

A STUDY OF INTEREST IN A GROUP OF NURSERY SCHOOL  
CHILDREN AS MANIFESTED IN FREE ACTIVITY

by

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## INTRODUCTION

The spontaneous activity of children, popularly called play, has been discussed since the time of Plato. Some theories of play are well known; the Schiller-Spencer theory that play results from a surplus of energy, the theory of Gross that it is a preparation for life; of Hall that it is a repetition of racial experience; of Patrick that it serves for relaxation; of Lee, who says that play is growth; and of Appleton who believes it exists because of biological necessity. The theories of Spencer and Hall are doubted. While the remaining theories are illuminating, no one of them is complete. Since the acceptance of the theory of organic evolution we explain play in terms of structure and function; we say that it is serious and that it is an essential element of growth and development, physical, mental and moral.

An attempt to provide a suitable environment for this spontaneous activity is being made by the nursery school of today. But in planning an environment and formulating a program for young children many questions arise as to methods and aims; questions which depend upon a precise knowledge of a child's nature and needs at various stages of development.

Since play is spontaneous its duration will depend upon the child's interest, an aspect of activity of which our



knowledge is meager. Some writers distinguish between interest and attention, using attention to designate the bodily adjustments which result in making the situation clear and vivid, and interest to mean the accompanying subjective feeling, but for the purposes of this study the two will be used as synonyms. Perhaps Burnham (1924) has given the best definition of interest. He says it is comparable to the tropisms of animal organisms, a reaction of the whole organism both physically and mentally to the situation.

Very little work has been done on the subject of interest (attention) in young children. We find in the literature some opinions of the importance of attention. Fenton (1925) says, "Sustained attention is a power as significant surely in the total effectiveness of a personality as any single factor." According to Norsworthy and Whitley (1923) the problem of education is the training of attention." There are some conflicting opinions as to the powers of attention of young children. Kilpatrick (1925) says, "A young child shifts his interest sooner than an older one." Norsworthy and Whitley (1923) say, "Duration (of attention) increases with maturity and with practice." The opinion of Fisher (1916) is that "The natural tendency in childhood is for flightiness and mental vagrancy." Burnham (1924) believes that "for any given situation the integration in the

mind of the normal child is often probably distinctly superior to that of most adults." Blanton (1927) suggests that "feverish interest is an 'excess' trait" and an indication of 'nervousness'." According to Johnson (1925) "The characteristic which we call flitting - the short span interest in materials, the distractibility or shifting of attention from one activity to another, we believe to have a physiological basis and to be significant from the point of view of method. As a mode of behavior it runs not only through strictly motor experiences but emotional and social as well. At this age life appears to be on a sensory level and the business of the organism is to achieve a complete and harmonious functioning of all the powers. This at two years is likely to be different from the same thing at twice two." Kell (1927) says that "by common consent we regard as overstimulated the child who flits from one project to another and shows marked lack of concentration." Norsworthy and Whitley (1923) advise "Let children of kindergarten age flit from one thing to another." They explain this tendency as due to a poverty of mental content.

A few general constructive suggestions for guidance of interest are given. Fisher (1916) suggests, "Keep child supplied with difficulties suitable to his strength." Dewey (1913) says, "Provide an environment that induces education and develops mental activities." Perhaps Burnham (1924)

is most helpful when he says, "The integration of the personality can be best developed by coordinated activity, physical and mental, in the doing of significant tasks."

The foregoing are opinions only. Actual work done on the question of interest and attention in young children appears to be limited to one study done by Bridges (1927) at McGill University, which is on page 15 of this study. The need of study of the interest of children as it is actually shown under normal conditions is evident.

#### ACKNOWLEDGMENTS

The writer wishes to express her appreciation to Dr. Helen W. Ford, without whose guidance this study would have been impossible.

#### PURPOSE OF THE STUDY

The purpose of this study was to investigate interest (attention) in young children; to determine in this group of children the duration and intensity of interest; to study the types of materials and the qualities in those materials that held interest; and to formulate a technique for judging the effect of environmental conditions in their relation to concentration of attention.

### CONDITIONS OF THE STUDY

The study was made in the Kansas State Agricultural College, Manhattan, Kansas. At the time of beginning the study, the nursery school had an enrollment of eighteen normal children between the ages of eighteen and forty-eight months. The nursery school day is from nine o'clock in the morning to three-thirty in the afternoon. Observations were made only during the indoor work period and the outdoor play period, between nine and eleven in the morning. The daily morning program, although flexible, is usually as follows:

9:00	Nurse inspection
9:00-10:00	Indoor work period
10:00	Orange juice
10:00-11:20	Outdoor play
11:20	Wash for lunch
11:30	Circle
	Stories
	Conversation
	Songs
	Rhythms
11:45-12:00	Rest
12:00-1:00	Lunch

### SUBJECTS OF THE STUDY

Observations were begun upon all of the eighteen chil-

dren. Because of absences or transference to a recently organized four-year-old group, observations upon some of the children were discontinued. The final list of subjects, thus arrived at by chance, included twelve children, six boys and six girls. Their chronological ages as shown in Table I are calculated from the mid-date of the period of observation which lasted approximately six months. The range of ages is from twenty-four months to thirty-six months, the average age being thirty and four-tenths months.

