

TECHNICAL MANUAL & USER GUIDE

REASONING TEST - CORPORATE

This manual has been created by the psychologists from the Science and Innovation department of Central Test.

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1. Introduction

Wechsler describes intelligence as “the aggregate or global capacity of the individual to act purposefully, to think rationally and to deal effectively with his environment.” These three capacities are of extreme importance in a corporate environment where executives are expected to take stable and reasonable measures and to accommodate to frequent market changes. This test assesses the overall and specific intellectual capacities corporate persons across three areas, namely, verbal, logical, and numerical. It is deemed that these three areas are important as they encompass the entire subset of skills required in the corporate world such as communication, planning, organizing, calculating, and foreseeing outcomes.

Theoretical background

Intelligence is a multifaceted and multilayered concept. Among all the factors considered to make up one’s intelligence, researchers found three principle factors, namely, numerical, verbal and logical to be most predictive of one’s daily functioning. These three factors come from a global factor commonly referred to as General Intelligence or Spearman’s “g-factor”. The IQ (intelligence Quotient) obtained on any intelligence test is a numerical representation of this “g-factor”. It offers a global picture of an individual’s capacity to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, learn from experience and adapt to most situations.

1.1. What does the test measure?

Verbal Intelligence

The verbal intelligence factor corresponds to the ability to understand language subtleties and to be at ease with verbal communications. Situations that draw on the verbal intelligence factor are numerous such as drafting reports or sales leaflets, speaking in public, playing word games, etc. The capacity to communicate and use language effectively is of the utmost importance for surviving as well as for thriving in today’s world.

Numerical Intelligence

The numerical factor of intelligence represents the ability to deal successfully and accurately with numbers. Real-life situations where numerical skills will be needed are varied such as in economics, finance, accounting, sales negotiations, quantitative data analysis, as well as doing mental calculations, etc.

Logical Intelligence

Every time a person discovers links between various elements, logical faculties are being utilized, which is the intellectual capacity most strongly related to general intelligence. In the professional world, numerous activities rely on a highly developed sense of logic such as in law, information technology, medicine, etc.

1.2. What will the test taker/test administrator get?

- An Intelligence Quotient (IQ) indicating the candidate's intellectual capacity;
- A graphical representation of the candidate's IQ and level of intelligence in reference to the population;
- A general description delineating the basics of intelligence and its relevance to this test;
- A graph comparing the candidate's verbal, logical, and numerical intellectual capacities;
- A detailed description of the implications of the candidates scores on various intellectual domains;
- The candidate's test profile with the appropriate solutions on the incorrect responses.

1.3. Application

42 questions in forced choice format, 35 minutes, online administration.

Recommended for assessing intellectual capacities such as reasoning, abstract thinking, analytical and critical thinking capacities of professionals such as sales persons, entrepreneurs, managers, and other office executives.

2. Psychometric Properties

Periodic assessment of sensitivity and fine-tuning of a test are crucial to its long-term survival and effectiveness. **REASONING TEST - CORPORATE** has been subject to a series of validation studies since its first online publication in July, 2007. The latest validation study was conducted in the month of May, 2010.

2.1. Sample descriptives

Analyses are done on a sample of 284 candidates who completed the test between January and May 2010. Tables below present sample characteristics (in %).

Table 1. Descriptives Based on Gender.

Gender	Percentage (%)
Male	64.00
Female	36.00

Mean age is 31 years with a standard deviation of 9 years (min = 18 years; max = 63 years)

Table 2. Descriptives Based on Age.

Age	Percentage (%)
18-15 years	35.00
26-30 years	25.00
31-40 years	23.00
41-63 years	17.00

Table 3. Descriptives Based on Education Level.

Study Level	Percentage (%)
MBA/Business School/Engineering School	37.00
University Degree	48.00
Diploma/Vocational training	15.00

Table 4. Descriptives Based on Region.

Region	Percentage (%)
Europe	39.00
North America	8.00
Africa	6.00
Asia	45.00
Oceania	2.00
Other	16.00

2.2. Descriptive statistics

Table 5. Means and Standard Deviations by Factor.

Factor	Mean	Standard Deviation	Standard Error	Min	Max
Logical reasoning	4.65	1.72	0.10	0.00	10.00
Numerical reasoning	5.00	2.32	0.14	0.00	10.00
Verbal reasoning	4.32	1.89	0.11	0.00	8.67

Mean and standard deviation together provide the estimate of candidate's position in the population of reference.

