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A Study of Types of Presentations & Materials Utilized in Selected Title I Math Programs in Kentucky

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White,

Judith Anne

1981

A STUDY OF TYPES OF PRESENTATIONS AND MATERIALS UTILIZED
IN SELECTED TITLE I MATH PROGRAMS IN KENTUCKY

A Thesis

Presented to

the Faculty of the Department of Educational Leadership
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Educational Specialist

by

Judith Anne White

April, 1981

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A STUDY OF TYPES OF PRESENTATIONS AND MATERIALS UTILIZED
IN SELECTED TITLE I MATH PROGRAMS IN KENTUCKY

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A STUDY OF TYPES OF PRESENTATIONS AND MATERIALS UTILIZED
IN SELECTED TITLE I MATH PROGRAMS IN KENTUCKY

Judith Anne White April 1981 49 pages

Directed by: Dr. Victor Christenson, Dr. David Shannon,
and Dr. Billy Broach

Department of School Administration
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Two groups of Title I Math teachers, one representing school systems which reported second and third grade student achievement gains of one year or more on the Comprehensive Test of Basic Skills for 1978-79, and one group which reported gains of less than eight months, were surveyed in an effort to identify which methods of presentation and types of materials apparently contributed to the most successful Title I Math programs, in terms of student achievement gains.

A study of survey results indicated that a Title I Math pull-out program served by a teacher in groups of less than ten students was the most common method of presentation in both survey groups. Results suggested that small-group settings, contact with a teacher and an aide in a pull-out situation, and a low student-teacher ratio were among the

factors which influenced the achievement of Title I Math students.

In regard to program planning, school systems which reported higher CTBS test scores achieved a more even balance of time spent between teaching from commercial materials/programs and teaching from teacher-made units or packets of work, with a limited amount of time utilized for games and other approaches; school systems which reported lower test scores devoted over half their teaching time to the use of teacher-made materials. Teachers from both groups indicated that their students, who represented several age groups from more than one grade level, necessitated a wide range of Math materials; because of the ages and individual differences in students, no one program or approach to teaching Title I Math was preferred or felt to be more effective than any other.

An approach to teaching Title I Math suggested paying heed to the abilities and needs of the students, utilizing resources from a variety of commercial materials, permitting the teacher flexibility in developing work packets as needed, and infusing any other methods in planning a Title I Math curriculum.

A STUDY OF TYPES OF PRESENTATIONS AND MATERIALS UTILIZED
IN SELECTED TITLE I MATH PROGRAMS IN KENTUCKY

I. Introduction

In the Evaluation Report for Title I Programs in Kentucky for FY 1979, the results revealed that funds made available by Title I of the Elementary and Secondary Education Act have become vital to the educationally deprived children of Kentucky.

That report related that the average gain of more than 100,000 remedial reading and math participants exceeded 11.0 months growth in achievement for 8.7 months taught. The report provided only one negative reaction--many other children are in need of such services.¹

As required by law and regulation, each Title I grant applicant annually conducts an assessment of the special needs of educationally disadvantaged children and establishes a priority for addressing these needs.

Planners in Kentucky school districts employed various methods in identifying and ordering learner needs. One hundred seventy-two districts made use of standardized achievement tests. Observation techniques were employed in 124

¹Kentucky, Evaluation of Title I Programs in Kentucky, 1979 (1979).

districts. Diagnostic tests and locally prepared cognitive tests were used in 122 and 93 districts, respectively. While other techniques were utilized, none were implemented in as many as half of the Commonwealth's school districts.

Inadequate reading development eclipsed all other concerns indicated by respondents, with 89 percent rating that as of major significance. Inadequate knowledge of mathematics and inadequate command of language ranked second and third in importance.

Of the total Title I staff--3,981 persons employed in the 181 Kentucky school districts--in 1978-79, classroom teachers comprised the largest group. Staff employed in Mathematics programs comprised 17.6 percent; 67.2 percent were assigned to compensatory Reading programs; and the remaining 15.2 percent were assigned to Reading-related programs, such as kindergarten and other programs which were devoted primarily to the development of reading or pre-reading skills.

A search for information regarding the Title I program yielded an abundance of information regarding the Reading program; however, the information concerning Title I Math programs was summarized in three pages. Further efforts to locate names of school districts which have Title I Math programs, information on teaching techniques, materials, and methods of presentation resulted in the discovery of a lack of written information. In order to plan and implement Title I Math programs more effectively, Title I Math teachers and Coordinators should be able to obtain some general

information regarding programs and practices in Kentucky. This study concludes with a report which contains implications for Title I Math personnel, based upon research results derived from Title I Math programs in Kentucky.

Purpose of the Study

The purpose of this study was to determine if a relationship exists between (a) methods of presentation (b) types of Math programs utilized in Title I Math units in Kentucky and gain in Math achievement scores in twenty-seven Kentucky school districts.

If a relationship exists, the information gained from this study has implications for Title I Math teachers and Coordinators in analyzing their methods of presentation and in selecting the materials they utilize in planning and teaching more effectively.

Objectives of the Study

The objectives of this study were as follows:

1. To conduct a survey of twenty-seven Title I Math teachers in Kentucky to determine
 - a. Type(s) of teaching presentations utilized in school systems reporting either very high (gain of one year or more), or limited (gain of less than eight months) gains in Math achievement on the CTBS for 1978-79
 - b. Which materials/programs utilized in school systems result in either high or limited gains in Math achievement on the CTBS for 1978-79

2. To utilize the survey results in preparing a report which will outline the findings of this study, and to develop a model plan for use in planning Title I Math programs, suggesting methods, materials, and organizational design(s) for instruction.

Definition of Terms

A. Title I School: a school which qualifies for federal funds to support compensatory programs in reading or math, based on the number of students from low income families served by that school.

B. Title I Student: any student, regardless of parent income level, who attends a Title I school, demonstrates normal intelligence by scoring seventy-six or above on an individual intelligence test, and shows an academic deficiency by scoring one or more years below grade level in reading or math.²

C. Migrant Program: a program to promote educational continuity for migrant children. This program serves children over and above all federal, state, and local programs for which they are eligible. Kentucky's migrant program operates as a part of the Division of Compensatory Education, ESEA Title I. Migrant districts are located throughout the state, with the exception of eastern and extreme northern Kentucky.³

²Bowling Green City Schools, Bowling Green, Kentucky, ESEA Title I Project Component (1979), Part IV.

³Kentucky, Title I Migrant Education Evaluation Report (1979).

