

HETEROGENEOUS VERSUS HOMOGENEOUS
GROUPING FOR INSTRUCTION
FOR GRADES FIVE THROUGH EIGHT

THESIS

Submitted to the Graduate Committee of the
Department of Education and Human Development

State University of New York

College at Brockport

in Partial Fulfillment of the
Requirements of the Degree of
Master of Science in Education

by

Timothy H. Tanea

State University of New York

College at Brockport

Brockport, NY

August, 1988

SUBMITTED BY:

Timothy H. Taven
Candidate

8/15/88
Date

APPROVED BY:

Meris J. Beem
Thesis Advisor

8/13/88
Date

Patricia C. Baker
Second Faculty Advisor

8-15-88
Date

Monn J. Beem
Director of Graduate Studies

8/15/88
Date

"No information derived from this thesis may be published without permission of the original author, with whom copyright lies."

Abstract

It was the purpose of this study to compare two methods of grouping students in the classroom. A group of 30 students (15 girls, 15 boys) who were homogeneously grouped and then heterogeneously grouped were tested for significant differences in their SAT (Stanford Achievement Test) Reading, Language, and Math scores. There was a significant difference found between the homogeneous and heterogeneous groupings at the .05 level. The results indicate that grouping students homogeneously would be the better method of grouping. Other conclusions and recommendations are made based on the above findings.

Table of Contents

	<u>Page</u>
Table of Contents	i
List of Tables	ii
Chapter	
I. Introduction	1
II. Review of Related Literature	3
III. Statement of the Problem	11
IV. Methods	
Subjects	12
Instrumentation	12
Procedures	12
V. Results	26
IV. Discussion	27
References	29

List of Tables

Table	<u>Page</u>
I.	Reading SAT Scores by Grade Level 14
	Source Table, Reading ANOVA 15
	Summary Statistics for Reading Scores 16
II.	Language SAT Scores by Grade Level 17
	Source Table, Language ANOVA 18
	Summary Statistics for Language Scores. 19
III.	Math SAT Scores by Grade Level 20
	Source Table, Math ANOVA 21
	Summary Statistics for Math Scores 22
IV.	Differences Between Reading Scores 23
	by Grade Level
V.	Differences Between Language Scores 24
	by Grade Level
VI.	Differences Between Math Scores 25
	by Grade Level

Chapter I

Introduction

An ongoing concern of educators, as well as many laymen, is that of a pursuit of excellence in education. One of the areas which is under scrutiny for the achievement of excellence is the area of grouping students for achievement. This is one of the oldest and most emotional issues of our time. Most of the controversy exists over whether it is better to group students homogeneously in classes according to their ability, or whether to group students heterogeneously.

Over time the same basic essential arguments have been advanced on both sides. The proponents of ability grouping have argued that ability grouping lets high achievers move rapidly and gives low achievers attainable goals and extra help. Opponents of ability grouping have countered that ability grouping is unfair to low achievers, citing problems of poor peer models, low teacher expectations, and slow instructional pace. (W. E. Schafer and C. Olexa, 1971), wrote the following excerpt about a personalized view of tracking:

" When you first go to Junior High School you feel something inside--it's like an ego. You have been from elementary to Junior High, you feel great inside . . . You get this shirt

that says Brown Junior High . . . and you are proud of that shirt. But then you go up there and the teacher says, "Well, so and so, you're in the basic section, you can't go with the other kids." The devil with the whole thing-- you lose--something in you--like it goes out of you."

From the above excerpt one can conclude that there needs to be some attention focused on the practice of grouping. This study will examine the achievement of 30 students who at first are grouped heterogeneously in the fifth grade and then grouped homogeneously during their middle school years (grades 6-8).

Chapter II

Review of Related Literature

There are numerous studies and research about grouping dating back as early as the 1920's. Tracking came about according to the research because of the substantial immigration which was taking place and the varying social background, of the individuals. A 1927 dissertation listed eighty-three "selected references" on the topic. Over this period the same basic arguments of today were developed. Proponents have argued that ability grouping lets high achievers move rapidly and gives low achievers attainable goals and extra help. Opponents according to (Slavin, 1986) have countered that ability grouping is unfair to low achievers, citing problems of poor peer models, low teacher expectations, and slow instructional pace.

