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An Experimental Study of the Effects of Phonic Games in Reading

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AN EXPERIMENTAL STUDY OF THE EFFECTS OF PHONIC GAMES IN READING

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

There is no one best program or method of teaching reading. Despite much research, there is still much to be understood on how individuals learn to read. Sidney Rauch and Russell Stauffer are among the educators who maintain that no approach has been developed to eliminate reading disability (20:519).

There are many procedures by which reading ability is developed and the phonics approach is just one consideration. Investigators such as Donald A. Benz (3:558-563), Robert A. Rosemier (3:558-563), Josephine Piekarz (19:114-117), Marianne Frostig (9:573-580) and Albert Harris (12:128-138) believe that a functional approach to the teaching of phonics will facilitate success in reading. Opposition to the phonic approach lies in the belief that there are too many exceptions to the rules. It is known that not more than 80 per cent of the words written in the English language are phonetically written (9:573-580). It is for this reason that the investigators mentioned above place a greater emphasis on a fundamental approach to the teaching of phonics rather than a systematic teaching of phonetic rules.

While some educators emphasize interest in particular skills in reading development, it is the purpose of this

paper to explore the method of teaching phonic skills in reading through games developed by Lyons and Carnahan.

One criticism of teaching phonics is the reliance upon drill (12:128-138). John Dewey and Colonel Francis H. Parker came out for a natural method of teaching reading as early as 1898. They criticized an over-reliance upon the use of drill and attacked the methods of instruction for being boring and not applying to the students' interests. They emphasized the importance of interest and motivation in teaching reading and proposed that phonics be integrated with the whole program and not taught as a separate subject. They emphasized the importance of accurate word recognition skills, especially in oral reading (12:128-138).

While progressive educators today are still criticizing education for many of the same reasons as Dewey and Parker, they are in general agreement that motivation plays an important role in reading. Coleman (6:70), Betts (4:518), Huey (13:115), Russell, Karp and Kelley (21:11) all agree that games increase motivation, illuminate difficult concepts and processes, help to socialize the student, and integrate classes of diverse ability levels. However, Dr. Kraft of Western Reserve University believes that an overindulgence in

games blunts and stifles self-determination. As a result, he said, "One becomes so interested in playing and winning the game that many other parts of life pass them by" (14:72). Coleman believes if used appropriately, educational games can provide greater benefit than most conventional methods of teaching (6:70). Huey suggests that games are the best approach for teaching phonics because they get the student involved (13:115). This paper is devoted to a study of the effects of the use of phonic games in reading.

I. THE PROBLEM

Statement of the problem. It was the purpose of this study to determine if games designed to teach phonics would improve phonetic skills as measured on the Lyons and Carnahan Developmental Reading Test. The null hypothesis investigated was that there would be no difference between groups receiving classroom game experience in phonic skills and groups receiving workbook experiences in phonic skills.

Importance of the study. There have always been educators who have stressed the importance of interest and motivation in reading. Dolch expresses this best when he writes "If only we could get real active interest in learning to read the learning would be likely to follow" (8:58-60). Dolch believes the teachers must develop the interest in

learning to read and suggests games as only one means (8:58-60).

While playing a game, a player either does well or poorly. Knowledge of his actions offer immediate feedback which builds upon his previous experiences. Research evidence indicates that feedback is important in the learning process. A typical example of the attitude of educational psychologists is taken from Wolfe:

> Laboratory studies are unequivocal in emphasizing the importance of giving a subject as specific and as immediate information as possible concerning the outcome of his efforts (22:1267-1286).

Other researchers who take this viewpoint are Angel and Troyer (1:84-85), Gagne and Balles (10:13-46), and Miller (18:1-16).

The investigator has found very little valid research evaluating the use of games for educational purposes and therein lies the real importance of the study.

II. DEFINITIONS OF TERMS USED

Educational games. Educational games may be defined as any simulated contest (play) among adversaries (players) operating under constraints (rules) for an objective (winning).

Phonic skills. Throughout the report of this investigation, the term "phonic skills" shall be interpreted as

skills being developed in (1) a single letter--a consonant or a vowel; (2) the consonant blend; (3) the consonant and vowel digraphs; (4) the diphthong; and (5) the syllable, the basic unit for the analysis of words.

Motivation. Stimulus to action.

Reading homes. Homes where children are read to and spoken to frequently by adults and as a result auditory discrimination tends to be quite good. Proper pronunciation and enunciation, and grammar are learned and reinforced outside of the classroom.

