August 17, 1964

To the Graduate Council:

I am submitting herewith a thesis written by Carolyn Wynette Varner, entitled "An Investigation of the Choices of Play Activities Made by Nursery School Children in a Free Play Situation." I recommend that it be accepted for nine quarter hours of credit in partial fulfillment of the requirements for the degree of Master of Science, with a major in Child Development.

Major Professor

We have read this thesis and
recommend its acceptance:

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Dean of the Graduate School

AN INVESTIGATION OF THE CHOICES OF PLAY ACTIVITIES MADE BY NURSERY SCHOOL CHILDREN IN A FREE PLAY SITUATION

A Thesis

Presented to

the Graduate Council of

The University of Tennessee

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

---

by

Carolyn Wynette Varner

August 1964

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CHAPTER I

INTRODUCTION

Because nursery school educators recognize that children learn basically from first hand experiences, one of the objectives of the progressive nursery school curricula is to provide activities and experiences which enable the child to gain knowledge of the world around him. Those following the Montessori (11, p. 75) method give a child a limited amount of choice of activities while present day educators such as Katherine Read (14, p. 53) advocate offering the child free choice from a variety of activities. Avid proponents exist for both the structured and free play philosophies, therefore, each nursery school director needs to consider the relative merits of these two philosophies when setting up specific programs. Most nursery schools now include in their program a free play period in which the child chooses an activity from a wide variety of activities. It is assumed by nursery school educators that the provision of a wide variety of activities will allow the child to select an activity in which he is interested and thus, more learning will occur since interest is vital to effective learning.

The selection of the activities included in a program seems to be based largely on tradition and text books which discuss nursery school curricula. Usually these books suggest a variety of activities to be

included in the program, but no reasons for these particular choices of activities are indicated.

There seems to be empirical evidence to support the assumption that the provision of a variety of play materials is the most effective way of educating the young child, but research is needed to support this assumption. This is an important area for concern at this particular time because the Montessori Method and other structured programs are receiving much public attention. If nursery school were to become a part of the public school system, public pressure might be exerted for a structured program. Research is needed in this area if nursery school educators expect to defend their belief in the value of free play for the child.

This study does not attempt to determine whether free or structured play is the most effective way of educating the young child, however it does attempt to explore the manner in which children participate in the activities offered in the present curriculum. Questions such as which activities children chose from the variety now offered and their interest in these activities must be answered before research concerning broader questions can be done. It is to these specific questions that the present study is directed.

Statement of the Problem. The purpose of the present study was to explore the manner in which children participate in activities during indoor free play in The University of Tennessee Nursery School. This study attempted to discover activities children choose from the variety offered,

and the relative degree of interest shown in the chosen activities. The amount of time spent in onlooker and unoccupied behavior was also investigated.

It was hypothesized that: (1) there is no significant difference in the amount of time that boys or girls spend in any one activity; (2) there is no significant difference in the amount of time that boys and girls spend in the activities as measured in the Fall and Spring Quarters of the same academic year; (3) there is no difference in the amount of time that boys and girls spend in unoccupied and onlooker behavior; (4) there is no significant difference in the time spent in any one activity as compared with the time spent in any other activity.

Since no criteria were available indicating now much interested behavior is desirable, or can be expected in any one activity, no hypothesis concerning interest and participation was made. However, if one assumes that participation is an indication of interest, the most chosen activity would have the highest percentage of interested participation. Participation was considered in the present study as an indication of interest when certain pre-defined movements, speed of work and verbalizations were observed.

CHAPTER II

RELATED STUDIES

The most concentrated era of research concerned with the ecology of nursery schools occurred in the late 1920's and early 1930's. These studies were largely of a normative and exploratory nature, attempting to ascertain the number of play activities actually participated in by normal children at various age levels. Few variables were controlled and data, generally, were obtained through consecutive observations.

Typical of early research, Bott's (3) study attempted to find methods for analyzing free play activities of preschool children. The purpose of this study was to answer the following questions concerning indoor play:

1. What toys did children select by preference from the assortment provided by nursery school?
2. What types of toys were preferred by children at different ages?
3. How long an attention span did children of varying ages exhibit in play with toys? (p. 68).

Consecutive observations which determined frequency of selection, time of usage, and method of usage, were utilized in this study. The study tended to show that attention span increased with age. Results further indicated that all children between the ages of two and four had the same order of preference: (1) raw materials; (2) locomotor toys; (3) pattern toys, and (4) mechanical toys.

A study by Hulson (9) closely paralled the work of Bott. Hulson determined the choices and use of play materials by four-year-olds in a situation where no stimulation other than the materials was provided. Data were collected through the use of detailed consecutive observations. In this study, materials were ranked by the number of times chosen, total number of minutes used, and persistance of use. Hulson found that blocks ranked first in order of choice, time, and usage. Sand, watching, wax doll play, and cars were also popular choices.