(Cotton & Savard, 1981) conducted some research on what the proponents of ability grouping were saying. They found that proponents of homogeneous ability grouping argued that the structure accommodates individual differences by allowing students to work at their own rates with others of similar ability and with methods and materials geared to their level. Many other homogeneous grouping advocates claim that

students achieve more and have more positive attitudes within this arrangement.

Those who favor heterogeneous grouping argue for their preference on many fronts. The first being that testing procedures used to place children in homogeneous groups often result in improper placement. Secondly, homogeneous grouping is undemocratic, of adversely affecting the self-concepts of all children by placing a stigma on the numbers of lower groups and higher-ability children in inflated, unrealistic sense of their own worth. Also, most life experiences do not occur in homogeneous ability groups, and interaction in the social context may be impeded. Finally, homogeneous grouping opponents say that this format causes teachers to be less sensitive to individual differences (Cotton & Savars, 1981).

In a review of findings between 1903 and 1972, Esposito (1973) addresses the concern about whether "ability grouping tends to enhance or reduce (the) school learning experience" (p. 163). Esposito contends that periodic reinterpretation of the accumulated research needs to take place for three reasons. First, homogeneous grouping is again a predominant means of classroom organization in public

schools in America, hence its impact should be assessed. Second, a study must be done to see if homogeneous grouping really does interfere with equal educational opportunity for all. Finally, Esposito proposes that periodic re-evaluation of ability grouping is necessary because it can be changed to promote the most productive educational environment.

Esposito also made some conclusions about the impact of grouping achievement, and they seem to differ little from those reached by Miller and Otto (1930) or Findley and Bryan (1975). Ability grouping appears to have a mixed impact upon the achievement of high ability students, while showing an almost uniformly negative influence upon the achievement of middle and low ability students.

It was not until the early 1970's that consistent evidence came forward on the effects of ability grouping on student achievement. Reviewers of the 1960's (e.g., Borg, 1965; National Education Association, 1968; Passou, 1962) generally concluded that research on ability grouping was a "hopeless muddle." For a number of methodological reasons, including poor experimental controls, most studies failed to find this consistent evidence that

achievement scores at the school level were affected by ability grouping (Findley and Bryan, 1971).

As noted in some earlier studies of the 1970's the research designs changed. Instead of comparing school averages, researchers compared the performance of students on high and low ranks within a single type of grouping system. In these studies there are clear findings that emerged demonstrating the existence of a self-fulfilling prophesy (Rist, 1973). Just for example, two other quantitative studies (Alexander and McDill, 1976; Weinstein, 1976) demonstrated that initial inequalities in achievement were actually increased over time by ability group systems.

Later, a line of research attempted to explain the differentials procedured by grouping systems. For example, Brophy and Good (1970) found that good performance was more often elicited from students and reinforced by teachers in higher level groups than in lower level ones, while Nest (1973) observed that teachers spent more instructional time and interacted more with students in higher level groups. But, a replication of Brophy and Good's (1970) study found just the opposite results. Another study (Filly and Barnett, 1981) failed to confirm the hypothesis that

pacing was faster in higher level reading groups, and in fact found faster pacing in lower groups.

Despite the weak support for the self-fulfilling phophesy the data does confirm prior research demonstrating direct groupings effects on achievement with students in higher groups obtaining an achievement advantage over students in lower groups by virtue of their group placement (Rowan and Miracle).

During the 1980's, Robert Slavin and Jeannie Oakes are two of the biggest names in the area of research on grouping. Robert Slavin wrote, in an article on ability grouping, the following quote:

"I felt good when I was with my (elementary) class, but when they went and seperated us--that changed us. That changed our thinking, the way we thought about each other, and turned us into emenies toward each other--because they said I was dumb and they were smart."

