EXPLORATORY LONGITUDINAL STUDIES OF CHILDREN

IN

THE UNIVERSITY EXPERIMENTAL SCHOOL

GRADES I AND IV

Dr. (Mrs.) P. Phatak

LTY OF EDUCATION AND PSYCHOLOGY
The M. S. University of Baroda
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Price Rs. 1=00 nP.

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Printed by Ramanlal J. Patel, Manager, The M. S. University of Baroda Press (Sadhana Press), Baroda and published by Prof. S. N. Mukerji, Dean, Faculty of Education and Psychology, Baroda. Dec. 1963.

FOREWORD

In our country the implications of Psychological Studies in education have suffered from the derth of direct observations of children in our culture. With the recent advent of research, the need is felt strongly. Continuous collection of observations of growth and development and their interpretations is one such area which requires urgent attention. Such longitudinal studies require planning and organisation.

In the following pages a small-term longitudinal study undertaken by Dr. (Smt.) P. Phatak, Reader in Educational Psychology, in the Faculty, is reported. The nature of the study is exploratory. Repeated observations of 70 children from the University Experimental School, Baroda, are made in some important aspects, such as, physical growth, social behaviour etc. The observations in each area are summarised systematically and are followed by suggested hypotheses for further study.

Those who are interested in systematic studies of children—especially the research workers—will find emmence stimulation for work in the present report.

S. N. Mukerji
Dean

EXPLORATORY LONGITUDINAL STUDIES OF CHILDREN IN THE UNIVERSITY EXPERIMENTAL SCHOOL

Introduction :

Growth and development during the early periods of child-life are obvious and are described in a fascinating manner in a number of publications by foreign authors. It was often felt that the observations of children in our country as regards their growth and development will be more revealing though not very different in the general pattern observed by the workers in the other countries. The present study was undertaken with a view to compiling some observational data about our children and to explore the growth tendancies and group and individual differences through the observations. The common objective of exploratory studies of drawing some inferences for further study was also kept in view. The study was possible because of the M. S. University grant.

Method of Research :

The two major methods of studying development are 'Cross-sectional method' and ' Longitudinal method'. Cross-sectional method is based upon the readings of the cross-section of the population. It involves a large number of subjects and leads to generalisations from the observed facts. It provides no opportunity to observe at close the development as it takes place. The generalisations at subsequent age-groups are looked to as development, of the year. As the object of the present research was to explore the developmental tendencies during the early childhood it was essential to get continuous observations

of the same children. The longitudinal method which comprises of repeated observations of the same children, though small in number, was chosen for the present study. Under the present study the same 70 children were measured, tested and observed three times during the period of study. The following aspects were selected for observations :

1. Height
2. Weight
3. Intelligence
4. Creativity
5. Social Behaviour.

Sample :

Children in Grade I and Grade IV from the University Experimental School were selected for the present study. They were 70 in all. Table 1* gives the details of the sample.

Procedure :

A programme for recording the various observations was chalked out at the outset. It was planned to take four readings during the year, each after an interval of three months approximately. However, due to some unavoidable circumstances the plan was curtailed to three readings in a period of seven months. The work was started in August and it went on according to the programme till the end of April. Table 2 gives the details of the programme followed in making the observations. The pages following give the analysis of the data collected, alongwith some discussion of observations.

Analysis of the Data :

Time interval is perhaps one of the important factors

* All Tables are given in the Appendix

in some aspects of development, such as growth, while in some aspects it may not be so important. However, during the early periods of life it cannot be ignored in any aspect of study. In studying the present observations the changes observed in the subsequent readings are considered to be releted to the time interval. The three recordings were done in cyclic order. The first cycle of readings was completed between August and October. The second round was started after Divali vacation, i.e. in November and completed in Jan., '62. The third reading was done during March and April. Thus the recordings of children under study were started first in August, then after 3 months in November and again after four months in March. Hence it is presumed that the changes observed in the first and second readings are brought about in three months while those between the second and third readings are the outcome of the next four months. The changes between the first and third readings are the effects of seven months duration.

Growth :

(a) Height :

The comparative study of the three readings of heights was made for two age groups and also for the groups of boys and girls, separately. The groups were studied by calculating the Mean height and SD for each group. The total range of increase in height was divided into ten intervals such as ' no increase ', ' increase of 0.25" etc. etc. upto ' increase of 2" '. Frequency of children in each interval was counted. Table Nos. 3 and 4 summarise the results of the observations.

The study of Table 3 leads to the following observations :—

1. In the period of seven months the average heights of all the groups have increased by about one inch.

2. Except in the case of boys in grade IV the increase in average heights is more during the four months duration than during the three months duration.

3. The average difference of 6″ between the two groups remain practically constant.

4. In the group of six-year-olds the girls' average heights in the 3 readings and their ranges are similar to those of boys. In the group of nine-year-olds the girls' average heights and their ranges are slightly less than those of boys. On an average the girls are shorter than boys by 1 to 1½ inch.

The study of Table 4 leads to the following observations:—

1. Most of the children, sixty-eight out of seventy have grown in height during the total period of study, viz. seven months. The two children who failed to show any progress belong to the lower age-group, i.e. six year-old.