III. LIMITATIONS OF THE STUDY

This study was limited to a comparison of one experimental group of twenty children with one control group of twenty children, selected from the sixth grade of Adams Elementary School at Yakima, Washington, during the 1968-1969 school year. Adams Elementary School is located in a low income, culturally disadvantaged area. The majority of the subjects were not from reading homes. The study was also limited to teaching the following phonic skills: (1) initial and final consonant sounds and symbols; (2) initial consonant blends and symbols; (3) initial and final consonant digraphs and symbols; (4) long and short vowels and symbols; (5) hard and soft sounds of "c" and "g"; (6) vowels, vowel

digraphs, and diphthongs; (7) syllabication. The experiment was conducted over an eight week period.

IV. ORGANIZATION OF REMAINDER OF THE THESIS

The present chapter identified and stated the problem. Chapter II will contain a review of related literature. The methods and procedure used to collect the data are to be presented in Chapter III. Chapter IV will analyze the findings of the study, and Chapter V will give the summary and conclusions.

CHAPTER II

REVIEW OF RELATED LITERATURE AND HISTORY OF PHONIC GAMES

In the 1890's and early 1900's much emphasis was placed on phonics drill, which consisted of flash cards, practice with words or phrases and oral reading. Silent reading and comprehension were ignored. Phonic instruction was often given in separate periods. Later the progressive movement attempted to determine what phonic principles were needed by beginning readers (12:132-133). When Arthur Gates developed the intrinsic method of teaching word analysis skills, the progressive movement adopted it. Gates was against phonic drills in isolation but favored practice exercise in which children had to select word forms in a meaningful setting (12:132-133). However, the fued continued between the progressive front, those in favor of a functional approach, and the traditionally oriented front, those who opposed phonics, reaching its peak in the 1920's and 1930's. Today there is still much literature written on phonics. However, the argument centers around these two viewpoints. First, the opponents realize that 80 per cent of our written English language can be pronunciated by letters. They oppose the use of phonics because there are too many exceptions to the rules. Second the defenders of phonics believe that a

rigid set of rules governing the pronunciation of letters is the only way to read (4:114-117). As a result of this uncompromising situation, many of our progressive educators of today like Marianne Frostig recommend a functional approach to phonics over a systematic teaching of phonic rules (9:573-580).

Games have been used in education for centuries, but it wasn't until Dolch manufactured the Picture Readiness Game in the early 1950's that games were produced commercially for the specific purpose of aiding the instruction of phonics. Dolch has been one of the earliest manufacturers in phonic games such as The Look Game, Consonant Lotto, Vowel Lotto, and the Listen Game (8:58-60). Lyons and Carnahan, in 1968, manufactured the Phonics Games Kit to teach word recognition skills. It is this games kit that the investigator used in his experiment.

Although little research exists on the use of phonic games in education, there has been some research on games designed to simulate military and business experiences. Germany discovered during World War I that they could design games to represent real military situations, thereby avoiding the expense of time and money involved in moving armies around in the field. By experimenting with alternate strategies in different situations, the effectiveness of war plans could be tested with almost no cost. In this way, too,

officers were trained to analyze military situations and their decision-making abilities were sharpened (2:437-458).

After World War II the game technique was applied to the area of business. Games provided an opportunity for businessmen to experiment with different decisions under different conditions. The players could evaluate their decisions in a few hours instead of several years. An example of one such game is American Management Association's Top Management Game. Each contestant plays the role of the management in competition with each other over a hypothetical product. Each company priced its products and determined their production, marketing, and research development. Each company received a statement listing its assets and liabilities. During the game each player's progress was charted on a map and at the end all contestants discussed the results (11:12).

Another industrial game is the Carnegie Tech Management Game, which is designed for training business managers (7:148-152). Role playing is utilized in much the same manner as in the game Top Management.

Results of training in the Carnegie Tech Management Game indicate that:

> Active participation in the Carnegie game has proved to be useful training for future businessmen. Students playing the game are challenged to deal effectively with many of the same types of problems faced by real executives. The game helps students understand that decisions

> made in different functional areas and on different dates are interrelated, and it helps them realize that their organization and procedures for decision making have consequences for the quality of performance which results (7:147).

In summary, writers on the subject of phonics in reading are divided into two opposing factions, those that favor a rigid set of rules governing the pronunciation of letters, and those who oppose phonic generalizations because there are too many exceptions to the rules.