#### APPARATUS AND MATERIALS

Attractiveness and accessibility of materials were two of the chief criteria used in furnishing the two rooms comprising the background for the children's indoor activity. Low shelves in one room held toys and materials, some of which were used at small tables, others on large or small rugs on the floor. In the second room, which also served as a sleeping-room, were the work-bench, sand-box, large floor blocks, a phonograph, and space for the use of pull-toys or play with balls. The children were given the maximum of freedom during the period, the only stipulations being that a toy or piece of work should be replaced before beginning another activity, and that there should be no interference with other children or misuse of material.

Materials actually used during this study were as fol-

lows:

Manipulative materials

Clay  
 Crayons  
 Paint  
 Paste and pictures  
 Sand-box with cups, molds, spoons, and shovels

Blocks

Large floor-blocks, 8"x7"x5", 10"x5½"x3½",  
 12"x5½"x1½", 24"x5½"x1½"  
 Set of nested blocks  
 Cubes 1" square, colored

Materials for "fitting-in"

Peg-board  
 Marble-board  
 Wooden beads  
 Tinker toy

Toys for pulling or pushing

Wooden train  
 Wooden duck  
 Rabbit  
 Iron automobile

Imitative toys

Three dolls and doll-clothes  
 Two beds and bedding  
 Two doll-trunks  
 Telephone  
 Saw  
 Hammer and nails

Miscellaneous material

Picture-books  
 Rubber balls  
 Phonograph

Note: This classification of materials is entirely arbitrary and was arrived at after the study was finished.

Two playgrounds provided the setting for outdoor activity. Trees to climb, and a cement walk upon which to ride kiddie-cars were attractions on one, while the other playground had the advantage of irregular ground which gave opportunities for coasting and climbing. Equipment included the following:

Slide  
 Sand-boxes  
 Swings  
 See-saws  
 Swinging trapeze  
 Bar and swinging rings  
 Packing-boxes of various sizes  
 Ladder  
 Tricycles, kiddie-cars, wagon, wheel-barrow,  
 scooter  
 Shovels, pails, pans, spoons, and cups, for  
 sand-box  
 Natural materials: dry leaves, dry grass, pine-  
 needles and pine-cones, soft dirt, twigs,  
 sticks, small stones, etc.

#### METHOD OF OBTAINING DATA

##### General Method

During the indoor work period, the writer, who was well known to the children, seated herself where observations could be made as unobtrusively as possible. (The ideal method would be for the observer to be entirely unseen, but this was impossible.) Since the aim of the study was to observe spontaneous activity only, no observations were taken of "domestic activities": caring for the bird, the gold-

fish, the potted plants or cut flowers, for the children were encouraged to work at these tasks until their completion. Records were not taken of any activity suggested by the director or assistants. At the beginning of the school year it was occasionally necessary to suggest various activities to the children. This study was not begun until most of the children had become sufficiently acquainted with the school to take material freely. Observations indoors were taken at random excepting during the last few weeks of the study, when certain children were observed in order to make the observations on each child equal twelve in number. Observations were made only on days when the school program was normal.

#### Specific Technique

A regulation stopwatch was used in timing the activities. Some practice was necessary before determining the exact time of starting and stopping the watch. The following method was decided upon as being most nearly accurate. When the child first touched the material in taking it from its place the watch was started. The child was then observed carefully until his attention changed to some other activity, when the watch was stopped. This shift of attention occurred in several ways.



1. The child put his material away.
2. The child went away from his material. Even if the child returned immediately to his material it was counted as a new activity.
3. The child sat with his material but picked up some other toy or material.
4. The child sat with the material but stopped all use of it.

Other details noted were the time of day, the cause of stopping activity, and exactly what the child did for the next ten seconds after ceasing to use his material. Two ratings were made in relation to each activity; a rating of the degree of interest shown and a rating of the amount of distraction present in the room.

Rating of Activity as to Degree of Interest Shown.

Each activity of which records were kept during the work period was given a rating number indicative of the degree of interest shown by the child. A medium or average amount of interest was rated at zero (0), a less than average amount as minus one (-1), and a more than average amount as plus one (+1). Two additional ratings, of minus two, (-2) and plus two (+2) were used in taking most of the data, but the results were combined into the three steps first mentioned. It is obvious that such a rating is arbitrary, depending up-

on the writer's judgment alone, nevertheless this judgment was based upon familiarity with the children and their reactions during the work period, and is at least of definite relative value. A high degree of absorption, little affected by distracting stimuli, was given the rating of +1. If a child spent a relatively large proportion of his time in gazing about, watching or talking to other children while working with his material in a desultory way, his activity was rated at -1. Zero ratings were given when a moderate amount of interest, one between the two extremes, was shown.

Rating as to the Amount of Distraction in the Room.

Records were kept of the amount of distraction in the room during each of the activities studied. Three steps were also used in this rating scale, -1, 0, and +1. A +1 rating was given if there was unusual noise or disturbance in the room, e. g. children running about, shouting, or quarreling. Activities occurring in situations such as the following were given a +1 rating:

Crayons and paper occupy two children at one table. At another table a child is using modeling clay. Another child is stringing beads, while at a fourth table one child is feeding the gold-fish and one is fitting marbles into a board. A little boy just arrived is taking off hat and coat in front of his locker. Two children are pushing some small

iron automobiles very noisily over the bare floor. They go in and out among the tables, shouting to each other, sometimes tumbling the cars over with much clatter.

When the atmosphere is quite normal as in the following example a zero rating was recorded for the activity:

Four children are seated on the large rug, one building a train of long blocks, one using the tinker toy blocks, one the peg-board and pegs, and one the colored inch cubes. At a table a child is working with clay. At another a boy is watering the cut flowers while a little girl watches him. Another girl is stringing beads at a third table. A girl is playing the phonograph rather softly in the adjoining room. Two others are putting a doll to bed. All tones of voice are conversational and each child is happily busy.