2. Comparative inspection of the total frequencies of various levels of increase during the 7 months, suggest that the two groups namely of age 6 and age 9, differ in the spread of increase in height. There are more individual variations in the younger group than in the older group. The frequencies in the younger group are more spread out.

3. The above observation is supported by the growing tendency observed in the intermediary observations. In the second measure of height 10 children failed to show any increase in the smaller group, while this figure is smaller by 4 in the older group. In the third reading of height after four months only 2 children in the younger group fail

to show any progress. In the older group there is no child who fails to show any increase in height.

Questions for further study :

The groups under study are too small to make any generalisations about the nature of growth in height. However, the following questions may be posed for further study as regards the growth in height :—

1. Do the girls as a group grow in height faster than boys ?
2. How long do the girls grow faster in height than boys ?
3. What is the significance of one month in the increase in height especially during the earlier period of life ?

Weight :

Changes in weight of the children under study during the period of study were recorded in the same way as that in height. The Table Nos. 5 and 6 give the relevant observations.

As changes in weight are caused by other factors besides growth in time it is difficult to draw inferences which deserve testing by further investigations. The following observations are made only with reference to the present groups.

1. The increase in the average weight of boys and girls in Grade I is about .75 lbs. In Grade IV it is 2.5 lbs.
2. In all the groups larger increase is observed during the first three months than during the next four months.
3. The average weights of six-year-olds and nine-year-olds differ by 10 to 12 lbs. in all the three readings. Nine-year-olds are heavier.
4. The range in the older groups is far larger, 43 to 45

lbs., than the range in the smaller group, 14 to 19 lbs. This tendency is observed in the groups of boys and girls as well. It suggests that, whatever the cause may be, as children grow the individual differences in weight increase.

5. As regards the average weights of the boys and girls it is observed that on average the girls are as heavy as boys in the younger group but in the older group they are less by 5 to 6 lbs. in all the three averages.

Going through the frequency of increase in weight as observed in the second and third readings in Table 6 we observe the followlng :—

1. There is a general tendency of putting on weight in both the groups. However, it is more prevalent in the older groups.

2. In the period of seven months in the group of six-year-olds 8 children lost their weights. Out of these seven have lost only 2 or 3 lbs. and five have not shown any increase. In the nine-year-olds group only one has lost the weight and two have remained where they were in the first reading.

The observations mentioned above suggest the following question for further observations :—

1. When do girls start putting in weight faster than the boys ?

Intelligence :

The children under study were tested on two tests of intelligence, *viz.*, Draw-a-man test and Shukla's Tests of Intelligence. Both the tests are standardised for Gujarati Children. The first one is a quick test of intelligence and therefore has limitations for individual study. Draw-a-man

Test was administered thrice during the period of study. The second one is the adaptation of Binet-Simon Tests. It is more useful for study in details. However the tests are time consuming and the programme of three-readings could not be fitted in. These tests were administered twice during the period of study.

The children's performances on both the tests were scored according to the instructions (8, 5)* and the Mean IQs of the various groups were calculated. IQs on Shukla's Testes were calculated by using the formula $\frac{\text{M.A.}}{\text{C.A.}} \times 100$. Scores on Phatak's Draw-a-man Scale were converted into Deviation IQs by referring to the table prepared by the author of the scale (6). They are given in the Table Nos. 7, 8 and the observations are made below.

Table 7 leads to the following observations :—

1. The average IQs of all the groups on Shukla's Tests fall between 98 and 110. This indicates that all the groups are average groups.

Table 8 gives the scorings on Draw-a-man Scale. The differences in the average IQs of the same groups on the two tests, *viz.*, Shukla's Tests of Intelligence and Draw-a-man Test may be the outcome of the differences in the nature of the two tests. The two tests are different as regards the material used, the manner of administration and the method of calculating IQs.

The following observations are made from the performances of children on Draw-a-man Test :—

1. On the average IQs, Grade IV group appears to be superior to Grade I group by about 10 points. This may be understood as the difference in the particular

* Figures in the parenthesis refer to the number in the references at the end.

groups under study. However, both the groups are within the range of normal intelligence.

2. The average IQs. of boys and girls also indicate different tendencies. In Grade I the girls average is better than that of the boys while in Grade IV the girls average IQs in all the three readings are very close to the boys average IQs.

Both the Tests used are standardised and therefore instead of drawing inferences from the observations for further study the IQs. may be used as fundamental measures for further group studies. However, Draw-a-man Test may be studied from the point of view of suitability of the material at the higher age levels.

Creativity :

Creativity was tested by using the two tests *viz.* Circles Test and Incomplete-figures Test used by Dr. Torrance in a study of creativity at the University of Minnesota, U.S.A. The tests were administered thrice as mentioned in table 2, and children's performances were scored for the following aspects according to the instructions. (3) ;

Circles Test :— ..... (1) Flexibility
(2) Originality
(3) Elaboration.
(4) Productivity.

Incomplete-figures Test :—.. (1) Originality.
(2) Productivity.
(3) Penetration.
(4) Elaboration.

All the scores for each child are summed up and are described as creativity scores.