Van Alystyne's (15) study was concerned with the differences in the uses of materials, by children of two-, three-, four-, and five-years of age, in a free play situation. In this study, emphasis was focused toward choice and use of materials. In addition, the length of the attention span was also investigated. Van Alystyne's findings indicated that there were variations in the ordering of preferences according to age groups. For example, children at age three preferred the doll corner, clay blocks and the wagon; children at the four-year old level chose blocks, clay, doll corner and small cars. The average number of materials played with in one observational period of forty-five minutes was found to be in inverse proportion to age with an average of five at age two and an average of two at age five. Attention span was also found to be related to age. Sex difference as related to choice in all categories was not significant.

Bridges' two studies (5 and 6) also attempted to discover variations in children's play activities according to age. Her study of three

year olds concerned choices of activities as well as attention span and looked at individual and sex differences. Bridges controlled the variable of intelligence as measured by the Stanford-Binet, and found intelligence to be approximately the same for boys and girls. Data were obtained by teacher observation of children in a free play situation. Information which concerned choice and time of total handling were recorded. Results of this study indicated that of the three divisions of materials, Montessori apparatus, toys, and domestic materials, the Montessori materials were most popular. This study also indicated that boys preferred an activity which required movement of large muscles, while girls preferred an activity in which they could sit at a table, and one which involved finger manipulation.

Bridges' study of four-year-olds (6) followed a method very similar to her study of three year olds, however, in the study of four-year-olds, she included the elements of distraction and attention as measures of what the child was doing. The variables of intelligence and sex were considered also. Bridges concluded that boys seemed to prefer less structured materials and materials involving hand and arm movements. Girls preferred using fine finger movements in tasks having a definite beginning and ending.

McDowell's (13) study, of 20, two- and three-year olds, also examined differences according to sex and considered the frequency of choice of material, use of materials and length of attention span. Verbalizations occurring during the use of materials as well as degree of imita-

tion and propriety during usage, as determined by the teacher, were also recorded. McDowell found that for the total group, materials used in constructing other objects ranked first, followed by manipulative materials as either their first or second choice, while girls chose doll play as their first choice, and manipulative play as second choice.

A more recent study by Childs (7) of choices preschool children make in a free play situation recorded activity and attention span using a time sampling technique. Activities were grouped in the following manner: blocks; raw creative materials; housekeeping materials; table toys; and transportation toys. Childs concluded that there was no difference in the popularity of any of the groups of materials. Although some choices were related to difference in sex, the difference was not statistically significant. Both sexes chose blocks and table toys with equal frequency, however, boys used transportation toys two and one-half times more often than girls, while the situation was reversed for housekeeping toys.

Not all studies of children's selection of activities in a free play situation have occurred in a nursery school situation. Other studies have used home observations as well as observations in controlled settings. Koch and Herring (10) used home observations to determine the interest and attention spans of preschool children controlling the variables of age, sex, time of day, intelligence, type of toy and length of attention span. Eighty children were used as subjects. Forty subjects were approximately age two and one-half and forty were four-year-olds. One-hour

observations were made in the homes of the children. Materials included in the study were a small iron truck, a picture book, a top, a lunchbox filled with acorns, and tinker toys in the form of a man. Choice of toy and length of attention span were recorded by the experimenter in all observations. Koch and Herring (10) concluded that interest span was a function of the type of toy offered to the child and the age of the child. Boys appeared to have a longer attention span than girls. Choices of toys by boys and girls were found to be of doubtful significance although the data were not treated statistically. All children preferred the truck with the exception of four-year-old girls, who preferred the top as their first choice and the truck as their second choice.

Cockrell (8) used a small group of nursery school subjects in a separate playroom to investigate what happened when good materials and children were put together and left alone. This study was one of the first studies of children's play which involved the use of a one-way screen and thus excluded adults from the group. The specific purposes of the study were to examine childrens' reactions to a change in the play environment; to note reactions to specific materials in the environment; and finally to determine the effects of no adult supervision upon play activities.

The procedure involved observation of six subjects in a separate play room at the Yale University Nursery School. Each child was seen individually and in combination with every other child in the group. Six different play settings were presented to the children. These

six settings were housekeeping, blocks, pictures and books, clay and crayons, companions, and all materials in combination. The investigator asked the children to come into the room and then left them alone until the children indicated they were ready to leave or left voluntarily. Data recorded from these observations included the material chosen and the length of time material was used.

With respect to the number of minutes of usage, the most used materials were the combined materials, followed in order by clay and crayons, pictures and books, blocks, housekeeping materials, and companions, according to Cockrell. The combined materials were used in the largest number of activities but the order of frequency for other materials was somewhat different. Cockrell concluded that the length of time children spent with a material was not entirely dependent upon the number of activities that the child performed with the material, but that children preferred materials which permitted activity which lead to further activity.

