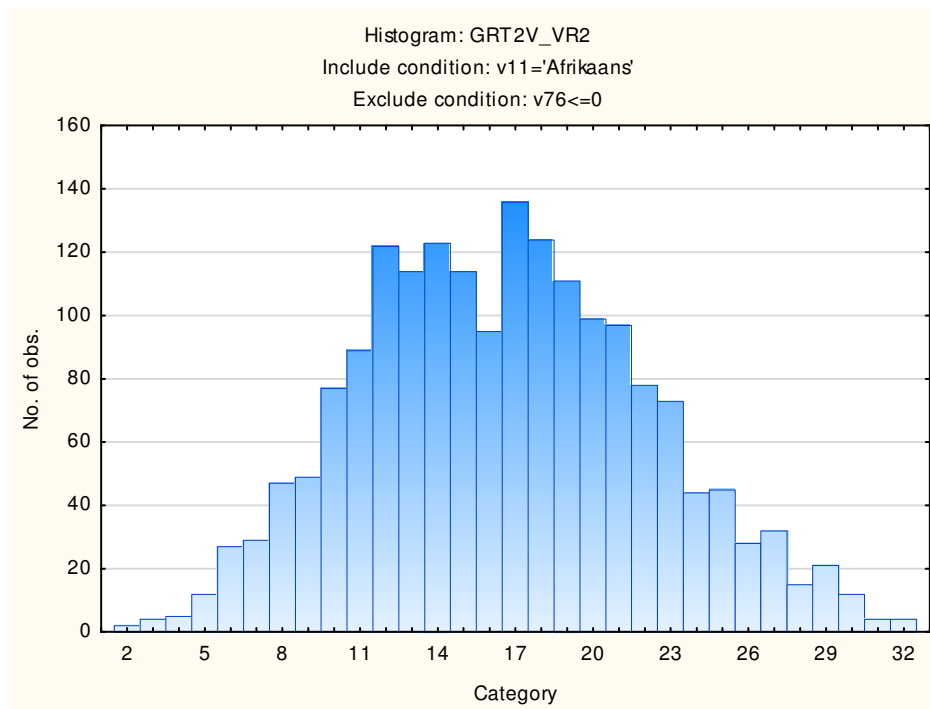
## General Numerical Reasoning Test

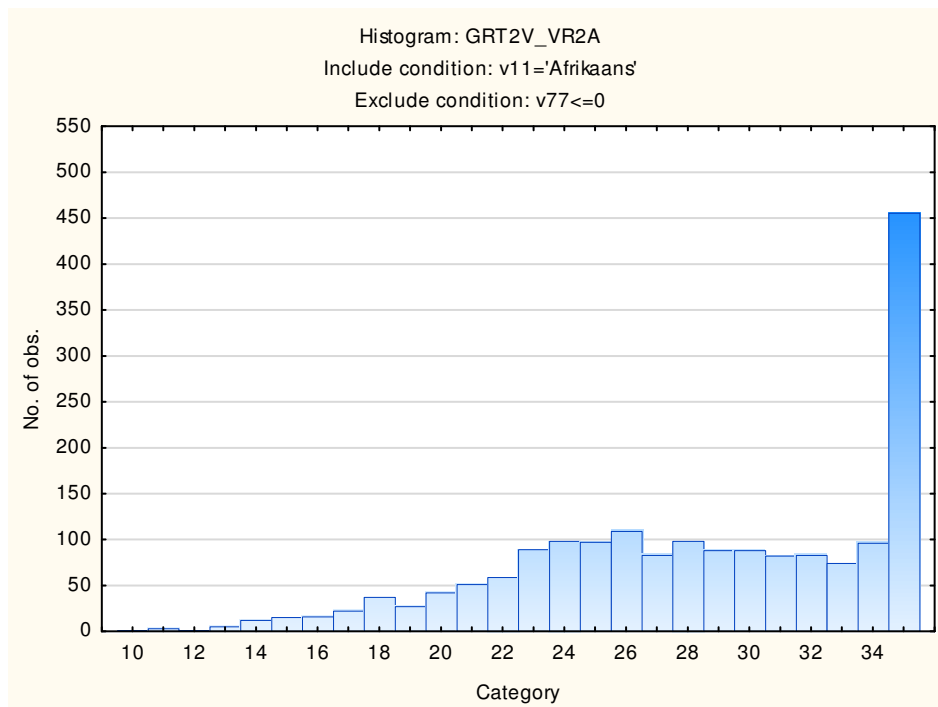
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning	10,86263	5,292377	0,000000	25,00000	1849	0
General Numerical Reasoning Items Attempted	17,16279	4,942527	5,000000	25,00000	1849	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning	16,59607	5,568259	2,00000	32,00000	1832	0
General Verbal Reasoning Items Attempted	28,50983	5,747643	10,00000	35,00000	1832	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-5	6-8	9-10	11-13	14-16	17-18	19-21	22-23	24-25
General Abstract Items Attempted	0-15	16-17	18-19	20-21	22-23	24-25			
General Numerical Reasoning	0-1	2-4	5-6	7-9	10-12	13-14	15-17	18-20	21-25
General Numerical Items Attempted	0-8	9-10	11-13	14-15	16-18	19-20	21-23	24-25	
General Verbal Reasoning	0-6	7-9	10-12	13-15	16-17	18-20	21-23	24-26	27-32
General Verbal Items Attempted	0-17	18-20	21-23	24-26	27-29	30-32	33-35		

# General Reasoning Test (GRT2)

## Norm Group: South Africans, English Speaking, Updated 2016

### Sample Composition

The sample consisted of South Africans with English as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition – General Abstract Reasoning Test

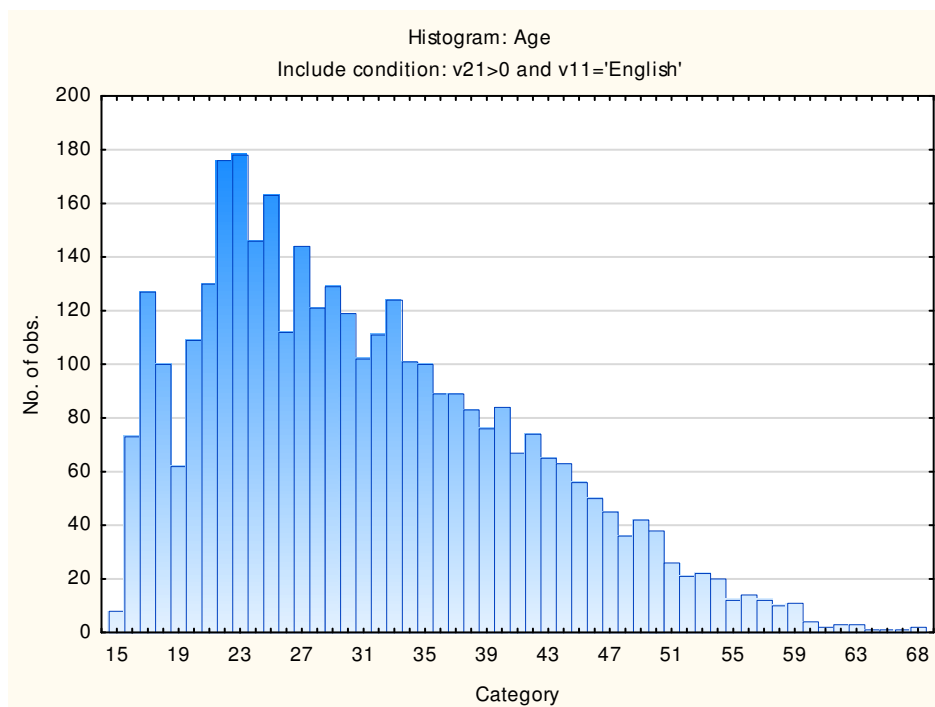
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	2175	2175	59,50752	59,5075
F	1473	3648	40,30096	99,8085
U	7	3655	0,19152	100,0000
Missing	0	3655	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	1501	1501	41,06703	41,0670
Post Graduate	282	1783	7,71546	48,7825
Unknown	20	1803	0,54720	49,3297
Tertiary	1138	2941	31,13543	80,4651
< Matric	354	3295	9,68536	90,1505
Missing	360	3655	9,84952	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3655	3655	100,0000	100,0000
Missing	0	3655	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	357	357	9,76744	9,7674
Asian	1201	1558	32,85910	42,6265
Coloured	825	2383	22,57182	65,1984
European	1166	3549	31,90150	97,0999
Indian	5	3554	0,13680	97,2367
Missing	101	3655	2,76334	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31,26989	10,20064	15,00000	68,00000	3557	98



## Sample Composition: General Numerical Reasoning Test

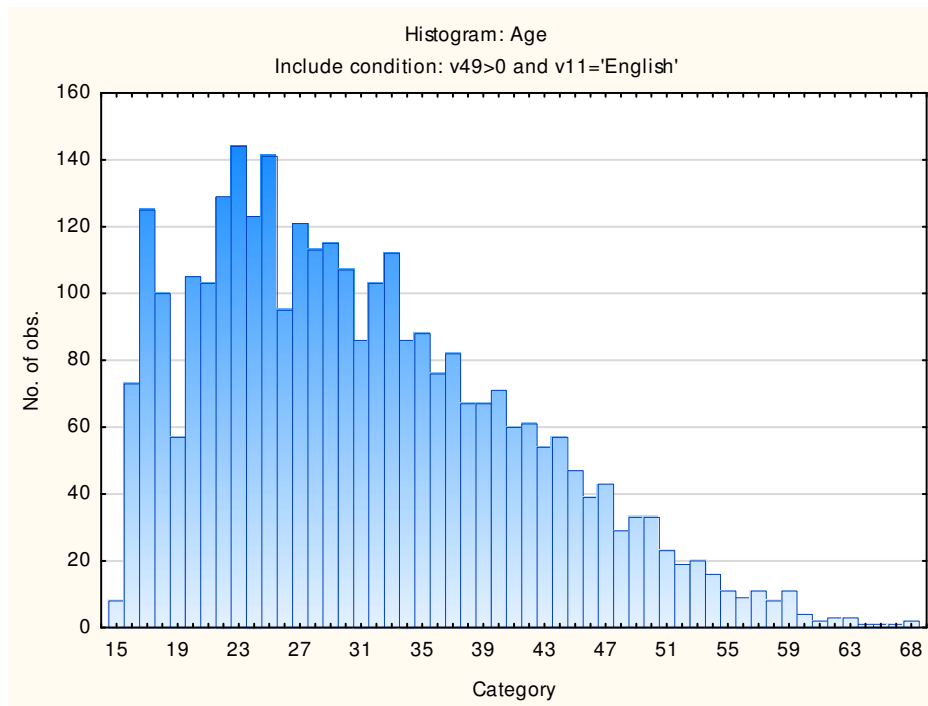
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1795	1795	56,41106	56,4111
F	1381	3176	43,40038	99,8114
U	6	3182	0,18856	100,0000
Missing	0	3182	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	1401	1401	44,02891	44,0289
Post Graduate	190	1591	5,97109	50,0000
Unknown	20	1611	0,62854	50,6285
Tertiary	934	2545	29,35261	79,9811
< Matric	334	2879	10,49654	90,4777
Missing	303	3182	9,52231	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3182	3182	100,0000	100,0000
Missing	0	3182	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	335	335	10,52797	10,5280
Asian	944	1279	29,66688	40,1948
Coloured	794	2073	24,95286	65,1477
European	1005	3078	31,58391	96,7316
Indian	5	3083	0,15713	96,8887
Missing	99	3182	3,11125	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31,15139	10,26498	15,00000	68,00000	3098	84



### Sample Composition: General Verbal Reasoning Test

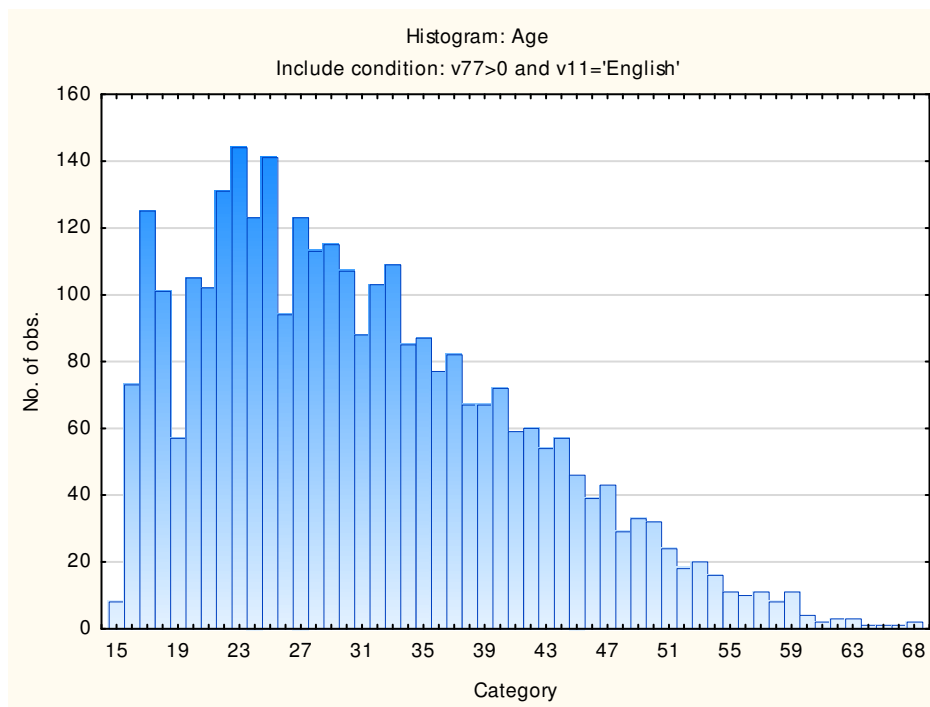
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1789	1789	56,25786	56,2579
F	1385	3174	43,55346	99,8113
U	6	3180	0,18868	100,0000
Missing	0	3180	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	1396	1396	43,89937	43,8994
Post Graduate	193	1589	6,06918	49,9686
Unknown	20	1609	0,62893	50,5975
Tertiary	933	2542	29,33962	79,9371
< Matric	334	2876	10,50314	90,4403
Missing	304	3180	9,55975	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3180	3180	100,0000	100,0000
Missing	0	3180	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	337	337	10,59748	10,5975
Asian	949	1286	29,84277	40,4403
Coloured	792	2078	24,90566	65,3459
European	998	3076	31,38365	96,7296
Indian	5	3081	0,15723	96,8868
Missing	99	3180	3,11321	100,0000

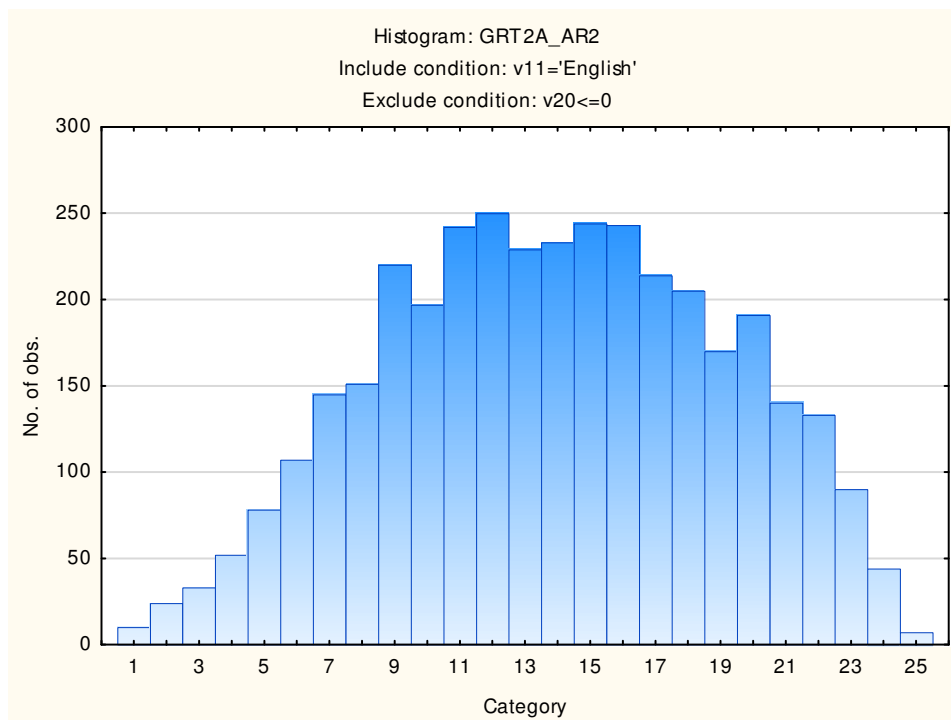
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31,13432	10,26865	15,00000	68,00000	3097	83

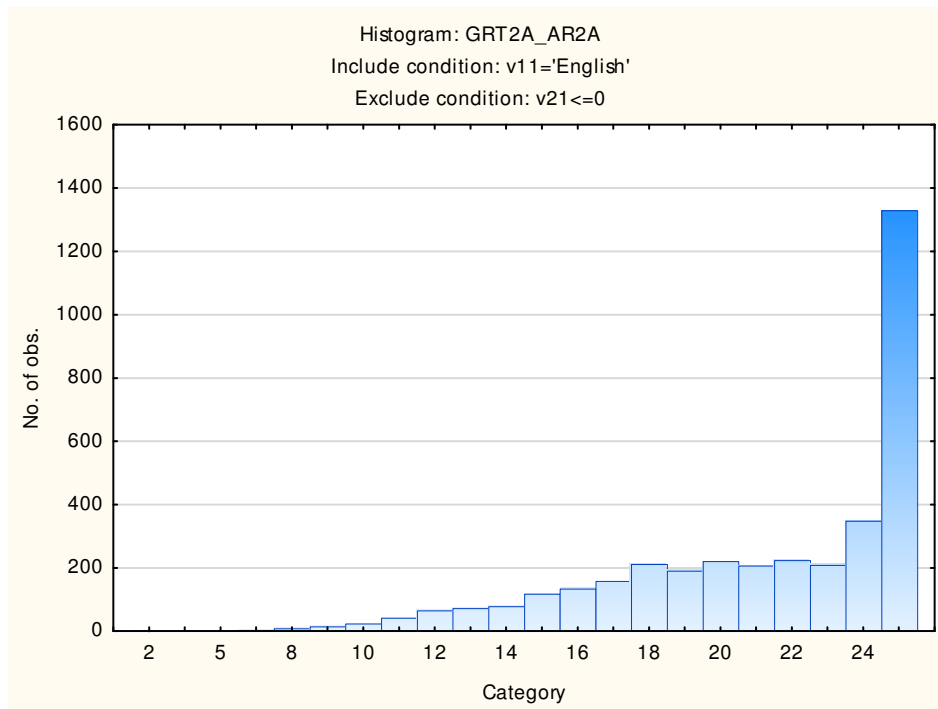


## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

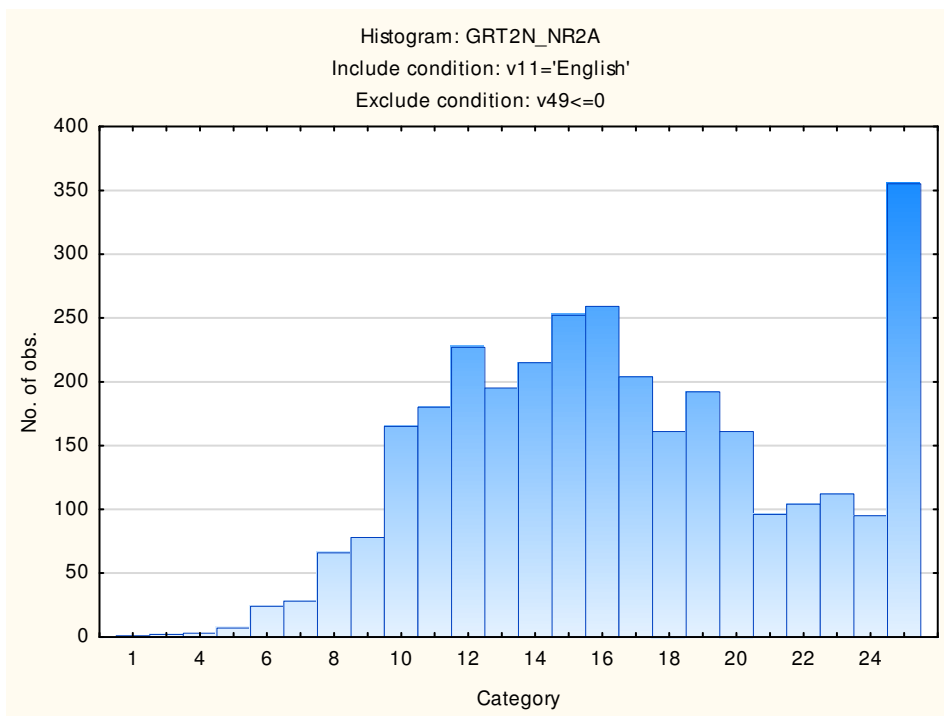
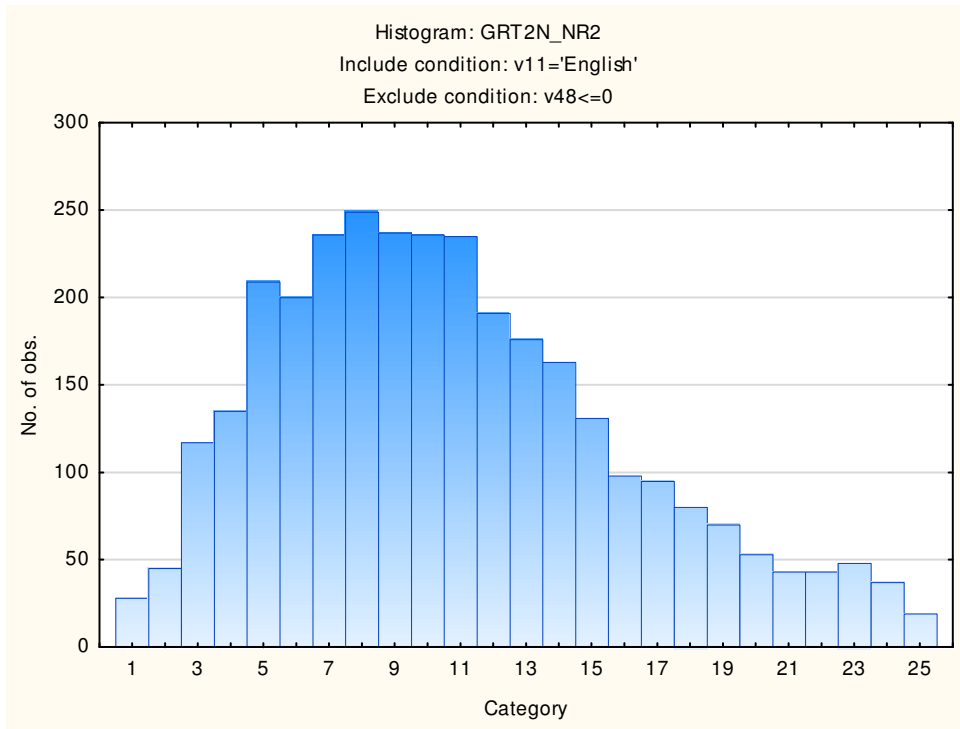
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	13,83420	5,180104	0,000000	25,00000	3655	0
General Abstract Reasoning Items attempted	21,28235	4,171692	2,000000	25,00000	3655	0





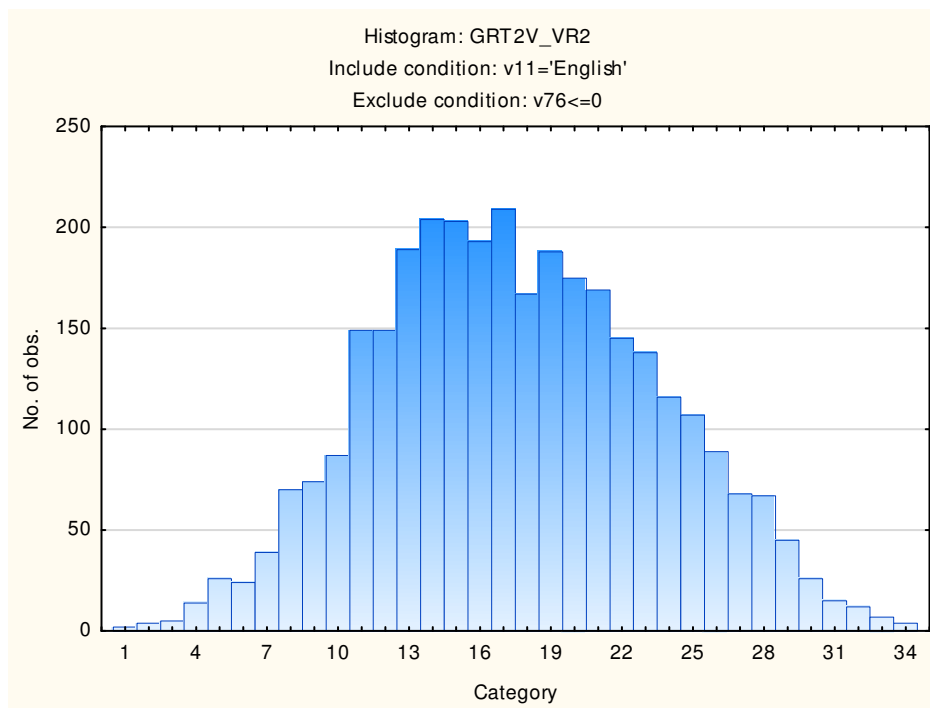
## General Numerical Reasoning Test

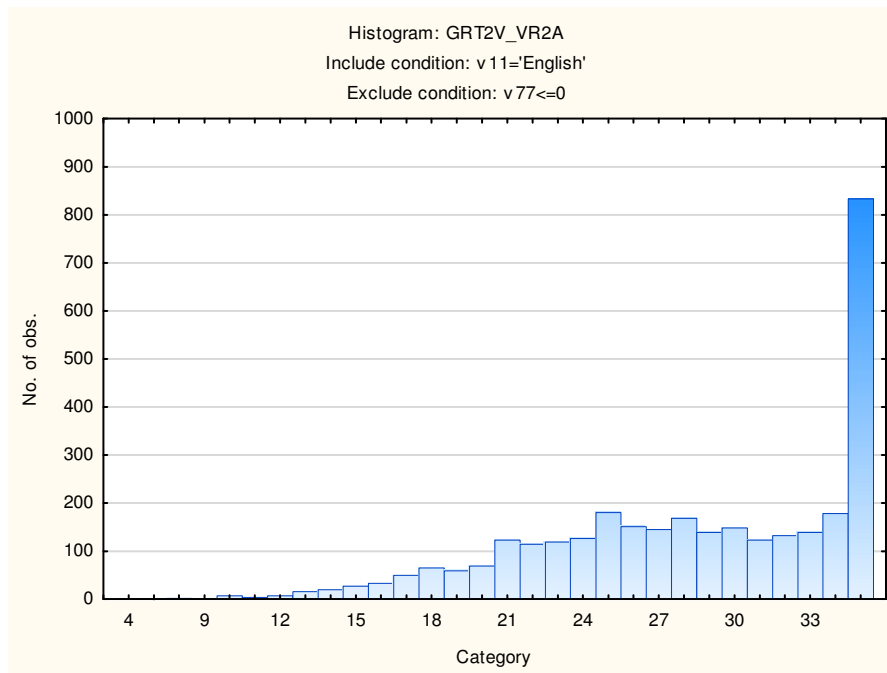
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	10,72659	5,331398	0,000000	25,00000	3182	0
General Numerical Reasoning Items Attempted	16,56631	5,081774	1,000000	25,00000	3182	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	17,58711	5,936194	0,000000	34,00000	3180	0
General Verbal Reasoning Items Attempted	28,41981	6,080992	4,000000	35,00000	3180	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-4	5-7	8-9	10-12	13-15	16-17	18-20	21-22	23-25
General Abstract Items Attempted	0-13	14-15	16-17	18-20	21-22	23-24	25-25		
General Numerical Reasoning	0-0	1-3	4-6	7-9	10-11	12-14	15-17	18-20	21-25
General Numerical Items Attempted	0-6	7-9	10-11	12-14	15-17	18-20	21-23	24-25	
General Verbal Reasoning	0-5	6-8	9-12	13-15	16-18	19-21	22-25	26-28	29-34
General Verbal Items Attempted	0-14	15-18	19-22	23-25	26-29	30-33	34-35		

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Speaking Indigenous Languages, Updated 2016

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### Sample Composition

The sample consisted of South Africans speaking an Indigenous language as their first language, tested by Psytech SA and collaborators during the period up to June 2015, via GeneSys for Windows. Since not all respondents completed all the subtests of the General Reasoning Test battery (GRT2), biographical particulars are reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	3903	3903	57,27073	57,2707
F	2888	6791	42,37711	99,6478
U	24	6815	0,35216	100,0000
Missing	0	6815	0,00000	100,0000

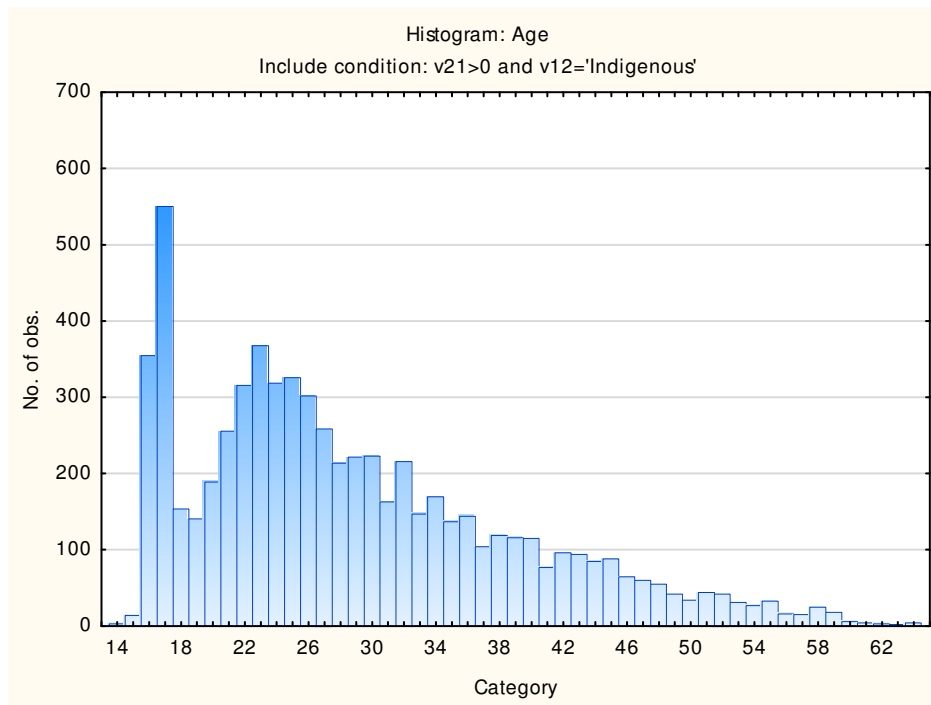
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	2579	2579	37,84299	37,8430
Post Graduate	304	2883	4,46075	42,3037
Unknown	67	2950	0,98313	43,2869
Tertiary	1771	4721	25,98679	69,2737
< Matric	1501	6222	22,02494	91,2986
Missing	593	6815	8,70139	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2250	2250	33,01541	33,0154
isiXhosa	1197	3447	17,56420	50,5796
Sesotho	926	4373	13,58767	64,1673
Sepedi	913	5286	13,39692	77,5642
Setswana	796	6082	11,68012	89,2443
Xitsonga	272	6354	3,99120	93,2355
Tshivenda	162	6516	2,37711	95,6126
siSwati	220	6736	3,22817	98,8408
isiNdebele	79	6815	1,15921	100,0000
Missing	0	6815	0,00000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6815	6815	100,0000	100,0000
Missing	0	6815	0,00000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	6740	6740	98,89949	98,8995
Asian	27	6767	0,39618	99,2957
Coloured	19	6786	0,27880	99,5745
European	13	6799	0,19076	99,7652
Missing	16	6815	0,23478	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,91209	10,10725	14,00000	64,00000	6609	206



### Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	3629	3629	56,36844	56,3684
F	2786	6415	43,27431	99,6427
U	23	6438	0,35725	100,0000
Missing	0	6438	0,00000	100,0000

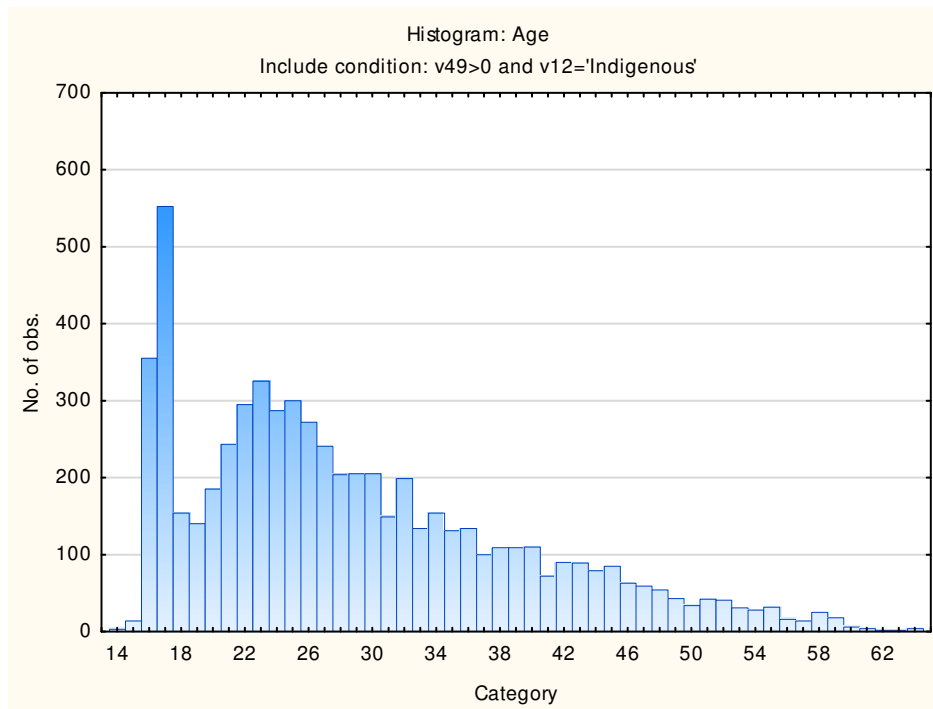
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	2520	2520	39,14259	39,1426
Post Graduate	244	2764	3,79000	42,9326
Unknown	67	2831	1,04070	43,9733
Tertiary	1530	4361	23,76514	67,7384
< Matric	1497	5858	23,25256	90,9910
Missing	580	6438	9,00901	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2106	2106	32,71202	32,7120
isiXhosa	1103	3209	17,13265	49,8447
Sesotho	880	4089	13,66884	63,5135
Sepedi	895	4984	13,90183	77,4153
Setswana	765	5749	11,88257	89,2979
Xitsonga	249	5998	3,86766	93,1656
Tshivenda	154	6152	2,39205	95,5576
siSwati	212	6364	3,29295	98,8506
isiNdebele	74	6438	1,14943	100,0000
Missing	0	6438	0,00000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6438	6438	100,0000	100,0000
Missing	0	6438	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	6369	6369	98,92824	98,9282
Asian	22	6391	0,34172	99,2700
Coloured	19	6410	0,29512	99,5651
European	10	6420	0,15533	99,7204
Missing	18	6438	0,27959	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,88049	10,25806	14,00000	64,00000	6242	196



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	3622	3622	56,18117	56,1812
F	2801	6423	43,44656	99,6277
U	24	6447	0,37227	100,0000
Missing	0	6447	0,00000	100,0000

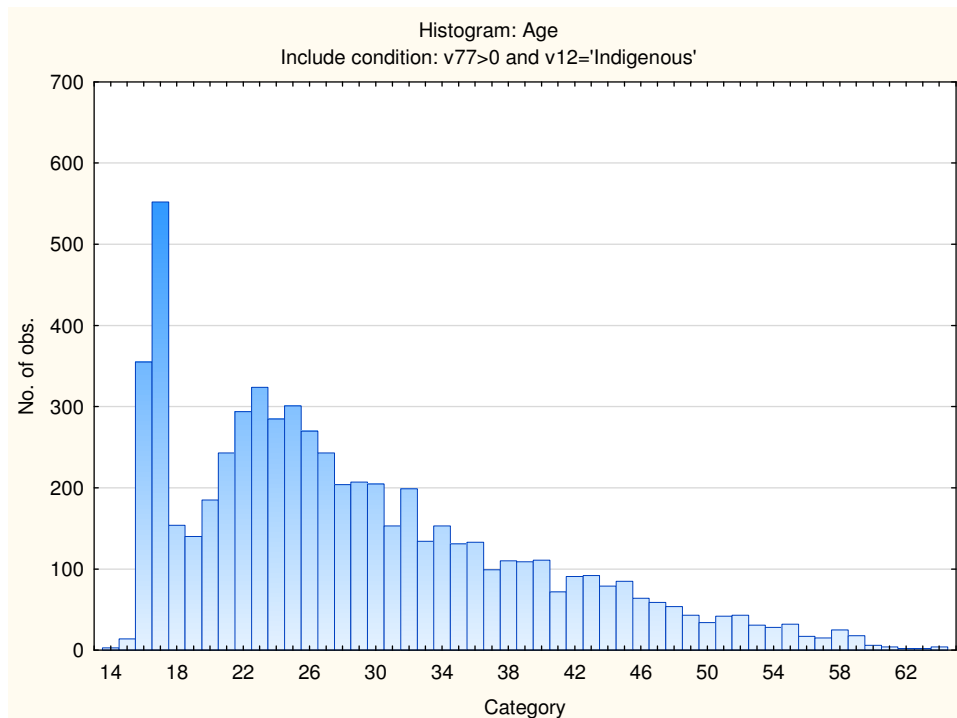
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	2513	2513	38,97937	38,9794
Post Graduate	245	2758	3,80022	42,7796
Unknown	67	2825	1,03924	43,8188
Tertiary	1548	4373	24,01117	67,8300
< Matric	1496	5869	23,20459	91,0346
Missing	578	6447	8,96541	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2111	2111	32,74391	32,7439
isiXhosa	1100	3211	17,06220	49,8061
Sesotho	880	4091	13,64976	63,4559
Sepedi	897	4988	13,91345	77,3693
Setswana	760	5748	11,78843	89,1577
Xitsonga	252	6000	3,90879	93,0665
Tshivenda	158	6158	2,45075	95,5173
siSwati	214	6372	3,31937	98,8367
isiNdebele	75	6447	1,16333	100,0000
Missing	0	6447	0,00000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6447	6447	100,0000	100,0000
Missing	0	6447	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	6380	6380	98,96076	98,9608
Asian	22	6402	0,34124	99,3020
Coloured	19	6421	0,29471	99,5967
European	10	6431	0,15511	99,7518
Missing	16	6447	0,24818	100,0000

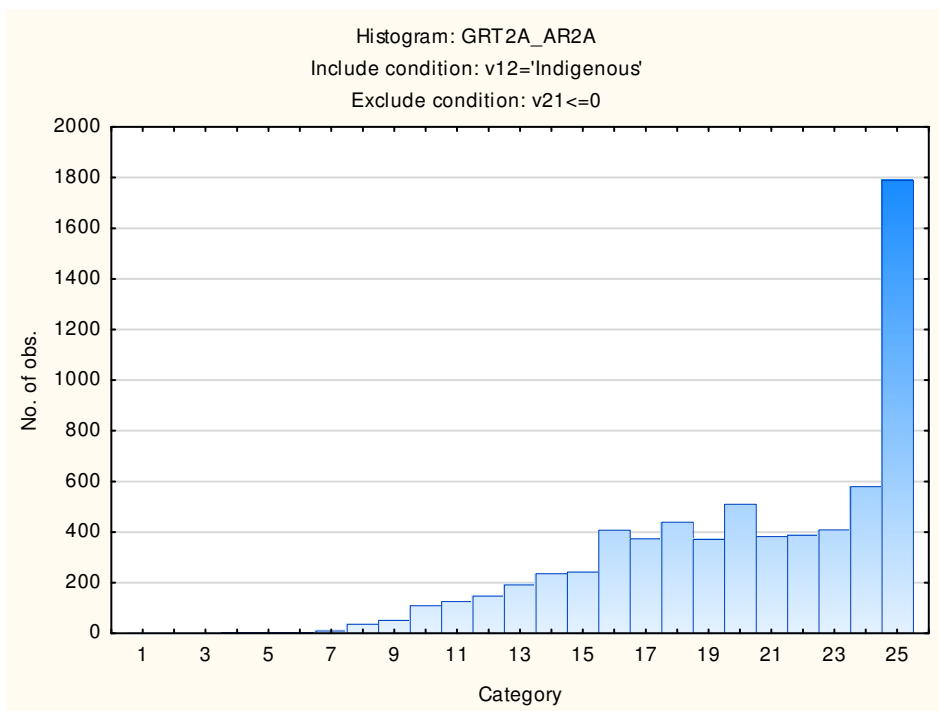
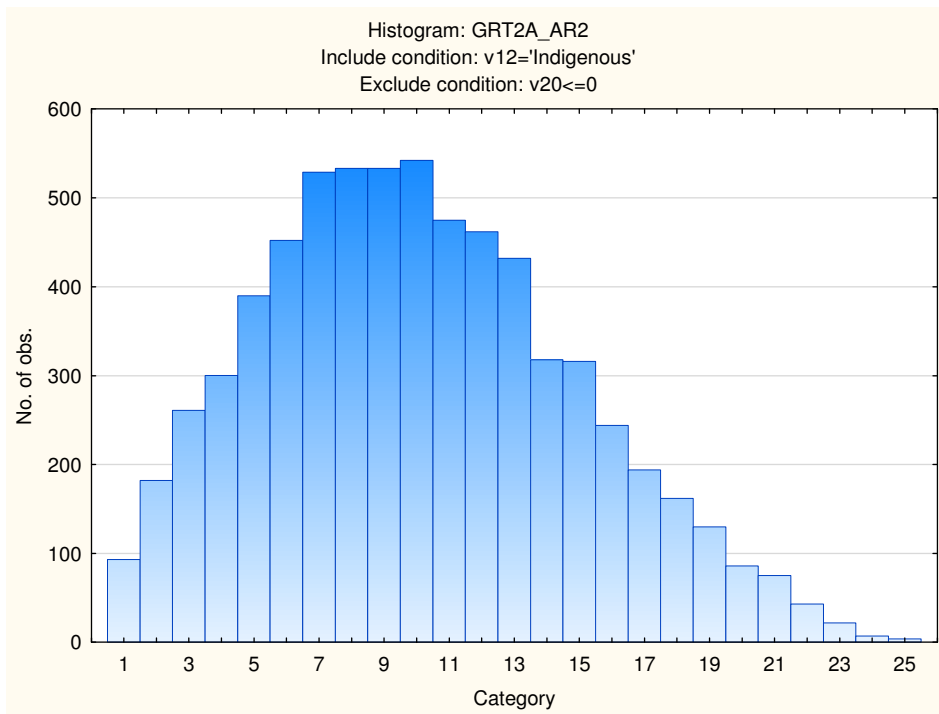
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,91300	10,27716	14,00000	64,00000	6253	194



## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

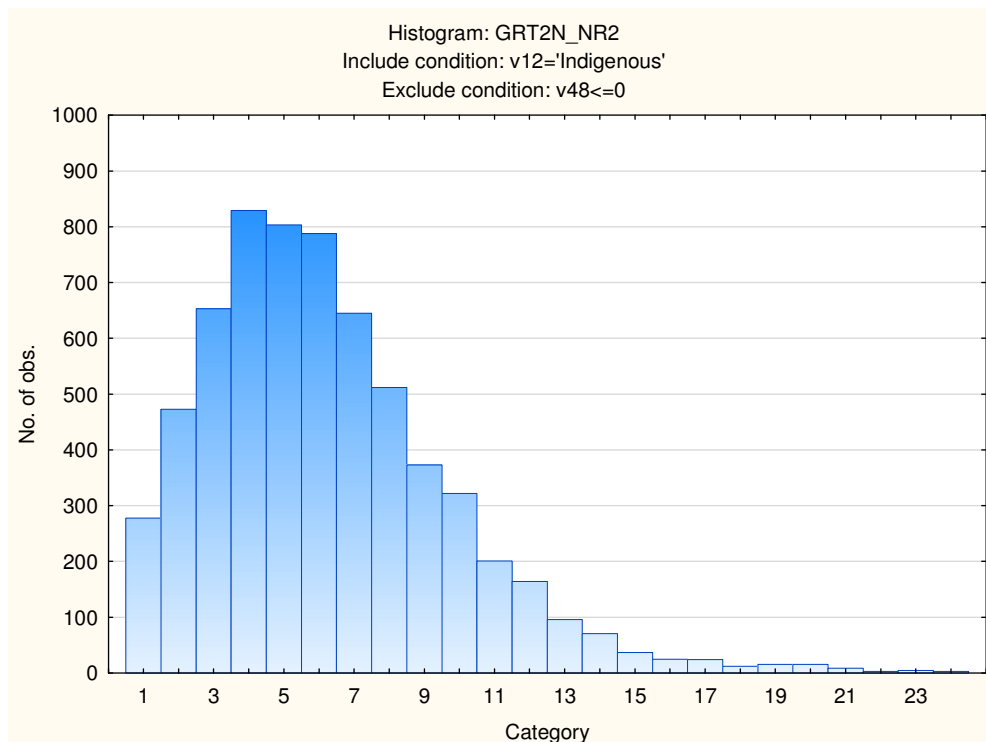
### General Abstract Reasoning Test

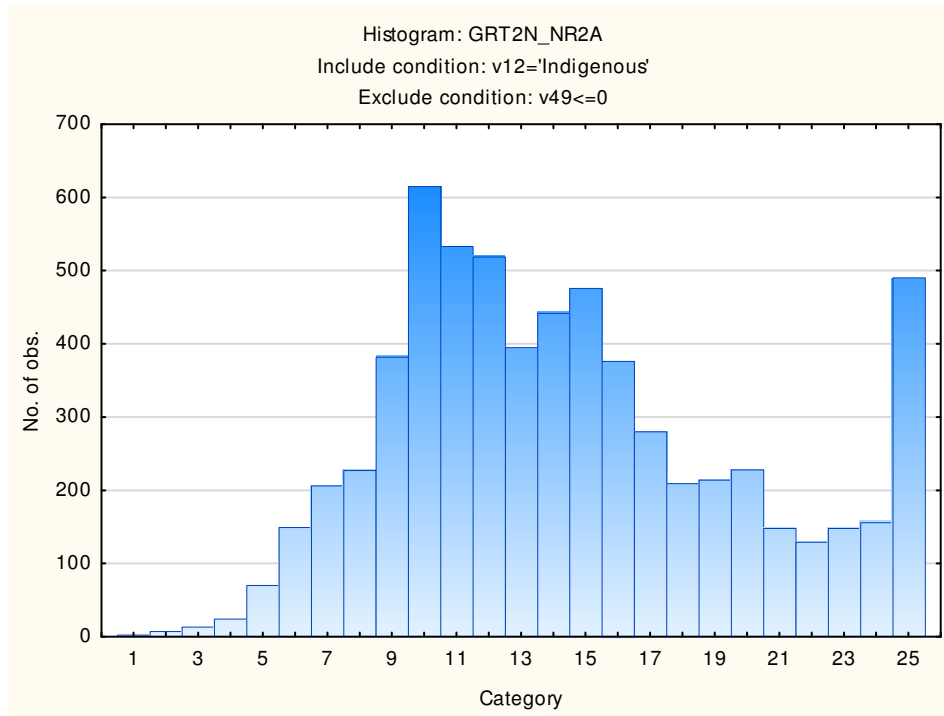
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	10,04637	4,821549	0,000000	25,00000	6815	0
General Abstract Reasoning Items Attempted	20,14307	4,564277	1,000000	25,00000	6815	0



## General Numerical Reasoning Test

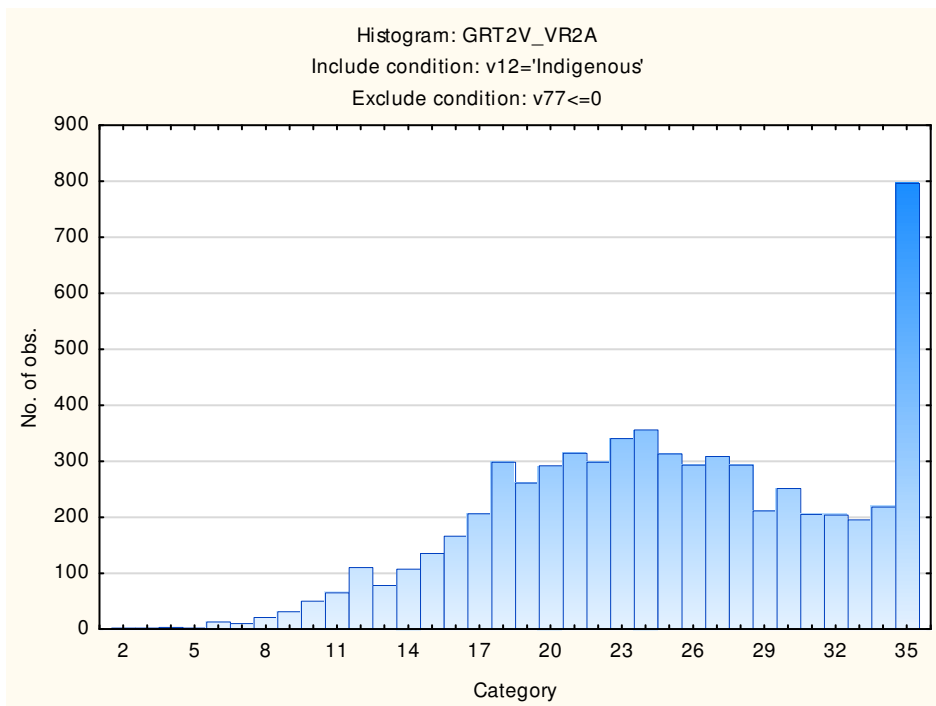
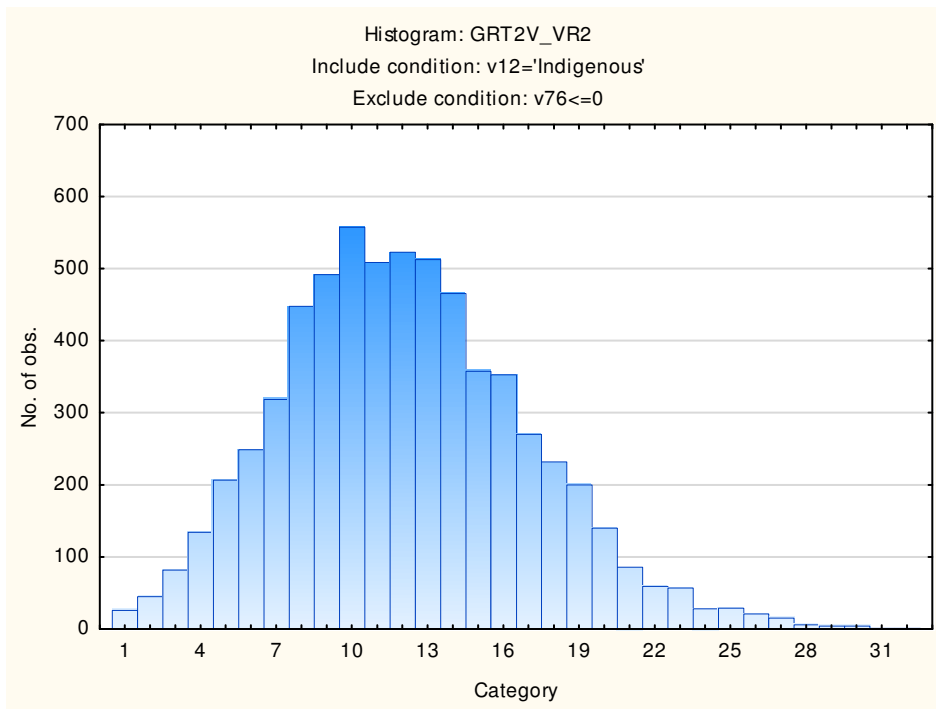
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning	6,13482	3,521720	0,000000	24,00000	6438	0
General Numerical Reasoning items attempted	14,49254	5,399600	1,000000	25,00000	6438	0





## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning	12,08841	4,856067	0,000000	32,00000	6447	0
General Verbal Reasoning Items Attempted	24,77680	6,982779	2,000000	35,00000	6447	0



## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-1	2-3	4-6	7-8	9-11	12-13	14-16	17-18	19-25
General Abstract Items Attempted	0-11	12-14	15-16	17-18	19-21	22-23	24-25		
General Numerical Reasoning	0-1	0-1	2-3	4-5	6-6	7-8	9-10	11-12	13-24
General Numerical Items Attempted	0-4	5-7	8-10	11-13	14-15	16-18	19-21	22-24	25-25
General Verbal Reasoning	0-3	4-5	6-8	9-10	11-13	14-15	16-18	19-20	21-32
General Verbal Items Attempted	0-12	13-15	16-19	20-22	23-26	27-30	31-33	34-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, isiXhosa Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with isiXhosa as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	631	631	52,71512	52,7151
F	565	1196	47,20134	99,9165
U	1	1197	0,08354	100,0000
Missing	0	1197	0,00000	100,0000

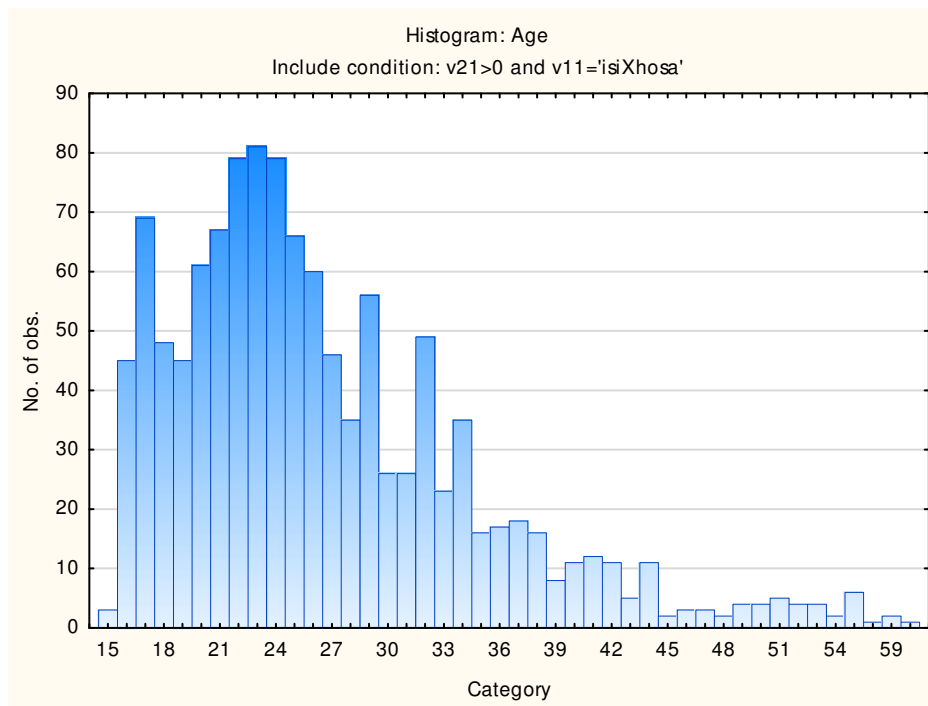
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	538	538	44,94570	44,9457
Post Graduate	38	576	3,17460	48,1203
Unknown	8	584	0,66834	48,7886
Tertiary	389	973	32,49791	81,2865
< Matric	150	1123	12,53133	93,8179
Missing	74	1197	6,18212	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiXhosa	1197	1197	100,0000	100,0000
Missing	0	1197	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	1197	1197	100,0000	100,0000
Missing	0	1197	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	1179	1179	98,49624	98,4962
Asian	3	1182	0,25063	98,7469
Coloured	9	1191	0,75188	99,4987
European	5	1196	0,41771	99,9165
Missing	1	1197	0,08354	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,56555	8,201302	15,00000	62,00000	1167	30



Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	565	565	51,22393	51,2239
F	537	1102	48,68540	99,9093
U	1	1103	0,09066	100,0000
Missing	0	1103	0,00000	100,0000

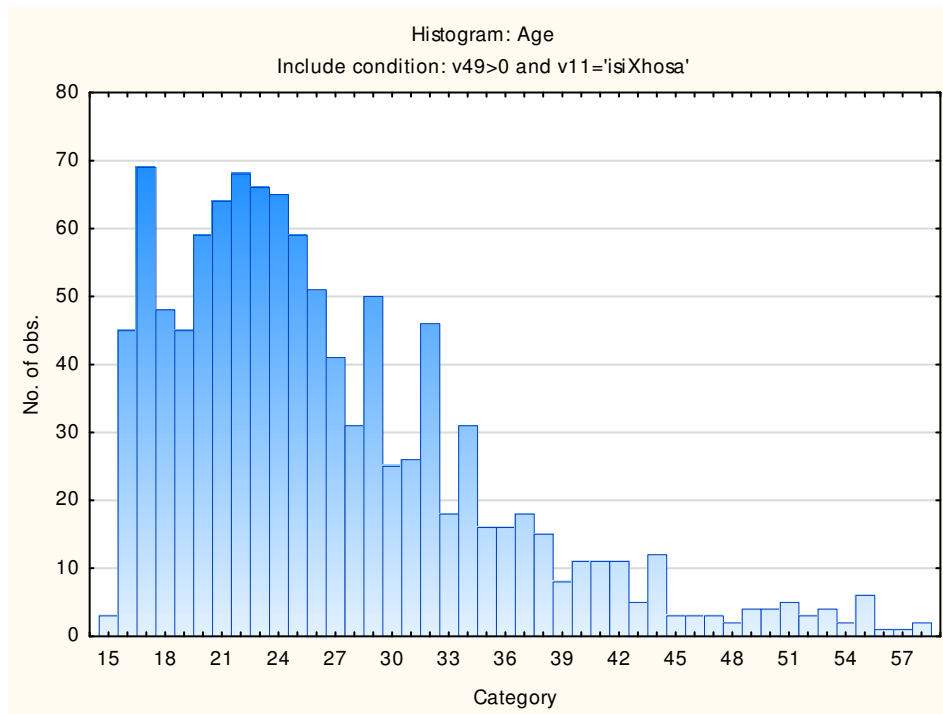
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	534	534	48,41342	48,4134
Post Graduate	28	562	2,53853	50,9519
Unknown	8	570	0,72529	51,6772
Tertiary	310	880	28,10517	79,7824
< Matric	150	1030	13,59927	93,3817
Missing	73	1103	6,61831	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiXhosa	1103	1103	100,0000	100,0000
Missing	0	1103	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	1103	1103	100,0000	100,0000
Missing	0	1103	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	1086	1086	98,45875	98,4587
Asian	2	1088	0,18132	98,6401
Coloured	9	1097	0,81596	99,4560
European	4	1101	0,36265	99,8187
Missing	2	1103	0,18132	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,61245	8,425840	15,00000	59,00000	1076	27



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	563	563	51,18182	51,1818
F	536	1099	48,72727	99,9091
U	1	1100	0,09091	100,0000
Missing	0	1100	0,00000	100,0000

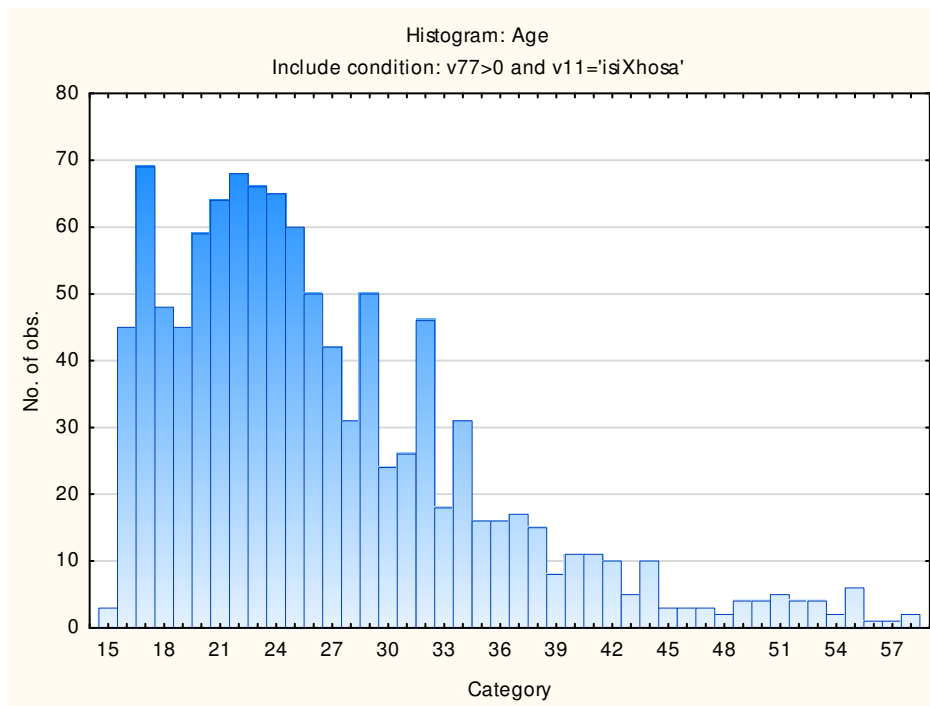
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	531	531	48,27273	48,2727
Post Graduate	28	559	2,54545	50,8182
Unknown	8	567	0,72727	51,5455
Tertiary	312	879	28,36364	79,9091
< Matric	150	1029	13,63636	93,5455
Missing	71	1100	6,45455	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiXhosa	1100	1100	100,0000	100,0000
Missing	0	1100	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	1100	1100	100,0000	100,0000
Missing	0	1100	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	1084	1084	98,54545	98,5455
Asian	2	1086	0,18182	98,7273
Coloured	9	1095	0,81818	99,5455
European	4	1099	0,36364	99,9091
Missing	1	1100	0,09091	100,0000

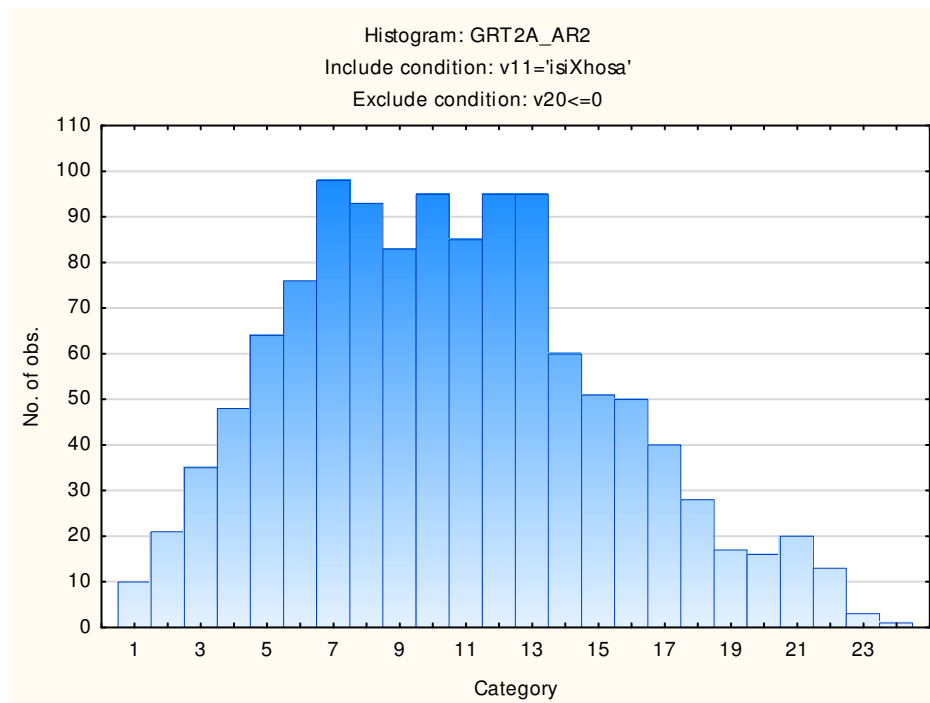
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,57596	8,420173	15,00000	59,00000	1073	27

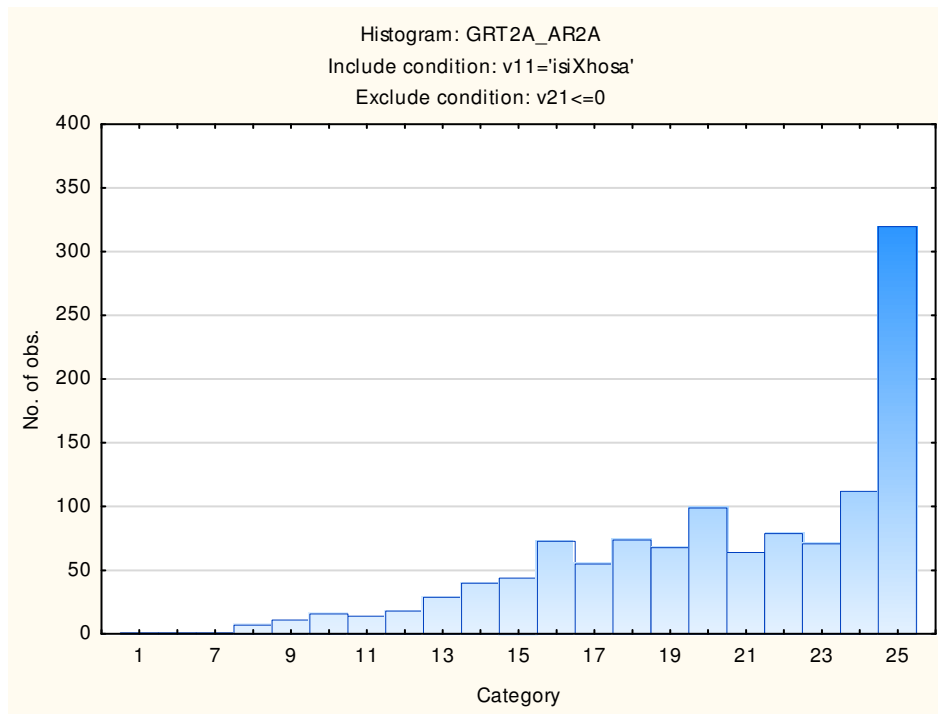


## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

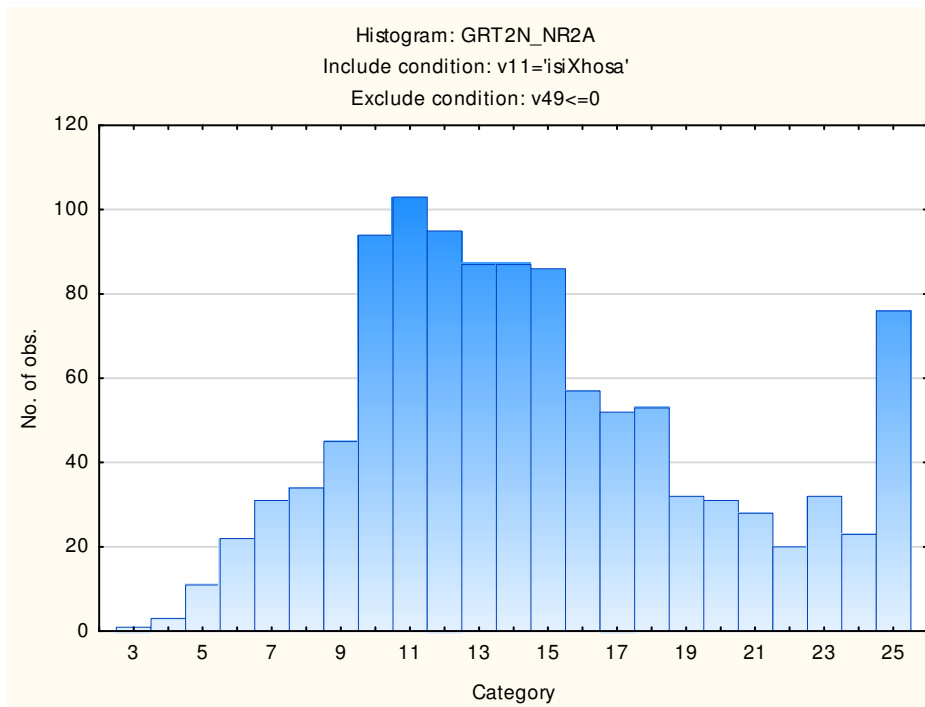
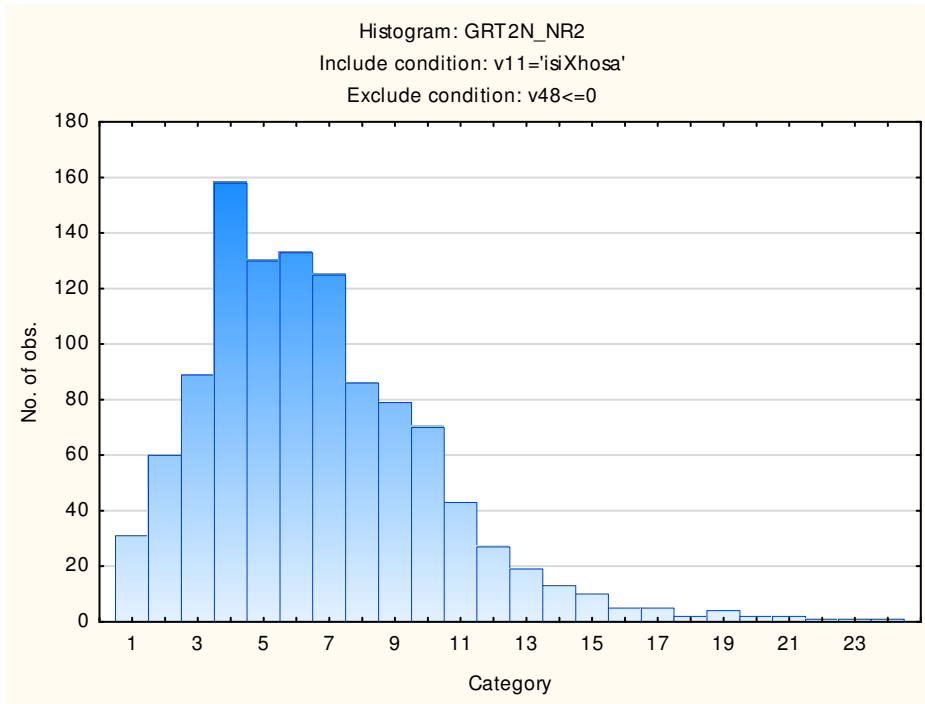
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	10,52047	4,707564	1,000000	24,00000	1197	0
General Abstract Reasoning Items attempted	20,38847	4,441967	1,000000	25,00000	1197	0





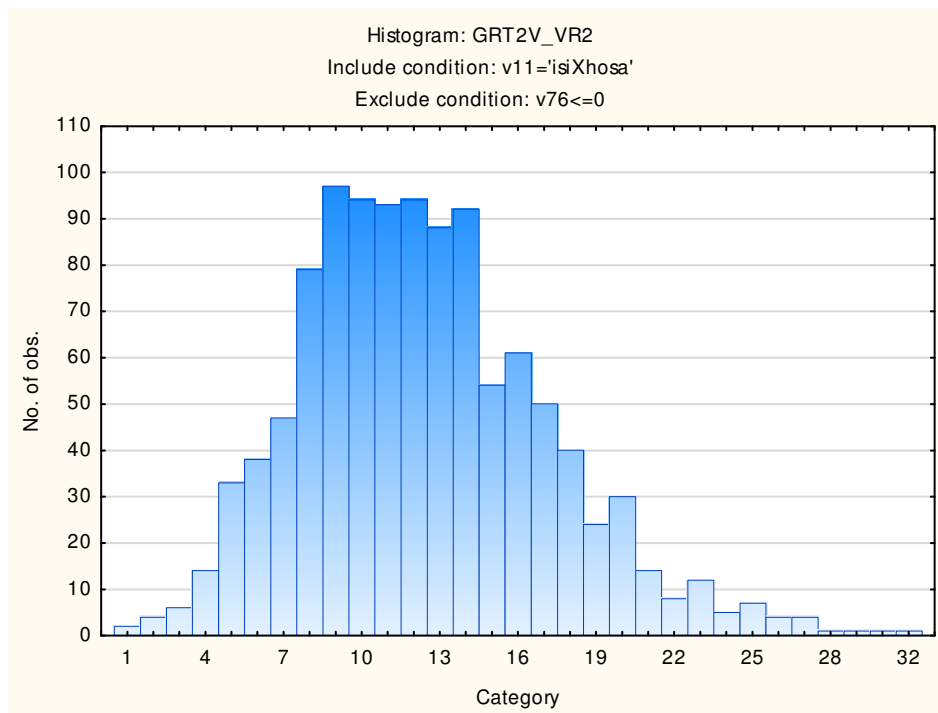
## General Numerical Reasoning Test

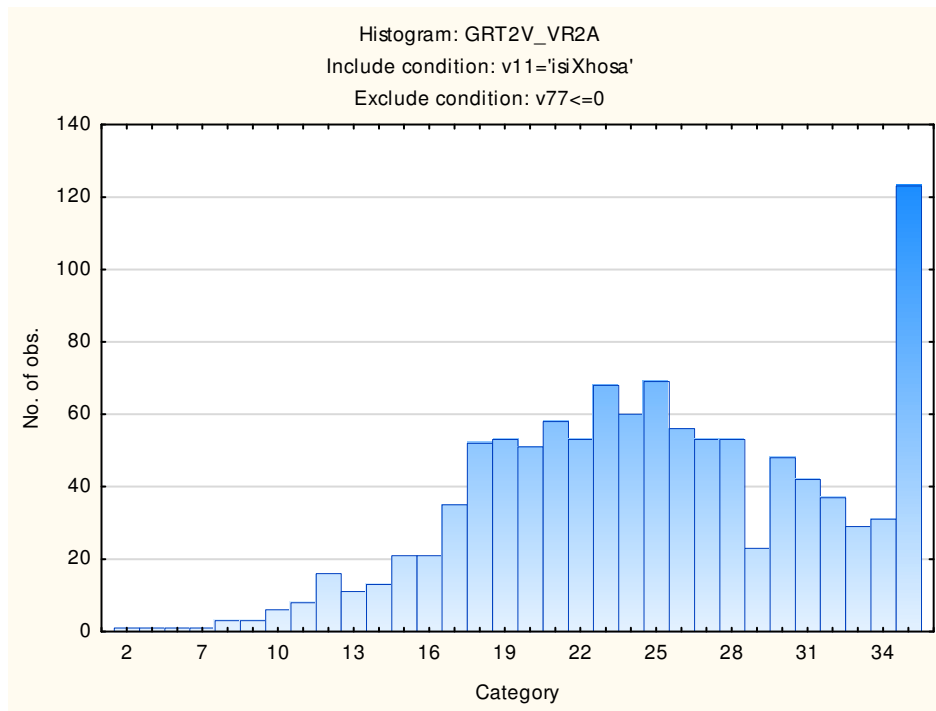
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	6,59655	3,546101	0,000000	24,00000	1103	0
General Numerical Reasoning Items Attempted	14,63463	5,158799	3,000000	25,00000	1103	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	12,38000	4,756602	0,000000	32,00000	1100	0
General Verbal Reasoning Items Attempted	24,85091	6,601731	2,000000	35,00000	1100	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-2	3-4	5-6	7-9	10-11	12-14	15-16	17-18	19-24
General Abstract Items Attempted	0-12	13-14	15-16	17-19	20-21	22-23	24-25		
General Numerical Reasoning	0-0	1-2	3-3	4-5	6-7	8-9	10-11	12-12	13-24
General Numerical Items Attempted	0-5	6-7	8-10	11-13	14-15	16-18	19-21	22-23	24-25
General Verbal Reasoning	0-3	4-6	7-8	9-11	12-13	14-15	16-18	19-20	21-32
General Verbal Items Attempted	0-12	13-16	17-19	20-22	23-26	27-29	30-33	34-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, isiZulu Speaking, Updated 2016

### Sample Composition

The sample consisted of South Africans with isiZulu as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1513	1513	67,24444	67,2444
F	730	2243	32,44444	99,6889
U	7	2250	0,31111	100,0000
Missing	0	2250	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	883	883	39,24444	39,2444
Post Graduate	105	988	4,66667	43,9111
Unknown	24	1012	1,06667	44,9778
Tertiary	514	1526	22,84444	67,8222
< Matric	523	2049	23,24444	91,0667
Missing	201	2250	8,93333	100,0000

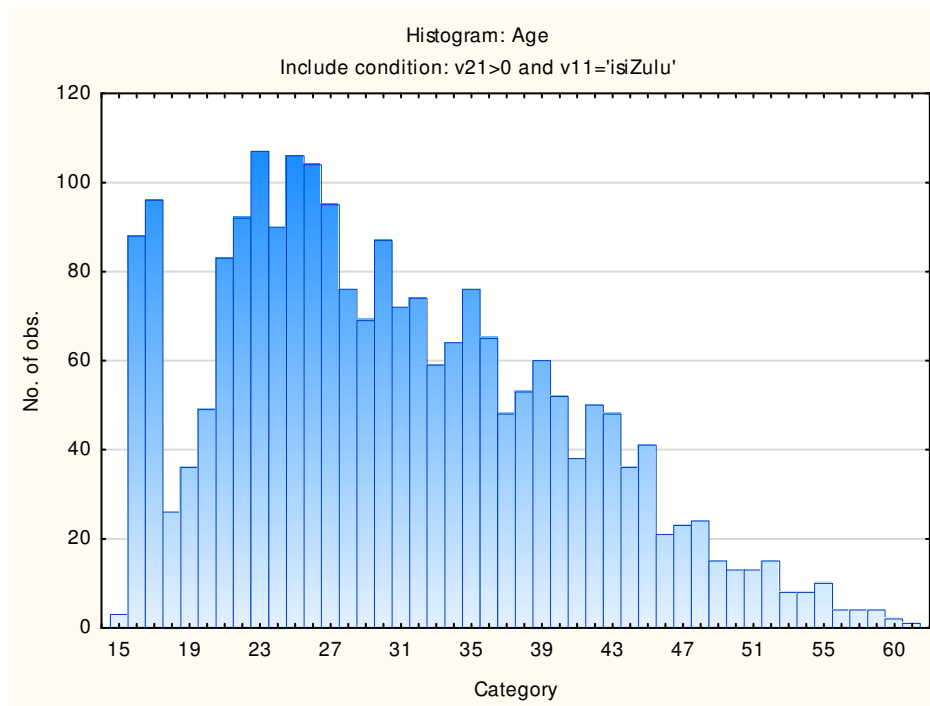
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2250	2250	100,0000	100,0000
Missing	0	2250	0,0000	100,0000



Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	2250	2250	100,0000	100,0000
Missing	0	2250	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	2226	2226	98,93333	98,93333
Asian	13	2239	0,57778	99,51111
Coloured	4	2243	0,17778	99,6889
European	3	2246	0,13333	99,8222
Missing	4	2250	0,17778	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,63949	9,554533	15,00000	64,00000	2208	42



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1404	1404	66,66667	66,6667
F	695	2099	33,00095	99,6676
U	7	2106	0,33238	100,0000
Missing	0	2106	0,00000	100,0000

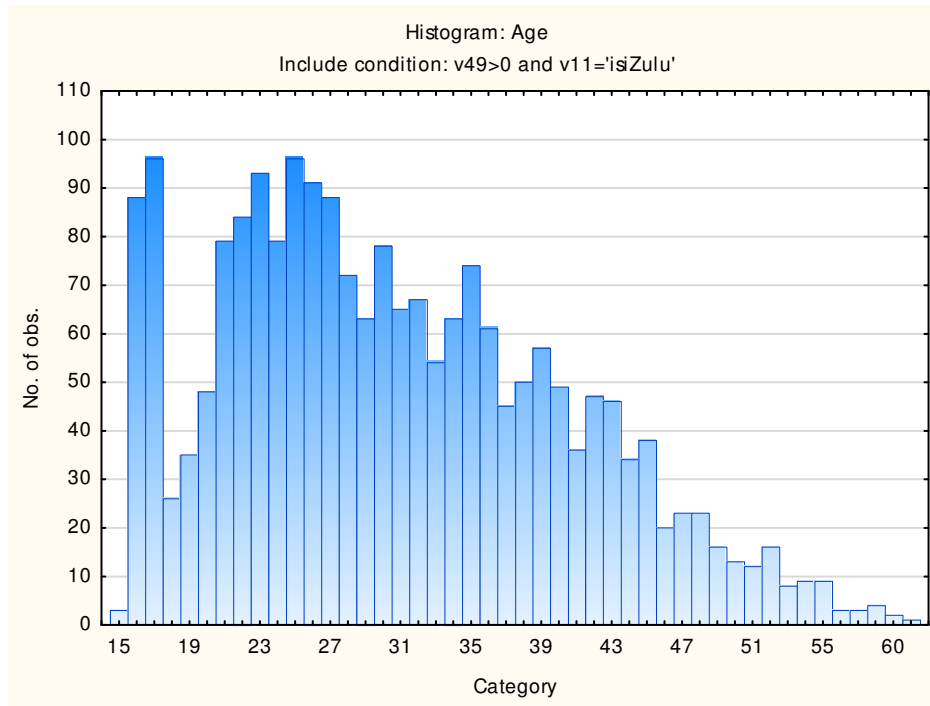
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	861	861	40,88319	40,8832
Post Graduate	83	944	3,94112	44,8243
Unknown	24	968	1,13960	45,9639
Tertiary	431	1399	20,46534	66,4292
< Matric	518	1917	24,59639	91,0256
Missing	189	2106	8,97436	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2106	2106	100,0000	100,0000
Missing	0	2106	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	2106	2106	100,0000	100,0000
Missing	0	2106	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	2083	2083	98,90788	98,9079
Asian	11	2094	0,52232	99,4302
Coloured	4	2098	0,18993	99,6201
European	3	2101	0,14245	99,7626
Missing	5	2106	0,23742	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No. cases Missing
Age	30,69328	9,685808	15,00000	64,00000	2067	39



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1406	1406	66,60351	66,6035
F	698	2104	33,06490	99,6684
U	7	2111	0,33160	100,0000
Missing	0	2111	0,00000	100,0000