D. Pull-out Program: as used in this study, a method of program organization in which students are removed from their classroom for purposes of receiving Title I Math instruction in a designated location.

II. Review of Literature

There existed a very limited amount of information regarding the teaching techniques and materials used in Title I Math programs in Kentucky. Most information was contained in final reports prepared by the Kentucky Department of Education; these reports contained information about both the Title I Reading and Math programs, with the bulk of the information devoted to the Reading program. All 181 Kentucky school districts had Title I Reading programs, while only 73 of the districts had Title I Math programs, many of which were funded under Migrant Education.

The Title I Reading program had existed since the mid-sixties; in 1965, Kentucky school systems were asked to determine their most pressing needs--all districts indicated Reading. In 1970, with a change in the definition of the migratory child, fifty school districts expanded their list of needs to include Title I Math; since that time, the number of school districts which contained both Title I Reading and Math units had risen to seventy-three.⁴

Information regarding materials utilized by Kentucky

⁴Interviews with Don Hart, Director, Kentucky Department of Education ESEA Title I, and Sandy Thomas, Evaluation Specialist and Consultant for Kentucky ESEA Title I Programs, Frankfort, Kentucky, 23 September 1980.

Title I Math teachers was practically non-existent; even names of Title I Math teachers were unavailable, other than through contacts with individual school system's Title I Coordinators.⁵ State Department Title I reports summarized Title I Math test data from all seventy-three districts into only one table; the names of school districts which had Title I Math units were not listed.

A model outlined in the West Virginia Department of Education's 1978-79 ESEA Title I Final Report was utilized in this study. The model described eight approaches, or presentations, utilized in instructional organization in Title I programs:

1. Pull-out--students removed from classroom; services on 1:1 basis from aide
2. pull-out--students removed from classroom; services on 2:1 basis from aide
3. pull-out--students removed from classroom; services from a teacher in groups of ten or more students
4. pull-out--students removed from classroom; services from a teacher in groups of fewer than ten students
5. pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more students

⁵Kentucky, Kentucky School Directory (1979).

6. pull-out--students removed from classroom;
services from an aide and a teacher in groups of
fewer than ten students
7. students receiving direct services from aide in
the classroom (no pull-out)
8. other approaches as determined by individual
school systems.⁶

⁶West Virginia, ESEA Title I Program Impact--Final
Report--School Year 1978-79 (1980).

III. Methodology

This study involved action research and attempted to determine the effect of methods of presentation on the math achievement of Title I second and third grade students in twenty-seven Kentucky school systems. A survey was conducted of Title I Math teachers in fifteen Kentucky school systems which reported second and third grade student achievement gains of one year or more on the Comprehensive Test of Basic Skills (CTBS) for the 1978-79 school year and of Title I Math teachers in twelve Kentucky school systems which reported second and third grade student achievement gains of less than eight months (one academic year) at either the second or third grade level on the CTBS for 1978-79. This study served as a means of identifying which methods of presentation and types of materials apparently contributed to the most successful Title I Math programs, in terms of student achievement gains.

Subjects

The subjects surveyed were Title I Math teachers who taught primary--second and third grade--students in twenty-seven designated school systems in Kentucky during the 1978-79 school year. First grade teachers were not included, as many Title I Math programs do not begin with first grade;

students are placed in Title I Math based upon achievement test results obtained from testing at the completion of their first year of school.

Materials

The instrument developed for the survey consisted of a form developed by Judy White, Title I Math teacher, L. C. Curry Elementary School, Bowling Green, Kentucky. The survey form, "Primary Level Title I Math Survey," was designed to elicit feedback from Title I Math teachers in regard to their methods of presentation and materials used in the classroom. (See Appendices A through C.)

Respondents to the survey were compared on the basis of the success of their programs in terms of student achievement gains to the methods of presentation and materials used. An effort was made to identify types of presentations and programs which contributed to greatest gains on achievement tests.

"Table XIV-- Achievement Gains," included in the 1978-79 Title I Final Reports of all Kentucky school systems which had Title I Math programs that school year, was used as a means of selecting school systems to be included in the survey. All school systems which reported results on the CTBS for both second and third grades were then utilized, a total of twenty-seven school systems out of seventy-three. The remaining school systems did not report results for both second and third grades (many had Title I units above second grade only)

or used an achievement test other than the CTBS in reporting test results.

Procedures

In order to survey the Title I Math teachers, a letter was sent to each Title I Coordinator in the twenty-seven school districts involved in this study, requesting that the Coordinator forward an attachment containing the survey form to their primary grade Title I Math teachers. (Names of individual teachers could not be obtained from the Title I Math office in Frankfort; only Title I Coordinators' names are kept on file.) Respondents were asked to return the survey form in an enclosure within three weeks of receipt of the survey. Results of the survey were compiled and analyzed to ascertain if a relationship existed between success of those programs which produced highest achievement test gains and the materials and methods of presentation utilized in those programs. Materials and methods used in those systems which produced lower achievement gains were also analyzed to determine if a relationship existed between limited achievement growth and approaches utilized.

The two major aspects of the survey were concerned with (a) materials used in Title I Math programs--respondents were asked to identify whether their program was established upon a commercial--"packaged" materials approach; a "teacher-made" materials--teacher-created approach, utilizing units of work or packets developed by the teacher; or a combination of both

approaches. In those school systems which utilized a commercial materials approach, respondents were asked to name the companies whose programs they used; findings are reported in a summary which lists programs Title I Math teachers may want to utilize as a point of reference in planning their curriculum.

The second aspect of this study dealt with the methods of presentation used by Title I Math teachers in each school system surveyed; respondents were asked to identify which of the following approaches is employed in their school systems: (1) Pull-out--students removed from classroom; services on 1:1 basis from aide; (2) pull-out--students removed from classroom; services on 2:1 basis from aide; (3) pull-out--students removed from classroom; services from a teacher in groups of ten or more students; (4) pull-out--students removed from classroom; services from a teacher in groups of fewer than ten students; (5) pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more; (6) pull-out--students removed from classroom; services from an aide and a teacher in groups of fewer than ten students; (7) students receiving direct services from aide in the classroom (no pull-out); and (8) respondent was to list any other approach utilized. Findings were analyzed to identify which methods of presentation apparently facilitated higher test gains.

Following analysis of the teacher survey results, a report was drawn up outlining findings of the study which includes descriptive interpretation of the survey results.