A more recent study by Bradley (4) utilized observation of children in a controlled play situation. The purpose of this study was to determine the preferences among three materials: clay, painting, and blocks. The relationship between choice and intelligence was also investigated. Bradley found that clay was most popular with children from three-years, six months through three-years, eleven months. Blocks were most popular at the earlier age with boys, but less popular with girls of the same age. Painting was the least popular group choice. Bradley also found

that children with lower I.Q.'s chose blocks while children of the same age, but with higher I.Q.'s chose painting.

A survey of research in the area of children's play choices suggests contradictory findings. For example, findings of Hulson (9), Bridges (5), and McDowell (13) indicated that blocks were the most frequent choices of boys at age three, but blocks appeared to be a less frequent choice in the experimental study by Cockrell (8). No differences according to sex were apparent in the results obtained by Childs which concerned block play. These contradictions may be the result of differences in selection of subjects, procedures utilized, and treatment of data. Subjects for this type of study have usually been children in attendence at a college nursery school and therefore a large portion of the children have come from the upper-middle socio-economic group. Observer bias may also have accounted for variations in the findings since the teacher was often the observer. Few tests of reliability were used to check the observational data. In light of these and other limitations, current research seemed necessary in this area if one considers free play an important educative tool for the preschool child.

CHAPTER III

METHODS OF PROCEDURE

This chapter describes the procedures used, in the present study, to obtain and compile data concerning the activity choices of children in a free play situation. Included in this chapter are a description of the subjects of the study and operational definitions of the terms employed in the study.

The Subjects. Fourteen children in regular attendence at The University of Tennessee Nursery School, during the Fall Quarter of 1963 and the Spring Quarter of 1964, were the subjects for the present study. Six girls and eight boys participated. The average age of the subjects at the beginning of the study was three-and-one-half years.

Procedure. In order to study the play participation of the subjects, a method of direct observation was used. Time sampling was chosen in order to obtain a representative picture of a child's participation during the free play period. In addition, time sampling permitted data to be quantitatively measured.

Time sampling has been defined as a method for observing behavior of individuals under ordinary conditions in a series of short time periods so distributed as to give a representative sampling of the behavior under observation. The reliability of the method depends upon a clear defini-

tion of the behavior to be observed. Other important features affecting reliability include the amount of behavior observed and the simplicity of both the recording system and the categories (2, p. 82-93).

Collection of Data. The essential features of the time sampling method were used in the present study. An observer scored each of the fourteen children in the Fall quarter for a minimum of four, five minute intervals; the maximum number of observations recorded for a single child was thirteen, five-minute intervals. Observations obtained in the Spring quarter were identical in number to those obtained in the Fall quarter.

Each observation consisted of a five minute unit divided into fifteen second intervals. The children were observed two days a week, during the indoor free play hour. The number of observations per day fluctuated due to the flexibility of the nursery school schedule. The following procedure was devised in order to arrive at a representative sampling of the child's behavior. According to this procedure, children were divided into two groups, A and B. Both groups were observed in sequence, then in inverted order. On subsequent observations, the child who was first on the list was moved to the bottom of the list, as were children who were absent.

The type of activity in which the child was engaged at the beginning of the five minute unit was recorded, and subsequent changes in activity were recorded on appropriate fifteen second intervals. (See Appendix, p. 42,43). Activities were classified into the following categories:

1. Creative Materials - clay, crayons, paper and paste, collage, easel painting, etc.

2. Manipulative Play - puzzles, hammer and pegs, table activities, small cars and trucks.

3. Doll Play - play in house corner or play with dolls.

4. Blocks - dramatic or manipulative play with large or small blocks.

5. Listening to Stories

6. Other - all unclassified activities such as, games involving more than one person, examining materials on the science table, talking, running, etc.

The child was given complete freedom in his choice of activities. All equipment was kept on low, open shelves, or in a closet accessible to the children. The housekeeping corner was available every day. Creative activities were changed from day to day, but at least one new creative material other than easel painting, was available.

Interest during participation was determined by looking at three aspects of behavior: movements, rate of speed of work, and verbalizations. Participation which involved a choice of activity was placed in one of the following categories:

Interested Participation. Concentration was indicated to the observer when the child participated in an activity in one or more of the following ways: (1) The child kept his eyes on the activity and did not let his eyes stray around to other people or activities. (2) The child worked at a consistent rate of speed. (3) Spontaneous singing or talking to himself occurred.

Non-interested Participation. The following criteria were used to evaluate non-interested participation: (1) The child did not keep his eyes on the activity and paid attention to other people and things in the room. (2) The child began an activity, but slowed down his rate of work, or did not finish the activity. (3) The child talked to others while engaged in an activity.

Four other categories of behavior were included in the study in order to measure behavior that did not involve a clear choice of activity or participation in an activity. Since these were not measures of choices or related interest, these categories were simply recorded across both the activity and interest column. These categories were as follows:

Unoccupied. This category included behavior in which: (1) The child was not playing, but appeared to the observer to be occupying himself with watching anything that happened to be of momentary interest. (2) The child sat in one spot and glanced around the room. The child appeared to be gaining little knowledge from his immediate environment when his behavior met the criteria for the unoccupied category.

