CHAPTER VIII
CHAPTER VIII

SUBSEQUENT STUDIES, RETROSPECT AND PROSPECT

I. (1) Relation between the Occupation of Parents and the Intelligence of Children

Social Status: Can one's intellectual abilities be improved or increased through modifications of the environment, or they subject to the limits imposed by heredity? is a prolonged controversy among educators and psychologists. Some say that the amount of one's intelligence is determined by heredity and innate ability with which he was endowed by nature. If his IQ changes, it is due to error in measurement or deficiency in measuring instrument. Others held that intelligence is determined by environmental factors and that it can and does change in accordance with the individual's training, experience or nature. Caste and occupation are the components of social status of parents which contribute to home environment of children. A child grows in a home and it requires for its growth not only food and shelter, but also the type and various social influences and emotional factors that come from the love and affection shown to it, and also the training and discipline that are given to it. Intellectual and social development depend to a large extent not only on the brain structure that has been inherited but also on the environmental
opportunities available.

The social pattern in India in general and in Karnataka in particular is fast changing. During Vedic time, changes in the society were very slow. Brahmins were the custodians of all knowledge and were engaged in intellectual and religious duties. Kshatriyas were the warring class, Vaishyas the merchant class and Sudras, the labour class. But the impact of technology, concept of vocational guidance and common schooling system prevalent in the present set up have brought about radical changes. Upward and downward mobility in the social system is the order of the day. Caste and profession are, generally the chief factors of social status of a man and hence their effect may be studied on the levels of intelligence of children separately.

The data gathered during the final run of the tests supply good information about caste and occupations of their parents/guardians etc. The various occupations may roughly be divided into the following five classes.

A classification of the various common occupations for our purpose is conveniently made as follows:

1. Professional
   Teachers, Doctors, Lawyers,
   Engineers, Officers of Civil
   and Military Departments

2. Business and Commerce
   Merchants, Contractors,
   Shopkeepers, Millowners,
   Cinema Managers, Hotel
   proprietors and Traders
3. Agriculture
   Jamindars, Farmers and Coffee Planters

4. Skilled Manual Labour
   Mechanics, Electricians, Photographers, Tailors, Carpenters, Goldsmiths, Typists, Motor Drivers, Compounders, Weavers and Potters.

5. Unskilled Manual Labour
   Attenders, Domestic Servants, Sweepers, Washermen, Tree makers and Beggars.

TABLE XXXV
CORRELATION BETWEEN IQs OF CHILDREN AND OCCUPATION OF THEIR FATHER/MOTHER

<table>
<thead>
<tr>
<th>Occupation Group</th>
<th>IQs</th>
<th>Total</th>
<th>Mean IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Below 90</td>
<td>90-99</td>
<td>100-109</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>38</td>
<td>161</td>
</tr>
<tr>
<td>2</td>
<td>134</td>
<td>214</td>
<td>698</td>
</tr>
<tr>
<td>3</td>
<td>158</td>
<td>213</td>
<td>765</td>
</tr>
<tr>
<td>4</td>
<td>185</td>
<td>268</td>
<td>401</td>
</tr>
<tr>
<td>5</td>
<td>126</td>
<td>160</td>
<td>148</td>
</tr>
<tr>
<td>Total</td>
<td>615</td>
<td>893</td>
<td>2173</td>
</tr>
</tbody>
</table>

Difference between the highest and the lowest mean IQ = 19
Coefficient of contingency = 0.41

The coefficient of contingency which is approximately equal to the coefficient of correlation when the table is divided into 5x5 or more cells is about .41 which though
statistically significant, is low in value. The value obtained by research workers vary between .21 and .53 (Neff W. S. 'Social-economic Status and Intelligence' quoted in Kamat, P. 233). Dr. K.G. Desai also found it to be .23 for Boys and .19 for Girls. Dr. Kamat in a similar study found the coefficient of correlation to be about .4 for Marathi and Kannada children. In the former case, the mean IQs of different groups do not show a wide difference, while in later two cases they reveal a greater difference (9 and 33 points between highest and lowest mean IQs respectively). The cause of this difference between the two studies is that the data included a wide range of ages.

