THE EFFECT OF ENVIRONMENTAL CONDITIONS UPON STUDY IN THE FIRST GRADE

THESIS

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

INTRODUCTION

At the present time there is so much work done involving mental effort in noisy surroundings that the determination of the effect of this noisy environment upon study even in the first grades becomes quite important.

It is said that Woodrow Wilson could concentrate to such an extent that he was alone within a throng of noisy people. College mathematics teachers have been known to conduct two classes during the same period. Also many teachers in the primary grades of today conduct reading classes with two or more groups participating simultaneously and independently.

Advising pupils how to study for the very best results is a common practice with many counselors, parents, and teachers. Upon various occasions pupils have been advised to select a quiet room for study in which radio programs were excluded. This study has been conducted in an attempt to determine the validity of some of the statements concerning the effect of environment upon study and to establish a few facts which might serve as a guide for counselors, parents, and teachers in helping pupils study.

Statement of the Problem

The problem under consideration is to determine the effect of certain prevailing environmental conditions of a distracting nature upon the process of study in the first grade. The conditions selected, those which are common to the schoolroom or home environment, were chewing gum, physical education classes, room confusion, rhythm band, singing, and recorded music. This study attempted to determine to what degree, if any, each of these distracting environmental conditions affect the process of study in the first grade.

Scope of the Study

The scope of this investigation may be stated as follows: (1) to give a brief introductory statement, (2) to state the problem and explain the method by which the study was conducted, (3) to determine the outcome of the study, (4) to form some tentative and possibly some definite conclusions based upon the investigations, and (5) to offer some suggestions for further consideration of this and other related studies.

Procedure

In an attempt to determine the effect of a few environmental conditions upon study in the first grade, the following distracting factors were selected for the experiment: chewing gum, physical education exercises, room confusion, rhythm band, singing, and recorded music.

This study includes the effect of the above-mentioned environmental conditions upon study of reading materials for the first-grade level. The material used consisted of stories from the book, Fun with Dick and Jane.[1] Two groups of twenty-five first-grade pupils in the North Elementary School of Odessa, Texas, were equated for the study. The method of study may be outlined as follows: (1) the two groups were equated on the basis of the California Test of Mental Maturity--Pre-Primary Series; (2) one group, the control group, studied in a natural, quiet study situation; (3) the other group, which was designated as the experimental group, studied while the environmental conditions to be employed were introduced; (4) immediately following the study period of each group a test consisting of fifteen "yes-no" questions was administered; (5) experimental and control groups were interchanged for some experiments in order to give more validity to the study.

Sources of Data

Data have been obtained from the North Texas State College Library in Denton, Texas, and from the Ector County Library, Odessa, Texas. Fun with Dick and Jane served as a guide for the test questions.

Other data were obtained from two groups of first-grade pupils in the North Elementary School, Odessa, Texas, upon

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[1]William S. Gray and May Hill Arbuthnot, Fun with Dick and Jane.

which the experiments were made. Valuable information and suggestions were obtained from personal interviews with faculty members of North Texas State College, Denton, Texas, first-grade teachers, the director of music and rhythm band, and the principal of the North Elementary School of Odessa, Texas.

Limitations of the Study

This study has the following limitations: (1) only reading material for the first-grade level was used; (2) the study was conducted with a small group; (3) the study was made in only one of the schools in Odessa, Texas; (4) only a few of the many environmental conditions which may affect study were considered; (5) one length of study period was used; and (6) the only basis for determining the effect of certain environmental conditions upon study in this experiment was the learning of facts by reading.

CHAPTER II

ORGANIZATION AND ANALYSIS OF EXPERIMENTS TO DETERMINE THE EFFECT OF SIX TYPES OF CONFUSION UPON STUDY

The purposes of this chapter are: first, to describe the means of equating the two groups; second, to describe briefly each of the six individual experiments which make up the study; and third, to acquaint the reader with the exact procedure by which the study was made.

Means of Equating the Groups

The California Test of Mental Maturity--Pre-Primary Series for the first grade was used as a basis for equating the two groups in this study. A large number of pupils were tested in each group so that two matched groups of twenty-five children each could be selected.

