The science of Staff**Matcher**™

Technical guide

Creating an accurate and reliable psychometric test requires strict adherence to a proven process based on sound psychology theory, and rigorous statistical analysis.

This guide outlines the various steps taken in the validity process, and will provide users of *Staff**Matcher**™* with the confidence required to adopt it as a legitimate and important part of their recruitment process.

Staff**Matcher**™
The end of recruitment fees!

Content Validity - Getting the basics right

At the core of *Staff**Matcher**™* is the 26 personality attributes that comprise the main content of the test. Deciding which attributes to test for was determined by a group of subject matter experts in organisational psychology, staff recruitment and business management. This was supported by a thorough literature review.

Furthermore, the *Staff**Matcher**™* model was based on sound psychology and management theory, including the renowned theories of Raymond Cattell (the 16 primary personality factors) and Lewis Goldberg (the "Big Five" global personality factors). However *Staff**Matcher**™* has extended on these theories, to include other robust measures of success considered to be important by business managers.

Testing of the 26 personality attributes was achieved by creating a series of questions. Each question was reviewed by the subject matter experts to determine whether the skill or knowledge measured by the question was "essential", "useful but not essential" or "not essential" to the attribute being tested. This was the starting point to ensure that the questions which comprise the *Staff**Matcher**™* test were representative of the personality attributes being tested.

Face validity - Does it work as expected?

Face validity is the recognition of a product working as expected. *Staff**Matcher**™* meets this criterion. *Staff**Matcher**™* was trialled with a large sample of employees across a broad cross-section of the workforce. The sample size used is statistically valid and demonstrated that the *Staff**Matcher**™* question set accurately tests for the 26 personality attributes. This is known as face validity e.g.: the *Staff**Matcher**™* test works as expected (effectively tests for the 26 attributes).

The tested employees were comprised of approximately 50% males and 50% females, and included a range of ages, cultures, ethnicities, and educational backgrounds. The group were equally divided between the *Staff**Matcher**™* employee categories of Team Member, Team Leader, Middle Manager and Senior Manager (refer to our sample report for more information).

Criterion based validity – On-the-job verification.

We tested employees with *Staff**Matcher**™*, and then compared the results to the assessments provided by their supervisors. The supervisors confirmed that the *Staff**Matcher**™* test results were an accurate reflection of their employee's on-the-job performance.

*Staff**Matcher**™* scores for the employees were found to have strong predictive validity with supervisor ratings of on-the-job performance, across top, middle, and lower level performers. Most importantly, *Staff**Matcher**™* was trialled with employees ranging from below average / poor performers, through to the most capable of employees. This is essential so that *Staff**Matcher**™* can clearly distinguish poor, average and high performance for each of its 26 personality attributes.

Statistical analysis – Proof by numbers.

Most psychometric tests available are measured by an internationally recognised statistical process; which confirms their internal consistency (reliability). This statistical process validates that the question set in use actually measures the intended personality attributes.

The most commonly used statistical analysis for psychometric tests is the formulation of Cronbach's alpha which is expressed as:

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K}\sigma_{Y_i}^2}{\sigma_X^2}\right)$$

Fig 1. The Cronbach alpha formula

The majority of psychometric tests in use today typically achieve a Cronbach alpha in the range of 0.75 to 0.85.

StaffMatcher™ relibility has been measured at 90%

Most tests are typically 75 – 85% reliable

This is the minimum acceptable relibility score for a pyschometric test.
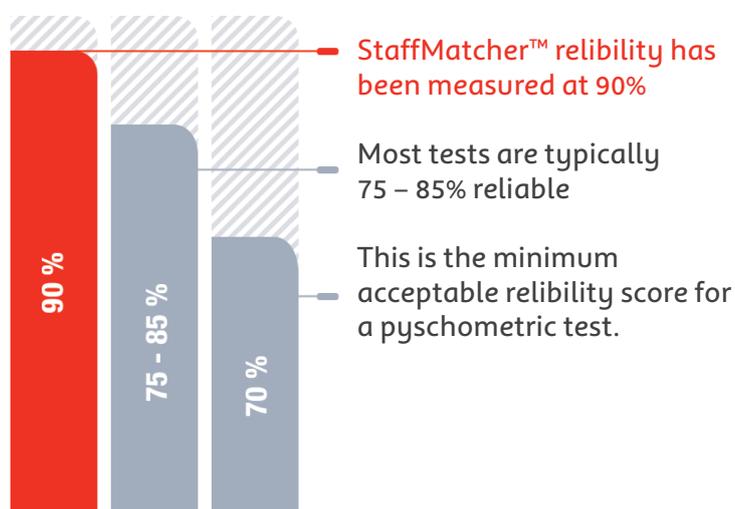
Fig 2. Cronbach alpha test reliability comparison

In simple terms, this means that the psychometric test will be between 75% and 85% reliable in use (a score of 0.70 or above indicates a reliable test).

By contrast, *Staff**Matcher**™* achieved a Cronbach alpha of 0.90, indicating that *Staff**Matcher**™* is 90% reliable. This exceptional result was achieved by utilising a number of specialist techniques in unison, and is a testament to the robustness of its conceptual design.

Analysis was undertaken using the industry standard software SPSS® (Statistical Package for the Social Sciences).
*SPSS is a registered trademark of IBM.

Retest reliability - Achieving the same results over time.

In order to verify that the *Staff**Matcher**™* scores were stable over time; the same subjects were re-tested at a later date (approximately 4 weeks apart). The re-test results yielded a Cronbach alpha of 0.905 (90.5% reliable).

Development of Scoring Standards

In order to recognise a high, medium or lower level performer, the scoring ranges used throughout the test were subjected to additional statistical analysis. The scoring ranges expressed in the *StaffMatcher™* report use a six point scale to indicate below average performance, average performance and above average/high performance, for the 26 personality attributes.

Proactive Vs Reactive				●		
Productivity					●	
Energy Level		●				
Remuneration Focus					●	
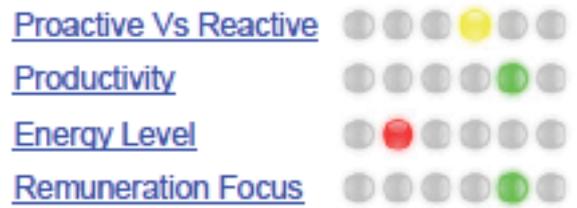
Comparing against other psychometric tests.

Concurrent validity is about comparing against other, validated psychometric tests. Whilst *StaffMatcher™* tests for a unique set of attributes; it shares several attributes with another validated psychometric test (Apollo). A significant correlation was found between *StaffMatcher™* scores, and the relevant scores in Apollo.

Similarities and Differences (in the right places).

Another measure of test validity is the requirement to demonstrate both similarities and differences with other psychometric tests. The *StaffMatcher™* model has demonstrated convergent validity (similarity) with a significant correlation found between *StaffMatcher™* scores and related attributes on Apollo.

Discriminant validity was also demonstrated with a lack of correlation found between unrelated attributes on Apollo.

Response reliability – Protecting against false answers.

When completing *StaffMatcher™* some candidates will feel inclined to answer 'strongly agree' to most questions, either consciously to appear a more attractive candidate or subconsciously due to a strong self-perception about their behaviour (whether true or not). *StaffMatcher™* utilises a number of methods in order to identify such candidates, which form the basis of the Response Reliability Indicator included in each candidate's report. These methods include:

- Randomised Response Method
- Forced Choice Questions
- Indirect Questioning

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