

RECOMMENDATIONS FOR PERSONNEL SELECTION IN INDIA BASED
ON THE BRITISH SELECTION METHODS IN THE CIVIL
SERVICE AND INDUSTRY¹

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SUMMARY

Selection procedures of the Civil Service and industry in Britain are reviewed. Two main types of procedure, paper and pencil tests and selection boards, are described in some detail, and validity data are presented where available. Critical observations on these procedures, their use and implications, are also detailed. The possible application, and suggested areas of modification, of these procedures for use in India follows the British survey. Some current work utilizing these procedures is briefly indicated.

PERSONNEL SELECTION METHODS

This report is based on interviews with leading British psychologists and on a survey of the research literature published from 1950 to 1956.

In Great Britain, as elsewhere, the primary objective of personnel selection is to predict from a field of applicants for a position, those applicants who will be most successful in the position. The task of prediction is qualified by considerations of economy, both of time and money. It is necessary, therefore, to devise methods for obtaining an optimum amount of information with minimum time and cost.

There are two types of personnel selection methods currently in use in Britain, both in the Civil Service and in industry :

- 1) paper and pencil tests of abilities,
- 2) selection boards.

In comprehensive selection programmes, as for the Administrative Class of the Civil Service, both of these types are utilized. Depending on the nature of the job, however, usually one or the other type will be chosen. Considerations relevant to the choice of type will be presented later in this report.

Paper and Pencil tests : Paper and pencil tests of ability have found wide use in the Civil Service and have also been used extensively in industrial selection by the National Institute of Industrial Psychology (NIIP). The design and content of several batteries of such tests will illustrate their general make-up. The basic test battery of the Civil Service for the Administrative Class selection consists of the following tests : NIIP test 70/1 for non-verbal intelligence; a verbal facility test; Babinpton Smith's advanced verbal intelligence test; and various versions of a test of general information, dealing chiefly with current affairs (Vernon, 1950). At other levels of the Civil Service, non-administrative in nature, paper and pencil tests are also used. The general pattern of these tests only can be given for security reasons. A specific test battery, consisting of a variety of tests, has been developed for each of the different grades of the Civil Service. While some tests are similar for all grades, others are specific to a particular grade. Those tests which are similar in all grades include verbal and non-verbal intelligence and arithmetic, and differ only in level of complexity with respect

¹ This report is based on a survey conducted in Great Britain by the author as a Research Fellow of the Indian Statistical Institute.

to the grade. The verbal intelligence tests include verbal analogies, grammar and verbal comprehension; the non-verbal intelligence tests include pictorial or diagrammatic materials presented in problem form; the arithmetic tests are of the customary type. Examples of tests specific for a particular grade include the clerical tests for the clerical grades and geography tests for Post Office Counter Clerks. Further tests used in the Ministry of Labour have been developed by psychologists at Birkbeck College in London. The content of these tests cannot be published for security reasons, however the tests have been modelled after the Admiralty Tests, described by Vernon and Parry (1940). The Admiralty battery consisted of the Shipley abstractions (Shipley and Burlingame, 1941), the Bennett Mechanical Comprehension Test (Bennett, 1948), Raven's Progressive Matrices (Raven, 1938), the NIIP Squares Test, a simple arithmetic test, a test of mathematical knowledge, and a test of mechanical and electrical knowledge. The last three tests were devised by the Admiralty psychologists.

Several different test batteries have been developed for and used by industry. The factory operatives selection battery for the Rowntree's Cocoa Works includes the following tests: an English achievement test; an arithmetic achievement test; intelligence tests of the abstraction type; and performance tests designed for use in the factory (Portous, 1950). Use of NIIP tests in industrial selection is discussed by Castle and Garforth (1951) and Handyside and Duncan (1954). NIIP has developed the following tests for use in industrial selection and vocational guidance: Group Test (GT) 20, "Accuracy in checking names and numbers"; GT 25, "Aptitude for general clerical work"; GT 33, 36, and 90A, verbal intelligence tests for different age groups; GT 70/1 and 70/23, non-verbal intelligence tests; GT 81, Squares, and Form Relations, space perception tests; and the Vincent Models Tests, a mechanical aptitude test.

Published validities for the Civil Service and industrial tests, the nature of the validation criterion and test population, and the significance of the coefficients not corrected for restriction of range are summarized in Table 1.