The moderate difference between mean IQs of different groups and the low value of the coefficient of contingency in the present study reveals that the intelligence of boys and girls as measured by these tests is only slightly dependent on the occupation of their fathers or guardians which is the chief factor determining their home environment.

(2) Relation Between Caste and Intelligence

For this study, the castes have been divided into five main classes: (1) Advanced Hindus; (2) Intermediate Hindus; (3) Backward Hindus; (4) Mohmedans; and (5) Christians. While calculating the average IQs of the groups, it was
found that the mean IQs of christians resembled that of advanced hindus while the average IQ of mohmedans resembled that of intermediate hindus. So these resembling groups have been merged together for computing the coefficient of contingency by making 3x3 table. The castes included in the three classes of Hindus have been shown here categorywise conveniently for the study:

1) Brahmin, Jain, Jangam, Lingayat, Vysya, Syva, Kshatriya, Marata, Christian, etc.
2) Kuruba, Valmiki, Bovi, Kumbar, Ganiga, Naika, Akkasali, Nevar, Bestha, Medar, Mohmedans etc.
3) Harijan, Lambani, Beda, Vadda, Kadukuruba.

**TABLE XXXVI**

**CORRELATION BETWEEN CASTES AND IQS OF CHILDREN**

<table>
<thead>
<tr>
<th>Caste Category</th>
<th>Iqs Below 90</th>
<th>Iqs 90-109</th>
<th>Iqs 110 and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>947</td>
<td>1732</td>
<td>1263</td>
<td>3942</td>
</tr>
<tr>
<td>2</td>
<td>628</td>
<td>1065</td>
<td>430</td>
<td>2123</td>
</tr>
<tr>
<td>3</td>
<td>162</td>
<td>180</td>
<td>93</td>
<td>435</td>
</tr>
<tr>
<td>Total</td>
<td>1737</td>
<td>2977</td>
<td>1786</td>
<td>6500</td>
</tr>
</tbody>
</table>

Coefficient of Contingency = 0.24
It is not possible to find out the correct correlation between the castes and IQs of children because the division of the pupils of the present data into three classes is not uniform. Most of the pupils belong to the first category and very less number to the third category and moderate number in the middle one. An approximate idea of the relation can be had by the coefficient of contingency which is found to be of negligible value. It shows that there is very slight correlation between castes and intelligence of the children.

Hunt maintains that the belief in intelligence as a 'fixed' quality, the development of which is predetermined by one's genes, is simply not tenable. In support of this conclusion, he cites the identical-twin and foster-children studies to show that, if properly interpreted, they demonstrate that environmental improvements have indeed produced significant increases in intelligence. He also offers evidence from a variety of other sources, including research in the areas of neuropsychology, animal learning, and the programming of computers, as well as studies of human development in both normal and retarded children to substantiate his position.

Hunt views intelligence as problem-solving capacity which is derived, to a considerable extent, from one's
past experiences. This concept has emerged from several sources, but Hunt is particularly indebted to the research findings and theories of Jean Piaget. In line with Piaget's work, Hunt maintains that a child's mental development depends largely upon the quantity and quality of his interactions with his environment. Mental development, in other words, is a gradual, continuous, sequential process which depends on the child's opportunities to use his abilities. These opportunities, in turn, are related to the intellectual stimulation he receives. The greater the variety of stimulating experiences he has, the greater his intellectual development is likely to be. Through a continuous, creative process of interaction with the world outside himself, the structure of the child's mind is reorganized, and growth takes place. For this purpose, intellectually stimulating experiences in infancy and early childhood are particularly important.

Hunt maintains that it is possible to achieve a substantially faster rate of intellectual development among children and a higher level of intellectual capacity among adults by improving the quality of human encounters with the environment, especially in the first few years of life. The discovery of ways to provide these encounters, he recognizes, would require a great deal of time, effort, and money. Even if such means could be
found, the Herculean task of modifying child-rearing practices and educational procedures would remain. Nevertheless, he claims, the possibility of finding ways to raise the level of intellectual capacity in a majority of the population by 30 or more points constitutes one of the major challenges of our times—a challenge where the chances of success are fairly good. Various experimental programs with preschool children, especially among the culturally disadvantaged, have been motivated, in part at least, by the optimism of men like Hunt'(W.B. Kolesnik, P.163).