Limitations of the Study

In conducting a study of Title I Math programs in Kentucky, certain factors contribute to the limitation of the study to a small number of school systems. The study is based upon Title I Math achievement test results reported for 1978-79; test results for 1979-80 are currently being analyzed by the Title I Math office in Frankfort; their report will not be completed for several months. Regarding validity, 1978-79 was the last year for many school systems to utilize the same instrument--the CTBS--in their testing programs; since that time, many systems have changed to the CAT or some other test, making it an almost impossible task to locate school systems which utilize the same tests. In elementary schools, test results for the primary grades (K-3) were reported mainly above first grade, limiting the study of primary grades to second and third; in many instances, Title I Math programs originated at the third grade level, omitting many more school systems from the study due to insufficient information.

Obtaining names of individual Title I Math teachers for purposes of mailing the survey form directly proved to be impossible, as the Title I office in Frankfort did not keep a list of individual teachers; rather, a list of Title I Coordinators for each system was filed. Test results were reported in summary form for the State and not for each district; therefore, it was necessary to visit the Title I office in Frankfort and search through files for all 181 school systems to obtain names of school systems utilizing

the CTBS in 1978-79, and to obtain actual test results for each system. Upon completion of this research in Frankfort, it was learned that seventy-three school systems had a Title I Math program; of that number, only twenty-seven reported test results on the CTBS for both second and third grades for 1978-79, making them eligible for this study. Return of the survey form was voluntary; sufficient survey returns--63.3 percent--were realized, enabling the study to progress.

Use of the Data

The results of this study produced data which has implications for Title I Math teachers and Coordinators in planning and implementing Title I Math programs. The study provides suggestions to consider in selecting from the hundreds of commercial (packaged) Math programs on the market, referring to those programs which were utilized in those school systems which have produced higher gains in Math achievement test scores. Also, from this study conclusions were drawn concerning program planning and techniques from successful school systems which reported utilizing approaches other than commercial materials. However, reporting was carefully guarded to avoid associating gains only with type(s) of programs; in addition, findings were reported regarding which of the eight types of presentations were most prevalent in successful Title I Math programs. This information should be of interest to Title I Coordinators in providing for staff and supportive personnel.

The amount of information available to Title I Math teachers and Coordinators regarding programs and practices in Kentucky was almost nil; this study provides some information which should be of interest to those involved in Title I Math programs, both at the State and local levels.

IV. Survey Results

In October, 1980, the Title I Math Teachers' Survey forms and accompanying letters were mailed to Title I Coordinators in the twenty-seven Kentucky school systems selected for this study, requesting that the Coordinators forward the survey to their elementary Title I Math teacher(s). The teachers were requested to return their completed survey forms in an enclosed stamped, addressed envelope within three weeks of their receipt of the forms. Respondents to the survey were sent a follow-up letter of appreciation for their interest and were invited to visit the Bowling Green Title I Math program (see Appendix D).

At the end of the month following the mail-out of survey forms, the State Title I Conference was held in Louisville; respondents to the survey were invited to visit the Bowling Green Title I exhibit. During the Conference, interviews were held with several Title I Math teachers who responded to the survey.⁷ This opportunity to share additional information enhanced the survey findings and provided insight into aspects of Title I Math programs which were not included on the survey form. The researcher attempted to contact

⁷Interviews with Title I Math Teachers from McLean County; Nicholas County; Oldham County and others, Louisville, Kentucky, 21 November 1980.

representatives of those school systems which had not responded to the survey; these efforts resulted in the return of three additional survey forms.

Returns were completed by December, 1980; 63.3 percent of the survey forms were returned. Sixty percent of the survey forms from school systems which had reported higher (gain of one year or more) test results on the CTBS for 1978-79 were returned; 66.6 percent were returned from school systems which reported lower (gain of less than eight months) test results, yielding a mean return of 63.3 percent. As the forms were received, each school system was assigned a code to assure privacy for the respondents. School systems which had reported higher test results were coded A through H(2); school systems which had reported lower test results were coded I through O. In six instances, sets of completed survey forms were returned from two different Title I Math teachers in the same school system; for purposes of identification, those were coded with either a (1) or (2) following the initial code letter.

Of all forms which were returned, two were labeled as ineligible for use in reporting results--one from a higher-scoring school system which indicated that their Title I Math program is no longer in existence and one from a lower-scoring program which reported results from a middle school rather than an elementary school.

Many respondents volunteered additional information concerning various aspects of their programs in regard to

program design, materials, class schedules, etc. (See Appendix E)

Data reported in this study included findings for thirteen Title I Math programs representing eight school systems which produced higher CTBS test results than the other eight Title I Math programs representing seven school systems which responded to the survey. All returned survey forms included the optional name and address for each school system represented. In analyzing the information, the first question studied related to the type(s) of teaching presentations utilized by the Title I Math teachers. Teachers were asked to indicate which of the following methods of organization were applicable to their situation:

- (a) Pull-out--students removed from classroom; services on 1:1 basis from aide
- (b) pull-out--students removed from classroom; services on 2:1 basis from aide
- (c) pull-out--students removed from classroom; services from teacher in groups of ten or more students
- (d) pull-out--students removed from classroom; services from teacher in groups of fewer than ten students
- (e) pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more students
- (f) pull-out--students removed from classroom;

services from an aide and a teacher in groups of fewer than ten students

(g) no pull-out; students receive instruction from direct services aide in classroom

(h) any other method of organization not listed in (a) through (g).

Results of this aspect of the study are given in Chart 1.

It is noted that 46 percent of the schools with higher CTBS test results reported more than one major method of program presentation, while only 12.5 percent of the lower-scoring school systems indicated more than one major method of program presentation.

Of the higher-scoring school systems, 34.6 percent were organized by method (d) pull-out--students removed from classroom; services from teacher in groups of fewer than ten students; 31.5 percent by method (f) pull-out--students removed from classroom; services from an aide and a teacher in groups of fewer than ten students; and the remaining 33.9 percent were scattered among methods (a) pull-out--students removed from classroom; services from aide on 1:1 basis (8.5 percent); (b) pull-out--students removed from classroom; services on 2:1 basis from aide (3.8 percent); (c) pull-out--students removed from classroom; services from teacher in groups of ten or more students (5.4 percent); and method (e) pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more students (16.2 percent).