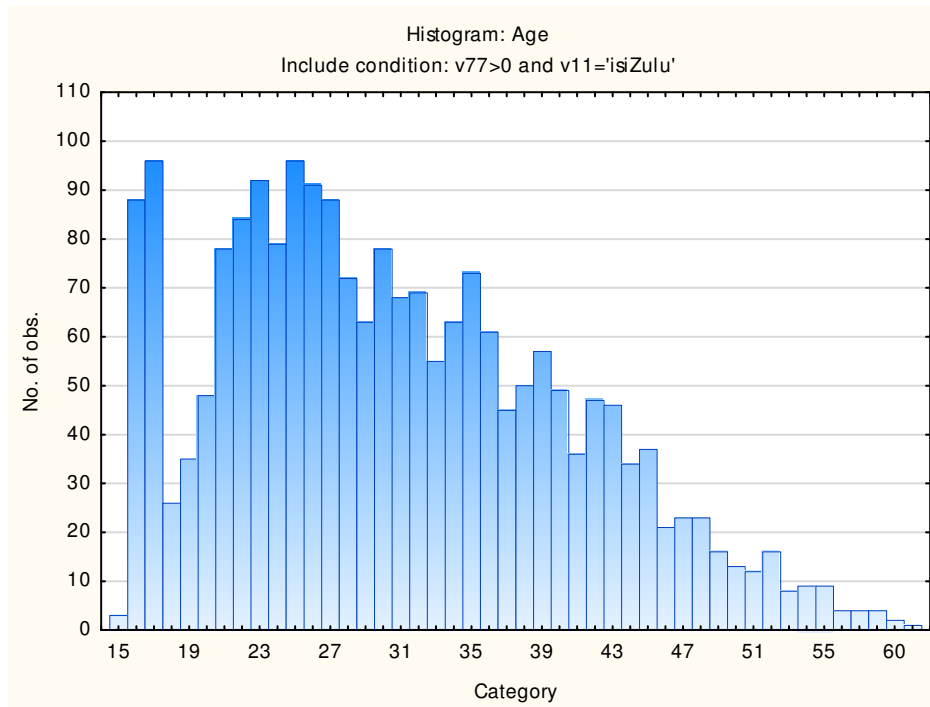
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	861	861	40,78636	40,7864
Post Graduate	84	945	3,97916	44,7655
Unknown	24	969	1,13690	45,9024
Tertiary	434	1403	20,55898	66,4614
< Matric	518	1921	24,53813	90,9995
Missing	190	2111	9,00047	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2111	2111	100,0000	100,0000
Missing	0	2111	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	2111	2111	100,0000	100,0000
Missing	0	2111	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	2089	2089	98,95784	98,9578
Asian	11	2100	0,52108	99,4789
Coloured	4	2104	0,18948	99,6684
European	3	2107	0,14211	99,8105
Missing	4	2111	0,18948	100,0000

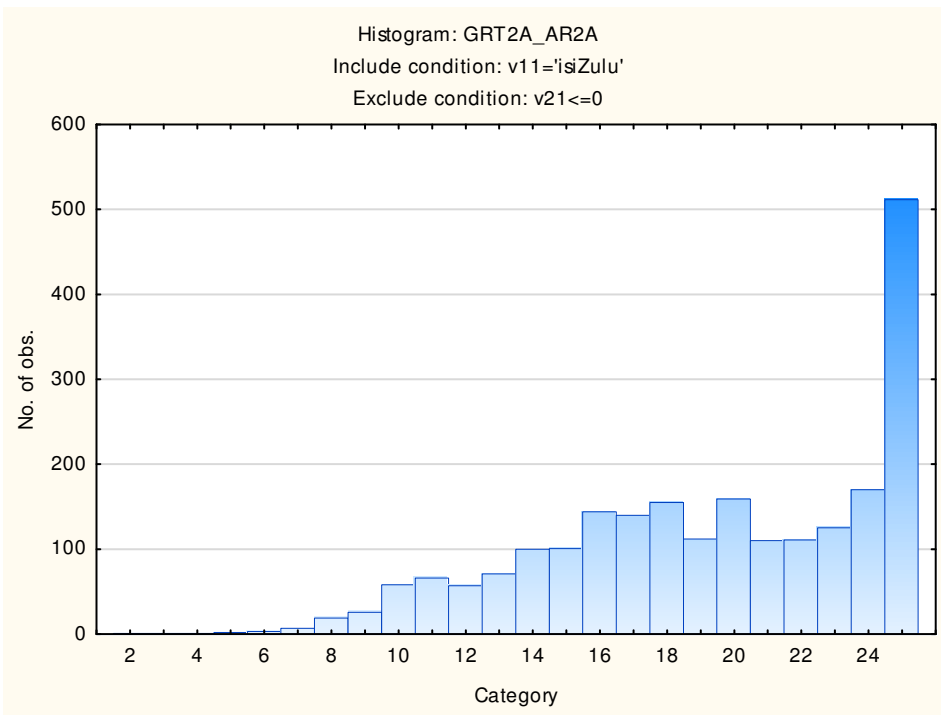
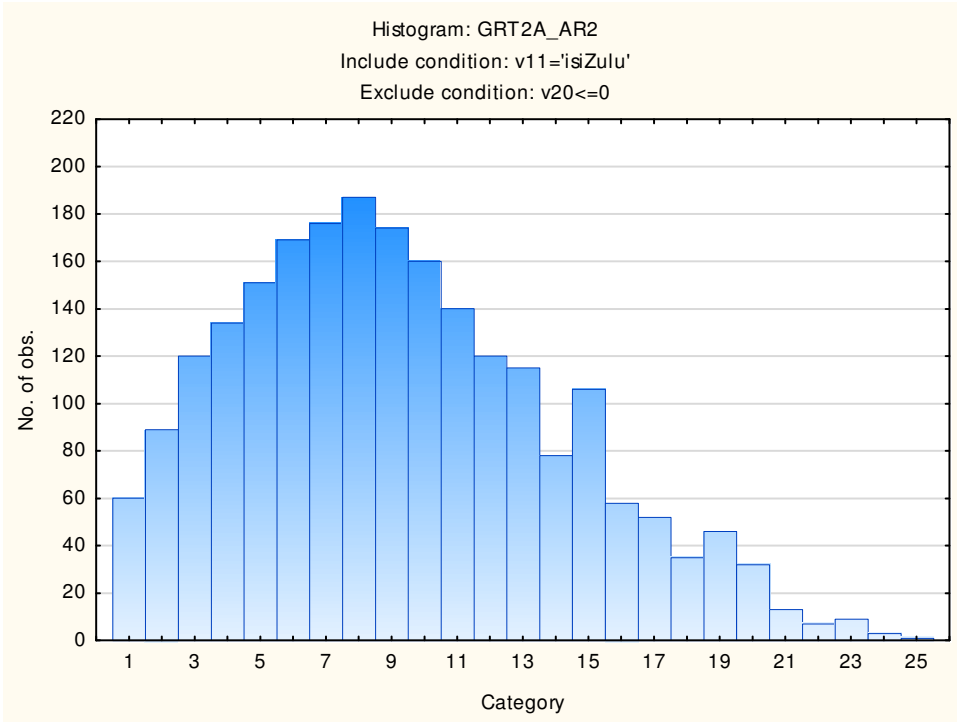
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,72780	9,703934	15,00000	64,00000	2072	39



## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

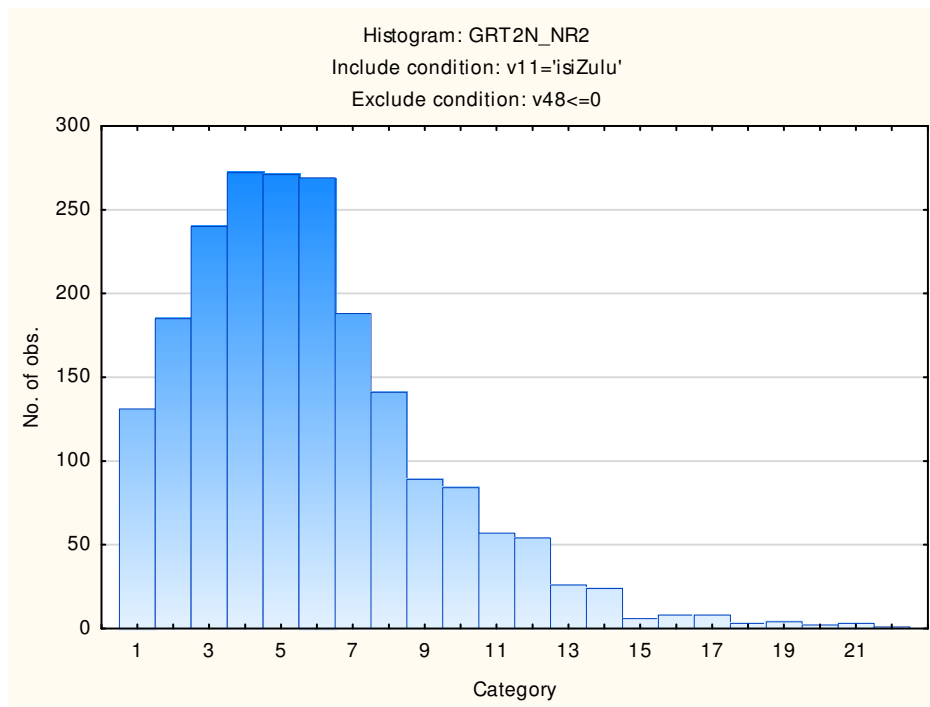
### General Abstract Reasoning Test

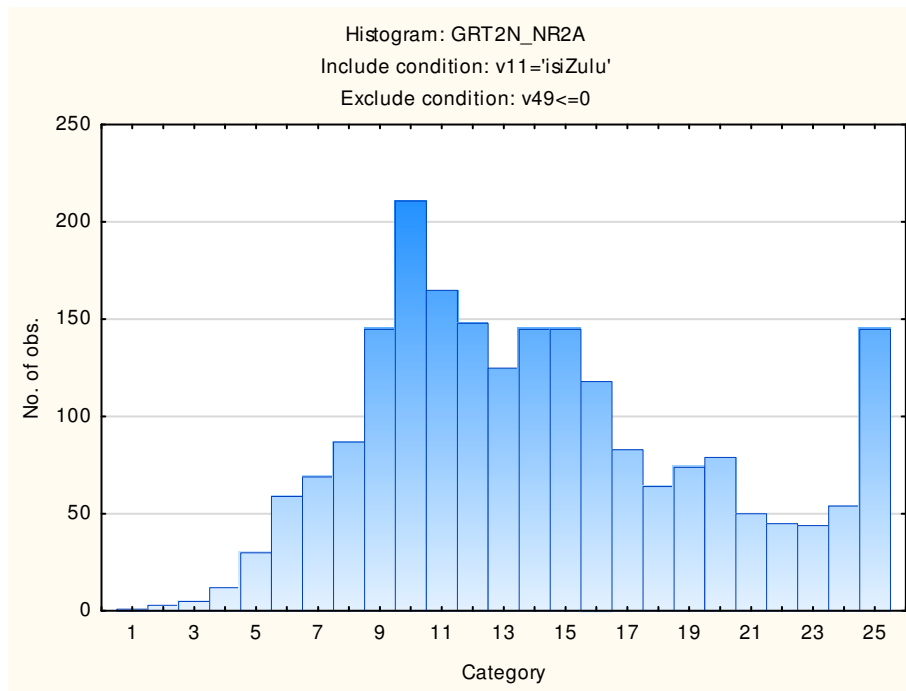
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	9,17378	4,921756	0,000000	25,00000	2250	0
General Abstract Reasoning Items attempted	19,36178	4,896597	2,000000	25,00000	2250	0



## General Numerical Reasoning Test

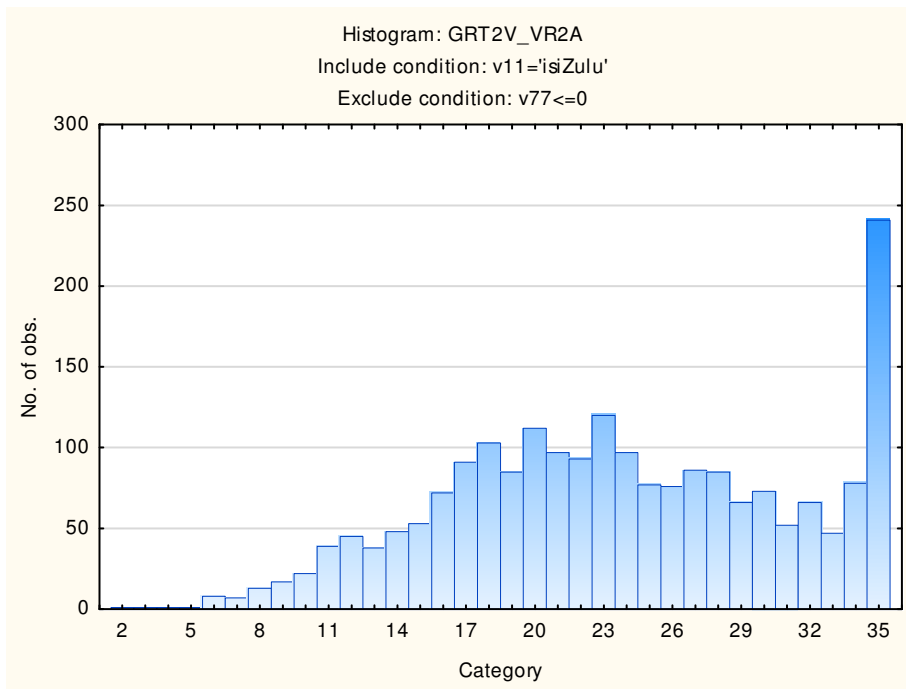
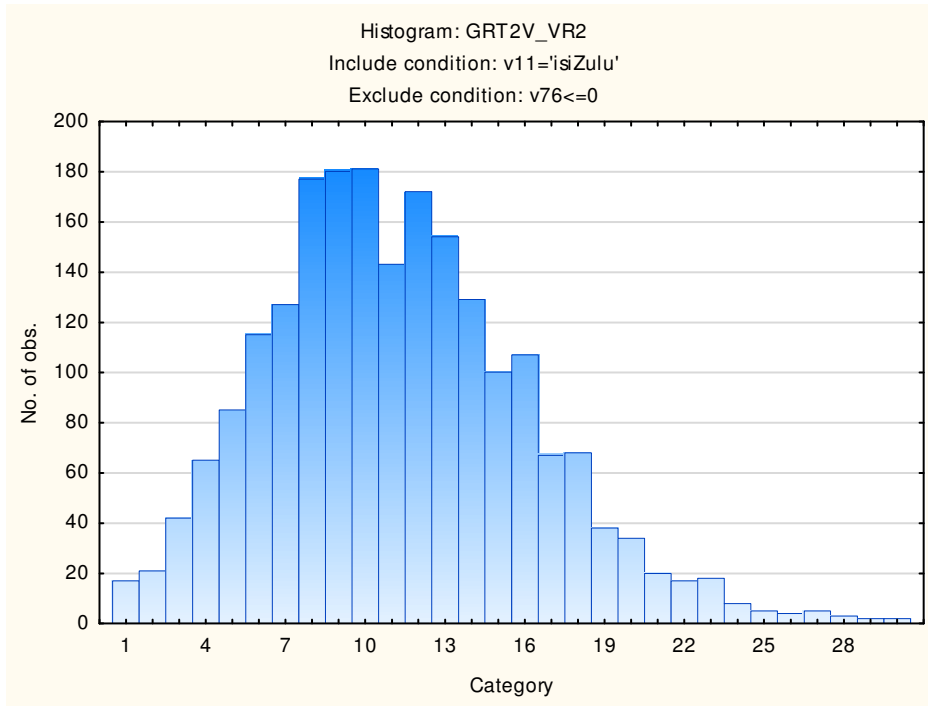
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	5,66097	3,428671	0,000000	23,00000	2106	0
General Numerical Reasoning Items Attempted	14,24454	5,476057	1,000000	25,00000	2106	0





## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	11,21885	4,906273	0,000000	30,00000	2111	0
General Verbal Reasoning Items Attempted	23,76409	7,440141	2,000000	35,00000	2111	0



## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-0	1-2	3-5	6-7	8-10	11-12	13-15	16-17	18-25
General Abstract Items Attempted	0-10	11-12	13-15	16-18	19-20	21-23	24-25		
General Numerical Reasoning	0--1	0-1	2-3	4-4	5-6	7-8	9-9	10-11	12-23
General Numerical Items Attempted	0-4	5-7	8-9	10-12	13-15	16-18	19-21	22-23	24-25
General Verbal Reasoning	0-2	3-4	5-7	8-9	10-12	13-14	15-17	18-19	20-30
General Verbal Items Attempted	0-10	11-13	14-17	18-21	22-25	26-29	30-33	34-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Sepedi Speaking, Updated 2016

### Sample Composition

The sample consisted of South Africans with Sepedi as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	399	399	43,70208	43,7021
F	509	908	55,75027	99,4524
U	5	913	0,54765	100,0000
Missing	0	913	0,00000	100,0000

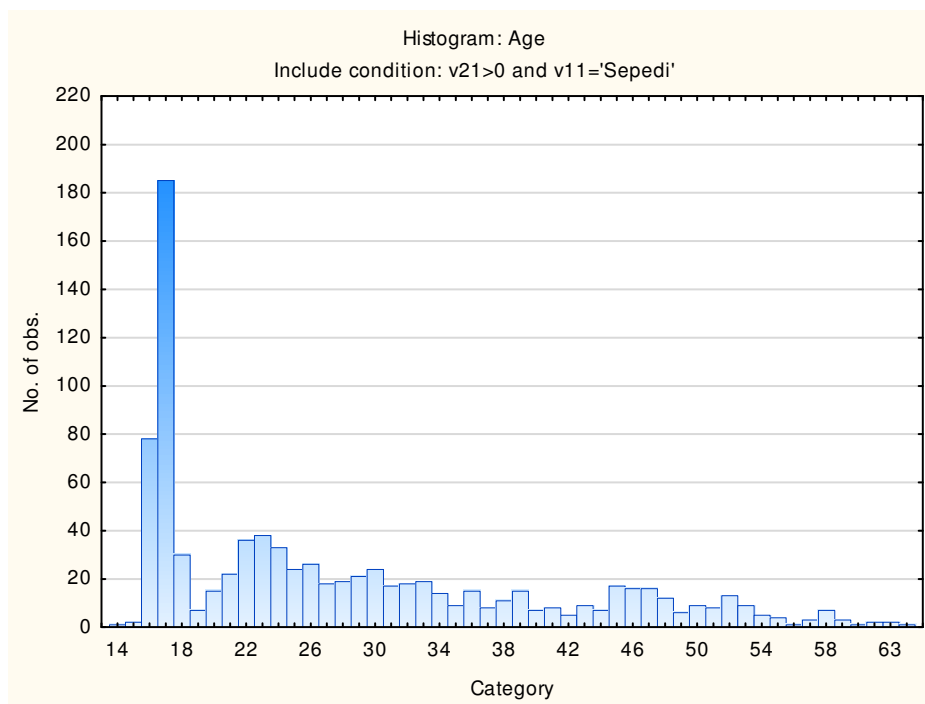
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	306	306	33,51588	33,5159
Post Graduate	28	334	3,06681	36,5827
Unknown	24	358	2,62870	39,2114
Tertiary	188	546	20,59146	59,8028
< Matric	311	857	34,06353	93,8664
Missing	56	913	6,13363	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sepedi	913	913	100,0000	100,0000
Missing	0	913	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	913	913	100,0000	100,0000
Missing	0	913	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	901	901	98,68565	98,6857
Asian	3	904	0,32859	99,0142
Coloured	2	906	0,21906	99,2333
European	1	907	0,10953	99,3428
Missing	6	913	0,65717	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,11872	12,06021	14,00000	64,00000	876	37



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	388	388	43,35196	43,3520
F	502	890	56,08939	99,4413
U	5	895	0,55866	100,0000
Missing	0	895	0,00000	100,0000

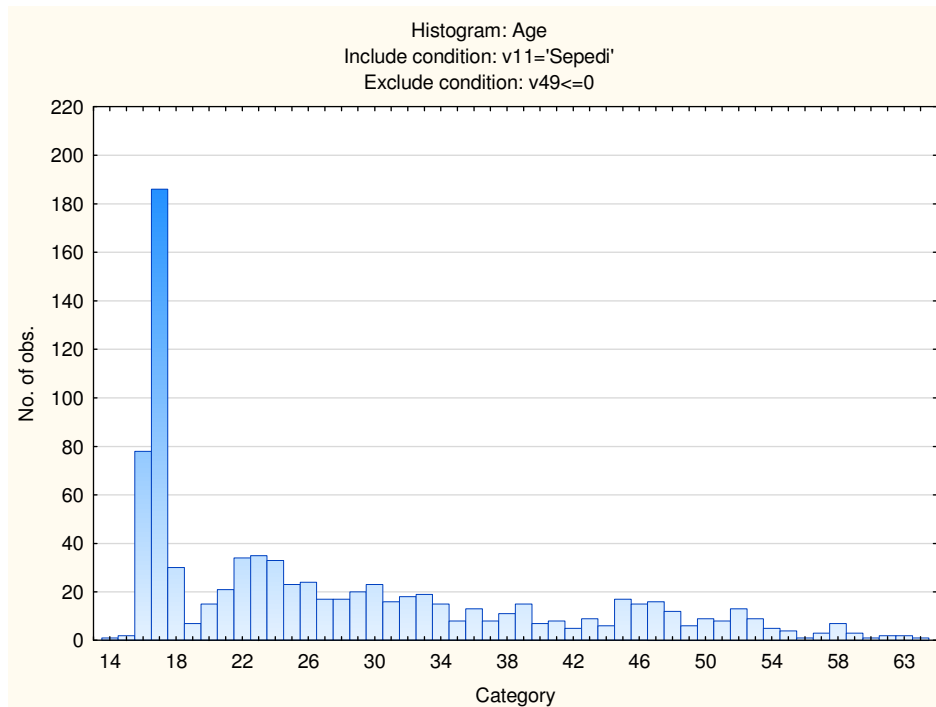
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	301	301	33,63128	33,6313
Post Graduate	25	326	2,79330	36,4246
Unknown	24	350	2,68156	39,1061
Tertiary	176	526	19,66480	58,7709
< Matric	312	838	34,86034	93,6313
Missing	57	895	6,36872	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sepedi	895	895	100,0000	100,0000
Missing	0	895	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	895	895	100,0000	100,0000
Missing	0	895	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	883	883	98,65922	98,6592
Asian	3	886	0,33520	98,9944
Coloured	2	888	0,22346	99,2179
European	1	889	0,11173	99,3296
Missing	6	895	0,67039	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,09091	12,14675	14,00000	64,00000	858	37



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	388	388	43,25530	43,2553
F	504	892	56,18729	99,4426
U	5	897	0,55741	100,0000
Missing	0	897	0,00000	100,0000

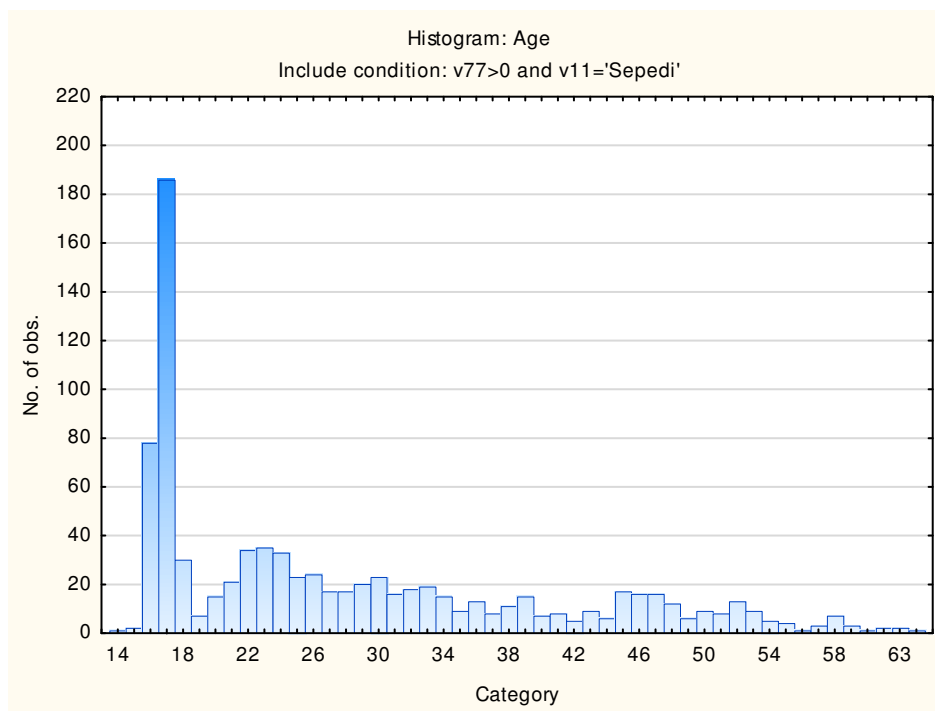
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	301	301	33,55630	33,5563
Post Graduate	25	326	2,78707	36,3434
Unknown	24	350	2,67559	39,0190
Tertiary	178	528	19,84392	58,8629
< Matric	312	840	34,78261	93,6455
Missing	57	897	6,35452	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sepedi	897	897	100,0000	100,0000
Missing	0	897	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	897	897	100,0000	100,0000
Missing	0	897	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	885	885	98,66221	98,6622
Asian	3	888	0,33445	98,9967
Coloured	2	890	0,22297	99,2196
European	1	891	0,11148	99,3311
Missing	6	897	0,66890	100,0000

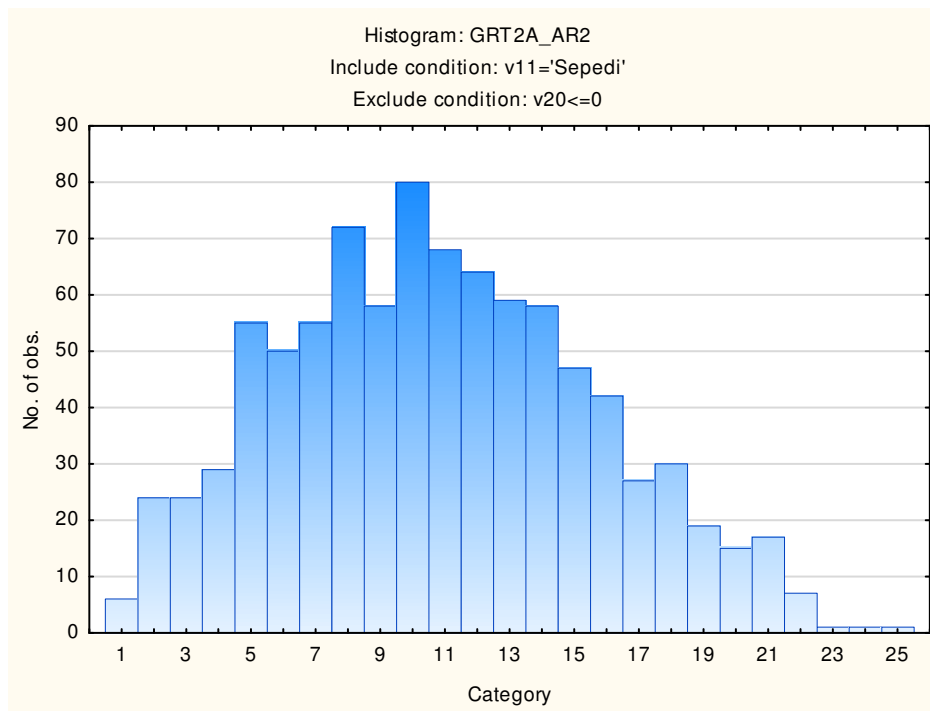
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,11977	12,15024	14,00000	64,00000	860	37

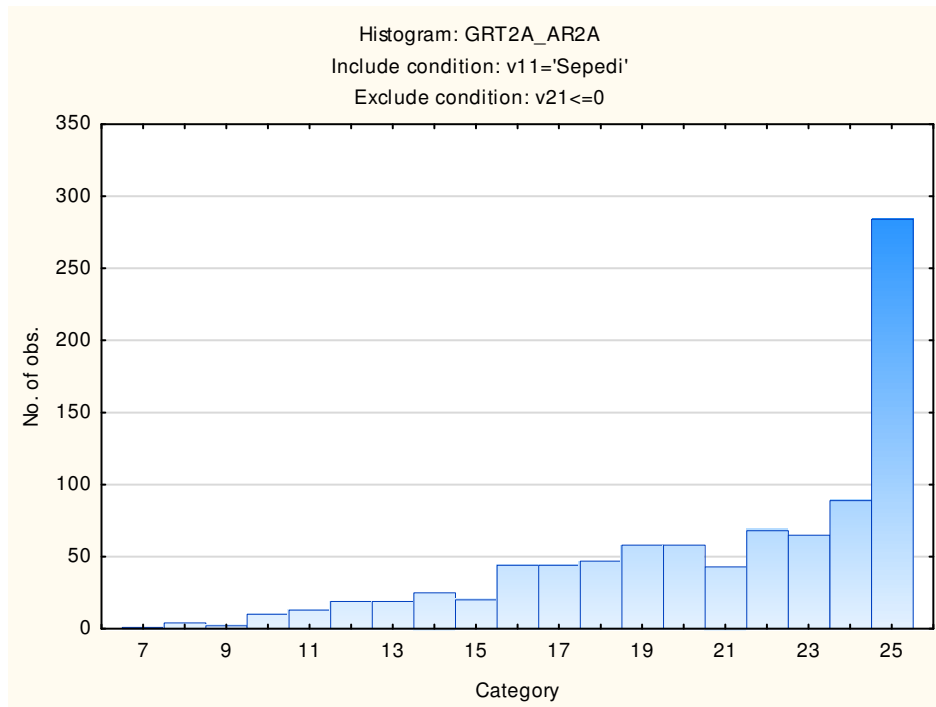


## Descriptive statistics and frequency distributions on General Reasoning Test Battery subtests

### General Abstract Reasoning Test

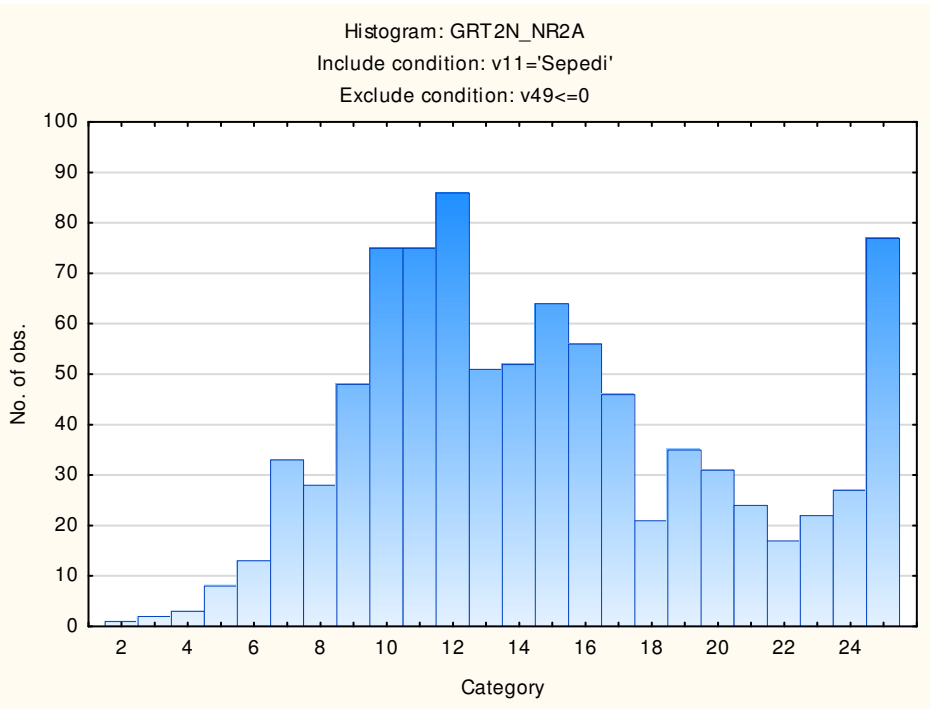
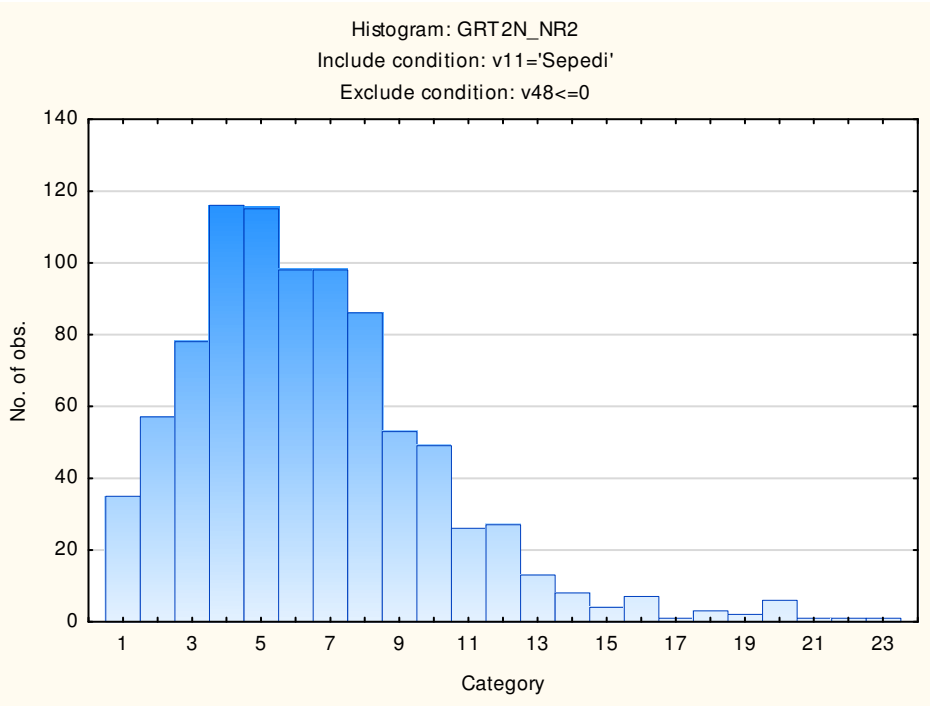
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	10,75027	4,861127	0,000000	25,00000	913	0
General Abstract Reasoning Items attempted	20,93647	4,260734	7,000000	25,00000	913	0





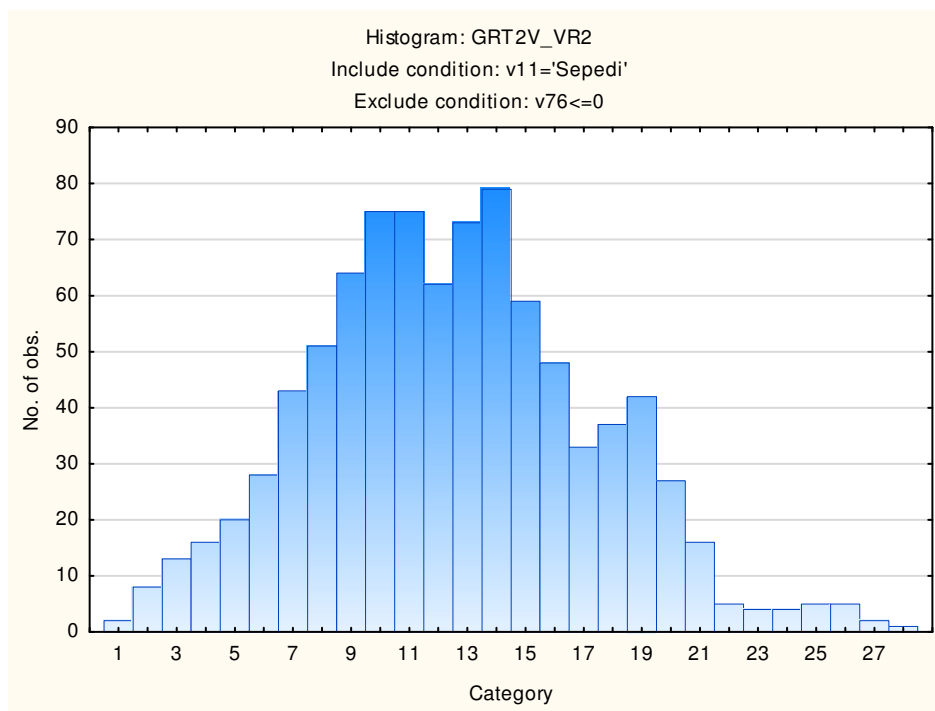
## General Numerical Reasoning Test

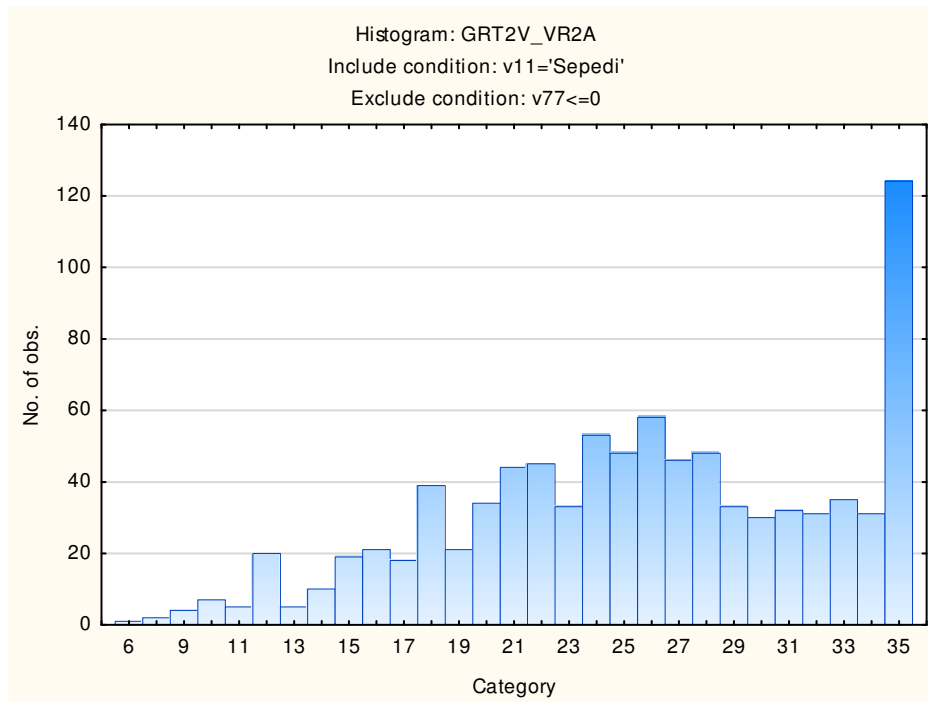
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	6,37877	3,607505	0,000000	23,00000	895	0
General Numerical Reasoning Items Attempted	14,83911	5,467295	2,000000	25,00000	895	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	12,53066	4,820368	1,000000	31,00000	897	0
General Verbal Reasoning Items Attempted	25,60201	6,751398	6,000000	35,00000	897	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-2	3-4	5-7	8-9	10-11	12-14	15-16	17-19	20-25
General Abstract Items Attempted	0-13	14-15	16-17	18-19	20-21	22-24	25-25		
General Numerical Reasoning	0-0	1-1	2-3	4-5	6-7	8-9	10-10	11-12	13-23
General Numerical Items Attempted	2-5	6-7	8-10	11-13	14-16	17-18	19-21	22-24	25-25
General Verbal Reasoning	1-4	5-6	7-8	9-11	12-13	14-16	17-18	19-20	21-31
General Verbal Items Attempted	6-13	14-17	18-20	21-23	24-27	28-30	31-34	35-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Sesotho Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with Sesotho as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	607	607	65,55076	65,5508
F	315	922	34,01728	99,5680
U	4	926	0,43197	100,0000
Missing	0	926	0,00000	100,0000

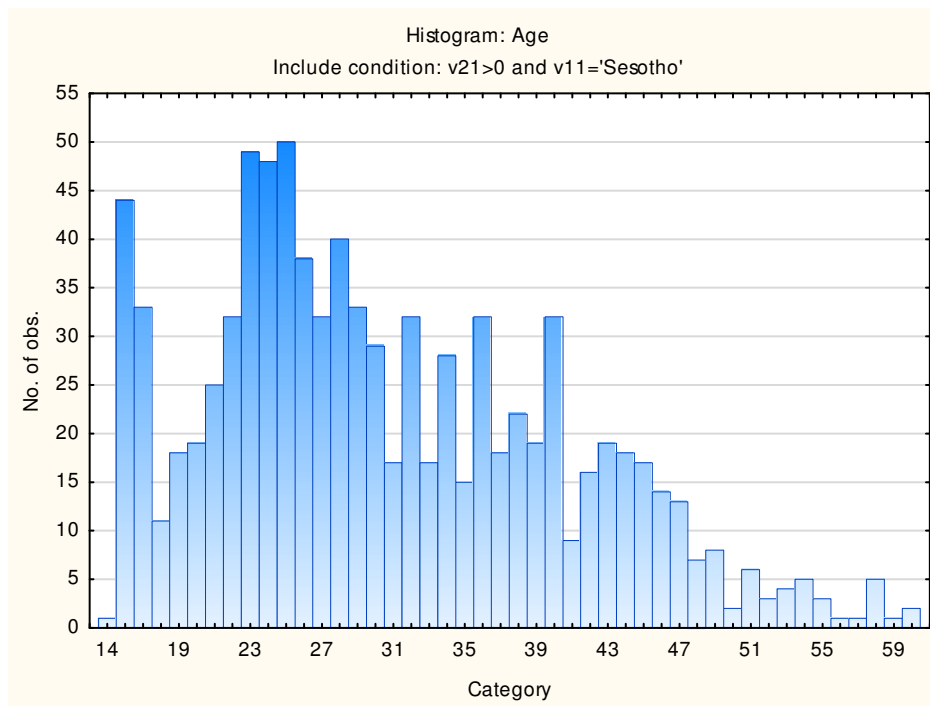
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	357	357	38,55292	38,5529
Post Graduate	43	400	4,64363	43,1965
Unknown	3	403	0,32397	43,5205
Tertiary	232	635	25,05400	68,5745
< Matric	198	833	21,38229	89,9568
Missing	93	926	10,04320	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	926	926	100,0000	100,0000
Missing	0	926	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	926	926	100,0000	100,0000
Missing	0	926	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	921	921	99,46004	99,4600
Asian	1	922	0,10799	99,5680
Coloured	2	924	0,21598	99,7840
European	1	925	0,10799	99,8920
Missing	1	926	0,10799	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,64077	9,834390	14,00000	60,00000	888	38



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	575	575	65,34091	65,3409
F	301	876	34,20455	99,5455
U	4	880	0,45455	100,0000
Missing	0	880	0,00000	100,0000

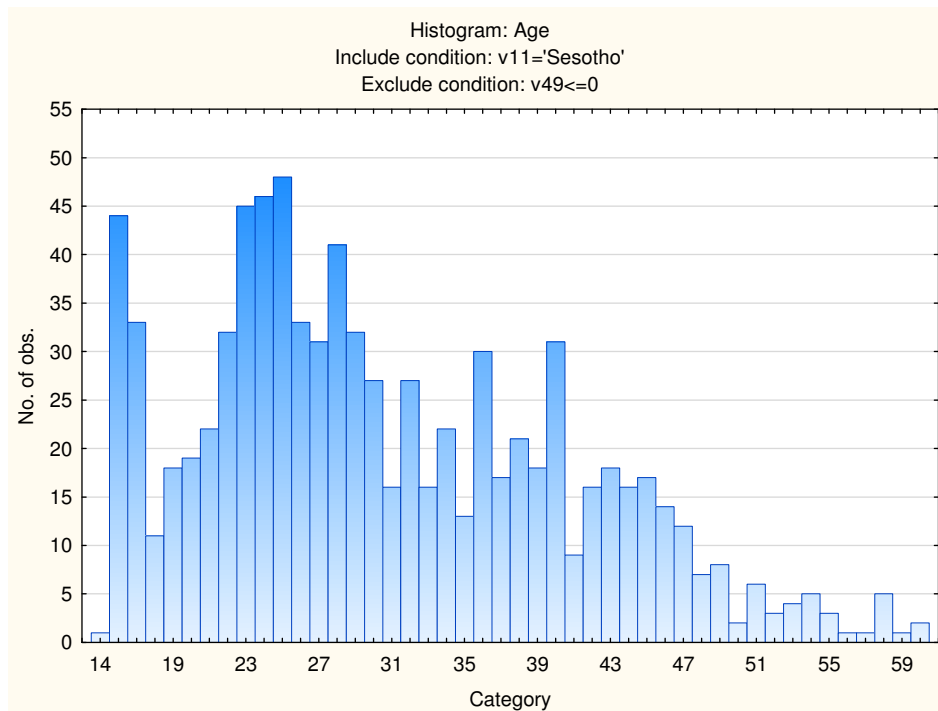
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	347	347	39,43182	39,4318
Post Graduate	30	377	3,40909	42,8409
Unknown	3	380	0,34091	43,1818
Tertiary	210	590	23,86364	67,0455
< Matric	199	789	22,61364	89,6591
Missing	91	880	10,34091	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	877	877	99,65909	99,6591
Coloured	2	879	0,22727	99,8864
Missing	1	880	0,11364	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,61137	9,970094	14,00000	60,00000	844	36



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	572	572	65,0000	65,0000
F	304	876	34,54545	99,5455
U	4	880	0,45455	100,0000
Missing	0	880	0,00000	100,0000

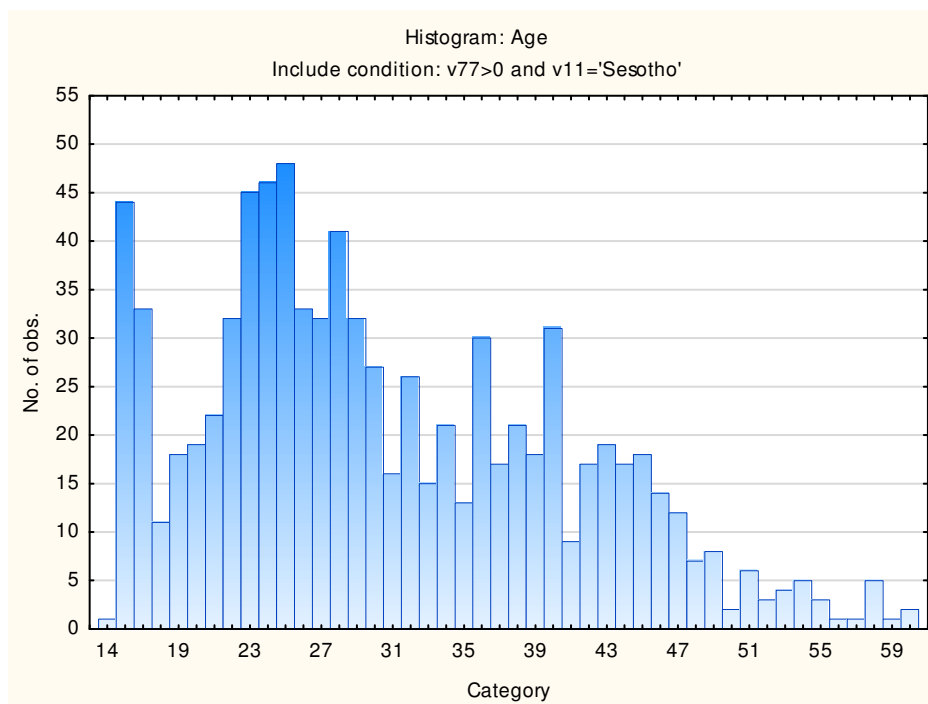
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	346	346	39,31818	39,3182
Post Graduate	30	376	3,40909	42,7273
Unknown	3	379	0,34091	43,0682
Tertiary	213	592	24,20455	67,2727
< Matric	198	790	22,50000	89,7727
Missing	90	880	10,22727	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	877	877	99,65909	99,6591
Coloured	2	879	0,22727	99,8864
Missing	1	880	0,11364	100,0000

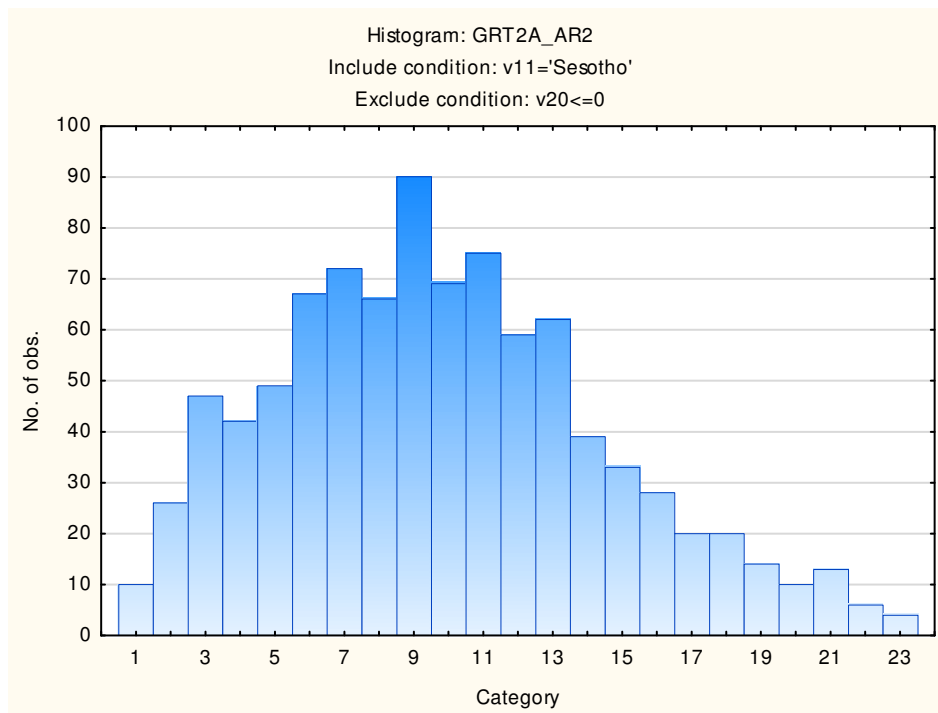
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,65957	9,997512	14,00000	60,00000	846	34

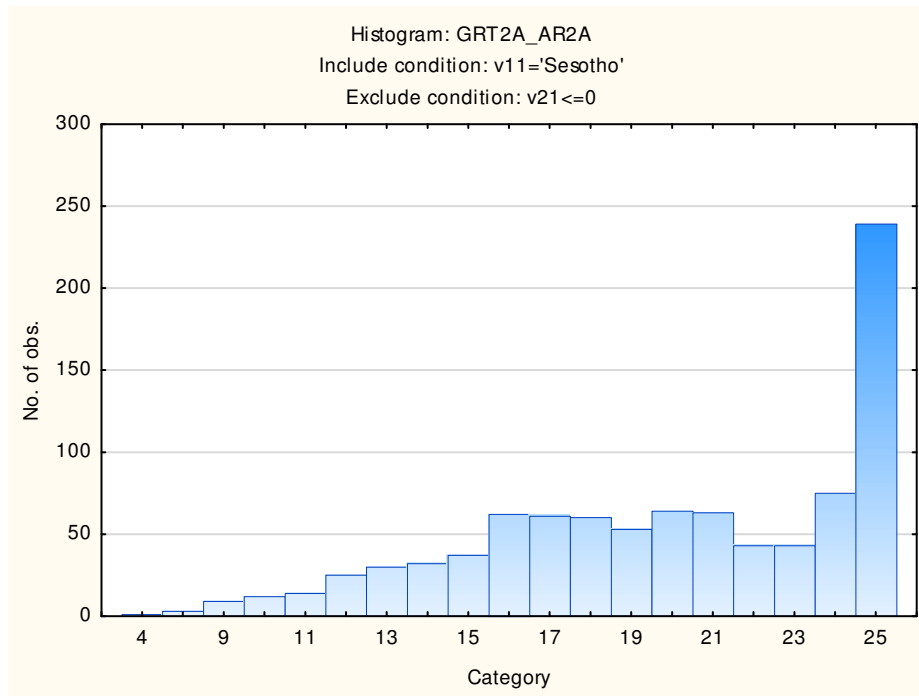


## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

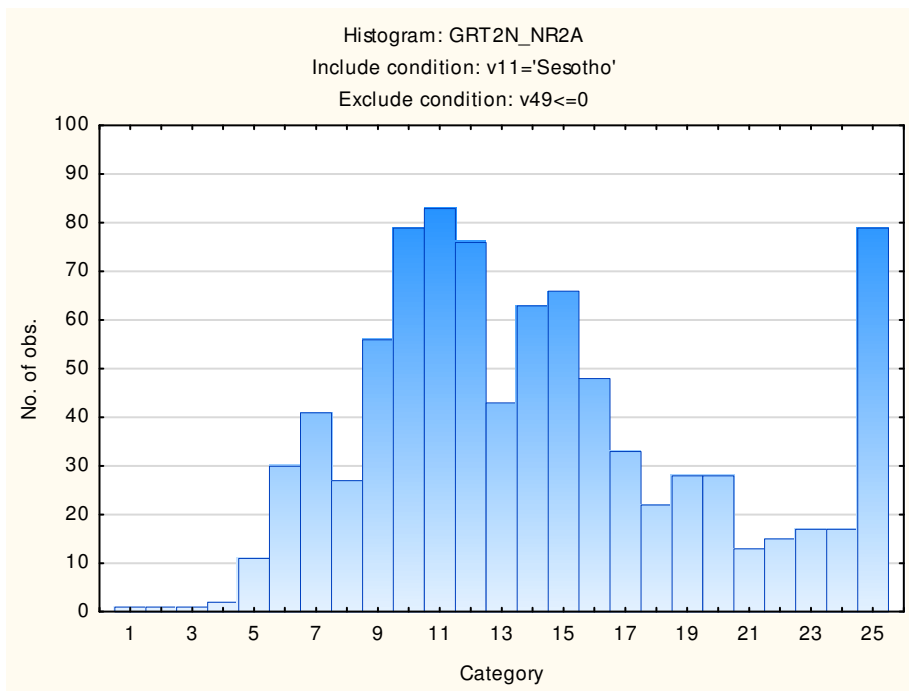
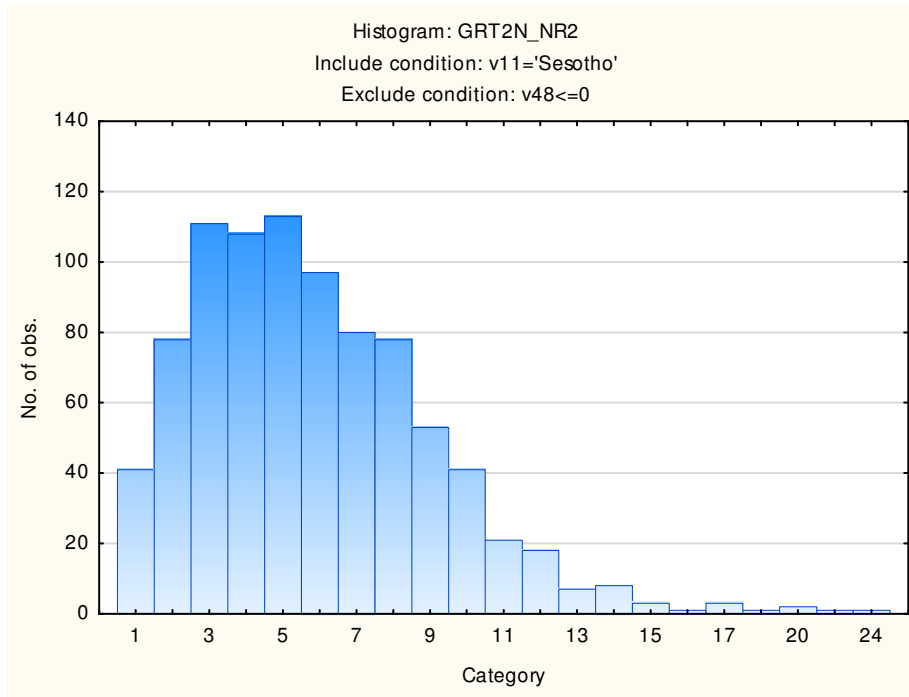
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	9,76350	4,749874	0,000000	23,00000	926	0
General Abstract Reasoning Items attempted	19,98380	4,518880	4,000000	25,00000	926	0





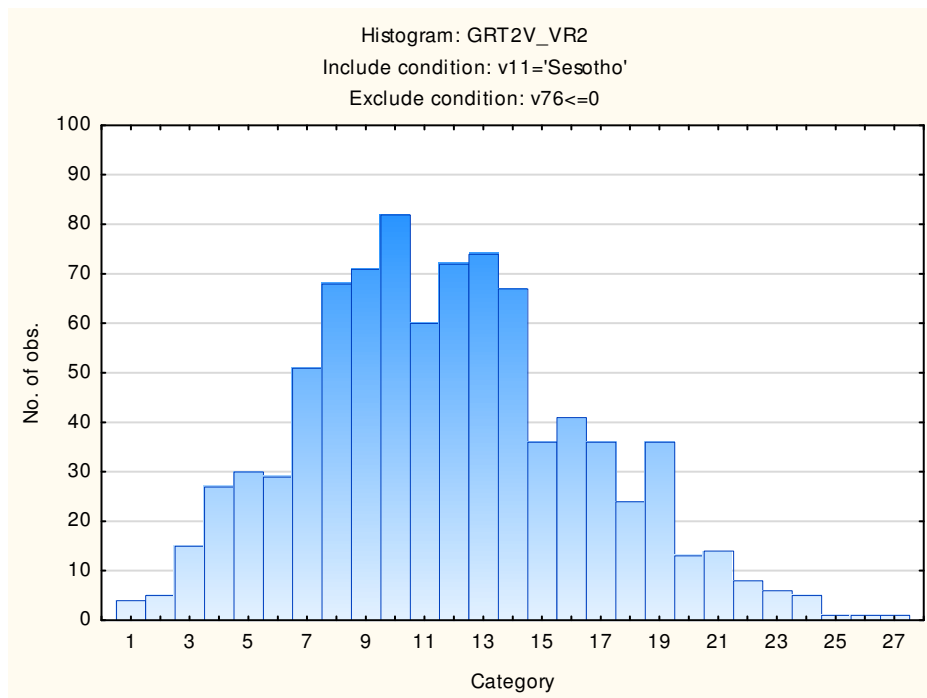
## General Numerical Reasoning Test

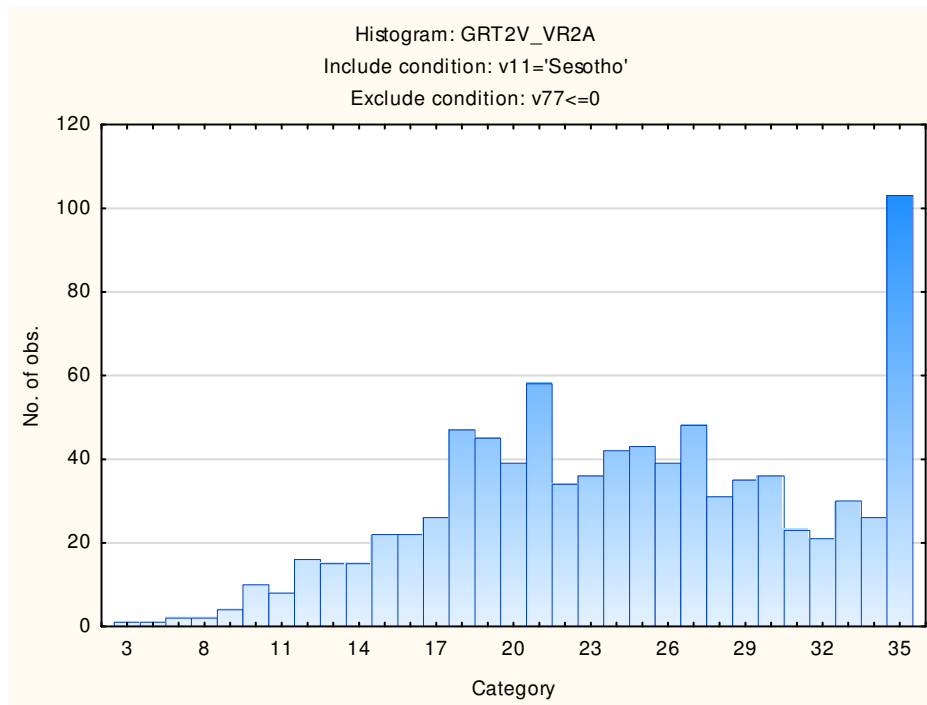
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	5,73636	3,320710	0,000000	24,00000	880	0
General Numerical Reasoning Items Attempted	14,20000	5,541939	1,000000	25,00000	880	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	11,66477	4,748044	0,000000	27,00000	880	0
General Verbal Reasoning Items Attempted	24,40795	7,026728	3,000000	35,00000	880	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-1	2-3	4-6	7-8	9-10	11-13	14-15	16-18	19-23
General Abstract Items Attempted	0-11	12-13	14-16	17-18	19-21	22-23	24-25		
General Numerical Reasoning	0-1	0-1	2-3	4-4	5-6	7-8	9-9	10-11	12-24
General Numerical Items Attempted	0-4	5-7	8-9	10-12	13-15	16-18	19-21	22-23	24-25
General Verbal Reasoning	0-3	4-5	6-7	8-10	11-12	13-15	16-17	18-20	21-27
General Verbal Items Attempted	0-11	12-15	16-18	19-22	23-26	27-29	30-33	34-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Setswana Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with Setswana as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	378	378	47,48744	47,4874
F	415	793	52,13568	99,6231
U	3	796	0,37688	100,0000
Missing	0	796	0,00000	100,0000

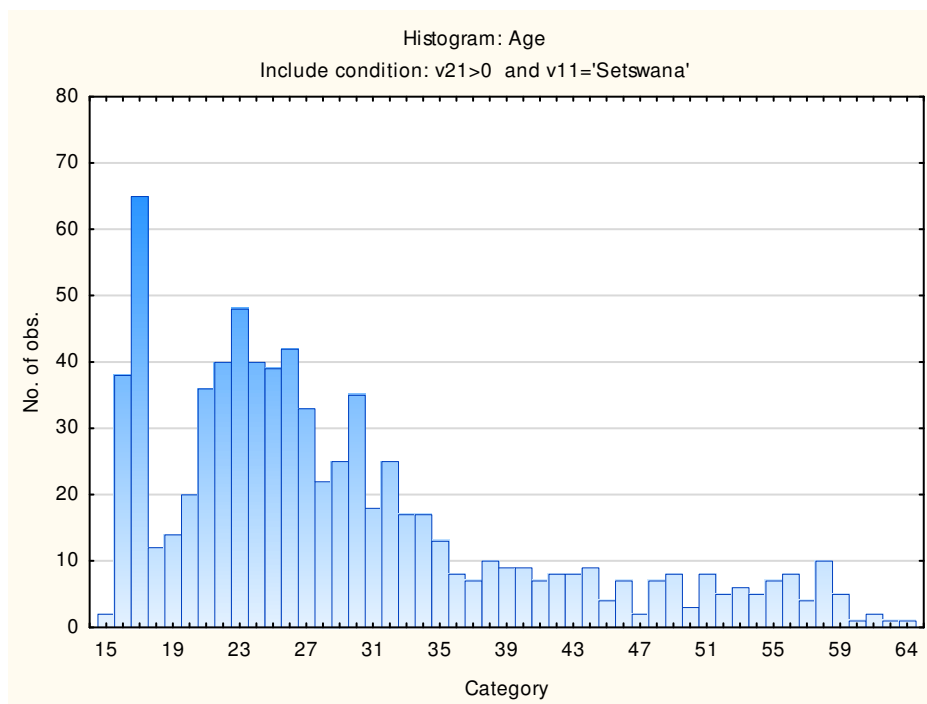
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	265	265	33,29146	33,2915
Post Graduate	50	315	6,28141	39,5729
Unknown	3	318	0,37688	39,9497
Tertiary	275	593	34,54774	74,4975
< Matric	115	708	14,44724	88,9447
Missing	88	796	11,05528	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Setswana	796	796	100,0000	100,0000
Missing	0	796	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	796	796	100,0000	100,0000
Missing	0	796	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	786	786	98,74372	98,7437
Asian	3	789	0,37688	99,1206
Coloured	2	791	0,25126	99,3719
European	2	793	0,25126	99,6231
Missing	3	796	0,37688	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,35195	11,14765	15,00000	64,00000	770	26



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	357	357	46,66667	46,66667
F	406	763	53,07190	99,7386
U	2	765	0,26144	100,0000
Missing	0	765	0,00000	100,0000

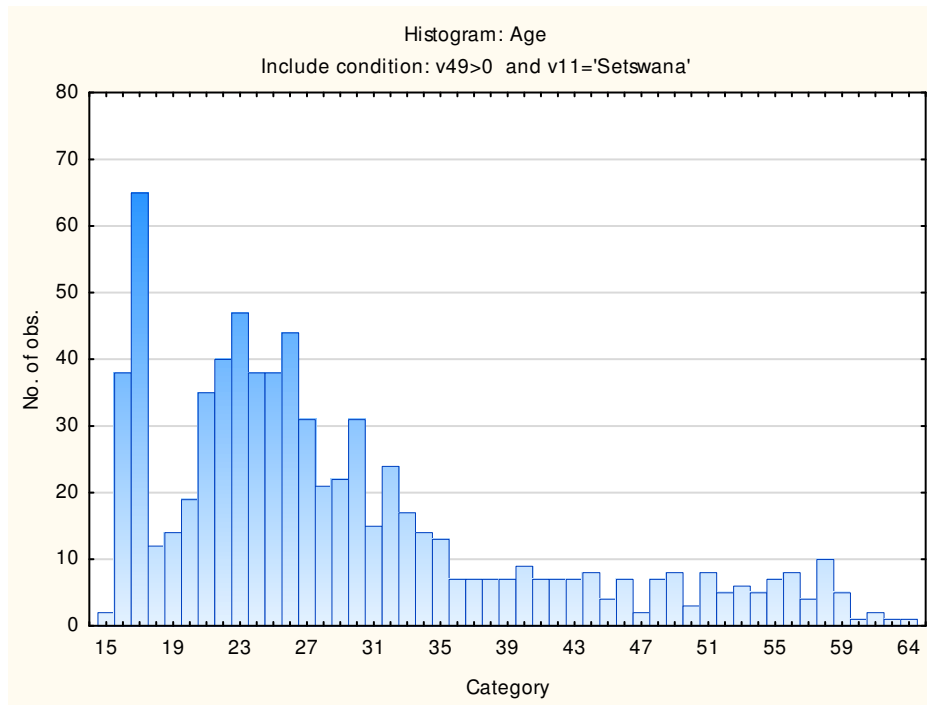
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	254	254	33,20261	33,2026
Post Graduate	48	302	6,27451	39,4771
Unknown	3	305	0,39216	39,8693
Tertiary	255	560	33,33333	73,2026
< Matric	115	675	15,03268	88,2353
Missing	90	765	11,76471	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Setswana	765	765	100,0000	100,0000
Missing	0	765	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	765	765	100,0000	100,0000
Missing	0	765	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	755	755	98,69281	98,6928
Asian	3	758	0,39216	99,0850
Coloured	2	760	0,26144	99,3464
European	2	762	0,26144	99,6078
Missing	3	765	0,39216	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,24730	11,28987	15,00000	64,00000	740	25



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	351	351	46,18421	46,1842
F	406	757	53,42105	99,6053
U	3	760	0,39474	100,0000
Missing	0	760	0,00000	100,0000

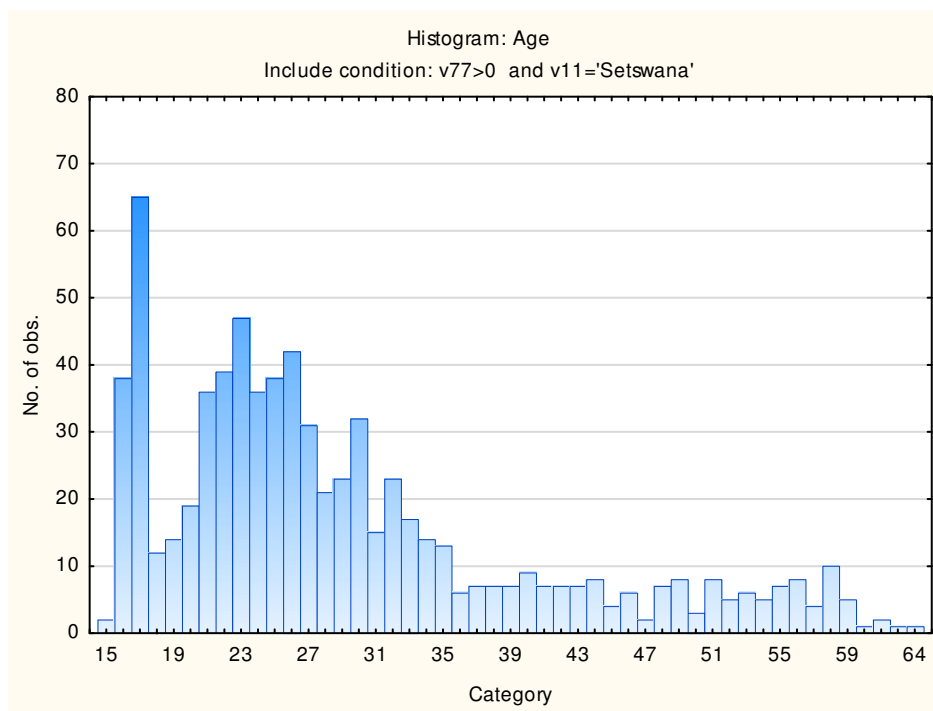
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	251	251	33,02632	33,0263
Post Graduate	48	299	6,31579	39,3421
Unknown	3	302	0,39474	39,7368
Tertiary	253	555	33,28947	73,0263
< Matric	115	670	15,13158	88,1579
Missing	90	760	11,84211	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Setswana	760	760	100,0000	100,0000
Missing	0	760	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	760	760	100,0000	100,0000
Missing	0	760	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	750	750	98,68421	98,6842
Asian	3	753	0,39474	99,0789
Coloured	2	755	0,26316	99,3421
European	2	757	0,26316	99,6053
Missing	3	760	0,39474	100,0000

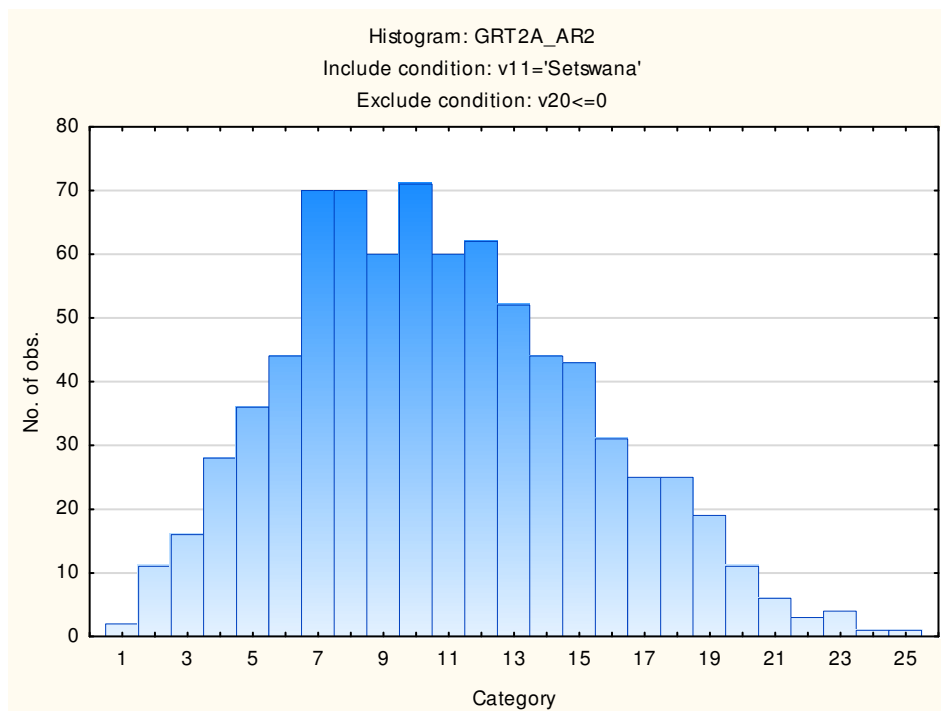
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,23401	11,30454	15,00000	64,00000	735	25

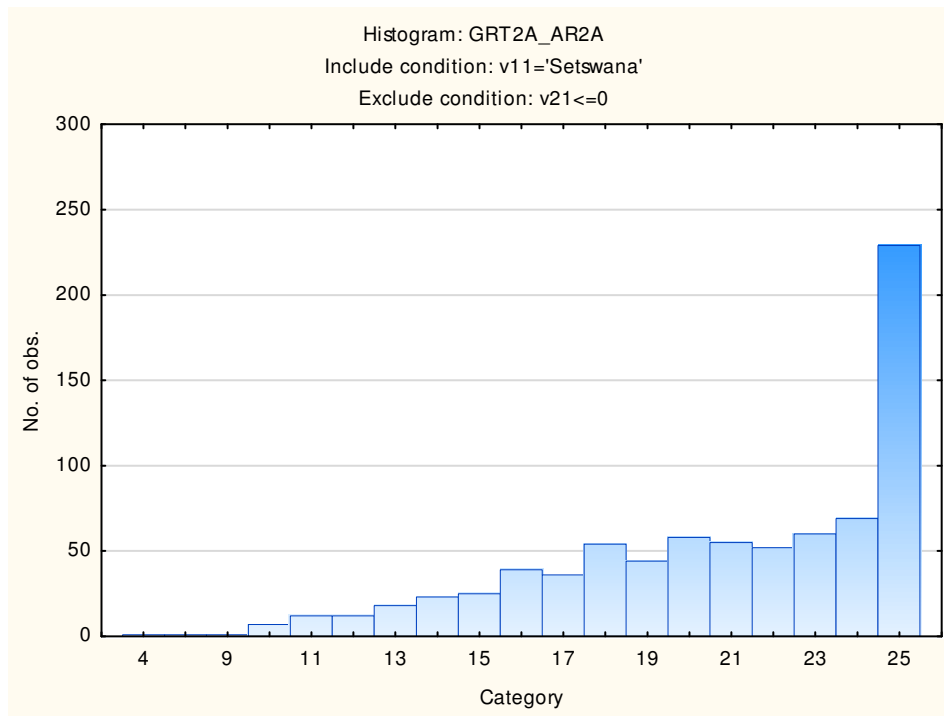


## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

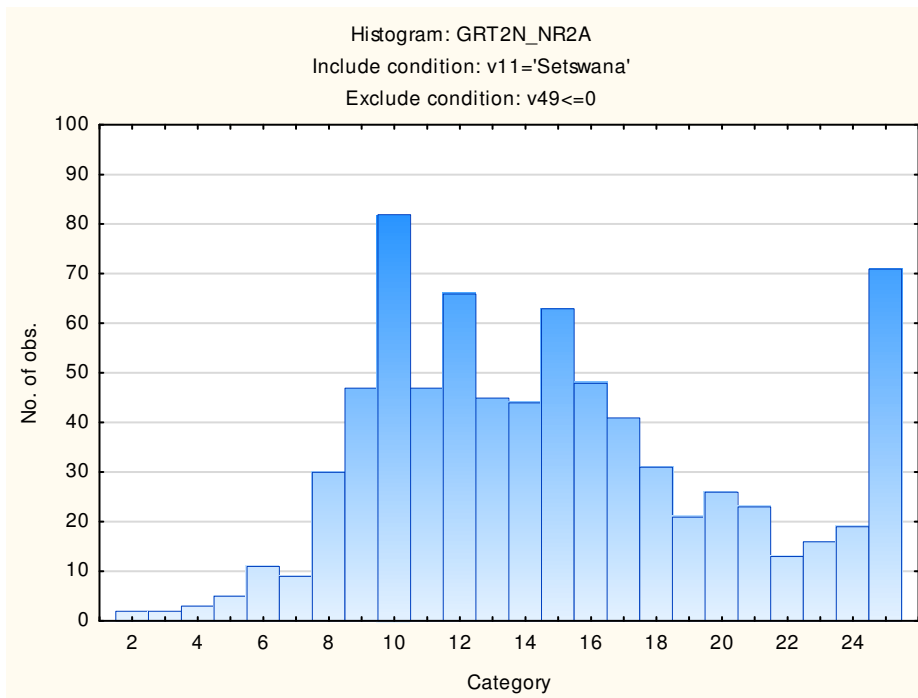
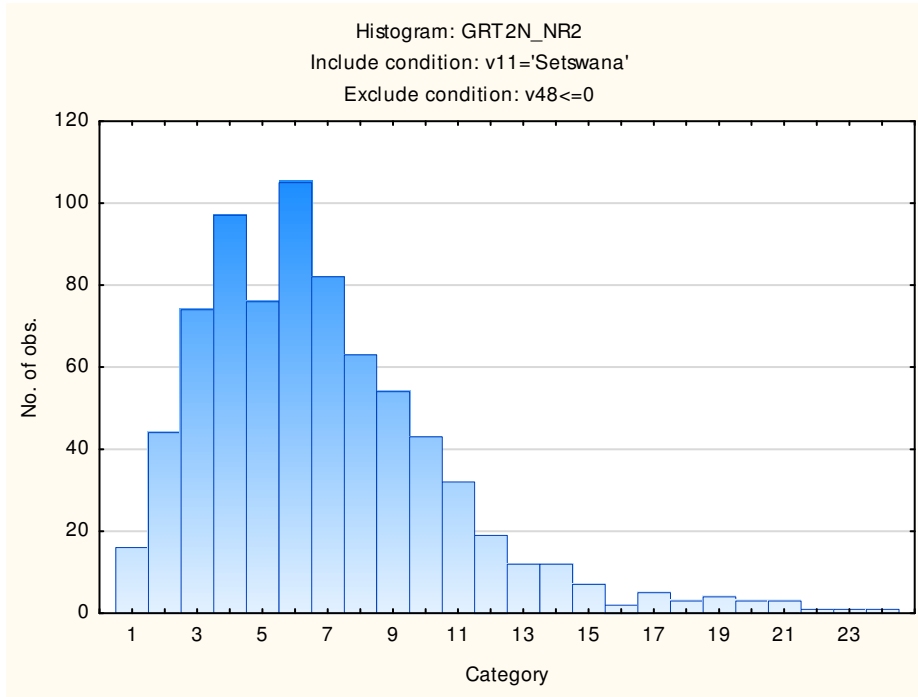
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	10,74623	4,525086	0,000000	25,00000	796	0
General Abstract Reasoning Items attempted	20,80653	4,138819	4,000000	25,00000	796	0





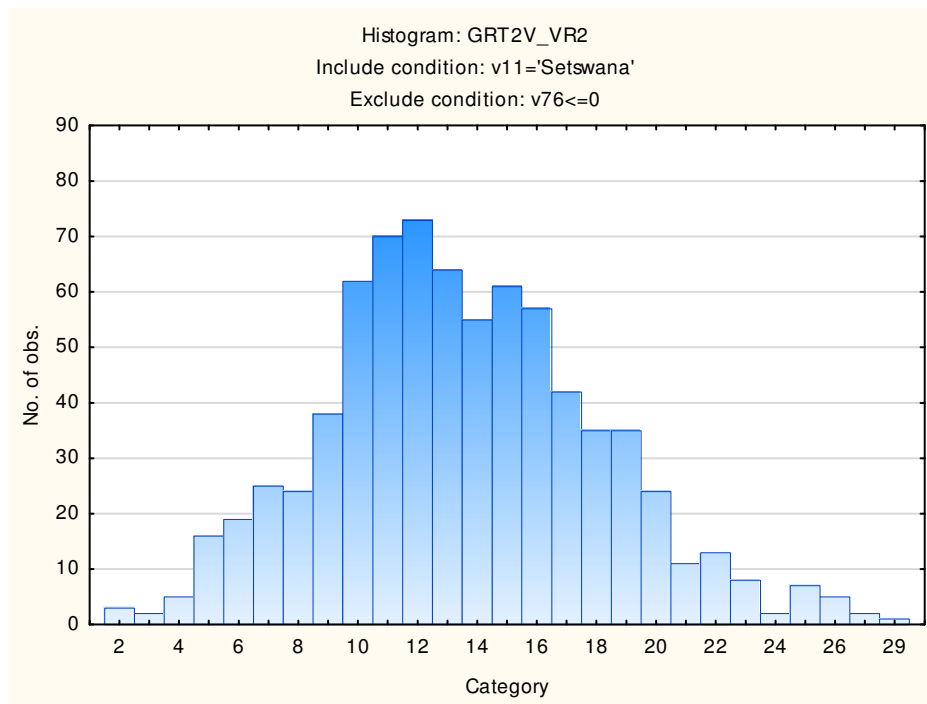
## General Numerical Reasoning Test

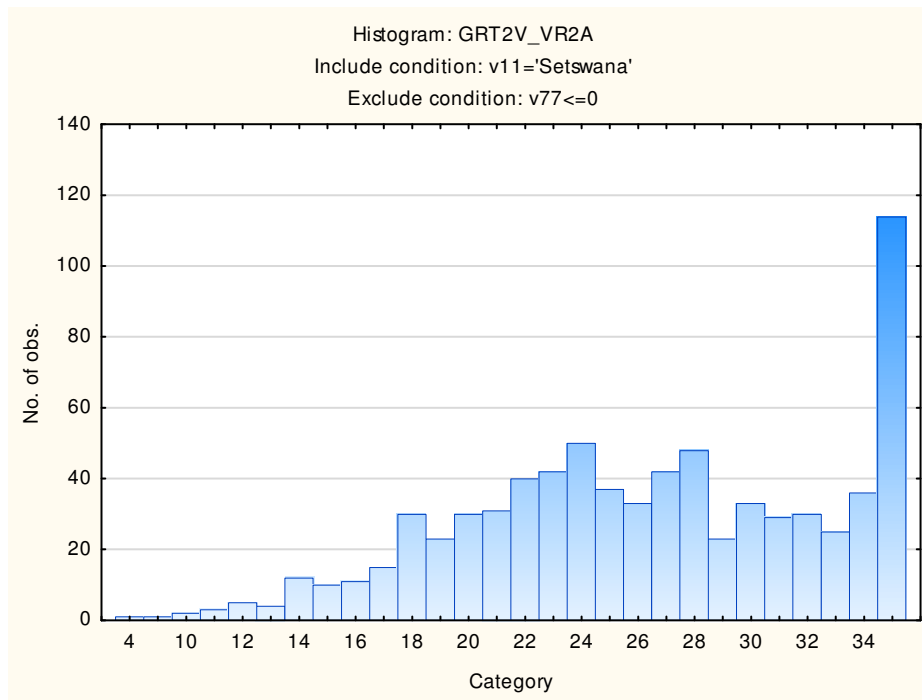
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	6,75294	3,790368	0,000000	24,00000	765	0
General Numerical Reasoning Items Attempted	14,93333	5,407431	2,000000	25,00000	765	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	13,49474	4,594202	0,000000	29,00000	760	0
General Verbal Reasoning Items Attempted	26,33421	6,348374	4,000000	35,00000	760	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-2	3-4	5-7	8-9	10-11	12-14	15-16	17-18	19-25
General Abstract Items Attempted	0-12	13-14	15-17	18-19	20-21	22-24	25-25		
General Numerical Reasoning	0-0	1-2	3-3	4-5	6-7	8-9	10-11	12-13	14-24
General Numerical Items Attempted	2-5	6-8	9-10	11-13	14-16	17-18	19-21	22-24	25-25
General Verbal Reasoning	0-5	6-7	8-9	10-12	13-14	15-16	17-19	20-21	22-29
General Verbal Items Attempted	0-14	15-18	19-21	22-24	25-27	28-31	32-34	35-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, siSwati Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with siSwati as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	92	92	41,81818	41,8182
F	128	220	58,18182	100,0000
Missing	0	220	0,00000	100,0000