Onlooker. This category included behavior in which: (1) The child spent time watching other children play. (2) The child often talked with children he was observing, asked questions or gave suggestions, but did not actively enter into the activity.

Routine Behavior. Behavior classified as routine behavior involved the child's participation in bathroom procedure and the cleanup

period for juice if they occurred during the five minute observational period. Some water play occurred in this category, but was not recorded separately since it was frequently impossible to distinguish from bathroom procedure.

Teacher Directed. This category involved behavior which seemed to be entirely directed by the teacher. Often this was interference on the part of the teacher to stop aggressive or other undesirable behavior. Some activities, such as music, were judged by the observer to be teacher directed.

In order to check the reliability of the time sampling method, two graduate students did independent simultaneous observations for three, one-hour periods. The inter-observer agreement was determined by totaling the number of corresponding agreements made by the two observers and dividing them by the total number of agreements and disagreements. The inter-observer agreement concerning selected activities was 92 per cent while agreement concerning measurement of interest was found to be 86 per cent.

CHAPTER IV

ANALYSIS OF THE DATA

Data were analyzed in order to examine the following: (1) the choice of activities according to sex and academic quarter; (2) the time spent in onlooker and unoccupied behavior according to sex; (3) the time spent in each of the categories involving a choice of activity; and (4) the time spent in interested participation in each of the activities.

A three way analysis of variance was used to test parts one and two of the general hypothesis. This test was chosen because it had the same effect as a number of one factor tests super-imposed upon each other. The results obtained from analysis of variance indicate the main effects of the variables tested as well as the interaction effects of the variables.

Data were compiled in order to show the minutes spent by each child in each of the activities in both the Fall and Spring Quarters. (Appendix, p. 44,45)* The formula used in the present study for analysis of variance is found in the Appendix, p. 46. Results of the analysis of variance are presented in Table I through V.

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*For purposes of statistical analysis, two subjects were dropped. These exclusions were #11 and #12. Observations were not completed in the Spring for #11 and #12 was over a year older than the other children in the study.

Table I, shows the F scores for the time spent by boys and girls in activities in the Fall Quarter. Results indicate that there was a difference in the time spent by children in activities according to the sex of the child. Thus the sex of the child was a significant factor in determining a child's choice of activity. Since analysis of variance did not indicate the direction of these choices the Duncan Multiple Range Test (12) was used to compare the time spent in the various activities. Results of this test are treated in a later part of the chapter.

F scores for the relationship of activity choices and sex of the child in the Spring Quarter are shown on Table II, p. 19. Results indicate that there was no significant difference in the time spent in the various activity categories according to the sex of the child. From the results obtained from the analysis of variance in the Fall, it can be anticipated that there will be significant difference in the time spent in the activities by the combined group when the Fall and Spring were compared. This difference is shown on Table III, p. 20.

As indicated by Table IV, p. 21, there was no significant difference in the time boys spent in each of the activities when the choices made in the Fall were compared with those made in the Spring. There was a significant change in the time spent by girls in the activity categories, however, when the Fall and Spring were compared. (Table V, p. 22).

The significant results obtained from the analysis of variance were used in the Duncan Multiple Range Test (12) to discover if children

TABLE I

ANALYSIS OF VARIANCE INDICATING THE RELATIONSHIP OF THE VARIABLES: ACTIVITY CATEGORY, SEX AND SEASON (FALL QUARTER)

Source of Variation	Variation	Degrees of Freedom	Mean Square	F Calculated	F Critical
Total	1,604.80	71			
Among Treatments	721.67	11	65.60	5.02**	1.95*
Among 1,2,3,4,5,6	401.47	5	80.29	6.15**	2.37*
Between A and B	203.68	1	203.68	8.74**	4.00*
Interaction AB	116.52	5	23.30	1.78	2.37*
Error	883.13	60	13.05		

*α = .05

** = Significant at the .05 level of confidence.

TABLE II

ANALYSIS OF VARIANCE INDICATING THE RELATIONSHIP OF THE VARIABLES: ACTIVITY CATEGORY, SEX AND SEASON (SPRING QUARTER)

Source of Variation	Variation	Degrees of Freedom	Mean Square	F Calculated	F Critical
Total	1150.45	71			
Among Treatments	221.75	11	20.16	1.30	1.95*
Among 1,2,3,4,5,6	50.08	5	10.01	.65	2.37*
Between A and B	40.01	1	40.01	1.19	4.00*
Interaction AB	167.66	5	33.53	2.17	2.37*
Error	928.70	60	15.46		

*α = .05

TABLE III

ANALYSIS OF VARIANCE INDICATING THE RELATIONSHIP FOR BOTH SEXES OF THE TIME SPENT IN EACH ACTIVITY IN THE FALL AND SPRING