In contrast, 54.2 percent of the lower-scoring school

CHART 1

Method of Organization of Selected Title I Math Programs in Kentucky

Method of Organization	Percentage of Programs	
	Higher-scoring systems	Lower-scoring systems
(a) Pull-out--students removed from classroom; services on 1:1 basis from aide	8.5	-0-
(b) Pull-out--students removed from classroom; services on 2:1 basis from aide	3.8	-0-
(c) Pull-out--students removed from classroom; services from teacher in groups of ten or more students	5.4	16.6
(d) Pull-out--students removed from classroom; services from teacher in groups of fewer than ten students	34.6	54.2
(e) Pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more students	16.2	4.2
(f) Pull-out--students removed from classroom; services from an aide and a teacher in groups of fewer than ten students	31.5	12.5
(g) No pull-out; students receive instruction from direct services aide in classroom	-0-	12.5
(h) Any other method of organization not listed above	-0-	-0-

systems were organized by method (d) pull-out--students removed from classroom; services from teacher in groups of fewer than ten students; 16.6 percent by method (c) pull-out--students removed from classroom; services from teacher in groups of ten or more students; 4.2 percent by method (e) pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more students; 12.5 percent by method (f) pull-out--students removed from classroom; services from an aide and a teacher in groups of fewer than ten students; and 12.5 percent by method (g) no pull-out--students receive instruction from direct services aide in classroom.

The next focus of this study related to the length of existence of the Title I Math program in each school system; years of Title I Math teachers' experience in the Title I program; and whether the Title I Math program was full-time in the school system or part-time (example: half-time Title I Math; half-time Title I Reading or Readiness). (See Chart 2.)

In the higher-scoring school systems, length of existence of the Title I Math program ranged from two to ten years (mean 5.4 years); teachers' years experience in Title I Math ranged from two months to ten years (mean 3.3 years); and 96 percent of the programs were full-time Title I Math within their respective schools.

In the lower-scoring school systems, length of existence of the Title I Math program ranged from two years to ten years (mean 7.1 years); teachers' years experience in Title I Math ranged from two months to five years (mean 2.5 years);

CHART 2

Length of Existence of Title I Math Programs in Selected Schools in Kentucky; Teaching Experience of Personnel; Duration of Programs

Length of Existence of Program in Selected Schools	Teacher's Years Experience in Title I Math	Program: Full- or Part-Time in School?
School System:		
A 10 years	4 years	Full-time staff member serving one school
B(1) 2 years	1 year 2 mo.	"
B(2) 4 years	2 years	"
C 2 years	2 years	"
D(1) *	10 years	Half-time Reading and Math program
D(2) 10 years	4 years	Full-time Math; one school
E(1) 4 years	4 years	"
E(2) 5 years	5 years	"
F 6 years	6 years	"
G(1) 7 years	1 year	"
G(2) 7 years	1 year	"
H(1) 3 years	2.5 years	"
H(2) 5 years	2 months	"
MEAN: 5.4 years	3.3 years	96% Full-time Math
I 2 years	2 years	Full-time Math; one school
J 4 years	2 months	*
K(1) 6 years	3 years	Full-time Math; one school
K(2) 6 years	5 years	"
L 4 years	4 years	"
M *	3 years	"
N 9 years	2.5 years	"
O 10 years	2 months	"
MEAN: 7.1 years	2.5 years	81% Full-time Math

*Insufficient information given

and 81 percent of the programs were full-time Title I Math units within their respective schools.

The next major aspect of this study dealt with the type(s) of programs utilized by the school systems and the amount of teaching time spent on the programs--whether a commercial program, teacher-made units/packets approach, or other method was employed. (See Charts 3 through 5)

Of the higher-scoring school systems, 100 percent reported utilizing a commercial program or programs at least part of the time--a mean of 37.9 percent for actual time spent on commercial materials; 92.3 percent spent some time on teacher-made materials--a mean of 41.3 percent for actual time spent on units or packets developed by the Title I Math teacher; and 84.6 percent spent a portion of their time utilizing games or other approaches--a mean of 20.8 percent for actual time devoted to games, etc.

Of the lower-scoring school systems, 62.5 percent reported utilizing a commercial program or programs at least part of the time--a mean of 31.3 percent for actual teaching time spent on commercial materials; 87.5 percent designated time to teaching from their own units or packets of work--a mean of 55.6 percent; and 75 percent spent time teaching from games or other approaches--a mean of 13.1 percent for this approach.

It is interesting to note that, of the commercial materials utilized by both high-and low-scoring school systems, no one program was utilized above all others. For each

CHART 3

Utilization of Teaching Time Regarding Materials in Title I
Math Programs in Kentucky:

Percentage of Time Spent by Title I Math Teachers on Teaching from Commercial Materials/Programs: Teaching Time Spent on Teacher-Made Units or Packets of Work: Teaching Time Spent on Other Approaches-- Games, etc.:

School System:	Percentage of Time Spent by Title I Math Teachers on Teaching from Commercial Materials/Programs:	Teaching Time Spent on Teacher-Made Units or Packets of Work:	Teaching Time Spent on Other Approaches-- Games, etc.:
<u>Higher Scoring School Systems:</u>			
A	50%	33.3%	16.7%
B(1)	30%	60%	60%
B(2)	15%	60%	25%
C	33.3%	33.3%	33.3%
D(1)	100%	-0-	-0-
D(2)	10%	80%	10%
E(1)	40%	40%	20%
E(2)	30%	40%	30%
G(1)	20%	60%	20%
G(2)	20%	60%	20%
H(1)	45%	40%	15%
H(2)	80%	20%	-0-
MEAN:	37.9%	41.3%	20.8%
<u>Lower-Scoring School Systems:</u>			
I	40%	50%	10%
J	-0-	100%	-0-
K(1)	40%	40%	20%
K(2)	40%	40%	20%
L	80%	-0-	20%
M	50%	25%	25%
N	-0-	90%	10%
O	-0-	100%	-0-
MEAN:	31.3%	55.6%	13.1%

Commercial Materials/Programs Utilized:

School District	Materials/Programs
* A	SRA; McCormick Mathers Math Lab; DPMP
B(1)	ICSP
B(2)	SRA
C	Addison-Wesley; Houghton-Mifflin
D(1)	Holt
D(2)	Holt
E(1)	Steck-Vaughn Workbooks
E(2)	Cuisenaire Rods; Addison-Wesley; Scholastic; Hoffman
F	Early Math; Let's Learn to. . . Add, Subtract, Multiply, Divide; Musical Multiplication
G(1)	Systems 80; Benton Modern Mastery Drills Workbooks; Love & Hayes Duplicating Masters
G(2)	Same as G(1)
H(1)	Fountain Valley
H(2)	Same as H(1)
**I	BASE; Holt; Kid's Stuff Math
J	(Did not utilize commercial materials)
K(1)	BASE; Hoffman; Math-a-Dot
K(2)	Continental Press Ditto Masters; Arithme- toons; Merrill Ditto Masters
L	BFA Computational Skills; EDL Arithmetic Skills
M	Distar II; Veri-Tech Math Lab
N	(Did not utilize commercial materials)
O	(Did not utilize commercial materials)

*School systems A through H(2) reported higher achievement test results than schools I through O.