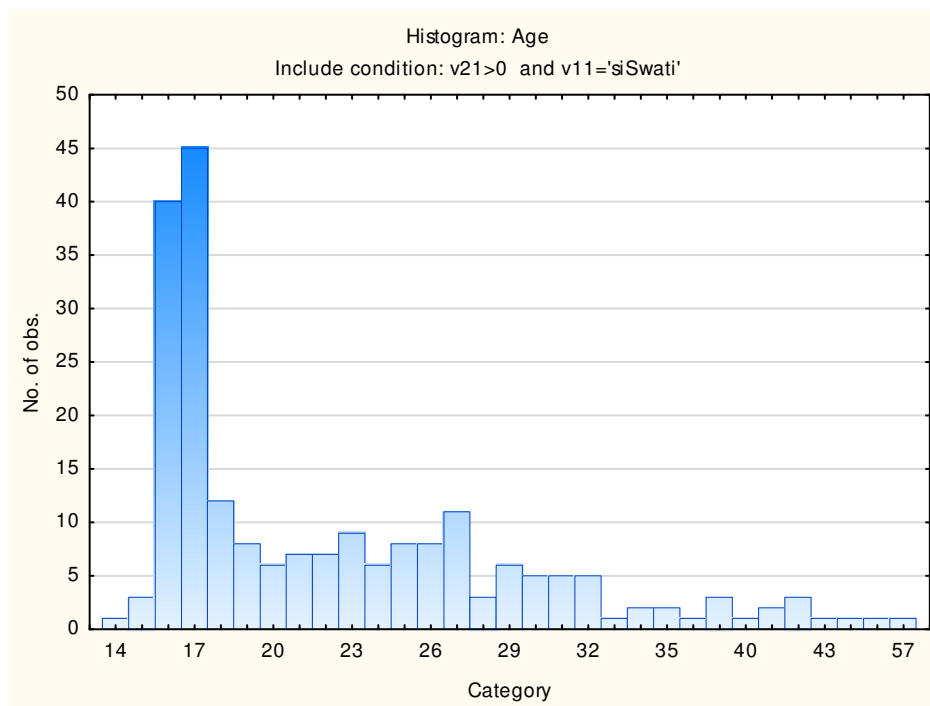
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	58	58	26,36364	26,3636
Post Graduate	5	63	2,27273	28,6364
Unknown	3	66	1,36364	30,0000
Tertiary	37	103	16,81818	46,8182
< Matric	109	212	49,54545	96,3636
Missing	8	220	3,63636	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
siSwati	220	220	100,0000	100,0000
Missing	0	220	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	220	220	100,0000	100,0000
Missing	0	220	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	218	218	99,09091	99,0909
Asian	1	219	0,45455	99,5455
European	1	220	0,45455	100,0000
Missing	0	220	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	22,44860	7,676234	14,00000	57,00000	214	6



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	86	86	40,56604	40,5660
F	126	212	59,43396	100,0000
Missing	0	212	0,00000	100,0000

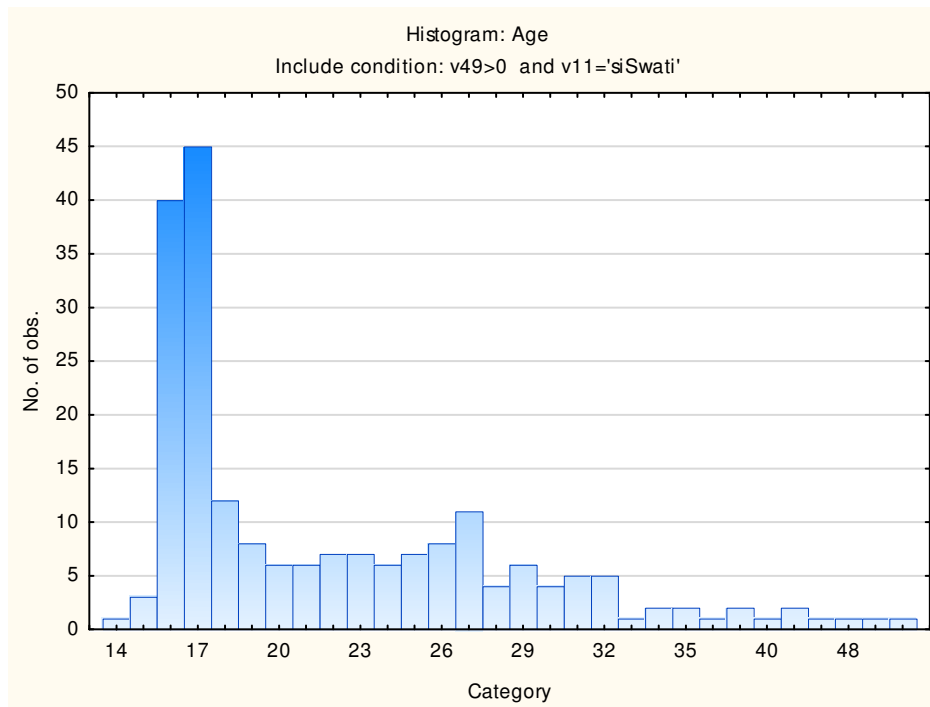
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	57	57	26,88679	26,8868
Post Graduate	3	60	1,41509	28,3019
Unknown	3	63	1,41509	29,7170
Tertiary	32	95	15,09434	44,8113
< Matric	109	204	51,41509	96,2264
Missin	8	212	3,77358	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
siSwati	212	212	100,0000	100,0000
Missing	0	212	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	212	212	100,0000	100,0000
Missing	0	212	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	212	212	100,0000	100,0000
Missing	0	212	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	22,07767	7,383157	14,00000	57,00000	206	6



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	86	86	40,18692	40,1869
F	128	214	59,81308	100,0000
Missing	0	214	0,00000	100,0000

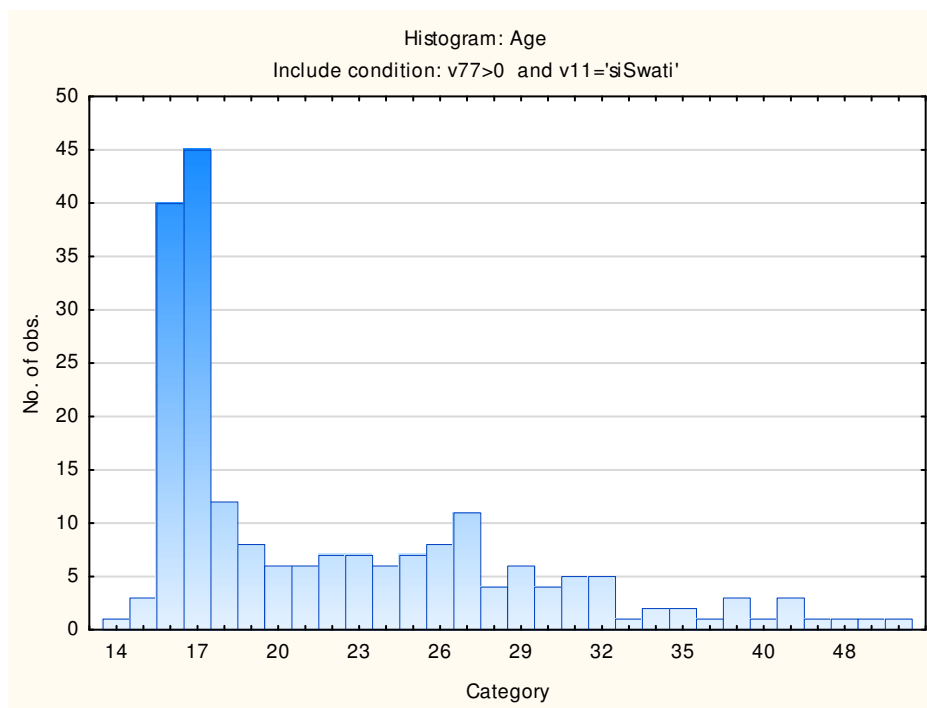
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	57	57	26,63551	26,6355
Post Graduate	3	60	1,40187	28,0374
Unknown	3	63	1,40187	29,4393
Tertiary	34	97	15,88785	45,3271
< Matric	109	206	50,93458	96,2617
Missing	8	214	3,73832	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
siSwati	214	214	100,0000	100,0000
Missing	0	214	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	214	214	100,0000	100,0000
Missing	0	214	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	214	214	100,0000	100,0000
Missing	0	214	0,0000	100,0000

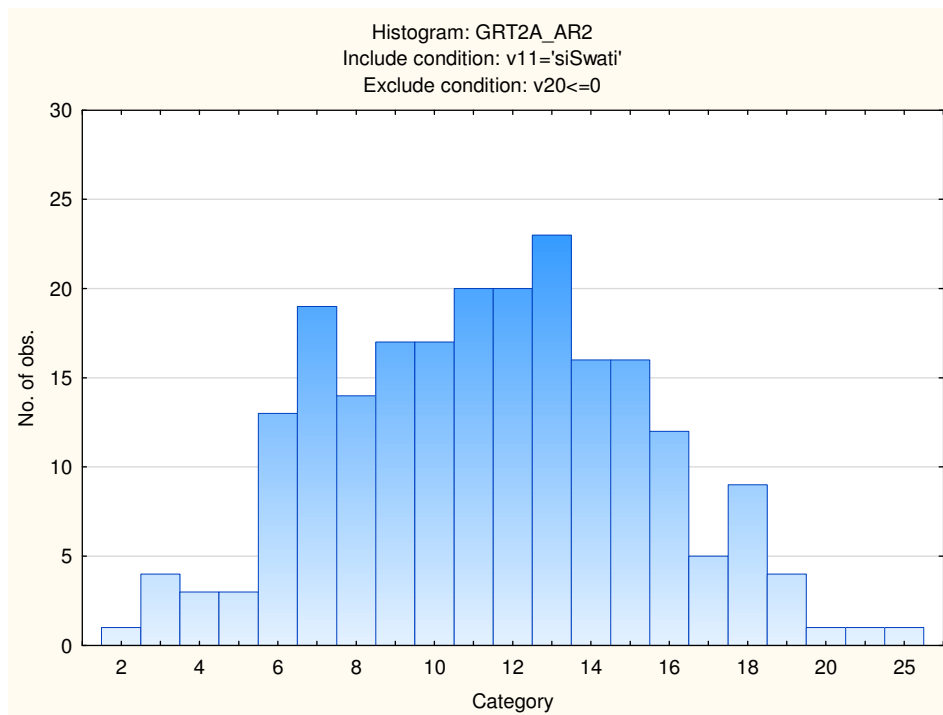
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	22,25000	7,556230	14,00000	57,00000	208	6

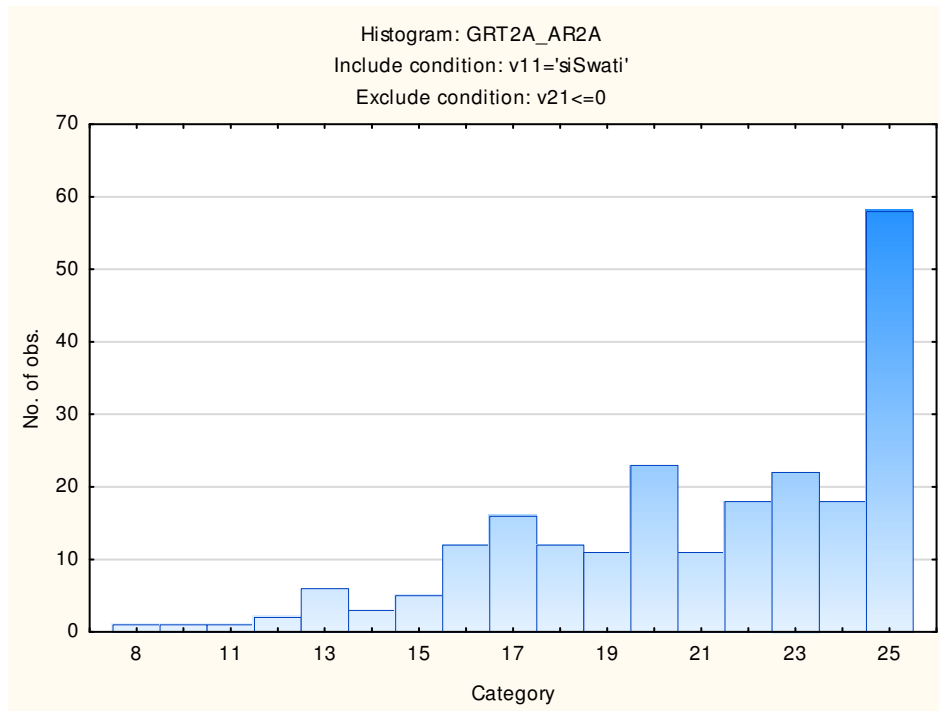


## Descriptive Statistics and Frequency Distributions On General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

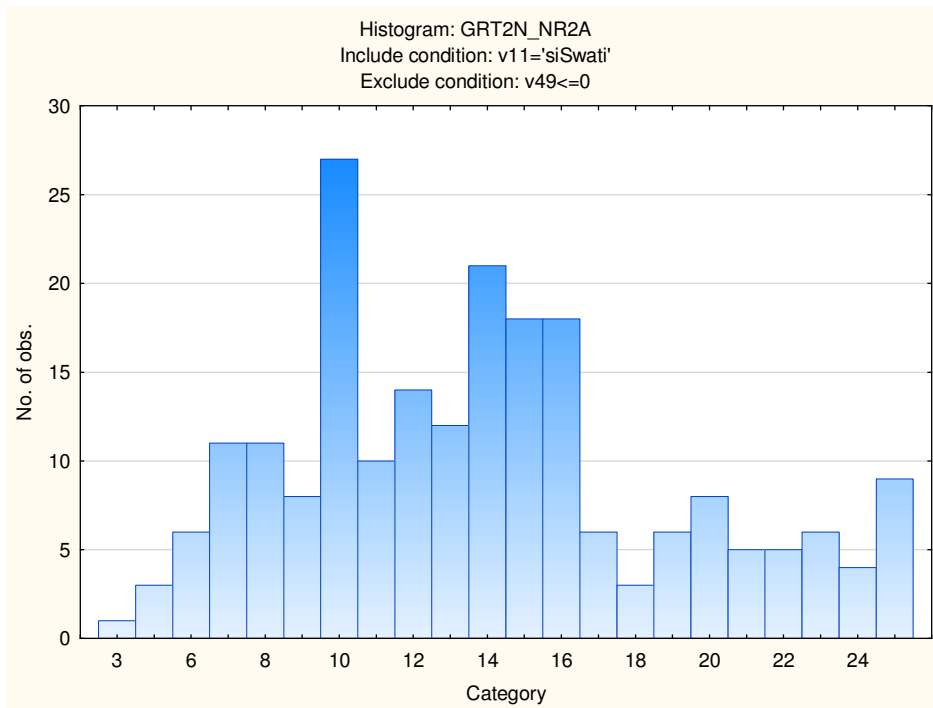
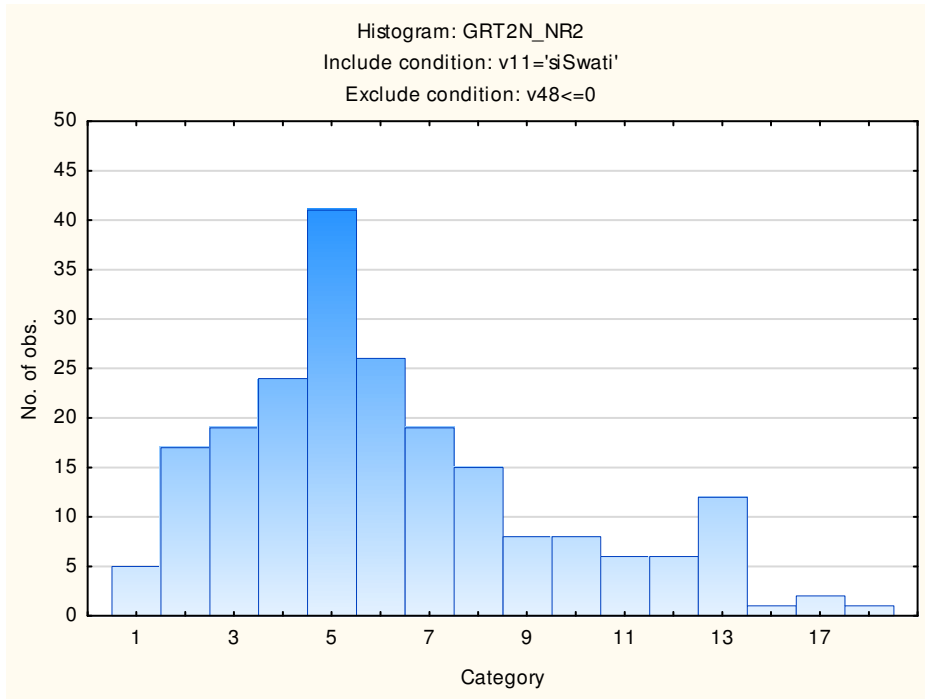
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	11,33636	4,089808	0,000000	25,00000	220	0
General Abstract Reasoning Items attempted	20,96364	3,816396	8,000000	25,00000	220	0





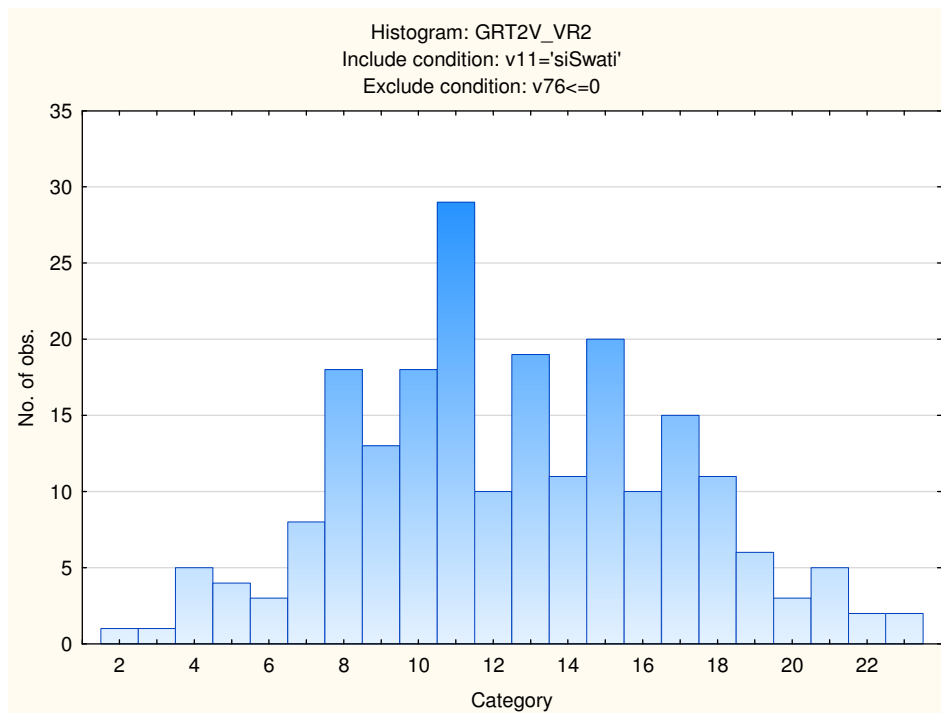
## General Numerical Reasoning Test

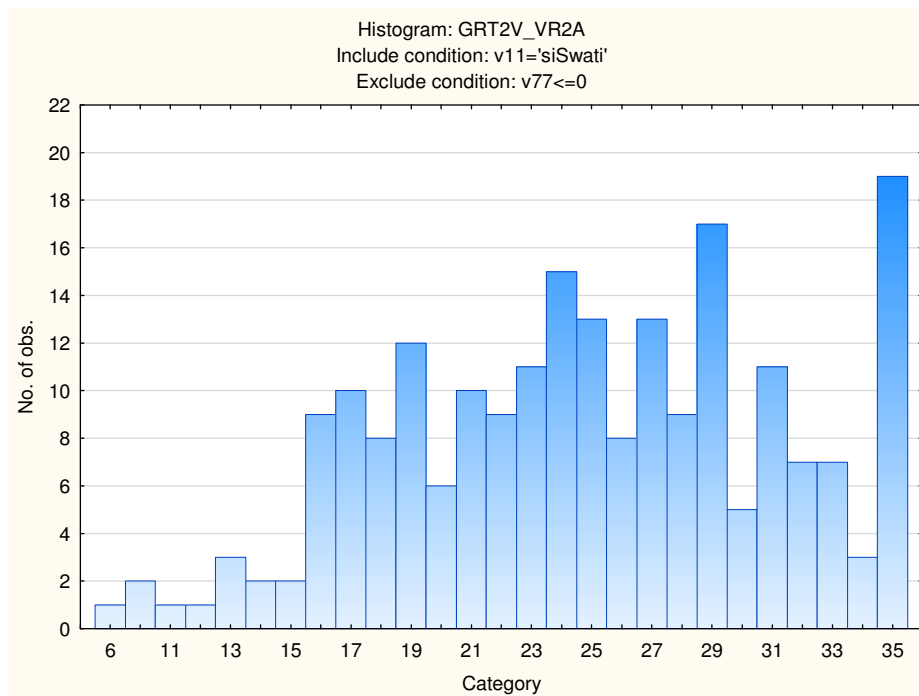
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	6,22170	3,419057	0,000000	18,00000	212	0
General Numerical Reasoning Items Attempted	13,91981	5,170843	3,000000	25,00000	212	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	12,55140	4,359941	2,000000	25,00000	214	0
General Verbal Reasoning Items Attempted	24,83645	6,337635	6,000000	35,00000	214	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-25
General Abstract Items Attempted	8-14	15-16	17-18	19-20	21-21	22-23	24-25		
General Numerical Reasoning	0-0	1-1	2-3	4-5	6-7	8-8	9-10	11-12	13-18
General Numerical Items Attempted	3-4	5-7	8-10	11-12	13-15	16-17	18-20	21-22	23-25
General Verbal Reasoning	2-4	5-7	8-9	10-11	12-13	14-15	16-18	19-20	21-25
General Verbal Items Attempted	6-13	14-16	17-20	21-23	24-26	27-29	30-32	33-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Tshivenda Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with Tshivenda as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	94	94	58,02469	58,0247
F	66	160	40,74074	98,7654
U	2	162	1,23457	100,0000
Missing	0	162	0,00000	100,0000

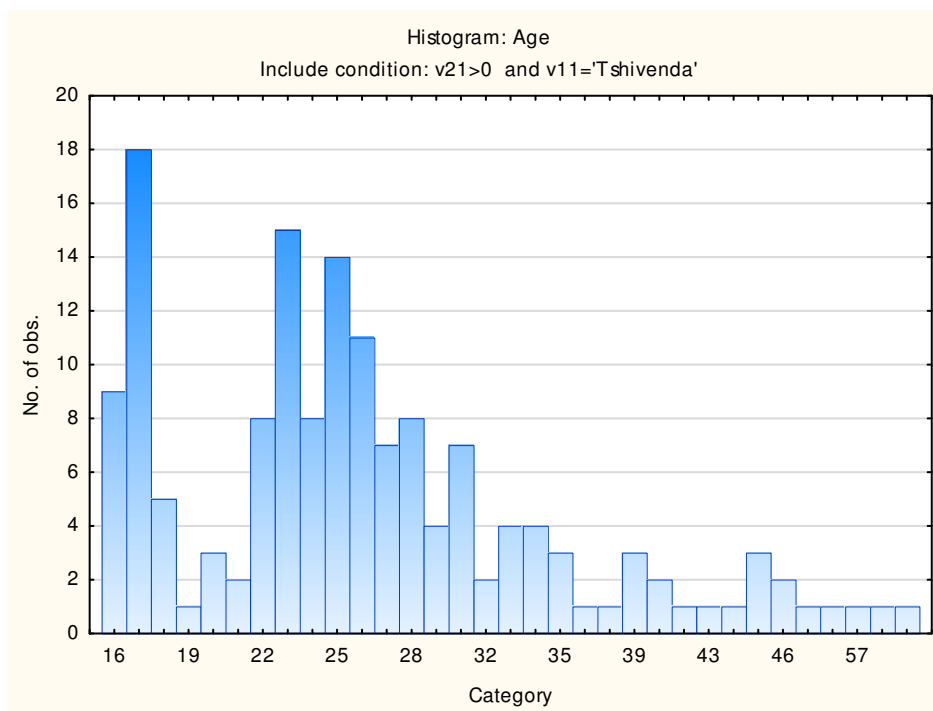
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	48	48	29,62963	29,6296
Post Graduate	6	54	3,70370	33,3333
Unknown	1	55	0,61728	33,9506
Tertiary	46	101	28,39506	62,3457
< Matric	30	131	18,51852	80,8642
Missing	31	162	19,13580	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Tshivenda	162	162	100,0000	100,0000
Missing	0	162	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	162	162	100,0000	100,0000
Missing	0	162	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	160	160	98,76543	98,7654
Asian	2	162	1,23457	100,0000
Missing	0	162	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,75163	9,106303	16,00000	62,00000	153	9



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	86	86	55,84416	55,8442
F	66	152	42,85714	98,7013
U	2	154	1,29870	100,0000
Missing	0	154	0,00000	100,0000

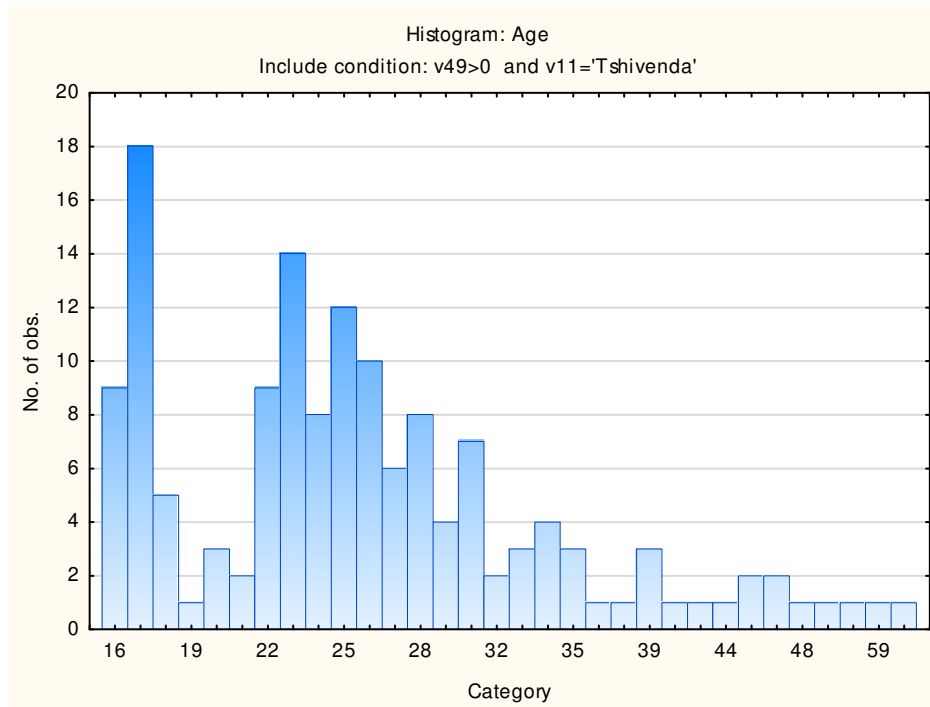
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	47	47	30,51948	30,5195
Post Graduate	5	52	3,24675	33,7662
Unknown	1	53	0,64935	34,4156
Tertiary	41	94	26,62338	61,0390
< Matric	30	124	19,48052	80,5195
Missing	30	154	19,48052	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Tshivenda	154	154	100,0000	100,0000
Missing	0	154	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	154	154	100,0000	100,0000
Missing	0	154	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	152	152	98,70130	98,7013
Asian	2	154	1,29870	100,0000
Missing	0	154	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,40000	9,043414	16,00000	62,00000	145	9



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	88	88	55,69620	55,6962
F	68	156	43,03797	98,7342
U	2	158	1,26582	100,0000
Missing	0	158	0,00000	100,0000

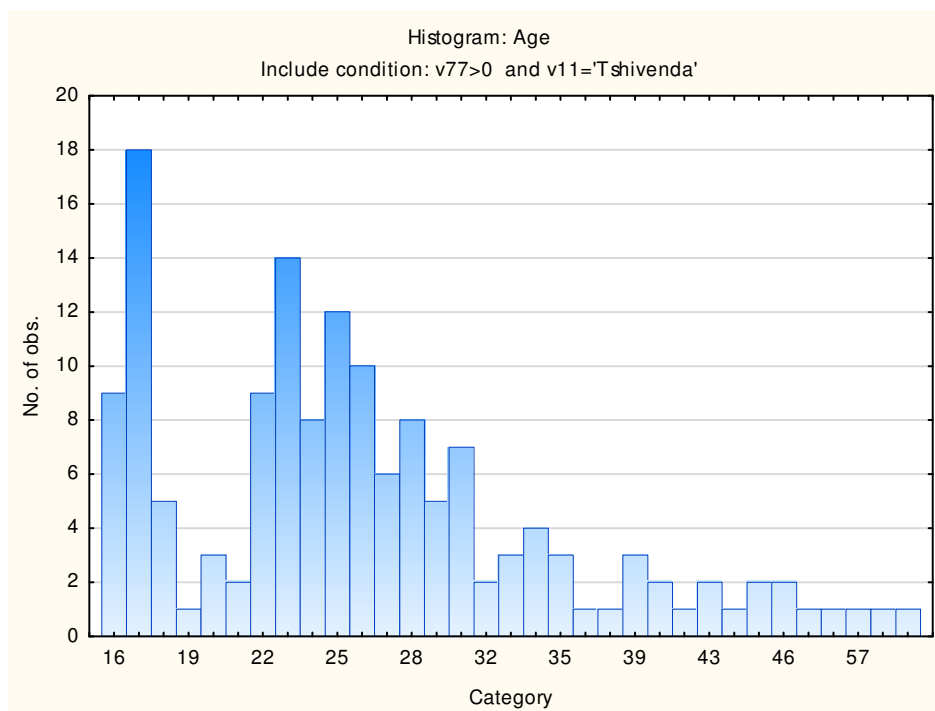
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	47	47	29,74684	29,7468
Post Graduate	5	52	3,16456	32,9114
Unknown	1	53	0,63291	33,5443
Tertiary	45	98	28,48101	62,0253
< Matric	30	128	18,98734	81,0127
Missing	30	158	18,98734	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Tshivenda	158	158	100,0000	100,0000
Missing	0	158	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	158	158	100,0000	100,0000
Missing	0	158	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	156	156	98,73418	98,7342
Asian	2	158	1,26582	100,0000
Missing	0	158	0,00000	100,0000

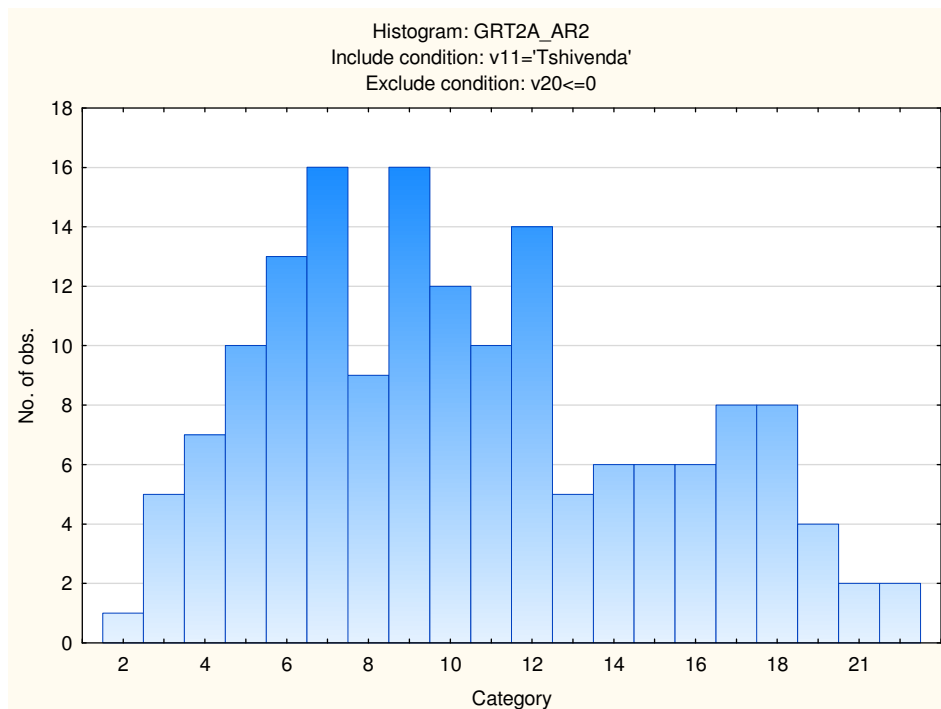
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,73154	9,191382	16,00000	62,00000	149	9

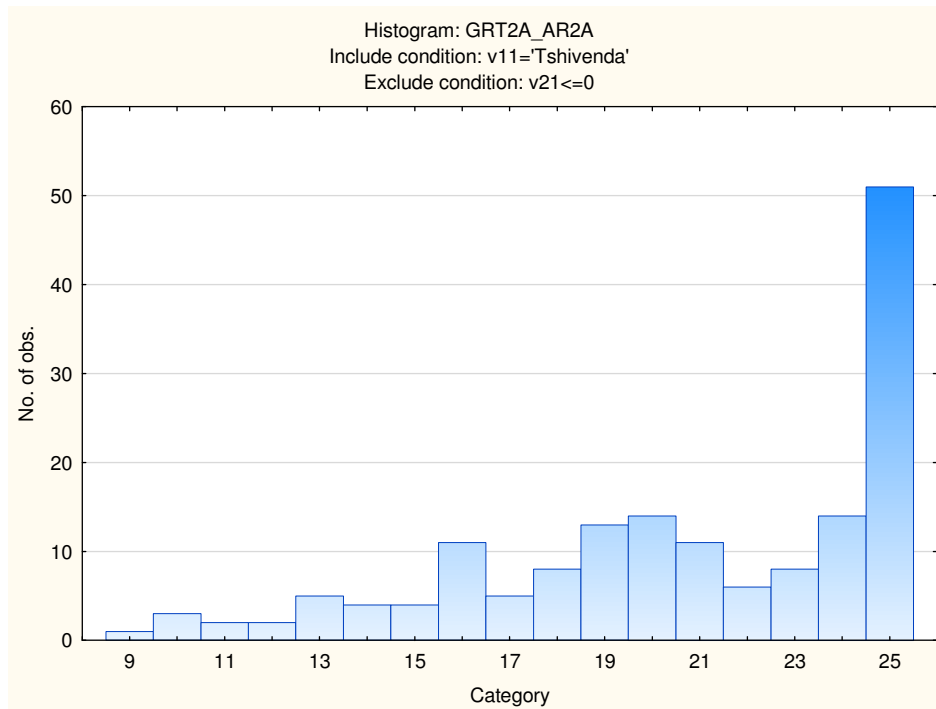


## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

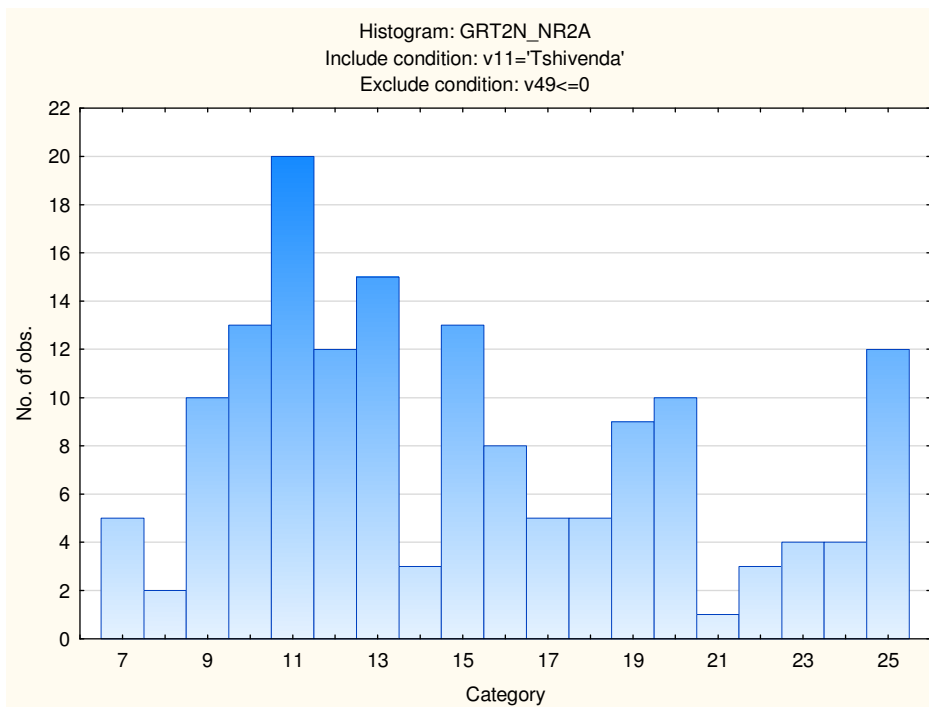
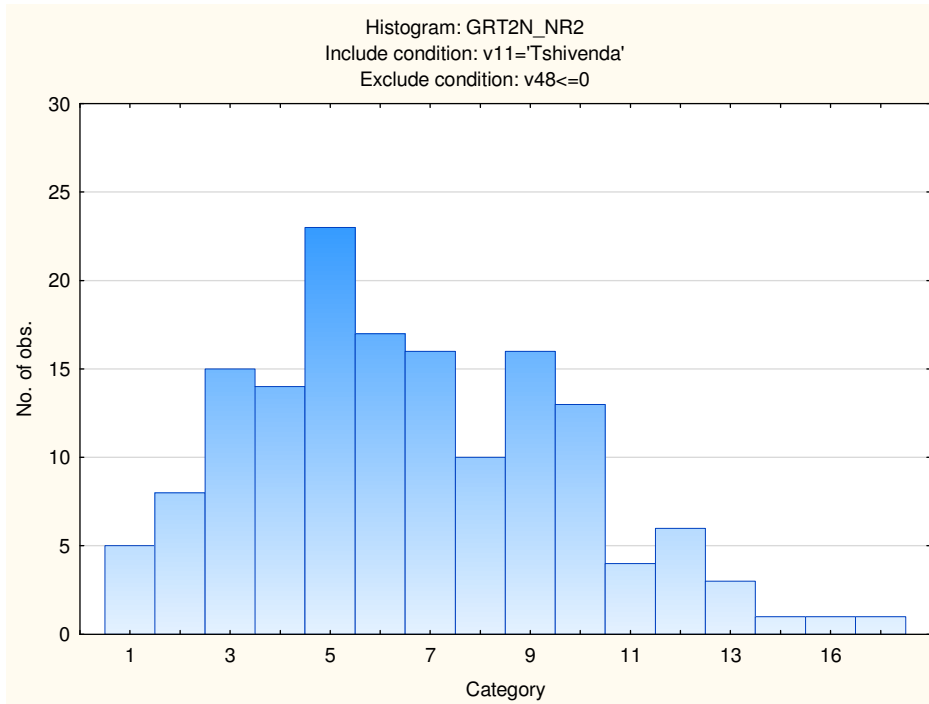
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	10,34568	4,811117	0,000000	22,00000	162	0
General Abstract Reasoning Items attempted	20,71605	4,308693	9,000000	25,00000	162	0





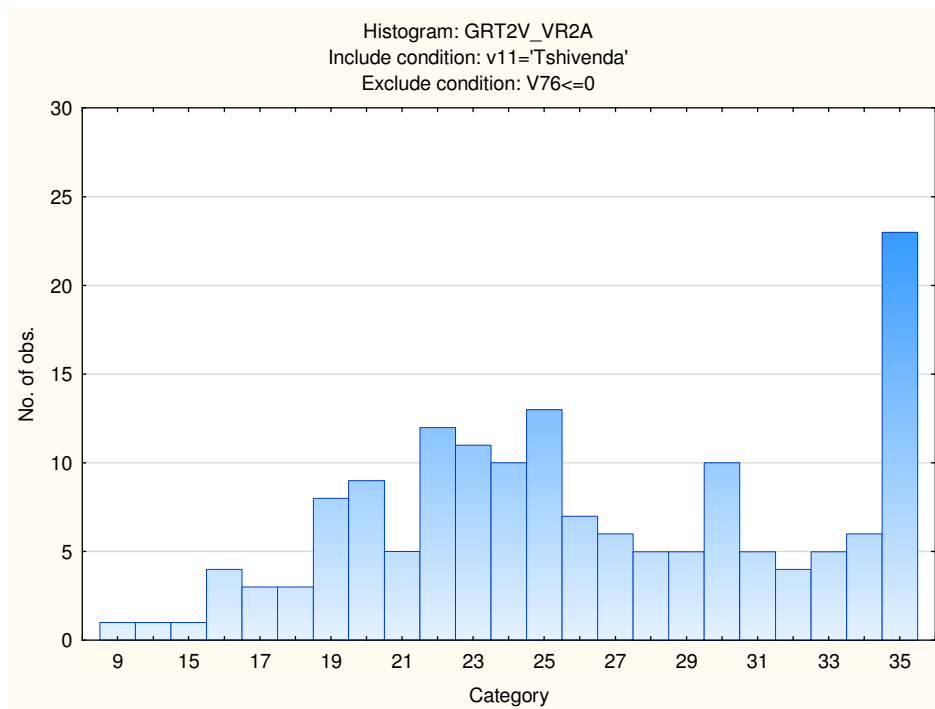
## General Numerical Reasoning Test

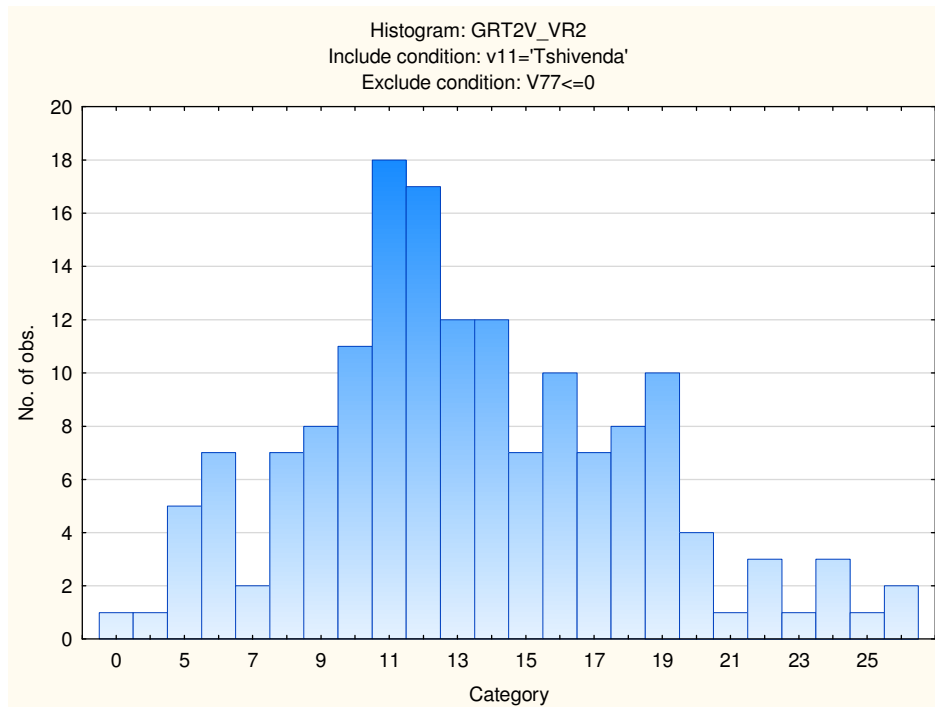
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	6,56494	3,335147	0,000000	20,00000	154	0
General Numerical Reasoning Items Attempted	15,03896	5,128267	7,000000	25,00000	154	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	13,32911	4,860399	0,000000	26,00000	158	0
General Verbal Reasoning Items Attempted	26,09494	6,070486	9,000000	35,00000	158	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-1	2-4	5-6	7-8	9-11	12-13	14-16	17-18	19-22
General Abstract Items Attempted	0-11	12-14	15-16	17-19	20-21	22-24	25-25		
General Numerical Reasoning	0-0	1-2	3-4	5-5	6-7	8-9	10-10	11-12	13-20
General Numerical Items Attempted	7-6	7-8	9-11	12-13	14-16	17-18	19-21	22-24	25-25
General Verbal Reasoning	0-4	5-7	8-9	10-12	13-14	15-16	17-19	20-21	22-26
General Verbal Items Attempted	9-15	16-18	19-21	22-24	25-27	28-30	31-33	34-35	

# General Reasoning Test (GRT2)

## Norm Group: South Africans, Xitsonga Speaking, Updated 2016

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### Sample Composition

The sample consisted of South Africans with Xitsonga as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	141	141	51,83824	51,8382
F	131	272	48,16176	100,0000
Missing	0	272	0,00000	100,0000

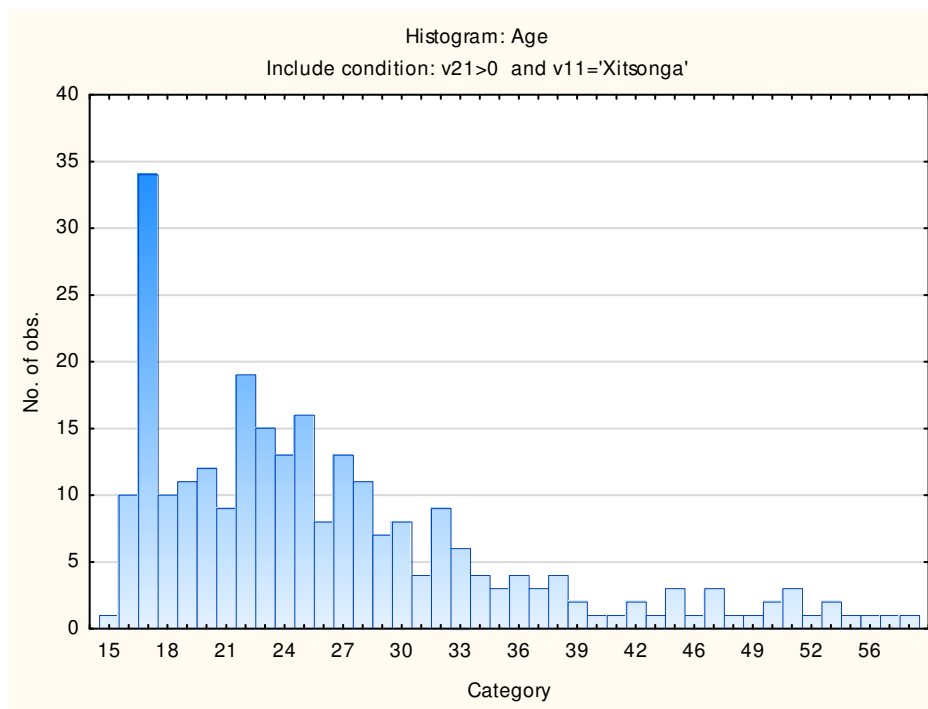
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	103	103	37,86765	37,8676
Post Graduate	19	122	6,98529	44,8529
Unknown	1	123	0,36765	45,2206
Tertiary	73	196	26,83824	72,0588
< Matric	49	245	18,01471	90,0735
Missing	27	272	9,92647	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Xitsonga	272	272	100,0000	100,0000
Missing	0	272	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	272	272	100,0000	100,0000
Missing	0	272	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	272	272	100,0000	100,0000
Missing	0	272	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,56489	9,477215	15,00000	59,00000	262	10



### Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	124	124	49,79920	49,7992
F	125	249	50,20080	100,0000
Missing	0	249	0,00000	100,0000

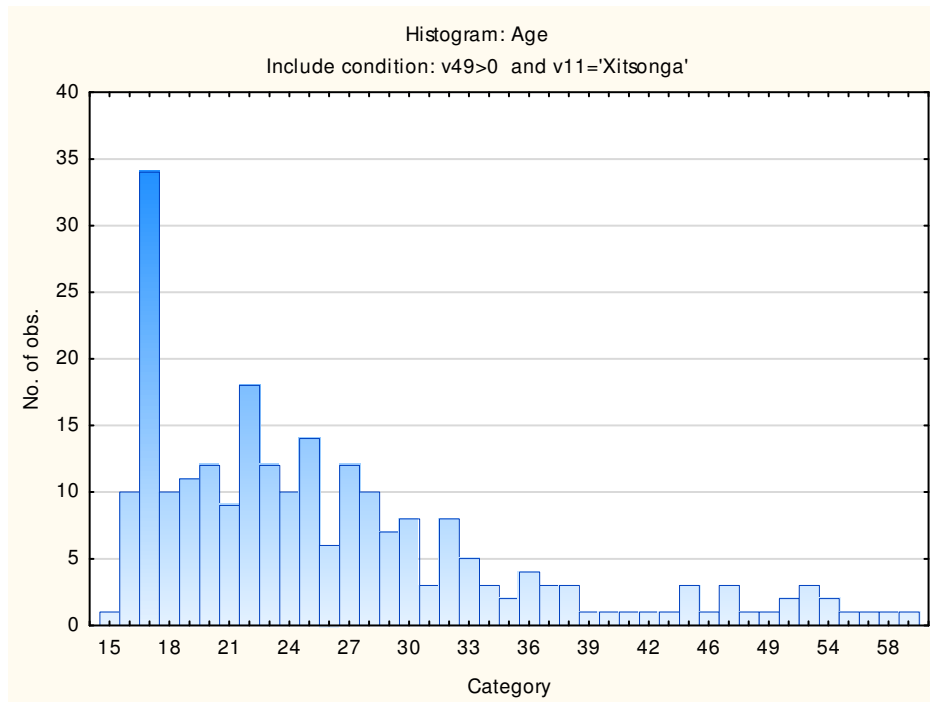
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	98	98	39,35743	39,3574
Post Graduate	12	110	4,81928	44,1767
Unknown	1	111	0,40161	44,5783
Tertiary	62	173	24,89960	69,4779
< Matric	49	222	19,67871	89,1566
Missing	27	249	10,84337	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Xitsonga	249	249	100,0000	100,0000
Missing	0	249	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	249	249	100,0000	100,0000
Missing	0	249	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	249	249	100,0000	100,0000
Missing	0	249	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,26667	9,582702	15,00000	59,00000	240	9



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	124	124	49,20635	49,2063
F	128	252	50,79365	100,0000
Missing	0	252	0,00000	100,0000

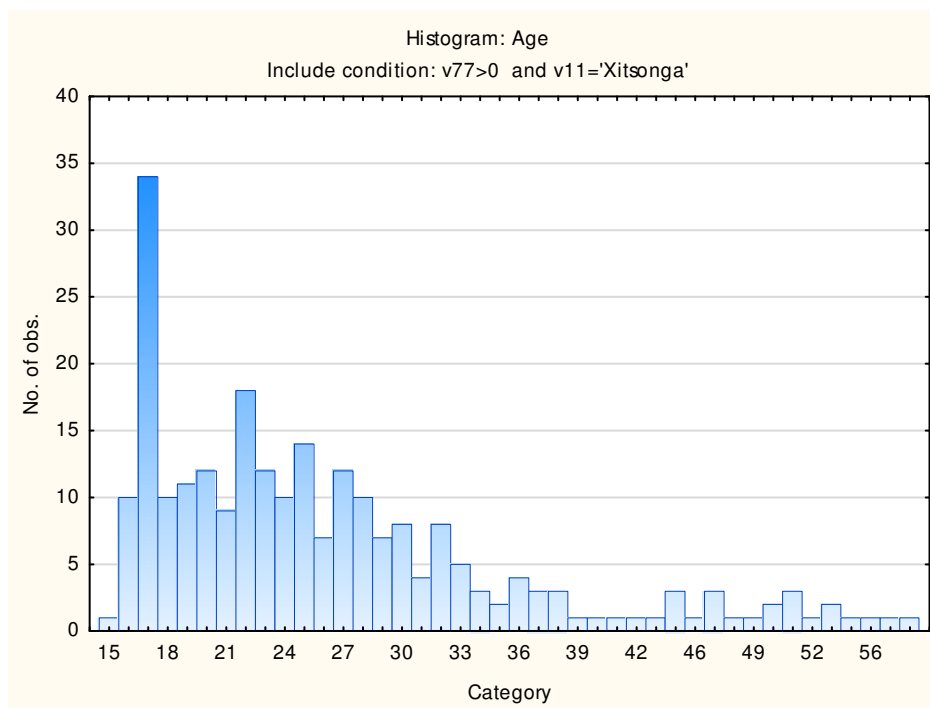
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	98	98	38,88889	38,8889
Post Graduate	12	110	4,76190	43,6508
Unknown	1	111	0,39683	44,0476
Tertiary	65	176	25,79365	69,8413
< Matric	49	225	19,44444	89,2857
Missing	27	252	10,71429	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Xitsonga	252	252	100,0000	100,0000
Missing	0	252	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	252	252	100,0000	100,0000
Missing	0	252	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	252	252	100,0000	100,0000
Missing	0	252	0,0000	100,0000

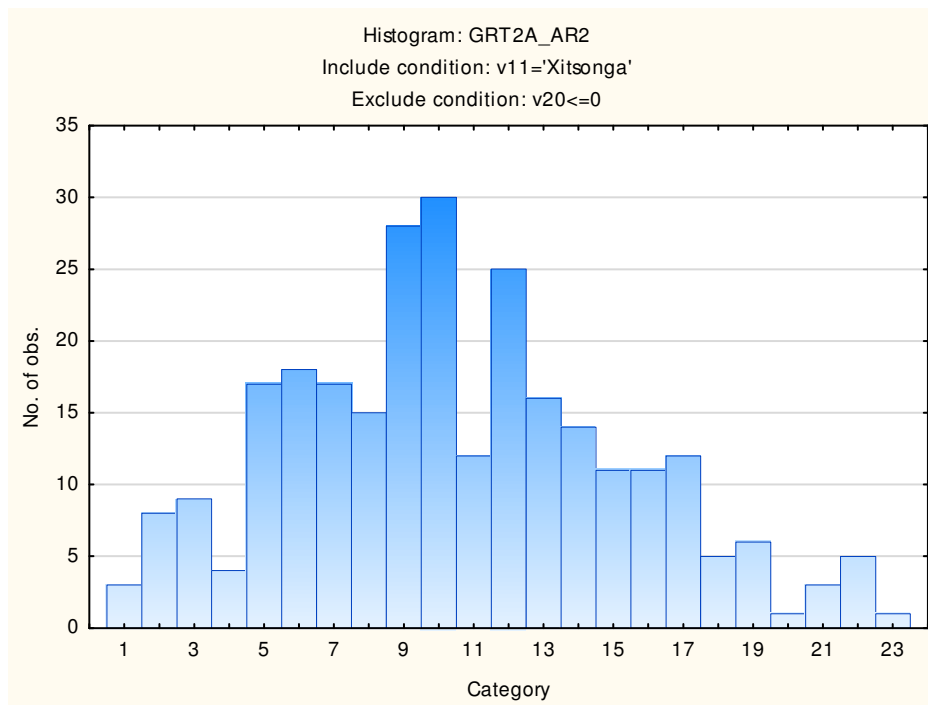
Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,39095	9,669724	15,00000	59,00000	243	9

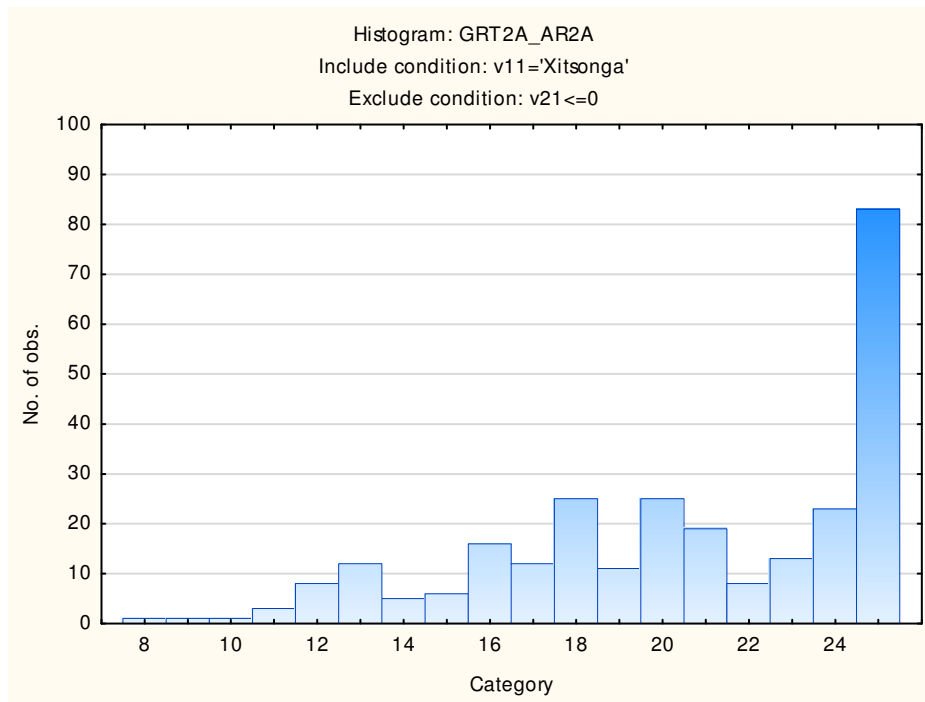


## Descriptive Statistics and Frequency Distributions on General Reasoning Test Battery Subtests

### General Abstract Reasoning Test

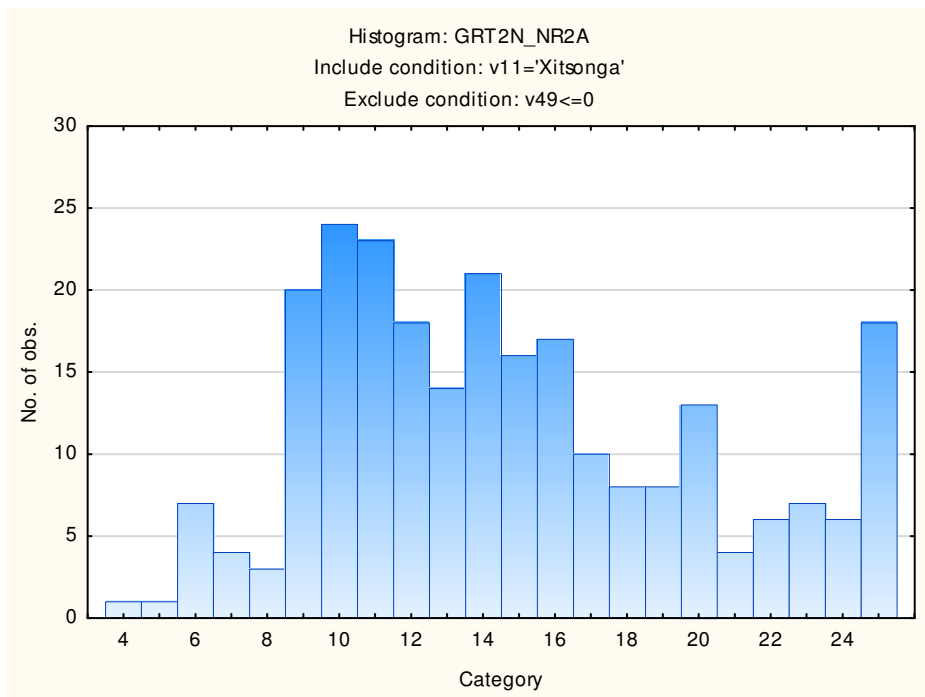
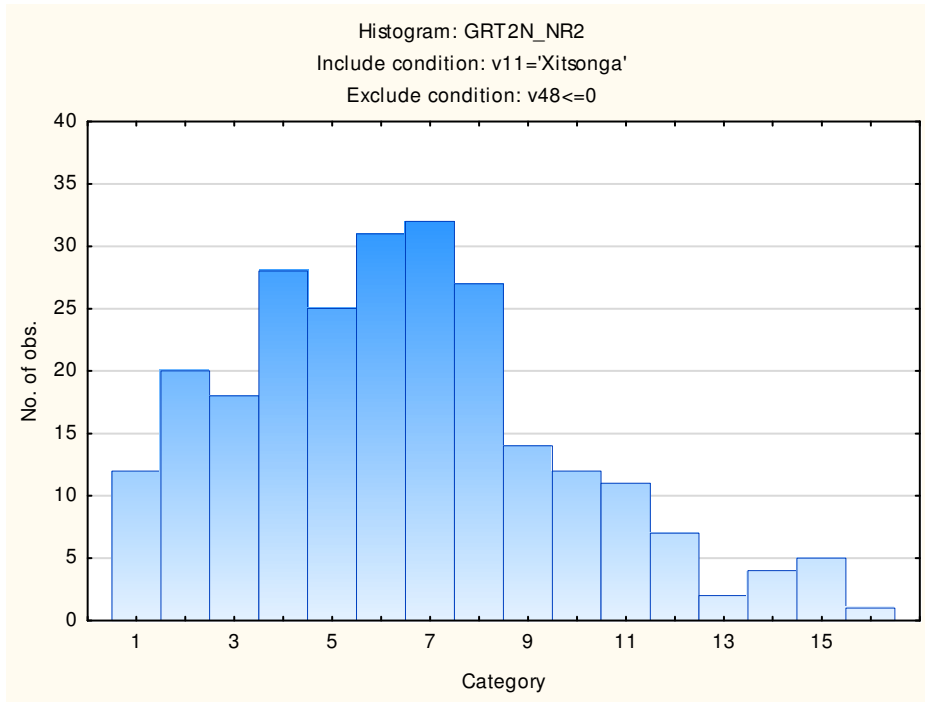
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Abstract Reasoning Test	10,46691	4,795332	0,000000	23,00000	272	0
General Abstract Reasoning Items attempted	20,55882	4,312112	8,000000	25,00000	272	0





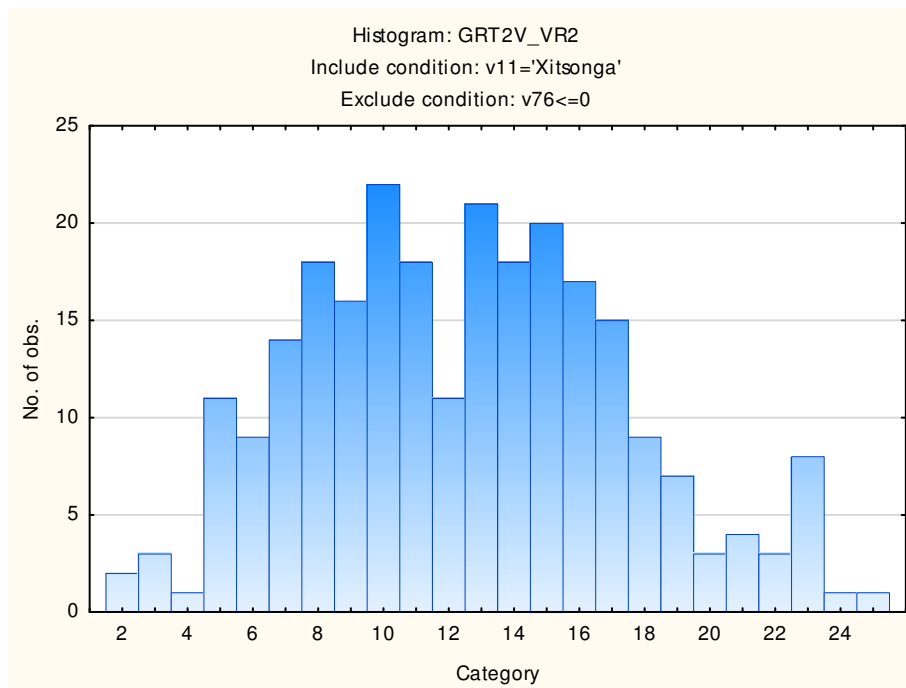
## General Numerical Reasoning Test

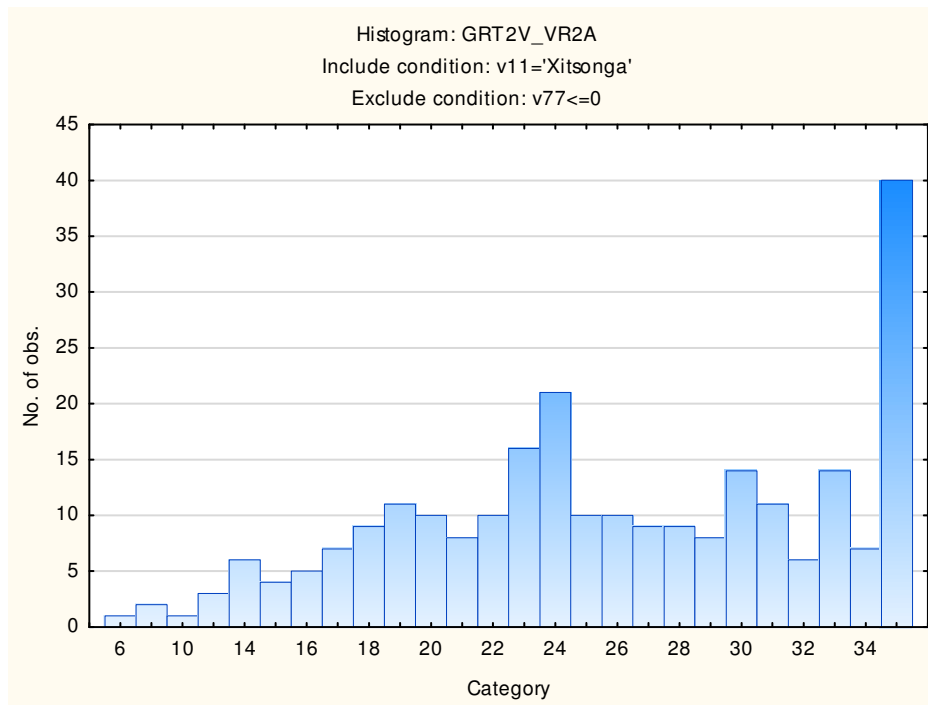
Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Numerical Reasoning Test	6,39759	3,313972	1,000000	16,00000	249	0
General Numerical Reasoning Items Attempted	14,76707	5,258821	4,000000	25,00000	249	0



## General Verbal Reasoning Test

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
General Verbal Reasoning Test	12,50794	4,838830	2,000000	25,00000	252	0
General Verbal Reasoning Items Attempted	25,92857	6,773135	6,000000	35,00000	252	0





## General Observations about the Group

The number of missing cases indicates that not all respondents disclosed their biographical information. The graphs illustrate that most people attempted to answer all the items, thereby showing that respondents did not time out during the test.

## Stanine Table

Scales	Stanine Groups								
	S9_1	S9_2	S9_3	S9_4	S9_5	S9_6	S9_7	S9_8	S9_9
General Abstract Reasoning	0-2	3-4	5-6	7-9	10-11	12-14	15-16	17-18	19-23
General Abstract Items Attempted	8-13	14-15	16-17	18-19	20-21	22-23	24-25		
General Numerical Reasoning	0-0	1-2	3-3	4-5	6-7	8-8	9-10	11-12	13-16
General Numerical Items Attempted	0-5	6-8	9-10	11-13	14-16	17-18	19-21	22-24	25-25
General Verbal Reasoning	0-3	4-6	7-8	9-11	12-13	14-16	17-18	19-21	22-25
General Verbal Items Attempted	0-13	14-17	18-20	21-24	25-27	28-31	32-34	35-35	

# General Reasoning Test Battery

## Reliability introduction

<b>General Reasoning Test Battery .....</b>	<b>1</b>
<b>Reliability introduction.....</b>	<b>1</b>
Reliability studies.....	1
Availability of biographical information.....	1
Relationship between reliability groups and norm groups .....	1
Standard error of measurement (SEM) .....	1
Choosing an appropriate comparison group for reliability .....	1
The effect of reliability on validity .....	1
What Does It Mean If A Test Has Low Reliability?.....	1
Advice to users.....	2
List of reliability studies for the General Reasoning Test Battery (GRT2).....	3

## ***Reliability studies***

Reliability studies are done whenever we receive a substantial body of data that contains item responses. Reliability calculation is one of the services offered by Psytech SA to its clients. In almost all cases, clients have been willing to share the results of these calculations with other users.

## ***Availability of biographical information***

Frequently, full biographical information is not collected, which makes it very difficult to calculate separate reliabilities on different racial and language groups. In some cases, it has been necessary to do a post-hoc classification of respondents based on their names. In such situations it is usually not possible to distinguish between Whites and Coloureds, and they have had to be classified together in one group.

## ***Relationship between reliability groups and norm groups***

It is not possible to create a norm group for each reliability sample, because of sample size constraints. It is also not possible to report Coefficient Alpha for every norm sample, because item response data are not always available. In some cases, we have used the Kuder-Richardson Formula 21 to calculate an index of reliability in the absence of detailed item response information. For ease of reference, we have included as much information as possible about the composition of the samples, rather than refer the user to the description of a related norm group.

## ***Standard error of measurement (SEM)***

Where data are available, the standard error of measurement is reported for every group for which we have calculated reliabilities. This is usually done for samples that are also used as norm groups. In some cases, the standard error of measurement is reported for a group that has been screened for English comprehension, and for the total group too.

## ***Choosing an appropriate comparison group for reliability***

If a larger, more diverse group is available that conforms to the demographic characteristics of the group you are interested in, use that table for comparison purposes.

## ***The effect of reliability on validity***

The reliability of a test places an upper limit on its validity. If a test is not reliable, it can not be valid.

## ***What Does It Mean If A Test Has Low Reliability?***

On an ability measure, Reliability is considered low if it is below 0.75. Personality measures should always be interpreted with caution. In cases where the reliability is below 0.65, the results should be interpreted with extreme caution by using additional information for this purpose. The interview prompts report can assist the user in obtaining additional information for the purpose of triangulation, directly from the respondent.

There are various reasons why the reliability of a test, or of a specific sample of the overall sample group, might be low:

- Respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution.

- Respondents may have rushed to complete the assessment or may have been lacking in motivation at the time of test completion. In this instance, a lower reliability could be attributed to guessing or hasty decision making.
- Respondents finding the test items too difficult.
- Shorter tests, although economic and quick to administer, tend to be less reliable.

It is best practice to always rely on multiple sources of information when making an informed decision utilising an assessment process. This is of particular importance when the reliability of an assessment is lower than usual.

### ***Advice to users***

- Collect full biographical information on the respondents.
- Verify whether the scales you are interested in for decision-making purposes, are reliable for the persons you want to test.
- Where available, bear the standard error of measurement in mind when making decisions on test results.
- Do not use unreliable scales for decision making.
- Do not rely on a single test when reliability is doubtful.

## General Reasoning Test Battery (GRT2) Reliability Index

Sample	Study Number
SA Employees and applicants in a company manufacturing tobacco products	R1
SA Applicants to a business school	R2
SA Managerial-Professional candidates	R3
SA Applicants to trainee positions in the Information Technology industry	R4
SA Workers and applicants with a construction company	R5
SA Industrial Psychology students	R6
SA Bank applicants	R7
SA Vocational Counselling clients	R8
SA Bus Co Learnership applicants	R9
SA Grade 7 pupils	R10
SA Grade 9 pupils	R11
SA General population	R12
SA Prospective University students	R13
SA General Population 2010	R14
European updated 2010	R15
SA Coloured 2011	R16
SA African 2011	R17
SA Asian	R18
SA English	R19
SA Afrikaans 2011	R20
SA Indigenous 2011	R21
SA Aggregate Population 2016	R22
SA Afrikaans 2016	R23
SA English 2016	R24
SA Indigenous 2016	R25
SA isiXhosa 2016	R26
SA isiZulu 2016	R27
SA Sepedi 2016	R28
SA Sesotho 2016	R29
SA Setswana 2016R	R30
SA siSwati 2016	R31
SA Tshivenda 2016	R32
SA Xitsonga 2016	R33

## GRT2 Reliability: Employees and applicants in a company manufacturing tobacco products

### Sample composition

Workers and applicants in a company making tobacco products in the Western Cape.  
Data were collected in 2003-2003.

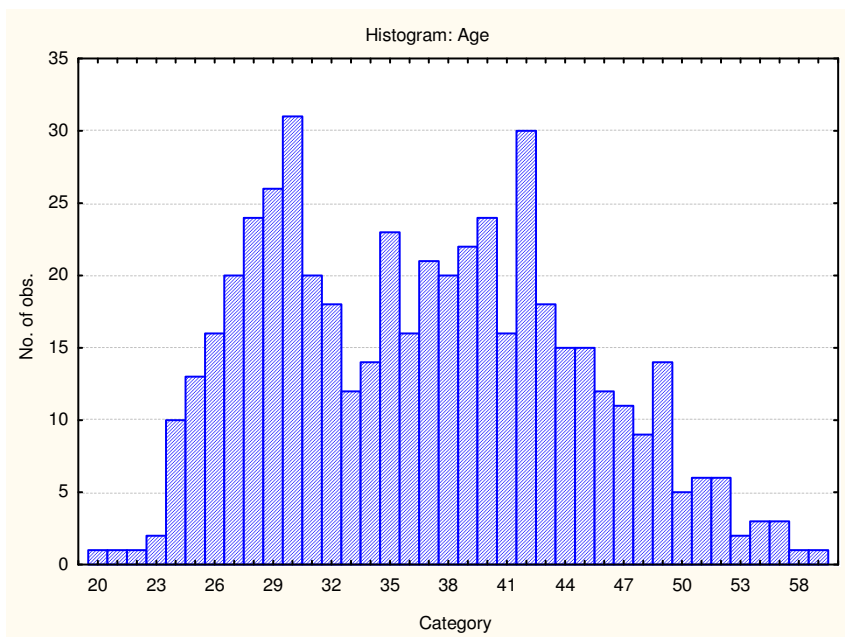
Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	491	491	97.80876	97.8088
F	11	502	2.19124	100.0000
Missing	0	502	0.00000	100.0000

Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Degree	11	11	2.19124	2.1912
Post Graduate National	1	12	0.19920	2.3904
Post Graduate Diploma	11	23	2.19124	4.5817
Vocational Training	10	33	1.99203	6.5737
Grade 12 - N2	1	34	0.19920	6.7729
Grade 10 or 11	35	69	6.97211	13.7450
University diploma	2	71	0.39841	14.1434
University entrance matri	3	74	0.59761	14.7410
Technikon	8	82	1.59363	16.3347
Std 7	36	118	7.17131	23.5060
Std 5	17	135	3.38645	26.8924
Grade 12	149	284	29.68127	56.5737
Std 6	46	330	9.16335	65.7371
Technikon (N2)	1	331	0.19920	65.9363
Std 8	63	394	12.54980	78.4861
Vocational Training - N2	4	398	0.79681	79.2829
Std 9	27	425	5.37849	84.6614
Technikon - N2	1	426	0.19920	84.8606
Technikon - N5	1	427	0.19920	85.0598
Grade 12 + N5 Fitter and	1	428	0.19920	85.2590
Vocational Training - N3	5	433	0.99602	86.2550
Grade 12 + ND in Fitting	1	434	0.19920	86.4542
Vocational Training - NTC	1	435	0.19920	86.6534
Grade 8	2	437	0.39841	87.0518
Grade 12 + Technikon Cert	1	438	0.19920	87.2510
Vocational Training - N4	5	443	0.99602	88.2470
Std 4	6	449	1.19522	89.4422

Category	Frequency table: First Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	33	33	6.57371	6.5737
Afrikaans	59	92	11.75299	18.3267
Sesotho	171	263	34.06375	52.3904
isiZulu	168	431	33.46614	85.8566
Setswana	5	436	0.99602	86.8526
Other	1	437	0.19920	87.0518
isiNdebele	5	442	0.99602	88.0478
Xitsonga	4	446	0.79681	88.8446
Sepedi	10	456	1.99203	90.8367
isiXhosa	16	472	3.18725	94.0239
siSwati	2	474	0.39841	94.4223
Missing	28	502	5.57769	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	21	21	4.18327	4.1833
European	54	75	10.75697	14.9402
African	387	462	77.09163	92.0319
Asian	6	468	1.19522	93.2271
Coloured	7	475	1.39442	94.6215
Missing	27	502	5.37849	100.0000

Variable	Descriptive Statistics AGE					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	36.69323	7.844898	20.00000	59.00000	502	0



***Internal consistency reliabilities on GRT2 subtests***

<b>Test</b>	<b>Alpha Total Group N = 502</b>	<b>Alphas Whites N = 54</b>	<b>Alphas Blacks N =387</b>
<b>Verbal Reasoning</b>	.837757	.794635	.720764
<b>Numerical Reasoning</b>	.831761	.794493	.572305
<b>Abstract Reasoning</b>	.838415	.802800	.769081

## GRT2 Reliability: SA Applicants to a business school

Applicants to a university in the Western Cape for admission to business school courses.  
Data were collected during 2002-2003.

### Sample composition

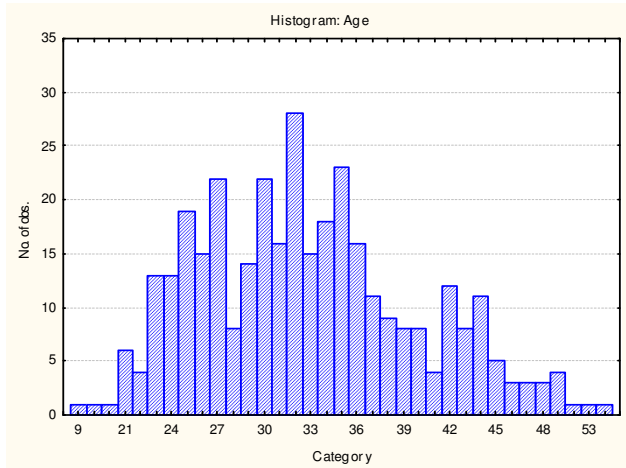
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	237	237	67.90831	67.9083
F	111	348	31.80516	99.7135
U	1	349	0.28653	100.0000
Missing	0	349	0.00000	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Degree	65	65	18.62464	18.6246
Grade 12	109	174	31.23209	49.8567
Grade 10 or 11	17	191	4.87106	54.7278
Technikon	34	225	9.74212	64.4699
Post Graduate	21	246	6.01719	70.4871
University diploma	17	263	4.87106	75.3582
Vocational Training	13	276	3.72493	79.0831
University entrance matric	1	277	0.28653	79.3696
University entrance matri	1	278	0.28653	79.6562
Missing	71	349	20.34384	100.0000

Category	Frequency table: First Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	135	135	38.68195	38.6819
Afrikaans	42	177	12.03438	50.7163
isiXhosa	45	222	12.89398	63.6103
Other	12	234	3.43840	67.0487
Setswana	1	235	0.28653	67.3352
isiNdebele	3	238	0.85960	68.1948
Sesotho	2	240	0.57307	68.7679
Missing	109	349	31.23209	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	162	162	46.41834	46.4183
African	91	253	26.07450	72.4928
Asian	24	277	6.87679	79.3696
European	9	286	2.57880	81.9484
Missing	63	349	18.05158	100.0000

Variable	Descriptive Statistics					N	No. cases Missing
	Mean	Std.Dev	Minimum	Maximum			
Age	32.79251	7.115289	9.000000	54.00000	347	2	



### ***Internal consistency reliabilities on GRT2 subtests***

Test	Sample size	Cronbach Alpha
General Verbal Reasoning	349	.821840
General Numerical Reasoning	349	.874462
General Abstract Reasoning	349	.812248

### ***Standard error of measurement***

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	General Verbal Reasoning	2.33837881	5.54	0.82184
2	General Numerical Reasoning	2.01604336	5.69	0.874462
3	General Abstract Reasoning	2.16651794	5	0.812248

## GRT2 Reliabilities: SA Managerial-Professional candidates

### Sample composition

Candidates tested for development or selection purposes by a South African consultancy group. The company works mainly with managerial-professional groups. Data were collected in 2001.

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	34.72876	7.197560	17.00000	58.00000	306	23

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
WC	305	305	92.70517	92.7052
A	3	308	0.91185	93.6170
B	21	329	6.38298	100.0000
Missing	0	329	0.00000	100.0000

Race information was coded on the basis of respondents' names. Whites and coloureds were coded as WC.

Category	Frequency table: Gender			
	Count	Cumulative Count	Percent	Cumulative Percent
M	118	118	35.86626	35.8663
F	209	327	63.52584	99.3921
U	2	329	0.60790	100.0000
Missing	0	329	0.00000	100.0000

### Reliabilities on GRT2 subtests

	Coefficient Alpha
Verbal Reasoning	.791457
Numerical Reasoning	.858394
Abstract Reasoning	.818556

**Standard error of measurement**

	1	2	3	4
	ScaleName	SEM	SD	Reliability
1	Verbal Reasoning	1.62861	3.566313	0.791457
2	Numerical Reasoning	2.049482	5.446322	0.858394
3	Abstract Reasoning	2.174649	5.105260	0.818556

## GRT2 Reliability: SA Applicants to trainee positions in the Information Technology industry

Respondents were tested by a training consultancy in Gauteng that specialises in placing persons from formerly disadvantaged groups in trainee positions within the IT industry. All applicants had to have at least a grade 12 level of education.

Data were collected in 2000-2002

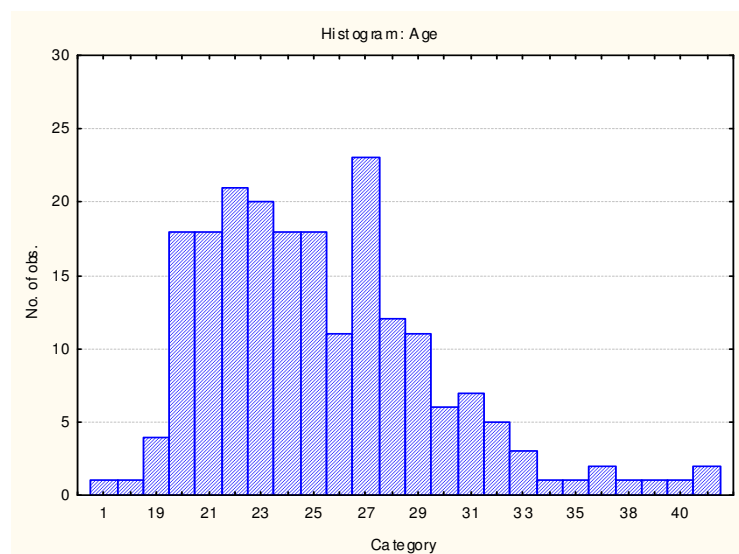
### Sample composition

Frequency table: Gender				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	148	148	71.84466	71.8447
F	44	192	21.35922	93.2039
Missing	14	206	6.79612	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
B	183	183	88.83495	88.8350
A	12	195	5.82524	94.6602
WC	8	203	3.88350	98.5437
Missing	3	206	1.45631	100.0000

Race information was not captured by the user – respondents' race was coded based on their names. The code WC was used for Whites or Coloureds.