Source of Variation	Variation	Degrees of Freedom	Mean Square	F Calculated	F Critical
Total	2813.74	143			
Among Treatments	668.37	11	60.76	3.93**	1.95*
Among 1,2,3,4,5,6	260.49	5	52.09	2.94**	2.37*
Between A and B	58.93	1	58.93	0.84	4.00*
Interaction AB	348.95	5	69.79	3.94**	2.37*
Error	2145.37	121	17.73		

*α = .05

** = Significant at .05 level of confidence.

TABLE IV

ANALYSIS OF VARIANCE INDICATING THE RELATIONSHIP FOR BOYS OF THE TIME SPENT IN EACH ACTIVITY IN THE FALL AND SPRING

Source of Variation	Variation	Degrees of Freedom	Means Square	F Calculated	F Critical
Total	1,008.48	71			
Among Treatments	166.58	11	15.14	1.08	1.95*
Among 1,2,3,4,5,6	122.35	5	24.47	1.74	2.37*
Between A and B	7.69	1	7.69	1.05	4.00*
Interaction AB	36.54	5	7.31	0.52	2.37*
Error	841.90	60	14.03		

*α = .05.

TABLE V

ANALYSIS OF VARIANCE INDICATING THE RELATIONSHIP FOR GIRLS OF THE TIME SPENT IN EACH ACTIVITY IN THE FALL AND SPRING

Source of Variation	Variation	Degrees of Freedom	Mean Square	F Calculated	F Critical
Total	1,728.52	71			
Among Treatments	750.42	11	68.22	4,30**	1.95*
Among 1,2,3,4,5,6	350.27	5	70.05	4.30**	2.37*
Between A and B	182.40	1	182.40	4.19**	4.00*
Interaction AB	217.75	5	43.55	2.67**	2.37*
Error	978.10	60	16.30		

*α = .05

** = Significant at the .05 level of confidence.

spend more time in one activity than in another. The Duncan test isolates the contributing factors to the significant results obtained in analysis of variance. In other words, the Duncan Multiple Range Test indicates which factors contribute significantly to the results of the analysis of variance. Since there was no significant change in the amount of time boys spent in each of the activities in the Fall and Spring, it was assumed that the time spent by girls in the Fall in each of the activities was responsible for the significant difference obtained when the group's time in each of the activities in the Fall and Spring was compared. Only the time girls spent in each of the activities in the Fall was tested by the Duncan Multiple Range. The following formula was used in the Duncan Multiple Range Test (12).

$$R_k = r_k \, s_y$$

where

k = number of categories;

r_k = values from Duncan Multiple Range Table;

$$s_y = \sqrt{\frac{\text{within mean square}}{n}}$$

Results of the Duncan Multiple Range Test indicated that girls spent a significantly greater amount of time in only one category, manipulative play (Table VI p. 24).

Data which showed the total number of minutes spent by boys and girls in unoccupied and onlooker behavior in the Fall and Spring were used in the Chi-square test of significance to determine the relationship among the variables specified in part three of the general

TABLE VI

DIFFERENCES IN TIME SPENT BY GIRLS IN EACH OF THE ACTIVITIES AS MEASURED BY THE DUNCAN MULTIPLE RANGE TEST

	Activities*				
Activities	6	4	1	5	2
3	1.4	1.6	1.9	2.4	7.3**
6		0.2	0.5	1.0	5.0**
4			0.3	0.8	5.7**
1				0.5	5.4**
5					4.9**

*Notations:

1 - Creative
2 - Manipulative
3 - Doll Play
4 - Blocks
5 - Listening to Stories
6 - Other

**Significant at .05 level of confidence.

hypothesis. A statistically significant χ^2 value indicated that there was some association between the variables, however, it did not indicate the degree or direction of the association. The following formula was used to compute the χ^2 values (1, p. 183).*

$$\text{adj. } \chi^2 = \sum_{i=1}^{k} \frac{(|o_1 = - e_1| - \frac{1}{2})^2}{e_1}$$

where

o = observed frequency;

e = expected frequency;

$\sum$ = sum.

The amount of time spent by boys and by girls in onlooker behavior was found to be non-significant in both the Fall and Spring at the .05 level of confidence (Table VII, p. 26). Differences according to sex in the amount of time spent in unoccupied behavior were present in the Fall but not in the Spring at the .05 level of confidence (Table VIII, p. 27).

The results obtained from the Duncan Multiple Range Test which indicated that girls spend in the Fall, a significantly greater amount of time in manipulative play than in other activities, were used to investigate differences in the amount of interested participation in each of the activities. From a tabulation of the percentage of time spent in interested participation in each of the activities, it was found that girls were more overtly interested in activities in which they did not spend a significant amount of time. It appears that interest was not the largest factor in the girls' choices of activity (Table IX, p. 28).

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*Yates' correction was used in this χ^2 formula to correct for continuity of the 2 x 2 tables.