TABLE 1. VALIDITY OF SELECTION TESTS

test name	N	r	P	r ¹	nature of criterion	nature of sample	reference
NIIP GT 70/1	202	-.069	—	-.042	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
verbal facility	149	.172	.05	.223	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
E. Smith advanced verbal intelligence.	159	.083	—	.240	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
NIIP GT 33 & 70/23	44	.59	.01	—	manager's ratings two years after selection	factory supervisors	Castle and Garforth (1951)
NIIP GT 33 & 70/23	44	.61	.01	—	composite criterion ² four years after selection	factory supervisors	Handyside and Duncan (1954)
general information	202	.030	—	-.140	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)

¹ Corrected for restriction of range by Vernon (1950).

² Composite criterion based on manager's assessments and incidence of promotion.

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The reported correlations for the Civil Service Administrative Class sample are consistently low. These values may be attributed to two factors: first, the highly homogeneous nature of the sample with respect to intellectual performance; and second, the collection of validation data on the successful candidates solely. The effect of these two factors would be to restrict variability, and hence to reduce the correlation coefficient. The higher correlations for the industrial samples reported in Table 1 may be due to the greater heterogeneity of the test sample with respect to the tested characteristics. Readers interested in the corrections for restricted variability, or restriction of range, are referred to Gulliksen (1950).

On a theoretical level, the tests described above adhere to Spearman's concept of "g" or general intelligence, which means that intelligence is treated as a unitary phenomenon rather than consisting of multiple abilities (Anastasi, 1954). In particular this is true of the Civil Service intelligence tests and the NIIP intelligence tests used in industrial selection. At the operational level, the addition of other tests to the selection batteries, such as mechanical comprehension and clerical aptitude, indicates acceptance of intelligence as consisting of multiple abilities. This contradiction that exists between the theoretical and operational levels should be resolved by empirical research on tests in relation to job performance. The resulting information would possibly enhance the predictive value of the selection tests in the Civil Service and in industry.

Another general characteristic of the test batteries described above is that they show little departure from the common pattern, i.e., verbal and nonverbal tests of intelligence, arithmetic tests, and several specific ability tests. In the field of selection, it may also be noted that there have been relatively few published reports of the validity of the various tests. Finally, it should be observed that the majority of the selection material used in Britain comes from three sources: the British forces (Vernon and Parry, 1949); the Civil Service (Wilson, 1943; Vernon, 1950); and NIIP (Castle and Garforth, 1951).

Selection Boards: The second major type of selection procedure, selection boards, was pioneered in Britain by the military forces' War Office Selection Boards (Vernon and Parry, 1949). Selection boards were later adopted by the Civil Service and NIIP. This method is generally known as a "new-type selection board" or Civil Service Selection Board (CISSB). The selection board can be most completely illustrated by reference to the CISSB procedure (Civil Service Commissioners, 1951; Vernon, 1950; Wilson, 1943).

"CISSB" is actually the second stage in Method II of the Normal Open Competitions for the Administrative Class and Foreign Service of the British Civil Service (Civil Service Commissioners, 1951), and consists of a series of tests and interviews requiring two to three days. The tests are divided into two classes, "psychological tests" and "analogous tests". The "psychological tests" include tests of ability and personality with the ability tests stressing verbal and reasoning facility, and the personality tests stressing motivation, interests and personal history. "Analogous tests" are designed to be comparable to situations which successful candidates will have to face in the Civil Service. Two of these tests are based upon a lengthy dossier describing an imaginary problem, e.g., setting up an atomic reactor station in a hypothetical town, or government sponsored emigration from some area in England to Australia. In the first analogous test candidates are required to write on a question of policy or principle after careful study of the dossier. In the second analogous test, every candidate is allotted a special policy problem related to the dossier, which he as

chairman must present to the committee (the other candidates) and lead the committee to a solution of the problem. Oral and written exercises on general problems relevant to the Civil Servant complete the analogous tests. Three interviews in addition to the written and oral tests complete the schedule of the CISSB board. The first interview is a viva or oral examination of intellectual performance, conducted by one of the staff members; and the second interview is a personality oriented interview, conducted by the psychologist; and the third interview is a general interview in the traditional manner by a third member of the staff. These three staff members, making up the Directing Staff, assess each candidate in the written and oral analogous exercises and in interview.