Slavin has done a lot of research on elementary and Junior High school students and the effects of grouping on these children. Since the following research is done with this age-group, we are especially interested in his findings. Slavin makes the differentiation in grouping. He says there are two kinds (1) Between class ability, and (2) Within class ability. He contends the research overwhelmingly

suggests there needs to be a change in our grouping patterns.

Slavin says that policy makers and administrators will not accept the research because of some basic reasons; (1) ability grouping makes the job easier for the teacher, (2) new teachers get low-level students, (3) pressure from top-level parents, (4) top track is the mark of status, and (5) probably the most important, that the profession does not value evidence on research. Education will not make any progress until they begin to value research (evidence).

Slavin offers a few options to ability grouping. Mastery Learning, Continuous Progress Model, Individualized Instruction, and Cooperative Learning are a few of these options. Slavin says we must start making changes if we intend to make schools "Humane, equitable, and truly educational places."

Jeannie Oakes suggests that tracking is a social response and not an educational one. Oakes conducted the study for John Goodlad's "A Place Called School" for tracking. She looked at three things (1) access to knowledge, (2) type of instruction, and (3) relationship in class. She looked at both tracked and not tracked students and came up with some interesting

things. She said members of a low-track English class were never exposed to the knowledge of Shakespeare. She noted that high level students get more instructional time than those in low-track classes. Students who are in need of the most instructional time, usually get the least. Oakes also says that "changes in school practice must pass 'social' as well as 'educational tests.'"

It seems that the evidence and research appear to be one-sided, but there are some who say all they are doing is stating the obvious. Yet there seems to be more controversy concerning this issue. Charles Nevi states in an article, that Oakes and Goodlad forget that students come with different abilities, aptitudes, and interests. Nevi says that schools do not create these differences, but the schools must accommodate them, and one way is through grouping students according to their needs and abilities. Nevi says that even Oakes recognizes this.

"Schools must concentrate on equalizing the day-to day educational experiences for all students. This implies altering the structures and contents of schools that seem to accord greater benefits to some groups of students than to others."

A meta-analysis of fifty-two studies of secondary programs found "only trivial effects on the achievement

of average and low-average students." The effect is near zero, with average and below average tracked students, but it is not negative. Nevi supports what he calls appropriate tracking.

It has been shown through this review of literature and studies that there is data and expertise to support both heterogeneous and homogeneous grouping. The conflicting and contradictory studies show the need for more productive research about grouping, and particularly its effect upon achievement.

Chapter III

Statement of the Problem

Will the students show any significant gain in the achievement scores, or will there be no significant difference in achievement scores when students who are grouped heterogeneously in the fifth grade are switched to being homogeneously grouped during their middle school years.

The null hypothesis in this study is that there is no significant difference in being grouped homogeneously or heterogeneously. The alternate hypothesis is that there is a significant difference in being grouped homogeneously as opposed to heterogeneously.

Chapter IV

Methods

Subjects

The sample involved in the study is composed of 30 students from the Newark Central School District in Newark, New York. All of the 30 students were selected from the class of 1990. In order to keep out the extraneous variables (other than heterogeneous versus homogeneous grouping) to a minimum, 15 girls and 15 boys were randomly selected.

Instrumentation

The testing instrument used in this experiment were the fifth grade SAT test, sixth grade SAT test, seventh grade SAT test, and the eighth grade SAT test. The SAT tests were given in the spring of the school in all grade levels. The SAT scores for all four years were collected from the same 30 students. These scores are reported in Tables I, II, and III.

Procedure

An initial analysis was done comparing SAT scores of Reading, Language, and Math in grades 5-8 using one-way analysis of variance (ANOVA) with the repeated measures design. This analysis can be found in the Source Tables for Reading, Language, and Math.

A secondary analysis was done using the testing of significance of means using the following formula:

$d = +[2MS/r]^{1/2}$ (Lindquist, 1953). This secondary analysis was reported in the form of tables of differences between Reading, Language, and Math scores by a grade level.

