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ABSTRACT

The purpose of this study was to: (1) determine whether or not interage grouping of elementary students results in significant gains in achievement in reading, arithmetic, and English, (2) determine the degree of emotional security developing in interage classes, and (3) determine changes in social climate in interage classrooms. Approximately 500 students from two schools placed in i terage classes grades 1-6, served as subjects. They were administered the California Achievement Tests, the Ohio Social Acceptance Scale, and the Sarason Anxiety Test. Results revealed that: (1) no significant differences in achievement gains occurred when comparisons were made for the experimental and control schools, (2) no significant differences occurred in any class, (3) no significant differences occurred in shifts of interpersonal choice levels, and (4) no significant differences between interage and control children in test responses to the Test Anxiety Scale occurred. Implications and limitations are discussed. (author/EK)

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END-OF-YEAR REPORT

JULY 1964

EXPERIMENTAL PROGRAM NUMBER A-27-63

EFFECTS OF INTERAGE GROUPING ON ACHIEVEMENT AND BEHAVIOR

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July 1964

This study was conducted under the auspices of and with the support of the New York State Department of Education.

Plainedge Public Schools
District #18
Dr. John S. Rinehart
Superintendent of Schools

CG005 304

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Effects of Interage Grouping on Achievement and Behavior

End-of-the-Year Report

July 1964

I. The Problem

The purpose of this study was to attempt to 1) determine whether or not interage grouping of elementary students results in a significant gain in achievement in reading, arithmetic, and mechanics of English; 2) determine the degree of emotional security developing in interage classes; and 3) determine the changes in the social climate in interage classrooms as expressed by changes in children's friendship choice patterns and indices of friendship choices.

A comparison was made of achievement gains made by children in interage classes in one school with children in regular classes in a comparable school in the district. The comparison was made to attempt to demonstrate that an interage classroom is a natural setting for children to learn and to explore subject matter at their level and pace. The age range in an interage class necessitates a broad scope of the curriculum in all areas, thereby providing for the child who is accelerated in any area, as well as the child who is moving at a slower pace in any area of the curriculum.

In such a setting children should be less anxious and should feel more secure in their academic achievements. In addition this kind of classroom atmosphere should be conducive to creativity, to thinking, and to enjoyment of school experiences.

II. Description of the year's work

A. Program of instruction and activity

There were twenty-two interage classes in the John H. West School this past year— 1963-64. The classes were organized as follows:

6 classes— six-seven-year-olds

3 classes— six-seven-eight-year-olds

5 classes— seven-eight-year-olds

3 classes— nine-ten-year-olds

5 classes— ten-eleven-year-olds

This was an increase of ten new interage classes this year. In addition to interage classes, there was one straight third grade class and one straight fourth grade class. The first three grades were on double session. This made it impossible to have interage classes of eight-nine-year-olds, or third and fourth graders.

Weekly buzz sessions were held the first semester in order to help the interage teachers with any problems which might arise out of this kind of organization. Some of the topics discussed were:

1. philosophy of interage
2. daily planning
3. keeping track of each child's progress
4. techniques and methods for individualizing instruction in all areas
5. exchange of materials and dittoes
6. diagnostic testing
7. pupil teams

8. reporting to parents

9. modern math

10. anxiety, social acceptance, and achievement tests

Monthly meetings were also held for parents during the day. Parents demonstrated a great interest in the philosophy of interage and asked many questions pertaining to:

1. how children were grouped

2. how teachers worked with individuals and small groups

3. why materials were different for some children

4. modern math

5. reading- basic and individualized

6. state research

7. testing program

8. how parents could help

The area of the curriculum which received most concentration this year was modern math. Several workshop sessions were held for the teachers, and several teachers visited schools where modern math had been introduced into the curriculum. In addition to the new math text and workbook materials which were being used, the fifth and sixth graders received modern math via T.V. (closed circuit from the high school). The teachers in John H. West exchanged ideas on how to individualize the teaching of some of the math.

Instruction in each classroom was individualized or given to small groups in order to permit each child to work at the level best suited to him at the time, and to permit each child to take an active part in every

lesson. Children were grouped for any number of reasons, e.g., ability, achievement, common interests, pupil teams, friends who work well together, etc. Bright children were not automatically placed in the top group in each subject. Differences in ability within each child in the various subject areas were taken into consideration, e.g., a child might be reading at a fourth grade level, but working at a first grade level in numbers. In an interage class, situations are available which take care of these differences within each child. He does not need to go to another classroom because he works at a different level from his neighbor.