In contrast to the research and literature being published about phonics, games used for educational purposes, especially phonic games, offer little or no evidence of research. Dolch has manufactured phonic games commercially since 1950, and Lyons and Carnahan have recently manufactured a phonics games kit. It is this games kit manufactured by Lyons and Carnahan that the investigator used in his experiment. Although little empirical evidence exists on games designed to teach phonics, there has been some research by American and European military and business organizations for the training of their personnel by simulating the type of experience they might receive in the field.

CHAPTER III

PROCEDURE

The subjects selected to participate in this experiment were selected according to their social and economic background during the months of January, February, and March of 1969 from two of the three sixth grade classes at Adams Elementary School in Yakima, Washington. Adams Elementary School is located in the center of Yakima's low income area. Fifty-seven of the 490 students enrolled at Adams were qualified for Title I summer school scholarships. Table I, located on page 12, summarizes the scale used by Title I for determining those families receiving funds for summer school. Approximately twelve per cent of the children enrolled at Adams qualify for funds under Title I. The Department of Public Assistance uses the same table as Title I for determining families qualified to receive food stamps and medical care.

The investigator used the results of the composite reading scores achieved on the Iowa Basic Skills Test to match the experimental and control groups. Students reading from one to three years below grade level comprised the population of this study.

The subjects' ages in both the control and experimental groups range from eleven to thirteen with the mean age

TABLE I

SCALE OF TITLE I FUNDS

Family Size	Monthly Income
2	$215
3	255
4	290
5	325
6	360
7	395
8	430
9	465
10	500
11	540
12	580
13	620

being twelve. Both the experimental and control groups had eight girls and twelve boys. Table II on page 14 summarizes the composite reading scores which range from 2.5 through 5.0 in the control group and from 2.6 through 5.0 in the experimental group. The mean reading score for the control group was 4.2 and 4.1 for the experimental group.

For instructional purposes both the control and experimental groups were subdivided into five groups of four with the experimental group receiving the game treatment while the control group utilized workbooks designed by Lyons and Carnahan to teach the same skills as the games.

In the experimental room game groups of four were designated and assigned numbers one through five. Two game groups would meet for 45 minutes at tables in the back of the room every day with each group playing a different game. In this way each of the five game groups could meet twice every week and play a different game. Teacher supervision was limited to giving instructions when introducing the games. Two games a week were played for five weeks with three weeks for review of any game thought necessary to reinforce a particular skill. The study lasted eight weeks with no phonic instruction being given by the investigator.

The classroom games used for this study was the "Phonics We Use Learning Games Kit" manufactured by Lyons and Carnahan. The manufacturer states:

TABLE II

IOWA BASIC SKILLS READING SCORES

Experimental Population	Reading Level Years and Mo.	Control Population	Reading Level Years and Mo.
1	3.4	1	4.3
2	4.6	2	4.3
3	4.4	3	4.6
4	3.4	4	2.5
5	4.6	5	4.6
6	3.4	6	4.1
7	2.9	7	4.3
8	5.0	8	4.4
9	4.6	9	3.2
10	3.6	10	5.0
11	2.9	11	4.0
12	4.4	12	4.8
13	2.6	13	4.3
14	4.1	14	4.1
15	4.4	15	3.4
16	4.6	16	4.1
17	4.0	17	4.6
18	4.4	18	4.8
19	5.0	19	4.1
20	5.0	20	4.1

Experimental Group Range	2.6 - 5.0	Mean	4.1
Control Group Range	2.5 - 5.0	Mean	4.2

> These games have been carefully designed for reinforcement of learning and playability. They develop auditory acuity and visual discrimination, leading through the sound-symbol relationship to the perception and expression of visual and verbal distinctions (15:1).

The "Phonics We Use Learning Games Kit" consists of ten games. They are: (1) Old Itch--a card game designed for practice with initial consonant sounds; (2) Spin-a-Sound--board game designed for drill with initial consonant sounds and symbols; (3) Bingobang--game designed for practice with final consonant sounds and symbols; (4) Blends Race--board game designed for drill in initial consonant blends and symbols; (5) Digraph Whirl--game designed to provide practice with initial consonant digraphs and symbols; (6) Digraph Hopscotch--board game designed for drill with initial and final consonant digraphs and symbols; (7) Vowel Dominoes--game that furnishes drill with long and short vowel sounds and symbols; (8) Spin Hard, Spin Soft--game designed to teach the hard and soft sounds of C and G; (9) Full House--game that provides drill in seeing and hearing variations in the form of vowel digraphs and diphthongs; (10) Syllable Count--game that provides drill in syllabication. The sequence of the games moves from very simple activities involving the most fundamental concepts to relatively complex games dealing with more difficult sound-symbol relationships.