The average of the total scores for the creativity are given in Table 9.

The averages of all the groups except the one underlined in the Table show consistent increase. In research reports of this type Grade IV is often described as " Slump year " (11). The present observations do not indicate such phenomena. The increase at subsequent recordings is higher in Grade IV group, in both the tests. It mayb e that Grade IV group is superior in creativity or the increase might be still higher during the left out period for the present study.

The scores for originality on the two tests and the scores for penetration on " Incomplete-figures Test " were studied separately. The Table Nos. 10 and 11 give the results.

The differences in the mean scores for originality on circles tests are significant. The differences on incomplete figures tests are also significant at the extreme interval of 7 months.

The significant differences suggest the development of originality in the children under study. Originality is scored by preparing a scale based on the frequencies of production in the first reading of the same groups. The highly frequent picture was valued least in originality and rare or out-of-the-way-picture valued most.

The differences in the average scores on penetration are significant only in Grade IV. Even in this group the difference in the average scores of first reading and the second reading is not significant.

The scoring of penetration is based on the concept of closure. Increase in the scores for penetration is interpreted as the development of the ability to resist the temptation of closing the figure in the simplest way possible.

As far as the two groups are concerned the development is observed only in Grade IV children.

The observations on the tests of creativity pose a number of questions for further study. They are ;

(1) What will be the nature of the development curve of creativity based on these tests ?

(2) Will the curves be different for boys and girls ?

(3) How will the scores relate to the scores on intelligence especially on Draw-a-man test ?

(4) Will the observations about originality and penetration stand on larger samples ?

(5) A more stable scale of originality based on a larger sample be developed.

(6) Will the high scores on these tests be " out-of-the-way " pupils ?

(7) Will the high scores on these tests be original in their thinking ?

Social Behaviour :

Social behaviour is a general term. In practical work it is necessary to limit the observations to specific aspects. When the plan for the study of social behaviour was finalised it was decided to observe, the social behaviour of children from the following points of view :—

(1) How constant are the groups formed for any purpose ?

(2) How constant is the social acceptance of children in their own group ?

(3) What is the tendency to co-operate and play an organised game when put in a situation.

Three different procedures were followed for recording the relevant behavioural phenomena.

Constancy of group :

In the school both the classes under study are sent for lunch according to a fixed programme. They are accompanied by their class teachers. It was decided to use this opportunity to study the stability of groups formed for the purpose. Before the class was to go to the lunch room children were asked to give their choice of five children who would like to take their lunch together. The groups were noted down. The observor then joined the children in the lunch room and quietly noted the shifts in the groupings.

In the lunch room seating arrnagements were reorganised to facilitate the grouping for lunch. For the reading the observations were continued for five days. Thus for one complete reading 35 groups—daily 5—for each grade under study *i e*, grade I and IV were observed. Most of this groups were of 5 children. Such three readings were done during the period under study, according to the programme shown in Table 2.

The constancy of group was analysed by classifying the groups according to the number of children constant in both the groups viz. group given in the class-room and the actual group taking lunch together. Table No. 12 gives the gradewise analysis of the three readings.

The study of Table 12 suggests the developmental trend from reading to reading but it does not appear to be related to age. The readings for grade I and grade IV do not support any kind of age relationship. Except the first reading of grade IV groups the boys and girls show the tendency of abiding by their class-room choices when they went to the lunch room. It was thought that grade I children will show more changes than grade IV children.

The study undertaken does not show the expected results. However the data is too scanty for rejecting the hypothesis. Moreover it is felt that the time interval between the classroom choice and the lunch room observation is too small to effect the mobility in the groups. Perhaps some other approach in studying the phenomena of the mobility of the groups in children is desirable.

Constancy of social acceptance :-

To study the nature of the social acceptance of children in the two grades under study sociometric data was collected thrice during seven months. The children were asked to give three names of their classmates in order of preference with whom they would like (1) to play in the recess and (2) to go on a trip. Weightage of 3, 2, 1 was given for 1st, 2nd, and 3rd order of preference respectively. The social acceptance score for each child was calculated by adding his total weightage from all the choices. Thus each child had three social acceptance scores.

The two groups were studied by noting the number under three categories, viz. (1) children showing consistant increase in their score for social acceptance (A), (2) children showing consistant decrease (D), and (3) children showing fluctuations in their scores (F). Table No. 13 gives the details of the classification.

In both the groups there is not a single child who has not scored anything in all the judgements. In Grade I there are two children who have scored 'Nil' twice and '2' once, but one of these children scores '2' in the third sociometric reading and therefore falls in the 'A' group while the other child scores '2' in the first reading and hence falls in the 'D' group.

There are three children who have scored 'Nil' once. Out of these one falls in 'D' group and his score deteriorates from 4 to zero through 3. One falls in 'A' group. His first score is zero and he accelerates by getting the score of 2 in the two subsequent readings. The third one is a fluctuate his three scores being 2–5–Nil respectively.