Data Obtained from Tests

Six tests which dealt with chewing gum, physical exercises, room confusion, rhythm band, singing, and recorded music were given to determine the effect of such distractions upon the process of study. The tests were designed to measure the knowledge of selected materials from the book, Fun with Dick and Jane.

Experimental Procedure

In this study the effect of certain environmental conditions upon study is determined by testing facts in reading. The whole study was composed of six small experiments. Each experiment consisted of these identical environmental factors: the selection of material from the same book, ten minutes for study, and a test composed of fifteen "yes-no" questions following each study period.

The first experiment was conducted to determine the effect of chewing gum upon the process of study. Both groups were allowed ten minutes in which to read a given selection. Group I, the control group, studied under quiet, natural conditions which are to be found in the ordinary classroom during a study period. Each member of Group II, which served as the experimental group, chewed gum during the study period. The two groups were as nearly equally motivated as possible in that no attempt was made to cause one group to become more interested in the experiment than the other. The same instructions were given to both groups before the study period and before testing. A test was administered to each group immediately after the study period.

The second experiment was conducted to determine the effect of physical education exercises upon the process of study in the first grade. Group II served as the control group, while Group I served as the experimental group. Group II studied under natural, quiet conditions for the

test. A physical education class, in which pupils were engaged in noisy exercises, was conducted on the second floor while Group II studied. Instructions were the same for Group I and Group II before and after the study period. At the close of the study period a test was administered to each group.

The third experiment was conducted to determine the effect of general room confusion upon the process of study. Group I served as the control group, while Group II was designated as the experimental group. Again a quiet situation existed as the control group studied, while general room confusion, such as people passing in and out the room, interruptions made by the public address system, and the nurse coming in for consultation with the teacher, prevailed as the experimental group studied. The groups were given the same instructions at the beginning of the study period and before testing. Both groups were as equally motivated as possible in that no attempt was made to interest one group more than the other in the experiment.

The fourth experiment was conducted in order to determine the effect of listening to rhythm band music upon study in the first grade. Group I served as the experimental group and Group II as the control group. Group II studied in an ordinary classroom situation, while as the experimental group studied, a rhythm band class was conducted in an adjoining room.

The fifth experiment was conducted to determine the effect upon study of listening to a class of first-grade pupils sing. Group I served as the control group while Group II served as the experimental group for this experiment. Group I studied under natural schoolroom conditions, while Group II studied as a music class sang in a near-by room. Instructions for both groups were the same before the study period and before testing. A test was administered immediately following the study period.

The sixth experiment was conducted to determine the effect of listening to recorded music upon study. Group I served as the experimental group, whereas Group II served as the control group. Group II studied in a quiet room with no disturbing factors, while as Group I studied records which first-grade pupils seem to enjoy were played on the phonograph.

CHAPTER III

INTERPRETATION OF THE SIX EXPERIMENTS IN DETERMINING THE EFFECT OF DISTRACTIONS UPON STUDY

Purposes of the Chapter

The purpose of this chapter is to present the data obtained from the six experiments in determining the effects of distractions upon study. Attention is given to the number of pupils participating in the study, to the individual differences, and to the results of the experiments as determined by the tests given the pupils.

Presentation and Analysis of Data

The first step in the study of the effects of distractions upon study was the determination of differences, if any, existing among the pupils or between the groups participating in the study. Table 1 gives the number of pupils in each group, the intelligence rating given each child as determined by the California Mental Maturity Test--Pre-Primary Series, and both the mean and the median intelligence scores for each group.

