CHAPTER 1
INTRODUCTION

Psychological testing has started since long, dated as far back as World War I. It gained increased popularity during World War II, as a result of the extensive use of psychological tests in recruitment of personnel for the different military services. Ever since, in the United States of America, psychological testing started getting acclaim in various fields, such as for admission from nursery schools to colleges and universities, for selection and placement in industries, etc. Today, in the American, European and other developed countries, psychological testing has attained high appreciation in almost all the fields. Different types of behaviour required in the academic institutions, business and occupations can be sampled out and tested to give the testee's ability to perform these kinds of behaviours. This makes testing an efficient tool for selection and placements. Psychological test is a standardized measure of a sample of behaviour where a person performs a series of prescribed tasks within a stipulated time period.

Psychological tests can be broadly divided into five categories, viz., Intelligence, Aptitude, Achievement, Personality and Sensori-motor tests. While achievement and personality tests require paper and
Pencil for performance, intelligence and aptitude tests require both paper-pencil and object manipulation, and the sensori-motor tests involve different types of mechanical equipments. Of the psychological tests mentioned, aptitude tests seem to play a pivotal role in educational and vocational guidance of the child. An aptitude test means a combination of characteristics indicative of an individual's capacity to acquire some specific knowledge, skill or a set of organized responses (Freeman, 1976). The aptitude tests include a large number of tests capable of assessing various segments of aptitudes.

To mention some of the aptitude tests, it may be noted that Wesman (1946) measured two useful aspects of aptitudes, viz., Verbal and Numerical, in 28 minutes by his Personnel Classification Test (PCT).

Bennett, Seashore and Wesman have devised the Differential Aptitude Test Battery (DAT, 1955), which consists of subjects measuring abilities within stipulated time period, on:

- Verbal Reasoning - 40 minutes
- Numerical Ability - 40 minutes
- Clerical Speed & Accuracy - 45 minutes
- Space Relations - 35 minutes
- Language usage I & II - 45 minutes

These tests are to be administered in six sessions.
Although the DAT assesses a number of abilities, the whole test administration takes a total time of about 3½ hours, exclusive of instructions and trial time period for each subtest. The manual of this test advises that the testing sessions may be held on six successive days or on the mornings and afternoons of three successive days.

Flanagan (1959) has developed Aptitude Classification Tests (FACT) which can measure fourteen abilities in two sessions.

In the first session the following eight subtests are administered:

1. Inspection (6 minutes)
2. Coding (10 minutes)
3. Memory (4 minutes)
4. Precision (8 minutes)
5. Assembly (12 minutes)
6. Scales (16 minutes)
7. Coordination (2 minutes 40 seconds)
8. Judgement & Comprehension (35 minutes)

This session takes a total period of about one hour and 34 minutes in the first session. In the second session, the abilities that are measured are:

9. Arithmetic (10 minutes)
10. Patterns (20 minutes)
The total time required for this session is one hour 58 minutes. Hence, the total time for the administration of the whole test is 3 1/2 hours, excluding the time required for instructions and trial sessions, etc. According to Flanagan the test can be used for 32 job categories which include clerical job but exclude the textile technician's job. Different job categories require different combinations of subtests, none requiring all of them together. Hence, for a specific occupational group the testing time reduces to about an hour and half which seems to be long enough where quick selection is necessary.

Boeder and Graham (date not available in the manual) developed Aptitude Tests for Occupations. These tests assess 6 aptitudes as follows:

- Personnel Social (20 minutes)
- Mechanical (20 minutes)
- General Sales (20 minutes)
- Clerical Routine (12 minutes)
- Computational (15 minutes)
- Scientific (20 minutes)
The administration of all the subtests take a total time of one hour and 47 minutes. These tests measure specific aptitudes rather than general ones, and also take long time for test administration.

Tests which measure more than one/two aptitudes take inordinately more time for test administration, and that too, more than one session. This breeds anxiety and demotivation in the testees. Since multidimensional aptitude testing is costly, industrial management is also interested in the testing time.