TABLE I
 READING SAT SCORES BY GRADE LEVEL

SUBJECT	GRADE 5	GRADE 6	GRADE 7	GRADE 8
1	8.5	11.1	12.9	12.9
2	5.9	9.2	8.9	12.0
3	3.0	5.7	5.3	6.1
4	3.5	4.3	6.3	6.6
5	5.5	11.5	10.4	8.3
6	6.9	9.6	12.9	12.9
7	3.7	5.5	12.6	12.9
8	4.4	6.5	8.0	6.1
9	5.5	10.1	9.5	12.6
10	5.2	11.2	11.4	11.5
11	3.3	3.9	6.9	4.9
12	3.8	7.0	8.9	12.6
13	5.8	10.1	12.6	9.2
14	11.2	12.9	12.9	12.9
15	5.9	5.9	7.5	12.6
16	4.5	8.2	7.5	12.9
17	4.7	10.6	6.6	10.9
18	5.9	11.2	12.9	12.9
19	4.0	7.5	12.9	10.4
20	4.2	9.0	12.0	12.9
21	10.7	12.9	12.9	12.9
22	3.2	6.2	5.9	6.3
23	3.8	8.8	7.7	9.2
24	5.3	10.1	8.3	8.0
25	4.0	7.4	8.0	12.9
26	5.5	12.9	7.7	12.9
27	5.3	8.5	6.8	6.9
28	3.8	6.1	7.5	12.0
29	3.3	10.7	6.9	7.5
30	4.9	8.5	7.7	10.9

SOURCE TABLE I

READING ANOVA

SOURCE	SS	DF	MS	F	P
BLOCKS/SUBJECTS	459.185	29			
GRADE LEVEL	465.950	3	155.317	53.045	<.001
ERROR	254.725	87	2.928		
TOTAL	1179.860	119			

SUMMARY STATISTICS
FOR
SAT READING SCORES

	GRADE 5	GRADE 6	GRADE 7	GRADE 8
SUBJECTS	30	30	30	30
MEAN	5.17	8.77	9.28	10.45
STD	1.99	2.54	2.60	2.73
SS	114.56	187.20	196.19	215.95

8.45

TABLE II
LANGUAGE SAT SCORES BY GRADE LEVEL

SUBJECT	GRADE 5	GRADE 6	GRADE 7	GRADE 8
1	7.6	12.3	12.9	12.9
2	6.9	11.2	12.9	12.9
3	3.1	6.7	7.1	6.3
4	5.7	5.3	5.7	6.0
5	6.9	5.8	12.0	12.9
6	6.7	12.3	12.0	12.9
7	3.9	6.1	7.8	6.9
8	3.5	5.5	6.3	6.1
9	6.5	9.7	10.5	12.7
10	6.0	12.9	12.0	11.0
11	3.5	5.0	5.4	5.7
12	3.9	6.4	5.9	9.5
13	6.3	6.7	8.0	8.9
14	12.9	12.9	12.9	12.9
15	8.7	12.9	12.9	12.9
16	6.9	7.9	7.1	8.5
17	5.2	10.4	6.9	7.6
18	7.2	12.3	10.5	12.7
19	5.2	9.0	6.9	6.7
20	5.8	7.4	10.0	12.9
21	10.6	12.9	12.7	12.9
22	4.1	7.0	7.6	3.7
23	4.1	11.2	8.3	3.1
24	4.4	5.5	7.4	7.8
25	3.9	6.7	6.9	6.6
26	9.9	12.9	11.7	9.0
27	6.9	7.9	11.4	11.4
28	3.9	6.4	7.4	7.6
29	3.7	5.3	5.2	5.6
30	5.6	6.7	7.6	7.2

SOURCE TABLE II

LANGUAGE ANOVA

SOURCE	SS	DF	MS	F	P
BLOCKS/SUBJECTS	709.927	29			
GRADE LEVEL	203.183	3	67.728	30.440	<.001
ERROR	193.583	87	2.225		
TOTAL	1106.692	119			