**School systems I through O reported lower achievement test results than schools A through H(2).

Games, Other:

School District	Games, Other
*A	Incentive for Learning, Inc., Folder Games
B(1)	Digitor Tutors; Little Professor and Charlie Calculators
B(2)	(General Math games, calculators, board races)
C	Cuisenaire Rods
D(1)	(Did not utilize games or other approaches)
D(2)	Teacher-made cassette tapes
E(1)	Dataman and Little Professor Calculators; the Numbrella Tree game
E(2)	(General manipulatives, games, and calculators)
F	Homemade games; Little Professor
G(1)	General games; Classmate 88 Calculator
G(2)	Same as G(1)
H(1)	Charlie Calculator; Dominoes; Fraction Bars
H(2)	(Did not utilize games or other approaches)
**I	Calculators
J	(Did not utilize games or other approaches)
K(1)	Frank Schaffer Gameboards; Tingo Discs; Smarty Tortoise and Hare Game
K(2)	Number Rummy; Flash Cards; Quizmo; Crypto
L	EDL Game Frame; Little Professor
M	Cuisenaire Rods
N	Comp IV Computer Game
O	(Did not utilize games or other approaches)

*School systems A through H(2) reported higher achievement test results than schools I through O.

**School systems I through O reported lower achievement test results than schools A through H(2).

school system, answers varied greatly, with few reporting utilization of the same materials.

Another aspect of this study requested that survey respondents list resource materials they found helpful if they did not utilize any commercial programs a major portion of their teaching time, indicating which materials they found to be the most and least effective with their students. No particular program was identified more than any other as unusually outstanding or as ineffective by Title I Math teachers in both high- and low-scoring school districts. Teachers from both groups indicated conflicting opinions regarding the value of various commercial programs, as well as the worth of using teacher-made materials, games, and other approaches. (See Appendix F)

V. Conclusions and Recommendations

The major objectives of this study were as follows:

1. To conduct a survey of twenty-seven Title I Math teachers in Kentucky to determine

(a) Type(s) of teaching presentations utilized in school systems reporting either very high (gain of one year or more) or limited (gain of less than eight months) gains in Math achievement scores on the CTBS for 1978-79.

(b) Which materials/programs utilized in school systems resulted in either high or limited gains in Math achievement scores on the CTBS for 1978-79.

2. To utilize the survey results in preparing a report which will outline the findings of this study and to develop a model plan for use in planning Title I Math programs--suggesting methods, materials, and organizational design(s) for instruction.

The mean return of 63.3 percent of survey forms yielded a sufficient sampling of school systems for the study to progress; this section of the report will concentrate on objective (2), expanding the findings for objective (1) (a) and (b) as described in Chapter IV, Survey Results and Summary of Findings.

For the purpose of simplification, and to insure

readability, Chart 1 should be referred to in reviewing results reported in this section; in addition, the eight organizational methods of arrangement of Title I programs are repeated for reference below:

Methods of Organization of Selected Title I Math Programs in Kentucky:

- (a) Pull-out--students removed from classroom; services on 1:1 basis from aide
- (b) pull-out--students removed from classroom; services on 2:1 basis from aide
- (c) pull-out--students removed from classroom; services from teacher in groups of 10 or more students
- (d) pull-out--students removed from classroom; services from teacher in groups of fewer than ten students
- (e) pull-out--students removed from classroom; services from an aide and a teacher in groups of ten or more students
- (f) pull-out--students removed from classroom; services from an aide and a teacher in groups of fewer than ten students
- (g) no pull-out; students receive instruction from direct services aide in classroom
- (h) any other method of organization not listed above

The majority of both high-and low-scoring Title I

Math programs was organized by method (d); 66.1 percent of the higher-scoring programs were organized by a combination of (d) and (f), similarly, 66.7 percent of the lower-scoring programs were organized by (d) and (f). These findings indicate that a pull-out program served by a teacher in groups of fewer than ten students is the most common arrangement in those school systems surveyed.

Upon closer scrutiny of survey results, a more notable finding is indicated by the distribution of the remainder of the programs into the other categories: those school systems reporting higher CTBS Title I Math scores are distributed by thirds into the following patterns--34.6 percent into (d); 31.5 percent into (f); and 33.9 percent into (a), (b), (c), and (e), thus illustrating that two-thirds of the systems which produced higher test results serve students in a setting of fewer than ten students, assisted by a teacher or a teacher and an aide; the same results are reported for the school systems which reported lower test results. Perhaps most significant is the distribution of the systems into categories organized by groups of more than ten students--higher-scoring systems report 5.4 percent for (c); 16.2 percent for (e); lower-scoring systems report 16.6 percent for (c); and 4.2 percent for (e). Conversely, no higher-scoring systems were organized by (g), but 12.3 percent were organized by a combination of (a) and (b); no lower-scoring systems were organized by (a) and (b), but 12.5 percent were organized by (g). These results suggest that small-group settings, contact with a teacher and a teacher and an aide in a pull-out

situation, and a low student-teacher ratio are among the factors which influence students' Math achievement; however, this aspect of the study should not be singled out as the one most important element which may affect achievement--many other variables enter into the program when viewed as a whole.

Objective 1(b) directs this study to the types of materials/programs utilized by the school systems included in the survey.

As illustrated by Chart 3, teaching time is divided into three major categories:

- (a) teaching from commercial materials/programs
- (b) teaching from teacher-made units or packets of work
- (c) other approaches--games, etc.

Results illustrate that more teaching time was spent on teaching from teacher-made units/packets by both high- (41.3 percent) and low-(55.6 percent) scoring school systems; second in preference was the utilization of commercial materials/programs: higher-scoring systems, 37.9 percent; lower-scoring systems, 31.3 percent; third, games and other approaches, higher-20.8 percent, lower-13.1 percent.