Conclusions: From these two studies, it can be said that the social status of fathers or guardians partly determined by their occupations and partly by their castes has slight effect on the intelligence of children as measured by the present tests. From this data it is not possible to conclude anything about the effects of heridity and environment on the intelligence of children, because although the occupation of father determines the home environment, the caste does not determine only heridity. 'The caste-system having its origin in the occupations, indicates more the social heridity than the physical' (K.G. Desai, P.206).

Thus the caste also determines environment of the children to some extent. It can simply be concluded
from these studies that the home environment of the child influences his intelligence slightly.

(3) **Sex and Intelligence**

In order to study whether any difference exists in intelligence between the two sexes in the age groups under study, means and standard deviations have been calculated separately for boys and girls of each age group.

**Means of Scores:** The following Table XXXIV shows the averages and standard deviations of boys and girls. From this table it can be seen that the rate of mental growth of girls above 11 years is slower than that of boys. And between 10 and 11 years, girls show faster mental growth than boys since they are generally not matured up to 11 years and on account of it they maintain mental concentration on intellectual habits. They seem to be subjected to complex cultural and traditional customs during maturation period between 11 to 13 years.

This is in agreement with Kamat's findings in his studies of sex differences. (Kamat, pp. 226-227).

Dr. K.G. Desai states 'The slightly lower mental level of girls may be due to their detention at home after puberty. The boys being free to move about anywhere, get a richer environment than girls.
Cyril Burt found that the mental ages of girls at almost all ages are slightly higher than those of boys. He attributes this to the fact that girls are sheltered, supervised and detained at homes and so they are engaged in literary pursuit and consequently excel boys in literary work (Burt quoted by Kamat p. 227 and Premalatha, p. 161). Cultural and social set up differ from India to foreign where sex education is in practice which is not so in India even today at school level.

TABLE XXXIV

AGEWISE COMPARISON OF MEAN AND STANDARD DEVIATION OF BOYS AND GIRLS

<table>
<thead>
<tr>
<th>Age</th>
<th>Boys</th>
<th></th>
<th></th>
<th></th>
<th>Girls</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Total</td>
<td>702</td>
<td>900</td>
<td>815</td>
<td>602</td>
<td>652</td>
<td>914</td>
<td>802</td>
<td>706</td>
</tr>
<tr>
<td>Mean</td>
<td>86.95</td>
<td>74.64</td>
<td>65.43</td>
<td>64.41</td>
<td>84.52</td>
<td>72.82</td>
<td>67.47</td>
<td>63.31</td>
</tr>
<tr>
<td>S.D.</td>
<td>15.86</td>
<td>17.02</td>
<td>15.70</td>
<td>15.07</td>
<td>16.47</td>
<td>16.00</td>
<td>17.72</td>
<td>15.72</td>
</tr>
</tbody>
</table>

Standard Deviation of Scores:

The standard deviation values of boys are more variable than those of girls. This is in accordance with the popular notion that the intelligence scores of boys show greater variability than those of girls. It is observed that the significant difference between the mean scores of boys and girls is not considerable at 13 and
10 years. This may be explained on the basis of the fact that boys and girls will be almost on par with each other in every respect in the pre-adolescent period. The average age of maturation for Indian girls may be taken as 11-12+. Girls have clumsy ideas in this period and so they lag behind in intelligence. It is observed in the present test results that the difference in mean scores at these ages are found to be significant.

4. The gifted children:

Psychologists have titled certain section of population as genius, gifted or very superior whose IQs are above 140 in their research studies. The gifted child is endowed with high level of intellectual capacity which will be manifested on various life situations frequently.

The gifted children are assets of the nation, because they are capable of providing leadership in various walks of life in future. Many of them pursue high academic careers and turn out to be writers, philosophers, scientists or administrators. 'Such highly intelligent children need special attention in school and home so that their abilities may be cultivated and turned into useful channels; otherwise they are also capable of developing into anti-social elements of the highest type if they fall prey to bad habits'. (K.G. Desai, P.208).
The nature of gifted children has been studied by many psychologists in the west, the most notable of which is the follow-up study undertaken by Terman and his collaborators over more than twenty five years.