A -1 rating was given when the room was unusually quiet, due to absences or to some of the children being occupied elsewhere. The following situation is an example:

Only five children are in the room. One is building with the floor blocks in a corner. One is working with a picture puzzle at a table. Two boys are in the middle of the floor loading clay into a small iron truck. The other child is standing in front of the shelves manipulating a toy telephone.

Rating the amount of distraction in the room is open to the same criticism as rating the degree of interest shown

It is based upon the writer's familiarity with the atmosphere of the nursery school day by day, and is of definite relative value.

Technique of Observing Activity Out-of-Doors. Some observations of out-door activity were desired. The method at first used was to measure with a stopwatch the time spent at each piece of apparatus. This was found to be impractical, for the children changed occupations so often and so quickly that accuracy was difficult to obtain. Perhaps after more practice this method could have been used. It would have been more desirable for purposes of comparison with indoor activity than the following method proved to be.

It was decided to observe (at random) each child for ten-minute periods, listing all of his activities during that time. Approximately eight ten-minute observations scattered throughout the entire period of the study were made for each of the twelve children. Anderson (1927) says, "If we regard the nursery school - - - - as a laboratory situation relatively constant in its nature, select a certain type of behavior and observe each child for a constant period of time we secure results that show reliability or precision in proportion to the specificity of the behavior we wish to observe and in proportion to the number of observations taken. Observations of the leading-following-

cooperating relation of children to their group were taken for one-minute periods. Correlating odd and even days for twenty such observations,  $r$  was found to be .70; for forty such observations  $r$  was .85."

#### Methods of Calculation Used in Preparing Tables

In finding averages, after totalling the columns, the seconds were reduced to decimal parts of a minute, and the results were then given in minutes and decimal parts of a minute.

In finding percentages, seconds less than 30 were disregarded. Thirty or more seconds were counted as one minute. Thus the total of percentages in any given case does not equal one hundred exactly.

In calculating chronological ages, days less than 15 were dropped. Fifteen or more days were called one month, i. e. 2 years, 7 months and 25 days was called 2 years and 8 months.

The subjects of this study are designated in the tables by letter, A being the child showing the shortest average concentration time, B the child showing next shortest concentration time, etc. Sexes are not shown in the tables. Subjects A, B, G, H, I, and K are boys. Subjects C, D, E, F, J, and L are girls.

## RESULTS OF THE STUDY

### Analysis of Table I

In Table I (See page 16) individual differences in time of concentration are apparent, although for such a small number of children they are more interesting than significant. Even at this early age striking individual differences do exist. Subject L's average concentration time is four times as great as that of subject A. Of more significance is the average concentration time for the group which is 8.1 minutes. This figure corresponds closely with the results found by Bridges (1927) who studied, for several weeks only, a group of six boys and four girls whose average age was 35 months, 4.7 months more than the average age, 30.3 months, of this group. He found the range of medians to be from 3 to 15 minutes and the median concentration time of the group to be 8.1 minutes. The writer used averages in this study rather than medians because the concentration times for each child were distributed rather evenly throughout the range.

In another study of older children Yarmolenko (1927) found that the average duration of the concentration reflex (for computation, reading and writing) in children of six, seven and eight years, amounts to about 30 or 40 minutes.

TABLE I

A Table Showing the Average Time of Concentration Indoors and Outdoors for Each Child and for the Group

Subject	Chrono- logical Age in Months	Average Con- centration Pe- riod Indoors in Minutes	Longest Time of Concentra- tion Indoors		Average Number of Changes in Occupation in 10-Minute Peri- od Outdoors	Average Concen- tration Period Outdoors in Minutes
			Min.	Sec.		
A	30	3.6	7	23	2.7	3.7
B	26	5.7	14	41	4.6	2.1
C	24	6.7	12	54	3.4	2.9
D	33	7.2	16	51	4.6	2.1
E	33	7.6	21	34	4.0	2.5
F	33	8.5	17	16	3.6	2.7
G	34	8.8	22	27	5.1	1.9
H	25	9.0	27	05	2.8	3.5
I	35	9.1	27	56	5.7	1.7
J	24	9.9	21	35	3.8	2.6
K	36	10.0	22	36	3.0	3.3
L	32	13.4	35	53	3.0	3.3
Average	30.4	8.1	20.7 minutes		3.8	2.7



Any inferences drawn from age and sex differences are open to the same criticism as are individual differences, the smallness of the group. The average concentration time for boys was 7.7 minutes and for girls 8.8 minutes. The average concentration time of the four subjects under 30 months was 7.8 minutes; that of the six subjects of 30 months or older was 8.5 minutes.

It will be seen that the children changed occupations much more frequently outdoors than indoors. The average concentration periods for each child outdoors were arrived at by dividing the average number of changes in occupation during ten-minute periods into 10. Thus as the average concentration period outdoors, 2.7 minutes, and the average concentration period indoors, 8.1 minutes, were arrived at in different ways, it is scarcely fair to compare the two. Yet it is evident that the time of attention to one activity is shorter out-of-doors. The reason for this is unknown. Typical outdoor activities were running, walking, climbing the ladder, going down the slide, pulling the wagon, working with sand, riding kiddie-cars and tricycles and playing in packing-boxes. With the exception of the sand-pile, these are chiefly non-constructive plays. It seems that the do-with type of material holds the child's interest longer by offering more possibilities for its use.