In comparing the two sets of results, it is apparent that the higher-scoring systems achieved a more even balance of time spent between categories (a) and (b), with 20.8 percent of their time devoted to (c). From this standpoint, it would appear that teaching time divided between commercial materials and teacher-made units/packets enabled students to

experience a greater success in Math achievement. The lower-scoring systems devoted over half (55.6 percent) of their teaching time to their own devices, while spending only 31.3 percent of their time on commercial programs. A small percentage of their time (13.1 percent) was spent on games and other approaches. As most commercial materials/programs are sequenced according to level of difficulty, and arranged into units or modules according to the concept(s) to be presented, the organization of the materials/programs and concentration on mastery of one skill or concept before moving on to new ideas may contribute to the achievement of those students who spend more time utilizing this approach. As evidenced by the results for the higher-scoring systems, a balance of commercial and teacher-made materials (which reinforce and supplement concepts and applications presented in commercial materials) may account for a better atmosphere of learning for Math students; however, care must be taken to avoid assuming that this factor alone influences achievement scores. The expertise of the teacher who presents the materials, creates the packets of work, and structures the students' learning situation must be considered as influential as the materials upon students' achievement.⁸

Attention must be given to the fact that teachers from both groups expressed concern in selecting appropriate materials which were geared to the needs, interests, and abilities

⁸National Institute of Education, Research Within Reach--Elementary School Mathematics; Evaluation in Mathematics Education, R & D Interpretation Service, CEMEREL, Inc., NIE (1980).

of their students--materials which were adaptable, and permitted flexibility in planning. Teachers indicated that their students represented several age groups from more than one grade level, resulting in a wide range of needs related to Math materials; because of the differences in students, no one program or approach to teaching Title I Math was preferred or felt to be more effective than any other. This factor is evidenced in Title I Math programs across the state.⁹

Therefore, it can be concluded that there is no "one answer" to selecting materials/programs, creating packets or units of work, or using games and other approaches; rather, a balanced approach which pays heed to the abilities and needs of the students, pulling resources from commercial materials, permitting the teacher to develop work packets as needed, and utilizing any other methods, is advisable in planning a Title I Math curriculum.

Finally, one other variable which may affect students' achievement in Title I Math programs relates to the length of existence of the program within the school, the teachers' years of experience in the program, and whether the program is part-time or full-time.

As outlined in Chart 2, the length of existence of the Title I Math program averaged 5.4 years for the higher-scoring school systems and 7.1 years for the lower-scoring school systems, suggesting that length of program existence

⁹Interview with Bill Padon, State Title I Program Coordinator, Bowling Green, Kentucky, 4 February 1981.

does not necessarily assure that students' achievement will be increased in proportion. Even more significant is the number of years' teaching experience of Title I Math teachers--less than half a year's difference was reported for the two groups--3.3 years for the higher-scoring systems and 2.5 years for the lower-scoring systems. In both instances, results indicated that the Math teachers had averaged a rather small amount of time in the Title I program compared to the length of existence of the program; the amount of experience was comparable for the two groups. Ninety-six percent of the higher-scoring systems had a full-time Title I Math teacher, as compared to eighty-one percent full-time for the lower-scoring systems. These high percentages do not represent enough contrast to assume that this aspect is influenced by the structure of the Math program in combination with Reading and/or Readiness programs, or existing as separate units from the other programs.

Recommendations

The following recommendations are for the planning and implementation of a Title I Math program at the elementary primary level; it should be noted that success of the program will be determined by a variety of factors, possibly including several of these:

Attempt to provide:

1. A pull-out program in which students are removed from the classroom, served by a teacher in groups of fewer than ten students, and/or
2. A pull-out program in which students are removed from the classroom, served by an aide and a teacher in groups of fewer than ten students.
3. Utilize a variety of commercial materials in program implementation, selecting according to the needs of the students.
4. Utilize teacher-made packets/units of work to reinforce areas in which students need practice; to build upon skills; to supplement commercial materials.
5. Provide games and other approaches occasionally as an alternative to routine daily work.
6. Be flexible in planning, teaching, and evaluation

of the Title I Math program, keeping students' abilities, needs, and interests as the main consideration.

APPENDICES

APPENDIX A

Title I Math Unit
L. C. Curry School
Durbin Drive
Bowling Green, KY 42101

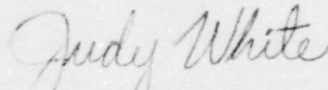
Dear Title I Coordinator,

I am a Title I Math teacher at L. C. Curry Elementary School in Bowling Green, I am completing an Ed.S. degree in School Administration at Western Kentucky University; as part of my Specialist's Project, I am conducting a survey of certain elements of Title I Math programs in Kentucky. My interest is in learning about various programs and approaches utilized by Title I Math teachers, and in the results produced by these programs.

One facet of this study involves a questionnaire to be completed by Title I Math teachers on a voluntary basis. As I do not have a listing of individual teachers' names (only a list of each district's Title I Coordinator), I would appreciate your forwarding the enclosed letter and return envelope to the elementary Title I Math teacher(s) in your school system.

Thank you for your assistance. If you are in Bowling Green, I would welcome you to visit my classroom, and would enjoy talking with you about the Title I Math program in your school system.

Very sincerely,



Judy White
Title I Math Teacher

APPENDIX B

Title I Math Unit
L. C. Curry School
Durbin Drive
Bowling Green, KY 42101

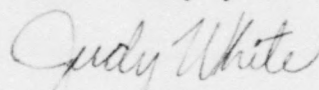
Dear Fellow Title I Math Teacher,

I am a Title I Math teacher at L. C. Curry Elementary School in Bowling Green. I am completing an Ed.S. degree in School Administration at Western Kentucky University; as part of my Specialist's Project, I am conducting a survey of certain elements of Title I Math programs in Kentucky. My interest is in learning about various programs and approaches utilized by Title I Math teachers, and in the results produced by these programs.

One facet of this study involves the enclosed questionnaire to be completed by Title I Math teachers on a voluntary basis. Your sharing of information will also help me to strengthen the Title I Math program in my classroom. I would sincerely appreciate your taking a few moments to respond to this questionnaire, and returning it to me in the attached stamped, addressed envelope.

Thank you for your cooperation. I hope to have the opportunity to visit with you in the future. Please feel free to visit my classroom if you are in Bowling Green. I would enjoy sharing ideas with you.

Sincerely yours,



Judy White
Title I Math Teacher

APPENDIX C

Title I Math Elementary Survey

Please complete the following form and return in the attached stamped, addressed envelope to: Judy White, Title I Math Unit, L. C. Curry Elementary School, Durbin Drive, Bowling Green, KY 42101. I would appreciate your returning this form within 3 weeks of your receipt of this document--thank you for your cooperation!