In Grade IV there are two children who have scored 'Nil' twice out of three scores. One of them belongs to group 'A' as he scores 1 in the last sociometric reading. The other one belongs to group 'F' as his score, which is 1, is gained at the 2nd record. There are three more who have scored 'Nil' once. Out of these one falls in group 'D' and his score deteriorates from 4 to zero through 3. The other two are fluctuates with scores 8–Nil–9 and 4–Nil –3 respectively.

(1) A glance at Table No. 12 locates the differences in the number of children described as deteriorating in the score on Social Acceptance. In Grade IV there is only one boy in this category, while there are 4 such boys and 4 such girls in Grade I.

(2) All the groups show larger number of Fluctuates. However, in Grade IV larger number of fluctuates is balanced by a larger number of Accelerates and the least number of Deteriorates. In Grade I the numbers of Accelerates and Deteriorates are very close. This phenomenon may be interpreted as a development in the social behaviour acceptable to some level in one's own social group. Children in Grade I may be described not as socialised for the group as they are in Grade IV. Perhaps it may be taken as evidence of unstable grouping.

Observations about the social acceptance as studied

under the present programme pose a number of questions, some of which may be further investigated.

(1) How far the observations will stand on a large sample ?

(2) Will the scores give a developmental curve if carried further ?

(3) How will the present observations relate to some other, more direct evaluation of development of socially conforming behaviour in children ?

Co-operation in a Structured Situation :

Co-operation, like all other qualities of heart, is far more desirable when it comes from within. To observe the development of co-operation in children the free play provides a good opportunity. But in the elementary school it becomes rather cumbersome for one or two observers to observe a group of about 35 children engaged in free play. It is also difficult to plan the recordings of free-play as required for the design of the present study. Moreover " Co operation " is gaining new value in social qualities. It is also becoming an important aspect of education and its evaluation. It is expected that people co-operate in all sorts of activities rather than remaining aloof. Naturally a tendancy to co-operate, perhaps sometimes even without any deep interest, is valued as important social quality. Taking into consideration all these thoughts it was decided that instead of studying co-operation in absolutely free activities it may be studied under some structured situation.

The structured situation was selected on the basis of possibility of organisation and providing some attraction to all. In the play room a kitchen and a drawing room was set with miniature toy-equipment. More than half

the play room was kept open for any use. It was decided to call five children at a time and to instruct them to play 'Home making'. Two observers would watch and make the notes as regards how the game started, how it proceeded, what were the activfties played and any other observations worth noting. At the end of two or three such observations the two observers exchanged and discussed the notes and a final report for each group in the play room was recorded under the following titles :—

1. Names of the participants.
2. Material used for the play—major set.
3. Activities played.
4. General description of the activity with referrence
   (a) to planning and organisation of the game and
   (b) Co-operation.
5. Incidental observations.

For each recording of this behaviour 10 groups from Grade I and 10 groups from Grade IV were called to the playroom. Thus during the period understudy 60 groups—thirty from each grade—came to the play room.

The play room observations were classified for the level of organisation and co-operation and for the variety of activities played.

Organisation of the play 'Home making' and levels of co-operation :

The two issues undar study were mixed up and were categorised as follows :—

(i) When there was an attempt to plan the activities before they are started and where the group played the major activities as one unit it was considered as a game played with "full co-operation". (F)

(ii) When there were sub-groups co-operating occassionally, each sub-group or at least one group had some planning done, it was considered as ' partial co-operation '. (P)

(iii) When participants acted in imitation of each other thus bringing about a common activity it was considered as ' least co-operation '. (L). Often such activities were stimulated by fhe toy *e. g.* a toy telephone stimulated every one to make a telephone call.

For studying the ' co-operation ' amongst children the frequencies of different categories of co-operation were counted grade-wise and reading-wise. Table 14 presents the observations.

The table suggests a developmental trend in the type of co-operation expected in the structured situation. More groups from Grade IV have played the game with full co-operation than groups from Grade I. Out of thirty groups from Grade I only one has played the game with full co-operation and that too in the last reading. In Grade IV eight groups are noted in this category, and their spread over the three readings is 1, 3 and 4 respectively. Groups from both the Grades under study show increase in co-operation as the time passes. Groups who have played the game with partial co-operation support the observations made from the fully co-operated groups. The number of partial co-operation groups increase per reading in Grade I and decrease in Grade IV. The number in both the grades come closer. This is understandable if we look to the increasing figures for Grade I and decreasing figures in Grade IV as the indication of development in co-operation. The last category of least co-operation

has a high frequency of seven in Grade I in the first reading. In the second and third readings it drops down to 3 and 4. As compared to these figures Grade IV frequency is consistantly low. It is 3, 2 and 3 in the three readings respectively. These observations may be tentatively generalised as follows :-

1. Children in Grade IV tend to co-operate more on demand than children in Grade I.
2. Within the grades, children tend to improve their ability to co-operate when repeatedly put in the same situation.

Activities played :-

When five children came to the play room they were instructed as follows. " You are called here to play " ' Home Making '. You have these two rooms. Inside is the kitchen equipment. You five persons live in this house. We want to see what you do ".

A part of our observation was to note down the various activities done by the groups. The activities noted were classified into three categories.

1. Activities pertaining to kitchen work.
2. Activities related to ' Home making ', such as going out for a walk, travelling, some going to the school or office.
3. Activities not related to home making, such as playing in the sand.