SUMMARY STATISTICS
FOR
SAT LANGUAGE SCORES

	GRADE 5	GRADE 6	GRADE 7	GRADE 8
SUBJECTS	30	30	30	30
MEAN	5.98	8.71	9.06	9.13
STD	2.31	2.93	2.68	3.18
SS	154.52	248.46	207.57	292.96

8.22

TABLE III

MATH SAT SCORES BY GRADE LEVEL

SUBJECT	GRADE 5	GRADE 6	GRADE 7	GRADE 8
1	6.5	11.0	12.2	12.9
2	7.0	11.4	11.7	12.9
3	4.6	6.8	6.8	8.1
4	4.8	5.7	7.9	9.9
5	5.0	9.4	10.1	12.9
6	6.5	10.1	12.9	12.9
7	4.0	6.6	7.5	9.9
8	5.8	7.6	8.8	10.2
9	7.7	10.7	11.2	12.9
10	6.2	12.9	12.9	12.9
11	5.1	4.9	5.3	5.3
12	4.2	4.2	5.1	6.7
13	5.3	6.5	7.0	7.4
14	9.5	12.9	12.9	12.9
15	7.7	11.9	11.2	12.9
16	6.3	9.6	9.4	12.7
17	4.9	7.3	7.2	8.4
18	5.7	10.1	9.8	12.9
19	5.1	7.4	8.6	7.2
20	6.4	9.4	8.1	10.1
21	7.2	11.9	11.1	12.9
22	5.1	7.4	11.1	10.8
23	5.5	7.3	10.4	10.2
24	4.9	7.5	7.7	10.2
25	5.4	9.0	9.8	10.7
26	11.0	11.4	12.9	12.9
27	4.7	7.0	6.8	9.0
28	5.0	8.0	7.5	8.3
29	4.4	7.0	7.9	8.2
30	7.1	7.5	8.1	11.5

SOURCE TABLE III

MATH ANOVA

SOURCE	SS	DF	MS	F	P
BLOCKS/SUBJECTS	448.792	29			
GRADE LEVEL	341.073	3	113.691	109.213	<.001
ERROR	90.587	87	1.041		
TOTAL	880.452	119			

SUMMARY STATISTICS
FOR
SAT MATH SCORES

	GRADE 5	GRADE 6	GRADE 7	GRADE 8
SUBJECTS	30	30	30	30
MEAN	5.95	8.68	9.33	10.56
STD	1.56	2.35	2.31	2.31
SS	70.37	159.63	154.46	154.91

8.63

TABLE IV

TABLE OF DIFFERENCES BETWEEN READING SCORES BY GRADE LEVEL

	GRADE 6	GRADE 7	GRADE 8
GRADE 5	3.60*	4.11*	5.28*
GRADE 6		0.51	1.68
GRADE 7			1.17

*Indicates significant difference at .05 level

TABLE V

TABLE OF DIFFERENCES BETWEEN LANGUAGE SCORES BY GRADE LEVEL

	GRADE 6	GRADE 7	GRADE 8
GRADE 5	2.73*	3.08*	3.15*
GRADE 6		0.35	0.42
GRADE 7			0.07

*Indicates significant difference at .05 level

TABLE VI

TABLE OF DIFFERENCES BETWEEN MATH SCORES BY GRADE LEVEL

	GRADE 6	GRADE 7	GRADE 8
GRADE 5	2.73*	3.38*	4.61*
GRADE 6		0.65	1.88
GRADE 7			1.23

*Indicates significant difference at .05 level

Chapter V

Results

There was a significant difference found at the .05 level between fifth and sixth grades for Reading, Language, and Math. In comparing the mean SAT scores between the fifth and sixth, sixth and seventh, and seventh and eighth; the means between the fifth and sixth were significantly different than the others. The significance was consistent in all three tested areas (Reading, Language, and Math) with the sixth being significantly higher than the fifth. There was no significant difference between the sixth and seventh, and the seventh and eighth grades.

