

## A brief guide to "psychometric tests"

The term psychometric test can cover a very wide range of tests: ability, aptitude, intelligence, personality, motivation, interests, career guidance, and more.

### Do we need psychometric tests?

Psychometric tests are widely used by the employers in selection and development of employees. Somewhere between 60% and 70% of graduates are exposed to psychometric tests in their job searching experience. Even if a candidate has outstanding educational attainments, most employers will still use psychometric testing. Why?

Dr Mike Smith of UMIST is a researcher who has investigated how good a predictor of job performance different assessment methods are. Here are his findings:

Assessment tool	Correlation
Assessment centre (promotion-multiple test)	0.7
Work sample test	0.6
Ability test	0.5
Assessment centres(performance)	0.4
Biodata (personal and/or work history)	0.4
Personality questionnaires	0.4
Structured interview	0.3
Typical interview	0.2
References	0.1
Astrology, graphology	0

In short, comparisons of psychometric tests with more traditional methods of candidate selection such as references and interviews often favours tests. The highest correlation coefficient is for Assessment Centres, where psychometric tests play an important part, underlining the importance of testing.

Given that tests are not a perfect predictor of the future job performance, results obtained by psychometric testing are best used in conjunction with other data (if available) about the person: past job performance, interview performance and references.

### How far can we trust test results?

Although the correlation between performance in tests and job performance is quite good, it is not perfect. It is entirely reasonable to question test results obtained by any individual due to the imperfect nature of psychometric tests. Such questioning may lead us to further improve the tests used, but not to abandon them. Without psychometric tests the selection process would be based entirely on subjective judgment, which is an inferior predictor of future job performance and can be particularly harsh towards some subgroups. This is not, of course, just damaging to potential employees: it is damaging to the employer to turn away people who might otherwise turn out to be tomorrow's stars.

There are some situations where the test has a very high predictive validity so it is possible to show that those who obtain low scores on the test would also have low job performance. In such situations rejecting the whole subgroup is reasonable. In these circumstances the sample size of a group should be at least 25 people (as full statistical significance is achieved at a group size of around 30 in most circumstances). In some cases giving extra training to the people with lower test results would improve their job performance significantly. In the time of skills shortages this approach provided a solution for some companies.

### **Equal Opportunities**

We all know that some ethnic and gender groups get lower scores on the aptitude and ability tests than the rest of the population. Those are usually differences only in average scores between the groups. Some individuals from ethnic minority groups score better than most members of the main group, and some members of the main group may have lower scores than most members of the ethnic minority group.

Secondly, higher or lower than average scores on the aptitude test for any subgroup doesn't point to innate or genetic attributes because tests are not culture free and test results can also reflect differences in socio-economic status, social expectations or different levels of opportunities to learn between members of the same society. However, users of the aptitude test should take particular care when the candidate is not a native speaker of the language in which tests are presented because language proficiency can mask true abilities.

### **When not to use psychometric tests**

Tests are normally used for the selection, development or deployment of employees. It is highly dangerous to use them as a basis for decisions regarding, for example, redundancies. There have been cases when such an approach has been used, and in general they have not led to happy outcomes for the employer or the employee. (These examples include employers, where industrial action resulted in the withdrawal of redundancy notices.)

### **Glossary**

Correlation ( $r$ ) is a mathematical function that indicates the strength of a link between two variables. The higher the coefficient, the more accurate the prediction that can be made from the test results. There are several different correlation coefficients used in psychometric testing but they all have values between -1 and 1. A higher (positive or negative!) coefficient of correlation implies a stronger link so the connection is more likely to occur on a regular basis. A correlation coefficient of 0 means that the variables are totally independent. Any correlation over 0.5 is positive.

That fact that correlation exists (i.e. the coefficient is non-zero) does not imply that one variable determines the other's value. For example, one study has shown that there is a negative correlation between the grades attained and the time spent studying (students preparing their exams longer had lower grades). We can't necessarily conclude that longer studying causes lower grades (or the best way to get highest grades would be to stop studying!) but we can do additional research and discover other differences between students with higher and lower grades, which can explain this link. (For example, the level of knowledge acquired in the previous school.)

In some cases the correlation can point towards the cause-effect link between two entities but that relationship has to be verified by other means in order to be acceptable.

Predictive Validity means that the score on the test is in correlation with future behavior, for example people who get a high score on an test battery would perform better on job than people with low score.