Table No. 15 gives the frequencies of different activities played. The table leads to some interesting observations.

(1) In all the readings Grade IV groups have done more activities than Grade I groups.

(2) Children in Grade I find it difficult to extend the game of ' Home making ' beyond the kitchen activities; Grade IV children do so. This is indicated by the difference in the " related activities " played by the groups of the two grades in all the readings.

To study the sex differences in playing the game all the observations were recasted according to the composition of the groups. The formation of groups was not controlled for this type of study. First the children were asked to come to the playroom in a group of five of their own choice. The only condition was that each child should come once only. This procedure covered seven groups. Then in each grade to make each reading of ten groups three more groups were called according to the entries in the class register. Table 16 gives the sex-wise analysis of the groups and Table 17 refers to the frequency of levels of co-operation.

The frequencies noted in Table 17 do not show any developmental tendency from readings I to III in any type of groups. Perhaps the groups are too few for the phenomenon to occur. However, the total frequencies suggest the following :

The frequency of least co-operation is highest in the boys groups. It suggests the inadequacy of boys' groups to play the game in co-operation. The girls' groups and the mixed groups tend to co-operate better. Another significant phenomenon is suggested by the high frequency of partial co-operation in mixed groups. In most of these groups girls and boys formed two-groups co-operating occassionally.

It is felt that the inadequacy of boys groups can be related to the difference in the attitude of boys and girls towards playing the game of " Home making " rather than taking it as a developmental difference. Boys appeared rather disappointed when they were told about it while the girls took it easy. This was specially so in Grade IV. Boys were also perplexed as regards what to do. They could not take to kitchen activities as c omfortably as girls did. Actually one group of boys played " running a hotel " in which they could adjust to the activities of the kitchen. The groups were not compelled to work in the kitchen. It appears that in the mind of boys and girls " playing Home making " is so much linked up with kitchen activities that they could not avoid it. Cultural influences have made the boys least prepared for any such activity. Hence it is felt very strongly that these observations are influenced by the inadequacy of the game.

The following comments may be made in summing up the study of social behaviours :

1. Group mobility and sex-differences could not be adequately, studied under the present programme. A better programme for studying such differences be thought of.
2. The developmental trends are noted with reference to social acceptance and ability to co-operate in a structured situation. However unless these observations are further supported they cannot be generalised.
3. As far as playing the game of " Home making " is concerned older children show wider activities.
4. The girls tend to play the game with better co-operation and organisation than the boys.

5, The present study however has suggested an area for investigation, viz., children's concept of "running a home"

Summary of Observations :-

Grade I

Age :-The Grade 1 pupils in the University Experimental School in 1961-62 was a group of 34 children consisting of 22 boys and 12 girls. The average age of the group was five years and nine months in August '61. The boys and girls as groups were very close to each other in age.

Height and Weight :-

The average height of the group was 42" in August '61. In a period of seven months the group as a whole has grown by one inch. The average height in March '62 was 43". The average heights of boys and girls were close to each other. The increase in the average height of girls was slightly more than the increase in the average height of the boys. There were two children who did not grow in height during seven months.

The average weight of the group was 37.48 lbs. in Aug. '61. In a period of seven months the group as a whole had put in three-fourths of a pound of weight. The average weights of boys and girls were very close. However the average weight of the boys group had increased a little more than the average weight of girls. There were five children who had not put in any weight in seven months and seven had lost it by 2 to 3 lbs.

In comparison with the heights, weights and the rate of increase given in standard growth curves based on

Western data the group is shorter, lighter and slower (7). In comparison with the average heights, weights and their relations based on Indian data* the boys and girls are slightly above the average. The boys average is also better than the average height of boys in Orissa and other rice regions (4).

The average weights of boys and girls are more than Ahmedabad averages by about 3 lbs. As compared with the average weights of other regions in India they are similar to the rice-region. In height-weight relationship the boys group is heaviour for their height than the observed relationship from the data in other provinces (4). However the relation between the increase in the average height and weight in seven months does not appear to be satisfactory. For one inch of increase in height there is just 0.75 lbs. increase in weight.

Intelligence :-

The group as a whole is of average intelligence. The groups of boys and girls are not very different on average.

Creativity :-

On the creativity tests the group shows a developmental tendency. The scores on originality are more significant in this respect than the scores on penetration. Children in Grade I do not show significant development in the ability to resist the tendency to achieve the simplest closure of incomplete figures.

Social Behaviour :-

During the period of study children in Grade I have

* I am thankful to Dr. A. K. Niyogi, Prof. of Social and Preventive Medicine, Medical College, Baroda, for providing me the data from his files.

Creativity :

Children in Grade IV develop their creativity by becoming more original and also by showing more penetration. The increase in scores in the period of seven months is significant.

Social Behaviour :

In the actual performance Grade IV children show less adherence to the group preselected for the activity. This might be because of the nature of the activity selected for this observation, namely, taking lunch together.

In social acceptance more and more children showed the development of congenial relationship. There are few deteriorates in " Social acceptance ".