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	25.27670	4.911524	1.000000	46.00000	206	0



**Internal consistency reliabilities for GRT2 tests**

Test	Cronbach Alpha
Verbal Reasoning	.807508
Numerical Reasoning	.785101
Abstract Reasoning	.736045

**Standard error of measurement**

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.371693	5.405703	0.8075
2	Numerical Reasoning	1.98428	4.280415	0.7851
3	Abstract Reasoning	2.188405	4.259541	0.7360

## GRT2 Reliabilities: SA Construction Workers

### Sample composition

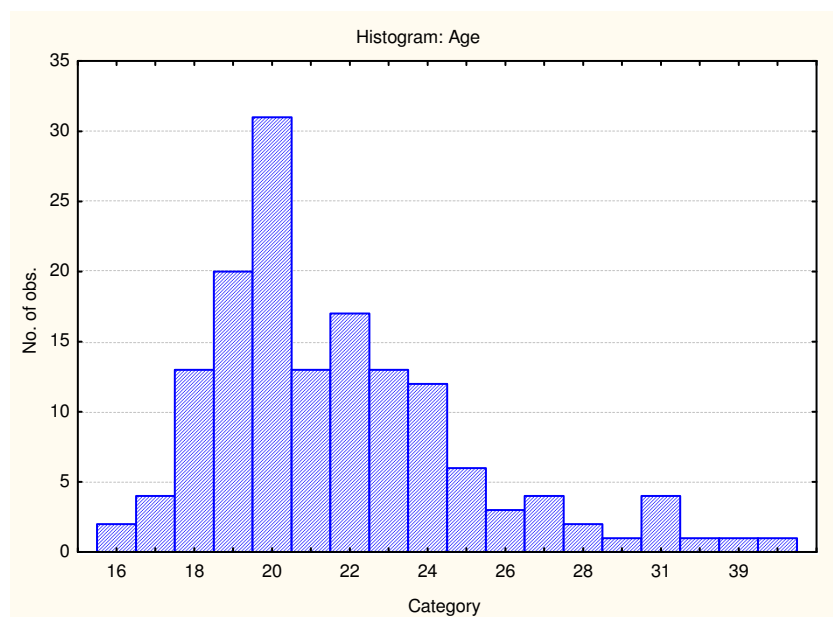
Workers and applicants tested by a South African construction company for employment and development purposes. Data were collected in 2002 and 2003. Minimum qualification was grade 10.

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	7	7	4,69799	4,6980
European	2	9	1,34228	6,0403
White	1	10	0,67114	6,7114
Asian	1	11	0,67114	7,3826
African	74	85	49,66443	57,0470
WC	64	149	42,95302	100,0000
Missing	0	149	0,00000	100,0000

Where race data were not captured, information was coded according to respondents' names. Where uncertainty existed, whites and coloureds were coded as WC.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	137	137	91.94631	91.9463
F	12	149	8.05369	100.0000
Missing	0	149	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	21.85135	4.103035	16.00000	47.00000	148	1



***Internal consistency reliabilities on GRT2 subtests***

	<b>Coefficient Alpha N = 149</b>
<b>Verbal Reasoning</b>	.756002
<b>Numerical Reasoning</b>	.884188
<b>Abstract Reasoning</b>	.822028

***Standard error of measurement***

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.430291	4.92	0.756002
2	Numerical Reasoning	1.929567	5.67	0.884188
3	Abstract Reasoning	2.248553	5.33	0.822028

## GRT2 Reliabilities: SA Industrial Psychology Students

### Sample Composition

Students in their third year at a university in Gauteng who completed the tests as part of their training in psychometrics. Data collected in 2003.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	80	80	85.10638	85.1064
M	14	94	14.89362	100.0000
Missing	0	94	0.00000	100.0000

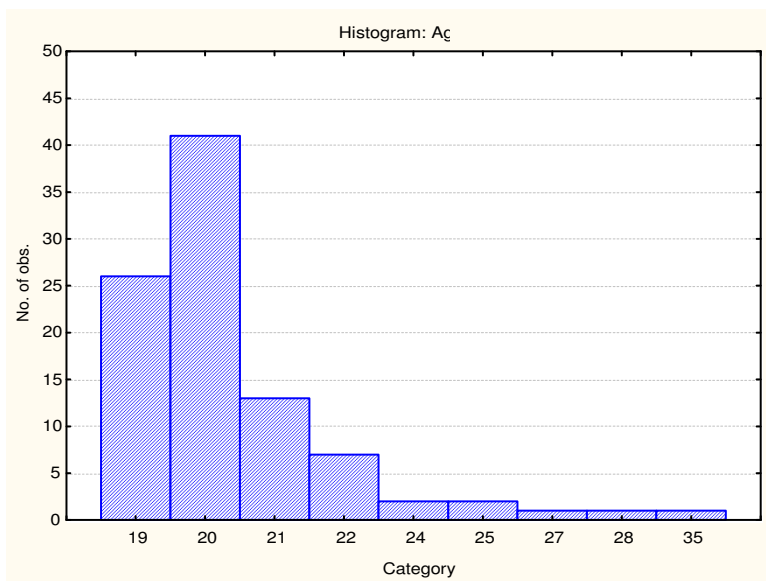
Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Degree	3	3	3.19149	3.1915
University entrance matri	88	91	93.61702	96.8085
Technikon	1	92	1.06383	97.8723
Grade 12	1	93	1.06383	98.9362
Post Graduate	1	94	1.06383	100.0000
Missing	0	94	0.00000	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
English	18	18	19.14894	19.1489
Afrikaans	59	77	62.76596	81.9149
isiZulu	3	80	3.19149	85.1064
Setswana	4	84	4.25532	89.3617
isiXhosa	2	86	2.12766	91.4894
Sepedi	1	87	1.06383	92.5532
Missing	7	94	7.44681	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Asian	6	6	6.38298	6.3830
European	72	78	76.59574	82.9787
African	14	92	14.89362	97.8723
Coloured	2	94	2.12766	100.0000
Missing	0	94	0.00000	100.0000

Frequency table: Educated in English				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Yes	36	36	38.29787	38.2979
No	57	93	60.63830	98.9362
Missing	1	94	1.06383	100.0000

Descriptive Statistics Age						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	20.52128	2.227534	19.00000	35.00000	94	0



### ***Internal Consistency Reliabilities on GRT2 subtests***

	Coefficient Alpha N = 94
Verbal Reasoning	.781624
Numerical Reasoning	.792052
Abstract Reasoning	.696991

### ***Standard error of measurement***

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.350999	5.030950	0.781624
2	Numerical Reasoning	1.981111	4.344415	0.792052
3	Abstract Reasoning	2.286459	4.153704	0.696991

## GRT2 Reliability: SA Bank applicants

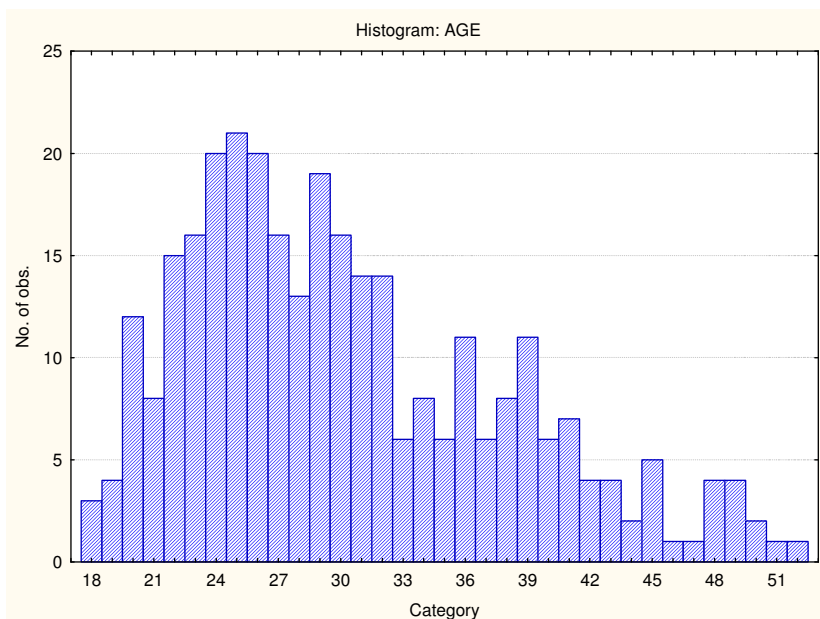
Applicants to various positions in a SA bank. A minimum qualification of grade 12 is required to apply. Data were collected between 1996 and 1999. Race information was not captured by the user. Race was coded based on respondents' names. Whites and Coloureds were coded as WC.

### Sample composition

Frequency table: RACE				
Category	Count	Cumulative Count	Percent	Cumulative Percent
WC	222	222	71.84466	71.8447
A	28	250	9.06149	80.9061
B	55	305	17.79935	98.7055
Missing	4	309	1.29450	100.0000

Frequency table: GENDER				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	184	184	59.54693	59.5469
M	124	308	40.12945	99.6764
U	1	309	0.32362	100.0000
Missing	0	309	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
AGE	30.32039	7.680571	18.00000	56.00000	309	0



S

**Internal consistency reliabilities on GRT2 tests**

Scale	Cronbach Alpha Total group N = 309	Cronbach Alpha Whites/ Coloureds N = 222	Cronbach Alpha Blacks N = 55
Verbal Reasoning VR2	.797184	.789906	.775422
Numerical Reasoning NR2	.861632	.867890	.805867
Abstract Reasoning AR2	.809311	.809397	.768621
Mean Alpha	<b>0.822709</b>	<b>0.822398</b>	<b>0.783303</b>

**Standard Error of Measurement**

**Total Group**

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.490441	5.53	0.797184
2	Numerical Reasoning	2.07192	5.57	0.861632
3	Abstract Reasoning	2.179031	4.99	0.809311

**Whites and Coloureds**

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoni	2.47514465	5.4	0.789906
2	Numerical Reas	2.06814085	5.69	0.86789
3	Abstract Reaso	2.15671031	4.94	0.809397

**Blacks**

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.620689	5.530086	0.775422
2	Numerical Reasoning	2.455819	5.573740	0.805867
3	Abstract Reasoning	2.402664	4.994950	0.768621

## GRT2 Reliability: SA Vocational Counselling Clients

Clients at a vocational counselling and career development centre at a historically white, English-medium university in Gauteng. Clients would have a minimum qualification of grade 11, and most would be either prospective students or current students contemplating a change in course or career direction. Persons who complete the GRT2 would not have a tertiary qualification.

### Sample composition

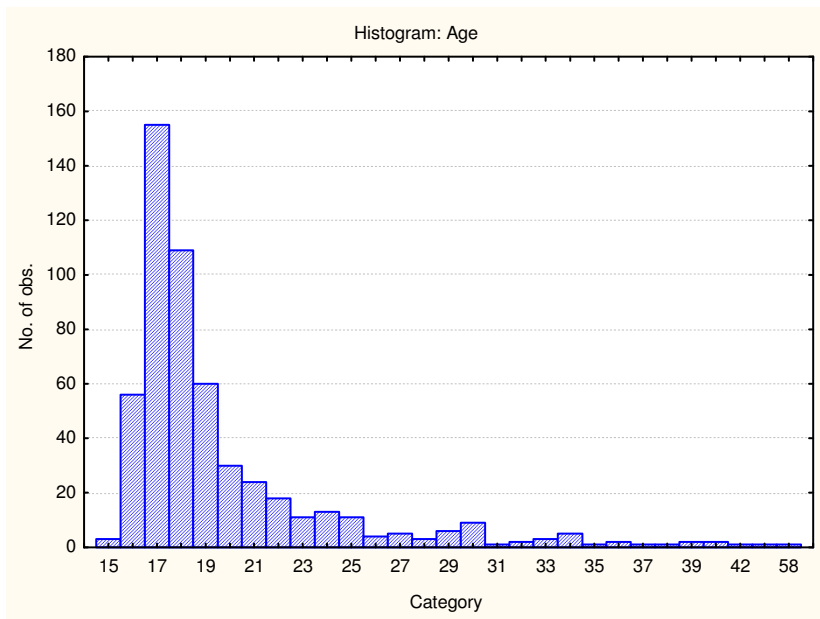
Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
WC	378	378	70.00000	70.0000
A	83	461	15.37037	85.3704
B	43	504	7.96296	93.3333
W	27	531	5.00000	98.3333
C	3	534	0.55556	98.8889
Missing	6	540	1.11111	100.0000

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	287	287	53.14815	53.1481
M	251	538	46.48148	99.6296
U	2	540	0.37037	100.0000
Missing	0	540	0.00000	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
University entrance matric	15	15	2.77778	2.7778
Grade 12	52	67	9.62963	12.4074
Degree	4	71	0.74074	13.1481
Grade 10 or 11	12	83	2.22222	15.3704
Missing	457	540	84.62963	100.0000

Category	Frequency table: First Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	71	71	13.14815	13.1481
Other	4	75	0.74074	13.8889
Afrikaans	3	78	0.55556	14.4444
isiZulu	2	80	0.37037	14.8148
Setswana	3	83	0.55556	15.3704
Missing	457	540	84.62963	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	19.70185	4.921461	15.00000	58.00000	540	0



### Reliabilities on GRT2 subtests

	Coefficient Alpha
Verbal Reasoning	.830037
Numerical Reasoning	.864597
Abstract Reasoning	.785522

### Standard error of measurement

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.24182	5.437805	0.830037
2	Numerical Reasoning	2.002526	5.442068	0.864597
3	Abstract Reasoning	2.106833	4.549238	0.785522

## GRT2 Reliabilities: SA Applicants for learnerships at a bus company

Applicants for learnerships – mostly as diesel mechanics or auto-electricians, to a bus company in Gauteng. Data were collected in 2003.

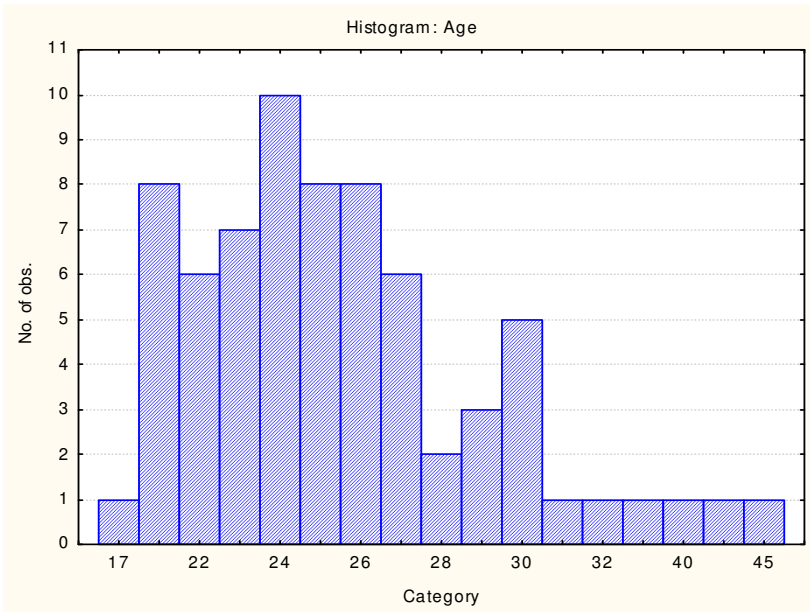
### Sample composition

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	60	60	83.33333	83.3333
F	10	70	13.88889	97.2222
U	2	72	2.77778	100.0000
Missing	0	72	0.00000	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
English	1	1	1.38889	1.3889
Sepedi	7	8	9.72222	11.1111
Sesotho	22	30	30.55556	41.6667
isiXhosa	4	34	5.55556	47.2222
Xitsonga	8	42	11.11111	58.3333
isiZulu	2	44	2.77778	61.1111
siSwati	2	46	2.77778	63.8889
Tshivenda	10	56	13.88889	77.7778
Setswana	9	65	12.50000	90.2778
isiNdebele	4	69	5.55556	95.8333
Missing	3	72	4.16667	100.0000

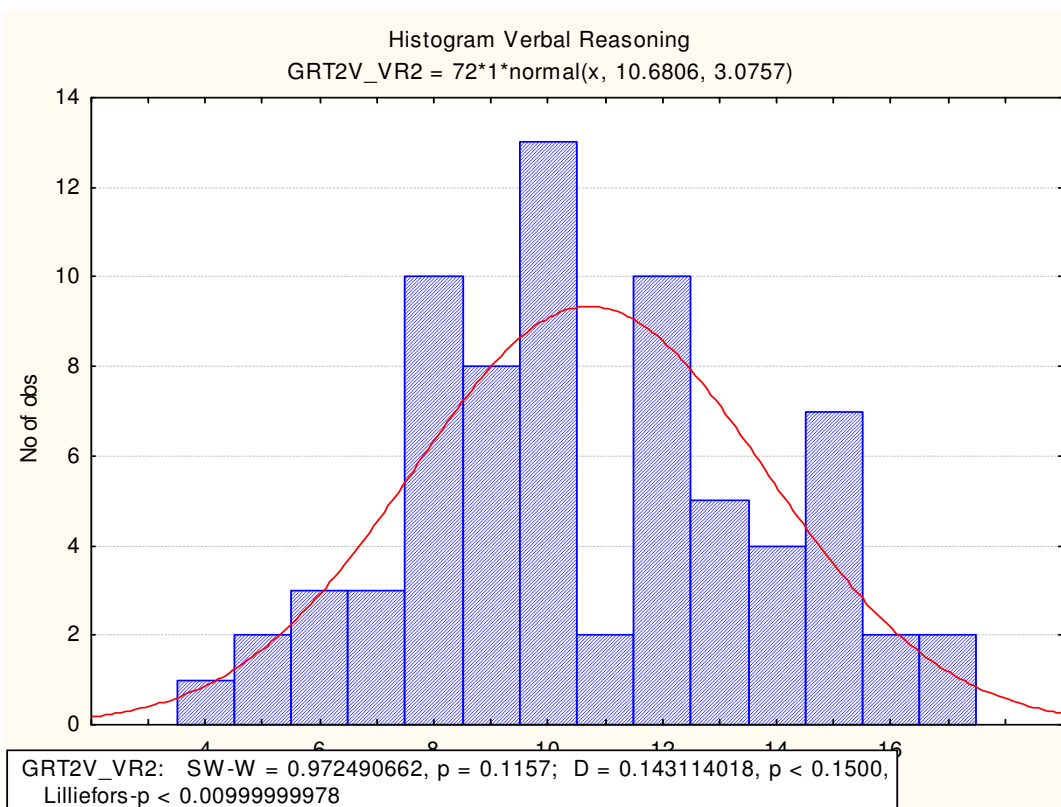
Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Asian	1	1	1.38889	1.3889
African	70	71	97.22222	98.6111
Missing	1	72	1.38889	100.0000

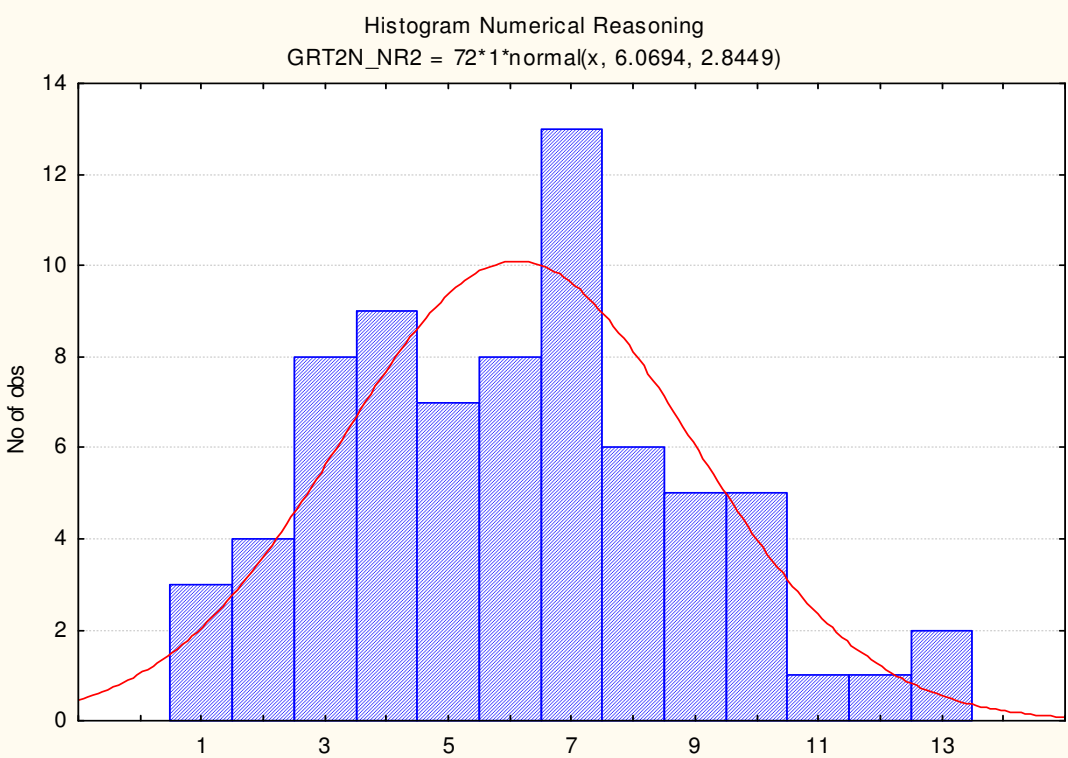
Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	25.80000	4.781001	17.00000	45.00000	70	2



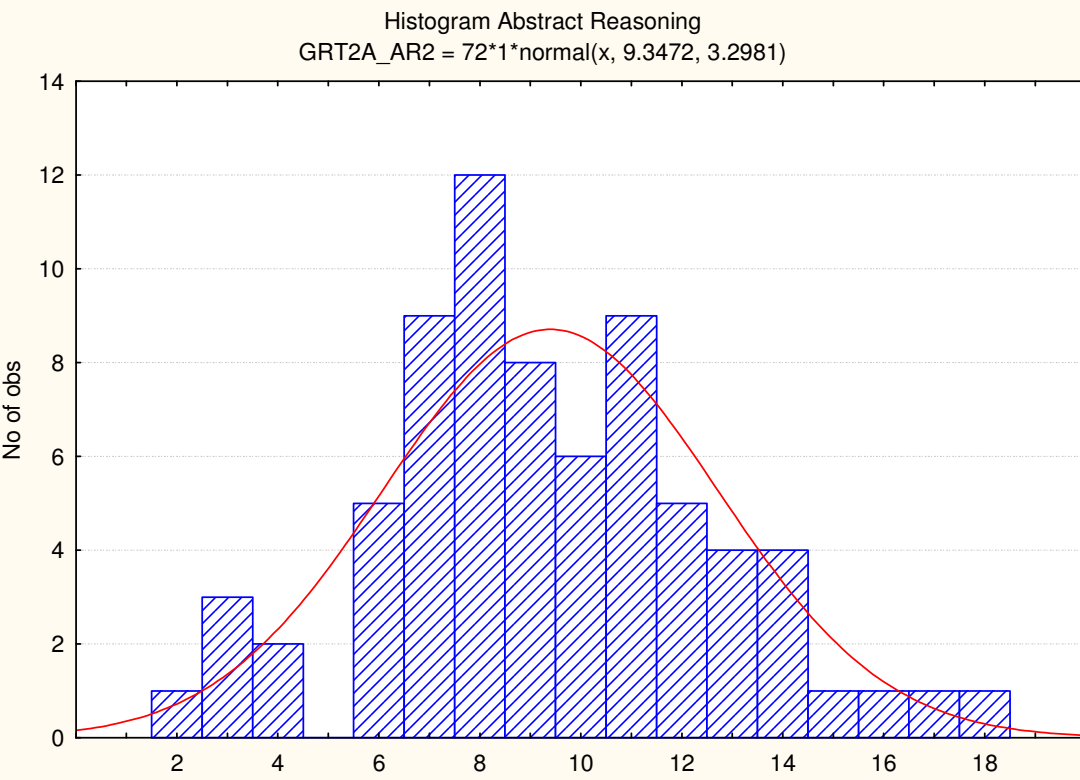
**Descriptive statistics on GRT2 subtests**

Variable	Descriptive Statistics				
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Verbal Reasoning	72	10.68056	4.000000	17.00000	3.075695
Numerical Reasoning	72	6.06944	1.000000	13.00000	2.844943
Abstract Reasoning	72	9.34722	2.000000	18.00000	3.298142





GRT2N\_NR2: SW-W = 0.971793029, p = 0.1054; D = 0.099846392, p < n.s., Lilliefors-p < 0.100000



GRT2A\_AR2: SW-W = 0.980098337, p = 0.3114; D = 0.102983489, p < n.s., Lilliefors-p < 0.100000001

For all three subtests, the distributions were normal, although the means were low. This indicates that the tests may have been difficult for the respondents.

***Reliabilities on GRT2 subtests***

	<b>Coefficient Alpha</b>
<b>Verbal Reasoning</b>	.4739
<b>Numerical Reasoning</b>	.5563
<b>Abstract Reasoning</b>	.5680

	<b>KR-21</b>
<b>Verbal Reasoning</b>	.2218
<b>Numerical Reasoning</b>	.4502
<b>Abstract Reasoning</b>	.4812

Even though these results are based on a rather small sample, the low reliabilities are a cause for concern. Alternative, easier tests, possibly with a lower verbal content, should be considered for this group and similar groups.

## GRT2 Reliability: SA Grade 7 pupils

Pupils at an English medium school in Gauteng, tested for vocational guidance purposes. Data were collected in 2001.

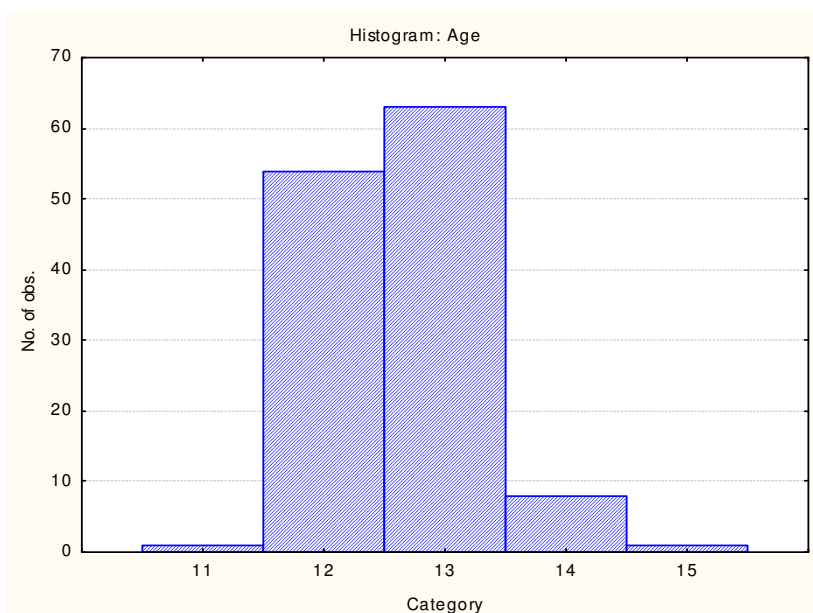
### Sample composition

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
A	17	17	13.38583	13.3858
WC	23	40	18.11024	31.4961
B	20	60	15.74803	47.2441
C	2	62	1.57480	48.8189
Missing	65	127	51.18110	100.0000

Race data was not captured consistently by the user – race was coded based on respondents' names. When doubt existed about whether an applicant was White or Coloured, the person was coded as WC.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	62	62	48.81890	48.8189
M	65	127	51.18110	100.0000
Missing	0	127	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	12.63780	0.650632	11.00000	15.00000	127	0



**Reliabilities on GRT2 subtests**

	Coefficient Alpha
Verbal Reasoning	.655255
Numerical Reasoning	.789366
Abstract Reasoning	.791066

**Standard Error of measurement**

	1	2	3	4
	ScaleName	SEM	SD	Reliability
1	Verbal Reasoning	2.489535	4.240033	0.655255
2	Numerical Reasoning	1.945748	4.239576	0.789366
3	Abstract Reasoning	2.217905	4.852196	0.791066

## GRT2 Reliability: Grade 9 scholars at an English-medium school

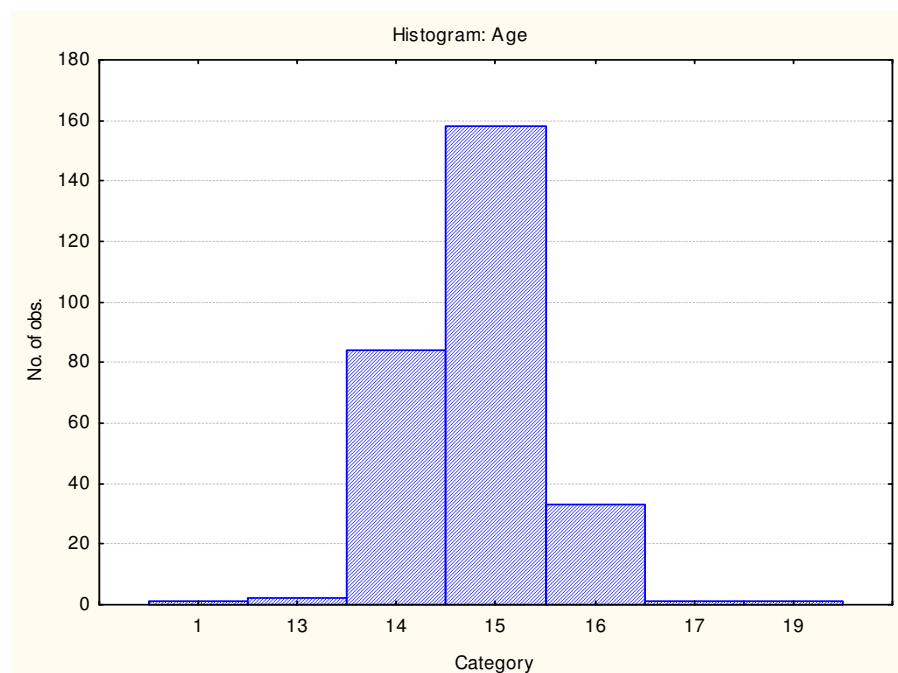
South African scholars tested for vocational guidance purposes. Language of education is English. Respondents were tested at various schools in Gauteng. Data were collected in 2001.

### Sample composition

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
WC	201	201	71.78571	71.7857
A	15	216	5.35714	77.1429
B	64	280	22.85714	100.0000
Missing	0	280	0.00000	100.0000

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
F	142	142	50.71429	50.7143
M	138	280	49.28571	100.0000
Missing	0	280	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	14.77500	1.082320	1.000000	19.00000	280	0



***Internal consistency reliabilities on GRT2 subtests***

Test	Cronbach Alpha
Verbal Reasoning	.79
Numerical Reasoning	.83
Abstract Reasoning	.80

***Standard error of measurement***

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.539875	5.542462	0.79
2	Numerical Reasoning	2.153487	5.222974	0.83
3	Abstract Reasoning	2.283994	5.107166	0.8

## GRT2 Reliability: SA General Population

These reliabilities were calculated from raw scores using the Kuder-Richardson Formula 21.  
Data were submitted by GeneSys users in 2002.  
All submitted data were used, thus this is a sample of convenience.

### *Sample composition*

Age			
Mean	Min	Max	Missing
30.30	14	60	82

Sex		
Male	Female	Missing
1104	1066	8

Education		
Grade 10 or 11	15	
Grade 12	50	
University entrance matric	0	
Vocational Training	3	
Technikon	1	
University diploma	0	
Degree	33	
Post Graduate	4	
Missing	1763	

Educated In English		
Yes	39	
No	0	
Missing	2139	

First Language		
isiZulu	12	
isiXhosa	5	
Afrikaans	26	
Sepedi	7	
English	23	
Setswana	5	
Sesotho	4	
Xitsonga	2	
siSwati	1	
isiNdebele	0	
Tshivenda	0	
Other	0	
Missing	1829	

Race		
Asian	3	
African	42	
Coloured	15	
European	43	
Other	0	
Missing	1789	

Applicant/Non-Applicant		
Applicant	Non-Applicant	Missing
96	281	1801

***Internal consistency reliabilities on GRT2 subtests***

Test	KR21 Reliability
Verbal Reasoning	.86
Numerical Reasoning	.86
Abstract Reasoning	.81

***Standard error of measurement***

	1 ScaleName	2 SEM	3 SD	4 Reliability
1	Verbal Reasoning	2.77631	7.42	0.86
2	Numerical Reasoning	2.215061	5.92	0.86
3	Abstract Reasoning	2.29714	5.27	0.81

## GRT2 Reliability: SA Prospective University Students

Prospective university students tested for vocational guidance purposes at an English-medium university in Gauteng. Detailed biographical information was not captured. Data were collected during 2001-2002.

### *Sample characteristics*

Age			
Mean	Min	Max	Missing
17.10	15	18	0

Sex		
Male	Female	Missing
56	64	3

Internal consistency reliability was calculated from raw scores using the Kuder-Richardson Formula 21.

### *Internal Consistency Reliabilities on GRT2 subtests*

Test	KR 21 Reliability
Verbal Reasoning	.86
Numerical Reasoning	.88
Abstract Reasoning	.88

### *Standard Error of Measurement*

	1	2	3	4
	ScaleName	SEM	SD	Reliability
1	Verbal Reasoning	2.570519	6.87	0.86
2	Numerical Reasoning	2.147743	6.2	0.88
3	Abstract Reasoning	1.974538	5.7	0.88

# GRT2 Reliabilities: South African General Population, updated 2010

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## Sample composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery in the period up to February 2010. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

## General Verbal Reasoning test: biographical composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	6310	6310	36.67112	36.6711
M	10838	17148	62.98599	99.6571
Missing	59	17207	0.34288	100.0000

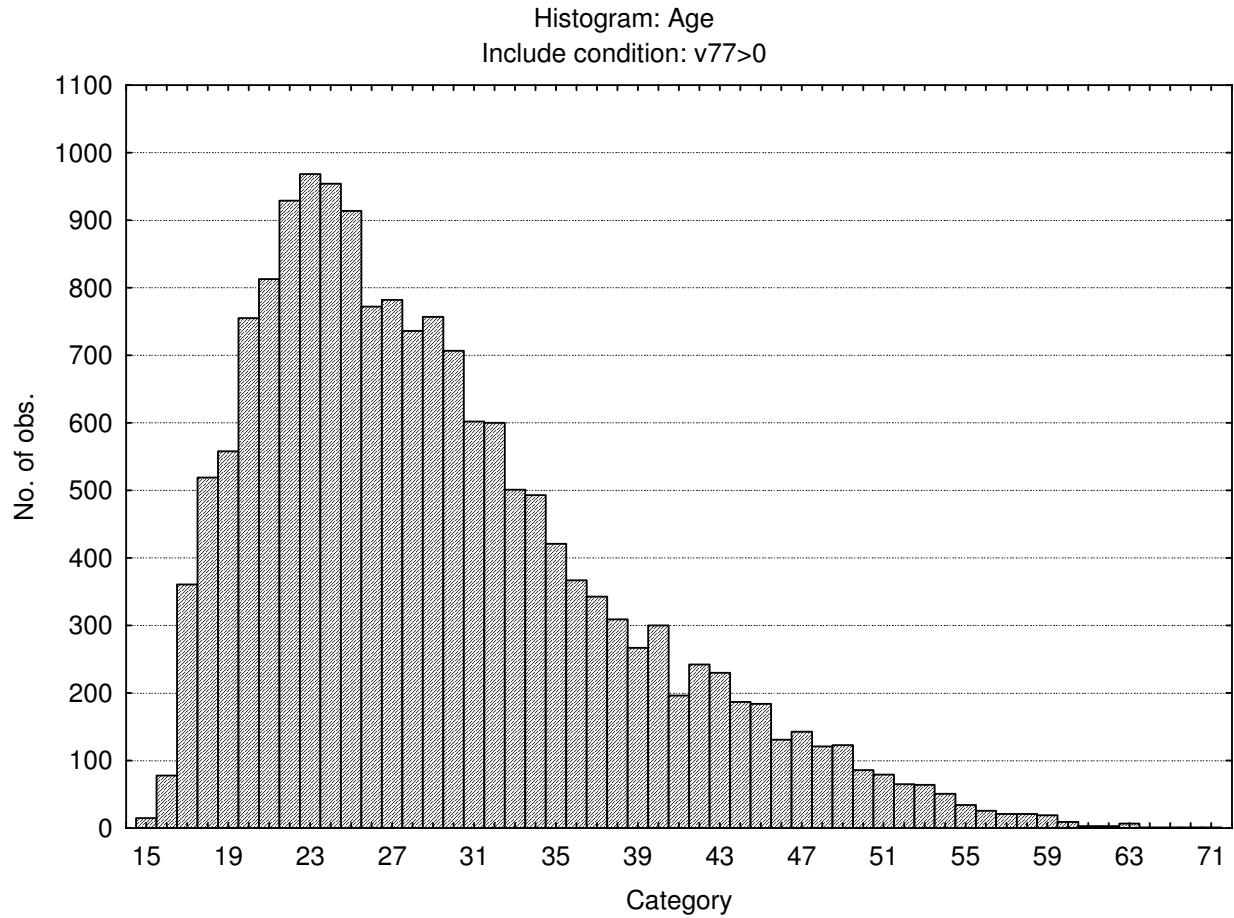
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1871	1871	10.87348	10.8735
Grade 12	4094	5965	23.79264	34.6661
University Diploma	340	6305	1.97594	36.6421
Degree	880	7185	5.11420	41.7563
Vocational Training	336	7521	1.95269	43.7090
Grade 10 or 11	902	8423	5.24205	48.9510
Grade 8	57	8480	0.33126	49.2823
Grade 9	64	8544	0.37194	49.6542
Grade 7	23	8567	0.13367	49.7879
Post Graduate	426	8993	2.47574	52.2636
Missing	8214	17207	47.73639	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1901	1901	11.04783	11.0478
English	2714	4615	15.77265	26.8205
Afrikaans	1880	6495	10.92579	37.7463
Setswana	558	7053	3.24287	40.9891
Sesotho	873	7926	5.07352	46.0626
Sepedi	229	8155	1.33085	47.3935
Xitsonga	121	8276	0.70320	48.0967
Tshivenda	66	8342	0.38356	48.4803
siSwati	58	8400	0.33707	48.8173
isiNdebele	32	8432	0.18597	49.0033
isiXhosa	1109	9541	6.44505	55.4484
Missing	7666	17207	44.55164	100.0000

Category	Frequency table: Language group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2714	2714	15.77265	15.7727
Afrikaans	1880	4594	10.92579	26.6984
Indigenous	5032	9626	29.24391	55.9423
Missing	7581	17207	44.05765	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5526	5526	32.11484	32.1148
European	2291	7817	13.31435	45.4292
Coloured	1248	9065	7.25286	52.6820
Asian	891	9956	5.17813	57.8602
Missing	7251	17207	42.13983	100.0000

Variable	Descriptive statistics: age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.31855	8.718063	15.00000	71.00000	16870	337



### General Numerical Reasoning Test: biographical composition

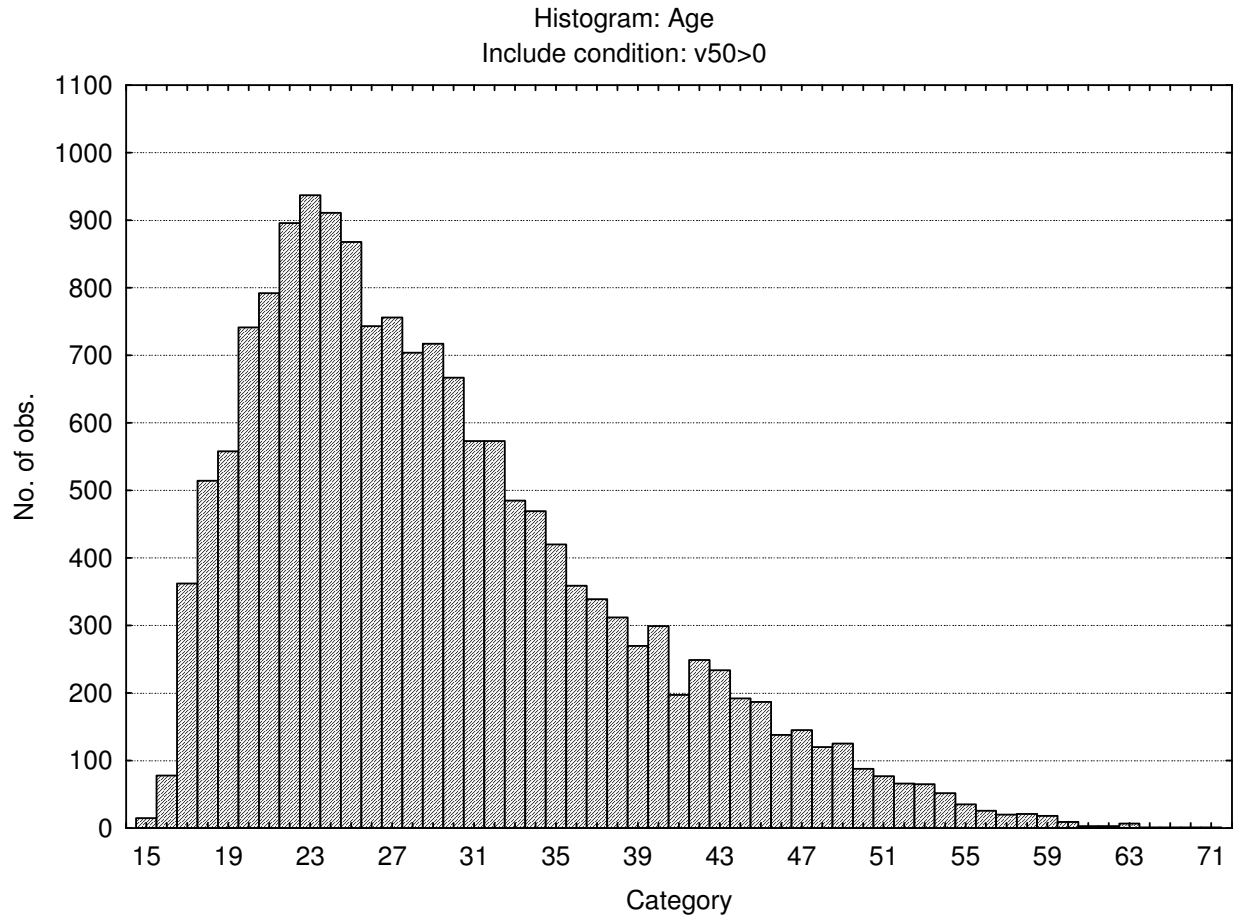
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	6015	6015	35.84625	35.8462
M	10705	16720	63.79619	99.6424
Missing	60	16780	0.35757	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1863	1863	11.10250	11.1025
Grade 12	4133	5996	24.63051	35.7330
University Diploma	339	6335	2.02026	37.7533
Degree	873	7208	5.20262	42.9559
Vocational Training	331	7539	1.97259	44.9285
Grade 10 or 11	910	8449	5.42312	50.3516
Grade 8	60	8509	0.35757	50.7092
Grade 9	65	8574	0.38737	51.0965
Grade 7	25	8599	0.14899	51.2455
Post Graduate	415	9014	2.47318	53.7187
Missing	7766	16780	46.28129	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1902	1902	11.33492	11.3349
English	2719	4621	16.20381	27.5387
Afrikaans	1897	6518	11.30513	38.8439
Setswana	560	7078	3.33731	42.1812
Sesotho	874	7952	5.20858	47.3897
Sepedi	229	8181	1.36472	48.7545
Xitsonga	120	8301	0.71514	49.4696
Tshivenda	66	8367	0.39333	49.8629
siSwati	58	8425	0.34565	50.2086
isiNdebele	32	8457	0.19070	50.3993
isiXhosa	1108	9565	6.60310	57.0024
Missing	7215	16780	42.99762	100.0000

Category	Frequency table: Language group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2719	2719	16.20381	16.2038
Afrikaans	1897	4616	11.30513	27.5089
Indigenous	5034	9650	30.00000	57.5089
Missing	7130	16780	42.49106	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5523	5523	32.91418	32.9142
European	2308	7831	13.75447	46.6687
Coloured	1257	9088	7.49106	54.1597
Asian	888	9976	5.29201	59.4517
Missing	6804	16780	40.54827	100.0000



**General Abstract Reasoning Test: biographical composition**

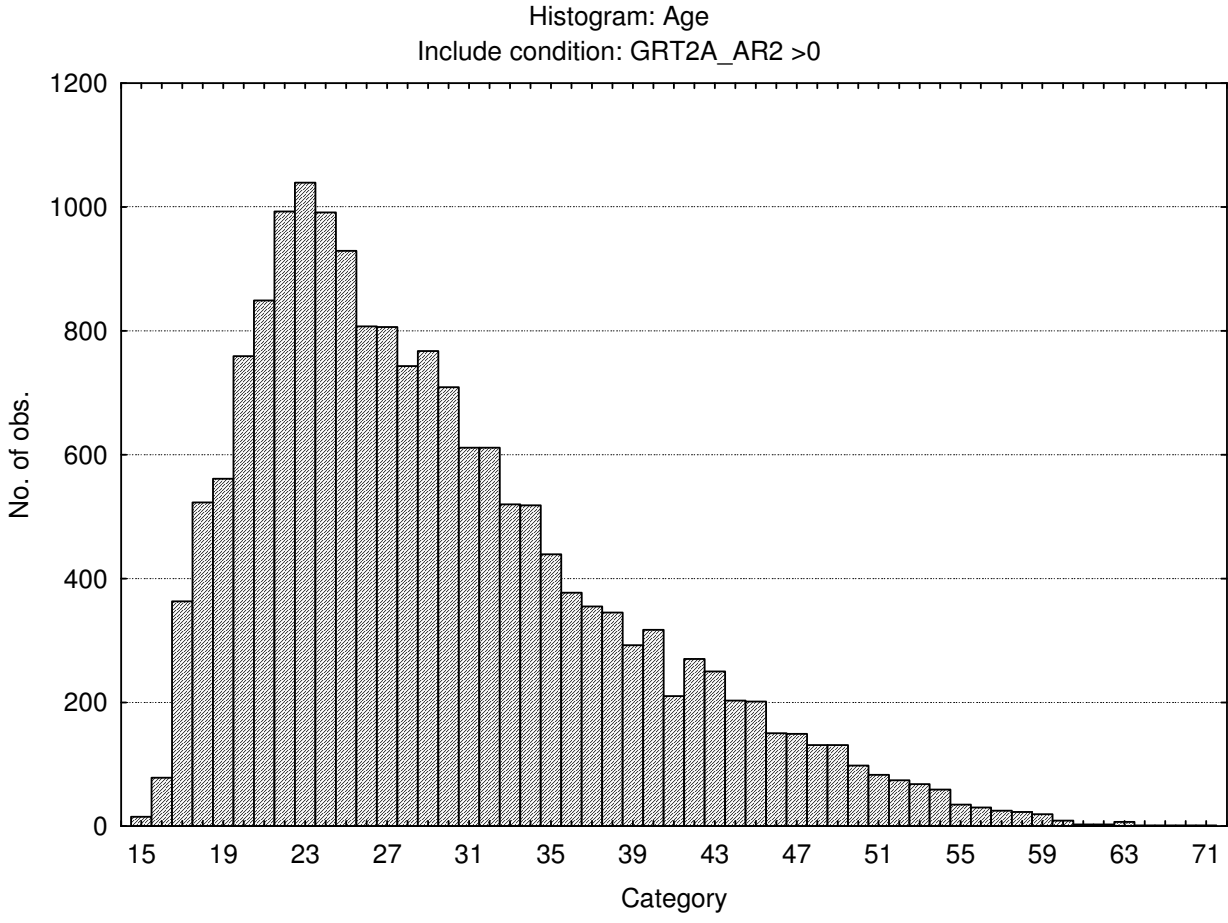
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	6256	6256	34.90682	34.9068
M	11604	17860	64.74724	99.6541
Missing	62	17922	0.34594	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	2095	2095	11.68954	11.6895
Grade 12	4312	6407	24.05981	35.7494
University Diploma	384	6791	2.14262	37.8920
Degree	1043	7834	5.81966	43.7116
Vocational Training	351	8185	1.95849	45.6701
Grade 10 or 11	919	9104	5.12778	50.7979
Grade 8	59	9163	0.32920	51.1271
Grade 9	66	9229	0.36826	51.4954
Grade 7	22	9251	0.12275	51.6181
Post Graduate	592	9843	3.30320	54.9213
Missing	8079	17922	45.07867	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2047	2047	11.42172	11.4217
English	3234	5281	18.04486	29.4666
Afrikaans	1972	7253	11.00324	40.4698
Setswana	586	7839	3.26972	43.7395
Sesotho	916	8755	5.11104	48.8506
Sepedi	238	8993	1.32798	50.1786
Xitsonga	136	9129	0.75884	50.9374
Tshivenda	70	9199	0.39058	51.3280
siSwati	63	9262	0.35152	51.6795
isiNdebele	33	9295	0.18413	51.8636
isiXhosa	1176	10471	6.56177	58.4254
Missing	7451	17922	41.57460	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3234	3234	18.04486	18.0449
Afrikaans	1972	5206	11.00324	29.0481
Indigenous	5350	10556	29.85158	58.8997
Missing	7366	17922	41.10032	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5868	5868	32.74188	32.7419
European	2566	8434	14.31760	47.0595
Coloured	1302	9736	7.26481	54.3243
Asian	1166	10902	6.50597	60.8303
Missing	7020	17922	39.16974	100.0000



**Cronbach coefficient alpha for the General Reasoning Test Battery  
subtests:**

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Verbal Reasoning Test	.84
General Numerical Reasoning Test	.85
General Abstract Reasoning Test	.84

# General Reasoning Test Battery Reliability: South Africans, ethnic group European, updated 2011

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## Characteristics of the sample

The sample consisted of South Africans of European race, tested by Psytech SA and collaborators in the period up to February 2011. Biographical particulars are reported separately for the different subtests of the GRT2, since not all respondents completed the entire battery.

## Biographical Characteristics: respondents who completed the Verbal Reasoning Test

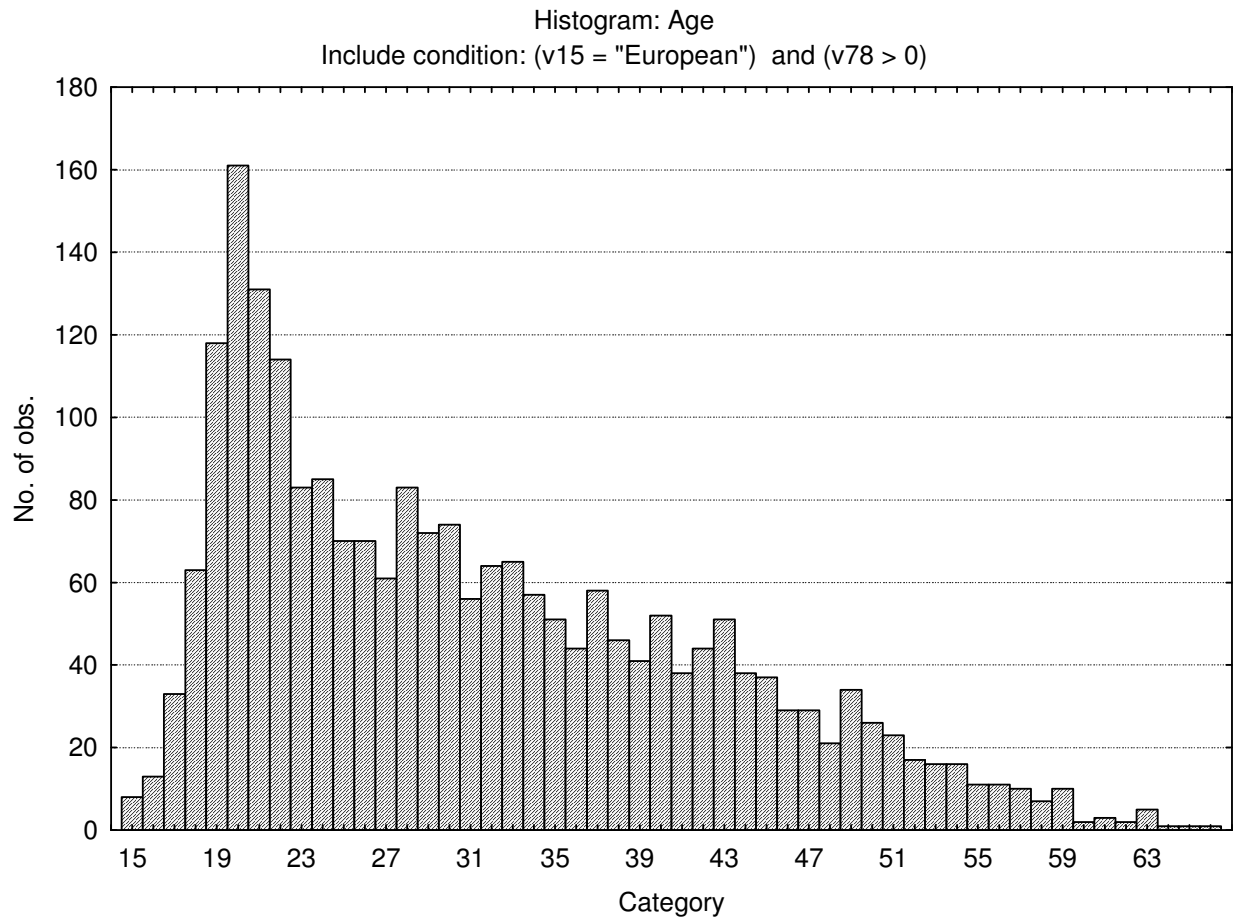
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	837	837	36.53426	36.5343
M	1447	2284	63.16019	99.6945
Missing	7	2291	0.30554	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	302	302	13.18202	13.1820
Grade 12	1033	1335	45.08948	58.2715
University Diploma	88	1423	3.84112	62.1126
Degree	179	1602	7.81318	69.9258
Vocational Training	66	1668	2.88084	72.8066
Grade 10 or 11	132	1800	5.76168	78.5683
Grade 8	2	1802	0.08730	78.6556
Grade 9	6	1808	0.26189	78.9175
Post Graduate	89	1897	3.88477	82.8023
Missing	394	2291	17.19773	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2	2	0.08730	0.0873
English	870	872	37.97468	38.0620
Afrikaans	1305	2177	56.96203	95.0240
Setswana	1	2178	0.04365	95.0677
Sesotho	1	2179	0.04365	95.1113
Sepedi	3	2182	0.13095	95.2423
isiXhosa	5	2187	0.21825	95.4605
Missing	104	2291	4.53950	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	870	870	37.97468	37.9747
Afrikaans	1305	2175	56.96203	94.9367
Indigenous	12	2187	0.52379	95.4605
Missing	104	2291	4.53950	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.23316	10.79142	15.00000	71.00000	2256	35



### Biographical characteristics: respondents who completed the Numerical Reasoning Test

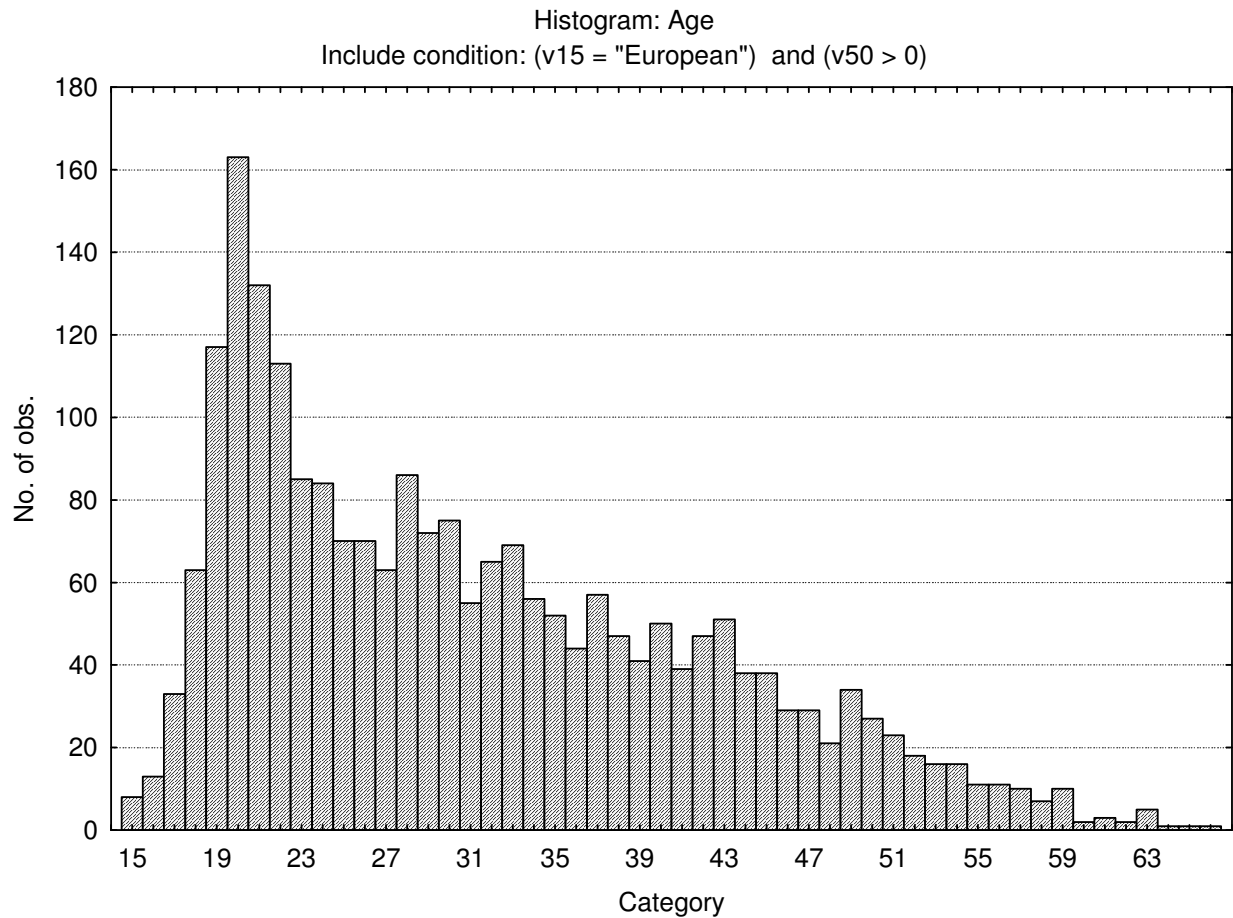
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	842	842	36.48180	36.4818
M	1459	2301	63.21490	99.6967
Missing	7	2308	0.30329	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	302	302	13.08492	13.0849
Grade 12	1045	1347	45.27730	58.3622
University Diploma	89	1436	3.85615	62.2184
Degree	178	1614	7.71231	69.9307
Vocational Training	66	1680	2.85962	72.7903
Grade 10 or 11	133	1813	5.76256	78.5529
Grade 8	2	1815	0.08666	78.6395
Grade 9	6	1821	0.25997	78.8995
Post Graduate	86	1907	3.72617	82.6256
Missing	401	2308	17.37435	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2	2	0.08666	0.0867
English	879	881	38.08492	38.1716
Afrikaans	1308	2189	56.67244	94.8440
Setswana	1	2190	0.04333	94.8873
Sesotho	1	2191	0.04333	94.9307
Sepedi	3	2194	0.12998	95.0607
isiXhosa	5	2199	0.21664	95.2773
Missing	109	2308	4.72270	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	879	879	38.08492	38.0849
Afrikaans	1308	2187	56.67244	94.7574
Indigenous	12	2199	0.51993	95.2773
Missing	109	2308	4.72270	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.25429	10.78301	15.00000	71.00000	2273	35



### Biographical characteristics: Respondents who completed the Abstract Reasoning Test

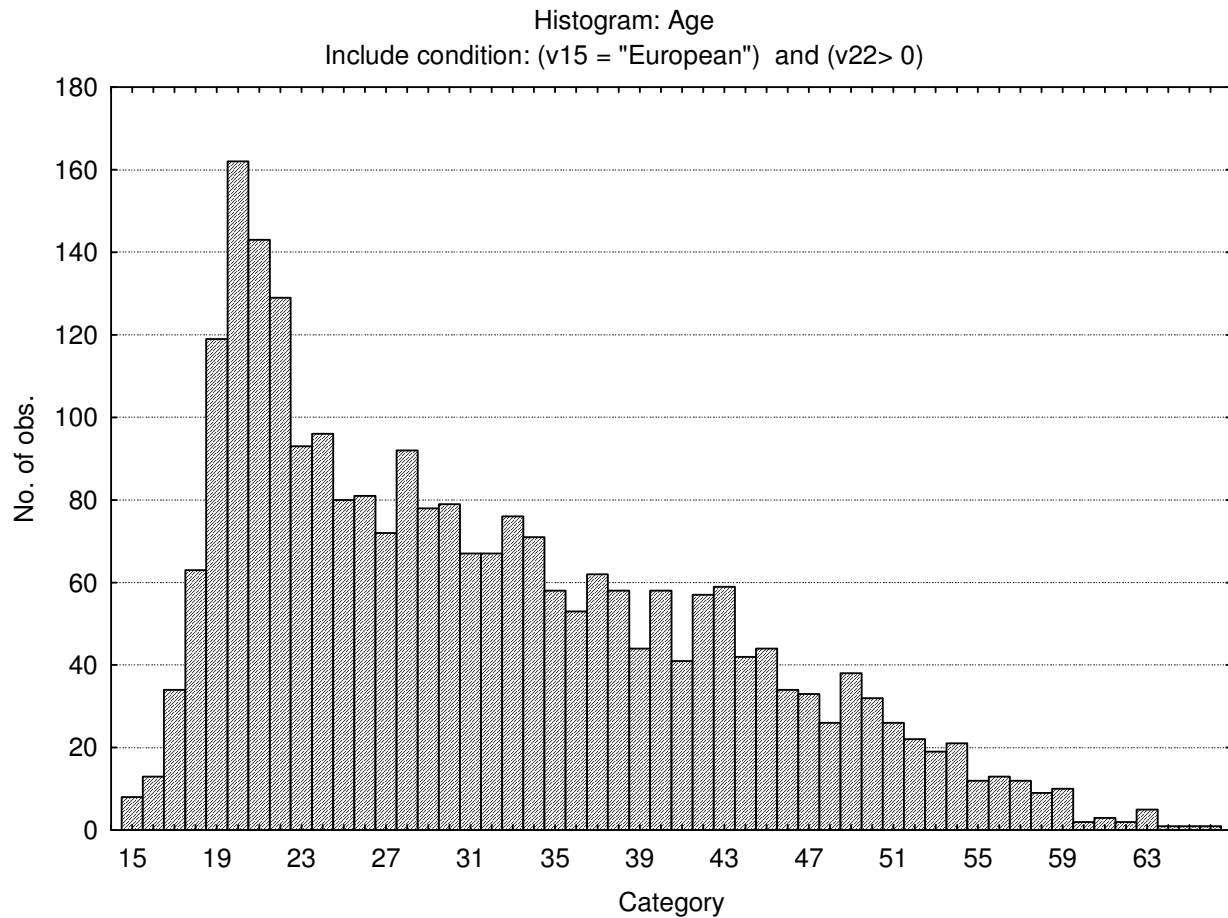
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	892	892	34.73520	34.7352
M	1668	2560	64.95327	99.6885
Missing	8	2568	0.31153	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	346	346	13.47352	13.4735
Grade 12	1107	1453	43.10748	56.5810
University Diploma	99	1552	3.85514	60.4361
Degree	225	1777	8.76168	69.1978
Vocational Training	67	1844	2.60903	71.8069
Grade 10 or 11	142	1986	5.52960	77.3364
Grade 8	2	1988	0.07788	77.4143
Grade 9	7	1995	0.27259	77.6869
Post Graduate	132	2127	5.14019	82.8271
Missing	441	2568	17.17290	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2	2	0.07788	0.0779
English	1061	1063	41.31620	41.3941
Afrikaans	1382	2445	53.81620	95.2103
Setswana	1	2446	0.03894	95.2492
Sesotho	2	2448	0.07788	95.3271
Sepedi	4	2452	0.15576	95.4829
siSwati	1	2453	0.03894	95.5218
isiXhosa	6	2459	0.23364	95.7555
Missing	109	2568	4.24455	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	1061	1061	41.31620	41.3162
Afrikaans	1382	2443	53.81620	95.1324
Indigenous	16	2459	0.62305	95.7555
Missing	109	2568	4.24455	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.61682	10.78160	15.00000	71.00000	2521	47



**Internal Consistency reliabilities for General Reasoning Test subtests**

Subtest	Cronbach Coefficient Alpha
Verbal Reasoning	.83
Numerical Reasoning	.87
Abstract Reasoning	.82

# General Reasoning Test Battery Reliability: South Africans, race Coloured, updated 2011

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## Sample composition

The sample consisted of South Africans belonging to the Coloured race group, tested by Psytech South Africa and collaborators during the period leading up to February 2011. Since not all the respondents completed all the subtests in the General Reasoning Test Battery, the sample composition is reported separately for the three subtests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	401	401	32.13141	32.1314
M	845	1246	67.70833	99.8397
Missing	2	1248	0.16026	100.0000

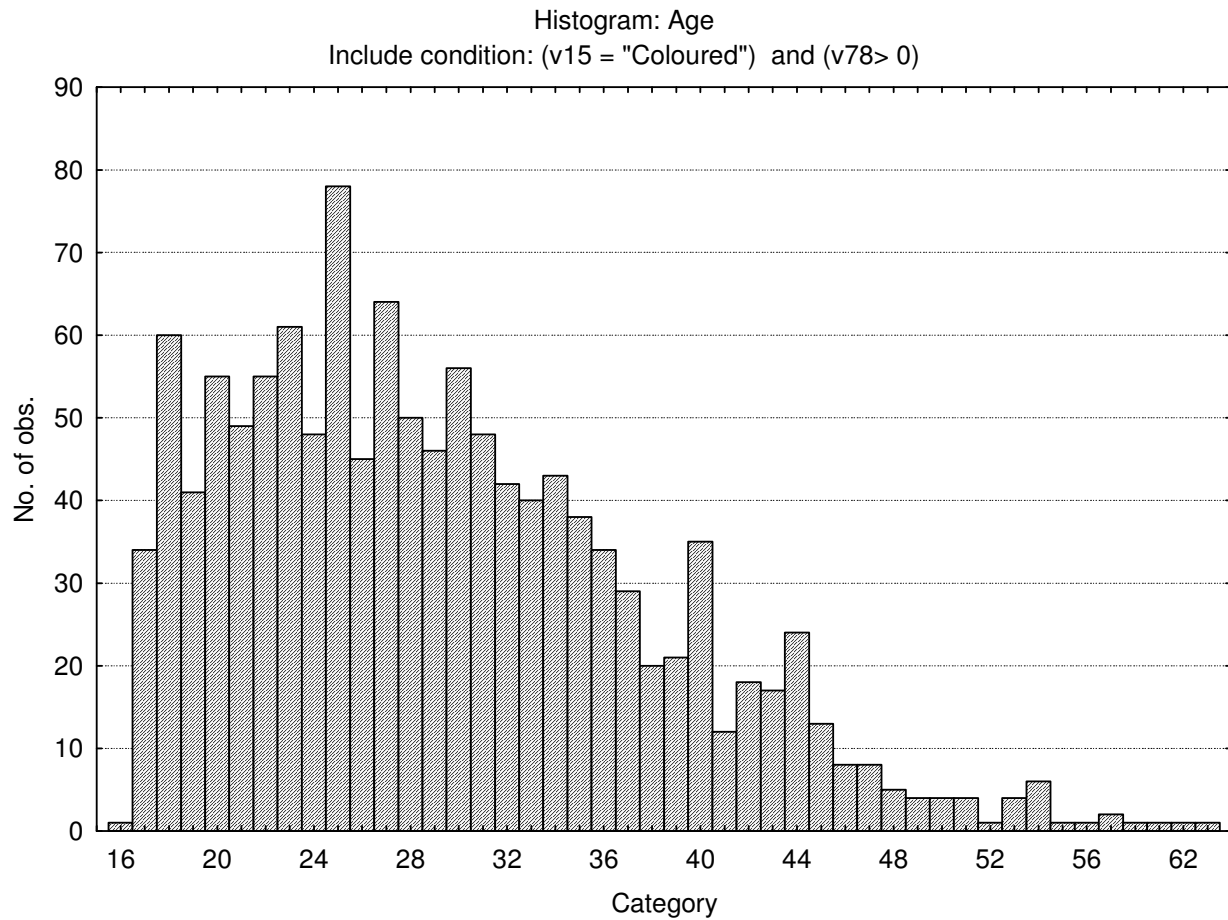
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	179	179	14.34295	14.3429
Grade 12	557	736	44.63141	58.9744
University Diploma	39	775	3.12500	62.0994
Degree	92	867	7.37179	69.4712
Vocational Training	45	912	3.60577	73.0769
Grade 10 or 11	135	1047	10.81731	83.8942
Grade 8	1	1048	0.08013	83.9744
Grade 9	5	1053	0.40064	84.3750
Grade 7	2	1055	0.16026	84.5353
Post Graduate	43	1098	3.44551	87.9808
Missing	150	1248	12.01923	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	4	4	0.32051	0.3205
English	715	719	57.29167	57.6122
Afrikaans	454	1173	36.37821	93.9904
Setswana	3	1176	0.24038	94.2308
Sesotho	1	1177	0.08013	94.3109
isiXhosa	9	1186	0.72115	95.0321
Missing	62	1248	4.96795	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	715	715	57.29167	57.2917
Afrikaans	454	1169	36.37821	93.6699
Indigenous	17	1186	1.36218	95.0321
Missing	62	1248	4.96795	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	1248	1248	100.0000	100.0000
Missing	0	1248	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.36697	8.546743	16.00000	63.00000	1229	19



**Sample composition: General Numerical Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	401	401	31.90135	31.9014
M	854	1255	67.93954	99.8409
Missing	2	1257	0.15911	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	179	179	14.24025	14.2403
Grade 12	567	746	45.10740	59.3477
University Diploma	39	785	3.10263	62.4503
Degree	92	877	7.31901	69.7693
Vocational Training	44	921	3.50040	73.2697
Grade 10 or 11	135	1056	10.73986	84.0095
Grade 8	1	1057	0.07955	84.0891
Grade 9	5	1062	0.39777	84.4869
Grade 7	2	1064	0.15911	84.6460
Post Graduate	43	1107	3.42084	88.0668
Missing	150	1257	11.93317	100.0000

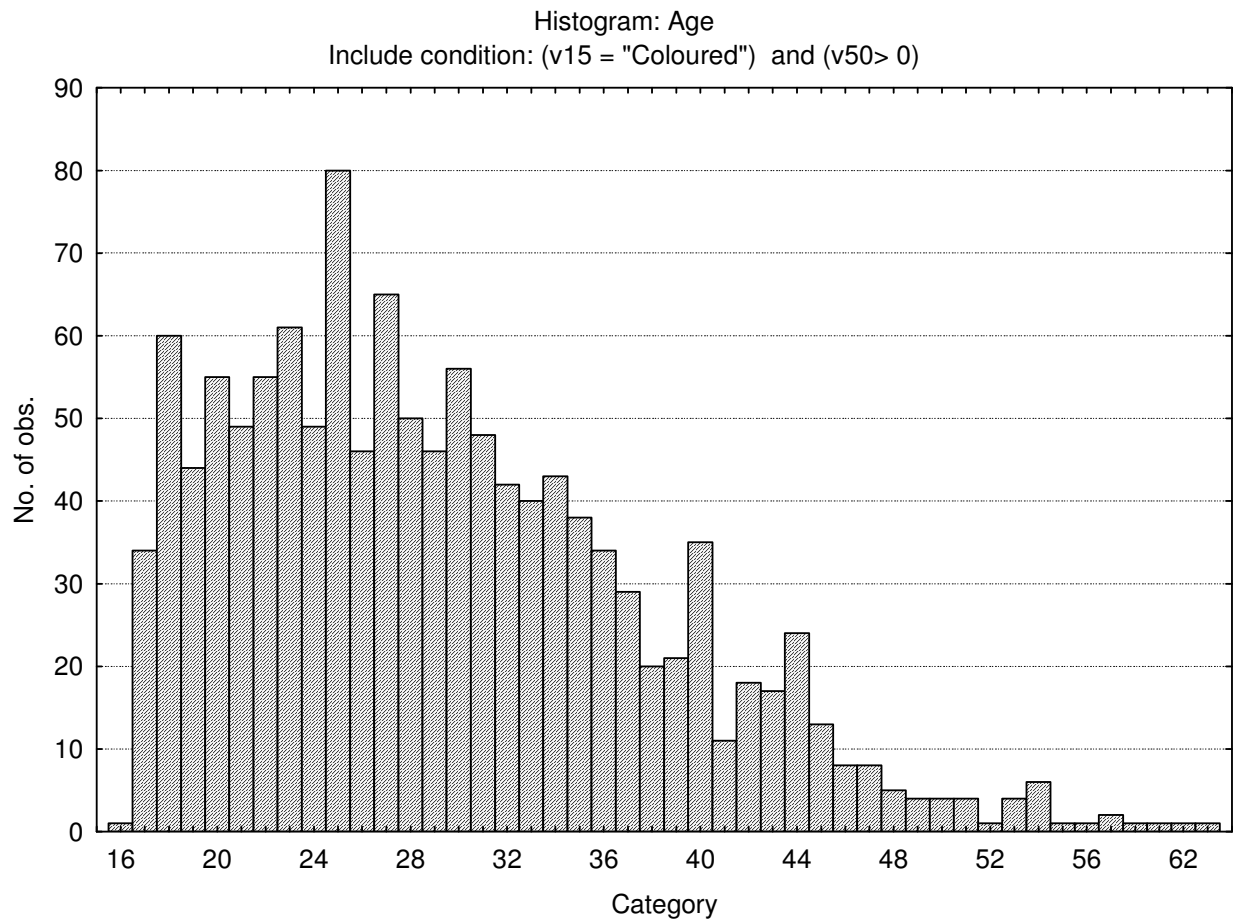
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	4	4	0.31822	0.3182
English	716	720	56.96102	57.2792
Afrikaans	463	1183	36.83373	94.1130
Setswana	3	1186	0.23866	94.3516
Sesotho	1	1187	0.07955	94.4312
isiXhosa	9	1196	0.71599	95.1472
Missing	61	1257	4.85282	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	716	716	56.96102	56.9610
Afrikaans	463	1179	36.83373	93.7947
Indigenous	17	1196	1.35243	95.1472
Missing	61	1257	4.85282	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	1257	1257	100.0000	100.0000
Missing	0	1257	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.31634	8.535200	16.00000	63.00000	1236	21



## Sample composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	421	421	32.33487	32.3349
M	879	1300	67.51152	99.8464
Missing	2	1302	0.15361	100.0000

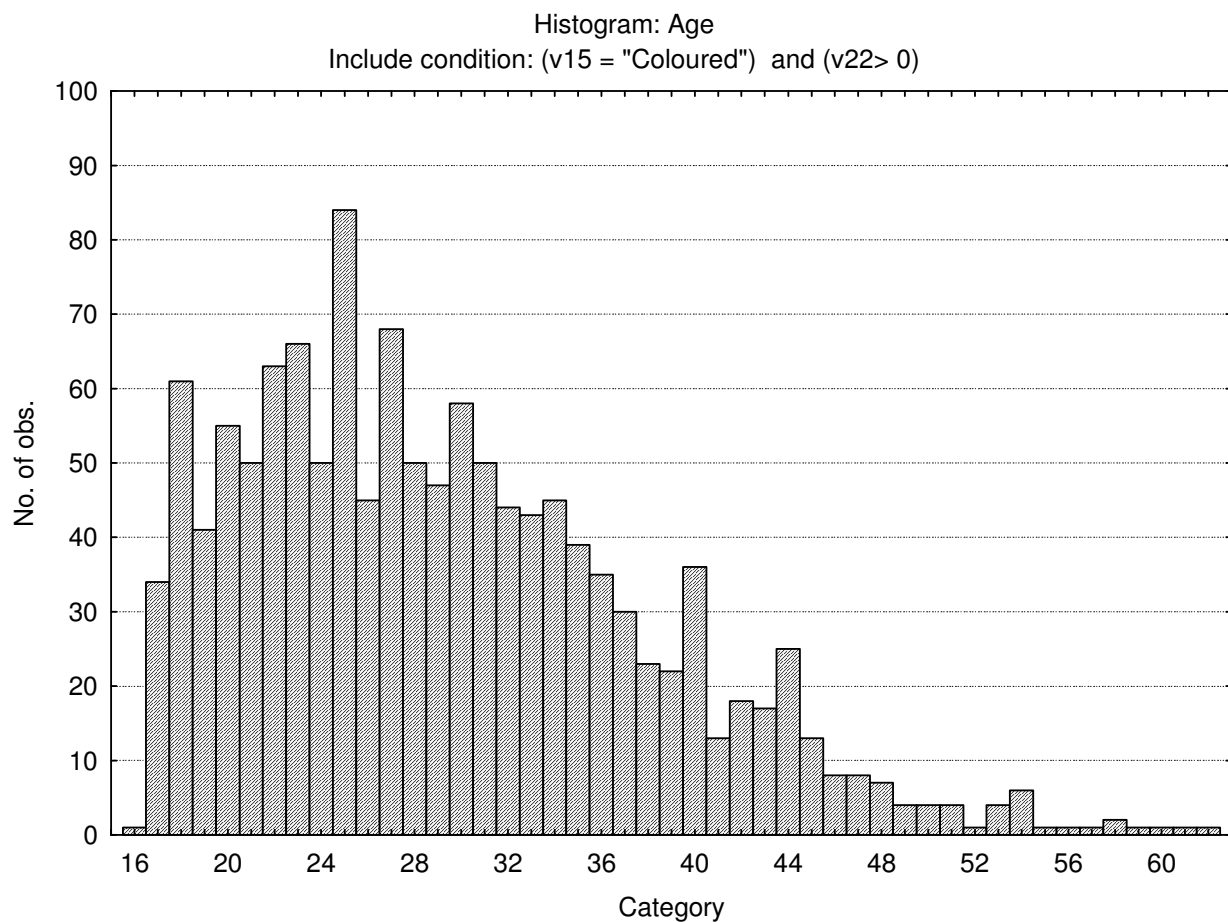
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	191	191	14.66974	14.6697
Grade 12	573	764	44.00922	58.6790
University Diploma	41	805	3.14900	61.8280
Degree	102	907	7.83410	69.6621
Vocational Training	46	953	3.53303	73.1951
Grade 10 or 11	135	1088	10.36866	83.5637
Grade 8	1	1089	0.07680	83.6406
Grade 9	6	1095	0.46083	84.1014
Grade 7	2	1097	0.15361	84.2550
Post Graduate	51	1148	3.91705	88.1720
Missing	154	1302	11.82796	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	4	4	0.30722	0.3072
English	756	760	58.06452	58.3717
Afrikaans	466	1226	35.79109	94.1628
Setswana	3	1229	0.23041	94.3932
Sesotho	1	1230	0.07680	94.4700
isiXhosa	9	1239	0.69124	95.1613
Missing	63	1302	4.83871	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	756	756	58.06452	58.0645
Afrikaans	466	1222	35.79109	93.8556
Indigenous	17	1239	1.30568	95.1613
Missing	63	1302	4.83871	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	1302	1302	100.0000	100.0000
Missing	0	1302	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.39032	8.533246	16.00000	63.00000	1281	21



## Internal Consistency Reliabilities for General Reasoning Test Battery subtests

	Cronbach Coefficient Alpha
General Verbal Reasoning Test	.80
General Numerical Reasoning Test	.84
General Abstract Reasoning Test	.80

# General Reasoning Test Battery Reliability: South Africans, Race African, updated 2011

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## Sample composition

The sample consisted of South Africans of African race who were tested by Psytech South Africa and collaborators during the period up to February 2011. Since not all respondents completed all the subtests of the General Reasoning Test Battery, the biographical characteristics are reported separately for the Verbal, Numerical and Abstract Reasoning tests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1608	1608	29.02527	29.0253
M	3914	5522	70.64982	99.6751
Missing	18	5540	0.32491	100.0000

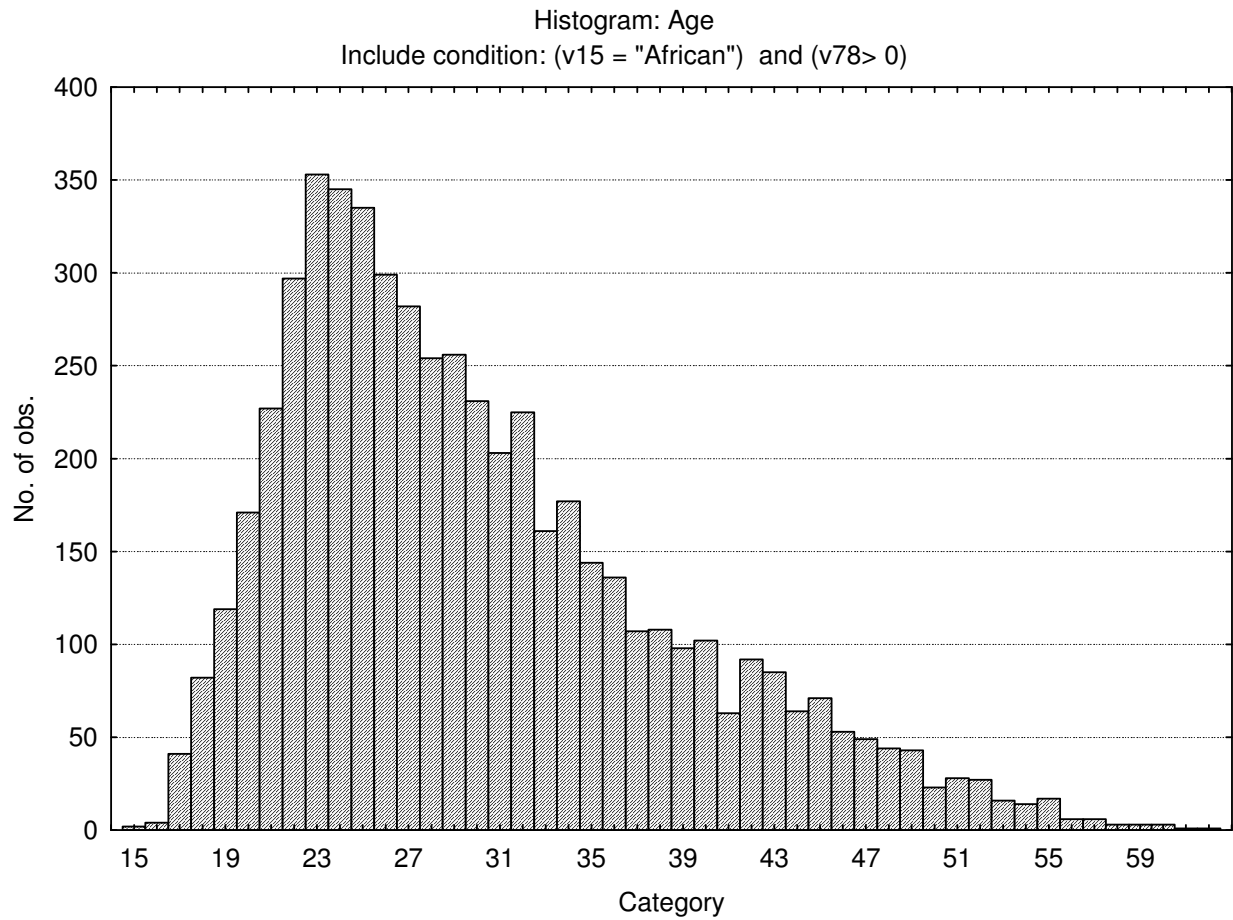
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1227	1227	22.14801	22.1480
Grade 12	1866	3093	33.68231	55.8303
University Diploma	182	3275	3.28520	59.1155
Degree	433	3708	7.81588	66.9314
Vocational Training	177	3885	3.19495	70.1264
Grade 10 or 11	546	4431	9.85560	79.9819
Grade 8	52	4483	0.93863	80.9206
Grade 9	48	4531	0.86643	81.7870
Grade 7	22	4553	0.39711	82.1841
Post Graduate	205	4758	3.70036	85.8845
Missing	782	5540	14.11552	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1883	1883	33.98917	33.9892
English	235	2118	4.24188	38.2310
Afrikaans	63	2181	1.13718	39.3682
Setswana	547	2728	9.87365	49.2419
Sesotho	870	3598	15.70397	64.9458
Sepedi	224	3822	4.04332	68.9892
Xitsonga	121	3943	2.18412	71.1733
Tshivenda	66	4009	1.19134	72.3646
siSwati	57	4066	1.02888	73.3935
isiNdebele	31	4097	0.55957	73.9531
isiXhosa	1080	5177	19.49458	93.4477
Missing	363	5540	6.55235	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	235	235	4.24188	4.2419
Afrikaans	63	298	1.13718	5.3791
Indigenous	4921	5219	88.82671	94.2058
Missing	321	5540	5.79422	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5540	5540	100.0000	100.0000
Missing	0	5540	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.07439	8.349547	15.00000	69.00000	5471	69