During ten of the 80 periods studied out-of-doors the



child's interest lasted throughout the period of ten minutes. In three of these cases he was occupied with sand, in six with the swing and in one with the see-saw. The swing was very popular. The two children who used it most enjoyed it both for its own sake and as a vantage point from which to watch the activities of the other children.

We are not to conclude that since the duration of attention to outdoor activities is shorter it is of less value than the work done indoors. Both are undoubtedly essential. Further study should enable us to determine the proportions of each to include in a well-balanced program meeting the child's needs.

#### Analysis of Table II

The kinds of materials preferred are shown in Table II (See page 19), also the degree of interest shown in using each kind of material. Manipulative material was used 38.3 per cent of the total time of observation indoors, and "fitting-in" material 30.2 per cent of the time. Since fitting marbles and pegs into holes and stringing beads are really a kind of manipulation, 68.5 per cent of the time was spent in this type of activity which allows much freedom in experimentation with matter, much sensory exploration, and at the same time calls for much eye-and-hand coordination in overcoming small obstacles. Blocks were used 15.4 per

TABLE II

A Table Showing Percentages of Total Time Each Class of Material Was Used, and the Relation of Degree of Interest Shown to Each Class of Material

Type of Material	Percentage of Minutes Used With Interest Rated at -			Total Time Used		Percentage of Total Time for All Materials Used
	-1	0	+1	Min.	Sec.	
Blocks	12.3	15.2	72.4	171	02	15.4
Manipulative Material	23.5	14.1	62.5	425	44	38.3
"Fitting-in" Material	6.3	21.8	71.9	334	11	30.2
Imitative Toys	4.1	31.1	63.6	95	42	8.5
Push-and Pull Toys	11.5	26.9	61.6	26	08	2.1
Miscellaneous Material	15.0	0	85.0	59	46	5.4

cent of the time, and for most of this time the large floor blocks were preferred. Imitative toys were used 8.5 per cent of the time, the chief interest being again manipulative, e. g. sawing and hammering were pursued not for the purpose of making something but for the interest in pushing and pounding; and doll play consisted of taking off and occasionally putting on clothes and involved very little dramatization. Push-and-pull toys were used only 2.1 per cent of the time. (They were enjoyed by a group of children 18 and 19 months old.) Miscellaneous toys, books, balls, and a phonograph operated by the children were used 5.4 per cent of the time. The sand-box, marble-board and phonograph were added to the equipment after the study was begun, so that the figures in Table II are not accurate for these materials.

The decided preference of children of this age for manipulative materials rather than for the ordinary type of "toys" is evident.

Bridges (1927) in his study previously mentioned, found that the most popular materials were the wooden cylinders, bricks  $1\frac{3}{4} \times 1\frac{3}{4} \times 4$ ", 8" or 12", and the color pairs. No materials approximating these were used in this study except that a box of blocks similar in size to the bricks was available but was not used during the time of observation.

Table II also shows the relation of the type of mate-

rial to the degree of interest shown. For each class of material over 60 per cent of the time spent with that material was spent with a degree of interest greater than medium. The highest percentage of time with interest shown as less than medium is for manipulative material. This is due to the fact that some children show a tendency to work with clay or sand in a dreamy desultory way, apparently busy, but in reality absorbed in watching the activity of others or in reverie in much the same manner as the swing is used out-of-doors. This difficulty is avoided by intelligent supervision.

Since a high degree of interest was shown for so large a percentage of the time, we may conclude that the materials used meet the needs of this group of children fairly well. Only after much more study of the use of materials by children will we be able to state definitely the value of each material. Interest shown by the child is surely a valid guide in selecting materials. Kirkpatrick (1911) says, "A material is suitable if it excites interest and leads to active effort." According to Hunt (1926), "Play at its higher levels is invariably characterized by absorption, drive, and satisfaction. Hill (1927) gives as bases for selecting successful material, "It must lead to (a) experimentation, (b) long-continued use, (c) absorbing interest, (d) imaginative play or (e) physical adventure and delight.

Burnham (1924) says that material must call forth effort, must be of absorbing interest and that the child must be free to take or leave the material at his pleasure.

#### Analysis of Table III

Table III, (See Pages 23 and 24) is a repetition in greater detail of Table II. The percentages of time used for each material in each class are given. The significance of these percentages is entirely dependent upon the total number of minutes each material was used. The floor blocks were the most popular kind of blocks. Of the manipulative material, clay was most used. Beads were the most popular of the "fit-in" toys and hammer and nails of the imitative toys. The train was used longest among the push-and-pull toys.

#### Analysis of Table IIIa

The materials given in Table III are rearranged in Table IIIa (See Page 25) to show their popularity as determined by the total length of time each was used. The clay, floor blocks and beads were the most popular. This table is not to be interpreted too literally. Many factors doubtless influence the choice of material by a child, such as suggestibility, position in the room, or novelty. Because

TABLE III

A Table Showing Relation of Each Type of Material Used to the Degree of Interest Shown

	Percentage of Minutes Used With Interest			Total Time Used	
	-1	0	+1	Minutes	Seconds
Floor blocks	12.6	13.8	74.2	143	08
Nested blocks	0	0	100.0	4	40
Cubes	13.6	27.2	61.0	22	14
All blocks	12.3	15.2	72.4	171	02
Clay	47.0	19.0	33.4	168	59
Sand-box	18.4	0	82.5	86	30
Crayons	6.7	28.3	64.3	70	14
Paint	0	10.0	90.0	70	27
Paste	0	0	100.0	29	34
All Manipulative Material	23.5	14.0	62.5	425	44
Beads	3.5	29.6	66.1	114	32
Marble-board	3.8	15.4	79.5	77	39
Peg-board	14.7	5.3	79.9	75	11
Tinker toy	3.7	34.3	61.3	66	49
All "fit-in" toys	6.3	21.8	71.9	334	11
Dolls	11.6	8.3	80.0	30	25
Telephone	0	100.0	0	4	57
Saw	0	33.3	64.7	17	36
Hammer and nails	0	39.5	60.5	42	44
All imitative toys	4.1	31.1	64.1	95	42