In the present standardisation of tests, about 2.43 percent of pupils—39 boys and 41 girls—are classed as 'near genius' or 'genius' or very superiors by Terman and others. A better name for them as suggested by Dr. Desai is 'gifted children'.

The present research does not include a special study on those 80 children spread all over the State, and a similar one in the case of backward 89 children, due to certain reasons. The researcher has humble explanation to offer. The main objective of the study is to construct and standardise a verbal and nonverbal group test of intelligence. Scope is set to provide a valid and reliable tool to measure intelligence of children. Accordingly, an exhaustive effort is made and he suggests these studies for future research which need careful clinical and individual diagnosis.

Thus, the present study serves as a base for measuring and classifying children according to their intelligence within the limitations stated earlier and enables further researches.
II. RETROSPECT AND PROSPECT

The end of a research is the beginning of another and probably many more; for the done, that is always small, appears to be insignificant, as compared against the vast undone. There can be a sense of achievement, but never of perfection. So, the present work may be judged for what it is, rather than what it would have been. It could surely have been better; but the real problem is whether it is good enough for the purpose.

Except a few limitations, the present test can favourable be compared with any well standardised group of intelligence scale in India or abroad. It has been standardised on a large and representative sample of the normative population for whom, it claims to be utilised. It has also been shown, that inspite of group difference, such general norms, established on a large unselected sample; can safely be utilised as indices of the individual's relative position in the group as a whole. The corrected or extrapolated norms are also found to have been valid. The test has been subjected to almost exhaustive and rigorous studies concerning reliability and validity.

It has been the object of the designer of these tests to produce a battery of intelligence tests, capable of testing the whole range of intelligence development from that of the normal child of 10 to that of the very
superior child of the age group 13+ and construct throughout on uniform principles.

A wide range of ability of pupils to be tested has been met with by including eight sub-tests of increasing difficulty. By employing such a scale, it is possible to attain a more accurate measurement of the abilities of the majority of the testees that would result from the application and adoption of scales.

While designing these sub-tests the following aims and guiding principles have been adopted.

1. To include only those types of sub-tests verbal and non-verbal to be highly saturated with 'G'.

2. To prepare a standardised battery including both the 'verbal' and 'non-verbal' aspects of measuring intelligence for the crucial stage of later childhood who attend the classes V to VII in Kannada medium of the Karnataka State.

3. To arrange the sub-tests and the successive items in each sub-test in order of increasing difficulty, so that the testee is not held up by a too difficult item while easier items are awaiting him/her.
4. To facilitate the use of the test for large number of subjects by providing the scoring key as simple and rapid as possible.

The construction, standardisation and validation of the tests have been described in the previous chapters. These are the original verbal and non-verbal tests standardised for the first time with instructions in Kannada on a large number of each of the age group from 10 to 13+.

The standardisation has been done separately for boys and girls to eliminate small differences in the average scores of different age groups that have been observed.

The reliability and validity of the tests have been calculated and found to be high.

1 Possible Uses of the Tests:

1. Classroom Surveys: To gain a fairly accurate knowledge of the intellectual abilities of every pupil in the classroom. This helps as an accurate aid for maintenance of the cumulative record card, if introduced into the primary schools also.
2. School Organisation: To classify and group the children of the Higher primary classes, as homogeneous, and heterogeneous with regard to general mental ability which would facilitate individual attention and guidance on the part of the teacher. Schools managements can also know the average mental levels of its population and plan to raise its standard.

3. Educational Guidance: To encourage very superior and gifted children and diagnose sub normal children for directing them to child clinics. This also facilitates the organisation of remedial teaching for backward children.

4. Vocational guidance and selection: The democratic philosophy of education recognises the importance of individual child in a programme of national development. There is a tendency in India today to rush to the Universities by students after P.U.C. without proper justice of their ability, talent and skill to prefer different courses. These things are to be assessed properly for directing them to different courses other than the University courses. This assessment
has to be made over a long period even commencing from Higher Primary Schools. Hence, the necessity for such battery of intelligence tests and other aptitude tests has been felt much nowadays to see right pupils in right courses—general and professional. School achievement tests assess the past but intelligence tests predict the future. We are surely interested in the future. Mental tests of this type have their own glory; but no one recommends their use.

