

# **The Validity and Cost-Benefit Utility of using Objective Selection Procedures**

## ***Cost-Benefit Utility Of Objective Selection Procedures***

### **Why use objective assessment?**

Many people will consider that they know how to interview "effectively", although it is not always acknowledged that objective and effective interviewing is a highly skilled job, which places many demands upon the interviewer. Yet, surveys show that the employment interview is the most popular method of recruiting staff and is used by 99 percent of companies. For the past 70 years, however, it has been the subject of persistent and extensive enquiry, for the "traditional" interview has been consistently shown to have negligible prediction of job performance. There are a number of reasons for this, which include both interviewer subjectivity and lack of a criterion based approach. Whilst structured, criterion based interviews (coupled with interviewer training) have been shown to offer significantly better prediction, the interview forms only one part of an objective and effective selection procedure.

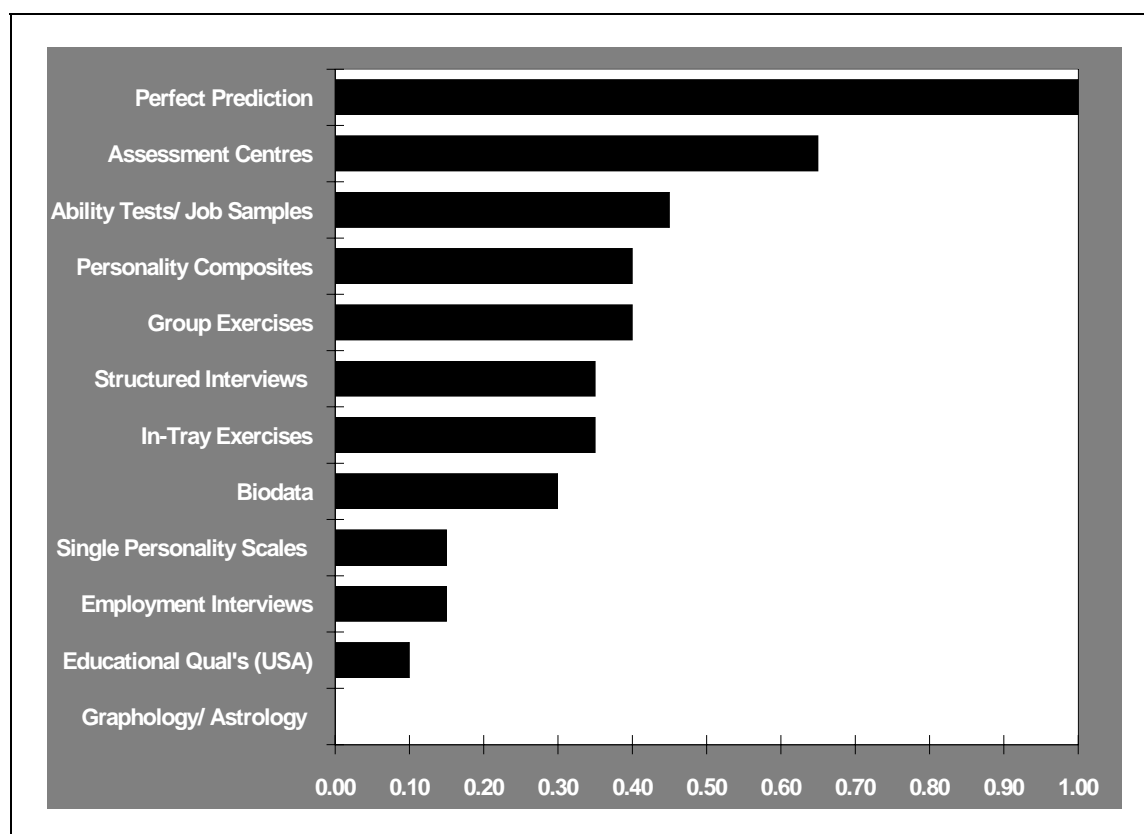
### **What else is needed for effective selection?**

Before *any* assessment can take place, it is necessary to identify the knowledge, skills and abilities required to effectively perform the job to be filled. This can only be achieved by conducting a comprehensive **job analysis**, to identify these factors and to provide a competency framework, against which to assess the candidate. When this knowledge is available, the appropriate assessment tools can then be chosen.

Extensive research has been conducted over many years, to assess how well ability tests and other objective measures can predict job performance. It is now universally acknowledged that valuable predictive information can be obtained by testing people for abilities relevant to the job (Figure 1). Ability tests are often included in the first stage of assessment, with many organisations using these (usually a maximum of two or three relevant tests) in conjunction with a structured or semi-structured interview.

Over the last 5 to 10 years, however, many organisations have begun to realise the additional value of assessing relevant personality characteristics, using job relevant personality questionnaires such as the OPQ™. There has also been a large increase in the number of companies combining these methods with additional exercises within an Assessment Centre setting (Boyle *et al*, 1993).