Grade IV children could play with co-operation on instruction to do so. The influence of sex-role was very perceptable in Grade IV. They could occasionaly do something beyond ' Kitchen activities ' in the game of " Home making ".

Grade I and Grade IV :

Height and Weight :

The two groups are similar in the increase in height.

Grade IV children increase in weight faster than Grade I children. This is true of the groups of boys as well as of the girls. On the whole the growth of Grade IV group is healthier.

Intelligence :

Both the groups are within the range of normal intelligence. However Grade I group is slightly lower than the Grade IV group.

Creativity :

Grade IV group shows faster progress on creativity. They are superior in originality as well as in penetration.

Social Behaviour :

As compared with Grade I group Grade IV children are more capable of co-operation on demand. Their social relations tend to be more congenial and hence more and more children rise in their score of social acceptance. They are more conscious of differences in the sex-roles in playing the game ' Home making '.

Grade IV children are more conscious of the cultural expectations in playing the game of ' Home making '. Still they were more capable of co-operating on demand.

Summary of questions posed for further investigations :

Growth :

Height : 1. Do the girls as a group grow faster than boys ?

2. How long do the girls grow faster than boys ?

Weight : 1. When do girls start putting in weight faster than the boys ?

Intelligence :

1. What are the limitations of age in using Draw-a-man Test as a measure of intelligence ?

Creativity :

1. What will be the nature of the development curve of creativity ?
2. Will the curves be different for boys and girls ?
3. How will creativity relate to intelligence especially Draw-a man scale ?

4. Will the high scorers on these tests especially on originality and penetration be 'out-of-the-way' pupils ?
5. Will the high scorers on these tests be original in their thinking.

Social Behaviour :

1. Will the developmental tendency in social acceptance and ability to co-operate be supported by further evidence ?
2. How will the concept of 'running a home' grow during childhood ?
3. How will the boys and girls differ in their concept of 'running a home' ?

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APPENDIX

Table 1

Sample under Study

Grade	*N*	*Sex*	*Average Age*
I	22	Boys	5 yrs. 9 months.
	12	Girls	5 yrs. 8 months.
	34	Mixed	5 yrs. 9 months.
IV	21	Boys	8 yrs. 9 months.
	15	Girls	8 yrs. 8 months.
	36	Mixed	8 yrs. 8 months.

Table 2

Observation Programme

Aspect of Observation.	*Dates of Observations*		
	Obs. No. I	II	III
Height & Weight:	21 Aug. to 23 Aug.	21 Nov. to 1 Dec.	27 March to 31 March '62
Intelligence :			
a. Draw-a-man Test,	25 Aug. to 31 Aug.	15 Nov. to 20 Nov.	18 March '62 to 28 March.
b. Shukla's Test of Intelligence	21 Aug. to 16 Sept.	17 Jan. to 1 March '62.	
Social Behaviour :			
a. Lunch Groups	3 Oct. to 7 Oct.	14 Dec. to 21 Dec.	14 Apr. to 18 Apr. '62
b, Sociograms	13 Oct. to 15 Oct.	19 Dec. to 24 Dec.	10 Apr. to 20 Apr. '62
c. Play-room observations.	19 Sept. to 1 Oct	1 Dec. to 13 Dec.	1 Apr. to 10 Apr. '62
Creativity :	9 Oct. to 12 Oct.	4 Jan. to 8 Jan. '62	17 April to 20 April '62

Table 3

Range and Mean Heights with S. D. of Boys, Girls and the whole class–Grades I and IV.

Sample			Range in inches			M. with SD.		
Grade	Sex	N	Reading I	Reading II	Reading III	Reading I inches	Reading II inches	Reading III inches
I	Boys	22	39 to 46.5 7.5	39.50 to 46.50 7.0	40 to 46.55 6.55	42.02 ± 2.1	42.34 ± 1.8	42.96 ± 1.9
	Girls	12	39 to 46 7.0	39.25 to 46.50 7.25	40 to 47 6.75	42.16 ± 1.8	42.54 ± 1.7	43.34 ± 1.7
	Whole Class	34	39 to 46.5 7.5	39.25 to 46.50 7.25	40 to 47 7.00	42.06 ± 2.1	42.41 ± 1.8	42.06 ± 2.5
IV	Boys	21	45.50 to 52.75 7.25	46 to 52.75 6.75	47 to 55 8.0	48.67 ± 2.6	49.47 ± 2.6	49.58 ± 3.09
	Girls	15	44.75 to 50.50 5.75	45.25 to 51 5.75	45.50 to 52 6.50	47.41 ± 1.7	47.81 ± 1.7	48.48 ± 1.8
	Whole Class	36	44.75 to 52.75 8.0	45.25 to 52.75 7.25	45.50 to 55 9.50	48.14 ± 2.5	48.53 ± 2.3	49.12 ± 2.7