5. Researches in Educational Psychology and in particular, mental testing, have to be done on a more and more scientific basis at present in India. Intelligence being one of the pre-requisites in many problem solving situations, this comprehensive battery of verbal and non-verbal test of intelligence will be of immense help as a valid instrument to measure it.

6. General surveys and action research studies in schools for teachers who have right type of research attitude use to find out interaction of general ability of pupils, curricula teaching methods and subjects.
2. Limitations:

Although everything possible has been done to make all the sub-tests fool-proof, they being group-tests, obviously have the limitations which are commonly found in such tests. The criminal proceedings in courts of law have their own ethics. They require that a single innocent man should not be punished, even though a thousand criminals may escape. Some such ethics needed for mental tests too though the mental analysis is not analogous to chemical analysis and mental analyses are not the ends but means to diagnosis, the work of guidance only begins with a mental test; it does not end with it.

A group test is administered to a number of persons at a time, so the rapport between the examiner and examinees which is essential in any psychological examinations, according to K.G. Desai, is not accomplished to the extent as it can be obtained in an individual test. In an individual test, any emotional disturbance in the examinee is at once known by the examiner who does not go along with the test without removing it. Whereas in a group-test, the examiner in the first place is unable to detect the emotional disturbance of a pupil, if any, and even if he comes to know it, he cannot attend to an individual case. As the present sub-tests are applicable to pupils of ages 10 onwards, Shyness, inhibition or similar other emotional disturbances may not
affect much for such examinees, but then, it is difficult sometimes to get the willing cooperation of pre-adolescent pupils. It requires tactful persuasion. Some group of pupils are not serious in the work entrusted. The person who administers the tests should have sufficient skill, tact and patience to deal with children. If the discipline of the group is disturbed during an examination, the result of that examination should not be taken as reliable.

Secondly, it is found that many pupils in rural areas do not follow properly the instruction and procedure of the tests with all the explanation offered, as found in the Manual of Directions. It is not advisable to apply the test to such pupils of the group.

Thirdly, it has been observed in the case of all group tests that they detect superior and gifted pupils rightly, but the sub-normal cases shown by them may or may not be truly so. The main cause of this is that some normal children due to inattention do not follow the method of some tests and consequently score low. So before accepting the sub-normal results in these tests, they should be verified by individual tests and school record achievement of the pupils concerned.
3. Suggestions for Further Research

Many researchers in Psychology and education require the use of a valid test of intelligence. There is a great field for experimentation in psychological and educational problems with special reference to Indian environment. In the beginning of this chapter it is said that 'undone is vast'. It would be in the fitness of things to suggest problems for further research, which may be undertaken. Most of these have already been mentioned or indirectly indicated but the investigator is tempted to enlist a few here with the expectation that some of them may be taken up.

The correlation between scores on verbal and non-verbal tests is found to be quite appreciable, yet establishment of verbal and non-verbal IQ norms on the line of Wechsler would be an interesting research.

Even though, almost exhaustive studies on the test reliability and validity were made, two more, which are quite valuable, would surely lead to a better evaluation of the test. One of them is the estimate of reliability at various ability levels. The other is the study of the predictive efficiency of the test over years. For this, the pupils tested in the present standardisation may be followed up and their progress watched and compared with their IQs of the present test. The remaining methods to calculate which are left here may be applied.
Standardisation for Boys and Girls may be made separately with vast sample to study the sex difference and effect on IQs.

Similar work, significant for the validity of the test, may be undertaken by collecting data about those 2.43 per cent, the testees who have been classified as 'very superior'. But more interesting and also more necessary, is the work of studying the 'mentally defective' groups. Such a study would, of course, be only elementary, limited and leave scope for further research on more scientific lines.

The test may be tried on grades IV to VII of the Primary Schools and separate norms for them may be fixed, provided they are found to work satisfactorily.

And lastly, it has been assumed that the norms established on a stratified sample of the eleven districts of Karnataka would be equally valid for the remaining parts of state. This assumption may experimentally be verified.