Table III-Page 2

Train	0	0	100.0	13	45
Duck	0	77.8	22.2	9	26
Rabbit	100.0	0	0	0	16
Automobile	100.0	0	0	2	41
All push-and pull Toys	11.5	26.9	61.6	<u>26</u>	<u>08</u>
Ball	0	0	100.0	3	11
Picture-books	0	0	100.0	15	37
Phonograph	21.9	0	78.1	40	58
All Miscellaneous Toys	15.0	0	85.0	<u>59</u>	<u>46</u>
			Total Time	1112	43

TABLE IIIa

A Table Showing Materials in Order of Popularity as Determined by the Total Length of Time Each was Used

---

Material	Total Time Used	
	Minutes	Seconds
Clay	168	59
Floor blocks	143	08
Beads	114	32
Sand-box	86	30
Marble-board	77	39
Peg-board	75	11
Paint	70	27
Crayons	70	14
Tinker toy	66	49
Hammer and nails	42	44
Phonograph	40	58
Dolls	30	25
Paste	29	34
Cubes	22	14
Saw	17	36
Picture-books	15	37
Train	13	45
Duck	9	26
Telephone	4	57
Nested blocks	4	40
Ball	3	11
Automobile	2	41
Rabbit	0	16

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of limited amounts of some materials, a child occasionally is obliged to substitute some activity for the one he first preferred. Gardner (1926) in a study of toys and equipment made in the same nursery school, but with a group of older children, their ages ranging from 3 to 5 years, found that the clay, paint and tinker-toy were the three most popular materials.

The results in this table further indicate the preference for manipulative material.

#### Analysis of Table IV

The distribution of interest shown in relation to each subject is given in Table IV. (See Page 27) All of the subjects except A, C, and H, show more than 50 per cent of their total time spent at the highest interest rating. The range of percentages at -1 interest is from 0 to 51. At +1 interest the range is from 27.3 to 87. The subject having the lowest concentration time has also the lowest percentage of time, 27.3 per cent, spent at +1 interest. The subject having the highest concentration time has next to the highest percentage of time, 81.7 per cent, spent with +1 interest. Thus a high degree of interest seems to accompany a high concentration time. The average of the percentages of each subject's time spent with +1 interest was 62.4 per cent.

TABLE IV

A Table Showing Individual Differences in Percentages of Subject's Time Spent At Varying Degrees of Interest

Subject	Percentage of Subject's Time Spent With Interest Rated at			Percentage of Subject's Time Spent With Interest Rating
	-1	0	+1	Unknown
A	20.5	31.8	27.3	20.4
B	30.0	14.6	55.6	0
C	16.0	39.5	44.5	0
D	9.2	18.4	73.5	0
E	0	8.7	87.0	4.3
F	0	27.4	72.6	0
G	17.0	13.2	54.6	16.0
H	51.0	6.4	41.6	0
I	2.7	15.9	81.6	0
J	3.3	32.8	59.6	4.2
K	16.6	12.5	70.0	0
L	8.1	10.8	81.7	0

Three-fourths of these children, then, showed a high degree of interest most of their time. This is in accordance with some expressed opinions. Burnham (1927) states that in general the intensity of concentration in children is high. "For any given situation the integration in the mind of the normal child is often probably distinctly superior to that in most adults. The child's whole psychophysic being reacts to the present situation; for the moment he shows complete concentration of attention."

Blanton (1927) suggests, however, that feverish interest is an "excess" trait and is allied with "nervousness". It is very likely that the normal type of attention lies somewhere between the extremes of feverish attention and bored indifference.

#### Analysis of Table V

The findings in Table V (See Page 29) further emphasize the conclusion reached from Table IV, that a high degree of interest was characteristic of the activities of these children. It is noticeable that the average time spent at each activity at -1 interest, 9.5 minutes, is higher than the average of all times for the whole group, 8.1 minutes. However, the average for -1 interest, 7.3 minutes, is higher than the average for 0 interest, 5.5. An explana-

TABLE V

A Table Showing the Percentages of Total Time Spent by the Whole Group at Varying Degrees of Interest

Ratings of Interest	Total Time Spent		Percentage of To- tal Time Spent	Average Time Spent in Minutes
	Minutes	Seconds		
+1	852	42	72.1	9.5
0	193	47	16.6	5.5
-1	132	49	11.3	7.3

tion may lie in the fact that there was a tendency for some children to sit rather passively with some materials for a relatively long time, thus making the average length of time spent with -1 interest higher than the average with 0 interest. The averages in this table are not so significant as the percentages of total time spent.

The formulation of a scale for rating nursery school procedure will be of increasing importance. The method used in rating interest in this study is of value and should suggest other possibilities in this direction.

#### Analysis of Table VI

The general atmosphere of the nursery school during the indoor work period while the observations in this study were being made is shown in Table VI on the following page.