Table 4

Frequency of Children showing Different Increases in Height

Unit of Increase in Inches	*Differences in the Subsequent Readings*					
	Grade I			*Grade IV*		
	II & I (3 mos.)	*III & II (4 mos.)*	*III & I (7 mos.)*	*II & I (3 mos.)*	*III & II (4 mos.)*	*III & I (7 mos.)*
No. Increase	10	2	2	6	2	—
.25	7	7	1	10	8	—
.50	14	9	4	16	12	6
.75	3	4	5	4	7	7
1.00	—	4	7	—	4	15
1.25	—	4	8	—	1	4
1.50	—	2	2	—	2	1
1.75	—	2	2	—	—	—
2.00	—	—	3	—	—	3
Total :	34	34	34	36	36	36

Table 5

Range, Mean, and S. D. of Weights of Boys, Girls and the Whole Class—Grades I and IV

	Sample		Range in Lbs.			Mean with S. D.		
Grade	*Sex*	*N*	*Reading I*	*Reading II*	*Reading III*	*Reading I Lbs.*	*Reading II Lbs,*	*Reading III Lbs.*
I	Boys	22	32 to 46 14	32 to 51 19	32 to 49.9 17.9	37.72 ±4.2	38.50 ±4.5	38.70 ±4.9
	Girls	12	32.5 to 44 11.5	34 to 44 10	35.5 to 44.9 9.4	37.34 ±4 66	38 33 ±3.4	37.73 ±2.9
	Whole Class	34	32 to 46 14	32 to 51 19	32 to 19.9 17.9	37 48 ±4.1	38.4 ±4.5	38.3 ±4.9
IV	Boys	21	38 to 78 40	39 to 80 41	40 to 80 40	50.35 ±9.4	51.23 ±9.8	52.42 ±9.5
	Girls	15	35 to 58.50 23.50	35 to 61 26	37 to 61 24	44.31 ±5.7	46.0 ±6.1	47.4 ±6.9
	Whole Class	36	35 to 78 45	35 to 80 45	37 to 80 43	47.84 ±8.5	49.05 ±8.8	50.33 ±8.6

Table 6

Frequency of children showing Different Increases in Weight Grades I and IV

Increase in weight. Lbs.	*Grade I*			*Grade IV*		
	II & I (3 mos.)	*III & II (4 mos.)*	*III & I (7 mos.)*	*II & I (3 mos.)*	*III & II (4 mos.)*	*III & I (7 mos,)*
-8	—	1	1	—	—	—
-7	—	—	—	—	—	—
-6	—	—	—	—	—	—
-5	—	—	—	—	—	—
-4	—	—	—	—	—	—
-3	1	2	—	—	—	—
-2	2	2	4	1	—	—
-1	2	8	3	3	2	1
No Increase	7	6	5	11	9	2
1.00	9	10	5	5	11	8
2.00	7	2	5	8	8	11
3.00	3	1	7	5	3	8
4.00	1	—	3	2	3	—
5.00	2	1	—	—	—	2
6.00	—	—	—	1	—	2
7 00	—	1	—	—	—	1
8.00	—	—	1	—	—	—
9 00	—	—	—	—	—	1
N	34	34	34	36	36	36

Table 7

Mean IQs with SD on Shukla's Tests of Intelligence
Grades I and IV

Sample			*Mean with SD.*	
Grade	*Sex*	*N*	*Reading I*	*Reading II*
I	Boys	22	98.17 ±14.5	105.08 ±16.3
	Girls	12	105.58 ±11.4	110.44 ±11.08
	Whole Class	34	100.79 ±14.08	106.94 ±14.09
IV	Boys	21	106.86 ±13.6	105.64 ±8.06
	Girls	15	111.93 ±10.9	109.44 ±10.8
	Whole Class	36	108.39 ±13.1	106.99 ±11.8

Table 8

Mean Deviation IQs with SD on Phatak's Draw-a-man Scale
Grades I & IV

Sample			*Mean with S.D.*		
Grade	*Sex*	*N*	*Reading I*	*Reading II*	*Reading III*
I	Boys	22	91.68 ±12.6	92.54 ±13.9	91.63 ±15.5
	Girls	12	101.83 ±9.1	102.66 ±8.8	104.41 ±10.7
	Whole Class	34	95.26 ±12.5	96.11 ±13.9	96.14 ±15.3
IV	Boys	20	104.85 ±7.6	102.5 ±7.4	102.7 ±7.5
	Girls	15	104.06 ±4.7	100.0 ±4.4	101.7 ±4.2
	Whole Class	35	104.51 ±6.6	101.42 ±6.6	102.0 ±6.5

Table 9

Mean Creativity Scores on (i) Circle Test, (ii) Incomplete Figures Test (iii) Total scores.

Grades I and IV

Sample	*Grade I (N=34)*			*Grade IV (N=36)*		
	Reading I	*Reading II*	*Reading III*	*Reading I*	*Reading II*	*Reading III*
Tests	*M with SD*	*M with SD*	*M with SD*	*M with SD*	*M with SD*	*M with SD*
Circles Test	24.8 ±10.03	22.67 ±7.5	27.05 ±5.6	37.72 ±11.7	44.13 ±14.9	78.36 ± 26.8
Incomplete Figures Test.	37.82 ±10.8	41.82 ±4.5	42.88 ±4.6	38.33 ±10.04	46.08 ±6.8	49.47 ±11.3
Total Scores	61.90 ±18.06	64.49 ±6.1	69.93 ±6.7	76.05 ±20.6	90.21 ±18.01	127.83 ±38.4

Table 10

Mean Originality Scores with S.D. and C. R. for Differences in Originality Scores on Circles Test and Incomplete Figures Test in the three readings.