TABLE VII

CHI-SQUARE VALUES FOR ONLOOKER AND NON-ONLOOKER BEHAVIOR

Behavior	Boys		Girls		Total	Chi-square
	o_1*	e_1**	o_1	e_1	o_1	
			FALL			
Onlooker	9.25	7.32	10.50	19.75		.2434
Non-onlooker	139.75	141.50	232.75	243.25	372.50	.2544
Total	149.00		243.25		392.25	.3855
						.7966
			SPRING			
Onlooker	10.00	9.57	6.00	6.43	16.00	.0004
Non-onlooker	170.00	170.43	115.00	114.57	285.00	.0006
Total	180.00		121.00		301.00	.0013
						.00134

*Observed frequency.

**Expected frequency.

***Significant at the .05 level of confidence.

TABLE VIII

CHI-SQUARE VALUES FOR OCCUPIED AND UNOCCUPIED BEHAVIOR

Behavior	Boys		Girls		Total	Chi-square
	o_1*	e_1**	o_1	e_1	o_1	
			FALL			
Occupied	139.750	133.99	232.75	238.50	372.50	.2067
Unoccupied	6.750	12.50	28.00	22.25	34.75	2.3277
Total	146.50		260.75		407.25	2.4455
						4.2009***
			SPRING			
Occupied	170.00	170.62	115.00	114.28	285.00	.00008
Unoccupied	10.50	9.88	6.00	6.62	16.50	.00158
Total	180.50		121.00		301.50	.00392

*Observed frequency.

**Expected frequency.

***Significant at the .05 level of confidence.

TABLE IX

PERCENTAGE OF TIME SPENT BY GIRLS AND BOYS IN INTERESTED PARTICIPATION IN EACH ACTIVITY IN THE FALL

Activity	(A) Minutes in Interested Participation	(B) Total Minutes in Activity	Per Cent A/B
	Girls		
Creative	23.00	41.25	55.75
Manipulative	46.00	81.50	56.44
Doll Play	12.75	17.75	72.11
Blocks	18.00	29.25	61,53
Listening to Stories	10.00	34.00	29.41
Other	9.00	29.00	31.04
	Boys		
Creative	10.25	15.00	68.34
Manipulative	32.50	44.50	73.03
Doll Play	4.50	9.25	48.64
Blocks	19.25	24.25	79.38
Listening to Stories	26.00	28.25	92.03
Other	11.00	18.50	59.43

Table X, page 30, indicates the percentages of interested participation spent by both sexes in each of the activities during the Spring Quarter. A diversity of interested participation occurred despite the fact that there was no difference in the amount of time spent by the children in each of the activities. It may be seen from inspection that boys and girls had opposite interest patterns in the following categories: (1) manipulative play; (2) doll play; and (3) blocks.

A comparison of the percentages of interested participation for boys and girls that occurred in each of the activities in the Fall and Spring indicates that the interest shown by boys was more stable from Fall to Spring than that shown by girls and that boys were consistently higher in the listening to stories and other categories (Table XI, p. 31).

TABLE X

PERCENTAGE OF TIME SPENT BY GIRLS AND BY BOYS IN INTERESTED PARTICIPATION IN EACH ACTIVITY IN THE SPRING

Activity	(A) Minutes in Interested Participation	(B) Total Minutes in Activity	Per Cent A/B
	Girls		
Creative	22.50	41.00	54.87
Manipulative	7.50	19.25	38.96
Doll Play	1.50	7.00	21.42
Blocks	6.00	15.50	38.70
Listening to Stories	3.00	5.25	57.14
Other	15.50	27.00	57.40
	Boys		
Creative	7.75	9.75	79.48
Manipulative	19.50	26.75	72.89
Doll Play	34.00	38.75	87.74
Blocks	25.25	41.50	60.84
Listening to Stories	17.00	22.00	77.27
Other	18.75	31.25	60.00

TABLE XI

A COMPARISON OF THE PERCENTAGE OF TIME SPENT BY BOYS AND GIRLS IN INTERESTED PARTICIPATION IN EACH OF THE ACTIVITIES IN THE FALL AND SPRING

Activity	Girls Per Cent Fall	Girls Per Cent Spring
Creative	55.75	54.87
Manipulative	56.44	38.96
Doll Play	72.11	21.42
Blocks	61.53	38.70
Listening to Stories	29.41	57.14
Other	31.04	57.40
	Boys	
Creative	68.34	79.49
Manipulative	73.03	72.89
Doll Play	48.64	87.74
Blocks	79.38	60.84
Listening to Stories	92.03	77.27
Other	59.43	60.00