The experimental and control groups were given the Lyons and Carnahan Developmental Reading Test as a pre-test

to measure the effectiveness of the treatment (game experiences). The test was administered in the mornings and early afternoons. The Lyons and Carnahan Developmental Reading Test has an overall Hoyt reliability coefficient of .95.

The developmental reading tests are composed of eleven tests which evaluate the following word recognition areas: (1) recognition of words in isolation; (2) recognition of words in context; (3) recognition of reversible words in context; (4) locating elements; (5) syllabication; (6) locating root words; (7) word elements; (8) beginning sounds; (9) rhyming sounds; (10) letter sounds; and (11) word synthesis. This test was designed to be used by third grade children and above.

CHAPTER IV

FINDINGS OF THE STUDY

A compilation of the findings of the study are reported in this section.

The hypothesis tested in this study was:

> No differences exist between groups receiving classroom game experience in phonic skills and groups receiving workbook experiences in phonic skills.

To test this hypothesis the investigator used t scores to measure the amount of gain in the following three areas of the Lyons and Carnahan Developmental Reading Test: (1) word recognition; (2) visual analysis; and (3) phonetic knowledge. Tables comparing the pre- and post-tests and showing the amount of gain by the experimental group over the control group will be found in the appendix.

The statistical analysis of the data on the word recognition test is shown in Table III, page 18. This test resulted in a t score of 2.0656 which indicated a difference which was significant at the .06 level.

Table IV on page 19 summarizes the statistical design used by the writer for visual analysis. The visual analysis test had a t score of 2.95 which indicated a difference which was significant at the .01 level.

The third test was phonetic knowledge. Table V, page 20, summarizes the statistical design used by the writer for

TABLE III

STATISTICAL DESIGN

RECOGNITION PATTERN

Experimental Group	Control Group
EX = 89 $(EX)^2$ = 7921	EX = 4 $(EX)^2$ = 16
EX^2 = 1381	EX^2 = 218
M = 4.45	M = .80
SD = 7.01	SD = 3.21
t = 2.0656	Req. t .05 = 2.093

TABLE IV

STATISTICAL DESIGN

VISUAL ANALYSIS

Experimental Group	Control Group
EX = 113 $(EX)^2$ = 12,769	EX = 20 $(EX)^2$ = 400
EX^2 = 1,455	EX^2 = 530
M = 5.75	M = 1.0
SD = 6.3	SD = 5.05
t = 2.95	Req. t .05 = 2.093

TABLE V

STATISTICAL DESIGN

PHONETIC KNOWLEDGE

Experimental Group	Control Group
EX = 227 $(EX)^2$ = 51,529	EX = 73 $(EX)^2$ = 5,329
EX^2 = 3,163	EX^2 = 1,171
M = 11.35	M = 3.65
SD = 5.41	SD = 6.87
t = 3.89	Req. t .05 = 2.093

the test on phonetic knowledge. This test had a t score of 3.89 which indicated a difference which was significant at the .001 level.

The immediate effect of the classroom games as measured by the post-test is that they are effective as a method of reinforcing phonetic skills. Students receiving classroom game experiences in phonetic skills were more able to recognize words in context and in isolation. They were more able to distinguish auditory and visual discrimination of word endings and beginnings, and they had more knowledge of letter sounds than students who did not receive the game treatment as measured by the Lyons and Carnahan Developmental Reading Test. Based upon these findings with a level of significance at the .06 level, the null hypothesis was rejected.

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

I. SUMMARY

This study investigated the use of the Lyons and Carnahan "Phonics We Learn Games Kit" as an instrument to improve phonic skills in reading.

The study consisted of one control group and one experimental group selected from the sixth grade at Adams Elementary School at Yakima, Washington. The experimental group received the game treatment while the control group received instruction by use of workbooks. Following an eight week period the same test used as a pre-test was given as the post-test. Significant differences were found in all three levels of instruction. The experimental group was found to be significantly better in word recognition, visual analysis, and phonetic knowledge.

II. CONCLUSION

The following conclusion was drawn from the findings reported in this study. It appears that the classroom games designed by Lyons and Carnahan improved phonic skills in reading as measured by the Lyons and Carnahan Developmental Reading Test. Although the Lyons and Carnahan Developmental Reading Test and the "Phonics We Learn Games Kit" were both

developed by Lyons and Carnahan, the Developmental Reading Test was developed in 1952 but the phonic games kit was not manufactured until 1968.

III. RECOMMENDATIONS

Teachers

There are many and varied methods of teaching children, but before educators adopt these methods, they must evaluate the research to find its validity. Replication of findings is necessary for research to be classified as valid. It is for this reason that the author suggests that this experiment be repeated to find if the results are the same.