1. Name _____ Date _____
2. School _____ District _____
 School Address _____
 School Phone _____
3. Presentation (Method of Organization) of the Title I Math Program in your school (please check the ones which apply):
 - (a) Pull-out--students removed from classroom; services on 1:1 basis from aide _____
 - (b) Pull-out--students removed from classroom; services on 2:1 basis from aide _____
 - (c) Pull-out--students removed from classroom; services from a teacher in groups of 10 or more students _____
 - (d) Pull-out--students removed from classroom; services from a teacher in groups of fewer than 10 students _____
 - (e) Pull-out--students removed from classroom; services from an aide and a teacher in groups of 10 or more students _____
 - (f) Pull-out--students removed from classroom; services from an aide and a teacher in groups of fewer than 10 students _____
 - (g) No pull-out--students receiving direct services from aide in the classroom _____
 - (h) Other (please list) _____
4. How long has the Title I Math Program been in your school? _____
5. How long have you taught in the Title I Math Program? _____
6. Do you teach Title I Math full-time? _____ In one school? _____
7. On the following page, please list the major Math program(s) you use in your classroom, by grade level(s); example: the Hoffman program, the DPMP program, SVE Beginning Math Concepts Kit, any cassette/worksheet programs, etc. Also, _____

APPENDIX C (continued)

please indicate the number of students you teach at each grade level:

Grade Level:	Program(s) Utilized:	Number of Students Served:
Readiness	_____	_____
1st	_____	_____
2nd	_____	_____
3rd	_____	_____
4th	_____	_____
5th	_____	_____
6th	_____	_____
7th	_____	_____
8th	_____	_____
9th	_____	_____
Other (please list)	_____	_____

Readiness _____
 1st _____
 2nd _____
 3rd _____
 4th _____
 5th _____
 6th _____
 7th _____
 8th _____
 9th _____
 Other (please list) _____

8. If you do not utilize any programs a major portion of the time (example: if you create your own packets or units of work), please describe the Math program in your classroom, listing any resource materials you find helpful: _____

9. Of the program(s) you listed, which do you feel are the most effective with your students, and why? _____

Which do you feel are the least effective, and why? _____

10. What other methods, teaching techniques, or materials do you use that you find especially effective (example: games, computers, Chisanbop, calculators, etc.)? _____

11. Please indicate the amount of time you utilize in teaching (by percentages): Commercial "packaged" programs you listed above _____; your own units or packets of work _____; other approaches (games, etc.) _____.

12. Please utilize the remaining space to add your comments regarding the Title I Math program, or to offer suggestions:

APPENDIX D

Title I Math Unit
L. C. Curry School
Durbin Drive
Bowling Green, KY 42101

Dear

I would like to thank you for your response to the Title I Math Teachers' Survey which I recently sent you.

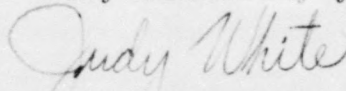
I sincerely appreciate your taking time out from your busy schedule to complete the form.

The responses I am receiving are most interesting. I am finding that the survey results will benefit my students even more than I imagined by giving me an abundance of ideas and information concerning Title I Math program resources throughout Kentucky.

Hopefully, I will be seeing you at the State Title I Conference in Louisville on November 21-22. Our school system will be exhibiting materials used in our Title I program in the Corn Island Room at the Galt House. I hope that you can stop by--I would enjoy meeting and talking with you. Also, I would like to invite you to visit our Title I Math program at L. C. Curry School at any time.

Thank you again for your kind response to my survey.

Very sincerely yours,



Judy White
Title I Math Teacher
(502) 842-0941

APPENDIX E

Title I Math Teachers' Comments and Suggestions Concerning
The Title I Math Program (Voluntary Responses):

School
Code:

Comments, Suggestions:

- A "I believe the Title I Math Program needs to be set up in a different manner. Instead of being for students below (the) fiftieth percentile I believe the program should be opened to all students for those particular areas where he/she is having problems. Instead of students pulled out for certain period(s) of time I would like to see program set up as a Math Resource Room supervised by Remedial Math teachers in the particular school. As any student encounters problems in any area of math, that student is sent immediately to the resource room for extra help on that area. When he understands and can perform he goes back to regular room to move on to next skill. Naturally, the lower the student the more often he'll need help. I feel this would benefit more people. Also it might help to improve the image of Title I teachers."
- C "I believe the most critical factor is diagnosis first and then prescription for instruction with continual evaluation of the effectiveness of both materials and methods."
- E(2) "As in any program, the teacher makes the difference."

APPENDIX E (continued)

The more involved the teacher becomes with the students, the better the performance tends to be. Also, I have a file, by skill, of material. Therefore, if I want to teach Graphing, I go to that file for appropriate material and activities pulled from various sources. I use particular packets with a group according to need: for example, there are certain materials that I ditto and staple together in a booklet for practice on a concept (example: subtraction w/regrouping) after teacher presentation, explanation, and examples."

- H(2) ". . . I highly recommend a system such as Fountain Valley. It is very organized system of teaching mathematics."
- I "Have a workshop--in-service program fitted to the needs of Title I Math program staff."
- J "We have found that we can get more mileage for our money through aides than through teachers, but we're better satisfied with release-time aides than direct services aides."
- K(2) "I've seen improvement every year since the program began and the only suggestion I can make is that the earlier you can begin working with them (students) the more results you can see. For instance last year I picked up six first graders after Christmas and this year only one pupil of that group is back."

APPENDIX F

Title I Math Teachers' Comments Concerning the Effectiveness
of Commercial Materials Utilized in Their Programs:

School Teachers' Comments as to Commercial Materials/Programs
Code: Which Are the Most Effective and Those Which Are the
Least Effective With Their Students:

A Most Effective: "I use the Math Lab and DPMP Program
. . . The SRA. . . 'The Math Group, Inc.'. . . also
'Disney Mathematics'. . . All the programs are very
effective, some more than another with particular
children. . ."

Least Effective: ". . . the McCormick Mathers
Mathematics Laboratory. The children simply become
bored with it quickly."

B(1) Most Effective: "I believe well chosen games can be
all around more effective for what most of my students
have needed."

Least Effective: ". . . if I were told to drop one
segment of my program, Computational Skills or ICSP
would be the first to go."

B(2) Most Effective: "Games, flashcards, and boardraces."

Least Effective: "SRA Diagnosis Kit-it seemingly bores
them (the students)."