TABLE VI

A Table Showing Percentages of the Total Time Spent by the Whole Group at Varying Degrees of Distraction

Rating as to Amount of Distrac- tion	Total Time Spent		Percentage of To- tal Time Spent	Average Time Spent in Minutes
	Minutes	Seconds		
-1	369	17	32.5	7.4
0	632	26	56.7	8.8
+1	114	05	10.8	9.5

The percentages may be due only to chance, but are of interest in relation to the rest of the study. During 56.7 per cent of the total time of observation the amount of distraction was normal, during 32.5 per cent of the time it was below normal, and during 10.8 per cent of the time it was above normal. The cause for less distraction than normal was usually a decrease in attendance. This suggests the need of further study of the effect of the size of the group on concentration time for if concentration decreases as distraction increases, then a small group of children would tend to concentrate better than a large group. There is also a possibility that children, having fewer associations, are less easily distracted than adults. But in this group the concentration time increases as the amount of distraction increases. The average time spent during the highest degree

of distraction is 8.5 minutes, slightly higher than the average of all times for the group, 8.1 minutes. Again this may be due to chance.

#### Analysis of Table VII

The highest degree of concentration would of course occur when interest was rated at +1 and distraction at +1. Similarly the lowest degree of concentration would occur with interest rated at -1 and distraction also rated at -1. During the highest amount of distraction, 77.1 per cent of the time spent was with interest rated at +1; during the normal amount of distraction 71.8 per cent of the time spent was with interest rated at +1; and during the least amount of distraction 67.7 per cent of the time spent was with interest rated at +1. Thus a high degree of interest was shown at all degrees of distraction, and the percentage of high interest increased slightly as the amount of distraction increased. Table VII is shown on page 32.

#### Analysis of Table VIII

The difficulty of determining why a child leaves an activity is shown by the fact that in 46.8 per cent of the cases (See Page 33) in Table VIII the writer could not determine the cause. In 22.4 per cent of the cases the child

TABLE VII

A Table Showing the Relation of Varying Degrees of Interest Shown to Varying Degrees of Distraction Present

	Percentage of Time When Interest Was Rated at		
	-1	0	+1
Rating of Amount of Distraction was -1	12.6	10.3	77.1
Rating of Amount of Distraction was 0	12.0	16.2	71.8
Rating of Amount of Distraction was +1	4.9	27.4	67.7

immediately began another activity which may or may not have attracted his attention before he stopped the first activity. The routine of the school, including attending to physical needs, served as a check to activity in 9.1 per cent of the cases, e. g., the child saw preparations being made for serving orange juice and put away his work. In 5.6 per cent of the cases the child apparently considered his work finished, although this is speculative. For example, he sawed a piece of wood completely off, or filled a paper with crayon markings, or used all of the pegs in the box, or filled all the holes in the marble-board, or made a finished object, such as a train or aeroplane with the floor blocks. In 2.8 per cent of the cases the child left his work to rescue or protect some of his own toys he had brought, and in 2.8 per cent he left his work to watch the

TABLE VIII

## A Table Showing the Causes of Ceasing Activity

Causes of Ceasing Activity	Number Of Cases	Percentage of Total Number of Cases
Unknown	67	46.8
Exchange for another activity	32	22.4
Routine of school	13	9.1
Work apparently finished	8	5.6
Defense of own property	4	2.8
Watching other children	4	2.8
Unnecessary interruption by adults	2	1.4
Miscellaneous	13	9.1

activity of another child. In 1.4 per cent of the cases there was unnecessary interruption by adults. The remaining 11.4 per cent included miscellaneous causes such as spilling and consequent discouragement, (once), material not ready for use (twice), furniture not adjusted so child could sit comfortably (once), helping another child (once), etc. Only once during the time of observation was it necessary to stop a child's activity because he was misusing material. About 6 per cent of the cases mentioned above could have been prevented by rearrangement of the routine of the school.

The need of further study in this direction, including



the relation of fatigue to interest, is evident. More knowledge regarding the amount and variety of material which should be available to a child at any one time, and the bearing of these facts upon possible over-stimulation, would be of value.

The whole matter of supervision of activity in the nursery school or in the home needs careful consideration. There is the danger of over-supervision, with the result that the child's activity is not self-activity at all. On the other hand, a word of encouragement or approval will often send a child back to a task with renewed interest. Too little supervision is undoubtedly better than too much. We can at least see that material is in readiness, that the child is physically as comfortable as possible, and that he is not interrupted. The advice never to interrupt a baby's staring is equally applicable to the activity of a two-year-old.

#### Analysis of Table IX

The determination of what qualities in the material or what factors related to it helped to hold the child's interest was found to be difficult. (See Table IX). During 37.2 per cent of the total time of observation the writer was unable to judge what qualities were most outstanding. Manipulation seemed to play the chief part in holding the

TABLE IX

A Table Showing the Percentages of Total Time for All the Group During Which Certain Qualities Played a Part in Holding the Child's Interest

Name of Quality	Time During Which Each Quality Held Interest		Percentage of Total Time in Minutes During Which Each Quality Held Interest
	Minutes	Seconds	
Manipulation	399	23	33.6
Imagination	192	40	16.4
Sound	100	18	8.4
Design and form	27	19	2.2
Color	24	42	2.1
Unknown	443	19	37.2

child's interest during 33.6 per cent of the time, e. g., patting or pounding clay and pulling it to pieces, putting pegs in and out of the box, digging in the sand-box. During 16.4 per cent of the time creative imagination was evidenced as in building garages, bridges, and aeroplanes. Interest in sound, such as shaking marbles in a can, or pounding two blocks together was shown during 8.4 per cent of the time. During 2.2 per cent of the time some interest in form and design was shown; a row of pegs was placed around the edge of peg-board; a grouping first of cylindrical forms, then of cubes, was made in stringing beads. Color played a part 2.1 per cent of the time as when one child selected eight yellow beads to string.