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1589	1589	28.77060	28.7706
M	3917	5506	70.92160	99.6922
Missing	17	5523	0.30780	100.0000

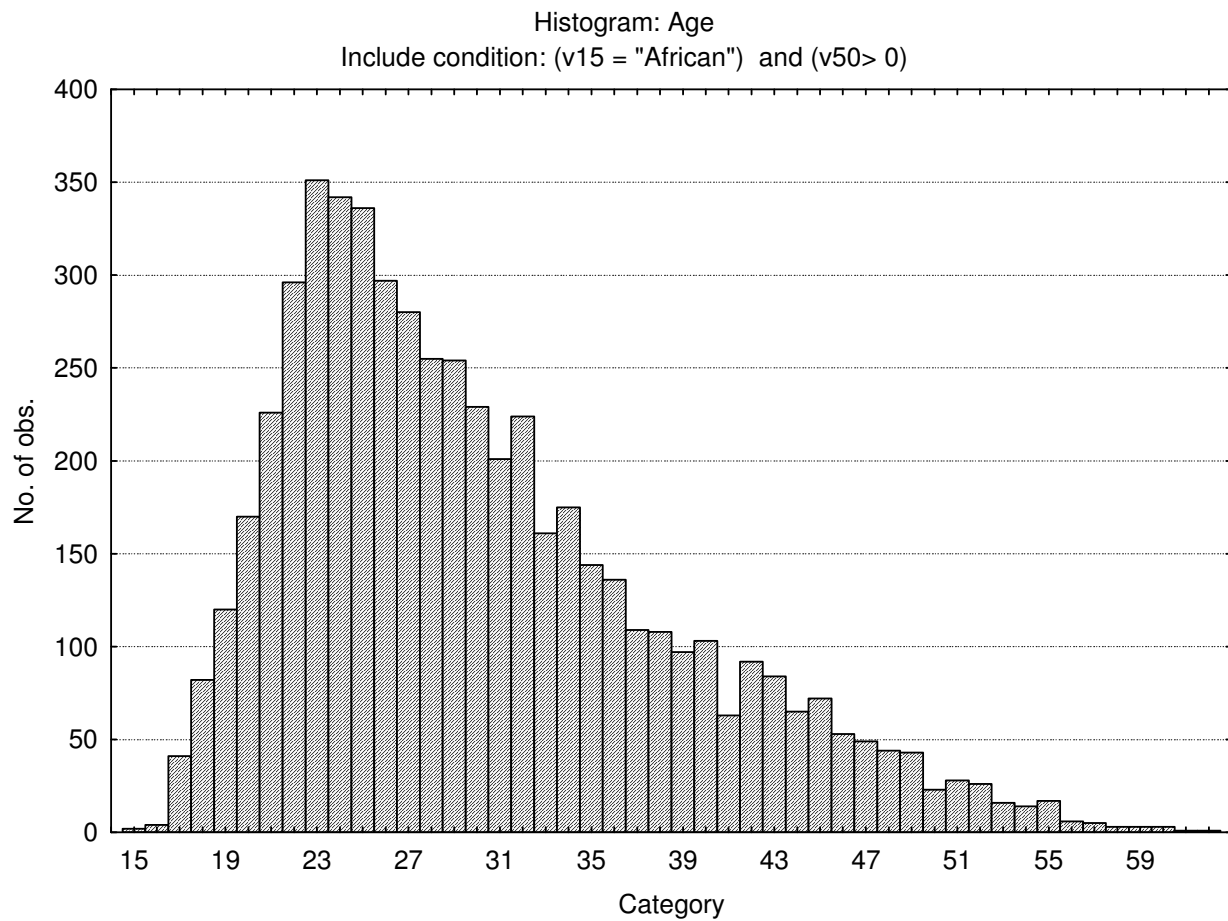
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1218	1218	22.05323	22.0532
Grade 12	1865	3083	33.76788	55.8211
University Diploma	180	3263	3.25910	59.0802
Degree	431	3694	7.80373	66.8839
Vocational Training	173	3867	3.13236	70.0163
Grade 10 or 11	549	4416	9.94025	79.9565
Grade 8	52	4468	0.94152	80.8981
Grade 9	49	4517	0.88720	81.7853
Grade 7	23	4540	0.41644	82.2017
Post Graduate	200	4740	3.62122	85.8229
Missing	783	5523	14.17708	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1878	1878	34.00326	34.0033
English	234	2112	4.23683	38.2401
Afrikaans	62	2174	1.12258	39.3627
Setswana	548	2722	9.92214	49.2848
Sesotho	867	3589	15.69799	64.9828
Sepedi	224	3813	4.05577	69.0386
Xitsonga	120	3933	2.17273	71.2113
Tshivenda	65	3998	1.17690	72.3882
siSwati	57	4055	1.03205	73.4202
isiNdebele	31	4086	0.56129	73.9815
isiXhosa	1076	5162	19.48217	93.4637
Missing	361	5523	6.53630	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	234	234	4.23683	4.2368
Afrikaans	62	296	1.12258	5.3594
Indigenous	4908	5204	88.86475	94.2242
Missing	319	5523	5.77585	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5523	5523	100.0000	100.0000
Missing	0	5523	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.07957	8.348953	15.00000	69.00000	5454	69



### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1685	1685	28.60295	28.6030
M	4188	5873	71.09150	99.6944
Missing	18	5891	0.30555	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1346	1346	22.84841	22.8484
Grade 12	1931	3277	32.77882	55.6272
University Diploma	206	3483	3.49686	59.1241
Degree	476	3959	8.08012	67.2042
Vocational Training	189	4148	3.20828	70.4125
Grade 10 or 11	554	4702	9.40418	79.8167
Grade 8	53	4755	0.89968	80.7163
Grade 9	50	4805	0.84875	81.5651
Grade 7	23	4828	0.39043	81.9555
Post Graduate	260	5088	4.41351	86.3690
Missing	803	5891	13.63096	100.0000

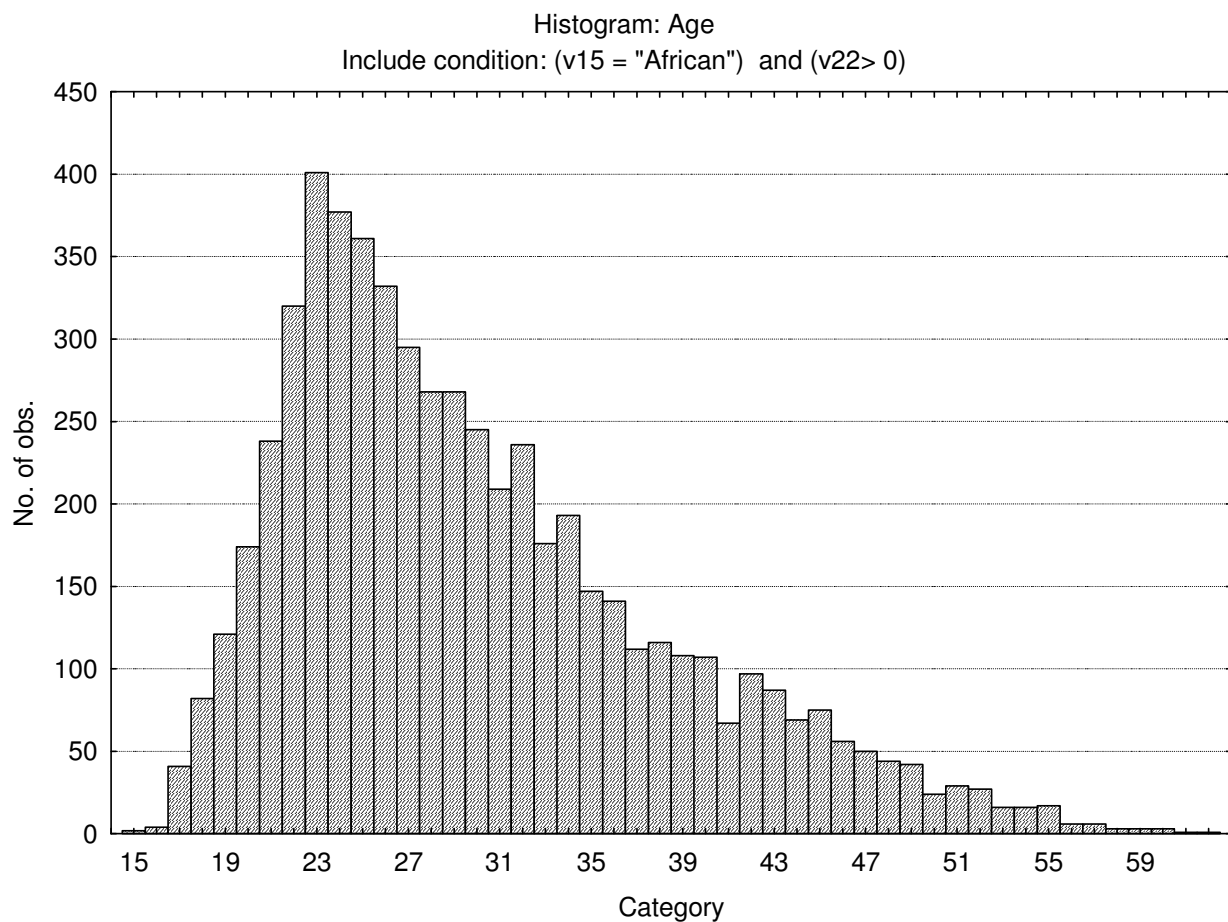
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2037	2037	34.57817	34.5782
English	252	2289	4.27771	38.8559
Afrikaans	65	2354	1.10338	39.9593
Setswana	574	2928	9.74368	49.7029
Sesotho	912	3840	15.48124	65.1842
Sepedi	232	4072	3.93821	69.1224
Xitsonga	137	4209	2.32558	71.4480
Tshivenda	70	4279	1.18825	72.6362
siSwati	60	4339	1.01850	73.6547
isiNdebele	32	4371	0.54320	74.1979
isiXhosa	1143	5514	19.40248	93.6004
Missing	377	5891	6.39959	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	252	252	4.27771	4.2777
Afrikaans	65	317	1.10338	5.3811
Indigenous	5239	5556	88.93227	94.3134
Missing	335	5891	5.68664	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5891	5891	100.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Missing	0	5891	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.00327	8.275381	15.00000	69.00000	5813	78



### Internal consistency reliabilities for General Reasoning Test Battery subtests

	Cronbach Coefficient Alpha
General Verbal Reasoning Test	.78

General Numerical Reasoning Test	.73
General Abstract Reasoning Test	.79

# General Reasoning Test Battery Reliability: South Africans, Race Asian, updated 2011

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## Sample composition

The sample consisted of South Africans belonging to the Asian race group, who were tested by Psytech South Africa and collaborators during the period leading up to February 2011. Since not all the respondents completed the full General Reasoning Test Battery, the sample compositions for the subtests are reported separately.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	294	294	32.99663	32.9966
M	596	890	66.89113	99.8878
Missing	1	891	0.11223	100.0000

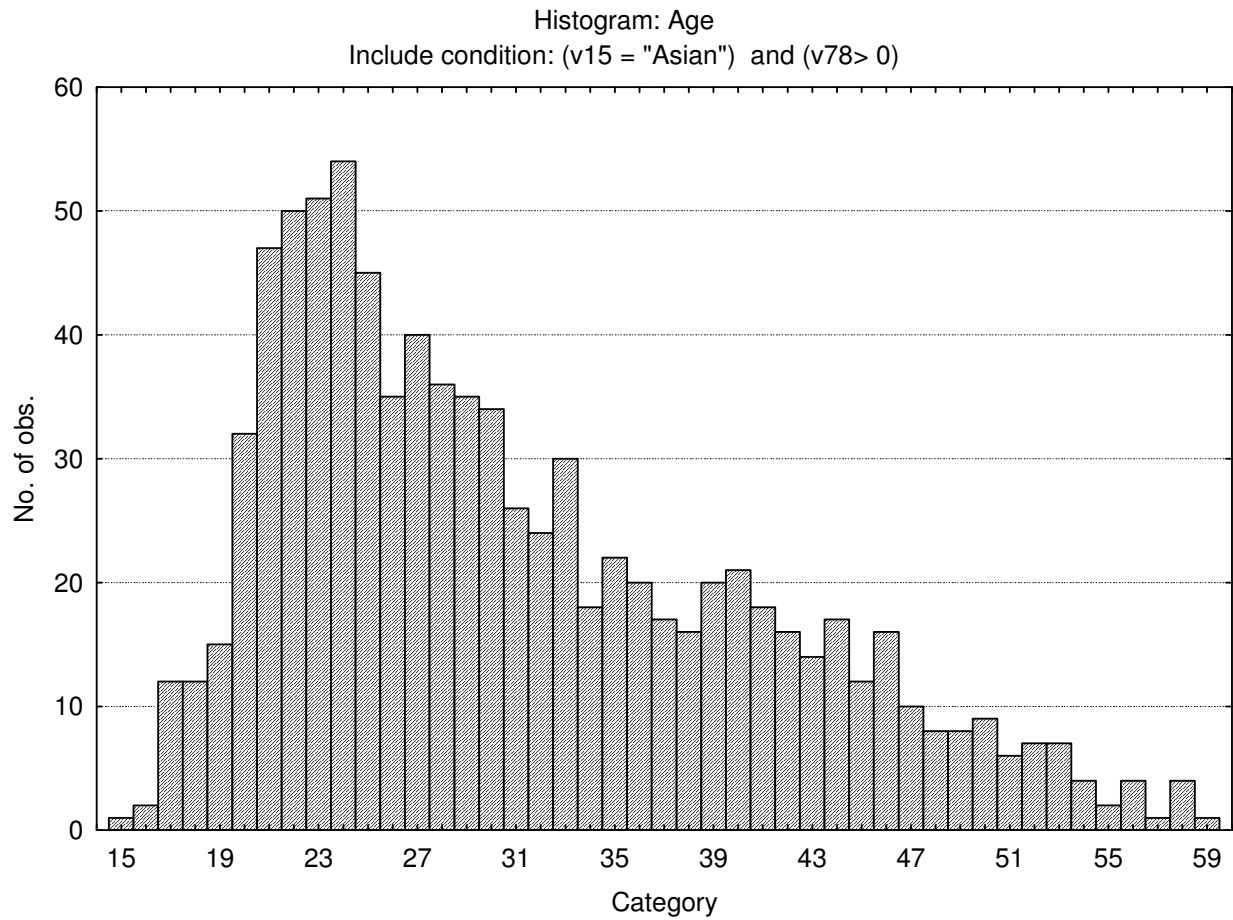
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	138	138	15.48822	15.4882
Grade 12	333	471	37.37374	52.8620
University Diploma	25	496	2.80584	55.6678
Degree	95	591	10.66218	66.3300
Vocational Training	42	633	4.71380	71.0438
Grade 10 or 11	66	699	7.40741	78.4512
Grade 8	5	704	0.56117	79.0123
Grade 9	5	709	0.56117	79.5735
Post Graduate	68	777	7.63187	87.2054
Missing	114	891	12.79461	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	8	8	0.89787	0.8979
English	806	814	90.46016	91.3580
Afrikaans	1	815	0.11223	91.4703
Setswana	2	817	0.22447	91.6947
Sepedi	1	818	0.11223	91.8070
Tshivenda	1	819	0.11223	91.9192
isiXhosa	2	821	0.22447	92.1437
Missing	70	891	7.85634	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	806	806	90.46016	90.4602
Afrikaans	1	807	0.11223	90.5724
Indigenous	15	822	1.68350	92.2559
Missing	69	891	7.74411	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Asian	891	891	100.0000	100.0000
Missing	0	891	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.05802	9.500752	15.00000	59.00000	879	12



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	293	293	32.99550	32.9955
M	594	887	66.89189	99.8874
Missing	1	888	0.11261	100.0000

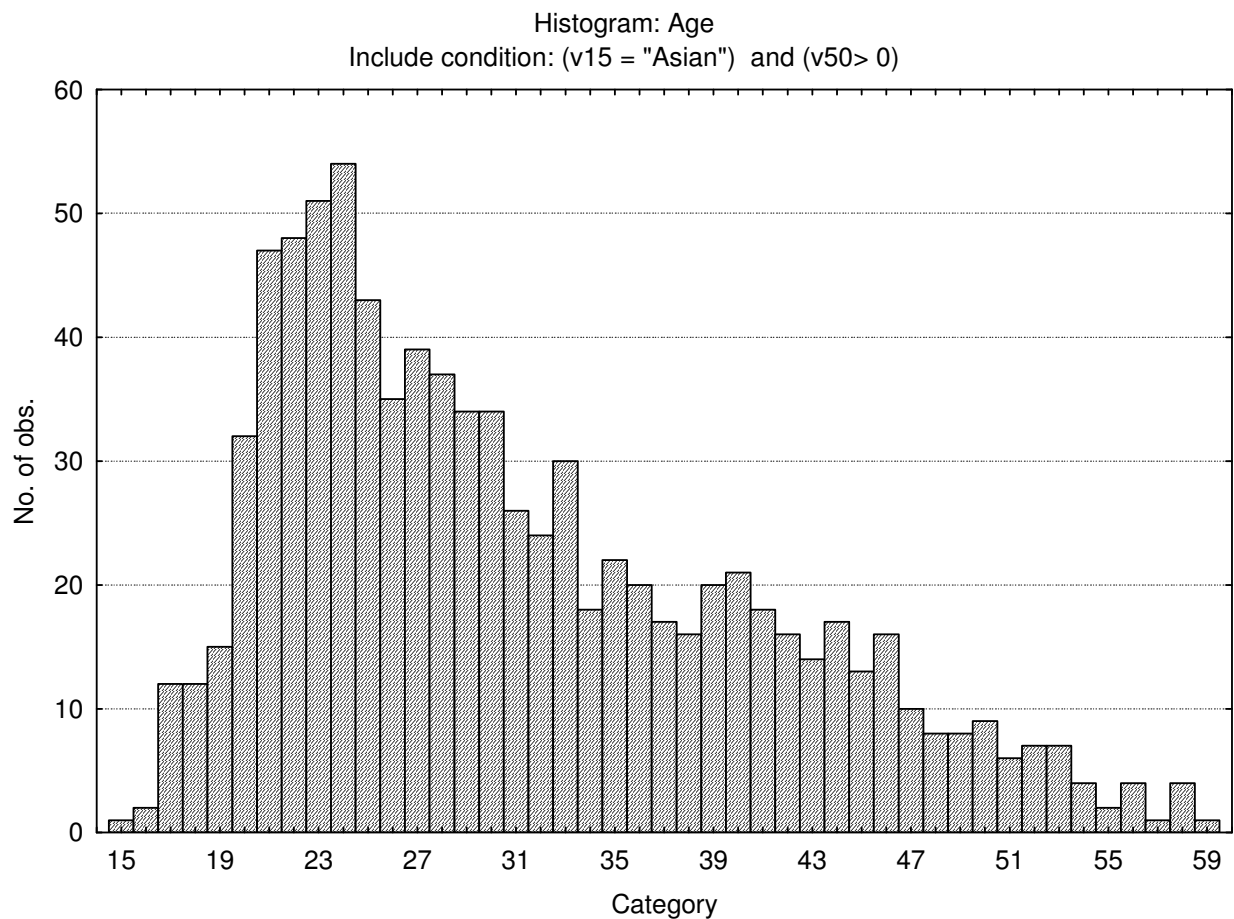
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	139	139	15.65315	15.6532
Grade 12	335	474	37.72523	53.3784
University Diploma	25	499	2.81532	56.1937
Degree	91	590	10.24775	66.4414
Vocational Training	42	632	4.72973	71.1712
Grade 10 or 11	66	698	7.43243	78.6036
Grade 8	5	703	0.56306	79.1667
Grade 9	5	708	0.56306	79.7297
Post Graduate	65	773	7.31982	87.0495
Missing	115	888	12.95045	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	8	8	0.90090	0.9009
English	801	809	90.20270	91.1036
Afrikaans	1	810	0.11261	91.2162
Setswana	2	812	0.22523	91.4414
Sepedi	1	813	0.11261	91.5541
Tshivenda	1	814	0.11261	91.6667
isiXhosa	2	816	0.22523	91.8919
Missing	72	888	8.10811	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	801	801	90.20270	90.2027
Afrikaans	1	802	0.11261	90.3153
Indigenous	15	817	1.68919	92.0045
Missing	71	888	7.99550	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Asian	888	888	100.0000	100.0000
Missing	0	888	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.11200	9.519042	15.00000	59.00000	875	13



### Sample composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	330	330	28.27763	28.2776
M	835	1165	71.55099	99.8286
Missing	2	1167	0.17138	100.0000

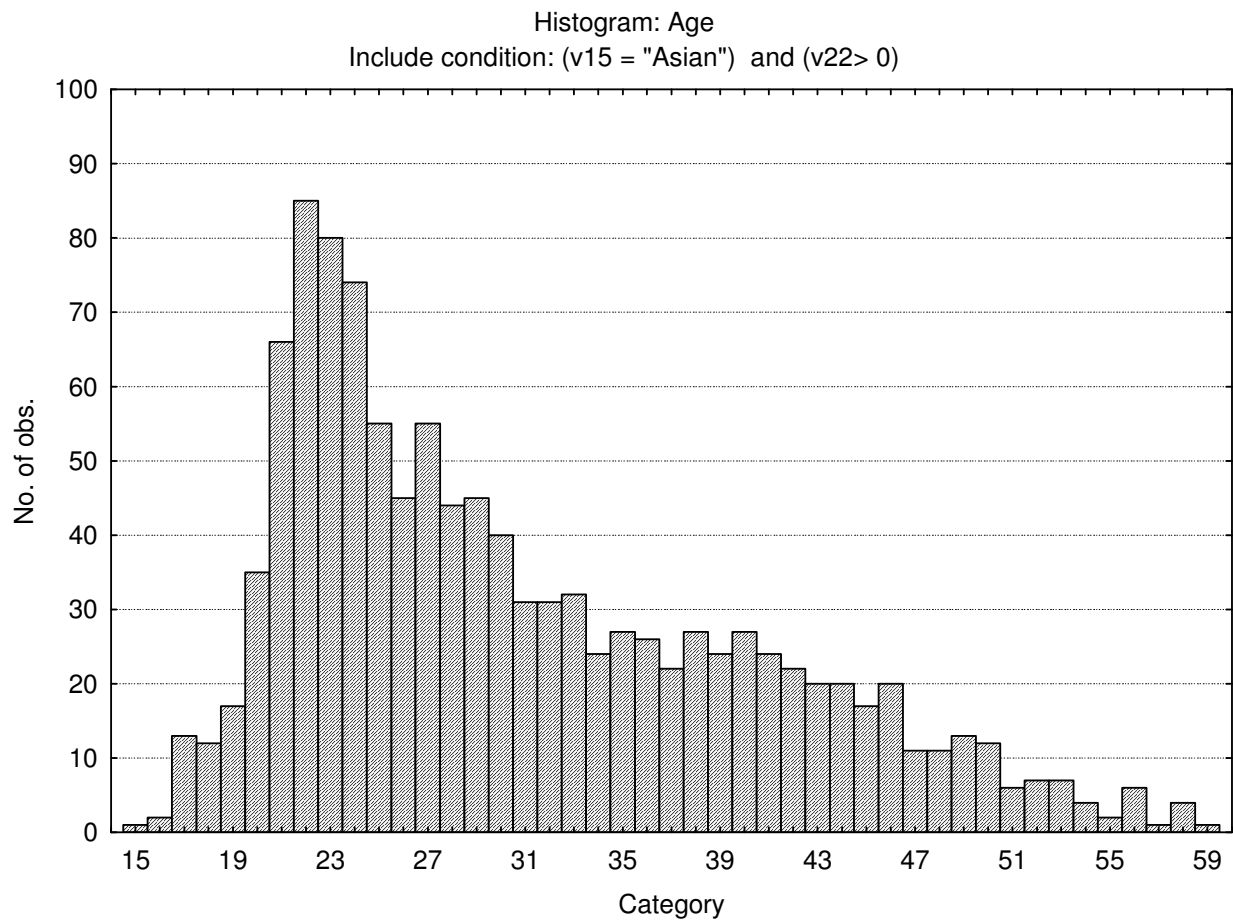
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	186	186	15.93830	15.9383
Grade 12	396	582	33.93316	49.8715
University Diploma	32	614	2.74207	52.6135
Degree	158	772	13.53899	66.1525
Vocational Training	43	815	3.68466	69.8372
Grade 10 or 11	70	885	5.99829	75.8355
Grade 8	5	890	0.42845	76.2639
Grade 9	5	895	0.42845	76.6924
Post Graduate	126	1021	10.79692	87.4893
Missing	146	1167	12.51071	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	10	10	0.85690	0.8569
English	1076	1086	92.20223	93.0591
Afrikaans	1	1087	0.08569	93.1448
Setswana	2	1089	0.17138	93.3162
Sesotho	1	1090	0.08569	93.4019
Sepedi	1	1091	0.08569	93.4876
Tshivenda	1	1092	0.08569	93.5733
siSwati	1	1093	0.08569	93.6590
isiXhosa	3	1096	0.25707	93.9160
Missing	71	1167	6.08398	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	1076	1076	92.20223	92.2022
Afrikaans	1	1077	0.08569	92.2879
Indigenous	20	1097	1.71380	94.0017
Missing	70	1167	5.99829	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Asian	1167	1167	100.0000	100.0000
Missing	0	1167	0.0000	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.81359	9.337894	15.00000	59.00000	1148	19



### Internal consistency reliabilities for General Reasoning Test Battery subtests

	Cronbach Coefficient Alpha
General Verbal Reasoning Test	.81
General Numerical Reasoning Test	.84
General Abstract Reasoning Test	.82

# General Reasoning Test Battery Reliability: South Africans, English speaking, Updated 2011

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## Sample composition

The sample consisted of South Africans tested by Psytech South Africa and collaborators during the period up to February 2011. Since not all respondents completed all the subtests of the General Reasoning Test Battery, biographical characteristics are reported separately for the different subtests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1013	1013	37.32498	37.3250
M	1698	2711	62.56448	99.8895
Missing	3	2714	0.11054	100.0000

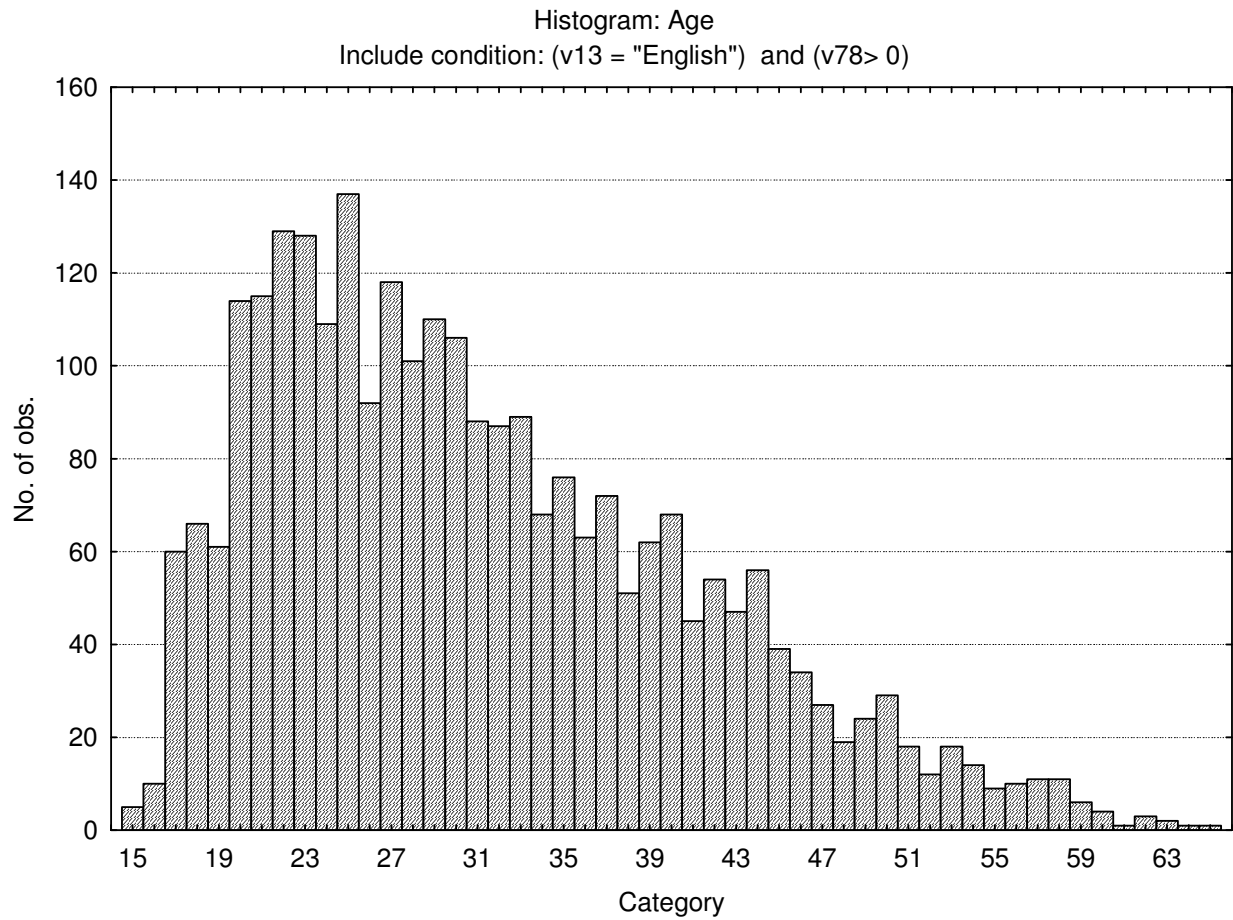
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	372	372	13.70671	13.7067
Grade 12	1127	1499	41.52542	55.2321
University Diploma	98	1597	3.61091	58.8430
Degree	280	1877	10.31688	69.1599
Vocational Training	102	1979	3.75829	72.9182
Grade 10 or 11	196	2175	7.22181	80.1400
Grade 8	7	2182	0.25792	80.3979
Grade 9	13	2195	0.47900	80.8769
Grade 7	1	2196	0.03685	80.9138
Post Graduate	168	2364	6.19013	87.1039
Missing	350	2714	12.89609	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2714	2714	100.0000	100.0000
Missing	0	2714	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2714	2714	100.0000	100.0000
Missing	0	2714	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	235	235	8.65881	8.6588
European	870	1105	32.05601	40.7148
Coloured	715	1820	26.34488	67.0597
Asian	806	2626	29.69786	96.7576
Missing	88	2714	3.24245	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.23993	9.825060	15.00000	68.00000	2680	34



Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1012	1012	37.21957	37.2196
M	1704	2716	62.67010	99.8897
Missing	3	2719	0.11033	100.0000

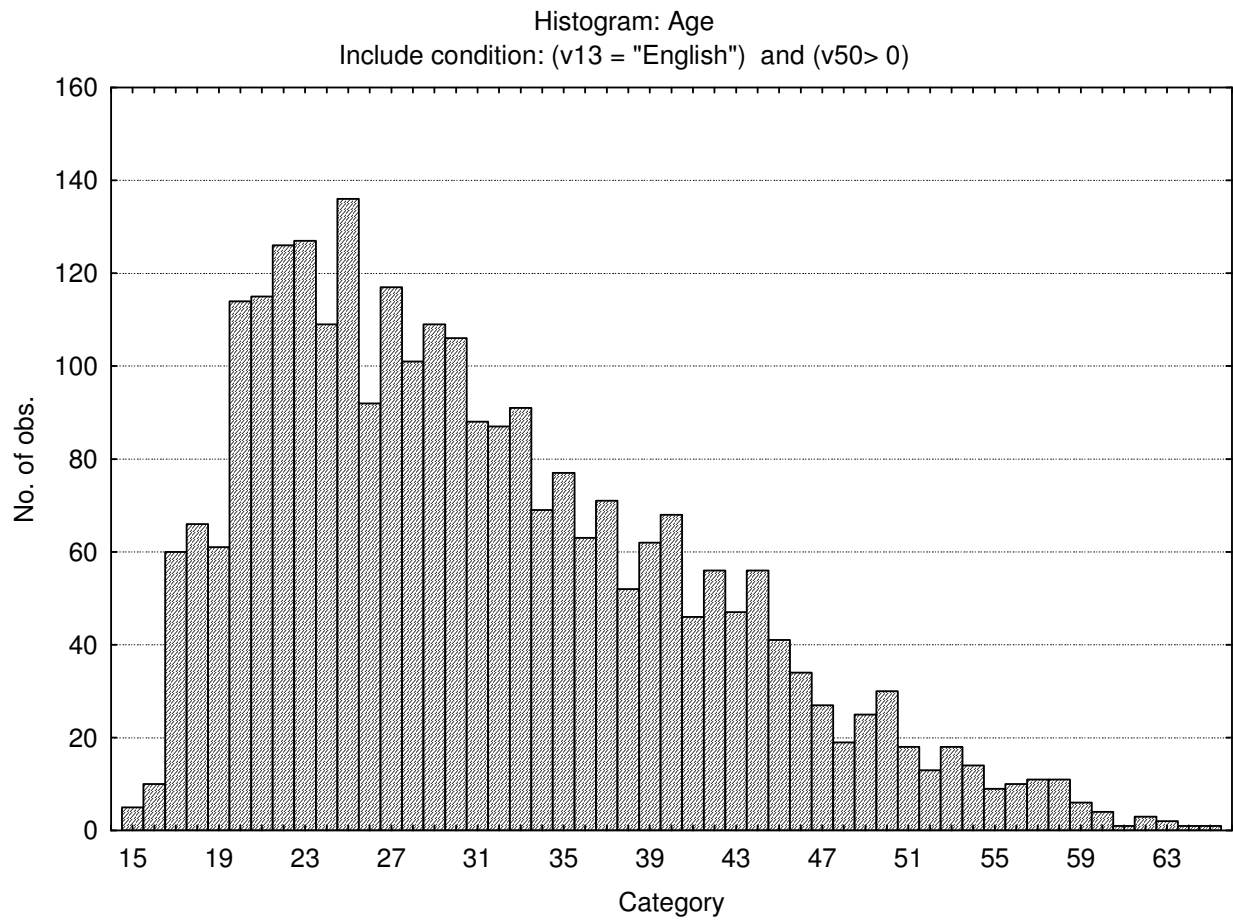
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	375	375	13.79184	13.7918
Grade 12	1137	1512	41.81684	55.6087
University Diploma	99	1611	3.64104	59.2497
Degree	275	1886	10.11401	69.3637
Vocational Training	102	1988	3.75138	73.1151
Grade 10 or 11	197	2185	7.24531	80.3604
Grade 8	7	2192	0.25745	80.6179
Grade 9	13	2205	0.47812	81.0960
Grade 7	1	2206	0.03678	81.1328
Post Graduate	163	2369	5.99485	87.1276
Missing	350	2719	12.87238	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2719	2719	100.0000	100.0000
Missing	0	2719	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	2719	2719	100.0000	100.0000
Missing	0	2719	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	234	234	8.60611	8.6061
European	879	1113	32.32806	40.9342
Coloured	716	1829	26.33321	67.2674
Asian	801	2630	29.45936	96.7267
Missing	89	2719	3.27326	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.30540	9.843325	15.00000	68.00000	2685	34



**Sample composition: General Abstract Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1103	1103	34.07476	34.0748
M	2130	3233	65.80167	99.8764
Missing	4	3237	0.12357	100.0000

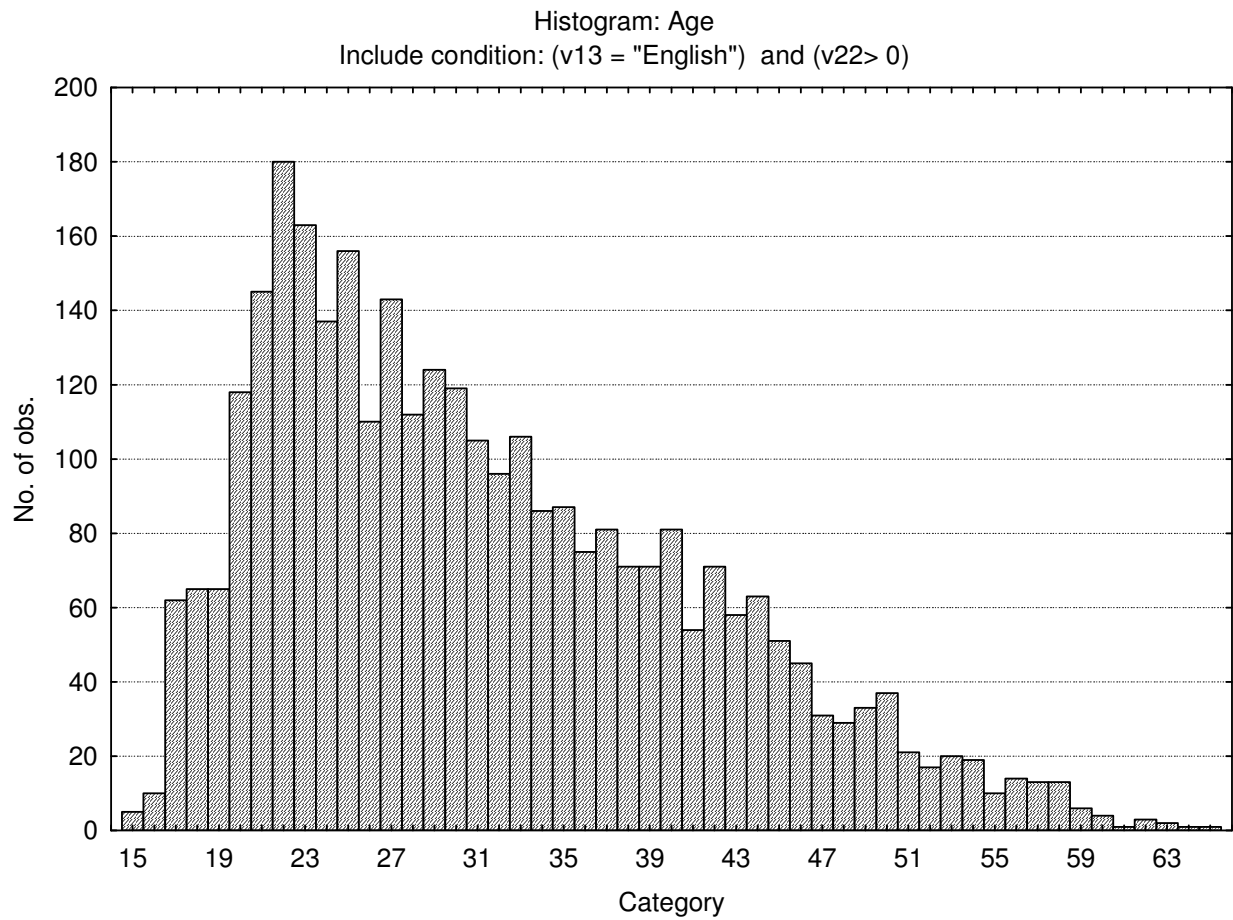
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	468	468	14.45783	14.4578
Grade 12	1240	1708	38.30707	52.7649
University Diploma	117	1825	3.61446	56.3794
Degree	381	2206	11.77016	68.1495
Vocational Training	104	2310	3.21285	71.3624
Grade 10 or 11	211	2521	6.51838	77.8808
Grade 8	7	2528	0.21625	78.0970
Grade 9	15	2543	0.46339	78.5604
Grade 7	1	2544	0.03089	78.5913
Post Graduate	265	2809	8.18659	86.7779
Missing	428	3237	13.22212	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3237	3237	100.0000	100.0000
Missing	0	3237	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3237	3237	100.0000	100.0000
Missing	0	3237	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	252	252	7.78499	7.7850
European	1061	1313	32.77726	40.5622
Coloured	756	2069	23.35496	63.9172
Asian	1076	3145	33.24065	97.1579
Missing	92	3237	2.84214	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31.45204	9.838141	15.00000	68.00000	3190	47



### Internal consistency reliability for General Reasoning Test subtests

	Cronbach Coefficient Alpha
General Verbal Reasoning Test	.84
General Numerical Reasoning Test	.86
General Abstract Reasoning Test	.82

# General Reasoning Test Battery Reliability: South Africans, Afrikaans speaking, updated 2011

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## Sample composition

The sample consisted of South Africans with Afrikaans as home language, tested by Psytech SA and collaborators in the period up to February 2011. Because not all respondents completed the whole General Reasoning Test Battery, biographical information is reported separately for the different subtests.

## Sample composition – General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	561	561	29.84043	29.8404
M	1313	1874	69.84043	99.6809
Missing	6	1880	0.31915	100.0000

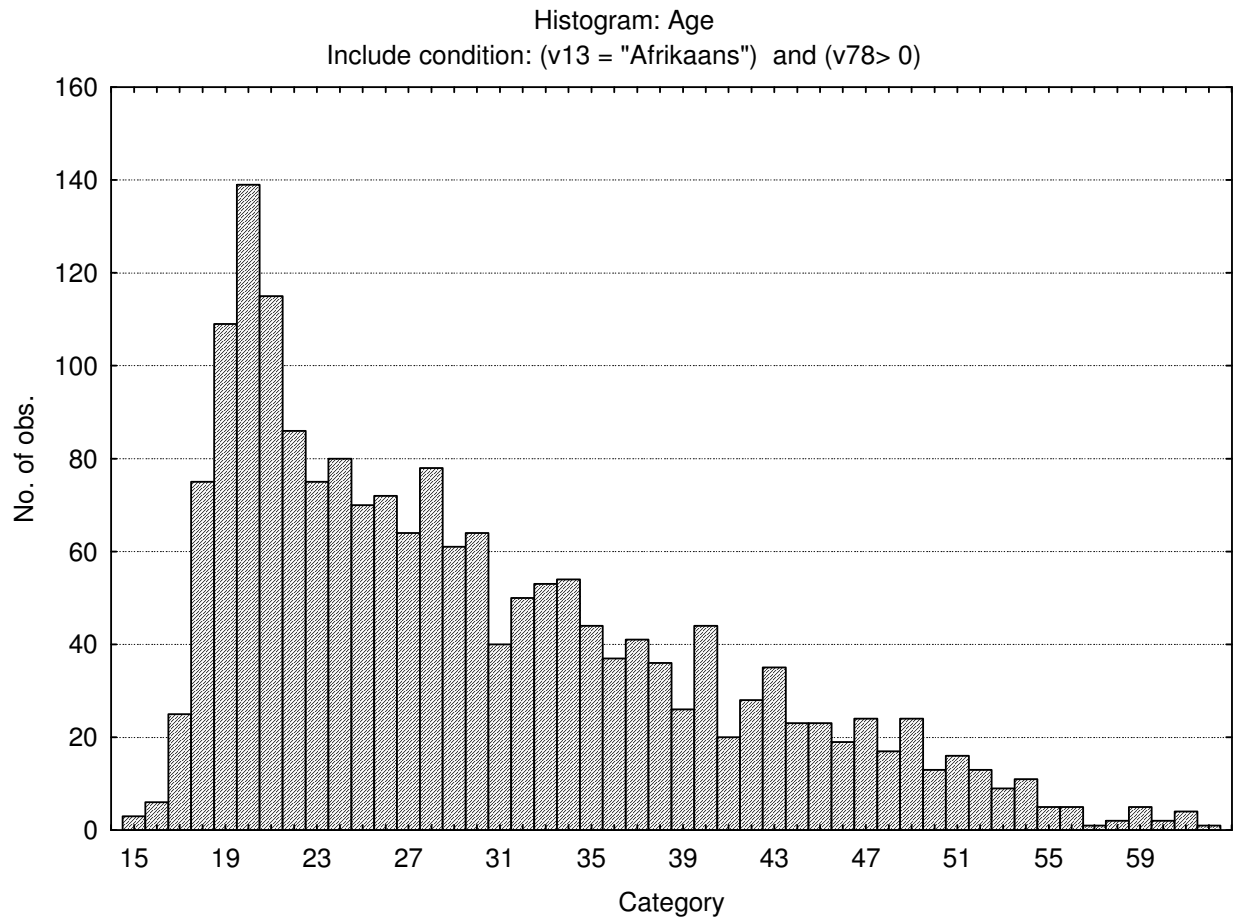
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	277	277	14.73404	14.7340
Grade 12	854	1131	45.42553	60.1596
University Diploma	57	1188	3.03191	63.1915
Degree	113	1301	6.01064	69.2021
Vocational Training	51	1352	2.71277	71.9149
Grade 10 or 11	146	1498	7.76596	79.6809
Grade 8	1	1499	0.05319	79.7340
Grade 9	3	1502	0.15957	79.8936
Post Graduate	57	1559	3.03191	82.9255
Missing	321	1880	17.07447	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1880	1880	100.0000	100.0000
Missing	0	1880	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1880	1880	100.0000	100.0000
Missing	0	1880	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	63	63	3.35106	3.3511
European	1305	1368	69.41489	72.7660
Coloured	454	1822	24.14894	96.9149
Asian	1	1823	0.05319	96.9681
Missing	57	1880	3.03191	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.84353	9.945948	15.00000	71.00000	1847	33



**Sample composition: General Numerical Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	564	564	29.73115	29.7312
M	1327	1891	69.95256	99.6837
Missing	6	1897	0.31629	100.0000

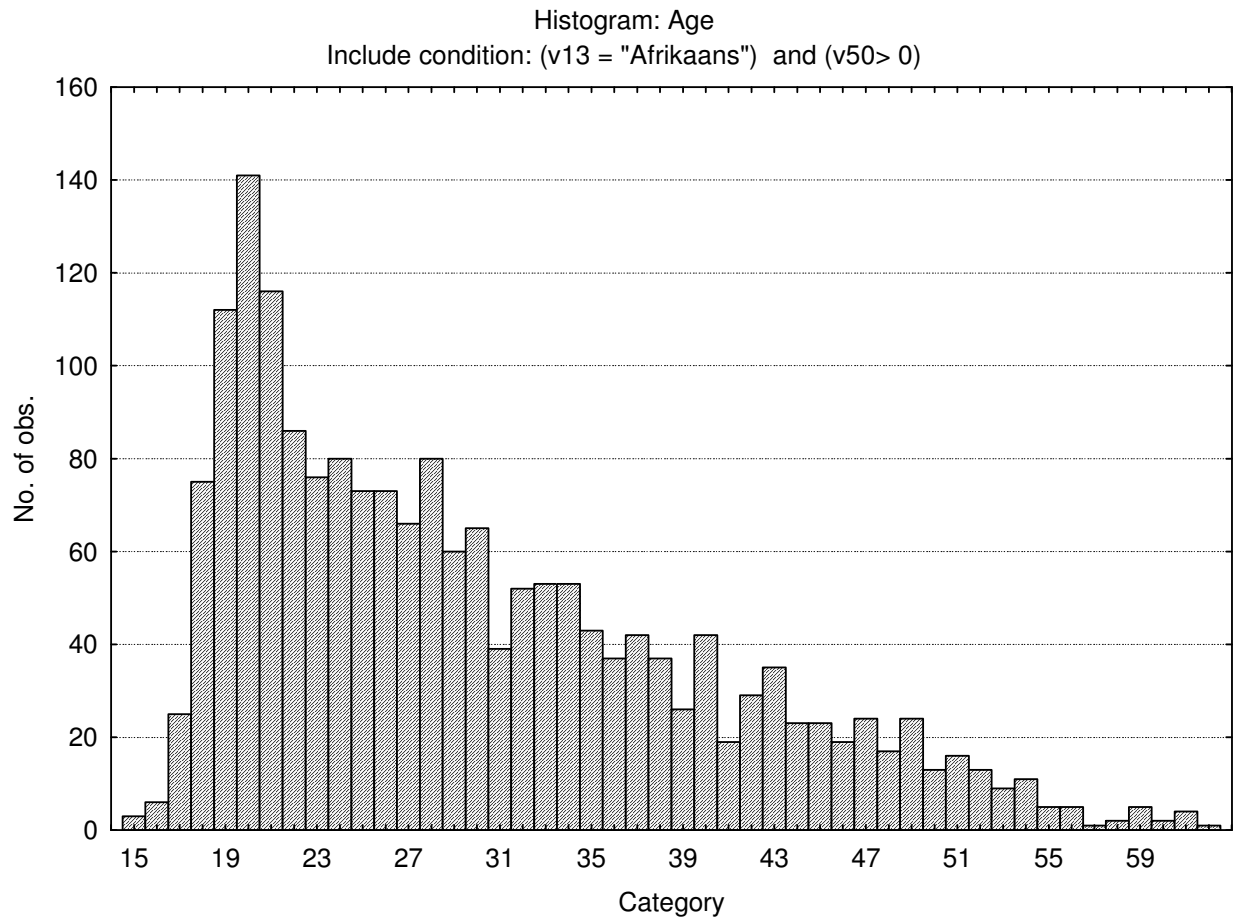
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	275	275	14.49657	14.4966
Grade 12	872	1147	45.96732	60.4639
University Diploma	57	1204	3.00474	63.4686
Degree	113	1317	5.95677	69.4254
Vocational Training	50	1367	2.63574	72.0611
Grade 10 or 11	146	1513	7.69636	79.7575
Grade 8	1	1514	0.05271	79.8102
Grade 9	3	1517	0.15814	79.9684
Post Graduate	57	1574	3.00474	82.9731
Missing	323	1897	17.02688	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1897	1897	100.0000	100.0000
Missing	0	1897	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1897	1897	100.0000	100.0000
Missing	0	1897	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	62	62	3.26832	3.2683
European	1308	1370	68.95098	72.2193
Coloured	463	1833	24.40696	96.6263
Asian	1	1834	0.05271	96.6790
Missing	63	1897	3.32103	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.78721	9.926659	15.00000	71.00000	1861	36



### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	587	587	29.76673	29.7667
M	1378	1965	69.87830	99.6450
Missing	7	1972	0.35497	100.0000

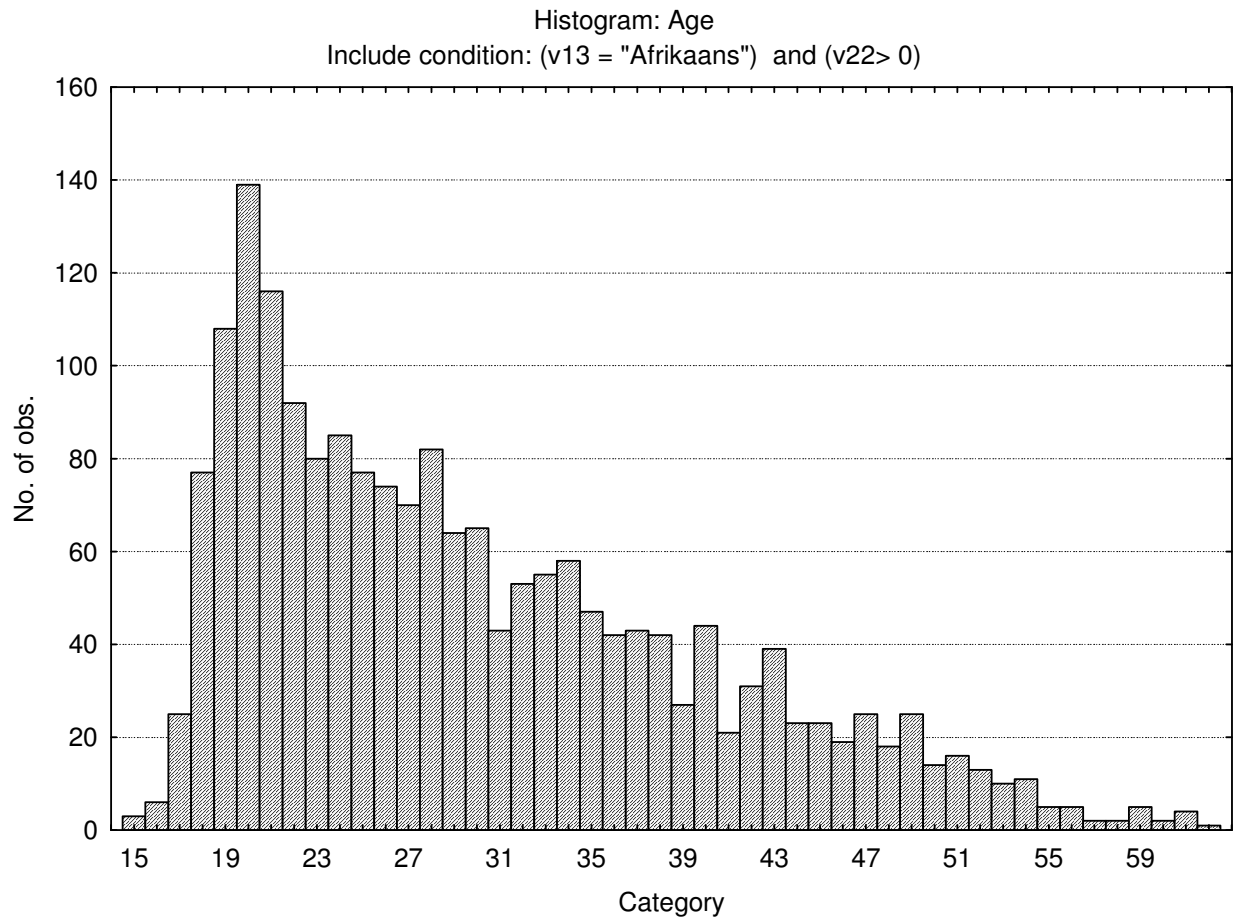
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	287	287	14.55375	14.5538
Grade 12	894	1181	45.33469	59.8884
University Diploma	60	1241	3.04260	62.9310
Degree	133	1374	6.74442	69.6755
Vocational Training	51	1425	2.58621	72.2617
Grade 10 or 11	147	1572	7.45436	79.7160
Grade 8	1	1573	0.05071	79.7667
Grade 9	3	1576	0.15213	79.9189
Post Graduate	71	1647	3.60041	83.5193
Missing	325	1972	16.48073	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1972	1972	100.0000	100.0000
Missing	0	1972	0.0000	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1972	1972	100.0000	100.0000
Missing	0	1972	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	65	65	3.29615	3.2961
European	1382	1447	70.08114	73.3773
Coloured	466	1913	23.63083	97.0081
Asian	1	1914	0.05071	97.0588
Missing	58	1972	2.94118	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29.93475	9.889540	15.00000	71.00000	1931	41



### Internal consistency reliabilities for General Reasoning Test Battery subtests

	Cronbach Coefficient Alpha
General Verbal Reasoning Test	.82
General Numerical Reasoning Test	.86
General Abstract Reasoning Test	.82

# General Reasoning Test Battery Reliability: South Africans, speaking indigenous languages, updated 2011

## Sample composition

The sample consisted of South Africans speaking an indigenous language as their first language, tested by Psytech SA and collaborators during the period up to February 2011. Since not all respondents completed all the subtests of the General Reasoning Test Battery, biographical particulars are reported separately for the different subtests.

## Sample composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1451	1451	28.75545	28.7554
M	3579	5030	70.92747	99.6829
Missing	16	5046	0.31708	100.0000

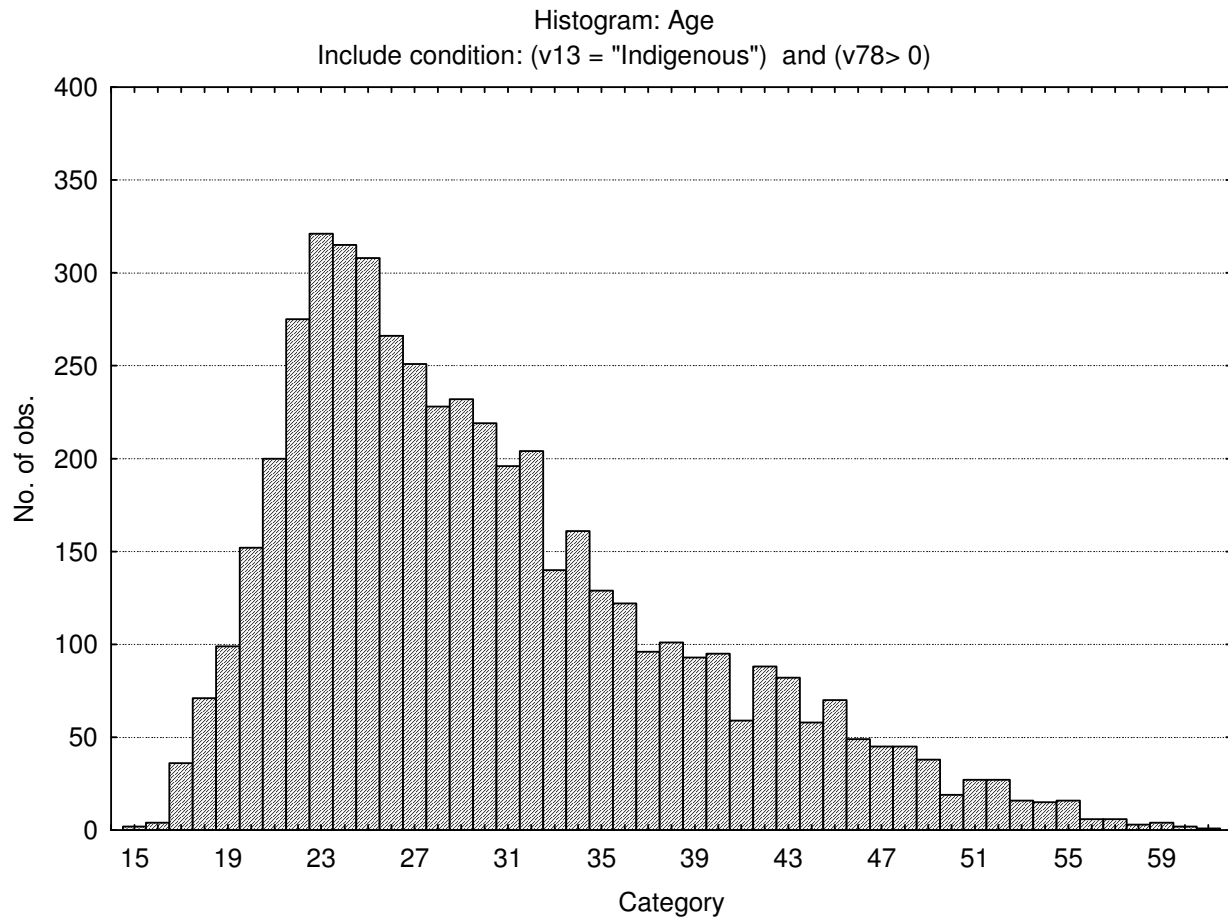
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1120	1120	22.19580	22.1958
Grade 12	1714	2834	33.96750	56.1633
University Diploma	154	2988	3.05192	59.2152
Degree	372	3360	7.37218	66.5874
Vocational Training	165	3525	3.26992	69.8573
Grade 10 or 11	527	4052	10.44392	80.3012
Grade 8	52	4104	1.03052	81.3317
Grade 9	47	4151	0.93143	82.2632
Grade 7	23	4174	0.45581	82.7190
Post Graduate	168	4342	3.32937	86.0484
Missing	704	5046	13.95164	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1907	1907	37.79231	37.7923
Setswana	559	2466	11.07808	48.8704
Sesotho	877	3343	17.38010	66.2505
Sepedi	229	3572	4.53825	70.7887
Xitsonga	121	3693	2.39794	73.1867
Tshivenda	67	3760	1.32778	74.5145
siSwati	58	3818	1.14943	75.6639
isiNdebele	32	3850	0.63417	76.2981
isiXhosa	1111	4961	22.01744	98.3155
Missing	85	5046	1.68450	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	5046	5046	100.0000	100.0000
Missing	0	5046	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	4921	4921	97.52279	97.5228
European	12	4933	0.23781	97.7606
Coloured	17	4950	0.33690	98.0975
Asian	15	4965	0.29727	98.3948
Missing	81	5046	1.60523	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.22216	8.406577	15.00000	63.00000	4992	54



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1437	1437	28.54589	28.5459
M	3582	5019	71.15614	99.7020
Missing	15	5034	0.29797	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1113	1113	22.10965	22.1097
Grade 12	1714	2827	34.04847	56.1581
University Diploma	152	2979	3.01947	59.1776
Degree	373	3352	7.40961	66.5872
Vocational Training	161	3513	3.19825	69.7855
Grade 10 or 11	527	4040	10.46881	80.2543
Grade 8	52	4092	1.03298	81.2872

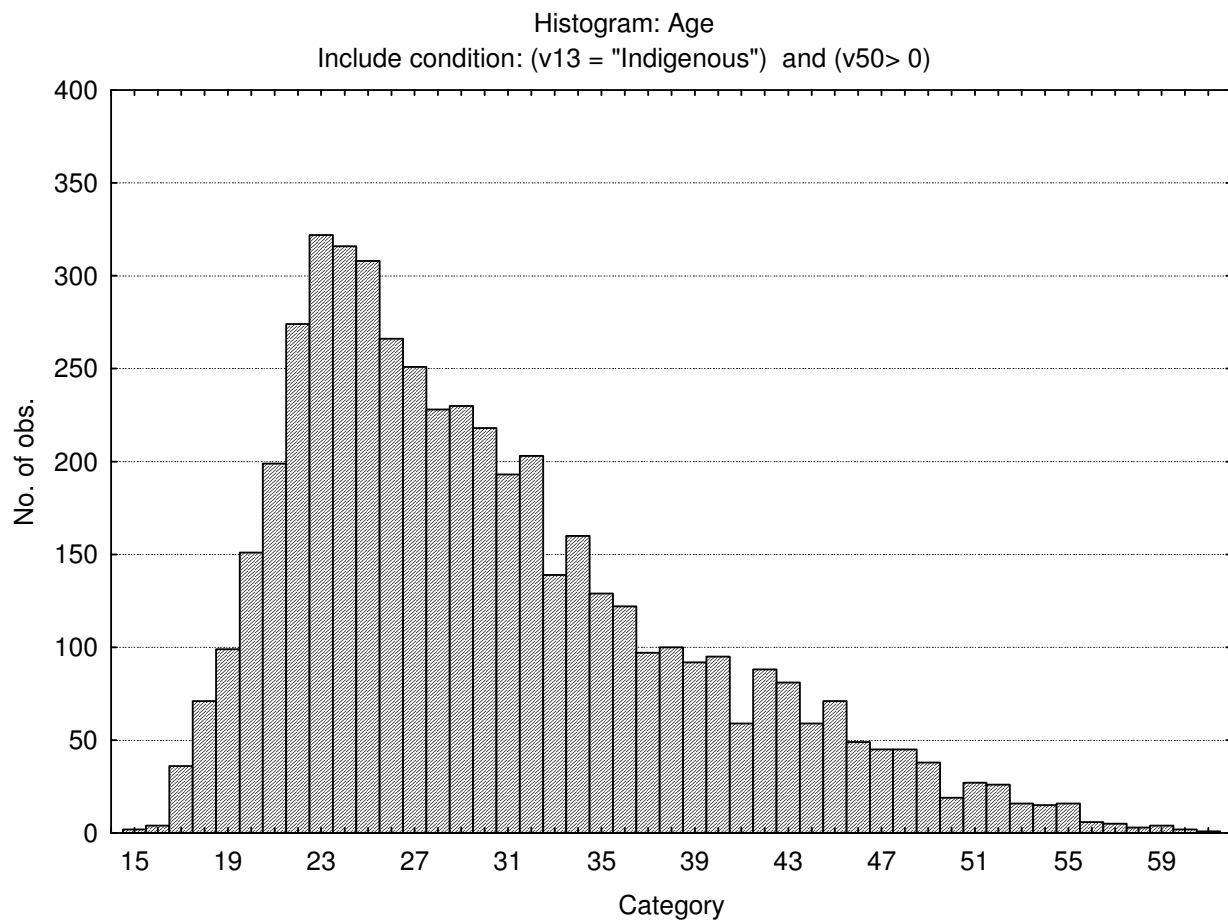
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 9	48	4140	0.95352	82.2408
Grade 7	24	4164	0.47676	82.7175
Post Graduate	166	4330	3.29758	86.0151
Missing	704	5034	13.98490	100.0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	1902	1902	37.78308	37.7831
Setswana	560	2462	11.12435	48.9074
Sesotho	874	3336	17.36194	66.2694
Sepedi	229	3565	4.54907	70.8184
Xitsonga	120	3685	2.38379	73.2022
Tshivenda	66	3751	1.31108	74.5133
siSwati	58	3809	1.15217	75.6655
isiNdebele	32	3841	0.63568	76.3012
isiXhosa	1108	4949	22.01033	98.3115
Missing	85	5034	1.68852	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	5034	5034	100.0000	100.0000
Missing	0	5034	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	4908	4908	97.49702	97.4970
European	12	4920	0.23838	97.7354
Coloured	17	4937	0.33770	98.0731
Asian	15	4952	0.29797	98.3711
Missing	82	5034	1.62892	100.0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.21486	8.401959	15.00000	63.00000	4980	54



**Sample composition: General Abstract Reasoning Test**

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
F	1517	1517	28.23376	28.2338
M	3840	5357	71.46845	99.7022
Missing	16	5373	0.29779	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Technikon	1236	1236	23.00391	23.0039
Grade 12	1778	3014	33.09138	56.0953
University Diploma	173	3187	3.21980	59.3151

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Degree	409	3596	7.61213	66.9272
Vocational Training	178	3774	3.31286	70.2401
Grade 10 or 11	533	4307	9.91997	80.1601
Grade 8	53	4360	0.98641	81.1465
Grade 9	49	4409	0.91197	82.0584
Grade 7	24	4433	0.44668	82.5051
Post Graduate	220	4653	4.09455	86.5997
Missing	720	5373	13.40034	100.0000

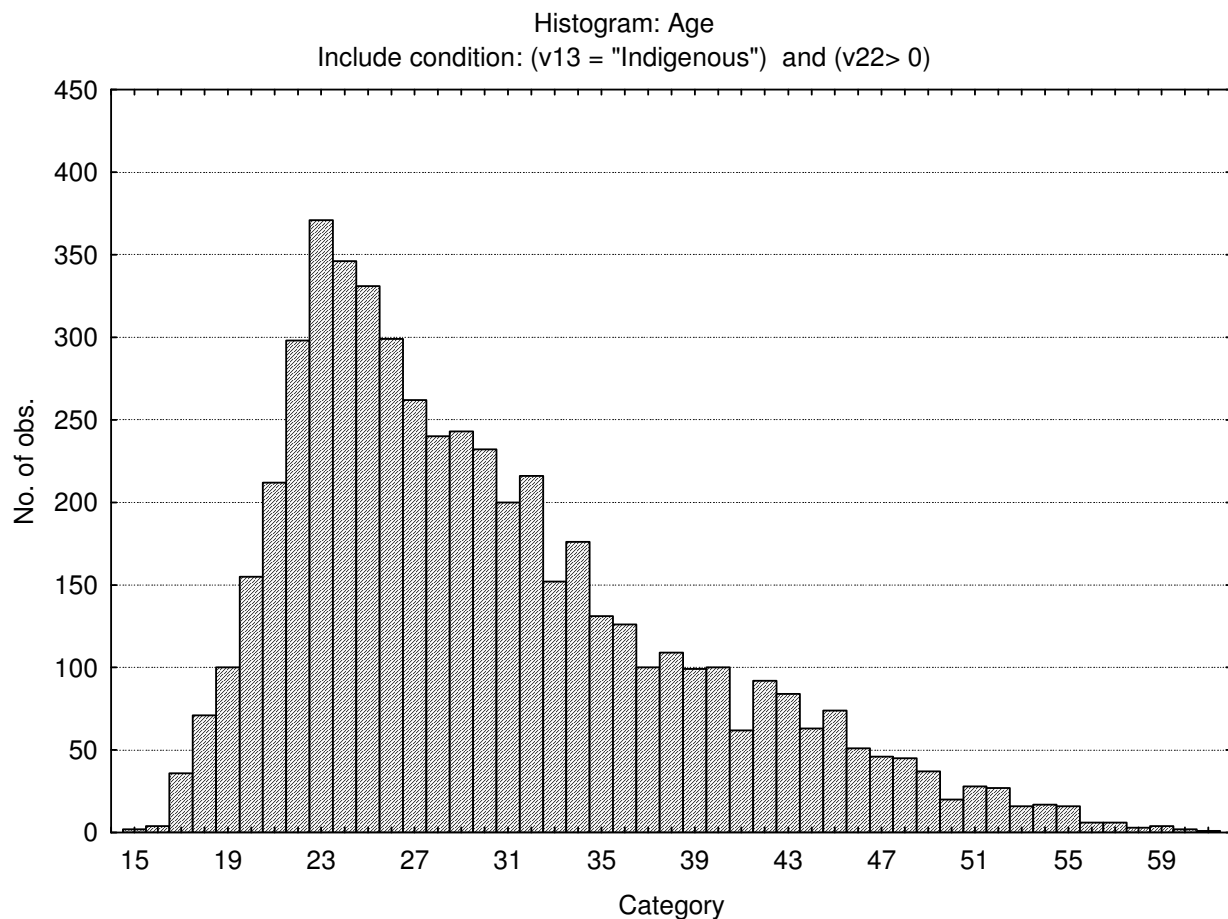
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2063	2063	38.39568	38.3957
Setswana	586	2649	10.90638	49.3021
Sesotho	921	3570	17.14126	66.4433
Sepedi	238	3808	4.42956	70.8729
Xitsonga	137	3945	2.54979	73.4227
Tshivenda	71	4016	1.32142	74.7441
siSwati	63	4079	1.17253	75.9166
isiNdebele	33	4112	0.61418	76.5308
isiXhosa	1176	5288	21.88721	98.4180
Missing	85	5373	1.58198	100.0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	5373	5373	100.0000	100.0000
Missing	0	5373	0.0000	100.0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	5239	5239	97.50605	97.5060
European	16	5255	0.29779	97.8038
Coloured	17	5272	0.31640	98.1202
Asian	20	5292	0.37223	98.4925
Missing	81	5373	1.50754	100.0000

Variable	<b>Descriptive Statistics: Age</b>
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	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30.11956	8.330023	15.00000	63.00000	5311	62



### Internal consistency reliability for General Reasoning Test Battery subtests

Subtest	Cronbach Coefficient Alpha
General Verbal Reasoning Test	.78
General Numerical Reasoning Test	.70
General Abstract Reasoning Test	.79

# General Reasoning Test (GRT2)

## Reliability: South Africans, Aggregate Population, Updated 2016

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### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### General Abstract Reasoning Test: Biographical Composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	9953	9953	57,04379	57,0438
F	7401	17354	42,41747	99,4613
U	94	17448	0,53874	100,0000
Missing	0	17448	0,00000	100,0000

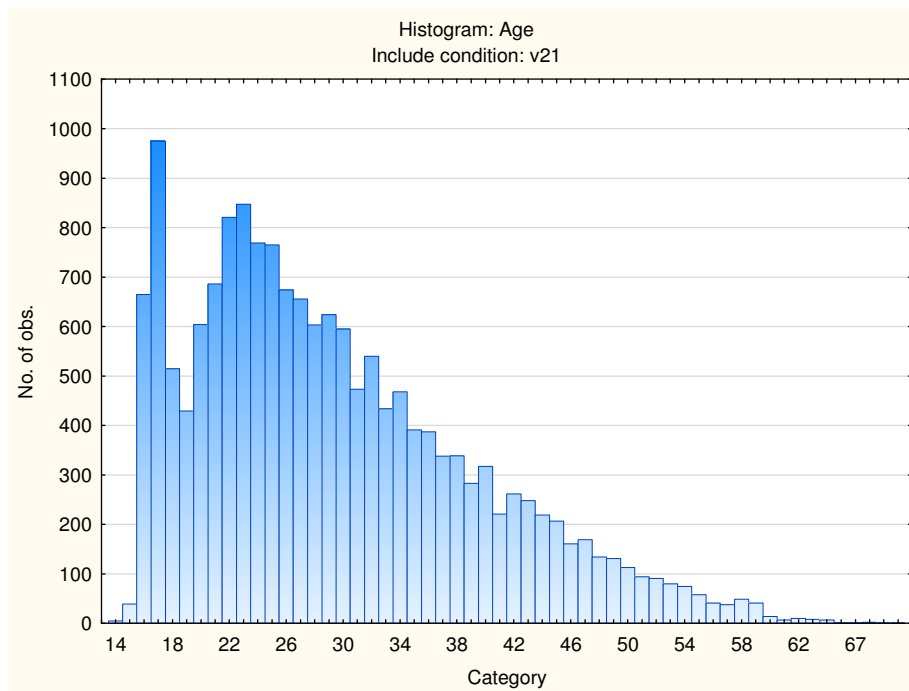
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	5524	5524	31,65979	31,6598
Post Graduate	733	6257	4,20105	35,8608
Unknown	147	6404	0,84250	36,7033
Tertiary	3718	10122	21,30903	58,0124
< Matric	2394	12516	13,72077	71,7331
Missing	4932	17448	28,26685	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	779	779	4,46470	4,4647
English	3655	4434	20,94796	25,4127
isiZulu	2250	6684	12,89546	38,3081
Afrikaans	1902	8586	10,90096	49,2091
isiXhosa	1197	9783	6,86039	56,0695
Sesotho	926	10709	5,30720	61,3767
Sepedi	913	11622	5,23269	66,6094
Setswana	796	12418	4,56213	71,1715
Xitsonga	272	12690	1,55892	72,7304
Tshivenda	162	12852	0,92847	73,6589
siSwati	220	13072	1,26089	74,9198
isiNdebele	79	13151	0,45277	75,3725
Missing	4297	17448	24,62746	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6815	6815	39,05892	39,0589
Afrikaans	1902	8717	10,90096	49,9599
English	3655	12372	20,94796	70,9078
Other	779	13151	4,46470	75,3725
Missing	4297	17448	24,62746	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	7798	7798	44,69280	44,6928
Asian	1300	9098	7,45071	52,1435
Coloured	1275	10373	7,30743	59,4509
European	2700	13073	15,47455	74,9255
Indian	6	13079	0,03439	74,9599
Unknown	188	13267	1,07749	76,0374
Missing	4181	17448	23,96263	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,37774	9,915655	14,00000	71,00000	16726	722



## General Numerical Reasoning Test: Biographical Composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	9151	9151	55,76818	55,7682
F	7167	16318	43,67725	99,4454
U	91	16409	0,55457	100,0000
Missing	0	16409	0,00000	100,0000

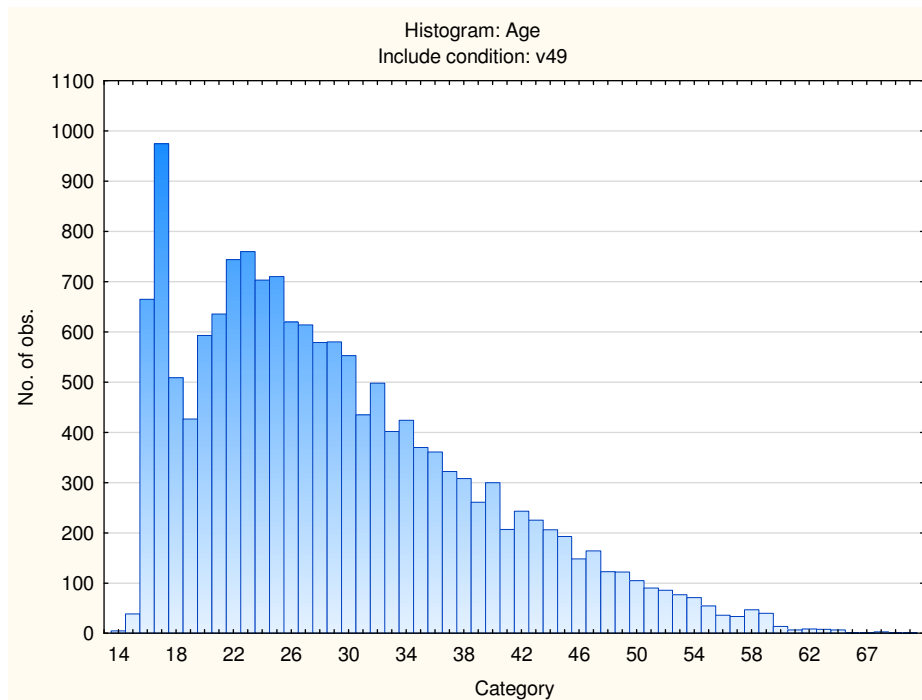
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	5368	5368	32,71375	32,7138
Post Graduate	560	5928	3,41276	36,1265
Unknown	147	6075	0,89585	37,0224
Tertiary	3226	9301	19,65994	56,6823
< Matric	2371	11672	14,44939	71,1317
Missing	4737	16409	28,86830	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	764	764	4,65598	4,6560
English	3182	3946	19,39180	24,0478
isiZulu	2106	6052	12,83442	36,8822
Afrikaans	1849	7901	11,26821	48,1504
isiXhosa	1103	9004	6,72192	54,8723
Sesotho	880	9884	5,36291	60,2352
Sepedi	895	10779	5,45432	65,6896
Setswana	765	11544	4,66208	70,3516
Xitsonga	249	11793	1,51746	71,8691
Tshivenda	154	11947	0,93851	72,8076
siSwati	212	12159	1,29197	74,0996
isiNdebele	74	12233	0,45097	74,5506
Missing	4176	16409	25,44945	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6438	6438	39,23457	39,2346
Afrikaans	1849	8287	11,26821	50,5028
English	3182	11469	19,39180	69,8946
Other	764	12233	4,65598	74,5506
Missing	4176	16409	25,44945	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	7396	7396	45,07283	45,0728
Asian	1038	8434	6,32580	51,3986
Coloured	1245	9679	7,58730	58,9859
European	2476	12155	15,08928	74,0752
Indian	6	12161	0,03657	74,1118
Unknown	188	12349	1,14571	75,2575
Missing	4060	16409	24,74252	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,27130	9,982204	14,00000	71,00000	15717	692



## General Verbal Reasoning Test: Biographical Composition

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	9118	9118	55,59756	55,5976
F	7192	16310	43,85366	99,4512
U	90	16400	0,54878	100,0000
Missing	0	16400	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	5326	5326	32,47561	32,4756
Post Graduate	568	5894	3,46341	35,9390
Unknown	147	6041	0,89634	36,8354
Tertiary	3247	9288	19,79878	56,6341
< Matric	2367	11655	14,43293	71,0671
Missing	4745	16400	28,93293	100,0000

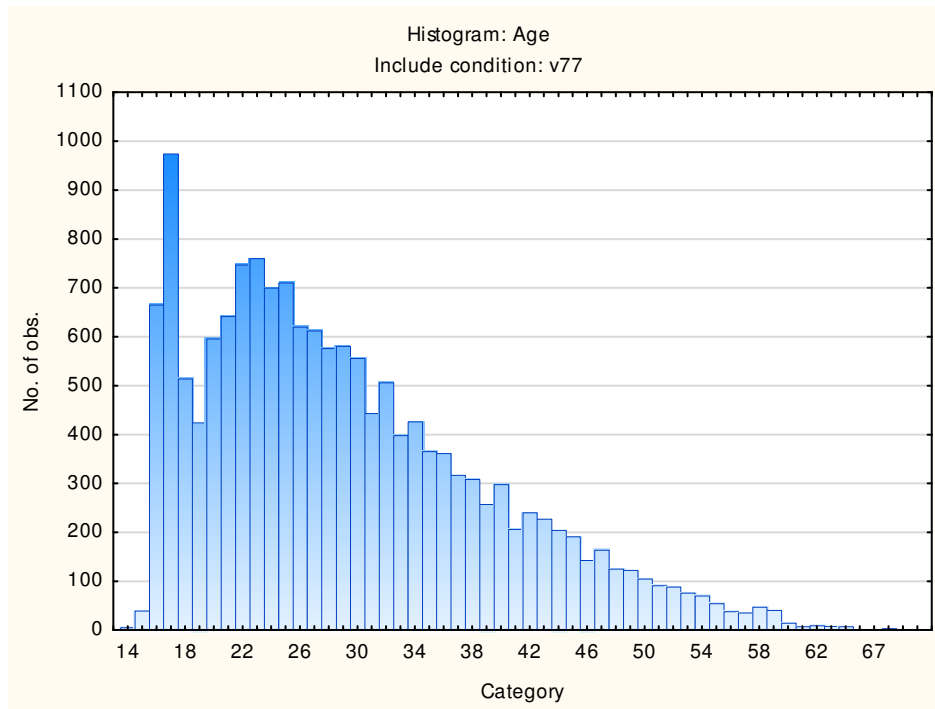
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Other	769	769	4,68902	4,6890
English	3180	3949	19,39024	24,0793
isiZulu	2111	6060	12,87195	36,9512
Afrikaans	1832	7892	11,17073	48,1220
isiXhosa	1100	8992	6,70732	54,8293

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	880	9872	5,36585	60,1951
Sepedi	897	10769	5,46951	65,6646
Setswana	760	11529	4,63415	70,2988
Xitsonga	252	11781	1,53659	71,8354
Tshivenda	158	11939	0,96341	72,7988
siSwati	214	12153	1,30488	74,1037
isiNdebele	75	12228	0,45732	74,5610
Missing	4172	16400	25,43902	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6447	6447	39,31098	39,3110
Afrikaans	1832	8279	11,17073	50,4817
English	3180	11459	19,39024	69,8720
Other	769	12228	4,68902	74,5610
Missing	4172	16400	25,43902	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	7406	7406	45,15854	45,1585
Asian	1042	8448	6,35366	51,5122
Coloured	1232	9680	7,51220	59,0244
European	2466	12146	15,03659	74,0610
Indian	6	12152	0,03659	74,0976
Unknown	188	12340	1,14634	75,2439
Missing	4060	16400	24,75610	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,25797	9,984034	14,00000	71,00000	15719	681



### Cronbach Coefficient Alpha for the General Reasoning Test Battery Subtests:

Subtest	Cronbach Coefficient Alpha
General Abstract Reasoning Test	0.84
General Numerical Reasoning Test	0.85
General Verbal Reasoning Test	0.85

# General Reasoning Test (GRT2)

## Reliability: South Africans, Afrikaans Speaking, Updated 2016

### Sample Composition

The sample consisted of South Africans with Afrikaans as home language, tested by Psytech SA and collaborators in the period up to June 2015, via GeneSys for Windows. Since not all respondents completed the whole General Reasoning Test battery (GRT2), biographical information is reported separately for the different subtests.