**Figure 1. Predicting Job Performance: A Guide to Validity (corrected) from Meta-Analysis**



**Source: M.Smith (1986)**

There are a number of reasons for the growth in popularity of objective assessment methods. These include general concerns about the organisational need to innovate and maintain market competitiveness, combined with a realisation that competitive edge leads to organisational success. This can be directly affected by the quality of employees. A more direct reason for the growing use of objective assessment is the vast body of evidence showing that better quality employees can be identified and recruited using these means (see Figure 1). Some specific reasons for utilising objective measures are summarised below:

- **Research** has consistently shown that well constructed tests can be good predictors of job performance.
- **Appropriate** use of tests, personality questionnaires and structured interviewing techniques leads to better assessment decisions which benefit the employer and are fairer to the employee.
- **Improving** the person/job match by using objective assessments, often leads to higher employee commitment and satisfaction and can reduce staff turnover.
- **Objective** assessment helps to avoid costly errors, wasted training and failure to identify those with the most potential.
- **Compared** to the cost of selection errors or failure to maximise the potential available, objective testing is inexpensive - typically costing between £3 to £20

per candidate. Even when assessor/selector training is considered, the potential gains can be enormous.

### Testing Utility

The following section provides information illustrating the potential cost-benefit utility (ie direct or indirect gains, expressed in monetary terms) achievable by using appropriate objective measures, to assess abilities and attributes relevant to the job.

This provides an estimate of the total addition to the bottom line from selecting staff using appropriate tests, over choosing people at random. The figures are presented per person selected, per year that they remain with the organisation:

**Table 1. Cost benefit per annum, for each person selected**

Salary	Validity		
	0.4	0.5	0.6
£10,000	£1,540	£1,700	£2,100
£15,000	£2,340	£2,700	£3,300
£20,000	£3,140	£3,700	£4,500
£25,000	£3,940	£4,700	£5,700
£30,000	£4,740	£5,700	£6,900
£35,000	£5,540	£6,700	£8,100
£40,000	£6,340	£7,700	£9,300
£45,000	£7,140	£8,700	£10,500
£50,000	£7,940	£9,700	£11,700

The formula for calculating the above figures is given in the appendix, and it should be noted that these figures do not include the value of lost business, opportunity costs or reputation due to ineffective job performance in areas of managing others or dealing with customers, for example. These figures, therefore, can be considered to be rather conservative.

### Example:

From the above Table, if a company selects 20 staff each year on a salary of £15,000 and achieves a validity of .4, this would be equivalent to a bottom line utility of £46,800 in the first year. The utility after 3 years will be 3 x 20 x £46,800, which will equate to £140,400. This assumes that none leave the company and that salaries remain constant.

It becomes apparent that as more staff are selected using objective measures, to replace leavers or to resource business expansion, the overall utility gain for the organisation will continue to increase.

The same assessment methods can also be used to assess staff for the purposes of training and development.

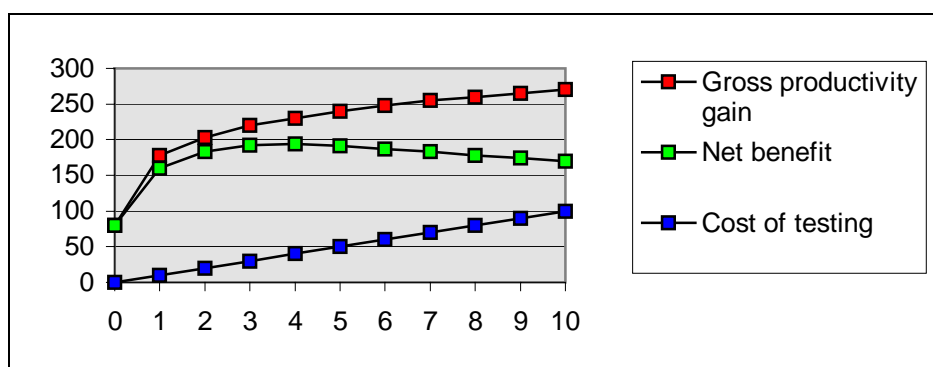
Ghiselli (1973) in a US survey of validation studies carried out over previous years, found that the average validity for most relevant tests was +0.45 for predicting training outcomes and +0.35 for job performance or proficiency.

Further compelling evidence for test validity was published by Dr Mike Smith (1986), who conducted a similar study in the UK. He concluded, overall, that ability tests had an approximate validity of +0.5, which has been supported by a number of other researchers (eg Hunter & Schmidt, 1989).

## Test Investment

Having considered the financial utility of using objective assessment, it would be useful to also consider the relationship between the financial benefits, costs of testing and number of applicants tested. This is especially important when it is considered that most organisations seek to reduce the numbers of people tested, to save on recruitment costs, even though reducing numbers of applicants tested can actually cost *more*. This apparent paradox is explained by the illustration of the nature of the relationship between applicant numbers, costs and financial gains:

**Figure 2. The relationship between number of applicants, costs of testing and productivity gain**



Guidance and Assessment Review (November, 1984)  
Schmidt and Hunter (1984): University of Michigan

The net benefit is the gross productivity gain less the cost of testing, shown here at £10 per applicant. In this example, the net benefit is still greater with 1000 applicants than with 100 applicants, even though the cost of testing is 10 times more, with the maximum gain peaking at about 400 applicants.