The preference of children of this age for manipulative rather than imaginative play is significant, and is probably quite different from what it would be a year or two later. Still largely occupied in experimenting with the physical qualities of materials, the child of two and one-half must be given abundant opportunity to carry on his investigations in his own way. This fact should be kept clearly in mind in planning his environment.

#### SUMMARY OF RESULTS

1. In this group of children the average period (during indoor activity) of duration of interest(attention) was 8.1 minutes. This approximates the results found by Bridges (1927) in studying a group of slightly older children. The average of the longest times spent by each child was 20.7 minutes. Therefore children of this age need frequent change of occupation. We should not expect them to continue one occupation or to sit still more than twenty minutes at the most, and usually for a much shorter time.

2. The average number of changes in occupation during ten-minute periods out-of-doors was 3.8. The time of concentration outdoors was shorter than that indoors, but further study is necessary to determine the causes or significance of this.

3. Manipulative materials were used during 38.3 per cent of the total time of observation, "fitting-in" materials during 30.2 per cent, blocks during 15.4 per cent, imitative toys during 8.5 per cent, push-and-pull toys during 2.1 per cent, and miscellaneous material during 5.4 per cent of the total time. Manipulative materials are preferred to ordinary "toys". A high degree of interest accompanied the use of each type of material. Correct materials will stimulate active interest.

4. All of the subjects except three were rated at the highest degree of interest during more than one-half of their total time of activity. Therefore these materials meet the needs of the subjects fairly well.

5. During 72.1 per cent of the total time of observation, interest greater than average was shown by the group. A high degree of interest is characteristic of children of this age. The method used in rating interest is of definite relative value in rating nursery school procedure.

6. During 56.7 per cent of the total time of observation the amount of distraction in the room was normal, during 32.5 per cent it was less than normal, and during 10.8 per cent it was more than normal. The amount of distraction is related to the size of the group. The average time of con-

centration increases slightly as the amount of distraction increases.

7. During 77.1 per cent of the time when the amount of distraction was more than normal, the degree of interest shown was also above average. During 71.8 per cent of the time when the amount of distraction was normal, the degree of interest shown was above average. During 67.7 per cent of the time when the amount of distraction was less than normal, the degree of interest shown was above average. A high degree of interest was shown at all amounts of distraction present.

8. It was impossible to determine the cause of ceasing activity in 59.2 per cent of the cases. In 28.3 per cent of the cases the child began immediately another activity. In the remaining cases the causes were varied. Six per cent of the total number of cases might have been preventable by a change in routine. Further study of this aspect of activity is needed. The matter of supervision needs careful consideration.

9. During 37.2 per cent of the total time of observation it was impossible to determine what qualities in the material played a part in holding the child's interest. Manipulation seemed to play a part during 33.6 per cent of the total time,

creative imagination during 16.4 per cent of the time, sound during 8.4 per cent, design and form during 2.2 per cent and color during 2.1 per cent. Children of this age prefer manipulative play to imaginative play. Opportunities for experimenting with qualities of materials should be abundant in the child's environment.

#### SUGGESTIONS FOR FURTHER STUDY

Questions as to the nature of interest in young children and its relation to other factors have constantly presented themselves as the study progressed, and are embodied in the following suggestions for further research:

1. Correlation of concentration in the nursery school with concentration in the home.
2. Relation of chronological age to concentration, by studying groups of children at each age level.
3. Relation of concentration to factors in the home background, as social status of parents, number of brothers, sisters, and playmates, order of subject in family, play space, kinds and amount of material and toys, and home atmosphere.
4. Relation of nutritional condition to concentration.
5. Relation of fatigue to concentration.
6. Relation of physiological age and mental age to concentration.

7. Relation of concentration to amount of gross bodily movement as measured by pedometers.
8. Correlation of concentration in solitary and in group play.
9. Correlation of concentration in groups of the same age or stage of development.
10. Relation of health history to concentration.
11. Relation of amount of speech activity to concentration.
12. Relation of motor coordination to concentration.
13. Relation of behavior problems to concentration.
14. Relation of suggestibility to concentration.
15. The qualities in materials which hold interest; size, color, texture, sound, weight, etc.
16. Suitability of materials to age and stage of development.
17. Achievement norms for use of each material at each age level.
18. A study of what specific activities are difficult for children at each age level.
19. Familiarity as compared with novelty of material in relation to concentration.
20. Methods of determining the type of physical, mental, and social development obtained from each material.
21. Methods of supervision which will foster concentration.

22. Methods of evaluating nursery school programs.
23. Methods of providing a program for the child including both constructive work and bodily activity, balanced from the standpoint of physical and mental hygiene.