As shown in Table 1, each group was composed of twenty-five pupils whose intelligence quotients ranged from a score

TABLE 1

EQUATION OF CONTROL AND EXPERIMENTAL GROUPS ON BASIS OF INTELLIGENCE QUOTIENTS

Group I		Group II	
Pupils	I.Q.	Pupils	I.Q.
1	130	1	127
2	127	2	126
3	125	3	126
4	125	4	125
5	125	5	122
6	123	6	119
7	122	7	120
8	119	8	119
9	119	9	118
10	118	10	118
11	116	11	117
12	115	12	119
13	115	13	113
14	114	14	116
15	113	15	109
16	111	16	114
17	109	17	111
18	109	18	109
19	108	19	110
20	109	20	106
21	105	21	105
22	104	22	108
23	102	23	104
24	101	24	100
25	92	25	94
Mean	114.24		114.04
Median	115		116.5
σ	9.165		8.378

of 92 to that of 130. The scores of both groups were arranged in columns with the highest scores at the top and the others falling in descending order.

According to the classification made by Terman, pupils having intelligence quotients from 90 to 110 were of normal

or average intelligence, pupils having intelligence quotients from 110 to 120 were of superior intelligence, while pupils having intelligence quotients from 120 to 140 indicated very superior intelligence.[1] Table 1 shows that the lowest score of each group, 92 for Group I and 94 for Group II, indicate normal or average intelligence. Furthermore, nine pupils with the lowest scores in each group may be classified as of average or normal intelligence. Nine pupils from Group I and eleven from Group II with intelligence quotients ranging from 110 to 120 may be classified as superior pupils. Seven pupils from Group I and five pupils from Group II have intelligence quotients above 120, which indicate very superior ability.

Table 1 further shows that the two groups have essentially equal potentialities. The mean score, the median score, and the standard deviation show a good equality of the two groups. The mean or average score for Group I is 114.24, while Group II has a mean intelligence score of 114.02. This shows that the two groups differ in mean intelligence scores only 0.2 of a point. The median or middle score for Group II is 116.5, while the median score for Group I is 115, a difference of 1.5 points. The standard deviation for the two groups shows very little variation. Both groups, then, are composed of capable pupils, and should the tests given in this experiment show that learning had not taken place, then it may be assumed

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[1] Lewis M. Terman and Maud A. Merrill, Measuring Intelligence, p. 79.

that something had occurred to disrupt the learning process or distract the attention and concentration of the pupils.

Table 2 presents the information on the tests given the two groups of pupils directly after the gum chewing experiment had been conducted.

TABLE 2

TEST SCORES OF GROUP I AND GROUP II TO DETERMINE THE EFFECT OF GUM CHEWING UPON STUDY

Group I (Control)		Group II (Experimental)	
Pupils	Test 1	Pupils	Test 1
1	15	1	12
2	14	2	12
3	13	3	14
4	15	4	13
5	13	5	14
6	10	6	13
7	14	7	12
8	11	8	13
9	13	9	10
10	15	10	15
11	12	11	14
12	13	12	12
13	14	13	14
14	14	14	12
15	14	15	14
16	13	16	14
17	11	17	13
18	15	18	14
19	11	19	12
20	13	20	14
21	10	21	12
22	11	22	10
23	13	23	9
24	12	24	8
25	10	25	11
Mean	12.72		12.36
Median	13		13
σ	1.503		1.724

The pupils in the control group answered an average of 12.72 questions correctly, while the experimental group answered an average of 12.36 questions correctly, a difference of .36 of a question.

Table 3 shows the effects of physical education exercise upon study.

TABLE 3

TEST SCORES OF GROUP I AND GROUP II TO AID IN DETERMINING THE EFFECT OF PHYSICAL EDUCATION EXERCISE UPON STUDY

Group I (Experimental)		Group II (Control)	
Pupils	Test 2	Pupils	Test 2
1	14	1	15
2	11	2	14
3	13	3	11
4	12	4	14
5	11	5	13
6	13	6	12
7	14	7	13
8	14	8	11
9	13	9	14
10	11	10	14
11	13	11	11
12	13	12	11
13	10	13	15
14	11	14	15
15	5	15	14
16	11	16	12
17	13	17	14
18	14	18	12
19	9	19	11
20	10	20	13
21	10	21	12
22	9	22	12
23	10	23	12
24	12	24	9
25	8	25	11
Mean	11.3		12.5
Median	11.5		12
σ	2.15		1.55

In this experiment the groups were reversed. Group I was made the experimental group, while Group II served as the control group.