Materials were purchased to help teachers individualize instruction. These included: SRA Reading and Phonics kits; special dittoes in science, math, language arts, and social studies; individualized progress math workbooks; new modern math workbooks; and multi-level spellers. Teachers have started to make collections of dittoes, workbooks, and texts which will be more suitable to individual needs rather than total class needs.

B. The Research Design

The Sample: Two schools were the source of subjects for this study. Approximately 500 children placed in interage classes grades 1-6 constituted the pool from which the experimental children were drawn. A second school in the same district of similar enrollment, parental socio economic level, and experience of teachers, but having children grouped in heterogeneous traditionally organized classes, was the source of the control group.

The interage classes established in the experimental school were as follows:

3 classes--- grades 1,2,3

6 classes--- grades 1,2

5 classes--- grades 2,3

3 classes--- grades 4,5

5 classes--- grades 5,6

The data: (1) The California Achievement Tests were administered to obtain measures of achievement in reading, arithmetic, English, and total achievement. (2) The Ohio Social Acceptance Scale was administered to determine amount of acceptance or friendship in the control and interage groups; and (3) The Sarason Anxiety Test was administered to obtain an estimate of children's school anxiety and feelings of defensiveness. The pre and post tests were administered in October 1963 and in April 1964 respectively.

The Statistical Analysis: The analysis in this study consisted of making comparisons of gains or change patterns in means and variances from pre to post tests in the achievement, sociometric, and anxiety

measures used. These comparisons were made between control and interage groups, and within the interage groups.

The statistical method applied in the comparisons of the achievement, sociometric and anxiety data, between control and interage groups, and within the interage classes was the one-way analysis of variance. The analysis of changes in sociometric or friendship choices between grade level groups within interage classes was made through one-way analysis of covariance.

The data processing was performed on the 7094 IBM Digital Computer. It proved necessary to modify available analysis of variance and covariance programs to perform the analysis for this study.

C. The Analysis of the data

This section presents the data in summary form, an analysis of the data and discussion of the results. The presentation will take up in turn the findings on achievement, interpersonal friendliness, and anxiety.

Academic Achievement

Three questions were asked in reference to school academic achievement in this study:

1. Will interage groups have higher achievement in reading, arithmetic, and mechanics of English than regularly organized classes in another school in the district?
2. What are the variabilities of achievement with interage classes as compared with variabilities in control classes?
3. Are the gains different in different types of interage grouping?

The examination of the data in relation to question one includes a comparison of the total achievement data for both schools. This is followed by an analysis by grade. This analysis presents the data, expressed in grade equivalent form, for the total subtest and the total battery scores of the California Test of Achievement.

Table I presents the analysis of the total achievement for both the interage and control schools.

TABLE I

Total Interage and Control School Means, Standard deviations, and the Analysis of Variance for Pre-to Post Test Data on the California Test of Achievement

In these tables the critical values of F are .05= 3.86; .01= 6.70

Test 1 Total Reading

	n	Pretest mean	S.D.	Post Test means	S.D.
Interage	456	4.70	1.98	5.39	1.82
Control	197	4.50	1.88	5.22	1.73
Total	653	4.45	1.95	5.34	1.79

Analysis of Variance

Source	SS	DF	MS	F	
Between	1.377	1	1.377	.043	N.S.
Within	20686.496	650	31.825		
Total	20687.873	651			

Test 2 Total Arithmetic

		Pretest		Post Test	
	n	Mean	S.D.	Means	S.D.
Interage	456	4.72	1.81	5.38	1.71
Control	197	4.41	1.69	5.05	1.63
Total	653	4.63	1.78	5.28	1.69

Analysis of Variance

Source	SS.	DF	MS	F	
Between	40.410	1	40.410	1.550	N.S.
Within	16951.434	650	26.079		
Total	16991.844	651			

Test 3 Total Language

		Pretest		Post Test	
	n	Mean	S.D.	Mean	S.D.
Interage	456	4.67	1.85	5.35	1.52
Control	197	4.42	1.72	5.14	1.48
Total	653	4.59	1.81	5.29	1.51

Analysis of Variance

Source	SS.	DF	MS	F	
Between	3.699	1	3.699	.130	N.S.
Within	18495.861	650	28.455		
Total	18499.561	651			