Chapter VI

Discussion

The original null hypothesis that there is no significant difference in being grouped homogeneously or heterogeneously was rejected. The results of the study indicate there was a significant difference between being grouped heterogeneously as compared to homogeneously.

This study was designed to examine the effects upon grouping in three subject areas (Reading, Language, and Math). In these three subject areas a few important elements remained constant throughout grades 5-8. Class size remained relatively the same, as classes only ranged from 18-24 students. As was mentioned earlier, students were picked at random (15 girls and 15 boys) with no respect given to the individual aptitudes. The same types of programs were used in the important transition from fifth to the sixth grade. The math program used was the CIMS program and the reading series was the MacMillen series which has been used since the second grade. The language program was consistent as it was the curriculum written specifically for the Newark School

District, following closely to the New York State Syllabus.

More studies and research need to be conducted to see if we would have the same conclusive results if students would have remained heterogeneously grouped. There needs to be further studies with a control group that stayed in a heterogeneous class.

Obviously, according to the results of this study, homogeneous grouping does have positive effects upon achievement. School districts should look at this research as well as the research of others in determining the best method of grouping students.

References

- Abadzi, H. (1985). Ability grouping effects on academic achievement and self esteem: Who performs in the long run as expected. The Journal of Educational Research, 79, 36-40.
- Bahner, J. M. (1960). Grouping within a school. Childhood Education, 36, 368-370.
- Barr, R. and Dreehen, R. (1983). How schools work. Chicago: University of Chicago Press.
- Beckerman, T. and Good, T. (1981). The classroom ratio of high and low aptitude students and its effect on achievement. American Educational Research Journal, 18, 317.
- Brophy, J. E. and Good, T. L. (1970). Teachers' communication of differential expectations for children's classroom performances: Some behavioral data. Journal of Educational Psychology, 61, 365-374.
- Clausen, R. (1960). Grouping for continuous learning. Childhood Education, 36, 352-354.
- Cotton, K. and Savars, W. G. (1981). Instructional grouping: Ability grouping, Research on school effectiveness project. Portland, Oregon. Northwest Regional Educational Lab.

- Edler, D. (1981). Ability grouping as a self-fulfilling prophecy: A macro-analysis of teacher-student interaction. Sociology of Education, 54, 1-15.
- Esposito, D. (1973). Homogeneous and heterogeneous ability grouping: Principal findings and implications for evaluating and designing more effective educational environments. Review of Educational Research, 43, 163-179.
- Goodlad, J. (1984). A place called school. New York: McGraw-Hill.
- Heynes, B. (1974, 1979) Social selection and stratifications within schools. American Journal of Sociology, 1434-1451.
- Lindquist, E. F. (1953). Design and Analysis of Experiments In Psychology and Education. Boston, MA, Houghton Mifflin Company.
- Miller, W. S. and Otto, H. J. (1930). Analysis of experimental studies in homogeneous grouping. Journal of Education Research, 21.
- Oakes, J. (1981). Tracking and ability grouping in American schools: Some constitutional questions. Paper presented at the annual meeting of the American Educational Research Association. Los Angeles, CA.

- Oakes, J. (1985). Keeping track: How schools structure inequality. New Haven, CT, Yale University Press.
- Oakes, J. (1987). Tracking in secondary schools: A contextual perspective. Educational Psychologists, 22, 129-153.
- Rist, R. C. (1973). The urban school: Factory for failure. Cambridge, MA, MIT Press.
- Schafer, W. E. and Olexa, C. (1971). Tracking and Opportunity. Scranton, PA, Chandler.
- Slavin, R. E. (1986). Ability grouping and student achievement in elementary schools: A best-evidence synthesis. Review of Educational Research, 57, 293-336.
- Slavin, R. E., and Karweit, N. L. (1985). Effects on whole class, ability grouped, and individualized instruction on mathematics achievement. American Educational Research Journal, 22, 351-367.
- Webb, N. M. (1980). A process-outcome analysis of learning in group and individual setting. Educational Psychologist, 15, 69-83.