Industrial use of CISSB type selection boards is reported by NIIP investigators (Fraser, 1950; Castlo and Garforth, 1951) and the industrial firm "Rowntrees" (Higham, 1952). In these reports, the selection boards are referred to as "new-type" selection boards. Between 1945 and 1950, about fifty of these selection boards had been carried out for industrial appointments by NIIP (Fraser, 1950). The majority of these selection boards were concerned with managerial positions or management trainees, but some were also concerned with sales, supervisory, and professional appointments. The NIIP procedure includes tests, interviews, and analogous exercises (Castlo and Garforth, 1951; Fraser, 1950; Handyside and Duncan, 1954). Choice of paper and pencil tests was usually made from the NIIP collection, previously listed. Two interviews were included in the board procedure, one by the psychologist, and one by the entire board staff. Analogous exercises utilized concrete industrial problems which were similar to those successful candidates would face in the job. NIIP considers the psychologist's interview to be the focal point of the selection board: it outlines the main behaviour patterns, while the analogous tests confirm these patterns, and the paper and pencil tests indicate the limits to which a candidate may be expected to develop (Fraser, 1950).

Industrial application of selection boards is also illustrated by Rowntrees Cocoa Works (Higham, 1952). Tests, interviews, and analogous problems again make up the board schedule, which is generally used in selection of salesmen, although it is also used for depot managers, trainee overlookers, and other posts. Analogous problems, performed in a group situation, provide information on the ability of candidates to handle ideas, their effectiveness as group members, and their reactions to stress. These analogous problems are designed to be complex in nature and to admit of various solutions, and are discussed in a general group discussion as well as committee type situation with each candidate acting as chairman in turn.

Three components in the selection boards are found in common in the above reports: the use of tests of ability and other characteristics; two or more interviews; and exercises analogous to the job task, partially or completely performed in a group situation. Validities for the test, interview, and analogous exercise components of the selection board, and the validity of the total selection board, are reported by some investigators, and are summarized in Table 2. The significance of the validity coefficients, nature of the criterion and test population are also summarized in Table 2.

Review of Table 2 shows relatively higher validities than those reported in Table 1. It is possible that this general difference is due to the pooling of more than one test in Table 2 having the effect of increasing reliability which in turn increases the validity coefficient. All the coefficients reported in Table 2 differed significantly from zero at the .01 point of confidence.

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TABLE 2. VALIDITY OF SELECTION BOARDS

procedure	N	r	P	nature of criterion	nature of sample	reference
tests	202	.318	.01	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
	44	.59	.01	manager's ratings two years after selection	factory supervisors	Castle and Garforth (1951)
	44	.51	.01	composite criterion ¹ four years after selection	factory supervisors	Handyside and Duncan (1954)
interviews	202	.487	.01	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
	44	.66	.01	manager's ratings two years after selection	factory supervisors	Castle and Garforth (1951)
	44	.55	.01	composite criterion ¹ four years after selection	factory supervisors	Handyside and Duncan (1954)
analogous tests	202	.445	.01	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
	44	.63	.01	manager's ratings two years after selection	factory supervisors	Castle and Garforth (1951)
	28	.58 ²	— ³	composite criterion four years after selection	factory supervisors	Handyside and Duncan (1954)
total procedure	202	.505	.01	supervisor's ratings two years after selection	administrative class, civil service	Vernon (1950)
	44	.68	.01	manager's ratings two years after selection	factory supervisors	Castle and Garforth (1951)
	44	.65	.01	composite criterion ¹ four years after selection	factory supervisors	Handyside and Duncan (1954)

¹ Composite criterion made up of manager's ratings and incidence of promotion.

² Corrected for selectivity.

³ Uncorrected coefficient not given for determining significance.

The relative value of the coefficients reported in Table 2 is made more meaningful in terms of selection procedures by reference to Table 3, which summarizes data from Castle and Garforth (1951) and Handyside and Duncan (1954). In these two studies, systematic or experimental selection was compared with the customary or control method of selecting supervisors in a large heavy engineering firm in Scotland. All men selected by either procedure were advanced to supervisory posts, permitting later comparison of the two methods. The superior prediction of the experimental procedure over the control procedure, in terms of the correlation with the criteria, is evident.

TABLE 3. EXPERIMENTAL COMPARISON OF SELECTION PROCEDURES

criterion	N	correlation of criterion with		reference
		control procedure	experimental procedure	
manager's ratings two years after selection	44	.23	.68	Castle and Garforth (1951)
composite criterion ¹ four years after selection	44	.18	.65	Handyside and Duncan (1954)

¹ Composite criterion derived from manager's ratings and incidence of promotion.