Table 4 shows the test scores made by the groups in the experiment with room confusion.

TABLE 4

TEST SCORES OF GROUP I AND GROUP II TO AID IN DETERMINING THE EFFECT OF ROOM CONFUSION UPON STUDY

Group I (Control)		Group II (Experimental)	
Pupils	Test 3	Pupils	Test 3
1	14	1	14
2	13	2	12
3	14	3	13
4	14	4	14
5	14	5	12
6	13	6	11
7	13	7	12
8	11	8	10
9	14	9	10
10	13	10	13
11	13	11	10
12	14	12	11
13	11	13	10
14	13	14	13
15	12	15	15
16	13	16	9
17	15	17	11
18	15	18	11
19	14	19	11
20	14	20	11
21	13	21	11
22	13	22	10
23	12	23	12
24	14	24	10
25	11	25	12
Mean	13.04		11.52
Median	13		11
σ	2.09		1.08

These data show that the control group answered an average of 1.52 of a question more often than the experimental group. The standard deviation, in this instance, was 1.02 which was significant from the standpoint of achievement.

Table 5 shows the test scores made by the groups in the experiment with the rhythm band.

TABLE 5

TEST SCORES OF GROUP I AND GROUP II TO AID IN DETERMINING THE EFFECT OF LISTENING TO RHYTHM BAND MUSIC UPON STUDY

Group I (Experimental)		Group II (Control	
Pupils	Test 4	Pupils	Test 4
1	9	1	14
2	13	2	15
3	10	3	14
4	14	4	13
5	14	5	12
6	12	6	14
7	13	7	14
8	11	8	14
9	11	9	12
10	15	10	14
11	13	11	14
12	14	12	14
13	15	13	14
14	13	14	15
15	14	15	15
16	13	16	10
17	12	17	15
18	15	18	14
19	10	19	15
20	14	20	13
21	13	21	11
22	8	22	13
23	13	23	12
24	10	24	14
25	14	25	11
Mean	12.52		13.44
Median	13		14
σ	1.82		1.36

In the fifth test Group I was chosen as the experimental group. The lesson here was studied to the accompaniment of a rhythm band, while Group II studied its lesson under quiet, normal conditions. The data show that Group I answered an average of 12.52 questions correctly, whereas Group II answered an average of 13.44 questions correctly. There was a difference of .52 in answering the questions in favor of the control group. Standard deviation, however, was only .42 and this was not significant enough to indicate any disturbing element on the part of the rhythm band.

In the fifth experiment, Group I again became the control group and Group II the experimental group. The effect of singing upon the study of pupils was investigated by having Group II study its lesson while a music class recited in an adjoining room. Group I studied the same lesson under quiet, normal circumstances. Table 6 shows the test scores made by the pupils in the two groups directly after the lesson study period had ended.

The pupils in Group I, or the control group, made average test scores as shown in Table 6. Group I answered 13.08 questions correctly, whereas the average number of questions answered correctly in Group II was 12.76, a difference of .32 in favor of the control group. Median scores for both groups were 13 and the standard deviation was only .04 which was not large enough to have any significance. The data may be interpreted to mean that the singing had little

TABLE 6

TEST SCORES OF GROUP I AND GROUP II TO AID IN DETERMINING THE EFFECT OF LISTENING TO SINGING UPON STUDY

Group I (Control)		Group II (Experimental)	
Pupils	Test 5	Pupils	Test 5
1	13	1	11
2	15	2	11
3	13	3	12
4	14	4	14
5	12	5	13
6	9	6	14
7	13	7	11
8	14	8	14
9	13	9	13
10	15	10	13
11	13	11	14
12	13	12	11
13	13	13	14
14	11	14	11
15	13	15	13
16	14	16	14
17	14	17	14
18	14	18	12
19	14	19	12
20	15	20	13
21	14	21	13
22	12	22	12
23	12	23	14
24	13	24	12
25	11	25	14
Mean	13.08		12.76
Median	13		13
σ	1.19		1.15

disturbing effect upon the learning process of a group of pupils.