In terms of monetary gain, the net benefit may appear unrealistically high, but when this is translated into terms of work output, it equates to between 10 to 20 percent above the level obtained by random selection. This range of financial gain is approximated in the figures given in Table 1 and may be considered a reasonable expectation.

The rationale behind the example given in Figure 2 is derived from empirical research and has supporting evidence from both Schmidt and Hunter (1984,1986) and other researchers (eg Smith,1986). The evidence provided by Schmidt and Hunter was obtained by combining hundreds of previous research studies and used sample sizes of up to 400,000. They demonstrated that aptitude tests had higher validities than some had thought and that they were less sensitive to variations in job content or situation - evidence that test validities can be generalised to a wider range of jobs and situations without having to conduct a validation study for every circumstance. This latter claim is one supported by many researchers, in addition

to which, SHL have an ongoing policy of supporting validity studies to ensure the tests are indeed relevant to specific situations and to monitor for fairness.

### **The Costs of Poor Selection**

- Advertising costs
- Time investment
- admin
- interviewing
- Salary
- Training
- Customer satisfaction/ opportunity costs

### **Evidence of Success**

Although there are often many external variables involved when calculating cost-benefits of objective assessment methods, it is still possible to estimate the gains obtainable and a number of applied and academic researchers have provided powerful evidence to support these claims.

Shown below are several examples of how implementing SHL objective assessment and selection procedures have led to productivity gains and this can be demonstrated across a variety of occupations:

- an insurance company found that sales agents selected using an SHL system earned 11% more commission than those selected without tests
- medical reps selected using an SHL system earned 16% more commission than those selected with the old system. The successful reps also stayed with the company longer, thereby reducing unwanted staff turnover and associated costs
- a catering organisation was able to cut unwanted early management wastage by half, by implementing a SHL psychometric screening procedure
- a retail organisation found that an SHL designed store manager "Assessment Centre" programme had a validity equivalent to a bottom line improvement of £225,000 per store, per annum

Further research by Schmidt *et al* (1986) looking at tax officers, customs inspectors and social insurance claims examiners, found that the productivity of those selected by tests exceeded those selected without tests, by 9.4 percent of output. This finding is congruent with that found by SHL in the insurance sales agents example given earlier.

### **Summary**

Overall, there is a wealth of powerful evidence available demonstrating that the use of technically sound and valid tests for selection and assessment, can produce significant financial gains to an organisation. There is also substantial evidence indicating that attempting to cut recruitment costs by limiting applicant numbers is misconceived, being a false economy in the longer term. There is, of course, the need for a realistic balance to be made between utility returns and time spent on any recruitment scheme.

When assessing the cost of recruitment, however, one should also consider the cost to the organisation of failure to maximise on available employee/applicant potential. Depending on the specific recruitment needs, there may be a case for

investing in the development of a structured application form (as opposed to the more usual biographic type of form), which will provide more objective, scorable data to enable large numbers of applicants to be speedily and objectively sifted into the next recruitment phase.

It should also be acknowledged that objective assessment, properly applied, should not only benefit the employing organisation, but should be fair to the employees as well, in terms of person-job matching and personal development of the individual.

In conclusion, when considering the cost-benefits of implementing objective assessment, the evidence overwhelmingly shows that the costs of test training, materials and administration are insignificant when compared to the financial, commercial and organisational benefits to be made.

#### References:

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#### Notes

1. The cost of testing in this example allows for testing six applicants for every person selected, using two ability tests with a combined validity of  $r = 0.4$ . See also the utility equation notes below.
2. The cost of testing in this example allows for testing six applicants for every person selected, using two ability tests and an OPQ™ (Occupational Personality Questionnaire) with a combined example validity of  $r = 0.5$ . See also the utility equation notes below.
3. Based on using multiple measures (ie within an assessment centre) giving a maximum validity of  $r = 0.6$  and selection ratio of 1:3. The costs deducted allow for testing three applicants for every person selected , using two ability tests, an OPQ™, In-tray, Presentation exercise and Group exercise. See also the utility equation notes.
4. Utility Equation

$$r_v \cdot Z_x \cdot SD_y \cdot N - C$$

where

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- $Z_x$  = mean Z score on the selection test(s) of the selected candidates. All examples given have assumed a mean Z score of 1 SD (Standard Deviation) above the mean.
- $R_v$  = validity coefficient (1= perfect prediction, 0 = no prediction)
- Sdy = standard deviation of profit on the job-performance criterion (in £ or \$). Estimated at 40% of gross salary - Schmidt *et al* (1979)
- N = number of applicants selected
- C = cost of testing

For all Tables/examples given, the cost of testing allows for consumable materials only (ie excludes reusable test booklets). If all materials (booklets/manuals), licence fees and training costs to use the tests are considered, the investment required is approximately 3% - 5% of the first year utility of the examples given. This proportion reduces significantly in the second and subsequent years.

These figures are represented as estimates, based on a utility formula which uses a number of assumptions regarding test cut-off scores, difference in value to the organisation of good versus poor job performance (as a percentage of gross salary), degree of test validity, number of selected applicants and the cost of the testing programme.