### Sample Composition – General Abstract Reasoning Test

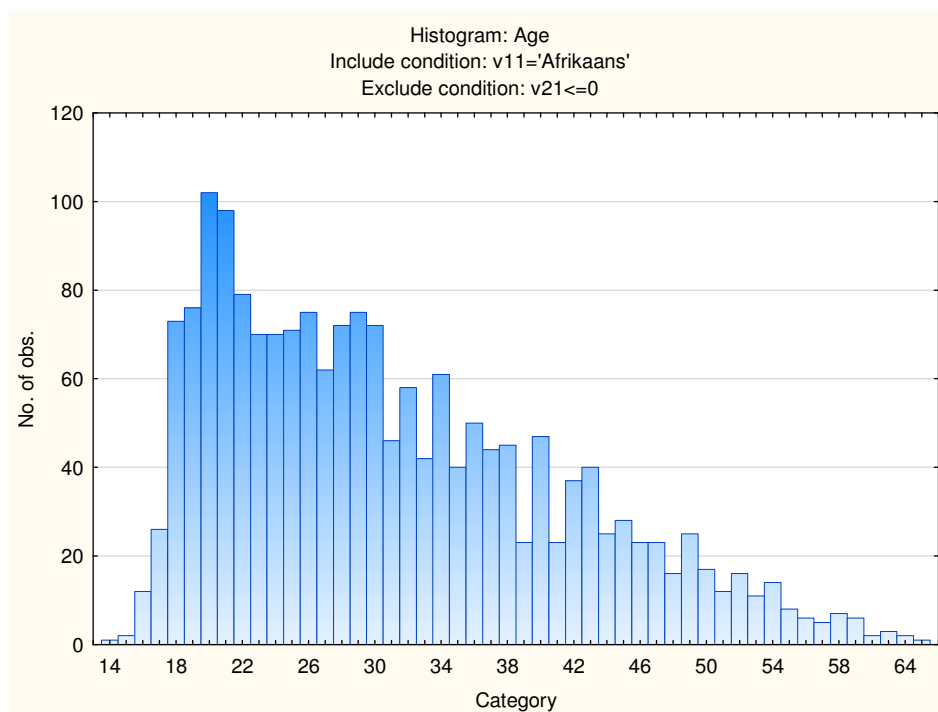
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1148	1148	60,35752	60,3575
F	748	1896	39,32702	99,6845
U	6	1902	0,31546	100,0000
Missing	0	1902	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	962	962	50,57834	50,5783
Post Graduate	91	1053	4,78444	55,3628
Unknown	10	1063	0,52576	55,8885
Tertiary	489	1552	25,70978	81,5983
< Matric	141	1693	7,41325	89,0116
Missing	209	1902	10,98843	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1902	1902	100,0000	100,0000
Missing	0	1902	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	47	47	2,47108	2,4711
Asian	1	48	0,05258	2,5237
Coloured	378	426	19,87382	22,3975
European	1422	1848	74,76341	97,1609
Missing	54	1902	2,83912	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,96634	10,24788	14,00000	71,00000	1842	60



### Sample Composition: General Numerical Reasoning Test

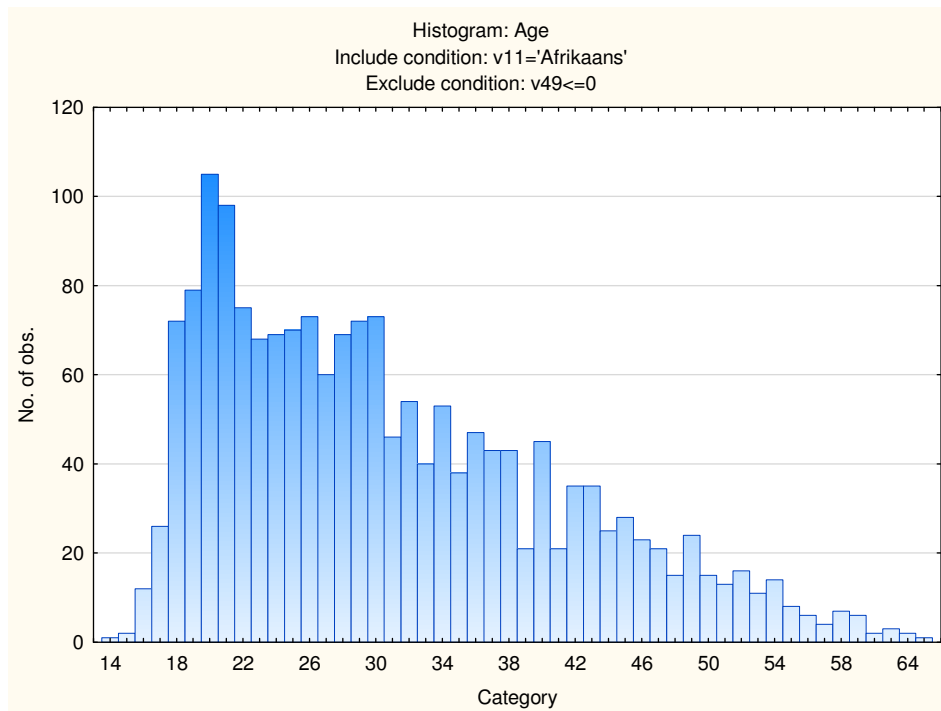
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1107	1107	59,87020	59,8702
F	736	1843	39,80530	99,6755
U	6	1849	0,32450	100,0000
Missing	0	1849	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	950	950	51,37912	51,3791
Post Graduate	76	1026	4,11033	55,4895
Unknown	10	1036	0,54083	56,0303
Tertiary	459	1495	24,82423	80,8545
< Matric	139	1634	7,51758	88,3721
Missing	215	1849	11,62791	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1849	1849	100,0000	100,0000
Missing	0	1849	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	47	47	2,54191	2,5419
Asian	1	48	0,05408	2,5960
Coloured	380	428	20,55165	23,1476
European	1363	1791	73,71552	96,8632
Missing	58	1849	3,13683	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,80827	10,29066	14,00000	71,00000	1789	60



### Sample Composition: General Verbal Reasoning Test

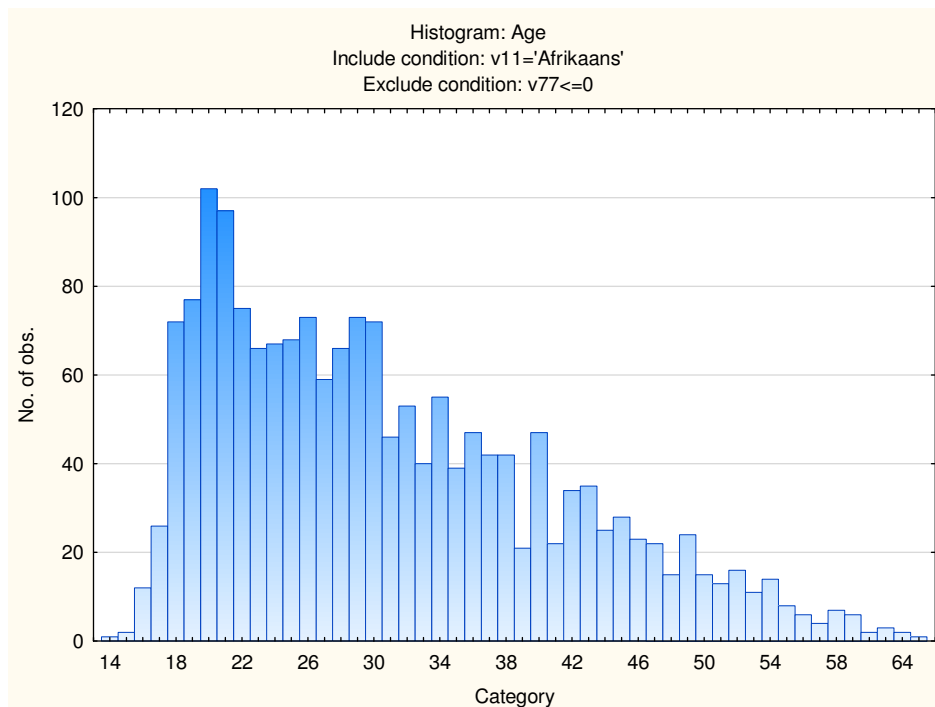
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1088	1088	59,38865	59,3886
F	738	1826	40,28384	99,6725
U	6	1832	0,32751	100,0000
Missing	0	1832	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	934	934	50,98253	50,9825
Post Graduate	76	1010	4,14847	55,1310
Unknown	10	1020	0,54585	55,6769
Tertiary	459	1479	25,05459	80,7314
< Matric	139	1618	7,58734	88,3188
Missing	214	1832	11,68122	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	1832	1832	100,0000	100,0000
Missing	0	1832	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	46	46	2,51092	2,5109
Asian	1	47	0,05459	2,5655
Coloured	369	416	20,14192	22,7074
European	1362	1778	74,34498	97,0524
Missing	54	1832	2,94760	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,89133	10,30919	14,00000	71,00000	1776	56



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.82
General Numerical Reasoning Test	.86
General Verbal Reasoning Test	.82

# General Reasoning Test (GRT2)

## Reliability: South Africans, English Speaking, Updated 2016

### Sample Composition

The sample consisted of South Africans tested by Psytech South Africa and collaborators during the period up to June 2015, via GeneSys for Windows. Since not all respondents completed all the subtests of the General Reasoning Test battery (GRT2), biographical characteristics are reported separately for the different subtests.

### Sample Composition – General Abstract Reasoning Test

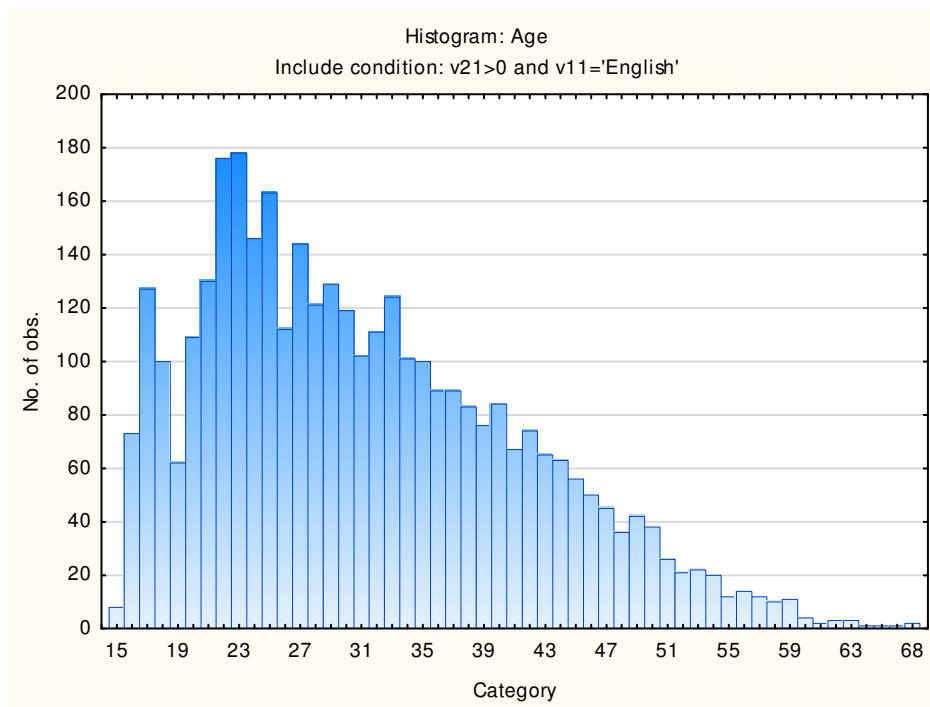
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	2175	2175	59,50752	59,5075
F	1473	3648	40,30096	99,8085
U	7	3655	0,19152	100,0000
Missing	0	3655	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	1501	1501	41,06703	41,0670
Post Graduate	282	1783	7,71546	48,7825
Unknown	20	1803	0,54720	49,3297
Tertiary	1138	2941	31,13543	80,4651
< Matric	354	3295	9,68536	90,1505
Missing	360	3655	9,84952	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3655	3655	100,0000	100,0000
Missing	0	3655	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	357	357	9,76744	9,7674
Asian	1201	1558	32,85910	42,6265
Coloured	825	2383	22,57182	65,1984
European	1166	3549	31,90150	97,0999
Indian	5	3554	0,13680	97,2367
Missing	101	3655	2,76334	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31,26989	10,20064	15,00000	68,00000	3557	98



## Sample Composition: General Numerical Reasoning Test

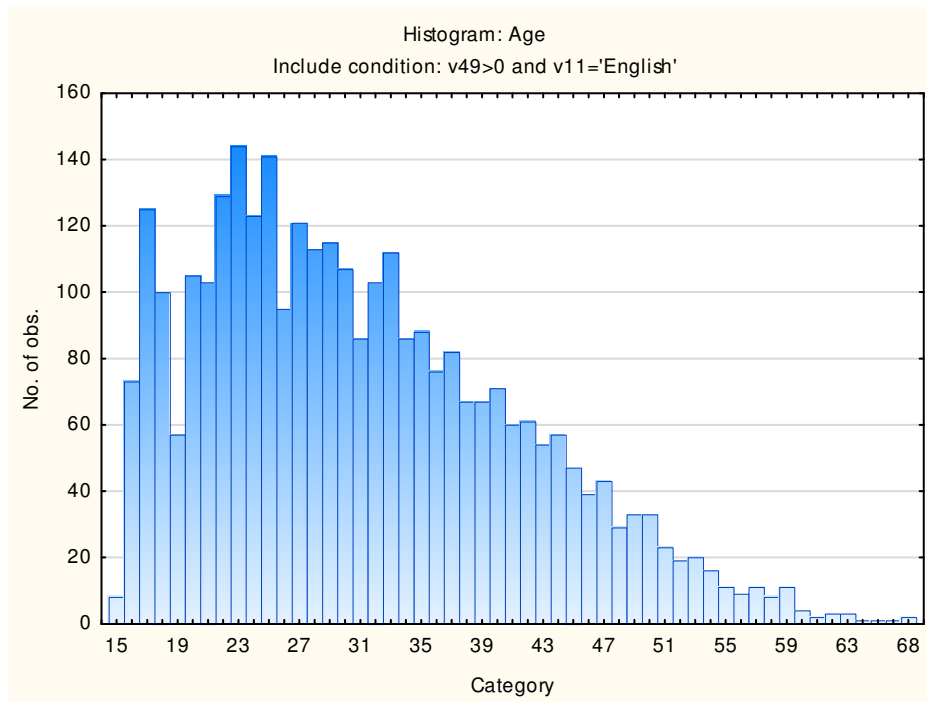
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1795	1795	56,41106	56,4111
F	1381	3176	43,40038	99,8114
U	6	3182	0,18856	100,0000
Missing	0	3182	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	1401	1401	44,02891	44,0289
Post Graduate	190	1591	5,97109	50,0000
Unknown	20	1611	0,62854	50,6285
Tertiary	934	2545	29,35261	79,9811
< Matric	334	2879	10,49654	90,4777
Missing	303	3182	9,52231	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3182	3182	100,0000	100,0000
Missing	0	3182	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	335	335	10,52797	10,5280
Asian	944	1279	29,66688	40,1948
Coloured	794	2073	24,95286	65,1477
European	1005	3078	31,58391	96,7316
Indian	5	3083	0,15713	96,8887
Missing	99	3182	3,11125	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31,15139	10,26498	15,00000	68,00000	3098	84



### Sample Composition: General Verbal Reasoning Test

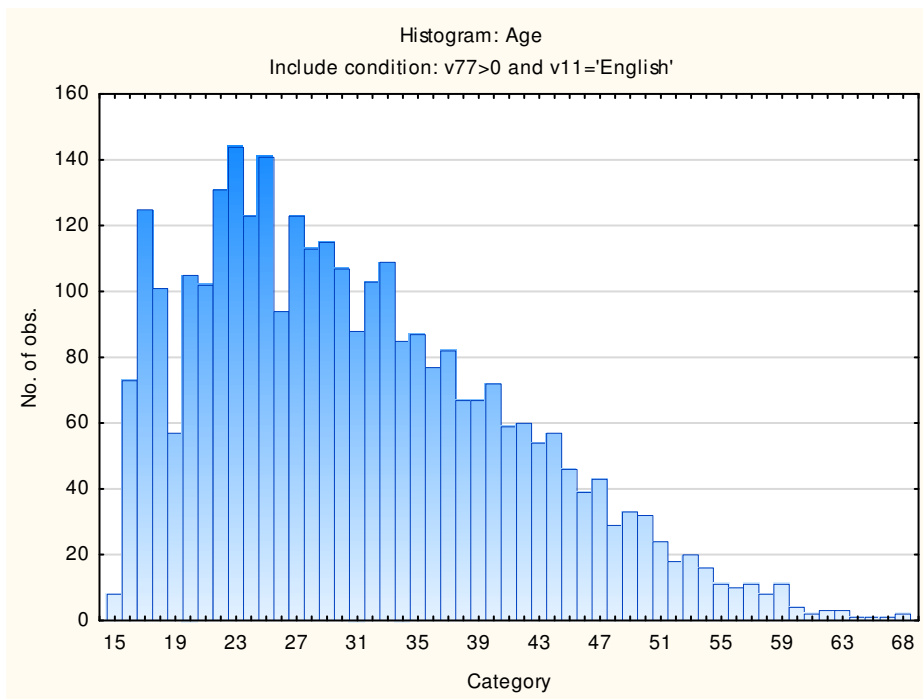
Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1789	1789	56,25786	56,2579
F	1385	3174	43,55346	99,8113
U	6	3180	0,18868	100,0000
Missing	0	3180	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	1396	1396	43,89937	43,8994
Post Graduate	193	1589	6,06918	49,9686
Unknown	20	1609	0,62893	50,5975
Tertiary	933	2542	29,33962	79,9371
< Matric	334	2876	10,50314	90,4403
Missing	304	3180	9,55975	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	3180	3180	100,0000	100,0000
Missing	0	3180	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	337	337	10,59748	10,5975
Asian	949	1286	29,84277	40,4403
Coloured	792	2078	24,90566	65,3459
European	998	3076	31,38365	96,7296
Indian	5	3081	0,15723	96,8868
Missing	99	3180	3,11321	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	31,13432	10,26865	15,00000	68,00000	3097	83



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

Subtest	Cronbach Coefficient Alpha
General Abstract Reasoning Test	.83
General Numerical Reasoning Test	.87
General Verbal Reasoning Test	.87

# General Reasoning Test (GRT2)

## Reliability: South Africans, Speaking Indigenous Languages, Updated 2016

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### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	3903	3903	57,27073	57,2707
F	2888	6791	42,37711	99,6478
U	24	6815	0,35216	100,0000
Missing	0	6815	0,00000	100,0000

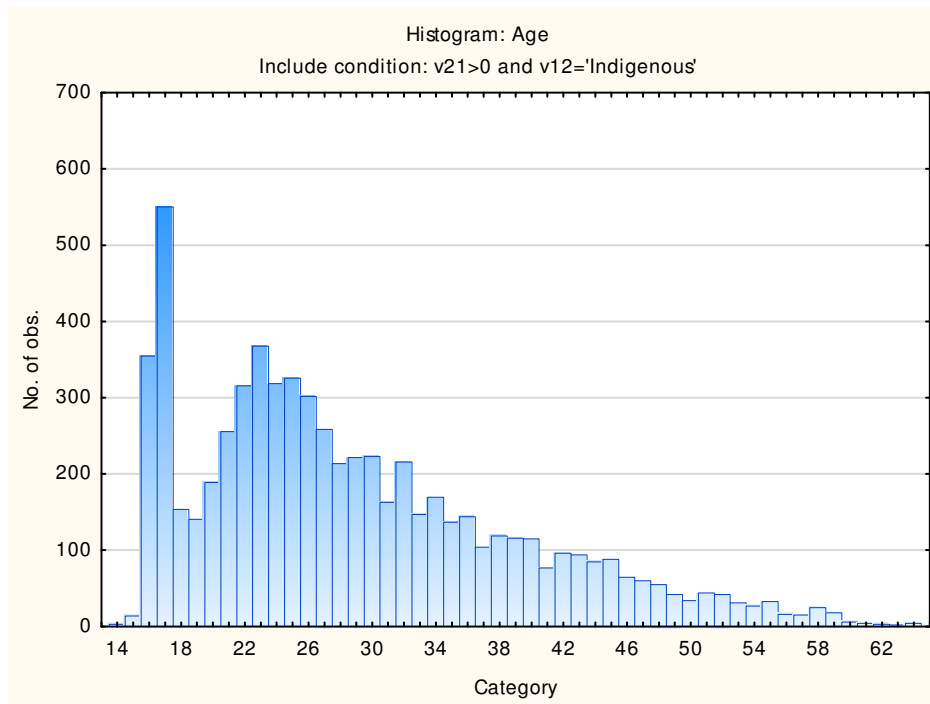
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	2579	2579	37,84299	37,8430
Post Graduate	304	2883	4,46075	42,3037
Unknown	67	2950	0,98313	43,2869
Tertiary	1771	4721	25,98679	69,2737
< Matric	1501	6222	22,02494	91,2986
Missing	593	6815	8,70139	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2250	2250	33,01541	33,0154
isiXhosa	1197	3447	17,56420	50,5796
Sesotho	926	4373	13,58767	64,1673
Sepedi	913	5286	13,39692	77,5642
Setswana	796	6082	11,68012	89,2443
Xitsonga	272	6354	3,99120	93,2355
Tshivenda	162	6516	2,37711	95,6126
siSwati	220	6736	3,22817	98,8408
isiNdebele	79	6815	1,15921	100,0000
Missing	0	6815	0,00000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6815	6815	100,0000	100,0000
Missing	0	6815	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	6740	6740	98,89949	98,8995
Asian	27	6767	0,39618	99,2957
Coloured	19	6786	0,27880	99,5745
European	13	6799	0,19076	99,7652
Missing	16	6815	0,23478	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,91209	10,10725	14,00000	64,00000	6609	206



### Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	3629	3629	56,36844	56,3684
F	2786	6415	43,27431	99,6427
U	23	6438	0,35725	100,0000
Missing	0	6438	0,00000	100,0000

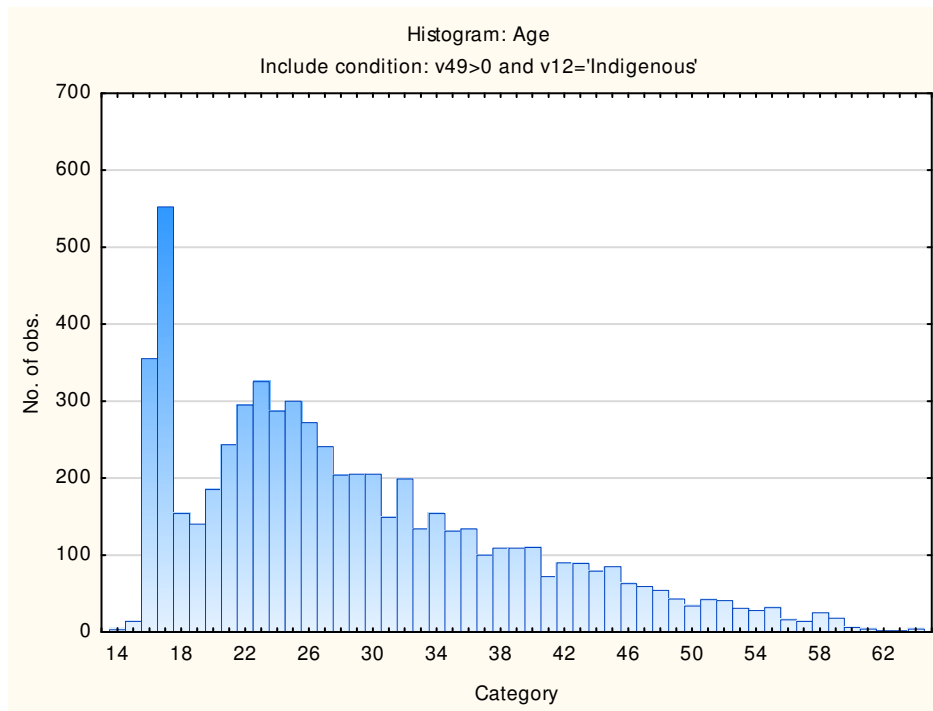
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	2520	2520	39,14259	39,1426
Post Graduate	244	2764	3,79000	42,9326
Unknown	67	2831	1,04070	43,9733
Tertiary	1530	4361	23,76514	67,7384
< Matric	1497	5858	23,25256	90,9910
Missing	580	6438	9,00901	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2106	2106	32,71202	32,7120
isiXhosa	1103	3209	17,13265	49,8447
Sesotho	880	4089	13,66884	63,5135
Sepedi	895	4984	13,90183	77,4153
Setswana	765	5749	11,88257	89,2979
Xitsonga	249	5998	3,86766	93,1656
Tshivenda	154	6152	2,39205	95,5576
siSwati	212	6364	3,29295	98,8506
isiNdebele	74	6438	1,14943	100,0000
Missing	0	6438	0,00000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6438	6438	100,0000	100,0000
Missing	0	6438	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	6369	6369	98,92824	98,9282
Asian	22	6391	0,34172	99,2700
Coloured	19	6410	0,29512	99,5651
European	10	6420	0,15533	99,7204
Missing	18	6438	0,27959	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,88049	10,25806	14,00000	64,00000	6242	196



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	3622	3622	56,18117	56,1812
F	2801	6423	43,44656	99,6277
U	24	6447	0,37227	100,0000
Missing	0	6447	0,00000	100,0000

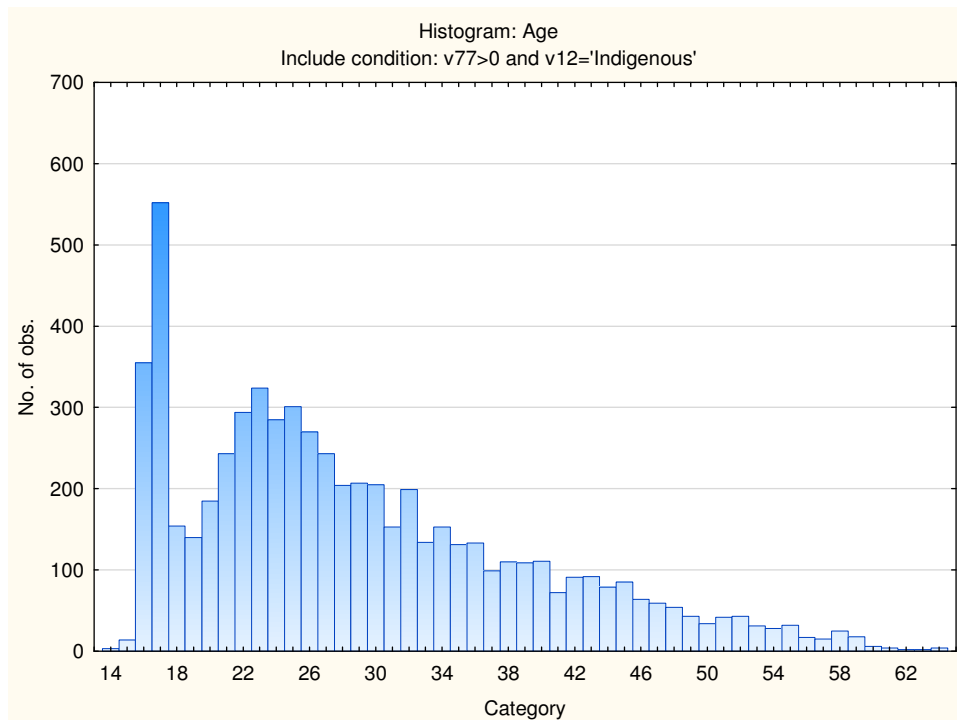
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	2513	2513	38,97937	38,9794
Post Graduate	245	2758	3,80022	42,7796
Unknown	67	2825	1,03924	43,8188
Tertiary	1548	4373	24,01117	67,8300
< Matric	1496	5869	23,20459	91,0346
Missing	578	6447	8,96541	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2111	2111	32,74391	32,7439
isiXhosa	1100	3211	17,06220	49,8061
Sesotho	880	4091	13,64976	63,4559
Sepedi	897	4988	13,91345	77,3693
Setswana	760	5748	11,78843	89,1577
Xitsonga	252	6000	3,90879	93,0665
Tshivenda	158	6158	2,45075	95,5173
siSwati	214	6372	3,31937	98,8367
isiNdebele	75	6447	1,16333	100,0000
Missing	0	6447	0,00000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	6447	6447	100,0000	100,0000
Missing	0	6447	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	6380	6380	98,96076	98,9608
Asian	22	6402	0,34124	99,3020
Coloured	19	6421	0,29471	99,5967
European	10	6431	0,15511	99,7518
Missing	16	6447	0,24818	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,91300	10,27716	14,00000	64,00000	6253	194



## Internal Consistency Reliability for General Reasoning Test Battery Subtests

Subtest	Cronbach Coefficient Alpha
General Abstract Reasoning Test	.80
General Numerical Reasoning Test	.72
General Verbal Reasoning Test	.79

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, isiXhosa Speaking, Updated 2016

### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	631	631	52,71512	52,7151
F	565	1196	47,20134	99,9165
U	1	1197	0,08354	100,0000
Missing	0	1197	0,00000	100,0000

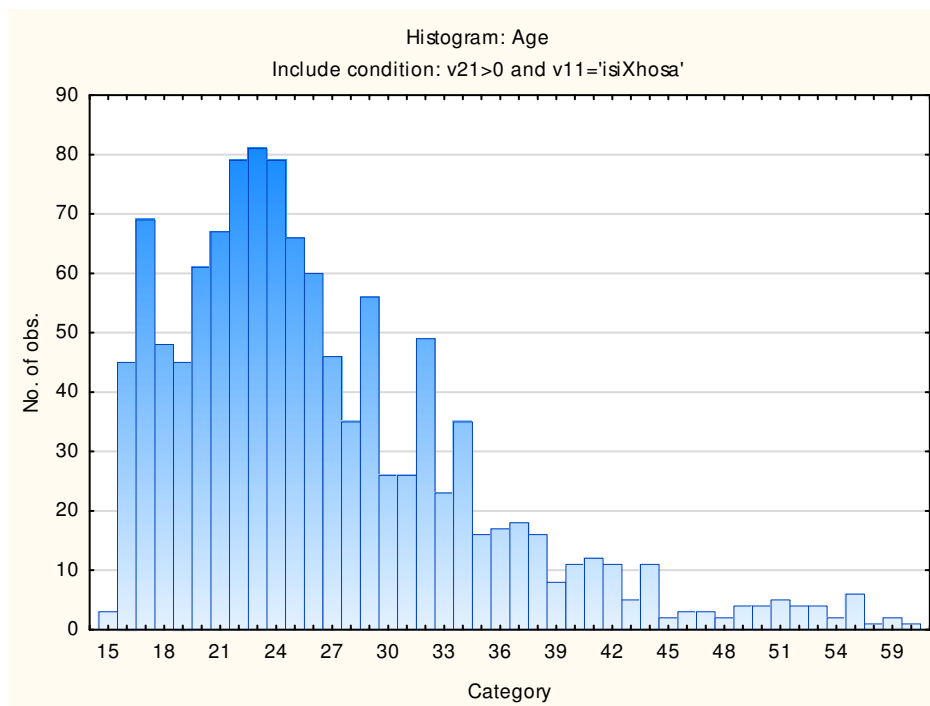
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	538	538	44,94570	44,9457
Post Graduate	38	576	3,17460	48,1203
Unknown	8	584	0,66834	48,7886
Tertiary	389	973	32,49791	81,2865
< Matric	150	1123	12,53133	93,8179
Missing	74	1197	6,18212	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiXhosa	1197	1197	100,0000	100,0000
Missing	0	1197	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	1197	1197	100,0000	100,0000
Missing	0	1197	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	1179	1179	98,49624	98,4962
Asian	3	1182	0,25063	98,7469
Coloured	9	1191	0,75188	99,4987
European	5	1196	0,41771	99,9165
Missing	1	1197	0,08354	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,56555	8,201302	15,00000	62,00000	1167	30



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	565	565	51,22393	51,2239
F	537	1102	48,68540	99,9093
U	1	1103	0,09066	100,0000
Missing	0	1103	0,00000	100,0000

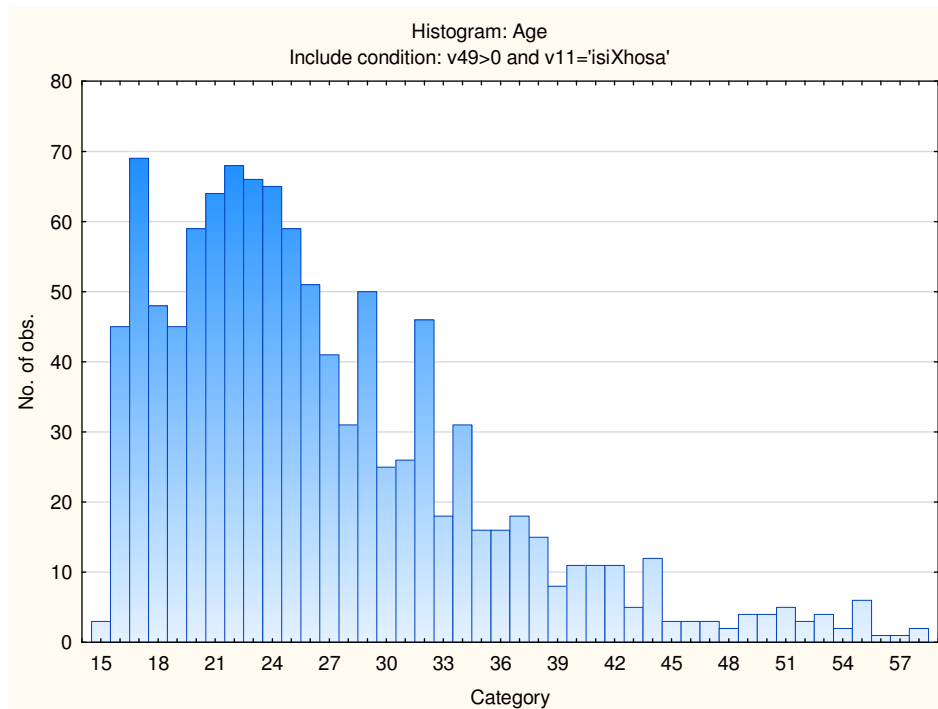
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	534	534	48,41342	48,4134
Post Graduate	28	562	2,53853	50,9519
Unknown	8	570	0,72529	51,6772
Tertiary	310	880	28,10517	79,7824
< Matric	150	1030	13,59927	93,3817
Missing	73	1103	6,61831	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiXhosa	1103	1103	100,0000	100,0000
Missing	0	1103	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	1103	1103	100,0000	100,0000
Missing	0	1103	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	1086	1086	98,45875	98,4587
Asian	2	1088	0,18132	98,6401
Coloured	9	1097	0,81596	99,4560
European	4	1101	0,36265	99,8187
Missing	2	1103	0,18132	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,61245	8,425840	15,00000	59,00000	1076	27



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	563	563	51,18182	51,1818
F	536	1099	48,72727	99,9091
U	1	1100	0,09091	100,0000
Missing	0	1100	0,00000	100,0000

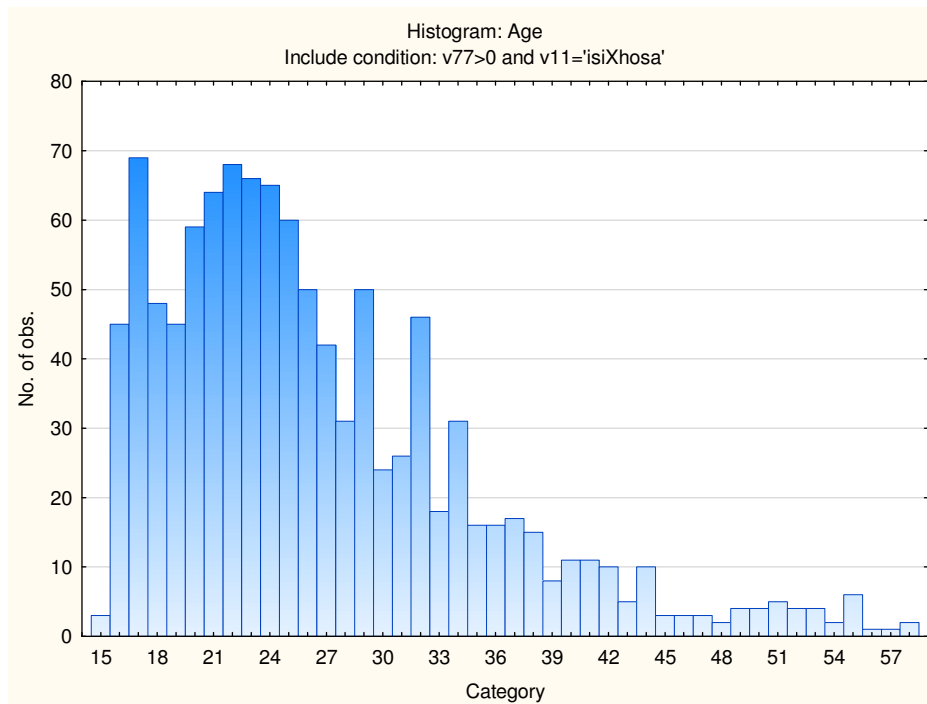
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	531	531	48,27273	48,2727
Post Graduate	28	559	2,54545	50,8182
Unknown	8	567	0,72727	51,5455
Tertiary	312	879	28,36364	79,9091
< Matric	150	1029	13,63636	93,5455
Missing	71	1100	6,45455	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiXhosa	1100	1100	100,0000	100,0000
Missing	0	1100	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	1100	1100	100,0000	100,0000
Missing	0	1100	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	1084	1084	98,54545	98,5455
Asian	2	1086	0,18182	98,7273
Coloured	9	1095	0,81818	99,5455
European	4	1099	0,36364	99,9091
Missing	1	1100	0,09091	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,57596	8,420173	15,00000	59,00000	1073	27



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.79
General Numerical Reasoning Test	.71
General Verbal Reasoning Test	.78

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, IsiZulu Speaking, Updated 2016

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### Sample Composition

The sample consisted of isiZulu speaking South Africans who were tested by Psytech South Africa and collaborators during the period up to June 2015, via GeneSys for Windows. Since not all respondents completed all the subtests of the General Reasoning Test battery (GRT2), the biographical characteristics are reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1513	1513	67,24444	67,2444
F	730	2243	32,44444	99,6889
U	7	2250	0,31111	100,0000
Missing	0	2250	0,00000	100,0000

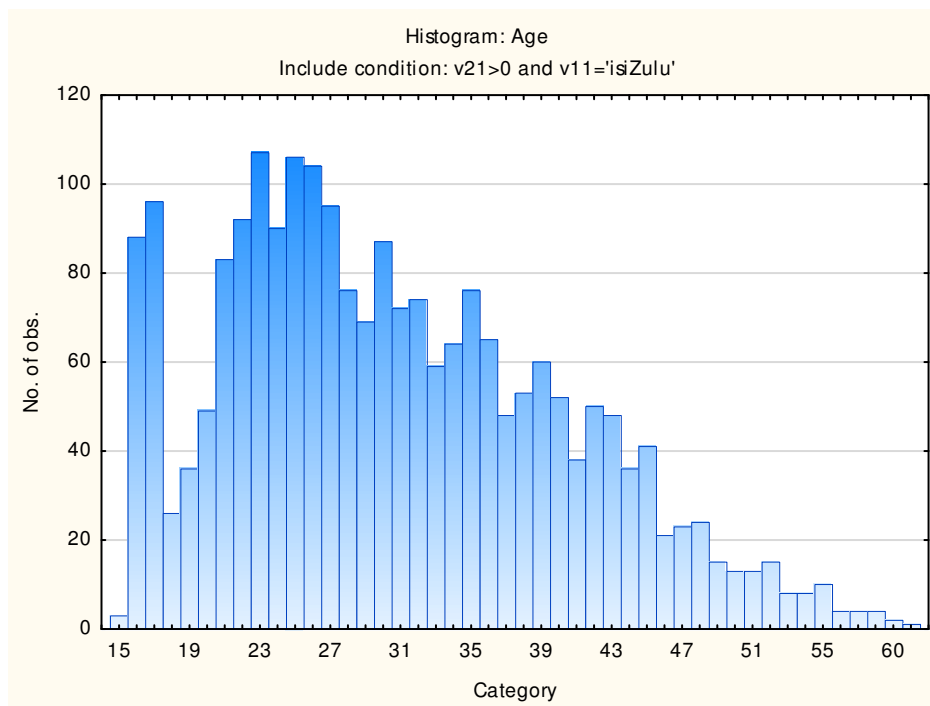
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	883	883	39,24444	39,2444
Post Graduate	105	988	4,66667	43,9111
Unknown	24	1012	1,06667	44,9778
Tertiary	514	1526	22,84444	67,8222
< Matric	523	2049	23,24444	91,0667
Missing	201	2250	8,93333	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2250	2250	100,0000	100,0000
Missing	0	2250	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	2250	2250	100,0000	100,0000
Missing	0	2250	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	2226	2226	98,93333	98,93333
Asian	13	2239	0,57778	99,51111
Coloured	4	2243	0,17778	99,6889
European	3	2246	0,13333	99,8222
Missing	4	2250	0,17778	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,63949	9,554533	15,00000	64,00000	2208	42



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1404	1404	66,66667	66,6667
F	695	2099	33,00095	99,6676
U	7	2106	0,33238	100,0000
Missing	0	2106	0,00000	100,0000

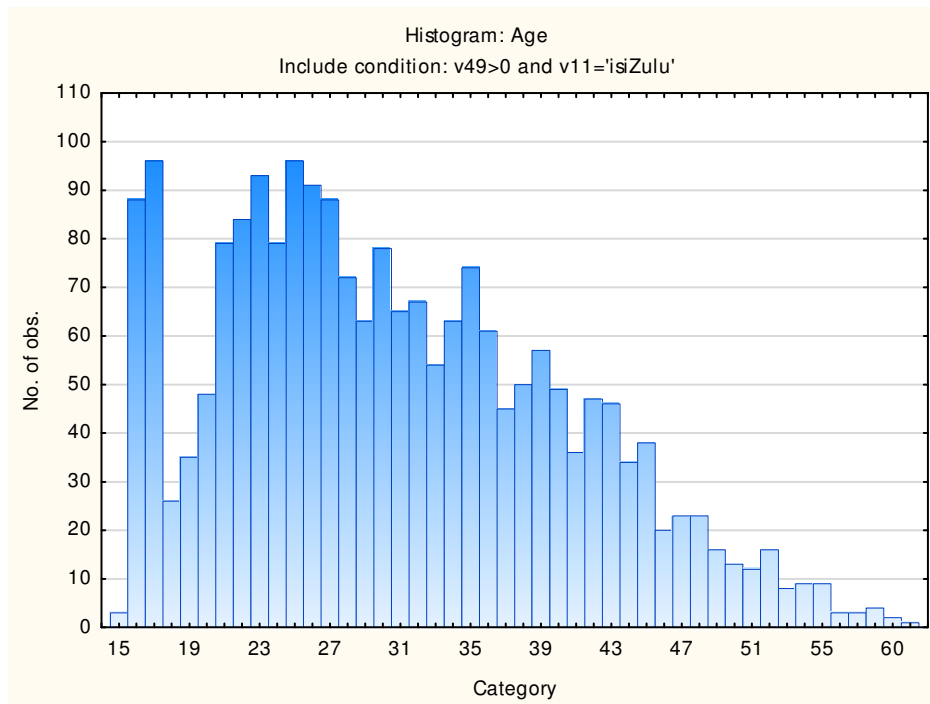
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	861	861	40,88319	40,8832
Post Graduate	83	944	3,94112	44,8243
Unknown	24	968	1,13960	45,9639
Tertiary	431	1399	20,46534	66,4292
< Matric	518	1917	24,59639	91,0256
Missing	189	2106	8,97436	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2106	2106	100,0000	100,0000
Missing	0	2106	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	2106	2106	100,0000	100,0000
Missing	0	2106	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	2083	2083	98,90788	98,9079
Asian	11	2094	0,52232	99,4302
Coloured	4	2098	0,18993	99,6201
European	3	2101	0,14245	99,7626
Missing	5	2106	0,23742	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,69328	9,685808	15,00000	64,00000	2067	39



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	1406	1406	66,60351	66,6035
F	698	2104	33,06490	99,6684
U	7	2111	0,33160	100,0000
Missing	0	2111	0,00000	100,0000

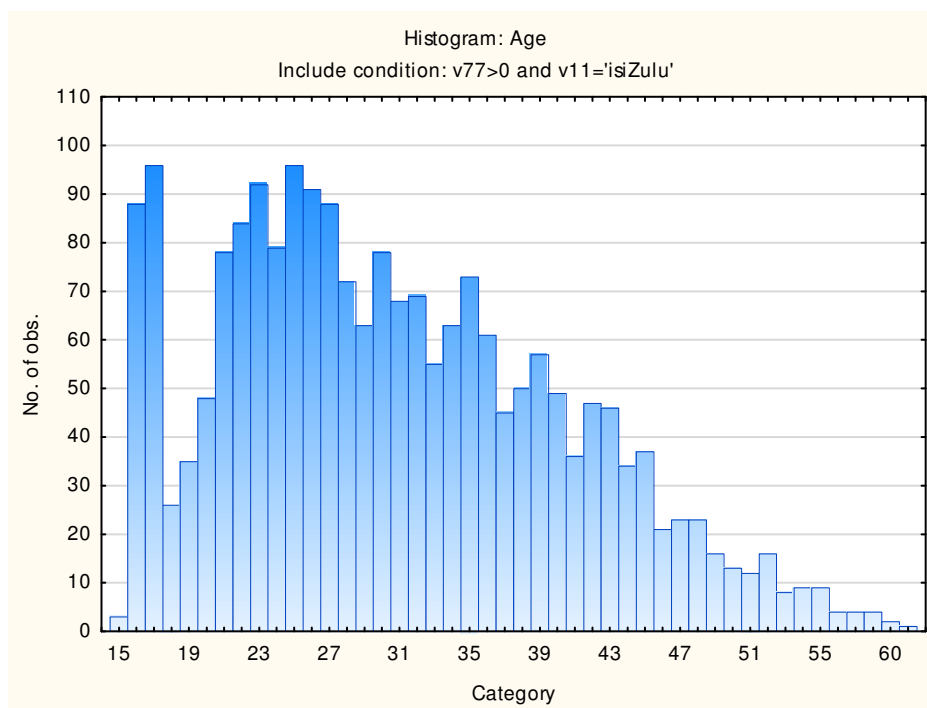
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	861	861	40,78636	40,7864
Post Graduate	84	945	3,97916	44,7655
Unknown	24	969	1,13690	45,9024
Tertiary	434	1403	20,55898	66,4614
< Matric	518	1921	24,53813	90,9995
Missing	190	2111	9,00047	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
isiZulu	2111	2111	100,0000	100,0000
Missing	0	2111	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	2111	2111	100,0000	100,0000
Missing	0	2111	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	2089	2089	98,95784	98,9578
Asian	11	2100	0,52108	99,4789
Coloured	4	2104	0,18948	99,6684
European	3	2107	0,14211	99,8105
Missing	4	2111	0,18948	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,72780	9,703934	15,00000	64,00000	2072	39



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.82
General Numerical Reasoning Test	.72
General Verbal Reasoning Test	.80

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, Sepedi Speaking, Updated 2016

### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	399	399	43,70208	43,7021
F	509	908	55,75027	99,4524
U	5	913	0,54765	100,0000
Missing	0	913	0,00000	100,0000

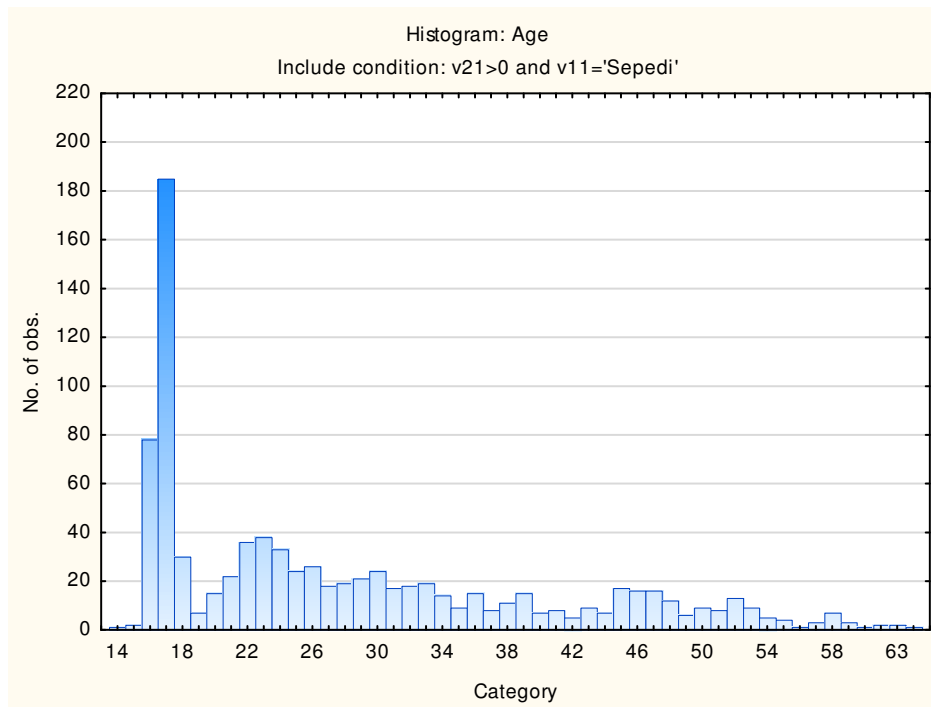
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	306	306	33,51588	33,5159
Post Graduate	28	334	3,06681	36,5827
Unknown	24	358	2,62870	39,2114
Tertiary	188	546	20,59146	59,8028
< Matric	311	857	34,06353	93,8664
Missing	56	913	6,13363	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sepedi	913	913	100,0000	100,0000
Missing	0	913	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	913	913	100,0000	100,0000
Missing	0	913	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	901	901	98,68565	98,6857
Asian	3	904	0,32859	99,0142
Coloured	2	906	0,21906	99,2333
European	1	907	0,10953	99,3428
Missing	6	913	0,65717	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,11872	12,06021	14,00000	64,00000	876	37



## Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	388	388	43,35196	43,3520
F	502	890	56,08939	99,4413
U	5	895	0,55866	100,0000
Missing	0	895	0,00000	100,0000

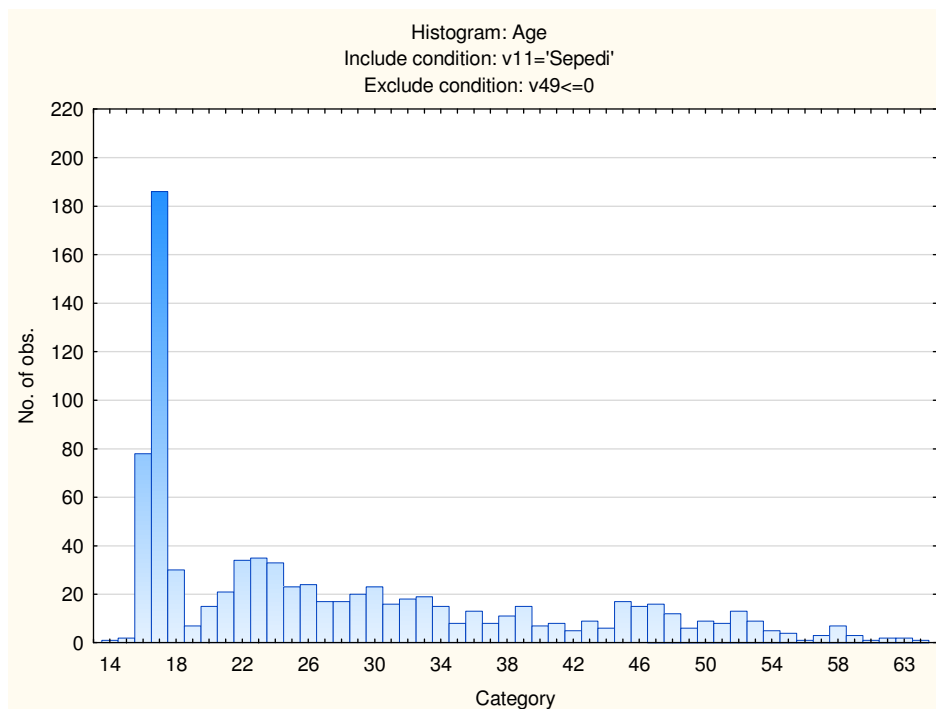
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	301	301	33,63128	33,6313
Post Graduate	25	326	2,79330	36,4246
Unknown	24	350	2,68156	39,1061
Tertiary	176	526	19,66480	58,7709
< Matric	312	838	34,86034	93,6313
Missing	57	895	6,36872	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sepedi	895	895	100,0000	100,0000
Missing	0	895	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	895	895	100,0000	100,0000
Missing	0	895	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	883	883	98,65922	98,6592
Asian	3	886	0,33520	98,9944
Coloured	2	888	0,22346	99,2179
European	1	889	0,11173	99,3296
Missing	6	895	0,67039	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	28,09091	12,14675	14,00000	64,00000	858	37



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	388	388	43,25530	43,2553
F	504	892	56,18729	99,4426
U	5	897	0,55741	100,0000
Missing	0	897	0,00000	100,0000

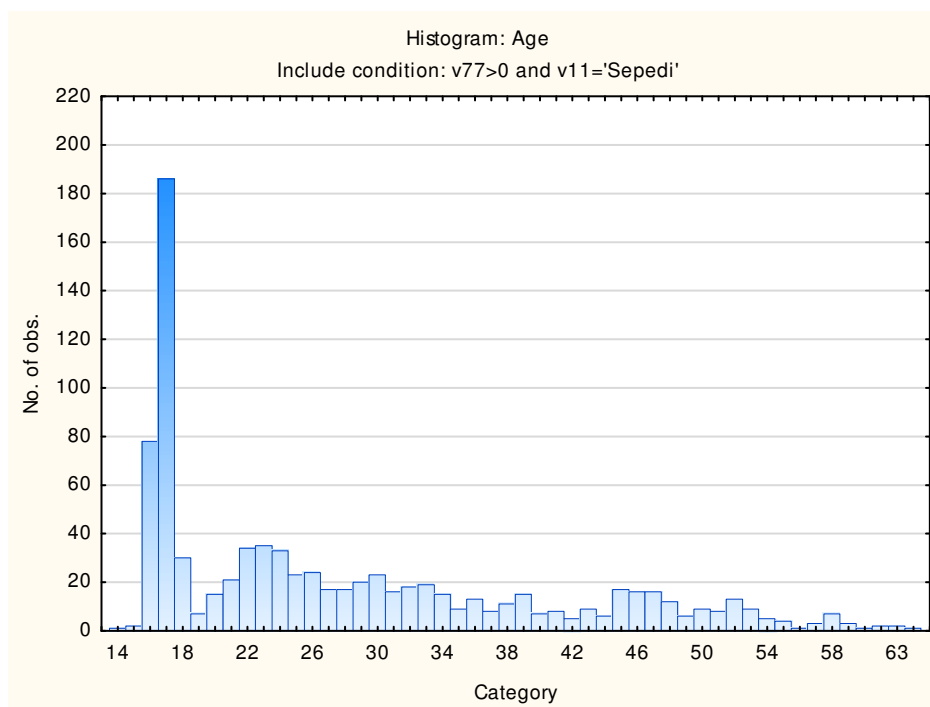
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	301	301	33,55630	33,5563
Post Graduate	25	326	2,78707	36,3434
Unknown	24	350	2,67559	39,0190
Tertiary	178	528	19,84392	58,8629
< Matric	312	840	34,78261	93,6455
Missing	57	897	6,35452	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sepedi	897	897	100,0000	100,0000
Missing	0	897	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	897	897	100,0000	100,0000
Missing	0	897	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	885	885	98,66221	98,6622
Asian	3	888	0,33445	98,9967
Coloured	2	890	0,22297	99,2196
European	1	891	0,11148	99,3311
Missing	6	897	0,66890	100,0000

Variable	Descriptive Statistics: Age					N	No.cases Missing
	Mean	Std.Dev	Minimum	Maximum			
Age	28,11977	12,15024	14,00000	64,00000	860	37	



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.80
General Numerical Reasoning Test	.72
General Verbal Reasoning Test	.77

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, Sesotho Speaking, Updated 2016

### Sample Composition

The sample consisted of Sesotho speaking South Africans who were tested by Psytech South Africa and collaborators during the period up to June 2015, via GeneSys for Windows. Since not all respondents completed all the subtests of the General Reasoning Test battery (GRT2), the biographical characteristics are reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	607	607	65,55076	65,5508
F	315	922	34,01728	99,5680
U	4	926	0,43197	100,0000
Missing	0	926	0,00000	100,0000

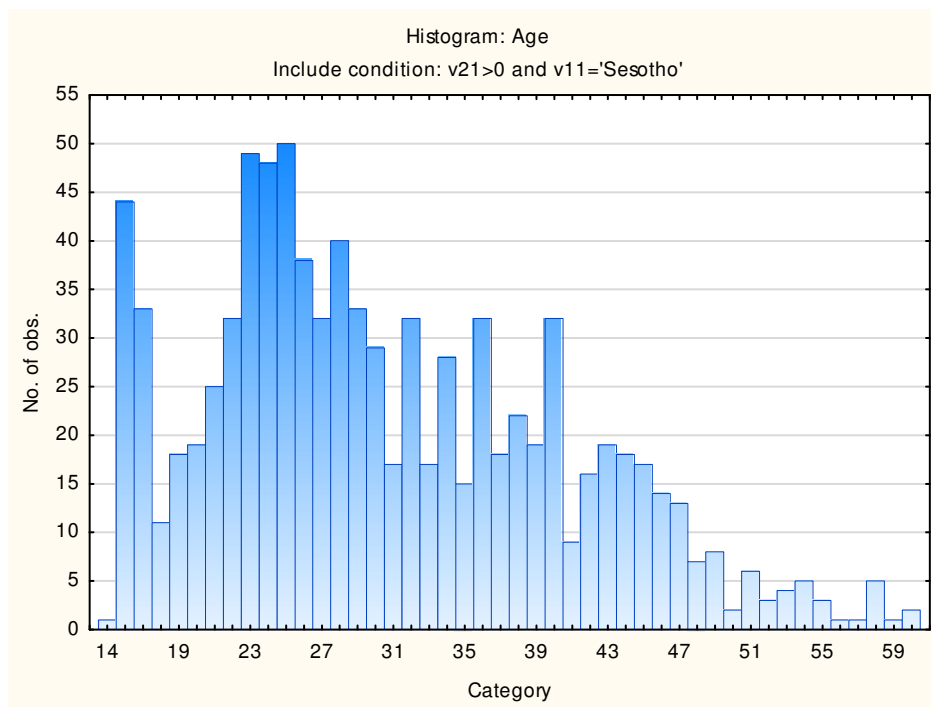
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	357	357	38,55292	38,5529
Post Graduate	43	400	4,64363	43,1965
Unknown	3	403	0,32397	43,5205
Tertiary	232	635	25,05400	68,5745
< Matric	198	833	21,38229	89,9568
Missing	93	926	10,04320	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	926	926	100,0000	100,0000
Missing	0	926	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	926	926	100,0000	100,0000
Missing	0	926	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	921	921	99,46004	99,4600
Asian	1	922	0,10799	99,5680
Coloured	2	924	0,21598	99,7840
European	1	925	0,10799	99,8920
Missing	1	926	0,10799	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,64077	9,834390	14,00000	60,00000	888	38



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	575	575	65,34091	65,3409
F	301	876	34,20455	99,5455
U	4	880	0,45455	100,0000
Missing	0	880	0,00000	100,0000

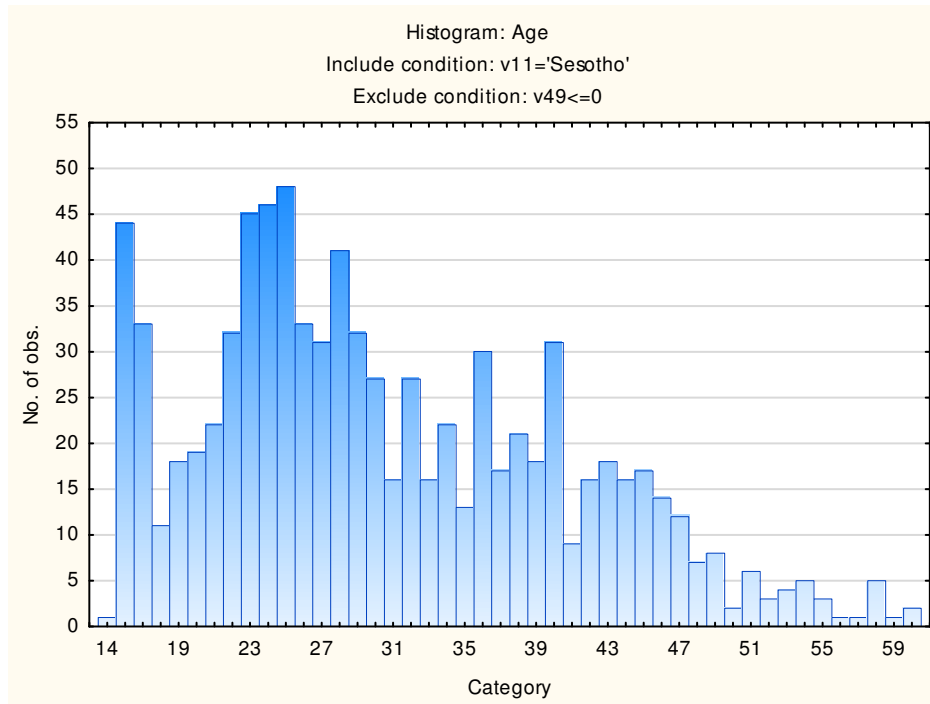
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	347	347	39,43182	39,4318
Post Graduate	30	377	3,40909	42,8409
Unknown	3	380	0,34091	43,1818
Tertiary	210	590	23,86364	67,0455
< Matric	199	789	22,61364	89,6591
Missing	91	880	10,34091	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	877	877	99,65909	99,6591
Coloured	2	879	0,22727	99,8864
Missing	1	880	0,11364	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,61137	9,970094	14,00000	60,00000	844	36



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	572	572	65,0000	65,0000
F	304	876	34,54545	99,5455
U	4	880	0,45455	100,0000
Missing	0	880	0,00000	100,0000

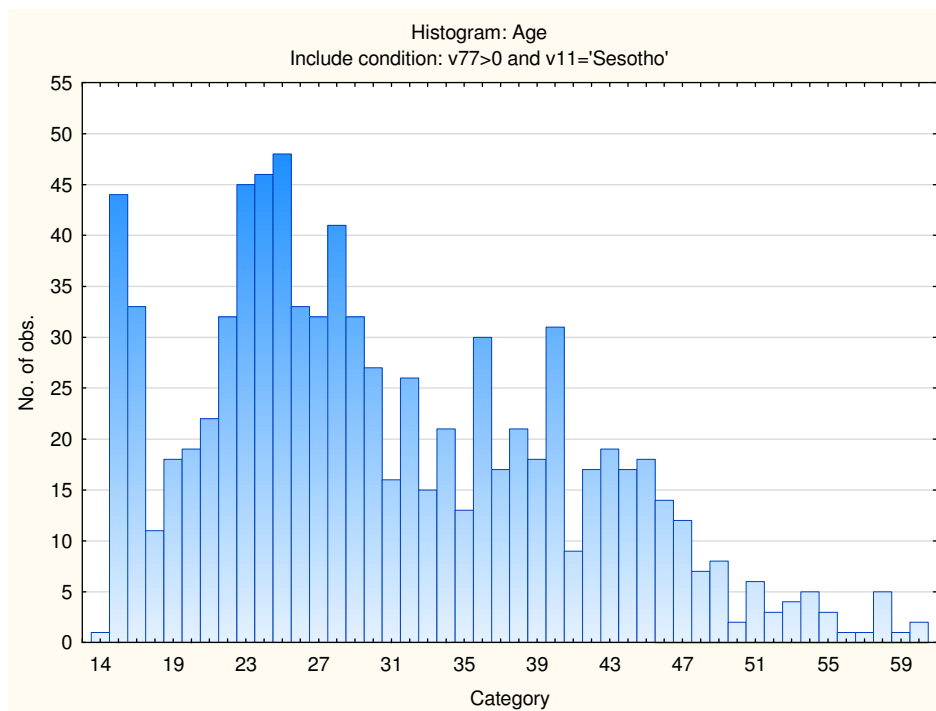
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	346	346	39,31818	39,3182
Post Graduate	30	376	3,40909	42,7273
Unknown	3	379	0,34091	43,0682
Tertiary	213	592	24,20455	67,2727
< Matric	198	790	22,50000	89,7727
Missing	90	880	10,22727	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Sesotho	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	880	880	100,0000	100,0000
Missing	0	880	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	877	877	99,65909	99,6591
Coloured	2	879	0,22727	99,8864
Missing	1	880	0,11364	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	30,65957	9,997512	14,00000	60,00000	846	34



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.80
General Numerical Reasoning Test	.69
General Verbal Reasoning Test	.78

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, Setswana Speaking, Updated 2016

### Sample Composition

The sample consisted of Setswana speaking South Africans who were tested by Psytech South Africa and collaborators during the period up to June 2015, via GeneSys for Windows. Since not all respondents completed all the subtests of the General Reasoning Test battery (GRT2), the biographical characteristics are reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	378	378	47,48744	47,4874
F	415	793	52,13568	99,6231
U	3	796	0,37688	100,0000
Missing	0	796	0,00000	100,0000

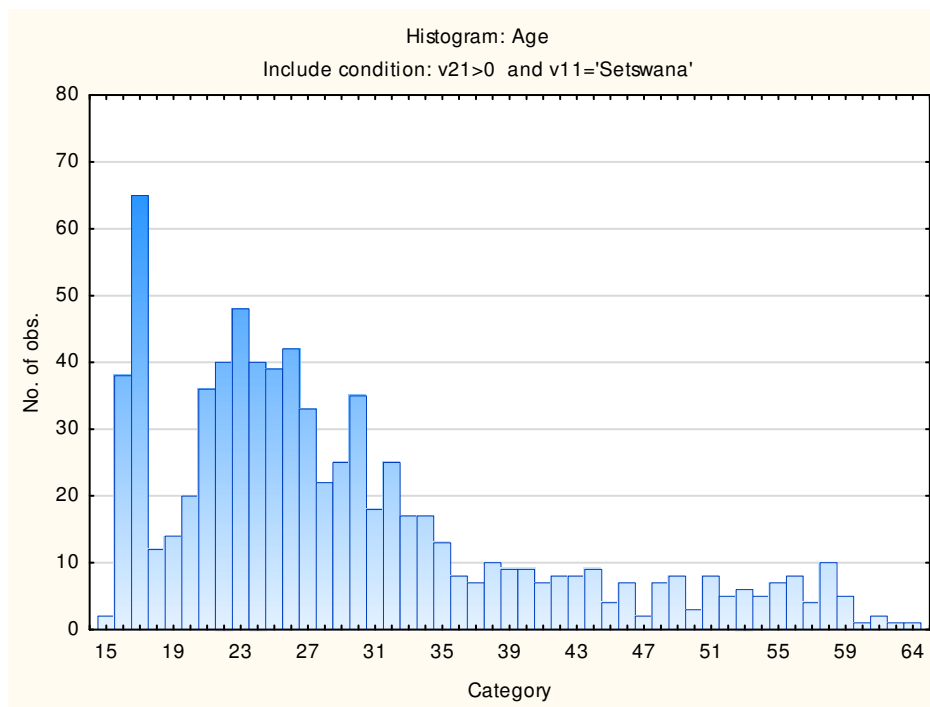
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	265	265	33,29146	33,2915
Post Graduate	50	315	6,28141	39,5729
Unknown	3	318	0,37688	39,9497
Tertiary	275	593	34,54774	74,4975
< Matric	115	708	14,44724	88,9447
Missing	88	796	11,05528	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Setswana	796	796	100,0000	100,0000
Missing	0	796	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	796	796	100,0000	100,0000
Missing	0	796	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	786	786	98,74372	98,7437
Asian	3	789	0,37688	99,1206
Coloured	2	791	0,25126	99,3719
European	2	793	0,25126	99,6231
Missing	3	796	0,37688	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,35195	11,14765	15,00000	64,00000	770	26



## Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	357	357	46,66667	46,6667
F	406	763	53,07190	99,7386
U	2	765	0,26144	100,0000
Missing	0	765	0,00000	100,0000

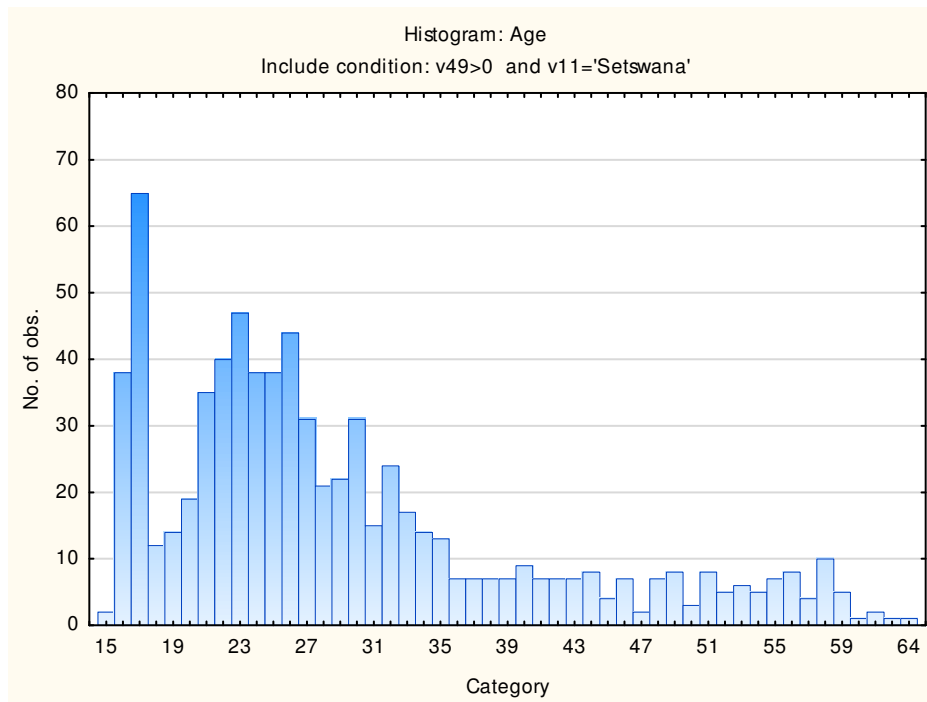
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	254	254	33,20261	33,2026
Post Graduate	48	302	6,27451	39,4771
Unknown	3	305	0,39216	39,8693
Tertiary	255	560	33,33333	73,2026
< Matric	115	675	15,03268	88,2353
Missing	90	765	11,76471	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Setswana	765	765	100,0000	100,0000
Missing	0	765	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	765	765	100,0000	100,0000
Missing	0	765	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	755	755	98,69281	98,6928
Asian	3	758	0,39216	99,0850
Coloured	2	760	0,26144	99,3464
European	2	762	0,26144	99,6078
Missing	3	765	0,39216	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	29,24730	11,28987	15,00000	64,00000	740	25



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	351	351	46,18421	46,1842
F	406	757	53,42105	99,6053
U	3	760	0,39474	100,0000
Missing	0	760	0,00000	100,0000

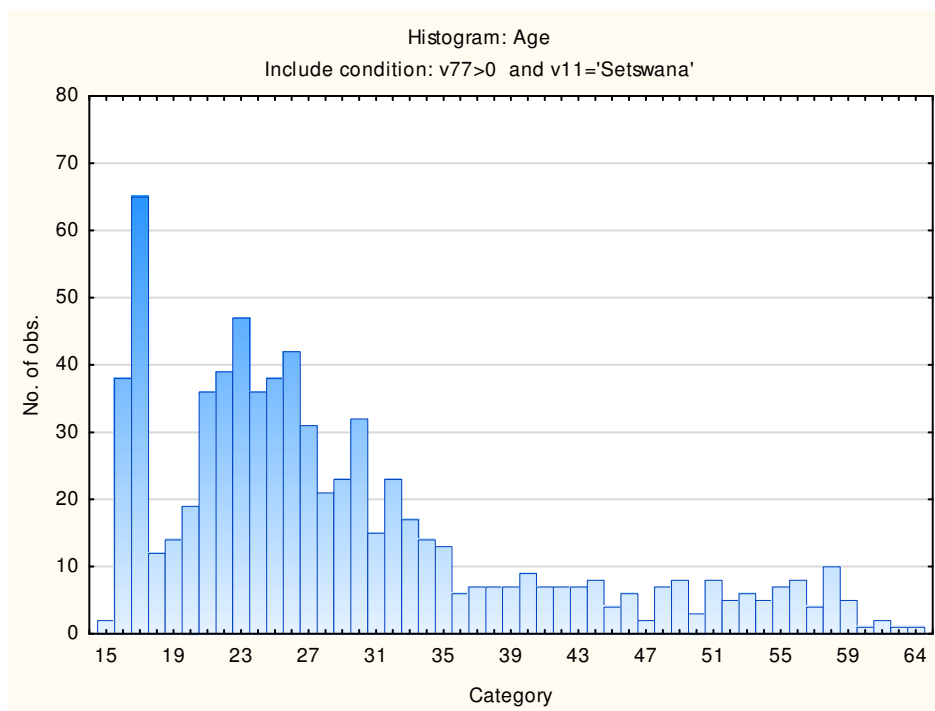
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	251	251	33,02632	33,0263
Post Graduate	48	299	6,31579	39,3421
Unknown	3	302	0,39474	39,7368
Tertiary	253	555	33,28947	73,0263
< Matric	115	670	15,13158	88,1579
Missing	90	760	11,84211	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Setswana	760	760	100,0000	100,0000
Missing	0	760	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	760	760	100,0000	100,0000
Missing	0	760	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	750	750	98,68421	98,6842
Asian	3	753	0,39474	99,0789
Coloured	2	755	0,26316	99,3421
European	2	757	0,26316	99,6053
Missing	3	760	0,39474	100,0000

Variable	Descriptive Statistics: Age					N	No.cases Missing
	Mean	Std.Dev	Minimum	Maximum			
Age	29,23401	11,30454	15,00000	64,00000	735	25	



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.78
General Numerical Reasoning Test	.74
General Verbal Reasoning Test	.74

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, siSwati Speaking, Updated 2016

### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	92	92	41,81818	41,8182
F	128	220	58,18182	100,0000
Missing	0	220	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	58	58	26,36364	26,3636
Post Graduate	5	63	2,27273	28,6364
Unknown	3	66	1,36364	30,0000
Tertiary	37	103	16,81818	46,8182
< Matric	109	212	49,54545	96,3636
Missing	8	220	3,63636	100,0000

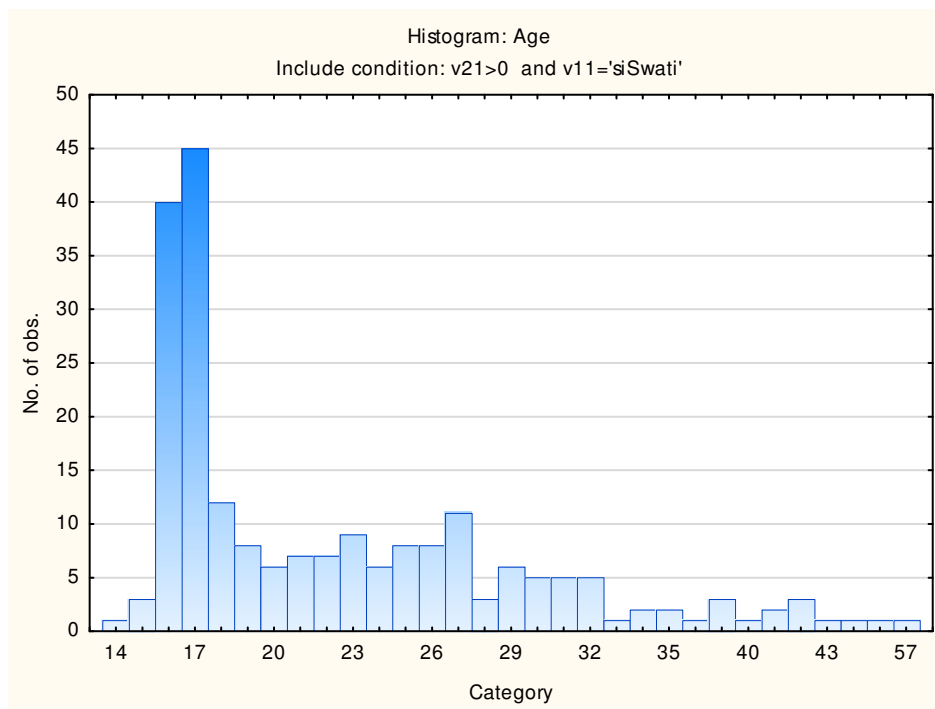
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
siSwati	220	220	100,0000	100,0000
Missing	0	220	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	220	220	100,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Missing	0	220	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	218	218	99,09091	99,0909
Asian	1	219	0,45455	99,5455
European	1	220	0,45455	100,0000
Missing	0	220	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	22,44860	7,676234	14,00000	57,00000	214	6



### Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	86	86	40,56604	40,5660
F	126	212	59,43396	100,0000
Missing	0	212	0,00000	100,0000



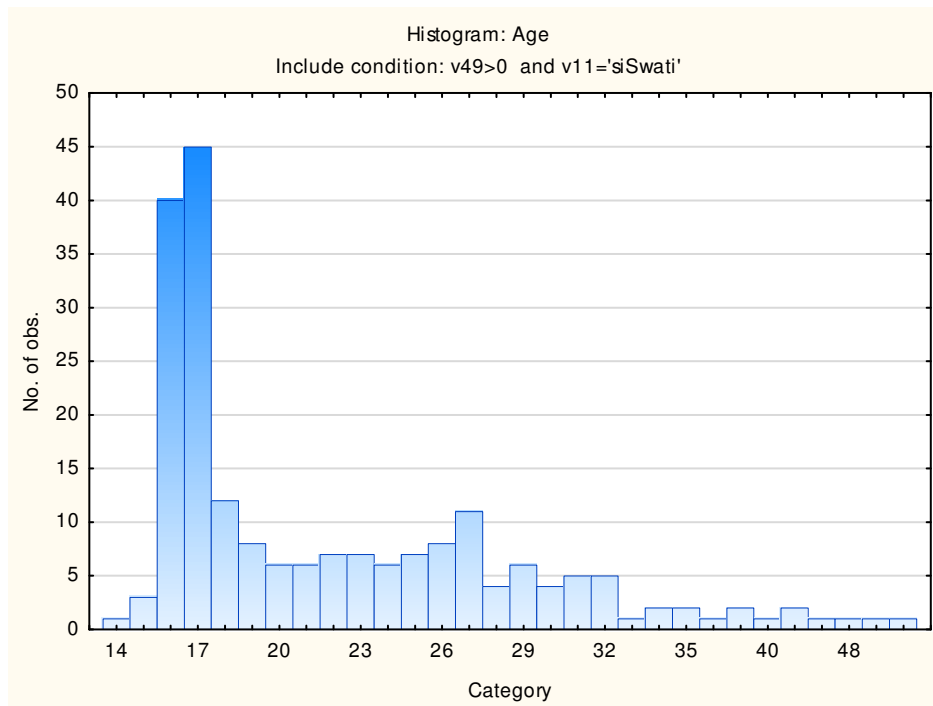
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	57	57	26,88679	26,8868
Post Graduate	3	60	1,41509	28,3019
Unknown	3	63	1,41509	29,7170
Tertiary	32	95	15,09434	44,8113
< Matric	109	204	51,41509	96,2264
Missin	8	212	3,77358	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
siSwati	212	212	100,0000	100,0000
Missing	0	212	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	212	212	100,0000	100,0000
Missing	0	212	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	212	212	100,0000	100,0000
Missing	0	212	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	22,07767	7,383157	14,00000	57,00000	206	6



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	86	86	40,18692	40,1869
F	128	214	59,81308	100,0000
Missing	0	214	0,00000	100,0000

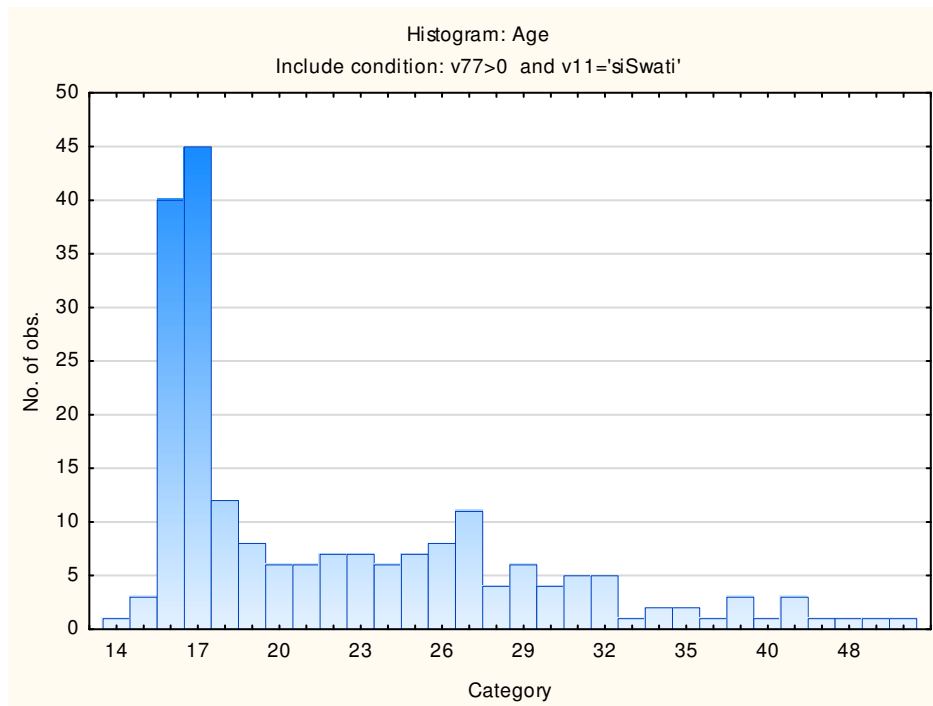
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	57	57	26,63551	26,6355
Post Graduate	3	60	1,40187	28,0374
Unknown	3	63	1,40187	29,4393
Tertiary	34	97	15,88785	45,3271
< Matric	109	206	50,93458	96,2617
Missing	8	214	3,73832	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
siSwati	214	214	100,0000	100,0000
Missing	0	214	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	214	214	100,0000	100,0000
Missing	0	214	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	214	214	100,0000	100,0000
Missing	0	214	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	22,25000	7,556230	14,00000	57,00000	208	6



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.70
General Numerical Reasoning Test	.69
General Verbal Reasoning Test	.73

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, Tshivenda Speaking, Updated 2016

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### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	94	94	58,02469	58,0247
F	66	160	40,74074	98,7654
U	2	162	1,23457	100,0000
Missing	0	162	0,00000	100,0000

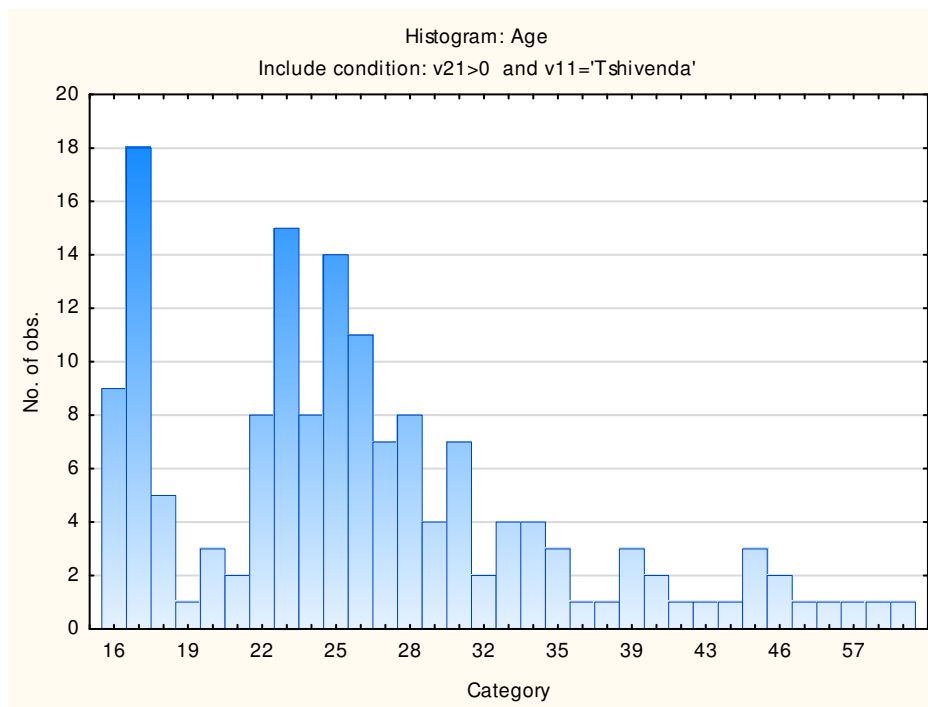
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	48	48	29,62963	29,6296
Post Graduate	6	54	3,70370	33,3333
Unknown	1	55	0,61728	33,9506
Tertiary	46	101	28,39506	62,3457
< Matric	30	131	18,51852	80,8642
Missing	31	162	19,13580	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Tshivenda	162	162	100,0000	100,0000
Missing	0	162	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	162	162	100,0000	100,0000
Missing	0	162	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	160	160	98,76543	98,7654
Asian	2	162	1,23457	100,0000
Missing	0	162	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,75163	9,106303	16,00000	62,00000	153	9



### Sample composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	86	86	55,84416	55,8442
F	66	152	42,85714	98,7013
U	2	154	1,29870	100,0000
Missing	0	154	0,00000	100,0000

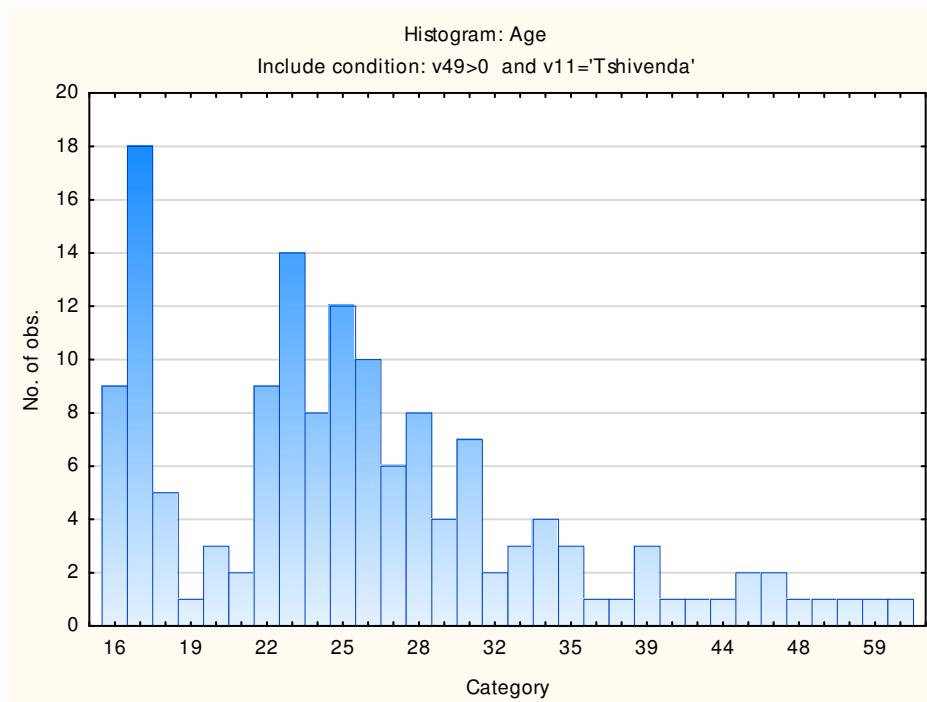
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	47	47	30,51948	30,5195
Post Graduate	5	52	3,24675	33,7662
Unknown	1	53	0,64935	34,4156
Tertiary	41	94	26,62338	61,0390
< Matric	30	124	19,48052	80,5195
Missing	30	154	19,48052	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Tshivenda	154	154	100,0000	100,0000
Missing	0	154	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	154	154	100,0000	100,0000
Missing	0	154	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	152	152	98,70130	98,7013
Asian	2	154	1,29870	100,0000
Missing	0	154	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,40000	9,043414	16,00000	62,00000	145	9



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	88	88	55,69620	55,6962
F	68	156	43,03797	98,7342
U	2	158	1,26582	100,0000
Missing	0	158	0,00000	100,0000

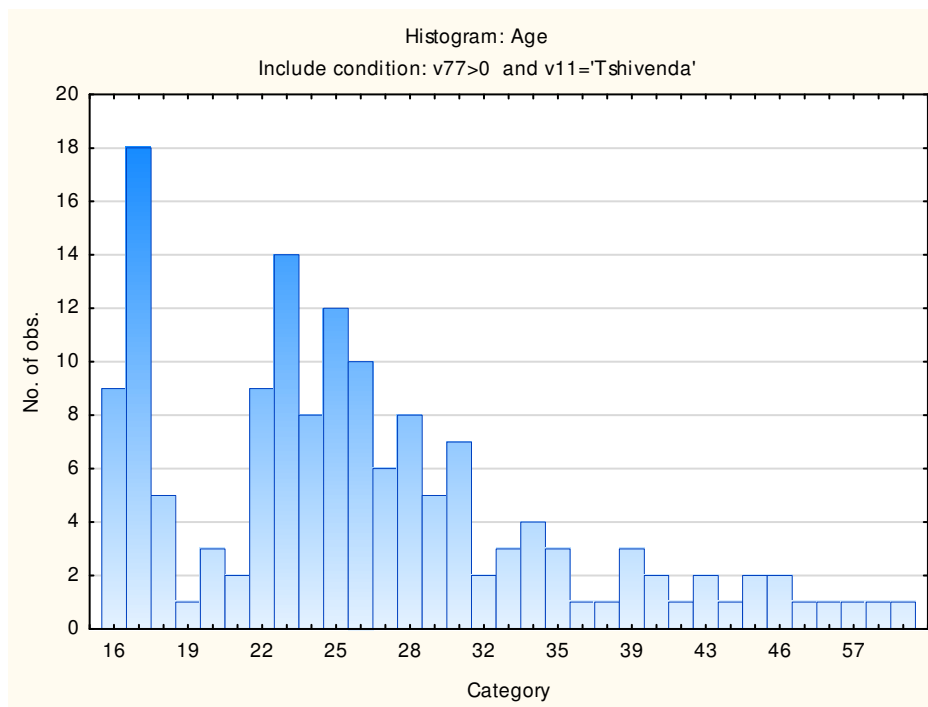
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	47	47	29,74684	29,7468
Post Graduate	5	52	3,16456	32,9114
Unknown	1	53	0,63291	33,5443
Tertiary	45	98	28,48101	62,0253
< Matric	30	128	18,98734	81,0127
Missing	30	158	18,98734	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Tshivenda	158	158	100,0000	100,0000
Missing	0	158	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	158	158	100,0000	100,0000
Missing	0	158	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	156	156	98,73418	98,7342
Asian	2	158	1,26582	100,0000
Missing	0	158	0,00000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,73154	9,191382	16,00000	62,00000	149	9



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

<b>Subtest</b>	<b>Cronbach Coefficient Alpha</b>
General Abstract Reasoning Test	.81
General Numerical Reasoning Test	.66
General Verbal Reasoning Test	.77

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test (GRT2)

## Reliability: South Africans, Xitsonga Speaking, Updated 2016

### Sample Composition

The sample consisted of respondents who had completed any of the subtests of the General Reasoning Test battery (GRT2) in the period up to June 2015, via GeneSys for Windows. Since not all the respondents completed all the subtests, biographical information is reported separately for the three tests.