Mean score is normally a mathematical average of all the observed scores. It provides a tentative assessment as to what extent the data is representative of the theoretical assumptions. Mathematically it tells as to which point on the scale most of the scores are falling around. In this test all the factors are scored on a 10-point scale ranging from 0 to 10. Ideally, the mean score should fall between 4.5 and 5.5. From the above tabulated scores mean scores are falling in the ideal score range but for verbal reasoning which is slightly below ideal score range.

Standard deviation is the mathematical average of all the individual deviation scores. It provides information as to what extent the scores are dispersed from the mean score. A high score indicates too much of dispersion and low score indicates too little.

For a scale of 10 points a standard deviation between 1.5 and 2.0 is good assuming that the characteristic measured by the scale is normally distributed in the population. Standard deviation for

numerical reasoning is a bit above that range, scores are more spread around the mean than for the other factors.

From the assessment point of view the test reasoning test provides correct evidence that it is corresponding with the theoretical background. It can be taken into consideration since every measurement contains some error.

2.3. Validity

Validity is the extent to which a test measures what it is supposed to measure and is a subjective judgment made on the basis of experience and empirical indicators. The validity of this test was assessed using different methods:

- **Construct Validity:** If a test has construct validity, it implies that it measures the domain that it seeks to measure. In order to establish construct validity, the domain that seeks to be measured needs to be carefully defined, and then items that are relevant to that domain require be carefully choosing, incorporating, and their relevance evaluated.

The items on this test were chosen by a team of psychologists, senior corporate executives, university academicians, statisticians and other relevant personnel after numerous consultations. These items are continuously reevaluated and updated depending on relevant statistical data.

- **Criterion validity:** Criterion validity is used to demonstrate the accuracy of a measure or procedure by comparing it with another measure (criterion) which has been demonstrated to be valid. Depending on the time positioning of the criterion, there are two types of criterion validity- concurrent validity and predictive validity.
- **Concurrent validity** occurs when the criterion measures are obtained at the same time as the test scores. This indicates the extent to which the test scores accurately estimate an individual's current state with regards to the criterion. For example, on the Corporate IQ Test, concurrent validity is established by comparing candidates' scores to their current functioning within companies and/or to their academic performance, as it is deemed appropriate. It is expected that candidates with higher IQ scores perform well on company tasks and academic endeavors. This was found to be true during recurrent validation studies, thus establishing the criterion/concurrent validity of the test.

2.4. Socio-cultural considerations

The test was also examined against some socio-cultural considerations like gender, region, educational background and age. These findings provide a good estimate of sensitivity of the test. With an objective of examining the socio-cultural influences on the scores of **REASONING TEST - CORPORATE**, a comparative statistical analysis was conducted. Comparing test scores among different socio-cultural groups serve two purposes:

- A. It provides a way to assess validity of an instrument (test, inventory, and profile). An instrument is valid if it is able to identify the difference between two groups as per the concept i.e. if it is established that men in general have good numerical ability than women

then a test of numerical ability must yield a higher mean score for men as compared to women.

- B. It provides an insight into interpretation of scores when two people belonging two different socio-cultural groups obtain same score on one or more factors of the test.

The candidates were classified according to their geographical origin, educational background, age and gender. For the sake of simplicity, certain regions were grouped together and assigned a code. Likewise, age and study levels were also grouped together. Please refer to the tables below:

2.4.1. Gender differences

Table 6. Mean Scores by Gender.

Factor	Male	Female
Logical reasoning	4.62	4.69
Numerical reasoning	5.17	4.71
Verbal reasoning	4.34	4.26

Following a t-test analysis, significant differences were found on numerical reasoning, with males scoring higher than females.

2.4.2. Age differences

Following an inter-factor correlation analysis, no significant correlations between the age of the respondents and their scores on the factors were found.

2.4.3. Education level differences

Table 7. Mean Scores by Education Level.

Factor	MBA	University	Diploma
Logical reasoning	4.61	4.23	4.43
Numerical reasoning	5.03	4.40	5.17
Verbal reasoning	4.23	4.15	4.80

An independent sample t-test was carried out to examine if reasoning capacity of a person is influenced by formal education. No significant differences are observed.

2.4.4. Geographical differences

Table 8. Mean Scores by Region.

Factor	Europe	Asia	Other
Logical reasoning	4.59	3.78	3.84
Numerical reasoning	5.05	4.26	3.85
Verbal reasoning	5.10	3.04	3.67

Note. Significant correlations where $p < 0.05$ are shown in red.

An independent sample t-test was carried out to examine if the region an individual is from has any influence on their reasoning ability. There are significant correlations in the reasoning capacity across region: people from group “Other” show lower numerical and verbal reasoning capacity than other regions. People from Asia have lower verbal ability than Europe. Cultural, Environmental and Ethical factors affect reasoning capacity of people. There are lots of evidences from past studies which prove the same.

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