The effect of recorded singing was the sixth experiment conducted. Group I, in this instance the experimental group, studied its lesson while recorded songs were played on the phonograph and Group II studied the same lesson without any

disturbing element of any kind. Table 7 gives the information on the test scores made by the pupils in both groups on the tests given over the lesson contents directly after the study period had ended.

TABLE 7

TEST SCORES OF GROUP I AND GROUP II TO AID IN DETERMINING THE EFFECT OF LISTENING TO RECORDED MUSIC UPON STUDY

Group I (Experimental)		Group II (Control)	
Pupils	Test 6	Pupils	Test 6
1	14	1	15
2	15	2	14
3	14	3	13
4	14	4	14
5	13	5	15
6	15	6	14
7	14	7	12
8	12	8	14
9	15	9	14
10	14	10	14
11	14	11	13
12	15	12	12
13	7	13	13
14	14	14	13
15	14	15	13
16	15	16	14
17	12	17	12
18	14	18	15
19	15	19	15
20	14	20	15
21	13	21	14
22	13	22	13
23	13	23	14
24	13	24	14
25	8	25	15
Mean	12.6		13.24
Median	14		14
σ	2.1		1.06

According to the data in Table 7, Group II answered an average of 13.2 questions correctly, while Group I, the

experimental group, answered an average of 12.6 questions correctly. The difference of the two mean scores for the groups, that of .64 of one question, was insignificant.

A comparison of the scores made by the control and equated groups on each test aided in determining the effect of environmental conditions upon study. Table 8 presents the composite data from all groups and all tests.

TABLE 8

A COMPARISON OF CONTROL AND EQUATED GROUPS ON EACH TEST IN DETERMINING THE EFFECT OF ENVIRONMENTAL CONDITIONS UPON STUDY

	Experimental Groups		Control Groups	
Test Number	Correct Answers	Possible Score	Correct Answers	Possible Score
1	313	375	331	375
2	281	375	315	375
3	288	375	330	375
4	313	375	336	375
5	317	375	330	375
6	335	375	347	375
Total	1847	2250	1987	2250
Per Cent Correct	82.08		83.5	
Mean	307.8		333.1	
σ	18.2		7.8	

Comparison of the Results of the Experiments

A comparison of the scores of the experimental groups with the scores of the control groups is shown in Table 8 The control groups answered 83.5 per cent of all the

questions correctly, while the experimental groups answered 82.08 per cent of all the questions correctly.

According to Tables 2, 3, 4, 5, 6 7, and 8, the evidence shows: first, that in each of the experiments the experimental groups answered fewer questions correctly than the control groups; second, that room confusion and the physical exercise had the most distracting effect upon study; third, that the effect of listening to singing had the least distracting effect upon study; and fourth, that the effect of listening to rhythm band music and recorded music did not have measurable effect upon the process of study.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this experiment was to ascertain the influence of various distractions upon the process of study in the first grade. An analysis of the tests reveals that of all the distracting elements measured, room confusion had the most disturbing effect upon the learning situation. The other five environmental conditions which affect study are listed in the order of the degree of disturbing influence upon the learning situation: physical education exercises, rhythm band music, recorded music, chewing gum, and singing.

Conclusions

An examination of the findings of the study lead to the following conclusions.

1. Of the six environmental conditions studied, it was concluded that all have a small degree of distracting effect upon the learning situation.

2. Room confusion indicates the most distracting effect upon study; therefore, it might be desirable for study periods to be conducted in a quiet atmosphere.

3. Since distracting environmental conditions such as chewing gum, singing, rhythm band music, and recorded music

have very little effect upon study, it seems unnecessary for teachers, parents, and counselors to give as much attention to these conditions as has been the custom.

Recommendations

On the basis of this study the following recommendations are made:

1. It is suggested that a study of the effect of these and other environmental conditions upon study be made with larger groups of pupils.

2. A study should also be made to determine the relationship between home environment and certain distracting conditions upon study.

3. A study to determine the relationship between mental ability and the effect of certain environmental conditions upon the learning situation should be made.

4. A study should be made to determine the effect of various types of music upon the learning situation.

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