### Sample Composition: General Abstract Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	141	141	51,83824	51,8382
F	131	272	48,16176	100,0000
Missing	0	272	0,00000	100,0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	103	103	37,86765	37,8676
Post Graduate	19	122	6,98529	44,8529
Unknown	1	123	0,36765	45,2206
Tertiary	73	196	26,83824	72,0588
< Matric	49	245	18,01471	90,0735
Missing	27	272	9,92647	100,0000

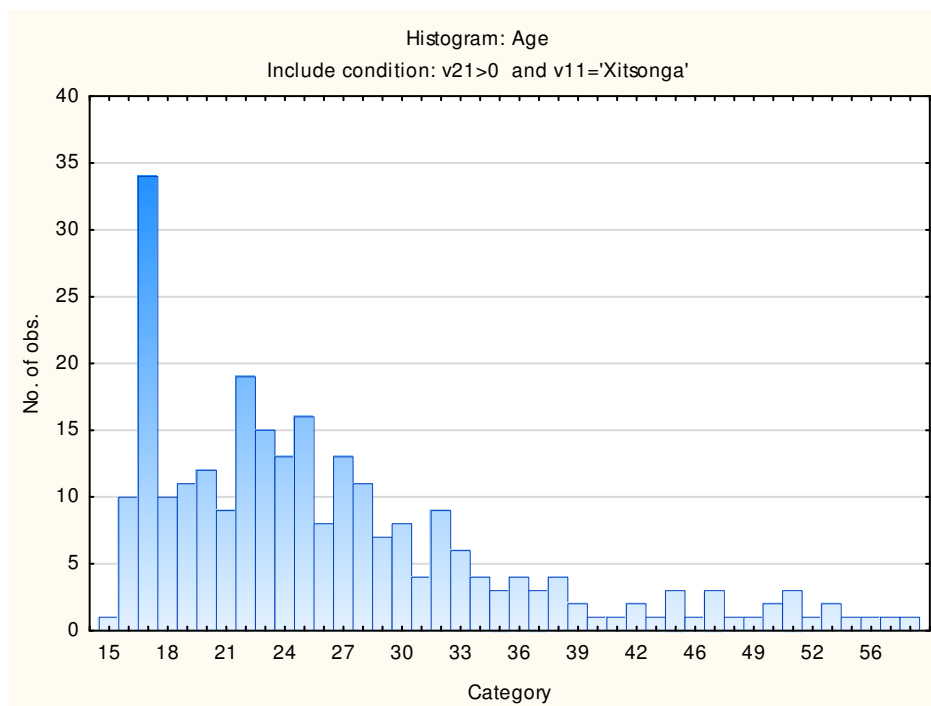
Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Xitsonga	272	272	100,0000	100,0000
Missing	0	272	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	272	272	100,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Missing	0	272	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	272	272	100,0000	100,0000
Missing	0	272	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,56489	9,477215	15,00000	59,00000	262	10



### Sample Composition: General Numerical Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	124	124	49,79920	49,7992
F	125	249	50,20080	100,0000
Missing	0	249	0,00000	100,0000

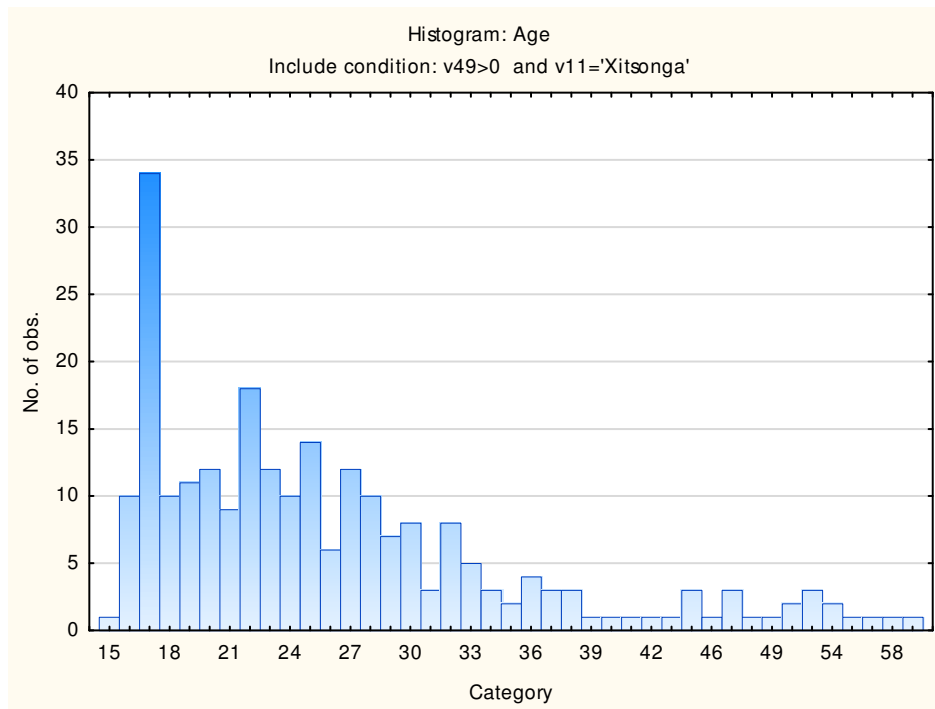
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	98	98	39,35743	39,3574
Post Graduate	12	110	4,81928	44,1767
Unknown	1	111	0,40161	44,5783
Tertiary	62	173	24,89960	69,4779
< Matric	49	222	19,67871	89,1566
Missing	27	249	10,84337	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Xitsonga	249	249	100,0000	100,0000
Missing	0	249	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	249	249	100,0000	100,0000
Missing	0	249	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	249	249	100,0000	100,0000
Missing	0	249	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,26667	9,582702	15,00000	59,00000	240	9



### Sample Composition: General Verbal Reasoning Test

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
M	124	124	49,20635	49,2063
F	128	252	50,79365	100,0000
Missing	0	252	0,00000	100,0000

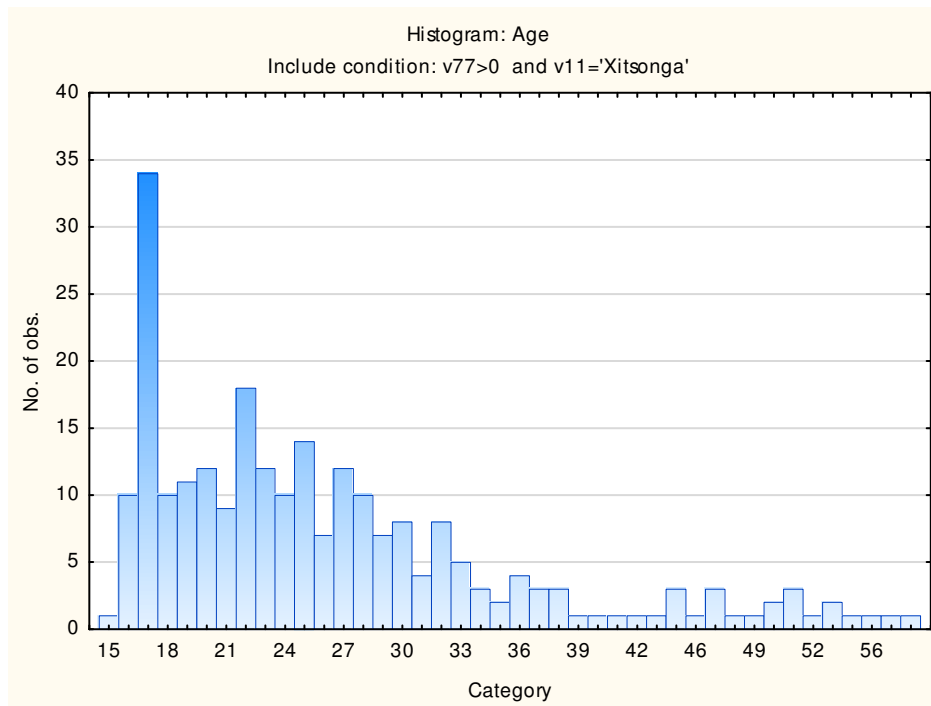
Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Grade 12	98	98	38,88889	38,8889
Post Graduate	12	110	4,76190	43,6508
Unknown	1	111	0,39683	44,0476
Tertiary	65	176	25,79365	69,8413
< Matric	49	225	19,44444	89,2857
Missing	27	252	10,71429	100,0000

Category	Frequency table: Language			
	Count	Cumulative Count	Percent	Cumulative Percent
Xitsonga	252	252	100,0000	100,0000
Missing	0	252	0,0000	100,0000

Category	Frequency table: Language Group			
	Count	Cumulative Count	Percent	Cumulative Percent
Indigenous	252	252	100,0000	100,0000
Missing	0	252	0,0000	100,0000

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
African	252	252	100,0000	100,0000
Missing	0	252	0,0000	100,0000

Variable	Descriptive Statistics: Age					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	26,39095	9,669724	15,00000	59,00000	243	9



## Internal Consistency Reliabilities for General Reasoning Test Battery Subtests

Subtest	Cronbach Coefficient Alpha
General Abstract Reasoning Test	.79
General Numerical Reasoning Test	.67
General Verbal Reasoning Test	.78

Results of lower than 0.75 are possibly related to respondents guessing the answers to items which they may not know. Results should therefore be interpreted with caution. Do not rely on these tests in isolation, but to consider the results as part of a holistic assessment, which incorporates additional sources of information.

# General Reasoning Test Battery Validity Introduction

## ***Recommendations***

Users are strongly encouraged to do validation studies on the instruments they use within their organisations or within their industry sectors, by co-operating with other organisations in the same industry. In some cases this may mean sharing information with organisations that are potential competitors. In the interest of professionalism, users are encouraged to overcome their reservations in this regard, since co-operation is in their interest. Psytech South Africa provides extensive support for validation studies done on its instruments, and users are welcome to contact their representatives in this regard.

For construct validation studies, it is necessary to assess a particular ability with more than one instrument on the same respondents. This may seem like an unnecessary expense at first, but it is worthwhile to verify how ability measures relate to one another, particularly if one is still introducing a new measure.

Predictive validation studies can be done against competency ratings, or against 'hard' data like production or sales figures. It is preferable to use both types of criterion information, because that enables one to validate the competency ratings as well.

At the time of writing, there was still a shortage of validity information, particularly predictive validity, regarding the General Reasoning Test Battery in South Africa. More information is being sought, and this section will shortly be updated.

## Index of validity studies on the General Reasoning Test Battery (GRT2)

<b>Study description</b>	<b>Study No</b>
Correlations with Critical Reasoning Test Battery	V1
Correlations with Business School subjects	V2
Correlations with Graduate Reasoning Test Battery	V3
Correlations with Technical Test Battery	V4
Correlations with Technical Test Battery (2)	V5

## GRT2 Construct Validity: Correlations between General Reasoning Test Battery (GRT2), Critical Reasoning Test Battery (CRTB2) and Learning Potential Computer Adaptive test (LPCAT)

The sample consisted of 25 candidates for articled clerkships at a South African bank.

Correlations that were not significant at the 5% level were discarded.

The variables were:

VR2	General Verbal Reasoning
NR2	General Numerical Reasoning
AR2	General Abstract Reasoning
VCR2	Verbal Critical Reasoning
NCR2	Numerical Critical Reasoning
LPPRE	LPCAT Pretest
LPPOST	LPCAT Posttest
LPDIFF	LPCAT Difference
LPCOMP	LPCAT Composite

Correlations found (Only correlations significant at the 5% level are reported)

Variable	VR2	NR2	AR2	VCR2	NCR2	LPPRE	LPPOST	LPDIFF	LPCOMP
VR2		.63*	.55*	.67*	.54*	.45*	.44*		.49*
NR2	.63*		.78*	.76*	.72*	.48*	.57*		.52*
AR2	.55*	.78*		.52*	.69*	.66*	.74*		.69*
VCR2	.67*	.76*	.52*		.62*		.44*		.42*
NCR2	.54*	.72*	.69*	.62*		.44*	.60*	.51*	.49*
LPPRE	.45*	.48*	.66*		.44*	1.00	.91*		1.00*
LPPOST	.44*	.57*	.74*	.44*	.60*	.91*		.48*	.93*
LPDIFF					.51*		.48*		
LPCOMP	.49*	.52*	.69*	.42*	.49*	1.00*	.93*	.	

## Comments:

The Abstract reasoning test correlated highly with the tests of numerical ability and learning potential. This supports the contention that the Abstract Reasoning test gives an indication of a respondent's ability to learn. As expected, the verbal reasoning subtests correlated highly, as did the numerical subtests. Correlations between the abstract reasoning test and the verbal reasoning tests were fairly high. The verbal critical reasoning subtest had the lowest correlation with Abstract reasoning and learning potential, indicating that this ability is perhaps most influenced by a person's educational experiences, and should not be used as an indication of potential.

## GRT2 Predictive validity: Correlations with Business School subjects

### Sample composition

The sample consisted of 184 students selected to attend business development courses at a graduate business school in SA. Because of the implementation of Recognition of Prior Learning at the university, persons without post-matric qualifications, but with work experience, were also considered for admission.

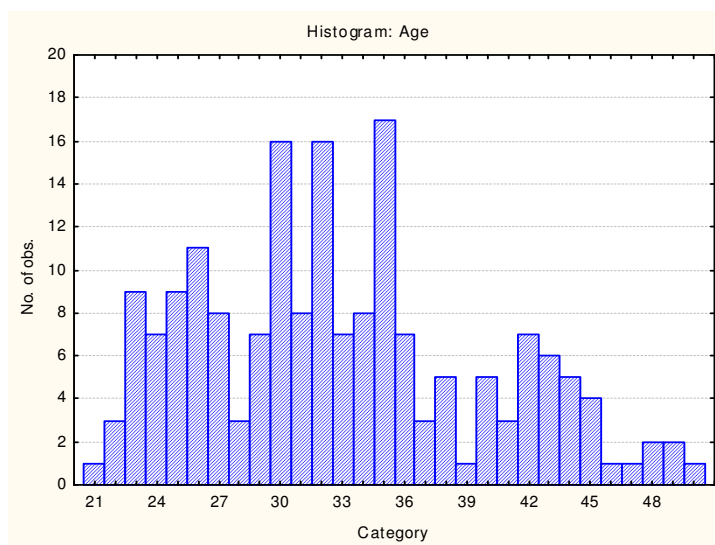
Category	Frequency table: SEX			
	Count	Cumulative Count	Percent	Cumulative Percent
Female	70	70	38.04348	38.0435
Male	114	184	61.95652	100.0000
Missing	0	184	0.00000	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Post Graduate	10	10	5.43478	5.4348
Grade 12	53	63	28.80435	34.2391
Technikon	22	85	11.95652	46.1957
Degree	29	114	15.76087	61.9565
Vocational Training	5	119	2.71739	64.6739
University diploma	10	129	5.43478	70.1087
Grade 10 or 11	6	135	3.26087	73.3696
Missing	49	184	26.63043	100.0000

Category	Frequency table: First Language			
	Count	Cumulative Count	Percent	Cumulative Percent
English	53	53	28.80435	28.8043
Afrikaans	18	71	9.78261	38.5870
isiXhosa	19	90	10.32609	48.9130
Sesotho	2	92	1.08696	50.0000
Other	7	99	3.80435	53.8043
isiNdebele	1	100	0.54348	54.3478
Missing	84	184	45.65217	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	80	80	43.47826	43.4783
African	39	119	21.19565	64.6739
Asian	15	134	8.15217	72.8261
European	5	139	2.71739	75.5435
Missing	45	184	24.45652	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	32.89071	6.849165	21.00000	51.00000	183	1



## Correlations with Business School subjects

Variable	Correlations Marked correlations are significant at $p < .0500$		
	Abstract Reasoning	Numerical Reasoning	Verbal Reasoning
Introduction to Finance	.2827 N=62 p=.026	.2836 N=62 p=.026	.3238 N=62 p=.010
Quantitative Management Techniques	.5255 N=30 p=.003	.6826 N=30 p=.000	.6403 N=30 p=.000
Economics for Managers	.2201 N=15 p=.431	.8918 N=15 0	.4792 N=15 p=.071
Introduction to Information systems	.4712 N=32 p=.006	.2992 N=32 p=.096	.3054 N=32 p=.089
Principles of management practice	.1900 N=82 p=.087	.1468 N=82 p=.188	.3093 N=82 p=.005
Principles of management accounting	.3759 N=37 p=.022	.4875 N=37 p=.002	.3064 N=37 p=.065
Principles of marketing management	.0683 N=99 p=.502	.0472 N=99 p=.642	.2713 N=99 p=.007
Human Resources Management	.2106 N=20 p=.373	.5542 N=20 p=.011	.6358 N=20 p=.003
Financial Management	.5061 N=16 p=.045	.5192 N=16 p=.039	.4155 N=16 p=.109
Operations Management	.2651 N=78 p=.019	.1175 N=78 p=.306	.2820 N=78 p=.012
Strategic Management	.3126 N=33 p=.077	.2604 N=33 p=.143	.2510 N=33 p=.159
Industrial Relations	-.0958 N=12 p=.767	.0065 N=12 p=.984	.0929 N=12 p=.774
Contemporary business communication	.2187 N=47 p=.140	.1898 N=47 p=.201	.1703 N=47 p=.252
Management Skills A	-.0024 N=32 p=.990	-.3395 N=32 p=.057	-.3130 N=32 p=.081
Management Skills B	.2818 N=29 p=.139	.0893 N=29 p=.645	.3401 N=29 0

**Comments:**

For some of the subjects, the sample sizes were small. It is clear from the significant correlations that were found, that different subjects access different aspects of reasoning ability, with abstract reasoning being particularly important for Quantitative Management Techniques, Introduction to Information Systems and Financial Management. Numerical Reasoning predicted performance on Quantitative Management Techniques, Economics for Managers (very high correlation), Principles of Management Accounting, Human Resources Management and Financial Management. Verbal Reasoning predicted Quantitative Management Techniques and Human Resources management, with some significant lower correlations with other subjects. All in all, it can be said that Verbal Reasoning played a less significant role than was expected, but on the whole the usefulness of the General Reasoning Test battery for these selections was supported by the results.

## GRT2 Construct validity: Correlations with GRT1

### Sample composition

The sample consisted of 184 students selected to attend business development courses at a graduate business school in SA, who had completed both the GRT1 and GRT2. Because of the implementation of Recognition of Prior Learning at the university, persons without post-matric qualifications, but with work experience, were also considered for admission.

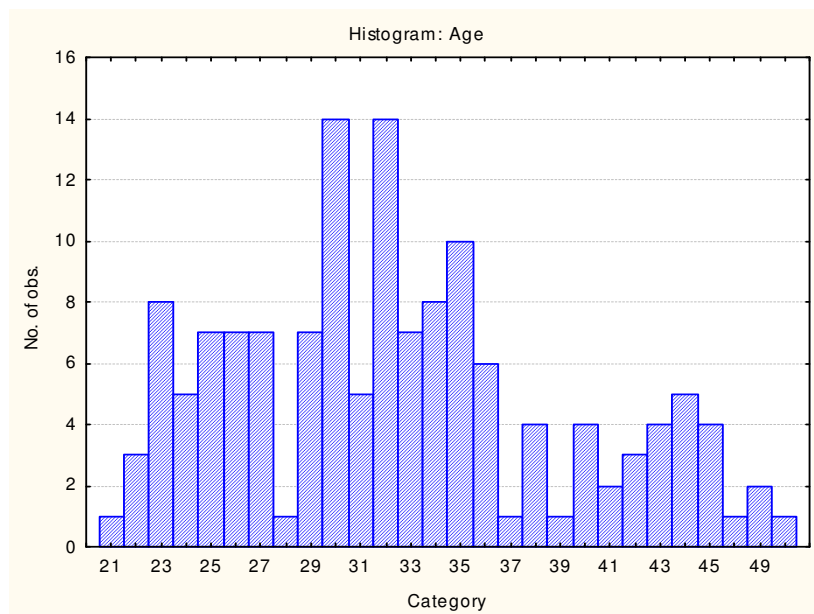
Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Female	54	54	38.02817	38.0282
Male	88	142	61.97183	100.0000
Missing	0	142	0.00000	100.0000

Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Post Graduate	9	9	6.33803	6.3380
Grade 12	53	62	37.32394	43.6620
Technikon	20	82	14.08451	57.7465
Degree	29	111	20.42254	78.1690
Vocational Training	5	116	3.52113	81.6901
University diploma	10	126	7.04225	88.7324
Grade 10 or 11	6	132	4.22535	92.9577
Missing	10	142	7.04225	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
English	51	51	35.91549	35.9155
Afrikaans	18	69	12.67606	48.5915
isiXhosa	19	88	13.38028	61.9718
Sesotho	2	90	1.40845	63.3803
Other	7	97	4.92958	68.3099
isiNdebele	1	98	0.70423	69.0141
Missing	44	142	30.98592	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	78	78	54.92958	54.9296
African	39	117	27.46479	82.3944
Asian	14	131	9.85915	92.2535
European	5	136	3.52113	95.7746
Missing	6	142	4.22535	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	32.55634	6.753538	21.00000	51.00000	142	0



### Correlations with Graduate Reasoning Test Battery

Variable	Correlations Marked correlations are significant at $p < .05000$ N=142 (Casewise deletion of missing data)		
	Graduate Abstract Reasoning	Graduate Numerical Reasoning	Graduate Verbal Reasoning
General Abstract Reasoning	0.61	0.54	0.28
General Numerical Reasoning	0.63	0.72	0.32
General Verbal Reasoning	0.51	0.48	0.59

These correlations are uncorrected.

### Comments:

The correlations of the General Reasoning Test Battery subtests with their counterparts in the Graduate Reasoning Test Battery are significant, and support the construct validity of both tests. While the Graduate Verbal Reasoning test did not correlate highly with the Abstract and Numerical subtests of the General Reasoning test battery, the correlation with the General Verbal Reasoning test was satisfactory, though not high enough to consider it a parallel form. It should be borne in mind that the difficulty levels of the Graduate Reasoning Test Battery tests are considerably higher than the General Reasoning Test Battery's subtest, and the restricted range would depress these correlations.

## GRT2 Construct Validity: Correlations with Technical Test Battery

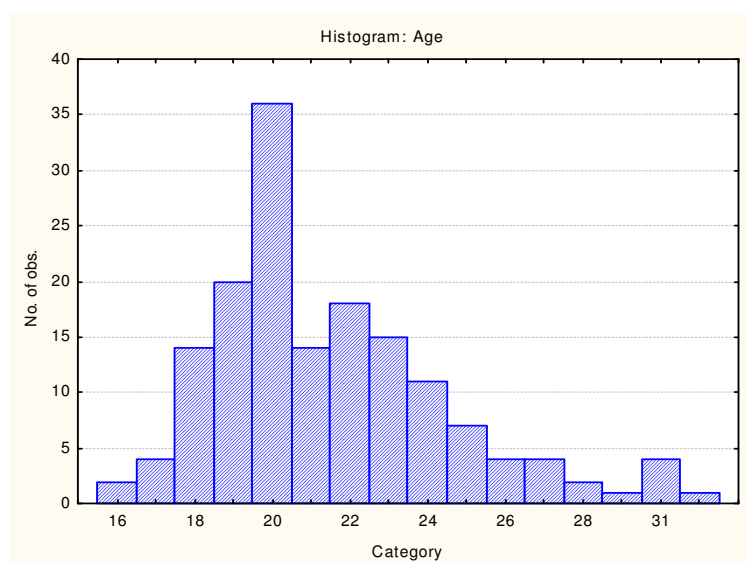
### Sample composition

The sample consisted of workers and applicants at a construction company based in the Western Cape. Data were collected during 2002-2003.

Category	Frequency table: Race			
	Count	Cumulative Count	Percent	Cumulative Percent
Whites and Coloureds	67	67	42.67516	42.6752
Blacks	87	154	55.41401	98.0892
Asians	2	156	1.27389	99.3631
Missing	1	157	0.63694	100.0000

Category	Frequency table: Sex			
	Count	Cumulative Count	Percent	Cumulative Percent
Male	140	140	89.17197	89.1720
Female	17	157	10.82803	100.0000
Missing	0	157	0.00000	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	21.54140	3.193524	16.00000	34.00000	157	0



### ***Correlations with Technical Test Battery subtests***

Variable	Correlations Marked correlations are significant at $p < .05000$ N=157 (Casewise deletion of missing data)	
	Mechanical Reasoning	Spatial Reasoning
Abstract Reasoning	0.60	0.52
Numerical Reasoning	0.55	0.56
Verbal Reasoning	0.50	0.41

### **Comments:**

All the correlations were significant. The overall correlations points to the influence of a general ability factor. The Abstract Reasoning subtest had the highest correlation with Mechanical Reasoning, indicating that Mechanical Reasoning requires a degree of abstract problem solving or fluid intelligence. The Verbal Reasoning subtest had the lowest correlation with Spatial Reasoning, which can be explained by the fact that the Spatial Reasoning test has a low verbal content and therefore places fewer demands on a respondent's verbal ability.

## GRT2 Construct Validity: Correlations with Technical Test Battery

### Sample Composition

The sample consisted of workers and applicants in a manufacturing company, who had completed both the General Reasoning Test Battery and the Technical Test Battery for selection or development purposes. Data were collected in 2002-2003.

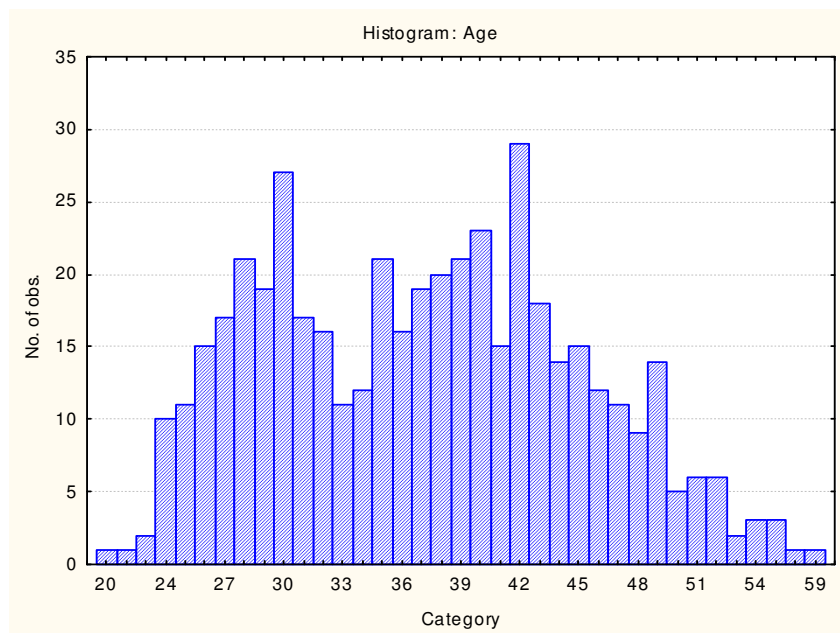
Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Male	455	455	98.06034	98.0603
Female	9	464	1.93966	100.0000
Missing	0	464	0.00000	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Afrikaans	55	55	11.85345	11.8534
Sesotho	171	226	36.85345	48.7069
isiZulu	168	394	36.20690	84.9138
English	11	405	2.37069	87.2845
Setswana	5	410	1.07759	88.3621
Other - N Sotho	1	411	0.21552	88.5776
Xitsonga	4	415	0.86207	89.4397
Sepedi	10	425	2.15517	91.5948
isiNdebele/Tshivenda	5	430	1.07759	92.6724
isiXhosa	15	445	3.23276	95.9052
siSwati	2	447	0.43103	96.3362
Missing	17	464	3.66379	100.0000

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
European	50	50	10.77586	10.7759
African	385	435	82.97414	93.7500
Asian	6	441	1.29310	95.0431
Coloured	7	448	1.50862	96.5517
Missing	16	464	3.44828	100.0000

Category	Frequency table: Education			
	Count	Cumulative Count	Percent	Cumulative Percent
Vocational Training	10	10	2.15517	2.1552
Grade 12 - N2	1	11	0.21552	2.3707
Grade 10 or 11	35	46	7.54310	9.9138
University entrance matri	2	48	0.43103	10.3448
Technikon	8	56	1.72414	12.0690
Std 7	36	92	7.75862	19.8276
Std 5	17	109	3.66379	23.4914
Grade 12	147	256	31.68103	55.1724
Std 6	46	302	9.91379	65.0862
Technikon (N2)	1	303	0.21552	65.3017
Std 8	63	366	13.57759	78.8793
Vocational Training - N2	4	370	0.86207	79.7414
Std 9	27	397	5.81897	85.5603
Technikon - N2	1	398	0.21552	85.7759
Degree	1	399	0.21552	85.9914
Technikon - N5	1	400	0.21552	86.2069
Grade 12 + N5 Fitter and	1	401	0.21552	86.4224
Vocational Training - N3	5	406	1.07759	87.5000
Grade 12 + ND in Fitting	1	407	0.21552	87.7155
Vocational Training - NTC	1	408	0.21552	87.9310
Grade 8	2	410	0.43103	88.3621
Grade 12 + Technikon Cert	1	411	0.21552	88.5776
Vocational Training - N4	5	416	1.07759	89.6552
Std 4	6	422	1.29310	90.9483
Grade 11	3	425	0.64655	91.5948
NTC 3	1	426	0.21552	91.8103
Vocational Training (Mill	1	427	0.21552	92.0259
Grade 12 + Teaching Diplo	1	428	0.21552	92.2414
University diploma	1	429	0.21552	92.4569
Grade 10	1	430	0.21552	92.6724
Grade 11 + BAdmin Diploma	1	431	0.21552	92.8879
Grade 9	2	433	0.43103	93.3190
Form 2	1	434	0.21552	93.5345
Vocational Training - Fit	1	435	0.21552	93.7500
Grade 12 & A+	1	436	0.21552	93.9655
Grade 12 + Fitter & Turne	2	438	0.43103	94.3966
Technikon - N3	1	439	0.21552	94.6121
Technikon - Marketing	1	440	0.21552	94.8276
Std 1	1	441	0.21552	95.0431
Grade 10 or 11 + Ind Refr	1	442	0.21552	95.2586
Vocational Training - N5	1	443	0.21552	95.4741
Vocational Training (N3)	1	444	0.21552	95.6897
Grade 12 + HRM Diploma	1	445	0.21552	95.9052
Vocational Training - N1	1	446	0.21552	96.1207
Grade 10 or 11 + Fitting	1	447	0.21552	96.3362
Missing	17	464	3.66379	100.0000

Variable	Descriptive Statistics					
	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	37.12500	7.879869	20.00000	59.00000	464	0



### Correlations with Technical Test Battery subtests

Variable	Correlations Marked correlations are significant at $p < .05000$ N=464 (Casewise deletion of missing data)	
	Mechanical Reasoning	Spatial Reasoning
Abstract Reasoning	0.60	0.55
Numerical Reasoning	0.56	0.51
Verbal Reasoning	0.60	0.49

### Comments:

The similarity to the results obtained in validity study number 5 should be noted – the pattern of correlations is very similar. All the correlations are significant, pointing to the influence of a general ability factor, or 'g'. The relationship between Verbal Reasoning and Spatial Reasoning was lower than the other correlations, indicating that Spatial Reasoning relies on verbal ability to a lesser extent. Mechanical Reasoning had higher correlations with Abstract and Verbal Reasoning, which indicates that Mechanical Reasoning requires some problems solving or fluid intelligence, and also some verbal understanding.

# General Reasoning Test Battery

## Differential Item Functioning

### Introduction

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## ***What is Differential Item Functioning?***

Differential item functioning is found when a test item behaves differently for different population groups. Normally this means that the item shows a different relationship to the construct in question for different population groups. Normally one groups the respondents in terms of their level of score achieved on the construct, and then compares the likelihood of getting an item correct for the different population groups and the different score levels.

There are two different forms of Differential Item Functioning that are of interest to us:

**Uniform bias** means that one population group consistently has a better chance of answering an item correctly, irrespective of their total score.

**Non-uniform bias** means that the relative chance of answering the item correctly is not the same across all score levels, for different groups. This can be seen clearly on a graph, when the lines plotting the mean item score for a group are not parallel and may cross in places.

## ***Ways of calculating Differential Item Functioning***

There are many different ways of investigating Differential Item Functioning.

For the purpose of this manual, **Factorial Analysis of Variance** was used. This technique allows us to investigate the effect of combinations of continuous and categorical variables on predictor variables. It produces a particularly informative graph which is useful for visualising the effect of non-uniform bias.

The Factorial Analysis of Variance can also indicate uniform bias when a significant effect for the race group variable is found. Non-uniform bias is indicated by a significant interaction effect for the race group variable and score level.

## ***Dividing the samples into score levels***

The samples were divided into score levels in such a way that there would be sufficient persons of each group in every score category. To do this, stanine scores were calculated and the frequency tables for every race group examined for the stanine scores. To avoid creating cells with very few cases, resulting in meaningless output, the groups could not always be divided up evenly. It should also be pointed out that the low end and high end of the distributions could not be examined in great detail, because there are few persons in any group that score at the extremes of the scale. Only if one has an extremely large sample can the high end and low end of a scale be fully studied for bias. The score level variable used in the study can only be considered ordinal data (the intervals are not of uniform size). This should be borne in mind when interpreting the graphs.

## ***Grouping respondents***

Ideally, one would want to examine all race groups in detail, but in practice this is not always possible. The grouping of respondents according to race group had to be determined by the availability of data. Grouping is usually done with all Black candidates on one group, and all the other groups in the other.

## ***Direction and magnitude of differences***

If DIF is found, the bias is not necessarily in favour of the Non-Black or Advantaged group. The size of the differences in item means scores must also be considered. In some cases the differences are very small. For every study, a summary of the findings is given, as well as a detailed report of the findings for every item. The differences between race groups, where bias is found, is graphically depicted.

***List of Differential item functioning studies reported for the General Reasoning Test Battery:***

<b>Tests</b>	<b>Grouping</b>	<b>Sample</b>	<b>Study number</b>
General Verbal Reasoning General Numerical Reasoning General Abstract Reasoning	Black-NonBlack	Applicants to business school courses	D1
General Verbal Reasoning General Numerical Reasoning General Abstract Reasoning	Black-NonBlack	Workers and applicants – construction company	D2

## GRT2 differential item functioning: applicants to a graduate business school. Grouping variable – race group.

### Sample composition

Frequency table: Racegroup				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Non-black	198	198	57.39130	57.3913
Black	105	303	30.43478	87.8261
Missing	42	345	12.17391	100.0000

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	237	237	67.90831	67.9083
F	111	348	31.80516	99.7135
U	1	349	0.28653	100.0000
Missing	0	349	0.00000	100.0000

Frequency table: Education				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Degree	65	65	18.62464	18.6246
Grade 12	109	174	31.23209	49.8567
Grade 10 or 11	17	191	4.87106	54.7278
Technikon	34	225	9.74212	64.4699
Post Graduate	21	246	6.01719	70.4871
University diploma	17	263	4.87106	75.3582
Vocational Training	13	276	3.72493	79.0831
University entrance matric	1	277	0.28653	79.3696
University entrance matri	1	278	0.28653	79.6562
Missing	71	349	20.34384	100.0000

Frequency table: First Language				
Category	Count	Cumulative Count	Percent	Cumulative Percent
English	135	135	38.68195	38.6819
Afrikaans	42	177	12.03438	50.7163
isiXhosa	45	222	12.89398	63.6103
Other	12	234	3.43840	67.0487
Setswana	1	235	0.28653	67.3352
isiNdebele	3	238	0.85960	68.1948
Sesotho	2	240	0.57307	68.7679
Missing	109	349	31.23209	100.0000

For the purpose of this analysis, a few persons who had not supplied their race information were classified as Black based on their names.

## ***Method***

Applicants were classified into Black and non-Black for the purpose of the analysis, since the size of the sample did not allow for finer distinctions.

Applicants were classified into score levels for the test being evaluated. The cut-offs for the levels were determined by examining the frequency distributions for both race groups, trying to ensure a sufficient number of cases for both races in each category.

The statistical technique used in this study was factorial analysis of variance. For every item a factorial analysis of variance was done, using the scored item response as dependent variable, and the race group and score level (on the overall test score for the subtest being investigated) as predictor variables. If a significant effect was found for race, that was taken as an indication of uniform item bias, and the least-square difference in the means for that item was plotted graphically to illustrate which race group had a higher probability of getting the item right. If a significant interaction effect was found for race group and score level that was taken as an indication of non-uniform item bias, and the means at all levels for both race groups were plotted to illustrate the severity of the non-uniform bias that was found.

## **Results by item: General Verbal Reasoning Test**

### **Summary table**

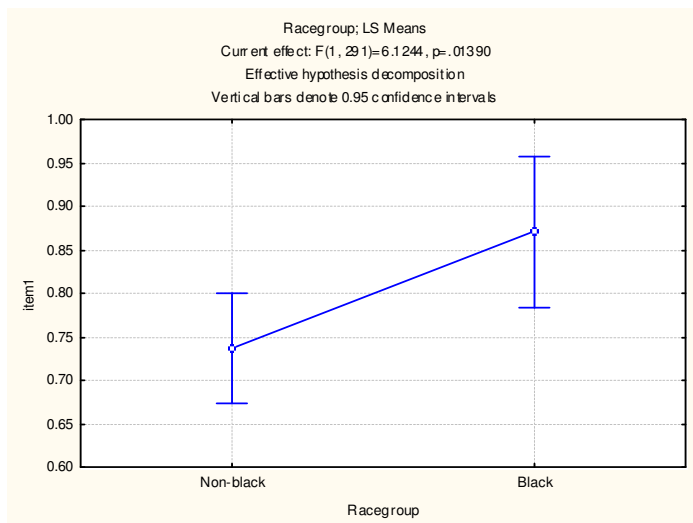
<b>Item number</b>	<b>Uniform bias</b>	<b>In favour of group</b>	<b>Non-uniform bias</b>
1	Yes	Black	No
2	No		No
3	No		No
4	No		No
5	No		No
6	No		No
7	No		No
8	No		No
9	Yes	Non-Black	No
10	No		No
11	No		No
12	No		No
13	No		No
14	No	Black	Yes
15	No		No
16	No		No
17	No		No
18	No		No
19	No		Yes
20	Yes	Non-Black	No
21	No		No
22	Yes	Black	No
23	No		No
24	No		No
25	No		No
26	No		No
27	No		No
28	No		No
29	No		No
30	No		No
31	No		No
32	Yes	Black	No
33	No		No
34	No		No
35	No		No

Uniform bias was found in six out of 35 items

In four out of the six items, the bias was in favour of the Black group.

Non-uniform bias was found in two out of 35 items. The impact of that bias is best evaluated by inspecting the graphs in the detailed results that follow.

Univariate Tests of Significance for item1 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	138.6964	1	138.6964	869.9851	0.000000
Racegroup	0.9764	1	0.9764	6.1244	0.013903
Scorelevel	1.2975	5	0.2595	1.6277	0.152530
Racegroup*Scorelevel	0.9695	5	0.1939	1.2162	0.301445
Error	46.3923	291	0.1594		



Univariate Tests of Significance for item2 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	78.06703	1	78.06703	391.3174	0.000000
Racegroup	0.20149	1	0.20149	1.0100	0.315743
Scorelevel	8.53427	5	1.70685	8.5557	0.000000
Racegroup*Scorelevel	0.79036	5	0.15807	0.7923	0.555880
Error	58.05390	291	0.19950		

Univariate Tests of Significance for item3 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	114.5756	1	114.5756	655.2100	0.000000
Racegroup	0.1874	1	0.1874	1.0716	0.301436
Scorelevel	2.9230	5	0.5846	3.3430	0.005948
Racegroup*Scorelevel	0.8251	5	0.1650	0.9437	0.453000
Error	50.8867	291	0.1749		

Univariate Tests of Significance for item4 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	88.84093	1	88.84093	428.1744	0.000000
Racegroup	0.03170	1	0.03170	0.1528	0.696197
Scorelevel	3.89974	5	0.77995	3.7590	0.002586
Racegroup*Scorelevel	1.84418	5	0.36884	1.7776	0.117311
Error	60.37892	291	0.20749		

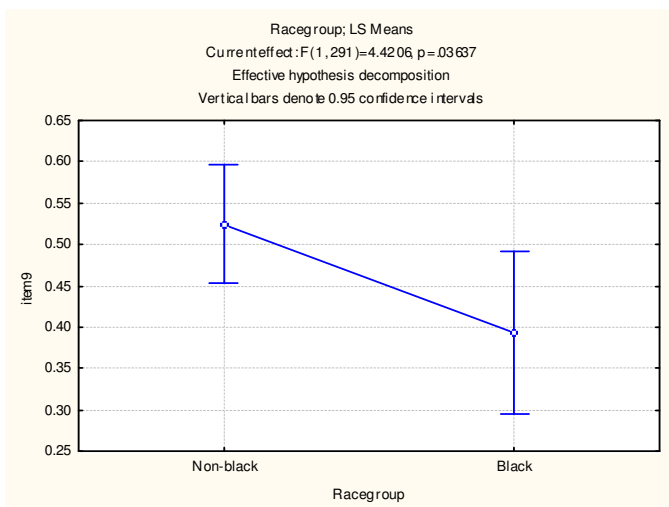
Univariate Tests of Significance for item5 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	107.6055	1	107.6055	638.4191	0.000000
Racegroup	0.1944	1	0.1944	1.1535	0.283716
Scorelevel	5.0717	5	1.0143	6.0180	0.000026
Racegroup*Scorelevel	1.5516	5	0.3103	1.8412	0.104768
Error	49.0480	291	0.1685		

Univariate Tests of Significance for item6 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	107.4785	1	107.4785	638.4649	0.000000
Racegroup	0.2642	1	0.2642	1.5697	0.211251
Scorelevel	5.3642	5	1.0728	6.3731	0.000012
Racegroup*Scorelevel	1.1538	5	0.2308	1.3708	0.235223
Error	48.9866	291	0.1683		

Univariate Tests of Significance for item7 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	9.22997	1	9.229971	54.10399	0.000000
Racegroup	0.21378	1	0.213779	1.25313	0.263880
Scorelevel	1.80948	5	0.361896	2.12135	0.062927
Racegroup*Scorelevel	1.55984	5	0.311968	1.82868	0.107129
Error	49.64369	291	0.170597		

Univariate Tests of Significance for item8					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	155.1569	1	155.1569	1360.947	0.000000
Racegroup	0.0012	1	0.0012	0.011	0.917925
Scorelevel	1.3297	5	0.2659	2.333	0.042409
Racegroup*Scorelevel	0.5145	5	0.1029	0.903	0.479668
Error	33.1759	291	0.1140		

Univariate Tests of Significance for item9					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	45.25204	1	45.25204	218.2013	0.000000
Racegroup	0.91678	1	0.91678	4.4206	0.036366
Scorelevel	9.27490	5	1.85498	8.9446	0.000000
Racegroup*Scorelevel	0.92859	5	0.18572	0.8955	0.484403
Error	60.34952	291	0.20739		



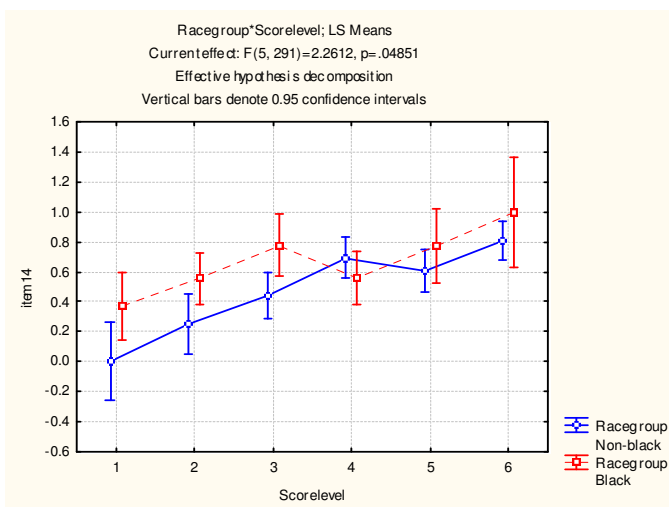
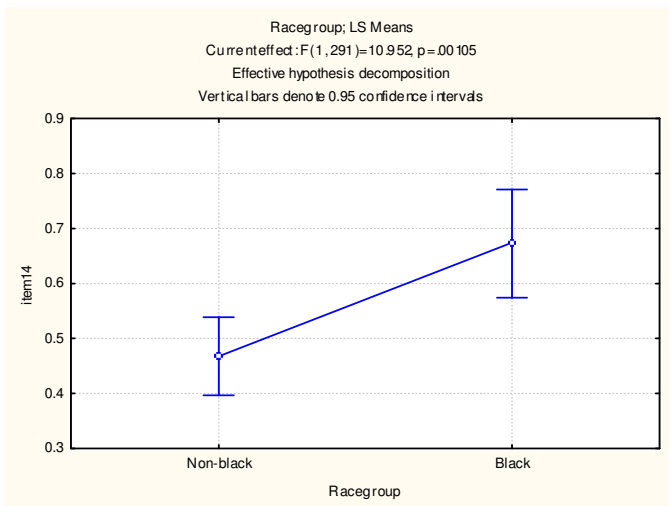
Univariate Tests of Significance for item10					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	30.17799	1	30.17799	137.4664	0.000000
Racegroup	0.38708	1	0.38708	1.7632	0.185262
Scorelevel	5.40412	5	1.08082	4.9234	0.000242
Racegroup*Scorelevel	0.79112	5	0.15822	0.7207	0.608315
Error	63.88320	291	0.21953		

Univariate Tests of Significance for item11 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	10.60763	1	10.60763	60.45620	0.000000
Racegroup	0.00356	1	0.00356	0.02032	0.886756
Scorelevel	1.94909	5	0.38982	2.22170	0.052227
Racegroup*Scorelevel	0.84554	5	0.16911	0.96380	0.440253
Error	51.05880	291	0.17546		

Univariate Tests of Significance for item12 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	95.54396	1	95.54396	500.9304	0.000000
Racegroup	0.00005	1	0.00005	0.0003	0.987274
Scorelevel	6.55129	5	1.31026	6.8696	0.000004
Racegroup*Scorelevel	0.70514	5	0.14103	0.7394	0.594465
Error	55.50330	291	0.19073		

Univariate Tests of Significance for item13 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	14.69166	1	14.69166	78.20950	0.000000
Racegroup	0.14668	1	0.14668	0.78081	0.377622
Scorelevel	1.73339	5	0.34668	1.84551	0.103957
Racegroup*Scorelevel	1.28630	5	0.25726	1.36950	0.235714
Error	54.66435	291	0.18785		

Univariate Tests of Significance for item14 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	69.84037	1	69.84037	337.2733	0.000000
Racegroup	2.26792	1	2.26792	10.9522	0.001053
Scorelevel	8.52978	5	1.70596	8.2384	0.000000
Racegroup*Scorelevel	2.34114	5	0.46823	2.2612	0.048512
Error	60.25840	291	0.20707		



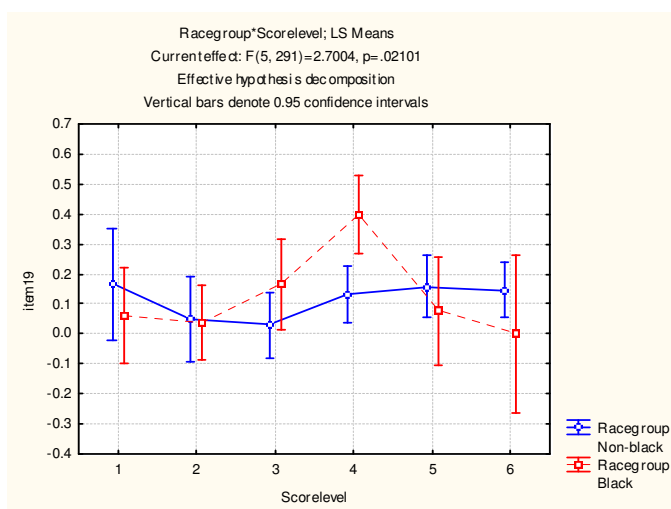
Univariate Tests of Significance for item15 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	117.7594	1	117.7594	839.9940	0.000000
Racegroup	0.0253	1	0.0253	0.1806	0.671197
Scorelevel	7.9175	5	1.5835	11.2953	0.000000
Racegroup*Scorelevel	0.6925	5	0.1385	0.9880	0.425280
Error	40.7955	291	0.1402		

Univariate Tests of Significance for item16 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	11.92985	1	11.92985	69.16555	0.000000
Racegroup	0.27079	1	0.27079	1.56996	0.211218
Scorelevel	3.76287	5	0.75257	4.36319	0.000761
Racegroup*Scorelevel	1.66005	5	0.33201	1.92489	0.090127
Error	50.19244	291	0.17248		

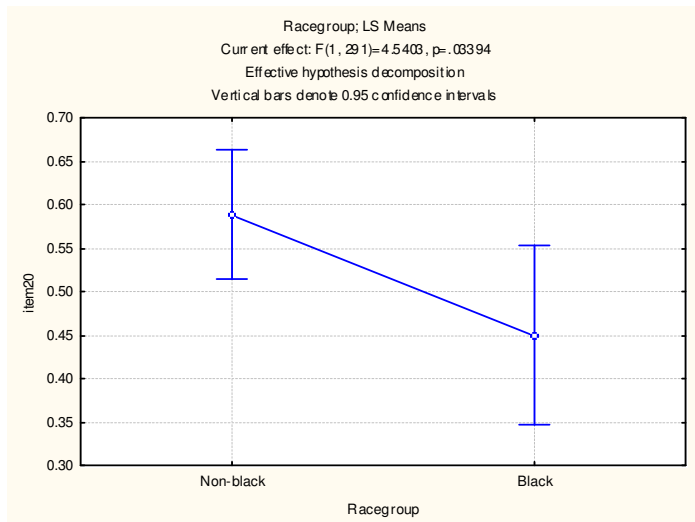
Univariate Tests of Significance for item17 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	103.2749	1	103.2749	766.4997	0.000000
Racegroup	0.0054	1	0.0054	0.0400	0.841616
Scorelevel	16.2027	5	3.2405	24.0510	0.000000
Racegroup*Scorelevel	0.1518	5	0.0304	0.2253	0.951385
Error	39.2081	291	0.1347		

Univariate Tests of Significance for item18 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	80.08579	1	80.08579	399.9907	0.000000
Racegroup	0.22751	1	0.22751	1.1363	0.287323
Scorelevel	5.99750	5	1.19950	5.9909	0.000027
Racegroup*Scorelevel	1.25996	5	0.25199	1.2586	0.281934
Error	58.26378	291	0.20022		

Univariate Tests of Significance for item19 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3.02242	1	3.022422	28.22610	0.000000
Racegroup	0.00590	1	0.005900	0.05510	0.814588
Scorelevel	1.65314	5	0.330629	3.08771	0.009862
Racegroup*Scorelevel	1.44576	5	0.289152	2.70036	0.021013
Error	31.15998	291	0.107079		

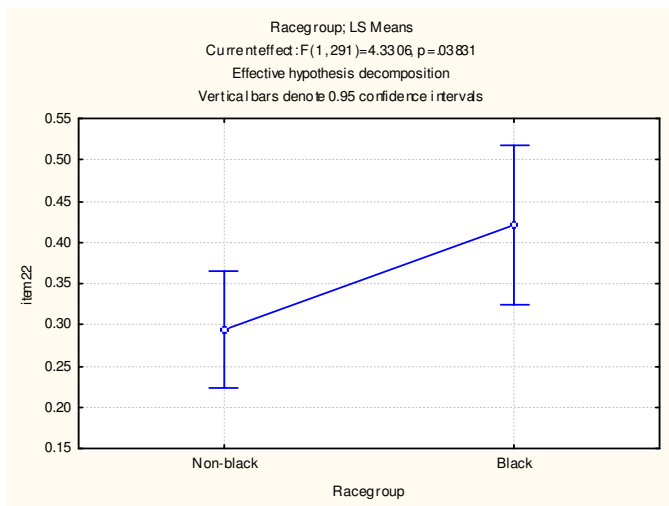


Univariate Tests of Significance for item20 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	57.94156	1	57.94156	254.8660	0.000000
Racegroup	1.03220	1	1.03220	4.5403	0.033944
Scorelevel	4.02607	5	0.80521	3.5419	0.003999
Racegroup*Scorelevel	0.69926	5	0.13985	0.6152	0.688365
Error	66.15632	291	0.22734		



Univariate Tests of Significance for item21 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	32.60463	1	32.60463	163.0119	0.000000
Racegroup	0.25768	1	0.25768	1.2883	0.257296
Scorelevel	10.91124	5	2.18225	10.9105	0.000000
Racegroup*Scorelevel	0.84566	5	0.16913	0.8456	0.518311
Error	58.20401	291	0.20001		

Univariate Tests of Significance for item22 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	27.45822	1	27.45822	137.7354	0.000000
Racegroup	0.86334	1	0.86334	4.3306	0.038306
Scorelevel	9.50615	5	1.90123	9.5369	0.000000
Racegroup*Scorelevel	0.94276	5	0.18855	0.9458	0.451627
Error	58.01225	291	0.19935		



Univariate Tests of Significance for item23					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	13.74636	1	13.74636	86.77326	0.000000
Racegroup	0.00030	1	0.00030	0.00190	0.965242
Scorelevel	6.54341	5	1.30868	8.26099	0.000000
Racegroup*Scorelevel	0.59953	5	0.11991	0.75691	0.581585
Error	46.09934	291	0.15842		

Univariate Tests of Significance for item24					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	21.59007	1	21.59007	126.2534	0.000000
Racegroup	0.33692	1	0.33692	1.9702	0.161493
Scorelevel	9.10544	5	1.82109	10.6493	0.000000
Racegroup*Scorelevel	0.23834	5	0.04767	0.2787	0.924579
Error	49.76267	291	0.17101		

Univariate Tests of Significance for item25					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	24.51740	1	24.51740	149.7282	0.000000
Racegroup	0.28966	1	0.28966	1.7689	0.184556
Scorelevel	15.14961	5	3.02992	18.5038	0.000000
Racegroup*Scorelevel	0.57664	5	0.11533	0.7043	0.620607
Error	47.65011	291	0.16375		

Univariate Tests of Significance for item26 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	5.21470	1	5.214700	46.84642	0.000000
Racegroup	0.11849	1	0.118493	1.06448	0.303052
Scorelevel	4.16928	5	0.833856	7.49098	0.000001
Racegroup*Scorelevel	0.99765	5	0.199530	1.79248	0.114261
Error	32.39260	291	0.111315		

Univariate Tests of Significance for item27 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	18.82859	1	18.82859	118.1013	0.000000
Racegroup	0.00115	1	0.00115	0.0072	0.932336
Scorelevel	10.62348	5	2.12470	13.3270	0.000000
Racegroup*Scorelevel	0.96136	5	0.19227	1.2060	0.306309
Error	46.39339	291	0.15943		

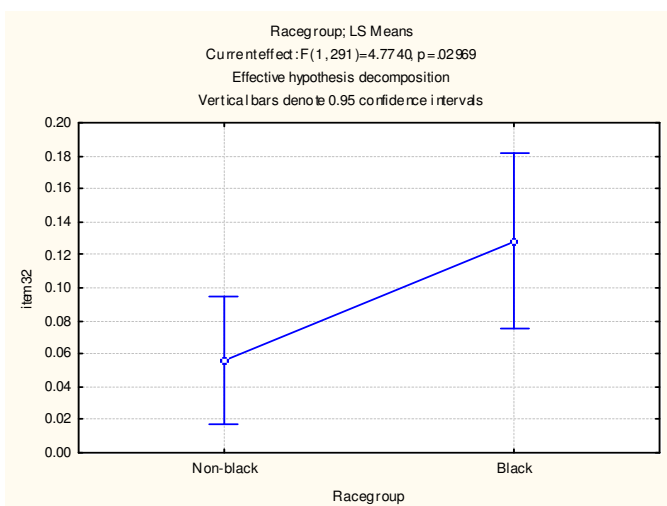
Univariate Tests of Significance for item28 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	10.16028	1	10.16028	76.78275	0.000000
Racegroup	0.19626	1	0.19626	1.48320	0.224261
Scorelevel	8.14798	5	1.62960	12.31511	0.000000
Racegroup*Scorelevel	0.37287	5	0.07457	0.56357	0.727914
Error	38.50657	291	0.13232		

Univariate Tests of Significance for item29 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	25.50988	1	25.50988	169.4247	0.000000
Racegroup	0.16834	1	0.16834	1.1181	0.291213
Scorelevel	15.47347	5	3.09469	20.5535	0.000000
Racegroup*Scorelevel	0.66523	5	0.13305	0.8836	0.492360
Error	43.81519	291	0.15057		

Univariate Tests of Significance for item30					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	5.42139	1	5.421389	52.45385	0.000000
Racegroup	0.03269	1	0.032689	0.31627	0.574289
Scorelevel	7.11717	5	1.423434	13.77222	0.000000
Racegroup*Scorelevel	0.34212	5	0.068425	0.66203	0.652556
Error	30.07642	291	0.103355		

Univariate Tests of Significance for item31					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	5.44002	1	5.440025	49.05132	0.000000
Racegroup	0.00023	1	0.000230	0.00207	0.963726
Scorelevel	6.11827	5	1.223653	11.03337	0.000000
Racegroup*Scorelevel	0.56958	5	0.113916	1.02715	0.401753
Error	32.27328	291	0.110905		

Univariate Tests of Significance for item32					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.82521	1	1.825212	30.80559	0.000000
Racegroup	0.28286	1	0.282855	4.77398	0.029690
Scorelevel	2.77938	5	0.555877	9.38198	0.000000
Racegroup*Scorelevel	0.45831	5	0.091662	1.54706	0.175175
Error	17.24157	291	0.059249		



Univariate Tests of Significance for item33 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	2.54307	1	2.543074	30.19422	0.000000
Racegroup	0.00009	1	0.000090	0.00107	0.973959
Scorelevel	3.41007	5	0.682013	8.09762	0.000000
Racegroup*Scorelevel	0.09701	5	0.019401	0.23035	0.949083
Error	24.50915	291	0.084224		

Univariate Tests of Significance for item34 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	4.84764	1	4.847640	43.50132	0.000000
Racegroup	0.00859	1	0.008594	0.07712	0.781436
Scorelevel	4.94104	5	0.988207	8.86789	0.000000
Racegroup*Scorelevel	0.20466	5	0.040932	0.36732	0.870782
Error	32.42806	291	0.111437		

Univariate Tests of Significance for item35 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.12172	1	1.121724	16.68072	0.000057
Racegroup	0.01730	1	0.017300	0.25727	0.612389
Scorelevel	1.18716	5	0.237432	3.53076	0.004089
Racegroup*Scorelevel	0.28056	5	0.056112	0.83441	0.526091
Error	19.56881	291	0.067247		

**Results by Item: General Numerical Reasoning Test**

Item	Uniform Bias	In Favour of Group	Non-Uniform Bias
1	No		No
2	No		No
3	No		No
4	No		No
5	No		No
6	No		No
7	No		No
8	No		No
9	No		No
10	No		No
11	No		No
12	No		No
13	No		No
14	No		No
15	No		No
16	No		No
17	No		No
18	No		No
19	No		No
20	No		No
21	No		No
22	No		No
23	No		Yes
24	No		No
25	No		No

Uniform bias was found in none of the items.

Non-uniform bias was found in one item only – item 23. This is graphically depicted in the detailed results that follow.

**Detailed results by item**

Univariate Tests of Significance for item1 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	55.05547	1	55.05547	285.3145	0.000000
Racegroup	0.00018	1	0.00018	0.0010	0.975406
Scorelevel	7.32379	4	1.83095	9.4885	0.000000
Racegroup*Scorelevel	1.50429	4	0.37607	1.9489	0.102392
Error	56.53849	293	0.19296		

Univariate Tests of Significance for item2 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	21.69530	1	21.69530	114.0730	0.000000
Racegroup	0.43317	1	0.43317	2.2776	0.132333
Scorelevel	10.50950	4	2.62738	13.8146	0.000000
Racegroup*Scorelevel	0.59218	4	0.14805	0.7784	0.539952
Error	55.72506	293	0.19019		

Univariate Tests of Significance for item3 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	57.51298	1	57.51298	326.3285	0.000000
Racegroup	0.14433	1	0.14433	0.8189	0.366234
Scorelevel	10.69591	4	2.67398	15.1721	0.000000
Racegroup*Scorelevel	0.97062	4	0.24266	1.3768	0.241958
Error	51.63908	293	0.17624		

Univariate Tests of Significance for item4 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	72.34570	1	72.34570	500.8679	0.000000
Racegroup	0.21604	1	0.21604	1.4957	0.222317
Scorelevel	14.64180	4	3.66045	25.3422	0.000000
Racegroup*Scorelevel	0.24394	4	0.06099	0.4222	0.792579
Error	42.32112	293	0.14444		

Univariate Tests of Significance for item5 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	52.96778	1	52.96778	304.9354	0.000000
Racegroup	0.48107	1	0.48107	2.7695	0.097146
Scorelevel	11.81232	4	2.95308	17.0009	0.000000
Racegroup*Scorelevel	0.34946	4	0.08736	0.5030	0.733592
Error	50.89458	293	0.17370		

Univariate Tests of Significance for item6 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	60.13783	1	60.13783	364.3848	0.000000
Racegroup	0.19259	1	0.19259	1.1669	0.280926
Scorelevel	12.15075	4	3.03769	18.4058	0.000000
Racegroup*Scorelevel	1.50968	4	0.37742	2.2869	0.060153
Error	48.35652	293	0.16504		

Univariate Tests of Significance for item7 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	42.15198	1	42.15198	217.0801	0.000000
Racegroup	0.27467	1	0.27467	1.4145	0.235268
Scorelevel	9.04807	4	2.26202	11.6492	0.000000
Racegroup*Scorelevel	0.73479	4	0.18370	0.9460	0.437644
Error	56.89389	293	0.19418		

Univariate Tests of Significance for item8 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	60.84778	1	60.84778	367.8751	0.000000
Racegroup	0.06731	1	0.06731	0.4069	0.524030
Scorelevel	11.39695	4	2.84924	17.2260	0.000000
Racegroup*Scorelevel	0.10121	4	0.02530	0.1530	0.961567
Error	48.46319	293	0.16540		

Univariate Tests of Significance for item9 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	51.45056	1	51.45056	221.2906	0.000000
Racegroup	0.52841	1	0.52841	2.2727	0.132745
Scorelevel	2.55477	4	0.63869	2.7470	0.028618
Racegroup*Scorelevel	1.24597	4	0.31149	1.3397	0.255210
Error	68.12314	293	0.23250		

Univariate Tests of Significance for item10 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	57.70804	1	57.70804	284.2214	0.000000
Racegroup	0.15762	1	0.15762	0.7763	0.378992
Scorelevel	4.67807	4	1.16952	5.7601	0.000178
Racegroup*Scorelevel	1.69296	4	0.42324	2.0845	0.082851
Error	59.49044	293	0.20304		

Univariate Tests of Significance for item11 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	14.08405	1	14.08405	81.23183	0.000000
Racegroup	0.48424	1	0.48424	2.79291	0.095750
Scorelevel	8.70714	4	2.17678	12.55493	0.000000
Racegroup*Scorelevel	0.24385	4	0.06096	0.35161	0.842830
Error	50.80061	293	0.17338		

Univariate Tests of Significance for item12 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	39.02605	1	39.02605	216.7547	0.000000
Racegroup	0.04076	1	0.04076	0.2264	0.634552
Scorelevel	13.21398	4	3.30350	18.3479	0.000000
Racegroup*Scorelevel	0.32157	4	0.08039	0.4465	0.774920
Error	52.75381	293	0.18005		

Univariate Tests of Significance for item13 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	13.53664	1	13.53664	79.40683	0.000000
Racegroup	0.01610	1	0.01610	0.09446	0.758806
Scorelevel	7.82335	4	1.95584	11.47307	0.000000
Racegroup*Scorelevel	1.10156	4	0.27539	1.61546	0.170333
Error	49.94830	293	0.17047		

Univariate Tests of Significance for item14 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	36.44386	1	36.44386	195.6442	0.000000
Racegroup	0.53585	1	0.53585	2.8766	0.090937
Scorelevel	13.08322	4	3.27081	17.5589	0.000000
Racegroup*Scorelevel	0.15147	4	0.03787	0.2033	0.936453
Error	54.57892	293	0.18628		

Univariate Tests of Significance for item15 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	17.57699	1	17.57699	92.46201	0.000000
Racegroup	0.00048	1	0.00048	0.00253	0.959917
Scorelevel	7.23460	4	1.80865	9.51422	0.000000
Racegroup*Scorelevel	0.96215	4	0.24054	1.26533	0.283708
Error	55.69919	293	0.19010		

Univariate Tests of Significance for item16 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	12.86984	1	12.86984	76.64992	0.000000
Racegroup	0.00007	1	0.00007	0.00043	0.983565
Scorelevel	9.23356	4	2.30839	13.74825	0.000000
Racegroup*Scorelevel	0.30775	4	0.07694	0.45822	0.766369
Error	49.19593	293	0.16790		

Univariate Tests of Significance for item17 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	6.57109	1	6.571088	44.00894	0.000000
Racegroup	0.00626	1	0.006265	0.04196	0.837846
Scorelevel	7.90481	4	1.976203	13.23534	0.000000
Racegroup*Scorelevel	0.11383	4	0.028457	0.19059	0.943214
Error	43.74859	293	0.149313		

Univariate Tests of Significance for item18 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	15.80144	1	15.80144	88.50972	0.000000
Racegroup	0.00934	1	0.00934	0.05231	0.819258
Scorelevel	9.99903	4	2.49976	14.00206	0.000000
Racegroup*Scorelevel	0.83307	4	0.20827	1.16658	0.325664
Error	52.30863	293	0.17853		

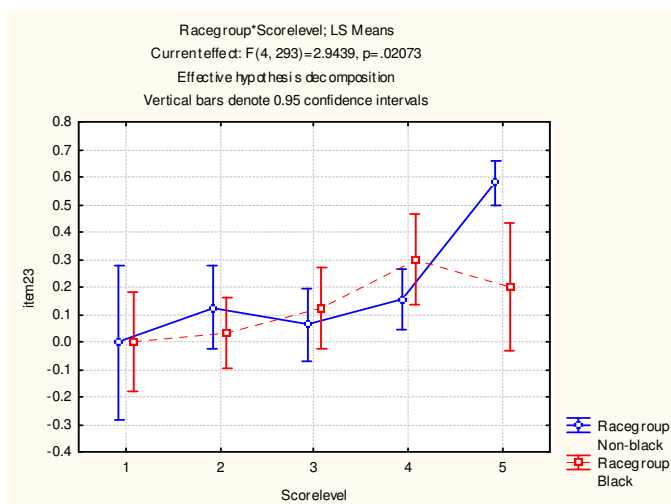
Univariate Tests of Significance for item19 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	23.37603	1	23.37603	121.6174	0.000000
Racegroup	0.04658	1	0.04658	0.2423	0.622889
Scorelevel	9.49417	4	2.37354	12.3487	0.000000
Racegroup*Scorelevel	0.71924	4	0.17981	0.9355	0.443646
Error	56.31740	293	0.19221		

Univariate Tests of Significance for item20 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	4.05161	1	4.051614	35.34904	0.000000
Racegroup	0.16774	1	0.167736	1.46345	0.227358
Scorelevel	7.80908	4	1.952269	17.03292	0.000000
Racegroup*Scorelevel	0.87169	4	0.217922	1.90130	0.110232
Error	33.58289	293	0.114617		

Univariate Tests of Significance for item21 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	2.30767	1	2.307670	21.17240	0.000006
Racegroup	0.00002	1	0.000016	0.00014	0.990478
Scorelevel	3.95025	4	0.987562	9.06068	0.000001
Racegroup*Scorelevel	0.62252	4	0.155631	1.42788	0.224703
Error	31.93532	293	0.108994		

Univariate Tests of Significance for item22 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	5.10463	1	5.104630	41.04765	0.000000
Racegroup	0.04973	1	0.049734	0.39992	0.527623
Scorelevel	8.02138	4	2.005345	16.12550	0.000000
Racegroup*Scorelevel	0.23969	4	0.059922	0.48185	0.749071
Error	36.43708	293	0.124359		

Univariate Tests of Significance for item23 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	4.67306	1	4.673063	32.77469	0.000000
Racegroup	0.13855	1	0.138550	0.97172	0.325064
Scorelevel	3.28979	4	0.822448	5.76827	0.000176
Racegroup*Scorelevel	1.67897	4	0.419742	2.94387	0.020726
Error	41.77636	293	0.142581		



Univariate Tests of Significance for item24 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	2.64250	1	2.642502	20.65070	0.000008
Racegroup	0.00078	1	0.000784	0.00613	0.937654
Scorelevel	1.98217	4	0.495542	3.87258	0.004408
Racegroup*Scorelevel	0.22975	4	0.057436	0.44885	0.773207
Error	37.49283	293	0.127962		

Univariate Tests of Significance for item25 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3.38447	1	3.384471	25.42991	0.000001
Racegroup	0.01302	1	0.013015	0.09779	0.754716
Scorelevel	3.12813	4	0.782032	5.87596	0.000146
Racegroup*Scorelevel	0.19713	4	0.049284	0.37030	0.829734
Error	38.99542	293	0.133090		

**Results by item: General Abstract Reasoning Test**

Item number	Uniform Bias	In Favour of Group	Non-Uniform Bias
1	No		No
2	No		No
3	No		No
4	No		No
5	No		No
6	No		No
7	No		No
8	No		No
9	No		No
10	No		No
11	No		No
12	No		No
13	No		No
14	No		Yes
15	No		No
16	No		No
17	No		No
18	No		No
19	No		No
20	No		No
21	No		No
22	No		No
23	No		No
24	No		No
25	No		No

Uniform bias was not found for any item

Non-Uniform bias was found for one item only – item 14. This is graphically depicted in the detailed results that follow

Univariate Tests of Significance for item1 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	46.74047	1	46.74047	205.8991	0.000000
Racegroup	0.00320	1	0.00320	0.0141	0.905499
Scorelevel	7.09665	4	1.77416	7.8155	0.000005
Racegroup*Scorelevel	0.98243	4	0.24561	1.0819	0.365584
Error	66.51295	293	0.22701		

Univariate Tests of Significance for item2 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	17.05261	1	17.05261	86.33270	0.000000
Racegroup	0.06683	1	0.06683	0.33836	0.561222
Scorelevel	8.83390	4	2.20848	11.18091	0.000000
Racegroup*Scorelevel	0.79798	4	0.19949	1.00998	0.402500
Error	57.87396	293	0.19752		

Univariate Tests of Significance for item 3 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	71.65269	1	71.65269	302.0751	0.000000
Racegroup	0.33991	1	0.33991	1.4330	0.232240
Scorelevel	1.29455	4	0.32364	1.3644	0.246330
Racegroup*Scorelevel	1.40012	4	0.35003	1.4757	0.209549
Error	69.50007	293	0.23720		

Univariate Tests of Significance for item4 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	58.63755	1	58.63755	270.5345	0.000000
Racegroup	0.37551	1	0.37551	1.7325	0.189125
Scorelevel	4.16947	4	1.04237	4.8091	0.000902
Racegroup*Scorelevel	1.35232	4	0.33808	1.5598	0.185075
Error	63.50688	293	0.21675		

Univariate Tests of Significance for item5 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	61.15734	1	61.15734	319.9343	0.000000
Racegroup	0.01483	1	0.01483	0.0776	0.780790
Scorelevel	8.44838	4	2.11210	11.0491	0.000000
Racegroup*Scorelevel	1.43594	4	0.35899	1.8780	0.114275
Error	56.00868	293	0.19116		

Univariate Tests of Significance for item6 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	44.19289	1	44.19289	179.7791	0.000000
Racegroup	0.43675	1	0.43675	1.7767	0.183586
Scorelevel	2.17369	4	0.54342	2.2107	0.067896
Racegroup*Scorelevel	0.17251	4	0.04313	0.1754	0.950918
Error	72.02459	293	0.24582		

Univariate Tests of Significance for item7 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	131.0084	1	131.0084	1692.787	0.000000
Racegroup	0.0399	1	0.0399	0.516	0.473272
Scorelevel	5.7374	4	1.4343	18.534	0.000000
Racegroup*Scorelevel	0.6833	4	0.1708	2.207	0.068265
Error	22.6759	293	0.0774		

Univariate Tests of Significance for item8 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	25.14495	1	25.14495	119.8385	0.000000
Racegroup	0.09068	1	0.09068	0.4322	0.511437
Scorelevel	5.42609	4	1.35652	6.4651	0.000054
Racegroup*Scorelevel	1.52963	4	0.38241	1.8225	0.124449
Error	61.47833	293	0.20982		

Univariate Tests of Significance for item9 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	23.62135	1	23.62135	114.3500	0.000000
Racegroup	0.09779	1	0.09779	0.4734	0.491979
Scorelevel	8.60361	4	2.15090	10.4124	0.000000
Racegroup*Scorelevel	0.57690	4	0.14423	0.6982	0.593735
Error	60.52522	293	0.20657		

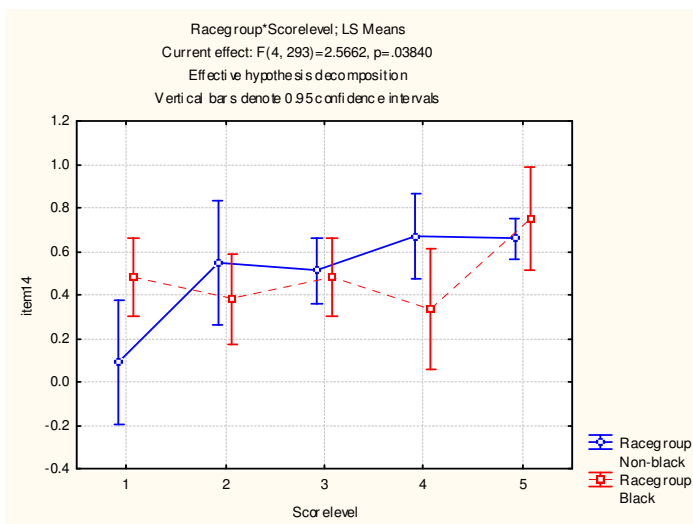
Univariate Tests of Significance for item10 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	60.53548	1	60.53548	325.7985	0.000000
Racegroup	0.00007	1	0.00007	0.0004	0.984015
Scorelevel	8.36021	4	2.09005	11.2485	0.000000
Racegroup*Scorelevel	0.43738	4	0.10934	0.5885	0.671227
Error	54.44131	293	0.18581		

Univariate Tests of Significance for item11 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	11.08426	1	11.08426	55.38358	0.000000
Racegroup	0.17388	1	0.17388	0.86879	0.352059
Scorelevel	1.48104	4	0.37026	1.85004	0.119298
Racegroup*Scorelevel	0.17142	4	0.04285	0.21412	0.930486
Error	58.63991	293	0.20014		

Univariate Tests of Significance for item12 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	62.02253	1	62.02253	349.4547	0.000000
Racegroup	0.29401	1	0.29401	1.6566	0.199084
Scorelevel	8.88318	4	2.22079	12.5127	0.000000
Racegroup*Scorelevel	0.21919	4	0.05480	0.3087	0.872040
Error	52.00274	293	0.17748		

Univariate Tests of Significance for item13					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	63.06932	1	63.06932	442.7980	0.000000
Racegroup	0.20215	1	0.20215	1.4193	0.234487
Scorelevel	12.31566	4	3.07891	21.6165	0.000000
Racegroup*Scorelevel	0.27218	4	0.06805	0.4777	0.752082
Error	41.73304	293	0.14243		

Univariate Tests of Significance for item14					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	46.03530	1	46.03530	196.0351	0.000000
Racegroup	0.00377	1	0.00377	0.0161	0.899257
Scorelevel	3.73644	4	0.93411	3.9778	0.003692
Racegroup*Scorelevel	2.41047	4	0.60262	2.5662	0.038402
Error	68.80576	293	0.23483		



Univariate Tests of Significance for item15					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	78.23436	1	78.23436	616.3026	0.000000
Racegroup	0.00020	1	0.00020	0.0015	0.968753
Scorelevel	12.98154	4	3.24539	25.5660	0.000000
Racegroup*Scorelevel	0.14970	4	0.03743	0.2948	0.881229
Error	37.19385	293	0.12694		

Univariate Tests of Significance for item16 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	48.01302	1	48.01302	280.5290	0.000000
Racegroup	0.02213	1	0.02213	0.1293	0.719427
Scorelevel	12.61876	4	3.15469	18.4321	0.000000
Racegroup*Scorelevel	0.60776	4	0.15194	0.8877	0.471572
Error	50.14744	293	0.17115		

Univariate Tests of Significance for item17 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	12.67092	1	12.67092	75.12119	0.000000
Racegroup	0.23476	1	0.23476	1.39178	0.239062
Scorelevel	11.07290	4	2.76822	16.41177	0.000000
Racegroup*Scorelevel	0.12898	4	0.03224	0.19117	0.942911
Error	49.42121	293	0.16867		

Univariate Tests of Significance for item18 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	24.67775	1	24.67775	121.5176	0.000000
Racegroup	0.09644	1	0.09644	0.4749	0.491288
Scorelevel	9.98409	4	2.49602	12.2909	0.000000
Racegroup*Scorelevel	0.25704	4	0.06426	0.3164	0.866902
Error	59.50236	293	0.20308		

Univariate Tests of Significance for item19 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	14.78674	1	14.78674	86.36751	0.000000
Racegroup	0.00890	1	0.00890	0.05197	0.819823
Scorelevel	9.76170	4	2.44043	14.25422	0.000000
Racegroup*Scorelevel	1.45142	4	0.36285	2.11939	0.078431
Error	50.16372	293	0.17121		

Univariate Tests of Significance for item20 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	27.64478	1	27.64478	142.4032	0.000000
Racegroup	0.00748	1	0.00748	0.0385	0.844542
Scorelevel	9.80774	4	2.45194	12.6304	0.000000
Racegroup*Scorelevel	0.28397	4	0.07099	0.3657	0.832980
Error	56.88021	293	0.19413		

Univariate Tests of Significance for item21 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	11.10351	1	11.10351	67.18794	0.000000
Racegroup	0.07070	1	0.07070	0.42780	0.513582
Scorelevel	8.19367	4	2.04842	12.39508	0.000000
Racegroup*Scorelevel	1.37449	4	0.34362	2.07928	0.083536
Error	48.42133	293	0.16526		

Univariate Tests of Significance for item22 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	11.82777	1	11.82777	68.82182	0.000000
Racegroup	0.03872	1	0.03872	0.22528	0.635399
Scorelevel	10.96748	4	2.74187	15.95402	0.000000
Racegroup*Scorelevel	1.30084	4	0.32521	1.89228	0.111779
Error	50.35519	293	0.17186		

Univariate Tests of Significance for item23 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	6.31779	1	6.317795	38.97364	0.000000
Racegroup	0.01865	1	0.018647	0.11503	0.734733
Scorelevel	7.17493	4	1.793732	11.06530	0.000000
Racegroup*Scorelevel	0.40209	4	0.100522	0.62011	0.648509
Error	47.49657	293	0.162104		

Univariate Tests of Significance for item24					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3.77080	1	3.770796	25.16920	0.000001
Racegroup	0.00946	1	0.009464	0.06317	0.801726
Scorelevel	2.01589	4	0.503972	3.36389	0.010337
Racegroup*Scorelevel	0.77739	4	0.194348	1.29723	0.271173
Error	43.89664	293	0.149818		

Univariate Tests of Significance for item25					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3.87430	1	3.874304	25.73976	0.000001
Racegroup	0.43290	1	0.432897	2.87604	0.090969
Scorelevel	3.17984	4	0.794960	5.28148	0.000404
Racegroup*Scorelevel	0.64893	4	0.162233	1.07783	0.367617
Error	44.10185	293	0.150518		

## GRT2 Differential item functioning: Workers in and applicants to a construction company.

### Sample composition

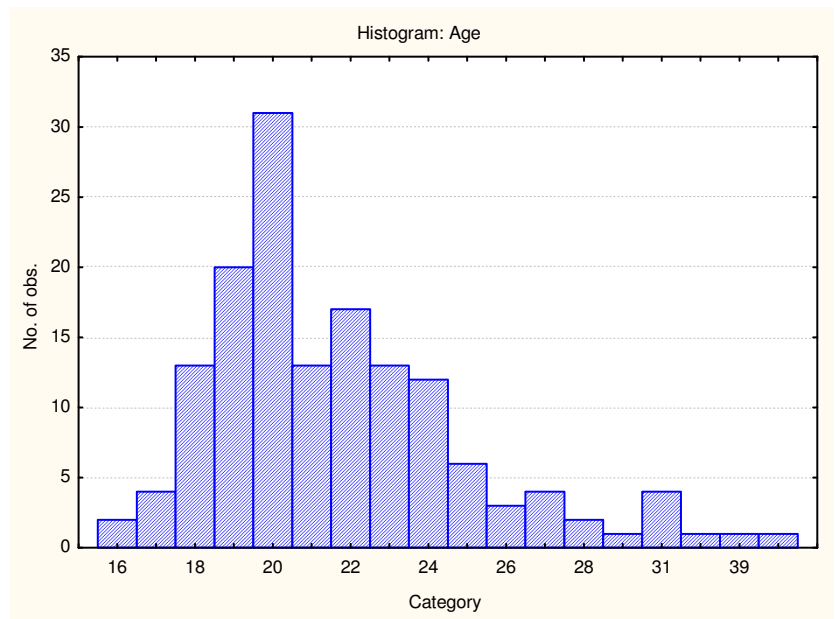
Workers and applicants tested by a South African construction company for employment and development purposes. Data were collected in 2002 and 2003. Minimum qualification was grade 10.