## REFERENCES

- Anderson, John E.  
 1926. The Value of Nursery School Education for the Child. Jour. Home Ec. 18:602-3.  
 1927. Psychological Methods, pp. 55-59. Proc. of Second Conf. on Research in Child Development. National Research Council, Washington, D. C.
- Arnold, Felix.  
 1906. The Psychology of Interest. Psych. Rev. 13:221-38, 291-315.
- Baldwin, Bird T., and Stecher, L. I.  
 1924. The Psychology of the Preschool Child. D. Appleton, N. Y.
- Blanton, Smiley and M. G.  
 1927. Child Guidance, pp. 284-287. The Century Co., N.Y.
- Bobbitt, Franklin.  
 1918. The Curriculum. Houghton Mifflin Co., Boston.
- Bridges, K. M. B.  
 1927. Occupational Interests of Three-Year-Old Children. Ped. Sem. 34:415-423.
- Burnham, Wm. H.  
 1924. The Normal Mind. pp. 34, 40, 56, 502, 525, 642. D. Appleton and Co., N.Y.
- Carr, Harvey A.  
 1902. The Survival Values of Play. Invest. of the Dept. of Psych and Educ. of the U. of Colo. Vol. I, No. 2.
- Chevaleva-Janovskaja, E.  
 1927. Les groupements spontanés d'enfants à l'âge préscolaires. (The spontaneous grouping of children of preschool age.) Arch. de psychol. 20:219-233. Psych. Abstracts, 1:661.
- Dewey, John.  
 1913. Interest and Effort in Education. Houghton Mifflin Co., Boston.

- Fenton, Jessie C.  
1925. A Practical Psychology of Babyhood. Houghton Mifflin Co., Boston.
- Fisher, D. C.  
1916. A Montessori Mother, pp. 95-98, 143-5, 190. Henry Holt and Co., N. Y.
- Forbush, Wm. B.  
1914. Manual of Play. Geo. W. Jacobs and Co., Philadelphia.
- Forest, Ilse.  
1927. Preschool Education. Macmillan Co., N. Y.
- Freeman, Frank N.  
1917. How Children Learn, pp. 66-70. Houghton Mifflin Co., Boston.
- Garrison, C. G.  
1926. Permanent Play Materials for Young Children. Charles Scribner's Sons, N.Y.
- Gates, Arthur I.  
1925. Elementary Psychology. Macmillan Co., N. Y.
- Groos, K.  
1901. The Play of Man, pp. 95-122, 144-152. D. Appleton and Co., N. Y.
- Hill, May.  
1927. The Nursery School and Parental Education. A. A. U. W., Washington, D. C.
- Hunt, Jean L.  
1926. Shall We Demand Efficiency in Play? Prog. Educ. 3:305-11.
- James, Wm.  
1906. Talks to Teachers, pp. 92-3. Henry Holt & Co., N. Y.
- Johnson, Harriet M.  
1925. Educational Implications of the Nursery School. Prog. Educ., 2:29-34.

- Kell, Ruth M.  
1927. A Study of Some of the Factors Affecting the Amount of Gross Bodily Movement in a Group of Nursery School Children, pp. 1-2. Masters Thesis, Kansas State Agricultural College library, Manhattan, Kansas.
- Kilpatrick, Wm. H.  
1906. Foundations of Method, pp. 136-159. Macmillan Co., N. Y.
- Kirkpatrick, E. A.  
1906. Fundamentals of Child Study. Macmillan Co., N. Y.  
1911. The Individual in the Making, pp. 11-51, 311. Houghton Mifflin Co., Boston.
- Lee, Joseph.  
1915. Play in Education, pp. 1-106. Macmillan Co., N. Y.
- Lehman, H. C., and Michie, Orbie C.  
1927. Extreme Versatility vs. Paucity of Play Interest. Ped. Sem. 34:29-298.
- Lehman, H. C., and Anderson, Thelma H.  
1927. Social Participation vs. Solitariness in Play. Ped. Sem. 34:279-289.
- Levy, David M., and Bartelme, Phyllis.  
1927. The Measurement of Achievement in a Montessori School and the Intelligence Quotient. Ped. Sem. 34:77-89.
- Meek, Lois Hayden.  
1926. Interests of Young Children. A. A. U. W., Washington, D. C.
- Monroe, W. S.  
1899. Play Interests of Children. Addresses and Proc. of the N. E. A. 38:1084-1090.
- Montessori, Maria.  
1912. The Montessori Method. F. A. Stokes Co., N. Y.
- Norsworthy, N., and Whitley, M. T.  
1923. Psychology of Childhood. Macmillan Co., N. Y.

- Patrick, G. T. W.  
1914. The Psychology of Play. Ped. Sem. 21:469-484.
- Pillsbury, W. B.  
1908. Attention. Macmillan Co., N. Y.
- Play and Recreation. Children's Bureau Pub. No. 92, 1925.
- Play. The Cyclopedia of Education. 4:727. 1913.
- Read, Mary L.  
1917. The Mothercraft Manual, pp. 248-251. Little, Brown and Co., Boston.
- Seashore, Carl E.  
1921. Psychology in Daily Life, pp. 1-37. D. Appleton and Co., N. Y.
- Sies, Alice C.  
1924. Spontaneous and Supervised Play in Childhood. Macmillan Co., N. Y.
- Stern, William.  
1924. Psychology of Early Childhood, pp. 295-308. George Allen and Unwin, London.
- Tanner, Amy E.  
1904. The Child, pp. 231-238, 393-415. The Rand McNally Press, Chicago.
- White, Wm. A.  
1927. The Mental Hygiene of Childhood, pp. 123-126. Little, Brown and Co., Boston.
- Woolley, Helen T.  
1923. The Habit of Attention, pp. 183-4. Proc. First Annual Meeting, Am. Child Hyg. Assoc., Detroit, Mich.
- Wundt, W.  
1901. Human and Animal Psychology. Lecture 24. Macmillan Co., N. Y.
- Yarmolenko, A. V.  
1927. A Determination of the Time of the Working Process in Children of Preschool Age. Abstract in Child Development Abstracts, Vol. 2, No. 1., Nat. Research Council, Washington, D. C.