Test 4 Total Achievement

		Pretest		Post Test	
	n	Mean	S.D.	Mean	S.D.
Interage	456	4.67	1.82	5.36	1.63
Control	197	4.41	1.68	5.11	1.54
Total	653	4.59	1.79	5.28	1.61

Analysis of Variance

Source	SS	DF	MS	F	
Between	5.410	1	5.410	.328	N.S.
Within	10709.469	650	16.476		
Total	10714.879	651			

The analysis of total school achievement patterns for the interage and control school classes revealed no statistically significant differences. It may be noted that the Means and Standard deviations of the interage children are slightly but consistently higher. Whether this difference might be due to slight population differences, teacher differences, or accrual from previous years of interage experience by the children this study is not able to ascertain.

Analyses of the subtests of each portion of the California Battery were also conducted, but in the interest of conserving space all these detailed analyses cannot be presented here. Only one subtest mean gain was found to be significantly different. This was the subtest on arithmetic fundamentals where the gain was in favor of the interage children. The F value obtained was 6.281 which was significant at greater than the .05 level.

Comparison of School Achievement by Grade-Interage and Control Schools

Since no general differences for total school achievement were found, analysis was made by grade levels comparing achievement in the interage and control schools.

Tables II through VI below present the means, standard deviations, and the F values derived through analysis of variance of the total achievement battery and the reading, arithmetic, and language subtests. To conserve space these F values are shown without the inclusion of the analysis of variance tables.

TABLE II

Means, Standard Deviations, and Values of F obtained from Analysis of Variance. Pre and Post Tests in achievement, Grade 1 - Interage and Control schools

n control= 25 n interage= 58

Test 1 Total Reading

	Pretest Means	S.D.	Post Test Mean	SD.	Obtained Value of F	
Control	1.63	.29	2.76	.93	3.298	N.S.
Interage	1.59	.42	3.08	.87		
Total	1.60	.39	2.98	.90		

Test 2 Total Arithmetic

Control	1.76	.33	2.50	.50	5.896	*
Interage	1.78	.53	2.83	.79		
Total	1.77	.48	2.73	.73		

Test 3 Total Language

Control	1.62	.17	2.75	.79		
Interage	1.49	.40	2.89	1.04		
Total	1.53	.35	2.85	.98		

Test 4 Total Achievement

Control	1.68	.25	2.68	.55	8.068	**
Interage	1.54	.37	2.81	.78		
Total	1.58	.34	2.77	.72		

Critical value of F with 1 and 80 df
.05= 3.96 *
.01= 6.96 **

TABLE III

Means, Standard Deviations and Values of F obtained from Analysis of Variance, Pre and Post Tests in Achievement, Grade 2, Interage and Control Schools

n Control (C) = 29
n Interage where 2nd (Y) graders are younger in grade 2-3 combination = 64
n Interage where 2nd (O) graders are older in grade 1-2 combination = 58

Test 1 Total Reading

	Pretest		Post Test		
	Mean	S.D.	Mean	S.D.	Obtained Value of F
C	2.61	.52	3.54	.71	1.030 N.S.
Y	3.62	.64	4.09	.45	
O	3.41	.74	4.07	.59	
Total	3.34	.76	3.98	.60	

Test 2 Arithmetic

C	3.03	.67	3.60	.75	2.135 N.S.
Y	3.82	.67	4.40	.70	
O	3.46	.79	4.10	.73	
Total	3.53	.78	4.13	.78	

Test 3 Total Language

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
C	2.88	.88	3.97	.86	.864 N.S.
Y	3.78	.77	4.62	.54	
O	3.49	.94	4.49	.74	
Total	3.50	.92	4.45	.73	

Test 4 Total Achievement

C	2.85	.63	3.68	.75	.235 N.S.
Y	3.72	.59	4.37	.50	
O	3.47	.72	4.21	.61	
Total	3.46	.72	4.18	.65	

Critical Value of F with 2 and 147 d.f.
.05 = 3.06 *
.01 = 4.75 **

TABLE IV

Means, Standard Deviations and Values of F, Pre and Post

Tests, Achievement, Grade 3, Interage and Control Schools

n Control (C) = 70
n Interage where 3rd (1-2-3) graders are in 1-2-3 class = 9
n Interage where 3rd (2-3) graders are in 2-3 class = 78