Grade I and IV

		Circles Test			*Incomplete-Figures Test*		
Gr.	*Reading*	*M with SD*	*C.R.*	*Significance Level*	*M with SD*	*C.R.*	*Significance Level*
I	I	7.55 ± 1.5	Bet. I & II 0.18	Not Sig.	11.08 ± 2.5	Bet. I & II 4.1	>.01
	II	7.64 ± 2.6	Bet. II & III 2 4	.05	12.97 ± 1.04	Bet. II & III 0.74	Not Sig.
	III	8.94 ± 1.8	Bet. I & III 3.5	.01	13.5 ± 3.3	Bet. I & III 3.5	.10
IV	I	12.55 ± 4.7	Bet. I & II 2.5	.05	12.13 ± 3.9	Bet. I & II 0.56	Not Sig.
	II	15.44 ± 5.1	Bet. II & III 8.9	Sig. >.01	12.58 ± 2.7	Bet. II & III 1.7	.10
	III	29.13 ± 9.9	Bet. I & III 9.2	> .01	13.83 ± 3.3	Bet. I & III 2.00	.05

Table 11

Mean Penetration Score with SD and 't' scores for differences in Penetration Scores on Incomplete-Figures Test in the three readings

Grades I and IV

Grade	*Readings*	*Incomplete Figures Test*		
		M with SD	*'t'*	*Remarks*
I	I	10.76 ± 3-3	I & II 1.04	Not Sig.
	II	11.7 ± 3.9	II & III —	—
	III	11.7 ± 3.8	I & III 1.04	Not Sig.
IV	I	12.13 ± 2.5	I & II 0.91	Not Sig.
	II	12.58 ± 2.4	II & III 2.19	.05 Sig.
	III	12.83 ± 2.5	I & III 2.9	.01 Sig.

Table 12

Frequency of Levels of Constancy of Classroom-Choice and Lunch Room Groups

Grades I & IV

Level of Constancy	*Readings*					
	I		II		III	
	Grade I	*Grade IV*	*Grade I*	*Grade IV*	*Grade I*	*Grade IV*
All Constant	14	8	22	19	23	20
One Changed	6	11	5	6	6	1
Two Changed	2	7	3	5	4	6
Three Changed	7	7	1	2	1	4
All Changed	4	2	4	3	1	3
Total Groups	33	35	35	35	35	35

Table 13

Frequency of Children Accelerating, Deteriorating and Fluctuating in Social Acceptance—Sex-wise and Grade-wise

Grade	*N*	*Accelerating (A)*			*Deteriorating (D)*			*Fluctuating (F)*		
		Boys	*Girls*	*Total*	*Boys*	*Girls*	*Total*	*Boys*	*Girls*	*Total*
I	34	5	2	7	4	4	8	13	6	19
IV	36	7	5	12	1	—	1	13	10	23

Table 14

Frequency of Different Levels of Co-operation observed in Play-room 'Home making' game—Reading-wise and Grade-wise

Co-operation Categories	Readings					
	I		II		III	
	Grade I	*Grade IV*	*Grade I*	*Grade IV*	*Grade I*	*Grade IV*
F	—	1	—	3	1	4
P	3	6	7	5	5	3
L	7	3	3	2	4	3
Total :	10	10	10	10	10	10

F = Full Co-operation

P = Partial Co-operation

L = Least Co-operation

Table 15

Frequency of the Types of Activities played in 'Home making' Grades I & IV

Type of Activities	*Reading I*		*Reading II*		*Reading III*	
	Grade I	*Grade IV*	*Grade I*	*Grade IV*	*Grade I*	*Grade IV*
Activities in the Kitchen	24	28	19	17	26	30
Activities related	2	15	11	21	14	21
Other Activities	11	5	7	3	5	4
Total:	37	48	37	41	45	55

Table 16

Sex-wise Analysis of Groups in the Play room

	Reading I		*Reading II*		*Reading III*		*Total*	
	Gr. I	*Gr. IV*	*Gr. I*	*Gr. IV*	*Gr. I*	*Gr. IV*	*Gr. I*	*Gr. IV*
Boys	4	3	4	5	6	3	14	11
Girls	3	2	2	5	1	2	6	9
Mixed	3	5	4	—	3	5	10	10

Table 17

Frequency of Levels of Co-operation in Sex wise Groups

Grades I & IV

Sex	*Grade*	*Reading I*			*Reading II*			*Reading III*			*Total*		
		F	P	L	F	P	L	F	P	L	F	P	L
Boys	I	—	1	3	—	1	3	—	2	4	—	4	10
	IV	—	1	2	—	3	2	—	—	3	—	4	7
Girls	I	—	1	2	—	2	—	—	1	—	—	4	2
	IV	—	1	—	3	2	—	1	1	—	4	4	—
Mixed	I	—	1	2	—	4	—	1	2	—	1	7	2
	IV	—	4	1	—	—	—	3	2	—	3	6	11