CHAPTER V

DISCUSSION

The purpose of this chapter is to present an interpretation of the findings obtained in the present study and to compare and contrast these findings with the results obtained from related studies. The common assumption that there exist definite choices of play activities according to sex was not supported in the present study. The non-significant relationship found in the present study with respect to sex of the child, time of the year, and choice of activity was in general agreement with most of the related studies reviewed in Chapter II. The present study indicated, as did the results obtained by Van Alstyne (15), Childs (7), and Koch and Herring (10), that play choices with regard to sex were not significant. The one significant finding in the present study which related to choice of activity was that girls spent significantly more time in manipulative play in the Fall than in other activities. This agrees with the findings of previous studies which have indicated that the sex of the child was a factor in the child's choice of activity. Bridges (5 and 6) found that girls preferred activities which involved fine finger movements and McDowell (13) found manipulative materials to be the second choice of girls. The significant amount of time spent by girls in manipulative play may have been due to several factors. As part of their reaction to the initial adjustment to nursery school, girls may have used manipulative

activities as a security mechanism since such activities did not involve direct contact with peers or teachers. Another possibility is that inexperienced student teachers may have suggested manipulative activities more often to girls than to boys or that manipulative activities were suggested more often than other activities. Girls may have been more amenable to these suggestions than boys, or girls may have had more contact with student teachers because girls are assumed to be quieter, less aggressive and easier to supervise than boys.

The majority of studies reviewed in Chapter II indicated an order of preference of activities for all children at a certain age, regardless of sex. The study by Childs (7) was the only one which supported the present finding that children, in nursery school, do not, in general, spend significantly more time in one activity than in another. It is suggested that the discrepancies between previous findings and the results obtained in this study are due to differences in study design and statistical analyses. Since descriptive statistical analyses were used in the earlier studies, few comparisons to the present findings could be made.

Both sexes spent a significant amount of time in unoccupied behavior in the Fall Quarter. It seems reasonable to assume that unoccupied behavior might be a reaction of any child, regardless of sex, to the bewildering number of activities and people confronted during the adjustment to nursery school. By Spring, it may be that the children had oriented themselves to the program so that little unoccupied behavior occurred.

The diversity of interested participation which was present in both the Fall and Spring may reflect the diversity of the children's interest or may simply be a reflection of the measuring device used in this study. There seems to be some indication of a pattern of reversed interest according to quarters, that is, children of the liked-sex seemed to be interested in the same thing at the same time of year (Table IX, p. 28). This pattern may be an indication of choices of like-sexed playmates. The change in interests over a period of time may indicate that children reach saturation points of interest in any activity and then move to other, more challenging activities.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The present study was concerned with an investigation of the choices of play activities made by fourteen nursery school children during the indoor free play situation at The University of Tennessee Nursery School. The average age of the subjects at the beginning of the study was three- and one-half years. The purpose of this study was to ascertain if differences existed in the time spent by boys and by girls in the various activities, and in onlooker and unoccupied behavior. In addition, differences which existed in the time children spend in various activities and the time children appeared to be interested in these activities were investigated. In order to compare differences over a sufficient time interval, data were obtained in the Fall and Spring Quarters.

Data for the present study were obtained through the use of a time sampling technique and were analyzed through the use of the following tests of significance: (1) analysis of variance; (2) Duncan Multiple Range Test; and (3) the Chi-square test for significance of difference. Major results of the present study included the following findings:

(1) A significant relationship was found between the sex of the child and the time spent in various activities in the Fall Quarter.

(2) No significant relationship was found between the sex of the child and the time spent in various activities in the Spring Quarter.

(3) No significant difference was found in the time spent by boys in the activity categories when the Fall and Spring were compared.

(4) A significant difference was found in the time spent by girls in various activities when the Fall and Spring were compared.

(5) Girls were found to have spent significantly more time during the Fall in manipulative activities.

(6) The amount of time spent in unoccupied behavior by all children was found to be significant in the Fall, but not in the Spring.

(7) The amount of time spent in onlooker behavior by all children was not significant in either the Fall or the Spring Quarter.

(8) A diversity of interested participation occurred in the activities. Differences, which concerned the comparison of interested participation in the Fall and Spring, indicated some differentiation according to sex in some areas, but not in others.

It appears from the present findings that children in nursery school do not, in general, spend significantly more time in any one

specific activity. Results of the present study indicate that children select a wide range of activities in a free play situation. It also appears that reactions to the initial adjustment to nursery school include a marked amount of unoccupied behavior or retreat into certain activities.

Results concerning interested participation and choice of activity should be interpreted cautiously as interest was measured by the child's overt actions and the measurement excluded all social contacts. Although no definite conclusions concerning this relationship can be made, it appears, from this study, that factors other than interest may have as much or more influence on the child's choice of activity as does interest. The need for further research concerning the relationship between choice and interest is indicated. Frequently nursery school curricula are based upon the assumption that children choose activities on the basis of interest and that interest is vital to the learning process. Fruitful areas for further research would be the isolation of the factors other than interest which affect the child's choice of activity, and the formulation of a measuring instrument more sensitive to interested participation.