The General Aptitude Test Battery (GATB) published by the United States Department of Labour, U.S.A. (1958) measures 9 aptitudes, viz.,

- Intelligence (G)
- Verbal Aptitude (V)
- Numerical Aptitude (N)
- Spatial Aptitude (S)
- Form Perception (P)
- Clerical Perception (Q)
- Motor Coordination (K)
- Finger Dexterity (F)
- Manual Dexterity (M)

These nine aptitudes are measured through the following twelve parts with the time limits indicated in
The administration of the test (Parts 1 to 12)
exclusive of the time for instructions and practice trials,
requires 46 minutes 15 seconds, out of which, parts 1 to 7 take 42 minutes.

G is obtained through parts 3, 4 & 6; V from part 4;
N from parts 2 & 6; S from part 3; P from parts 5 & 7;
Q from part 1; K from part 8; F from parts 11 & 12; and
M from parts 9 & 10. Each test part has a different
weightage for different aptitudes.

Thus it is clear that the administration of the
gate takes least time compared to the other aptitude tests.
mentioned earlier. Moreover, it includes aptitudes that are generally required for day-by-day work for a wider range of occupations as mentioned in the GATB Manual (144 occupations). The GATB, therefore, shows advantages in respect of occupations, aptitudes and time for administration, over that of the other aptitude tests.

In the developing countries, psychological testing has still not gained wide usage which it enjoys in the western countries. In India psychological services were started in 1938 in Calcutta, when the noted psychologist, Sir C.S. Myers came to attend the International Science Congress. Since then the movement has taken a route, and psychological tests are now being used by various organizations for purposes of channelizing students to various academic and professional or technical training, recruiting persons for jobs, etc. The organizations that provide such services are summarized in Table-1 (pp.8-10).

It is seen from the Table that psychological testing is not much in vogue in India compared to its geographical area and wide industrial spectrum. However, some services are offered by the academic and research institutions, Government departments in the public sectors, and a few consulting organizations for dealing with personnel relations, placement and managerial problems.
### Table-I

**NATURE OF PSYCHOLOGICAL SERVICES IN VARIOUS INDIAN ORGANIZATIONS**

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<tr>
<th>Organization</th>
<th>Nature of Activity</th>
<th>Remarks on Practical Use</th>
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<tbody>
<tr>
<td>1. Various Universities: postgraduate departments of psychology, education, management</td>
<td>Teaching and Research: teaching theory and principles of test construction; research on test construction for postgraduate/Ph.D. students.</td>
<td>The tests are constructed as an exercise in test construction and not for suggesting a practical need for industrial vocational selection. The tests are not widely published or available to industries.</td>
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<tr>
<td>2. National Council of Educational Research and Training (NCERT), State vocational guidance, and Bureau of Ministry of Education.</td>
<td>Training and Research: bachelor of teaching, career master, M.Ed. students, research and test construction</td>
<td>Used for vocational and educational guidance in school. Some of these tests are adopted for industries, but no organized effort or demand.</td>
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<tr>
<td>3.a. Directorate of Psychological research, Ministry of Defence, Govt. of India</td>
<td>Research and Services: continuous adaptation and construction of tests of personality, intelligence and aptitudes.</td>
<td>Used specially for selection of service officers and other ranks. Tests are secret and not available to industries.</td>
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<tr>
<td>3.b. Directorate General of Ordinance Factories, Ministry of Defence, Govt. of India</td>
<td>Services to its own factories: test adaptation</td>
<td>Used for selection of trade apprentices, supervisory personnel in different ordinance factories.</td>
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<th>Nature of Activity</th>
<th>Remarks on Practical Use</th>
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<tr>
<td>4.b. Directorate General of Factory Advice Service and Labour Institutes, Ministry of Labour and Employment, Govt. of India.</td>
<td>Training, Service and Research: training of personnel managers, advisory service to industries and research in the field of safety.</td>
<td>Tests used for research in Ergonomics.</td>
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<tr>
<td>5. National Institute of Occupational Health, Indian Council of Medical Research, Ministry of Health, Govt. of India, Ahmedabad.</td>
<td>Research and Services: research in the area of occupational health and ergonomics</td>
<td>Tests used for the assessment of the psychological effects caused by the adverse physical conditions, viz., heat, noise, illumination, ventilation, etc., on neuro-muscular activities and for Ergonomics.</td>
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<td>and South India:</td>
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<td>Textile Research Association (SITRA)</td>
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<tr>
<td>7. Specialized Academic Institutes:</td>
<td>Some lectures on test construction and its uses</td>
<td>Some individual faculty members construct tests and render advisory services.</td>
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<tr>
<td>Tata Institute of Social Science (TISS), Indian Institute of Technology (IIT), National Institute of Training</td>
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<tr>
<td>8. Consulting Organizations</td>
<td>Service: Assignments of selection problems</td>
<td>Nature of tests are usually not known to others.</td>
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<tr>
<td>9. Specialized Associations:</td>
<td>Training/Promotional activities: conducts trainings, seminars, often by external faculties</td>
<td>Carrying out good work for propagating the knowledge on managerial psychological research but not having adequate resources to demonstrate its usefulness.</td>
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<td>Management Associations, National Productivity Council, Indian Institute of Personnel Management, etc.</td>
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Some of the reasons why psychological testing has failed to gain popularity in business and industries may be outlined as:

a) Psychological tests are handled by company executives often without knowing what these tests might assess.

b) Decision of personnel selections are generally taken up at lower levels of management, thus making some enthusiastic personnel make sporadic attempts to administer psychological tests. The results thereby show little inferential values and loose importance at the top level of management.

c) Follow-up action generally is not taken after personnel selection.

d) Sometimes recruitment is done on the basis of test scores obtained from a questionnaire containing items drawn from different popular magazines, or adhoc items written for the purpose.

e) Norms developed in the western countries are often used indiscriminately in our country.

All these drawbacks in the use of psychological tests usually culminate into improper selection, as a result of which job success of the recruits does not
appear to be appreciably high.

The studies that have been carried out so far, more or less, cluster around the selection of students for various academic courses at school levels. Studies on personnel selection in business and industry, based on aptitude testing are scanty. Some of the very progressive organizations are, however, taking keen interest in using psychological tests (prepared by trained psychologists) for personnel selection purposes. But, all the aptitude tests mentioned earlier include a number of subtests, the administration of which is time consuming, breeds boredom, and become fatigueing for the testees. The psychological tests, therefore, should be such, as could be capable of assessing aptitudes required for different job categories, in a relatively short time period.

The GATB fulfilled the criteria of being less time consuming and general in nature. Therefore, an attempt was made to administer this test on an Indian population of the textile industry. The purpose was to study the relationships between the test scores on the GATB parts and job performance scores for persons involved in clerical and supervisory job categories. It was also intended to examine whether the stipulated time period for test administration could further be reduced by substituting a few GATB parts that might reveal similar information, with a single part, following McQuitty's elementary linkage analysis, 1957 (described later on page 31).
OBJECTIVES

1. To find out whether the performance of the clerical and supervisory technical personnel on the GATB differ according to the demographic variables, viz., length of service, education, levels of occupations, and departments.

2. To study the degree of association existing within the GATB parts.

3. To test whether the GATB parts form elementary linkages amongst themselves, and if so, the patterns of the linkages that emerge.

4. To examine the degree of association between the test scores on those GATB parts that may emerge from the elementary linkage analysis (objective 3), and the job performance scores.

5. To formulate multiple regression equations involving job performance scores and test scores on those GATB parts as emerging from the elementary linkage analysis (objective 3).
SCOPE

The seven parts of the GATB would assess the cognitive and perceptual aptitudes for the clerical and the supervisory technical personnel working in a textile industry in India, opening new vistas for personnel selection on Indian textile population.

The clustering of a few tests into groups and thereby substituting tests, revealing similar information, by a single one, would reduce the time for test administration. This would thus encourage the management personnel of varied industrial concerns to go in for more and more psychological testing for recruitment of personnel appropriate to various job categories.

Further, the weights on these test parts, as emerging from the elementary linkage analysis, would allow obtaining job performance scores directly through a Multiple Regression Equation. The managerial personnel would, therefore, find the administration of the GATB quite easy and less time consuming, thus making the test more acceptable, and beneficial to the textile industry.