Use of Games

A question that developed during the experiment was whether or not the games would be effective with diverse ability levels. Is the key factor in deciding the use of a game the composition of the class? Do ability groups create social divisions in the classroom that limit interaction among students? How would games create equal interaction and opportunity? Another experiment manipulating these variables might provide the answers to these questions.

Further Use

More research is necessary to find evidence that transfer might exist and result from relationships with

games. The transfer effects of games could prove to be very interesting.

Research is needed to determine if the size of the group or sex of the population could affect transfer. Further experimentation in these areas is needed.

These are only a few of the problems which research has exposed. Research evidence in the field of educational games is very limited. Educators are beginning to realize the possibilities which game techniques may provide for improving educational objectives. However, precise evaluation procedures have yet to be developed to prove beyond a doubt that games, in certain circumstances, teach better than other known methods. This experiment has been only one of the many needed before educators will adopt different techniques in the teaching of reading.

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APPENDICES

APPENDIX A

RECOGNITION PATTERN - EXPERIMENTAL GROUP

Population	Pre-test	Post-test	Gain
1	80	80	0
2	77	80	3
3	38	42	4
4	26	41	15
5	80	80	0
6	78	80	2
7	80	80	0
8	64	72	8
9	78	80	2
10	74	73	- 1
11	54	66	12
12	73	79	6
13	74	74	0
14	60	66	6
15	71	79	8
16	52	50	- 2
17	60	66	6
18	58	73	15
19	62	65	3
20	78	80	2
Totals	1317	1406	89

APPENDIX B

RECOGNITION PATTERN - CONTROL GROUP

Population	Pre-test	Post-test	Gain
1	71	70	- 1
2	79	77	- 2
3	78	75	- 3
4	66	71	5
5	81	78	- 3
6	77	77	0
7	77	76	- 1
8	75	73	- 2
9	74	74	0
10	81	80	- 1
11	75	80	5
12	78	78	0
13	80	82	2
14	72	79	7
15	78	77	- 1
16	79	80	1
17	77	74	- 3
18	79	80	1
19	70	75	5
20	68	75	7
Totals	1515	1531	16

APPENDIX C

VISUAL ANALYSIS - EXPERIMENTAL GROUP

Population	Pre-test	Post-test	Gain
1	73	79	6
2	71	77	6
3	46	52	6
4	35	43	8
5	58	78	20
6	61	68	7
7	77	81	4
8	62	76	14
9	65	71	6
10	67	70	3
11	54	60	6
12	70	73	3
13	68	63	- 5
14	62	70	8
15	52	67	15
16	51	55	4
17	61	64	3
18	71	71	0
19	68	69	1
20	76	74	- 2
Totals	1248	1361	113

APPENDIX D

VISUAL ANALYSIS - CONTROL GROUP

Population	Pre-test	Post-test	Gain
1	61	57	- 4
2	67	70	3
3	73	71	- 2
4	55	54	- 1
5	74	76	2
6	67	65	- 2
7	64	64	0
8	60	58	- 2
9	75	67	- 8
10	66	63	- 3
11	66	72	6
12	70	67	- 3
13	81	80	- 1
14	49	66	17
15	71	77	6
16	70	71	1
17	80	85	5
18	76	77	1
19	66	70	4
20	68	69	1
Totals	1359	1379	20

APPENDIX E

PHONETIC KNOWLEDGE - EXPERIMENTAL GROUP

Population	Pre-test	Post-test	Gain
1	94	105	11
2	91	96	5
3	48	65	17
4	47	66	19
5	98	109	11
6	94	105	11
7	87	107	20
8	88	106	18
9	87	97	10
10	82	95	13
11	86	93	7
12	87	102	15
13	81	96	15
14	71	73	2
15	90	97	7
16	60	75	15
17	82	87	5
18	85	90	5
19	73	90	17
20	102	106	4
Totals	1633	1860	227

APPENDIX F

PHONETIC KNOWLEDGE - CONTROL GROUP

Population	Pre-test	Post-test	Gain
1	85	97	12
2	88	92	4
3	71	66	- 5
4	93	91	- 2
5	111	111	0
6	91	98	7
7	95	94	- 1
8	95	103	8
9	102	97	- 5
10	109	112	3
11	95	97	2
12	86	101	15
13	113	116	3
14	92	79	-13
15	99	100	1
16	91	103	12
17	107	112	5
18	96	103	7
19	102	110	8
20	78	90	12
Totals	1899	1972	73