C Most Effective: "Teacher-prepared because, through
experience, we had collected and combined the most
effective materials for our students."

Least Effective: "Houghton-Mifflin is not presenting

APPENDIX F (continued)

enough challenge for stronger students and their (H-M) scarcity of story problems weakens application skills."

- E(1) ". . . Gaining Math Skills (McCormick Mathers); Ready, Go Mathtapes; Kid's Stuff Math and games; Arithme-
toons; Moving Up in Money and Moving Up in Time."
[The abovementioned were the most effective for
school system E(1).]

Least Effective: "Cuisenaire-time-consuming; The
Six Wonderful Records of Facts-too boring; Programmed
Math-had answers and they could not be covered. I
have ordered several games that are too hard."

- E(2) Most Effective: "Chip Trading; Addison-Wesley; and
Scholastic."

Least Effective: "Hoffman-explanations are less clear,
and it leaves a gap in the time between the student
having a question and the teacher being available for
the answer."

- F Most Effective: "Homemade games, records, individual
folders on problem areas."

Least Effective: "Early Math I, II, III."

- G(1) Most Effective: ". . . duplicating masters and teacher
and
G(2) made materials. . . can meet individual needs better."

Least Effective: "System(s) 80 in older groups-
materials are too elementary."

- H(1) Most Effective: "The students especially love listening

APPENDIX F (continued)

to S. R. A. Math Computapes. They begin with 'upbeat' music, tell a story and teach a math skill then check the problems with the students."

Least Effective: "Any kit that presents math problems (or dittos) without catchy illustrations or something that will get a child's attention--i.e. Skill Modes; Gaining Math Skills; Fact Pacer Kit."

I Most Effective: "Milliken Math Word Problem Worksheets, BASE Diagnostic Test. . . each is effective for the specific purpose I use it for." (No comments were included for the least effective materials from school system I.)

K(1) Most Effective: "BASE--identifies skills to be taught and I develop folders with different materials to teach the different skills." [No comments were included for the least effective materials from school system K(1).]

K(2) Most Effective: "Steck Vaughn SIM workbooks. They're interesting and yet have a lot of drill without being monotonous. They cover the basic skills."
Least Effective: "I have the Hoffman Program but don't use (it). . . too much 'Modern Math' seems to confuse the students."

L Most Effective: "EDL Compu-Cards (McGraw-Hill) individualized-self checking-good management system."

M Most Effective: "Distar II with second graders--the

APPENDIX F (continued)

repetition, participation of students, and work sheets are effective. The test results at the end of year show improvement." (No comments were included for the least effective materials from school system M.)

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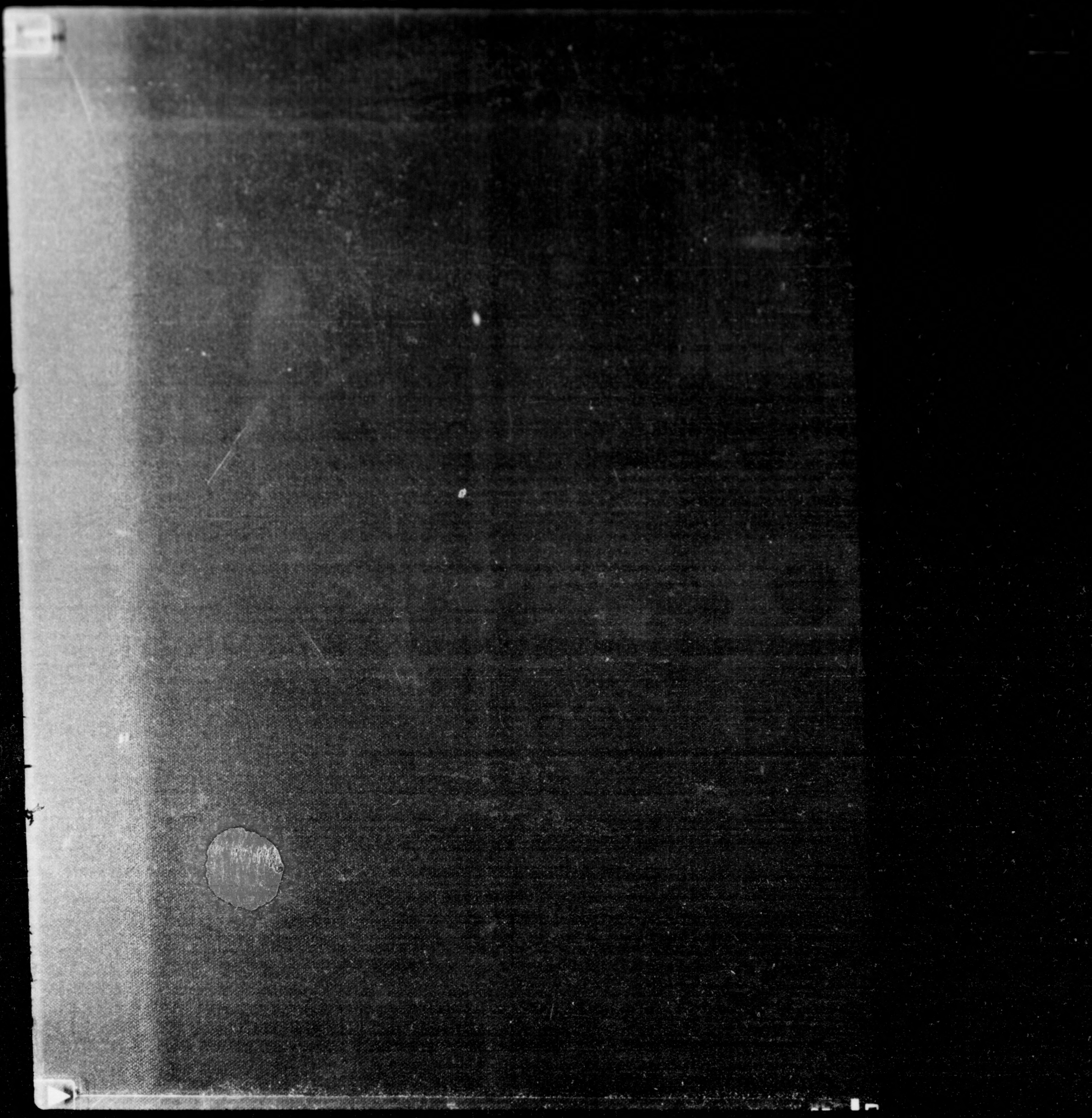
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CORRECT A POSSIBLE ERROR***

Bill, F9