Frequency table: Race				
Category	Count	Cumulative Count	Percent	Cumulative Percent
Coloured	7	7	4.69799	4.6980
European	2	9	1.34228	6.0403
White	1	10	0.67114	6.7114
Asian	1	11	0.67114	7.3826
African	74	85	49.66443	57.0470
WC	64	149	42.95302	100.0000
Missing	0	149	0.00000	100.0000

Where race data were not captured, it was coded according to respondents' names. Where uncertainty existed, whites and coloureds were coded as WC.

Frequency table: Sex				
Category	Count	Cumulative Count	Percent	Cumulative Percent
M	137	137	91.94631	91.9463
F	12	149	8.05369	100.0000
Missing	0	149	0.00000	100.0000

Descriptive Statistics						
Variable	Mean	Std.Dev	Minimum	Maximum	N	No.cases Missing
Age	21.85135	4.103035	16.00000	47.00000	148	1



## Method

Applicants were classified into Black and non-Black for the purpose of the analysis, since the size of the sample did not allow for finer distinctions.

Applicants were classified into score levels for the test being evaluated. The cut-offs for the levels were determined by examining the frequency distributions for both race groups, trying to ensure a sufficient number of cases for both races in each category.

The statistical technique used in this study was factorial analysis of variance. For every item a factorial analysis of variance was done, using the scored item response as dependent variable, and the race group and score level (on the overall test score for the subtest being investigated) as predictor variables. If a significant effect was found for race, that was taken as an indication of uniform item bias, and the least-square difference in the means for that item was plotted graphically to illustrate which race group had a higher probability of getting the item right. If a significant interaction effect was found for race group and score level, that was taken as an indication of non-uniform item bias, and the means at all levels for both race groups were plotted to illustrate the severity of the non-uniform bias that was found.

**Detailed results by item: General Verbal Reasoning Test**

Item number	Uniform Bias	In favour of group	Non-Uniform Bias
1	No		No
2	No		No
3	No		No
4	No		No
5	No		No
6	Yes	Non-Black	No
7	No		No
8	No		No
9	No		No
10	No		No
11	No		No
12	No		No
13	Yes	Black	Yes
14	No		No
15	Yes	Black	No
16	No		No
17	No		No
18	No		No
19	No		No
20	Yes	Non-Black	No
21	Yes	Non-Black	No
22	Yes	Non-Black	No
23	No		No
24	No		No
25	No		No
26	No		No
27	No		No
28	No		Yes
29	No		No
30	No		No
31	No		No
32	No		No
33	No		No
34	No		No
35	No		No

Uniform bias in favour of the Non-Black group was found in four items

Uniform bias in favour of the Black group was found in two items

Non-uniform bias was found in two items, one of which also exhibited uniform bias in favour of the Black group.

Univariate Tests of Significance for item1 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	103.3011	1	103.3011	1541.159	0.000000
Racegroup	0.0932	1	0.0932	1.391	0.240259
scorelevel	0.5039	4	0.1260	1.879	0.117432
Racegroup*scorelevel	0.2622	4	0.0655	0.978	0.421749
Error	9.3169	139	0.0670		

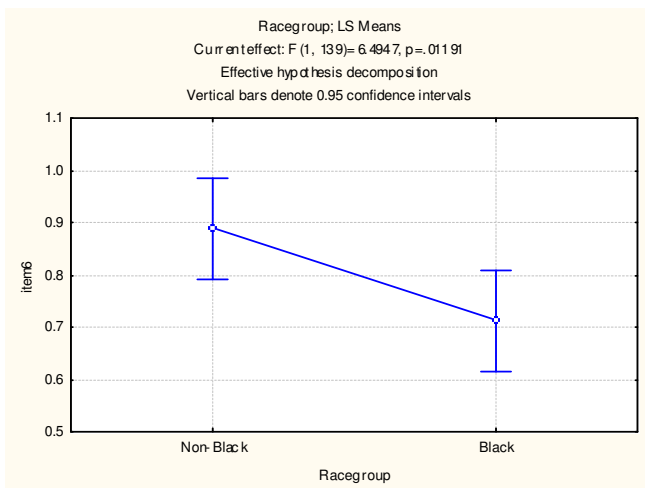
Univariate Tests of Significance for item2 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	22.28184	1	22.28184	100.2379	0.000000
Racegroup	0.00001	1	0.00001	0.0001	0.994240
scorelevel	3.78247	4	0.94562	4.2540	0.002804
Racegroup*scorelevel	1.90093	4	0.47523	2.1379	0.079309
Error	30.89825	139	0.22229		

Univariate Tests of Significance for item3 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	46.17965	1	46.17965	192.6381	0.000000
Racegroup	0.01643	1	0.01643	0.0685	0.793889
scorelevel	0.44147	4	0.11037	0.4604	0.764680
Racegroup*scorelevel	0.54328	4	0.13582	0.5666	0.687313
Error	33.32139	139	0.23972		

Univariate Tests of Significance for item4 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	60.81851	1	60.81851	323.2153	0.000000
Racegroup	0.38676	1	0.38676	2.0554	0.153913
scorelevel	2.50546	4	0.62636	3.3288	0.012265
Racegroup*scorelevel	1.20241	4	0.30060	1.5975	0.178362
Error	26.15524	139	0.18817		

Univariate Tests of Significance for item5 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	79.04272	1	79.04272	567.9935	0.000000
Racegroup	0.00080	1	0.00080	0.0058	0.939544
scorelevel	1.73886	4	0.43471	3.1238	0.016981
Racegroup*scorelevel	0.14556	4	0.03639	0.2615	0.902195
Error	19.34342	139	0.13916		

Univariate Tests of Significance for item6 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	77.71959	1	77.71959	533.8692	0.000000
Racegroup	0.94549	1	0.94549	6.4947	0.011906
scorelevel	1.29979	4	0.32495	2.2321	0.068628
Racegroup*scorelevel	0.67440	4	0.16860	1.1581	0.332055
Error	20.23534	139	0.14558		



Univariate Tests of Significance for item7 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	13.67003	1	13.67003	61.44005	0.000000
Racegroup	0.00677	1	0.00677	0.03042	0.861791
scorelevel	1.32253	4	0.33063	1.48603	0.209684
Racegroup*scorelevel	0.73582	4	0.18396	0.82679	0.510232
Error	30.92664	139	0.22249		

Univariate Tests of Significance for item8 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	97.01244	1	97.01244	1060.161	0.000000
Racegroup	0.00000	1	0.00000	0.000	0.995732
scorelevel	1.14976	4	0.28744	3.141	0.016520
Racegroup*scorelevel	0.15278	4	0.03820	0.417	0.795877
Error	12.71952	139	0.09151		

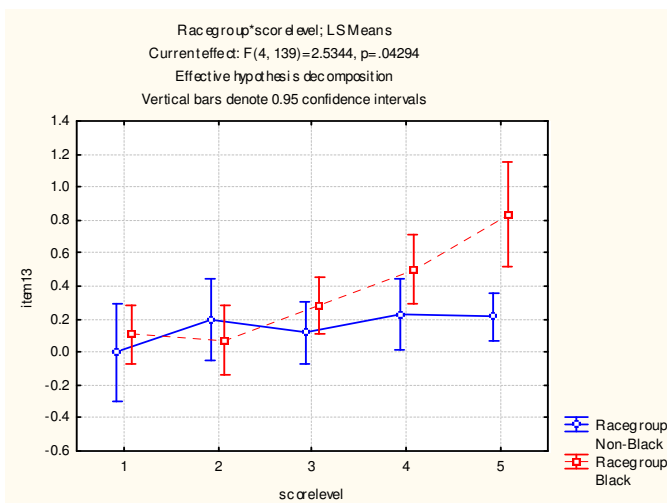
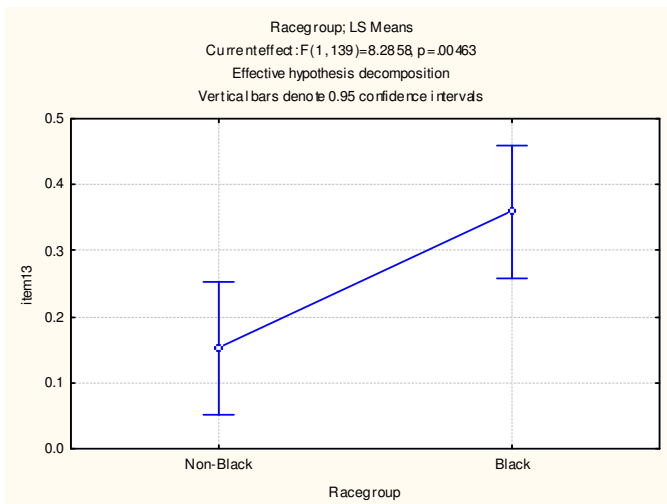
Univariate Tests of Significance for item9 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	20.50998	1	20.50998	86.38117	0.000000
Racegroup	1.62252	1	1.62252	6.83349	0.009932
scorelevel	0.15813	4	0.03953	0.16650	0.955077
Racegroup*scorelevel	0.78618	4	0.19654	0.82778	0.509613
Error	33.00357	139	0.23744		

Univariate Tests of Significance for item10 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	26.30877	1	26.30877	110.8585	0.000000
Racegroup	0.39225	1	0.39225	1.6528	0.200710
scorelevel	1.56469	4	0.39117	1.6483	0.165573
Racegroup*scorelevel	0.82505	4	0.20626	0.8691	0.484240
Error	32.98726	139	0.23732		

Univariate Tests of Significance for item11 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	6.50665	1	6.506648	36.99688	0.000000
Racegroup	0.60215	1	0.602149	3.42383	0.066385
scorelevel	2.40730	4	0.601825	3.42198	0.010575
Racegroup*scorelevel	0.01860	4	0.004650	0.02644	0.998632
Error	24.44596	139	0.175870		

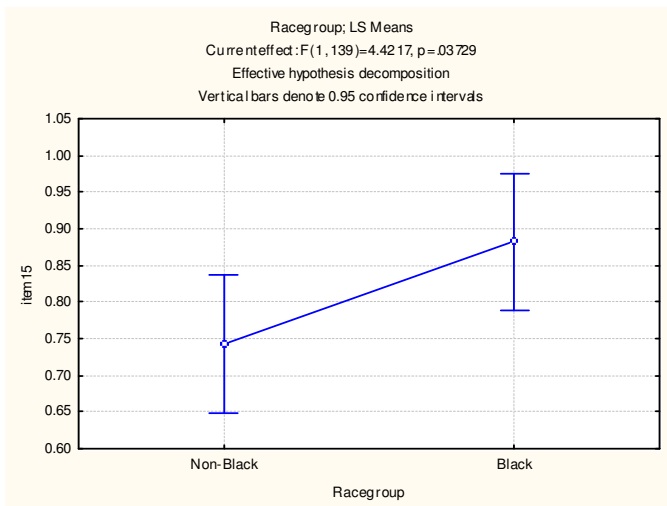
Univariate Tests of Significance for item12					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	60.50475	1	60.50475	312.1038	0.000000
Racegroup	0.70184	1	0.70184	3.6203	0.059145
scorelevel	1.20116	4	0.30029	1.5490	0.191431
Racegroup*scorelevel	0.44981	4	0.11245	0.5801	0.677569
Error	26.94667	139	0.19386		

Univariate Tests of Significance for item13					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	7.94282	1	7.942825	50.82232	0.000000
Racegroup	1.29496	1	1.294959	8.28582	0.004628
scorelevel	3.03033	4	0.757583	4.84741	0.001088
Racegroup*scorelevel	1.58440	4	0.396099	2.53445	0.042945
Error	21.72378	139	0.156286		



Univariate Tests of Significance for item14					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	38.19549	1	38.19549	177.5954	0.000000
Racegroup	0.36041	1	0.36041	1.6758	0.197634
scorelevel	6.02335	4	1.50584	7.0016	0.000036
Racegroup*scorelevel	0.17205	4	0.04301	0.2000	0.937992
Error	29.89477	139	0.21507		

Univariate Tests of Significance for item15					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	80.16139	1	80.16139	597.2971	0.000000
Racegroup	0.59343	1	0.59343	4.4217	0.037287
scorelevel	1.60624	4	0.40156	2.9921	0.020918
Racegroup*scorelevel	0.71375	4	0.17844	1.3296	0.261993
Error	18.65476	139	0.13421		



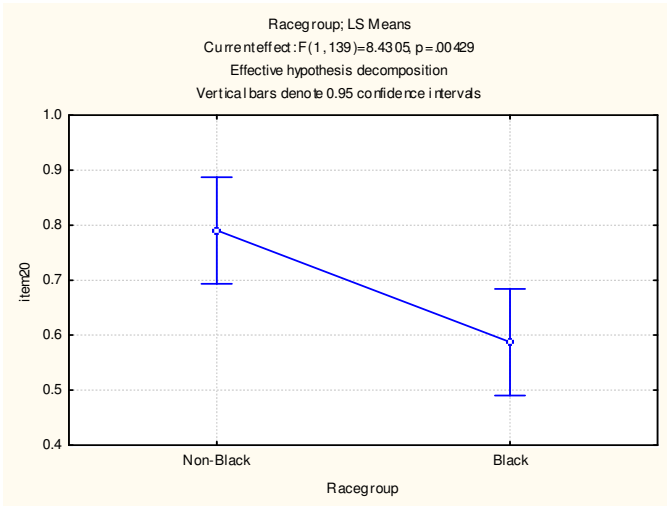
Univariate Tests of Significance for item16					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	7.48712	1	7.487117	41.56360	0.000000
Racegroup	0.02069	1	0.020691	0.11486	0.735186
scorelevel	2.15678	4	0.539195	2.99326	0.020879
Racegroup*scorelevel	0.68495	4	0.171238	0.95060	0.436861
Error	25.03896	139	0.180136		

Univariate Tests of Significance for item17 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	42.62932	1	42.62932	215.0345	0.000000
Racegroup	0.65396	1	0.65396	3.2988	0.071486
scorelevel	4.41549	4	1.10387	5.5682	0.000346
Racegroup*scorelevel	0.22576	4	0.05644	0.2847	0.887510
Error	27.55593	139	0.19824		

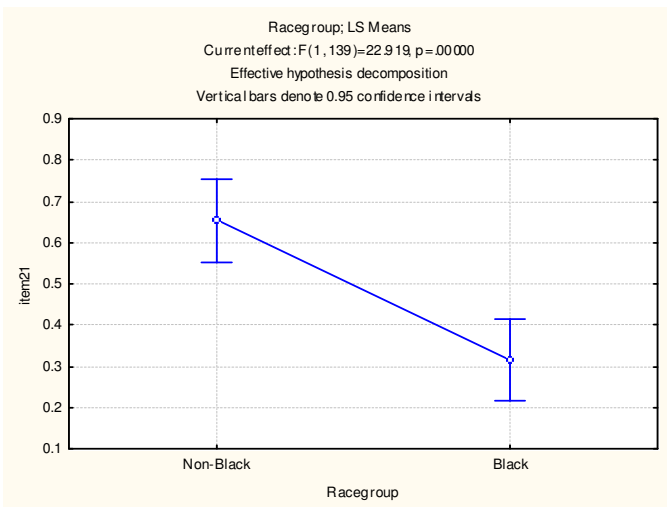
Univariate Tests of Significance for item18 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	46.10056	1	46.10056	222.4083	0.000000
Racegroup	0.11970	1	0.11970	0.5775	0.448597
scorelevel	1.98463	4	0.49616	2.3937	0.053463
Racegroup*scorelevel	1.75270	4	0.43818	2.1139	0.082270
Error	28.81177	139	0.20728		

Univariate Tests of Significance for item19 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.370255	1	0.370255	8.653127	0.003826
Racegroup	0.053271	1	0.053271	1.244980	0.266439
scorelevel	0.327373	4	0.081843	1.912735	0.111668
Racegroup*scorelevel	0.357300	4	0.089325	2.087585	0.085650
Error	5.947619	139	0.042789		

Univariate Tests of Significance for item20 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	57.52603	1	57.52603	387.4930	0.000000
Racegroup	1.25157	1	1.25157	8.4305	0.004293
scorelevel	5.05945	4	1.26486	8.5201	0.000004
Racegroup*scorelevel	0.90565	4	0.22641	1.5251	0.198178
Error	20.63552	139	0.14846		

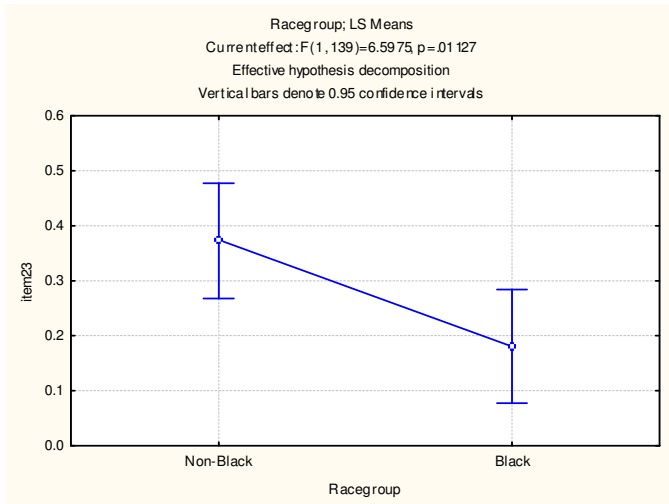


Univariate Tests of Significance for item21 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	28.40521	1	28.40521	186.6523	0.000000
Racegroup	3.48785	1	3.48785	22.9188	0.000004
scorelevel	6.72831	4	1.68208	11.0530	0.000000
Racegroup*scorelevel	0.29344	4	0.07336	0.4820	0.748881
Error	21.15336	139	0.15218		



Univariate Tests of Significance for item22 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	22.28758	1	22.28758	102.3199	0.000000
Racegroup	0.05380	1	0.05380	0.2470	0.619984
scorelevel	3.29847	4	0.82462	3.7857	0.005922
Racegroup*scorelevel	0.91149	4	0.22787	1.0461	0.385789
Error	30.27732	139	0.21782		

Univariate Tests of Significance for item23 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	9.34261	1	9.342612	55.67284	0.000000
Racegroup	1.10714	1	1.107143	6.59749	0.011267
scorelevel	3.14997	4	0.787492	4.69268	0.001392
Racegroup*scorelevel	0.58070	4	0.145175	0.86510	0.486676
Error	23.32597	139	0.167813		



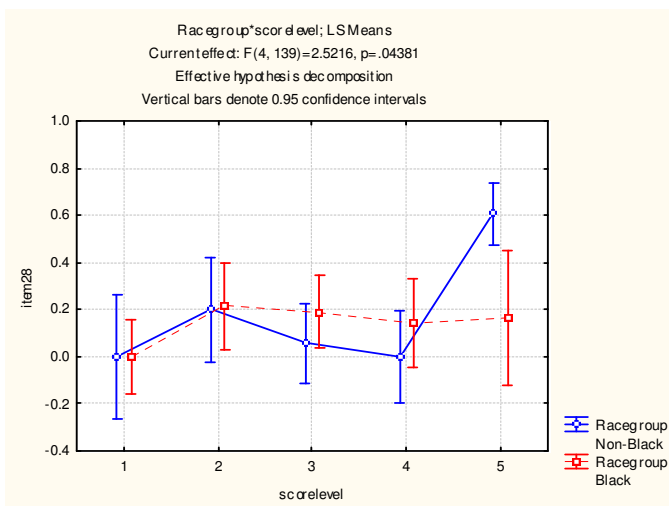
Univariate Tests of Significance for item24 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	13.31313	1	13.31313	64.94663	0.000000
Racegroup	0.21615	1	0.21615	1.05445	0.306269
scorelevel	2.60855	4	0.65214	3.18138	0.015499
Racegroup*scorelevel	1.42788	4	0.35697	1.74144	0.144290
Error	28.49301	139	0.20499		

Univariate Tests of Significance for item25 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	16.12557	1	16.12557	81.86561	0.000000
Racegroup	0.08806	1	0.08806	0.44705	0.504848
scorelevel	4.38906	4	1.09726	5.57055	0.000345
Racegroup*scorelevel	1.00046	4	0.25011	1.26977	0.284830
Error	27.37968	139	0.19698		

Univariate Tests of Significance for item26 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.92951	1	1.929508	17.86375	0.000043
Racegroup	0.11694	1	0.116944	1.08269	0.299903
scorelevel	1.50544	4	0.376360	3.48441	0.009574
Racegroup*scorelevel	0.07924	4	0.019809	0.18340	0.946702
Error	15.01374	139	0.108012		

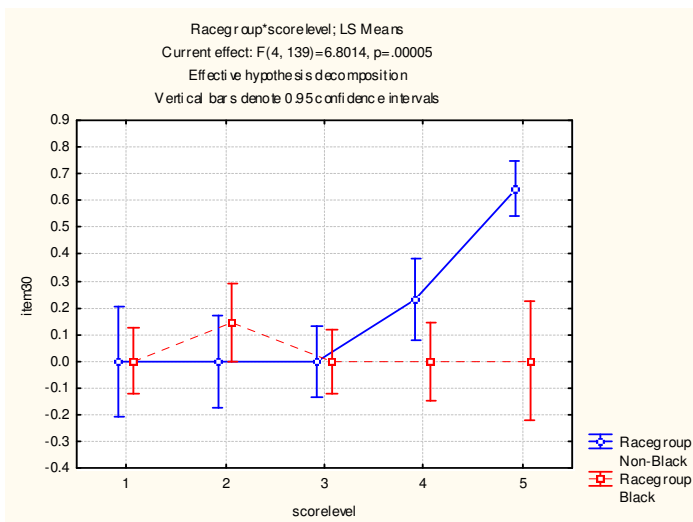
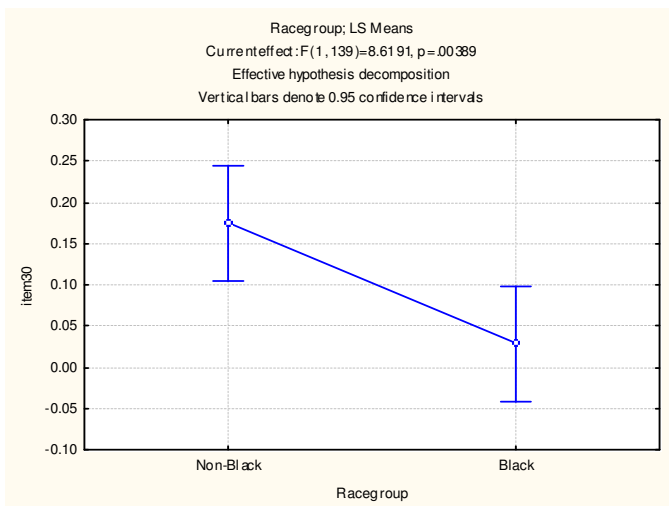
Univariate Tests of Significance for item27 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	9.58251	1	9.582511	65.88393	0.000000
Racegroup	0.01086	1	0.010865	0.07470	0.785017
scorelevel	7.97489	4	1.993723	13.70771	0.000000
Racegroup*scorelevel	0.23595	4	0.058988	0.40557	0.804395
Error	20.21690	139	0.145445		

Univariate Tests of Significance for item28 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3.03024	1	3.030238	24.25921	0.000002
Racegroup	0.02792	1	0.027918	0.22350	0.637125
scorelevel	1.83633	4	0.459082	3.67528	0.007063
Racegroup*scorelevel	1.25992	4	0.314980	2.52164	0.043812
Error	17.36261	139	0.124911		



Univariate Tests of Significance for item29					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	7.70498	1	7.704983	62.83757	0.000000
Racegroup	0.01011	1	0.010109	0.08244	0.774440
scorelevel	7.06509	4	1.766272	14.40473	0.000000
Racegroup*scorelevel	0.35634	4	0.089086	0.72654	0.575247
Error	17.04383	139	0.122617		

Univariate Tests of Significance for item30					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.25379	1	1.253790	16.67633	0.000074
Racegroup	0.64801	1	0.648014	8.61907	0.003894
scorelevel	1.55289	4	0.388223	5.16365	0.000658
Racegroup*scorelevel	2.04542	4	0.511355	6.80140	0.000050
Error	10.45055	139	0.075184		



Univariate Tests of Significance for item31 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.00543	1	1.005429	12.15839	0.000655
Racegroup	0.07200	1	0.072002	0.87070	0.352381
scorelevel	1.53110	4	0.382774	4.62878	0.001542
Racegroup*scorelevel	0.68110	4	0.170275	2.05909	0.089454
Error	11.49451	139	0.082694		

Univariate Tests of Significance for item32 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.317982	1	0.317982	8.124194	0.005033
Racegroup	0.029064	1	0.029064	0.742557	0.390327
scorelevel	1.095041	4	0.273760	6.994366	0.000037
Racegroup*scorelevel	0.100088	4	0.025022	0.639290	0.635338
Error	5.440476	139	0.039140		

Univariate Tests of Significance for item33 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.05498	1	1.054982	13.61472	0.000321
Racegroup	0.00554	1	0.005542	0.07152	0.789526
scorelevel	0.77972	4	0.194931	2.51562	0.044225
Racegroup*scorelevel	0.36138	4	0.090345	1.16592	0.328561
Error	10.77088	139	0.077488		

Univariate Tests of Significance for item34 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.48120	1	1.481195	16.37127	0.000086
Racegroup	0.10582	1	0.105818	1.16958	0.281361
scorelevel	2.06607	4	0.516518	5.70895	0.000277
Racegroup*scorelevel	0.07878	4	0.019696	0.21769	0.928222
Error	12.57606	139	0.090475		

Univariate Tests of Significance for item35 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.412912	1	0.412912	6.506292	0.011832
Racegroup	0.008427	1	0.008427	0.132781	0.716119
scorelevel	0.618148	4	0.154537	2.435054	0.050135
Racegroup*scorelevel	0.124017	4	0.031004	0.488535	0.744141
Error	8.821429	139	0.063464		

***Detailed results by item for General Numerical Reasoning Test***

Item number	Uniform Bias	In favour of group	Non-Uniform Bias
1	No		No
2	No		No
3	No		No
4	Yes	Non-Black	No
5	Yes	Non-Black	No
6	Yes	Non-Black	No
7	No		No
8	No		No
9	No		No
10	Yes	Non-Black	No
11	Yes	Non-Black	Yes
12	No		No
13	Yes	Non-Black	Yes
14	Yes	Non-Black	Yes
15	Yes	Non-Black	No
16	Yes	Non-Black	No
17	Yes	Non-Black	Yes
18	Yes	Non-Black	Yes
19	Yes	Non-Black	Yes
20	No		No
21	No		Yes
22	No		No
23	Yes	Non-Black	Yes
24	No		No
25	Yes	Non-Black	No

Uniform bias was found in 14 out of 25 items, all in favour of the Non-Black group.

Non-Uniform bias was found in 8 items – this is illustrated in the detailed results that follow.

It is clear that many items in this test are more difficult for the Black respondents.

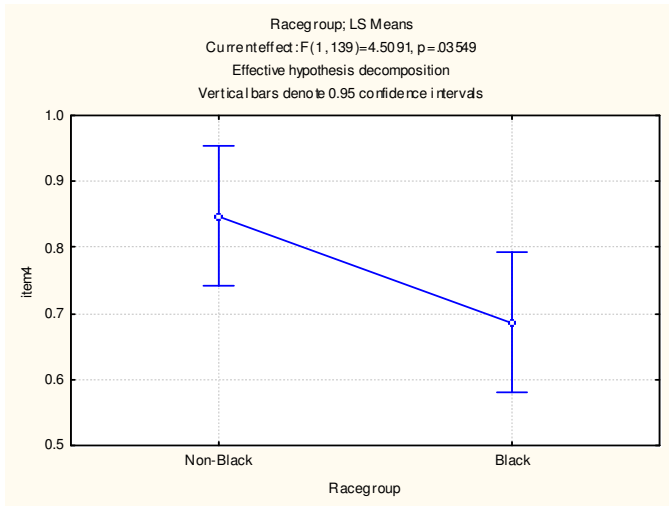
Unfortunately detailed information about educational levels was not available for this sample, and it is therefore not possible to separate the effect of race from education.

Univariate Tests of Significance for item1 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	69.47746	1	69.47746	389.0939	0.000000
Racegroup	0.09246	1	0.09246	0.5178	0.472993
scorelevel	1.63750	4	0.40938	2.2926	0.062515
Racegroup*scorelevel	0.34243	4	0.08561	0.4794	0.750793
Error	24.82014	139	0.17856		

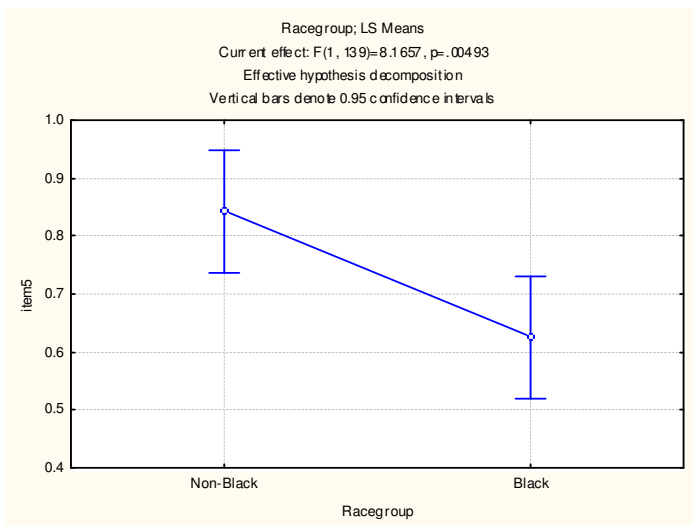
Univariate Tests of Significance for item2 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	32.81061	1	32.81061	130.0925	0.000000
Racegroup	0.17095	1	0.17095	0.6778	0.411749
scorelevel	0.33170	4	0.08293	0.3288	0.858248
Racegroup*scorelevel	0.53272	4	0.13318	0.5281	0.715290
Error	35.05717	139	0.25221		

Univariate Tests of Significance for item3 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	30.23968	1	30.23968	121.2424	0.000000
Racegroup	0.11875	1	0.11875	0.4761	0.491342
scorelevel	1.42757	4	0.35689	1.4309	0.226937
Racegroup*scorelevel	0.49142	4	0.12286	0.4926	0.741190
Error	34.66870	139	0.24942		

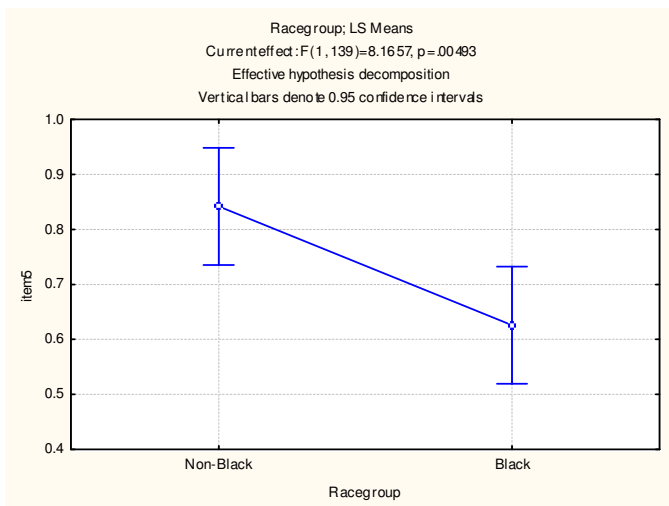
Univariate Tests of Significance for item4 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	71.35605	1	71.35605	407.9333	0.000000
Racegroup	0.78874	1	0.78874	4.5091	0.035486
scorelevel	0.51189	4	0.12797	0.7316	0.571855
Racegroup*scorelevel	0.21040	4	0.05260	0.3007	0.877075
Error	24.31400	139	0.17492		



Univariate Tests of Significance for item5 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	65.45727	1	65.45727	374.9102	0.000000
Racegroup	1.42569	1	1.42569	8.1657	0.004926
scorelevel	1.13528	4	0.28382	1.6256	0.171186
Racegroup*scorelevel	1.10670	4	0.27668	1.5847	0.181742
Error	24.26864	139	0.17459		



Univariate Tests of Significance for item6 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	65.61446	1	65.61446	332.3511	0.000000
Racegroup	0.80511	1	0.80511	4.0780	0.045366
scorelevel	0.32878	4	0.08220	0.4163	0.796646
Racegroup*scorelevel	0.49914	4	0.12479	0.6321	0.640435
Error	27.44209	139	0.19743		

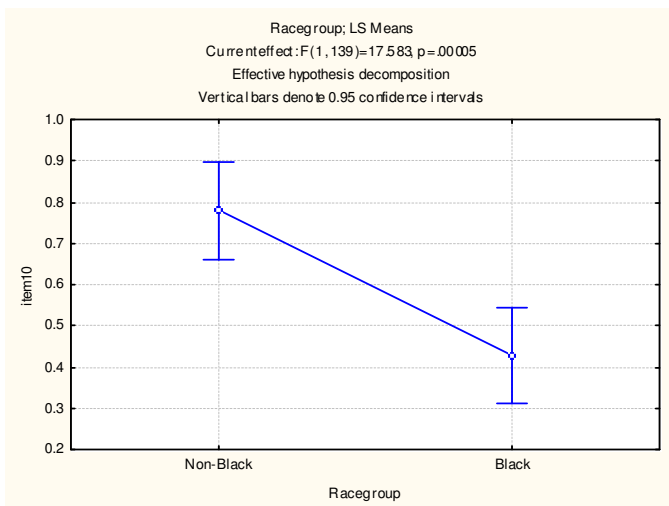


Univariate Tests of Significance for item7 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	50.46056	1	50.46056	232.7709	0.000000
Racegroup	0.37898	1	0.37898	1.7482	0.188271
scorelevel	1.18572	4	0.29643	1.3674	0.248380
Racegroup*scorelevel	1.34044	4	0.33511	1.5458	0.192311
Error	30.13271	139	0.21678		

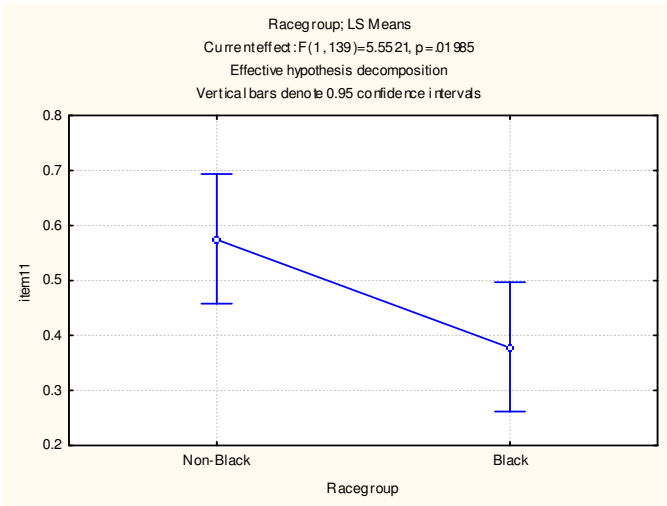
Univariate Tests of Significance for item8 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	65.72948	1	65.72948	325.3259	0.000000
Racegroup	0.02890	1	0.02890	0.1430	0.705862
scorelevel	0.58857	4	0.14714	0.7283	0.574083
Racegroup*scorelevel	1.83507	4	0.45877	2.2707	0.064671
Error	28.08383	139	0.20204		

Univariate Tests of Significance for item9 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	44.34806	1	44.34806	183.8236	0.000000
Racegroup	0.07042	1	0.07042	0.2919	0.589886
scorelevel	0.18184	4	0.04546	0.1884	0.944110
Racegroup*scorelevel	0.77809	4	0.19452	0.8063	0.523127
Error	33.53422	139	0.24125		

Univariate Tests of Significance for item10 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	44.32818	1	44.32818	210.7461	0.000000
Racegroup	3.69840	1	3.69840	17.5830	0.000049
scorelevel	0.92195	4	0.23049	1.0958	0.361158
Racegroup*scorelevel	0.97183	4	0.24296	1.1551	0.333438
Error	29.23716	139	0.21034		

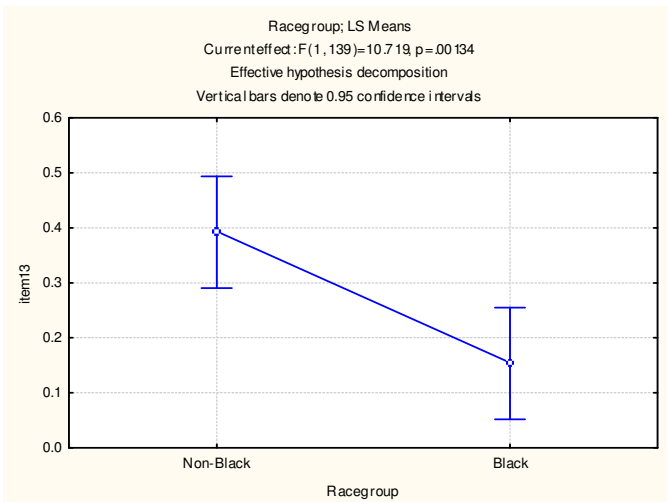


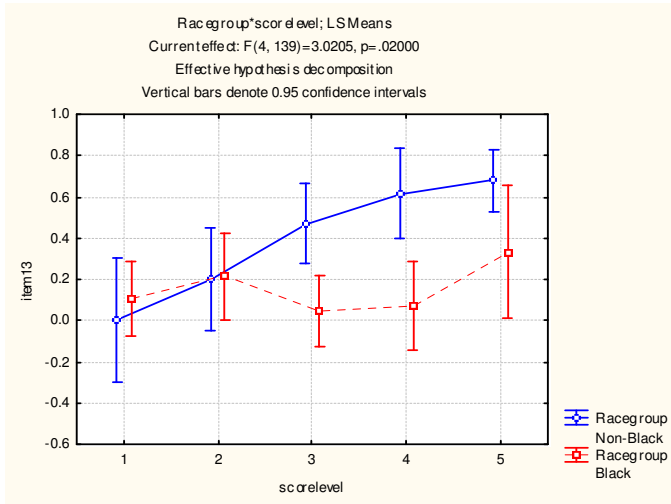
Univariate Tests of Significance for item11 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	27.67146	1	27.67146	130.9312	0.000000
Racegroup	1.17340	1	1.17340	5.5521	0.019855
scorelevel	3.74305	4	0.93576	4.4277	0.002125
Racegroup*scorelevel	0.69466	4	0.17366	0.8217	0.513405
Error	29.37675	139	0.21134		



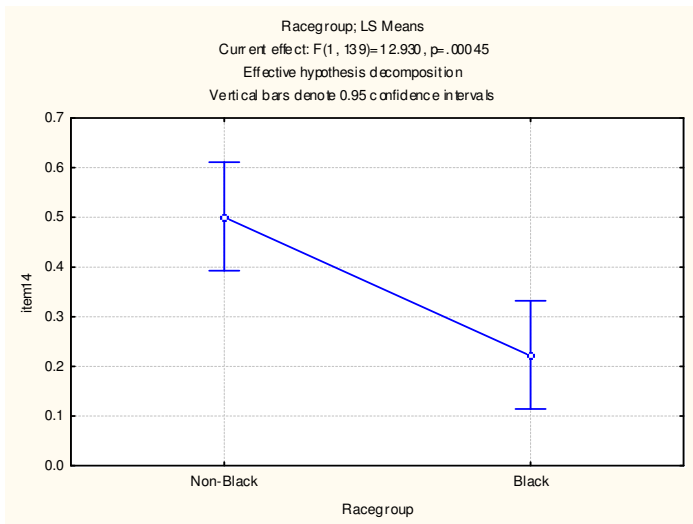
Univariate Tests of Significance for item12 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	41.22708	1	41.22708	174.5498	0.000000
Racegroup	0.50223	1	0.50223	2.1264	0.147039
scorelevel	1.18073	4	0.29518	1.2498	0.292847
Racegroup*scorelevel	1.38277	4	0.34569	1.4636	0.216552
Error	32.83055	139	0.23619		

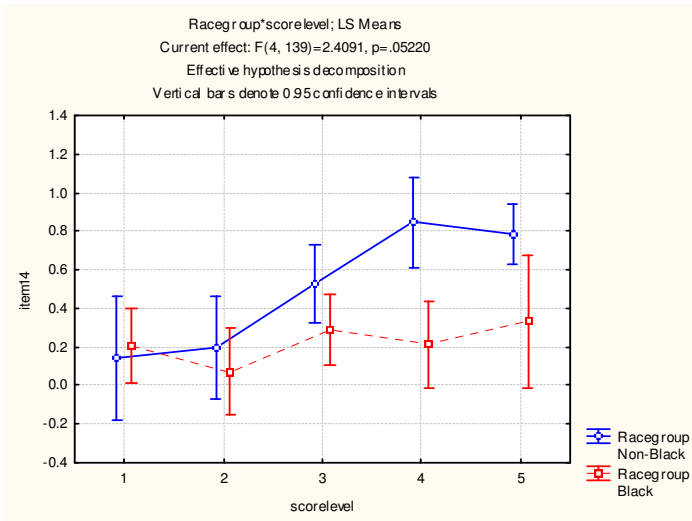
Univariate Tests of Significance for item13 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	9.08671	1	9.08671	56.43602	0.000000
Racegroup	1.72593	1	1.72593	10.71948	0.001338
scorelevel	2.30831	4	0.577077	3.58413	0.008168
Racegroup*scorelevel	1.94532	4	0.486331	3.02052	0.019999
Error	22.38026	139	0.161009		



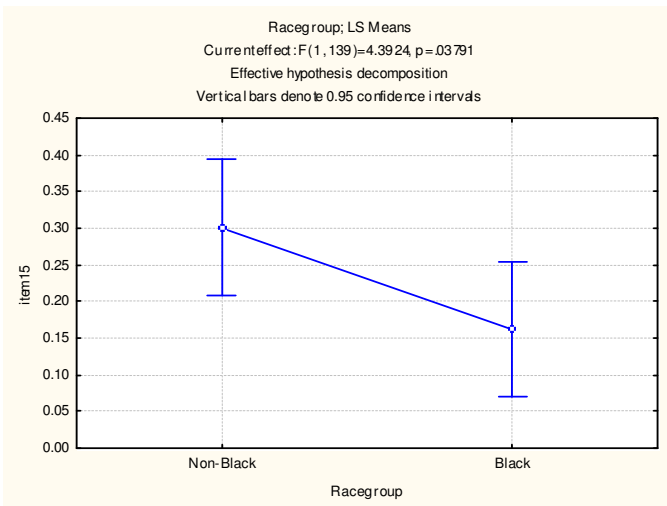


Univariate Tests of Significance for item14 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	15.89656	1	15.89656	87.81694	0.000000
Racegroup	2.34064	1	2.34064	12.93031	0.000448
scorelevel	3.50045	4	0.87511	4.83436	0.001111
Racegroup*scorelevel	1.74434	4	0.43609	2.40906	0.052201
Error	25.16169	139	0.18102		

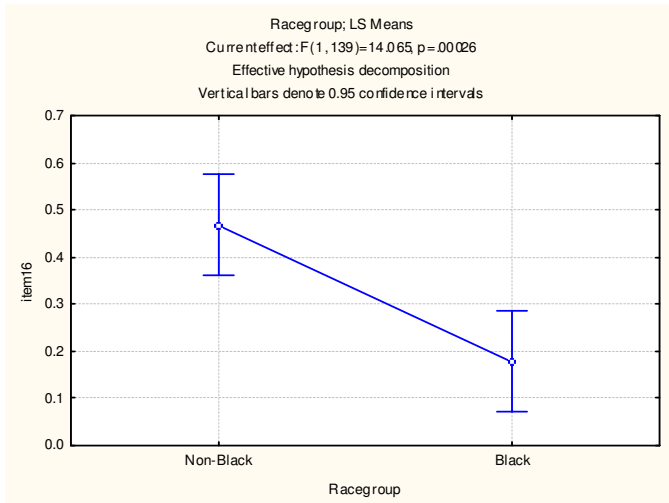




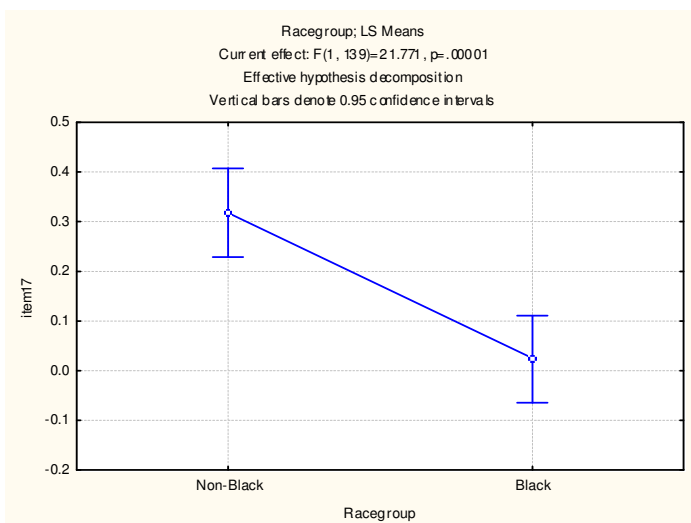
Univariate Tests of Significance for item15 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	6.50401	1	6.504013	48.58652	0.000000
Racegroup	0.58799	1	0.587986	4.39240	0.037913
scorelevel	4.08486	4	1.021215	7.62872	0.000014
Racegroup*scorelevel	0.81007	4	0.202518	1.51286	0.201724
Error	18.60718	139	0.133865		

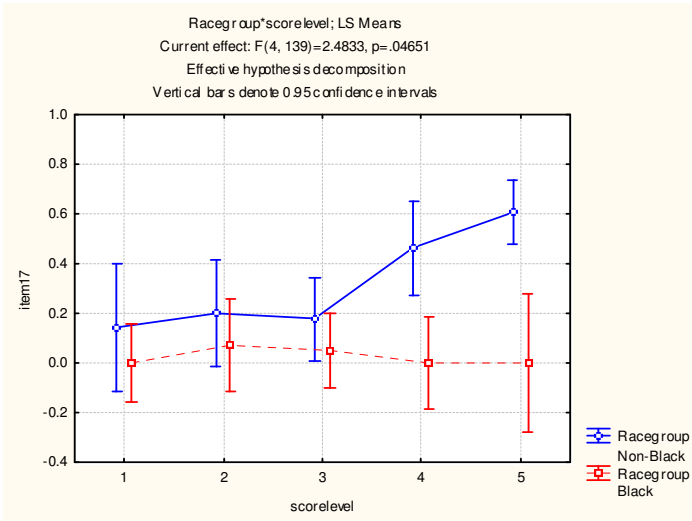


Univariate Tests of Significance for item16					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	12.69197	1	12.69197	69.76533	0.000000
Racegroup	2.55882	1	2.55882	14.06535	0.000258
scorelevel	1.95577	4	0.48894	2.68763	0.033792
Racegroup*scorelevel	0.51635	4	0.12909	0.70957	0.586701
Error	25.28741	139	0.18192		

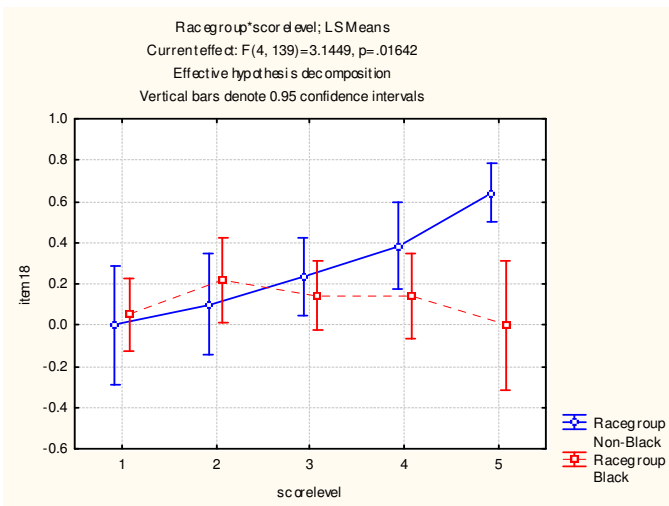


Univariate Tests of Significance for item17					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3.53606	1	3.536062	29.40017	0.000000
Racegroup	2.61845	1	2.618453	21.77082	0.000007
scorelevel	0.80065	4	0.200164	1.66424	0.161736
Racegroup*scorelevel	1.19472	4	0.298681	2.48334	0.046506
Error	16.71802	139	0.120274		

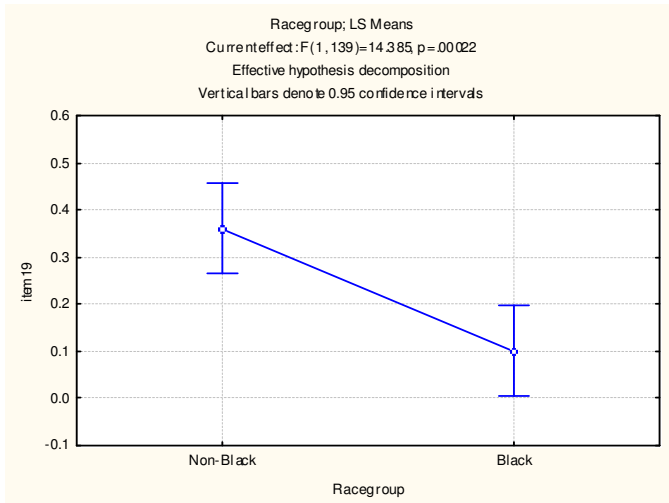




Univariate Tests of Significance for item18 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	4.45187	1	4.451867	29.39078	0.000000
Racegroup	0.79641	1	0.796414	5.25785	0.023349
scorelevel	1.05996	4	0.264991	1.74944	0.142584
Racegroup*scorelevel	1.90548	4	0.476370	3.14495	0.016421
Error	21.05454	139	0.151472		

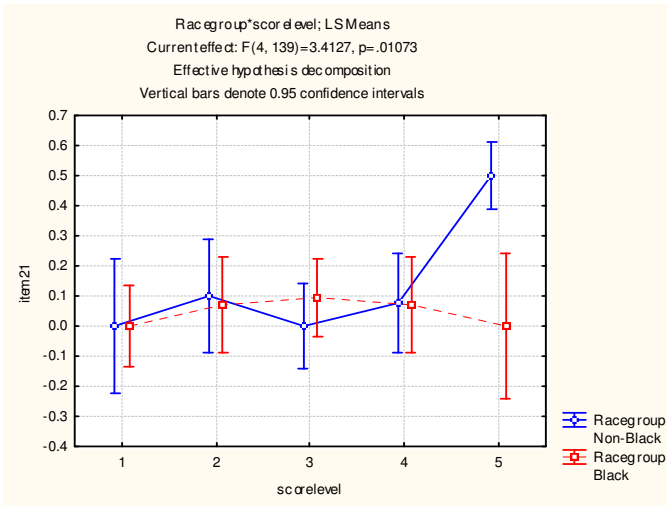


Univariate Tests of Significance for item19					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	6.45333	1	6.453325	44.84474	0.000000
Racegroup	2.07006	1	2.070059	14.38502	0.000221
scorelevel	2.08047	4	0.520118	3.61435	0.007784
Racegroup*scorelevel	0.88253	4	0.220633	1.53320	0.195869
Error	20.00262	139	0.143904		



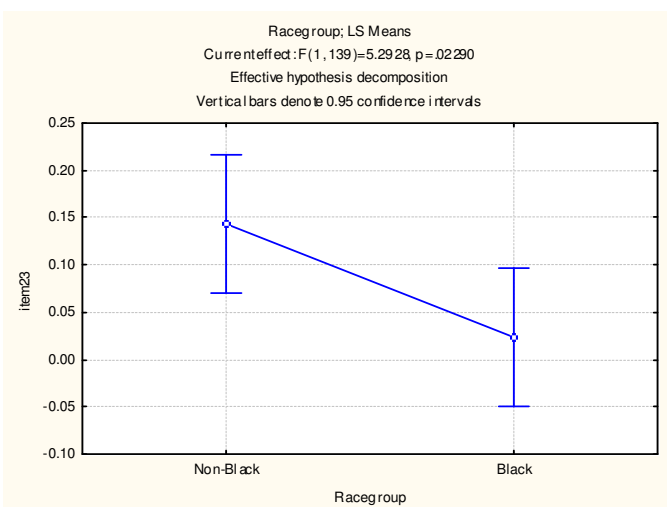
Univariate Tests of Significance for item20					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.46210	1	1.462105	13.71220	0.000306
Racegroup	0.10076	1	0.100761	0.94497	0.332691
scorelevel	0.63474	4	0.158685	1.48822	0.209026
Racegroup*scorelevel	0.19635	4	0.049088	0.46036	0.764705
Error	14.82130	139	0.106628		

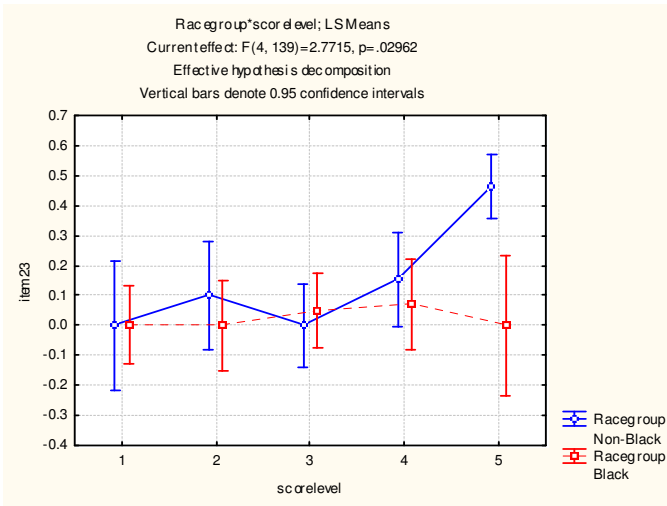
Univariate Tests of Significance for item21					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.01598	1	1.015976	11.30694	0.000998
Racegroup	0.23368	1	0.233675	2.60060	0.109091
scorelevel	0.74142	4	0.185354	2.06283	0.088945
Racegroup*scorelevel	1.22659	4	0.306647	3.41271	0.010732
Error	12.48974	139	0.089854		



Univariate Tests of Significance for item22 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.20954	1	1.209537	13.61587	0.000321
Racegroup	0.22120	1	0.221202	2.49009	0.116838
scorelevel	1.46022	4	0.365056	4.10947	0.003532
Racegroup*scorelevel	0.56372	4	0.140929	1.58645	0.181271
Error	12.34777	139	0.088833		

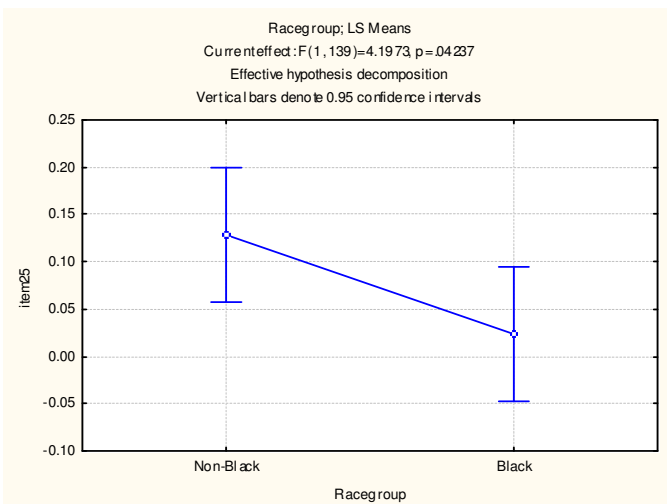
Univariate Tests of Significance for item23 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.85047	1	0.850474	10.33578	0.001623
Racegroup	0.43551	1	0.435512	5.29276	0.022903
scorelevel	0.75437	4	0.188592	2.29195	0.062580
Racegroup*scorelevel	0.91221	4	0.228052	2.77150	0.029621
Error	11.43755	139	0.082285		





Univariate Tests of Significance for item24 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.331781	1	0.331781	5.269469	0.023199
Racegroup	0.221928	1	0.221928	3.524751	0.062554
scorelevel	0.396550	4	0.099138	1.574542	0.184448
Racegroup*scorelevel	0.543242	4	0.135811	2.156995	0.077022
Error	8.751832	139	0.062963		

Univariate Tests of Significance for item25 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.69833	1	0.698327	8.915460	0.003343
Racegroup	0.32877	1	0.328766	4.197317	0.042370
scorelevel	0.35525	4	0.088814	1.133873	0.343143
Racegroup*scorelevel	0.47840	4	0.119601	1.526932	0.197657
Error	10.88755	139	0.078328		



### ***Detailed results by item for General Abstract Reasoning Test***

<b>Item number</b>	<b>Uniform Bias</b>	<b>In favour of group</b>	<b>Non-Uniform Bias</b>
1	No		No
2	Yes	Non-Black	No
3	No		No
4	No		No
5	No		No
6	No		No
7	No		Yes
8	No		Yes
9	No		No
10	No		No
11	Yes	Black	No
12	No		No
13	No		No
14	No		No
15	Yes	Black	No
16	No		No
17	No		No
18	No		No
19	No		No
20	No		No
21	Yes	Non-Black	No
22	No		No
23	No		No
24	No		Yes
25	No		No

Uniform bias was found in four of 25 items.

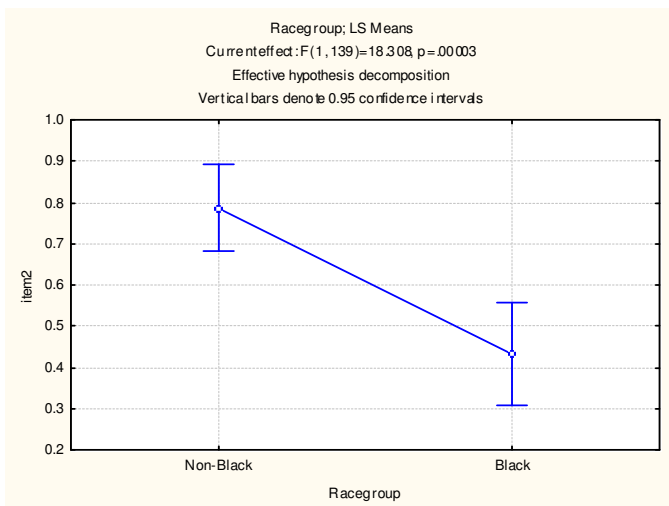
In two items the uniform was in favour of the Black group, in two items in favour of the Non-Black group.

Non-uniform bias was found in three items.

The graphs in the detailed results that follow illustrate the nature of the bias that was found.

Univariate Tests of Significance for item1 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	40.98498	1	40.98498	179.7798	0.000000
Racegroup	0.14105	1	0.14105	0.6187	0.432862
scorelevel	2.10350	4	0.52587	2.3067	0.061167
Racegroup*scorelevel	0.20060	4	0.05015	0.2200	0.926922
Error	31.68828	139	0.22797		

Univariate Tests of Significance for item2 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	35.07834	1	35.07834	217.8643	0.000000
Racegroup	2.94782	1	2.94782	18.3083	0.000035
scorelevel	2.86631	4	0.71658	4.4505	0.002049
Racegroup*scorelevel	0.39388	4	0.09847	0.6116	0.654978
Error	22.38040	139	0.16101		



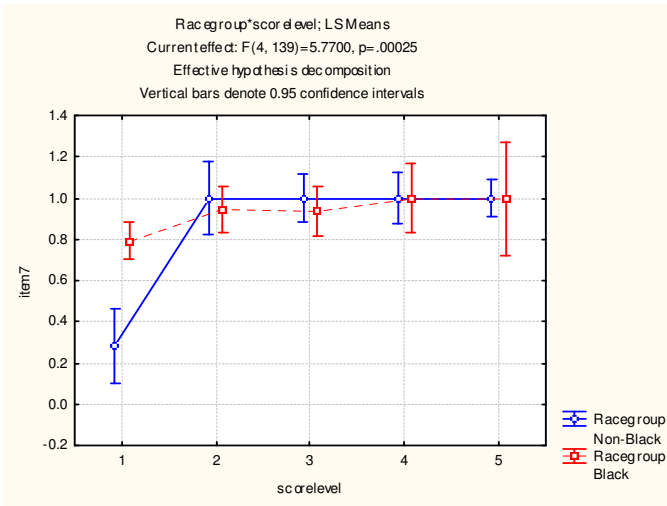
Univariate Tests of Significance for item3 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	22.81713	1	22.81713	97.52833	0.000000
Racegroup	0.01666	1	0.01666	0.07122	0.789969
scorelevel	1.38008	4	0.34502	1.47474	0.213120
Racegroup*scorelevel	1.04515	4	0.26129	1.11683	0.351112
Error	32.51958	139	0.23395		

Univariate Tests of Significance for item4 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	45.15371	1	45.15371	217.8864	0.000000
Racegroup	0.20206	1	0.20206	0.9750	0.325141
scorelevel	1.96604	4	0.49151	2.3718	0.055311
Racegroup*scorelevel	0.89205	4	0.22301	1.0761	0.370757
Error	28.80568	139	0.20724		

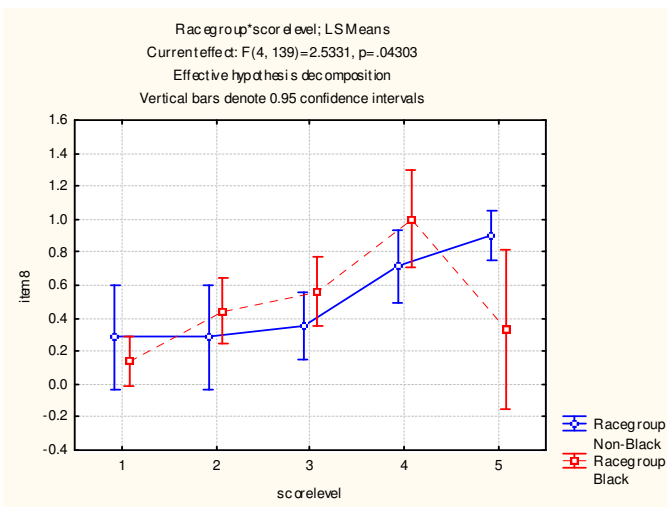
Univariate Tests of Significance for item5 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	41.50989	1	41.50989	214.8457	0.000000
Racegroup	0.07214	1	0.07214	0.3734	0.542179
scorelevel	3.82423	4	0.95606	4.9483	0.000926
Racegroup*scorelevel	0.39128	4	0.09782	0.5063	0.731166
Error	26.85590	139	0.19321		

Univariate Tests of Significance for item6 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	37.80092	1	37.80092	157.5253	0.000000
Racegroup	0.20689	1	0.20689	0.8621	0.354748
scorelevel	1.91849	4	0.47962	1.9987	0.098055
Racegroup*scorelevel	0.35338	4	0.08834	0.3682	0.830998
Error	33.35545	139	0.23997		

Univariate Tests of Significance for item7 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	75.73800	1	75.73800	1304.673	0.000000
Racegroup	0.14298	1	0.14298	2.463	0.118833
scorelevel	3.49112	4	0.87278	15.035	0.000000
Racegroup*scorelevel	1.33983	4	0.33496	5.770	0.000252
Error	8.06914	139	0.05805		



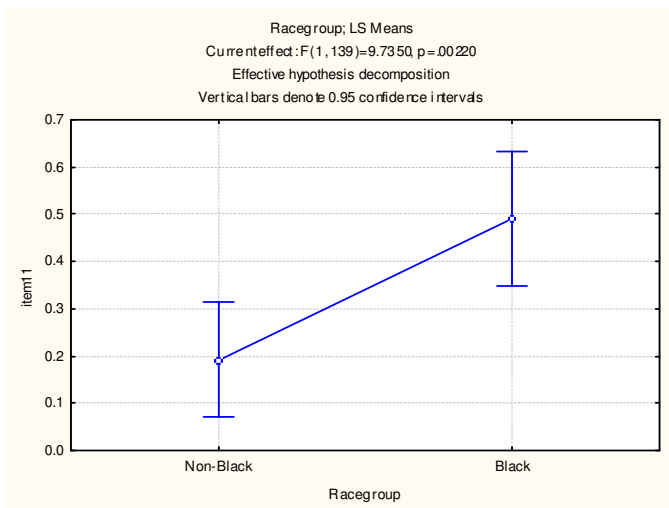
Univariate Tests of Significance for item8 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	23.74043	1	23.74043	133.0960	0.000000
Racegroup	0.00345	1	0.00345	0.0193	0.889649
scorelevel	5.00496	4	1.25124	7.0148	0.000036
Racegroup*scorelevel	1.80734	4	0.45184	2.5331	0.043033
Error	24.79353	139	0.17837		



Univariate Tests of Significance for item9 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	30.20069	1	30.20069	137.5542	0.000000
Racegroup	0.05456	1	0.05456	0.2485	0.618913
scorelevel	5.31464	4	1.32866	6.0516	0.000161
Racegroup*scorelevel	1.43356	4	0.35839	1.6323	0.169497
Error	30.51812	139	0.21955		

Univariate Tests of Significance for item10 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	41.71638	1	41.71638	227.5803	0.000000
Racegroup	0.01759	1	0.01759	0.0960	0.757167
scorelevel	4.66129	4	1.16532	6.3573	0.000100
Racegroup*scorelevel	0.79939	4	0.19985	1.0903	0.363842
Error	25.47926	139	0.18330		

Univariate Tests of Significance for item11 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	11.02847	1	11.02847	51.19509	0.000000
Racegroup	2.09712	1	2.09712	9.73500	0.002199
scorelevel	1.53393	4	0.38348	1.78016	0.136214
Racegroup*scorelevel	0.47244	4	0.11811	0.54828	0.700573
Error	29.94343	139	0.21542		

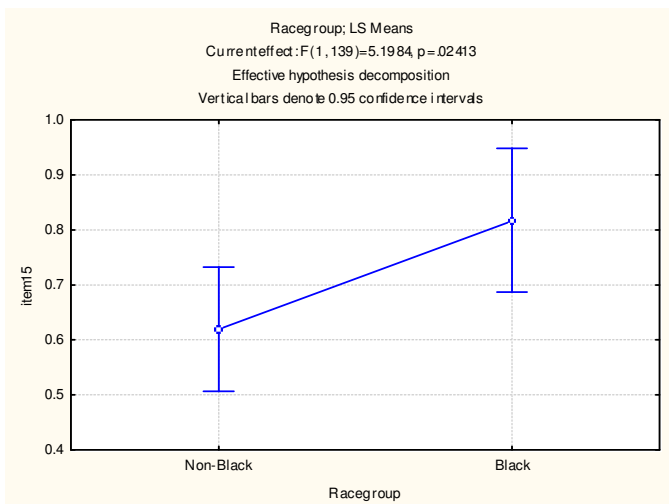


Univariate Tests of Significance for item12 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	47.71857	1	47.71857	277.4524	0.000000
Racegroup	0.00767	1	0.00767	0.0446	0.833111
scorelevel	2.89775	4	0.72444	4.2121	0.002998
Racegroup*scorelevel	0.54228	4	0.13557	0.7882	0.534666
Error	23.90638	139	0.17199		

Univariate Tests of Significance for item13 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	56.19910	1	56.19910	375.5146	0.000000
Racegroup	0.15014	1	0.15014	1.0032	0.318277
scorelevel	4.50086	4	1.12522	7.5185	0.000016
Racegroup*scorelevel	0.22229	4	0.05557	0.3713	0.828765
Error	20.80258	139	0.14966		

Univariate Tests of Significance for item14 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	33.40902	1	33.40902	139.7267	0.000000
Racegroup	0.00853	1	0.00853	0.0357	0.850476
scorelevel	1.18900	4	0.29725	1.2432	0.295522
Racegroup*scorelevel	0.09555	4	0.02389	0.0999	0.982320
Error	33.23527	139	0.23910		

Univariate Tests of Significance for item15 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	48.69699	1	48.69699	274.3139	0.000000
Racegroup	0.92284	1	0.92284	5.1984	0.024129
scorelevel	3.91330	4	0.97833	5.5110	0.000379
Racegroup*scorelevel	0.71582	4	0.17896	1.0081	0.405555
Error	24.67568	139	0.17752		



Univariate Tests of Significance for item16 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	48.17098	1	48.17098	298.0159	0.000000
Racegroup	0.00471	1	0.00471	0.0291	0.864711
scorelevel	4.80395	4	1.20099	7.4301	0.000019
Racegroup*scorelevel	0.24923	4	0.06231	0.3855	0.818746
Error	22.46782	139	0.16164		

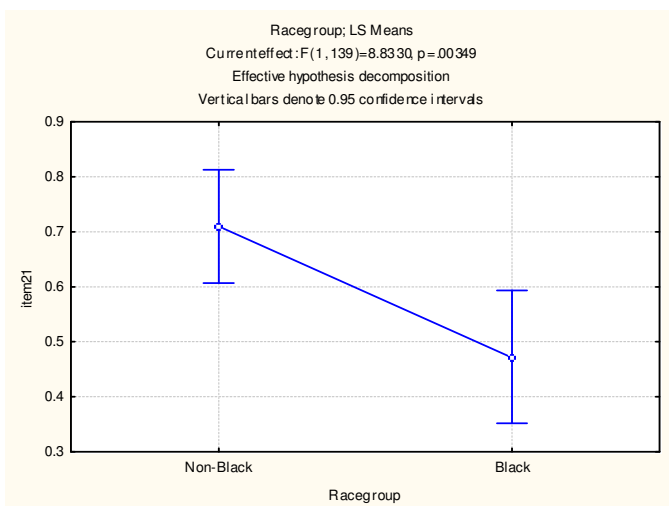
Univariate Tests of Significance for item17 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	30.45057	1	30.45057	158.0508	0.000000
Racegroup	0.00032	1	0.00032	0.0017	0.967437
scorelevel	6.68781	4	1.67195	8.6781	0.000003
Racegroup*scorelevel	0.60106	4	0.15027	0.7799	0.540025
Error	26.78017	139	0.19266		

Univariate Tests of Significance for item18 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	22.72859	1	22.72859	113.4666	0.000000
Racegroup	0.13762	1	0.13762	0.6870	0.408598
scorelevel	4.75256	4	1.18814	5.9315	0.000195
Racegroup*scorelevel	0.41503	4	0.10376	0.5180	0.722635
Error	27.84321	139	0.20031		

Univariate Tests of Significance for item19 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	24.93515	1	24.93515	157.2255	0.000000
Racegroup	0.00341	1	0.00341	0.0215	0.883624
scorelevel	7.26480	4	1.81620	11.4518	0.000000
Racegroup*scorelevel	0.23178	4	0.05795	0.3654	0.832955
Error	22.04468	139	0.15859		

Univariate Tests of Significance for item20 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	37.35013	1	37.35013	215.6376	0.000000
Racegroup	0.10786	1	0.10786	0.6227	0.431385
scorelevel	5.83626	4	1.45907	8.4238	0.000004
Racegroup*scorelevel	0.15304	4	0.03826	0.2209	0.926407
Error	24.07589	139	0.17321		

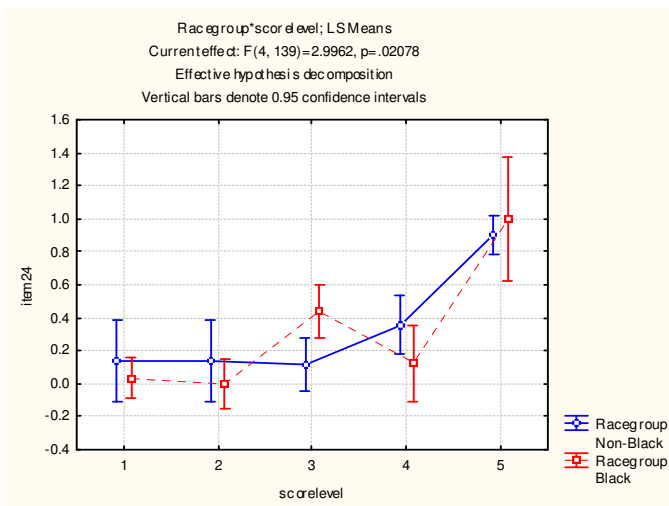
Univariate Tests of Significance for item21 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	32.95210	1	32.95210	217.8115	0.000000
Racegroup	1.33633	1	1.33633	8.8330	0.003487
scorelevel	4.79019	4	1.19755	7.9157	0.000009
Racegroup*scorelevel	0.41011	4	0.10253	0.6777	0.608528
Error	21.02892	139	0.15129		



Univariate Tests of Significance for item22 Sigma-restricted parameterization Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	24.94811	1	24.94811	161.4284	0.000000
Racegroup	0.32697	1	0.32697	2.1157	0.148050
scorelevel	6.20186	4	1.55047	10.0324	0.000000
Racegroup*scorelevel	0.34944	4	0.08736	0.5653	0.688250
Error	21.48189	139	0.15455		

Univariate Tests of Significance for item23					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	14.01643	1	14.01643	88.14980	0.000000
Racegroup	0.00048	1	0.00048	0.00299	0.956438
scorelevel	6.94998	4	1.73750	10.92717	0.000000
Racegroup*scorelevel	0.27493	4	0.06873	0.43226	0.785138
Error	22.10196	139	0.15901		

Univariate Tests of Significance for item24					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	10.00897	1	10.00897	91.70256	0.000000
Racegroup	0.00381	1	0.00381	0.03487	0.852140
scorelevel	6.59024	4	1.64756	15.09500	0.000000
Racegroup*scorelevel	1.30809	4	0.32702	2.99619	0.020783
Error	15.17129	139	0.10915		



Univariate Tests of Significance for item25					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	11.18431	1	11.18431	75.76314	0.000000
Racegroup	0.00891	1	0.00891	0.06034	0.806325
scorelevel	5.80696	4	1.45174	9.83416	0.000000
Racegroup*scorelevel	0.36902	4	0.09225	0.62494	0.645484
Error	20.51946	139	0.14762		