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APPENDIX

OBSERVATION SHEET

Date	Name		Jill	
Sec.	Act.	Int.		
15			Cp	X
30				X
45				X
60				X
15				
30				
45			Mp	0
60				0
15				0
30				X
45				X
60				X
15				
30				
45				
60				
15			Dp	0
30				0
45				
60				

CODING FOR OBSERVATION SHEET

Symbol	Meaning of Symbol
|	Interested Participation
X	Non-interested Participation
O	Onlooker Behavior
$\sum$	Unoccupied Behavior
Td	Teacher Directed
R	Routine
$\wedge$	Not Visible
C	Creative Materials
Bl	Blocks
Ls	Listening to stories
Dp	Doll Play
Mp	Manipulative Play
Oth	Other

THE NUMBER OF MINUTES SPENT BY CHILDREN IN EACH ACTIVITY IN THE FALL

Subject	I**	II	III	IV	V	VI	Total
1	9.25	16.50	5.25	4.75	4.25	4.75	44.75
2*	0.00	4.00	6.75	6.50	8.00	3.50	28.75
3	6.50	13.25	3.00	0.00	5.75	2.75	31.25
4*	0.00	11.50	0.00	4.50	0.00	1.25	17.25
5	5.75	12.00	0.00	0.00	4.25	9.75	31.75
6	7.00	11.25	0.00	2.25	6.75	8.50	35.75
7*	4.75	3.50	0.00	0.00	0.00	0.00	8.25
8	7.25	0.00	3.25	4.75	7.50	3.25	26.00
9*	0.00	5.00	0.00	6.50	0.00	3.75	15.25
10*	0.00	3.75	0.00	2.50	6.00	4.75	17.00
11*x	0.00	2.25	0.00	5.25	0.00	0.75	8.25
12*x	6.25	8.00	2.50	1.50	5.50	2.50	26.25
13*	4.00	6.50	0.00	2.75	8.50	0.00	21.75
14	5.50	28.50	6.25	12.25	5.75	2.00	60.25
Total	56.25	126.00	27.00	53.50	62.50	47.50	372.50

x Subjects dropped for analysis of variance.

*Male subjects.

**Roman numerals denote the following activities:

I Creative
II Manipulative
III Doll Play
IV Blocks
V Listening to Stories
VI Other

THE NUMBER OF MINUTES SPENT BY CHILDREN IN EACH ACTIVITY IN THE SPRING

Subject	I**	II	III	IV	V	VI	Total
1	8.00	0.75	0.00	4.50	0.50	1.25	15.00
2*	2.50	1.00	5.25	15.00	0.00	3.25	27.00
3	14.75	2.25	0.00	0.00	0.00	10.50	27.50
4*	0.00	5.50	12.50	3.75	5.25	5.00	32.00
5	8.50	8.50	0.00	5.25	0.75	0.00	23.00
6	5.50	0.00	0.00	0.00	1.00	7.50	14.00
7*	3.25	14.50	0.00	0.00	0.00	0.00	17.75
8	0.00	3.00	1.75	0.00	3.00	0.50	8.25
9*	1.00	1.25	0.75	13.25	4.25	1.25	21.75
10*	0.00	4.00	4.75	0.00	0.00	2.75	11.50
11*x	0.00	0.50	0.50	0.25	0.00	12.50	13.75
12*x	0.00	0.00	15.00	5.00	2.00	3.00	25.00
13*	3.00	0.00	0.00	4.25	10.50	3.50	21.25
14	4.25	4.75	5.25	5.75	0.00	7.25	27.25
Total	50.75	46.00	45.75	57.00	27.25	58.25	285.00

x Subjects dropped for analysis of variance.

*Male subjects.

**Roman numerals denote the following activities:

I Creative
II Manipulative
III Doll Play
IV Blocks
V Listening to Stories
VI Other

ANALYSIS OF VARIANCE FORMULA*--MODEL III

Source of Variation	Variation	Degrees of Freedom	Mean Square	F Calculated
Total	$\sum y_{ij} - \frac{T_i^2}{rk}$	kr - 1	$\frac{\text{variation}}{\text{degrees of freedom}}$	
Among Treatments	$\frac{\sum T_1^2}{r} - \frac{T..^2}{rk}$	k - 1	"	$\frac{2MS}{6MS}$
Among Activities	$\frac{\sum_{1}^{c} T_1^2}{rq} - \frac{T..^2}{rk}$	c - 1	"	$\frac{3MS}{5MS}$
Among Quarters	$\frac{\sum_{1}^{q} T_{ij}}{rc} - \frac{T..^2}{rk}$	q - 1	"	$\frac{4MS}{6MS}$
Interaction	$\frac{\sum T_i^2}{r} - \frac{\sum T_i^2}{rq} - \frac{\sum T_{ij}^2}{rc} - \frac{\sum T..^2}{rk}$	k + 1 - (c+q)	"	$\frac{5MS}{6MS}$
Error	$\sum y_{ij} - \frac{\sum T_i^2}{r}$	k (r - 1)		

Notations in this table were used with the permission of Mr. John Cherry.

y_{ij} = one observation
T.. = sum of all observations
T_{ij} = row total
r = number of replications
k = number of treatments
c = number of levels of activities
q = number of levels of seasons
Σ = sum