Recent work in British personnel selection has been reviewed above, in terms of major types of procedures, and with special attention to validity data. It is now pertinent to consider how and where such procedures may be applied in India. The following points are to be discussed :

- 1) areas for which each type of procedure is suited;
- 2) modifications desirable for their application in India;
- 3) current use of such techniques.

It will be recalled that in the British Civil Service, only paper and pencil tests were used for selection of non-administrative grades, while selection boards were limited to selection of administrative grades. It is presumed that the basic reason for this practice lies in economy, both of time and money. The selection boards are more expensive in terms of these factors than the paper and pencil tests alone, and hence must be used only where this greater cost is justified. The assumption of CISSB is that a person who ultimately fails in his job at the administrative level is more costly than the insurance money spent in the more detailed and elaborate selection procedures. Hence, considerations of long run economy are operating even in this case. In the case of the non-administrative classes, the greater replaceability of failures leads to the choice of less expensive selection procedures. These considerations would appear to be applicable also in India. For the majority of posts, especially with a job scarcity and large labour market, the more economical procedures would be most practical. With higher level posts, of administrative, policy-making character, more detailed selection methods may be desirable. Where factors of group cooperation, personal contact, and leadership are important, as in the village development schemes, the more elaborate selection boards may also be of value.

The question next arises as to how these procedures should be modified to suit Indian conditions. With respect to paper and pencil tests, and tests used in selection boards,

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validation of the tests in India is of primary importance. Language factors and items with cultural connotations should be altered, where foreign tests are used, to be more understandable to the test population. In addition to these factors, investigators in India may benefit by reviewing British efforts, and develop efficient batteries of tests which agree at both theoretical and empirical levels. These batteries should be based on thorough job analysis, which will improve prediction of persons who will ultimately be successful in the job (Stevenson, 1951). Interview procedures, already in wide use, do not require modification in terms of cultural context; they may benefit, however, from the application of a standard method of organization and mark procedure. This will permit quantification of hitherto purely subjective factors, will assist in the judgmental process, and permit later analysis of reliability and validity. Work in this direction is reported by the Psychological Research Wing of the Defence Science Organization, Ministry of Defence (1953). The analogous tests do not require cultural modification: the only requisite is that the tasks chosen be pertinent to jobs successful candidates will undertake. Assessment of performance on these tasks will also benefit from the use of a mark procedure, which can be standardized and validated. Fundamentally, the successful use of paper and pencil tests and selection boards depends on careful analysis of the job and careful construction of tests for maximum prediction.

The applications of the selection procedures and suggested modifications have been described above. These techniques, in a modified form, are currently being studied in actual job selection in the Indian Statistical Institute. For stenographer applicants, a battery of aptitude and performance tests has been combined with a standardized interview procedure permitting quantitative assessments. For more technical positions, special examinations are administered along with standardized interviews and group discussion. Studies reporting the use of both tests and selection boards in the Indian Services have been published in *Sankhyā* (Psychological Research Wing, 1953; Sharma, 1953).

CONCLUSIONS

Both types of selection procedure currently used in Great Britain have applicability in India. The paper and pencil test battery is recommended for economy, and for non-administrative personnel selection. The selection board is recommended where policy-making, leadership, personal contact and group cooperation are important. Starting with careful job analysis, these techniques may be modified to achieve greater cultural meaning and to provide more standard quantitative assessments.

INTERVIEWS

The following leading psychologists in Great Britain were interviewed in connection with this survey: Professor John Cohen, Manchester University; Professor Lee J. Cronbach, Scientific Liaison Officer, United States Navy; Mr. David C. Duncan, National Institute of Industrial Psychology; Professor Hans J. Eysenck, Institute of Psychiatry, University of London; Mr. W. D. Furneaux, Nuffield Research Unit, Institute of Psychiatry, University of London; Mr. John D. Handyside, National Institute of Industrial Psychology; Mr. K. A. G. Murray, Chairman, Civil Service Selection Board; Mr. A. K. Rice, Tavistock Institute of Human Relations; Mr. Alec Rodger, Editor of "Occupational Psychology", Birkbeck College; Professor Roger W. Russell, University College, London; Miss Margaret S. Stevenson, Research Psychologist, Civil Service Commission; and Professor Philip E. Vernon, Institute of Education, University of London.

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