Test 1 Total Reading

	Pretest		Post Test		
	Mean	S.D.	Mean	S.D.	Obtained Value of F
C	4.47	.95	5.27	.79	.281 N.S.
1-2-3	4.53	.99	5.28	.71	
2-3	4.79	.87	5.41	.67	
Total	4.63	.93	5.34	.73	

Test 2 Total Arithmetic

C	4.08	.77	4.86	.74	.775 N.S.
1-2-3	4.51	.48	4.98	.57	
2-3	4.43	.70	5.10	.56	
Total	4.28	.74	4.98	.65	

Test 3 Total English

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
C	4.46	.87	5.18	.81	.075 N.S.
1-2-3	4.37	1.07	5.05	.96	
2-3	4.75	.88	5.38	.72	
Total	4.60	.90	5.27	.78	

Test 4 Total Achievement

C	4.32	.80	5.09	.71	.249 N.S.
1-2-3	4.46	.77	5.12	.71	
2-3	4.63	.76	5.29	.62	
Total	4.49	.79	5.19	.67	

Critical Value of F with 2 and 153 d.f.
.05 = 3.06 *
.01 = 4.75 **

TABLE V

Means, Standard Deviations, and Values of F, Pre and Post Tests, Achievement, Grade 5, Interage and Control Schools

- n Control (C) = 47
- n Interage where 5th graders are younger in 5-6th grade combination (Y) = 44
- n Interage where 5th graders are older in 4-5th grade combination (O) = 38

Test 1 Total Reading

	Pretest		Post Test		
	Means	S.D.	Mean	S.D.	Obtained Value of F
C	6.08	.90	6.45	1.00	2.806 N.S.
Y	5.79	.81	6.37	.80	
O	6.95	1.17	7.51	1.21	
Total	6.24	1.07	6.73	1.13	

Test 2 Total Arithmetic

C	5.98	.54	6.39	.55	6.582**
Y	5.90	.55	6.51	.73	
O	6.81	.78	7.47	.76	
Total	6.20	.74	6.75	.82	

Test 3 Total English

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
C	5.63	.84	6.15	.67	1.732 N.S.
Y	5.80	.68	6.22	.72	
O	6.61	1.05	6.97	.85	
Total	5.97	.96	6.42	.82	

Test 4 Total Achievement

C	5.84	.64	6.26	.61	4.926 **
Y	5.82	.59	6.31	.60	
O	6.70	.94	7.25	.90	
Total	6.08	.83	6.57	.83	

Critical value of F with 2 and 125 d.f.
.05 = 3.07 *
.01 = 4.78 **

TABLE VI

Means, Standard Deviations, and Values of F, Pre and Post Tests, Achievement, Grade 6, Interage and Control Schools

n Control = 26
n Interage = 71

Test 1 Total Reading

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
Control	6.50	1.20	7.25	1.25	.138 N.S.
Interage	6.92	1.15	7.47	1.06	
Total	6.84	1.18	7.41	1.12	

Test 2 Total Arithmetic

Control	6.56	.91	7.17	..99	.516 N.S.
Interage	6.95	.91	7.40	.86	
Total	6.85	.93	7.34	.90	

Test 3 Total Language

Control	6.50	1.02	6.85	.90	.320 N.S.
Interage	6.68	.86	6.92	.84	
Total	6.63	.91	6.90	.86	

Test 4 Total Achievement

Control	6.45	.91	7.05	1.01	.732 N.S.
Interage	6.80	.91	7.26	.89	
Total	6.71	.92	7.20	.93	

Critical values of F with 1 and 94 d.f.
.05 = 3.96
.01 = 6.90

Comparisons of the gains in achievement for interage and control classes reveal no consistent pattern of change.

1. In grade 1 significant differences in favor of the interage children appear in arithmetic ($p. < .05$), Language ($p. < .05$), and total achievement ($p. < .01$). The probability value approaches .05 in reading; the gains being in favor of the interage group.
2. No significant differences appear between interage second graders, whether in 1-2 or 2-3 classes, and the second graders in the control group. This finding also holds for grade 3.
3. In grade 5 significant differences in favor of the interage children appear in reading ($p. < .05$), arithmetic ($p. < .01$), and in total achievement ($p. < .01$). The greatest gains appear for the fifth graders in 4-5 interage classes.
4. No differences were found between sixth grade interage and control class achievement gains.

The third question asked in reference to achievement was whether gains within interage groupings differed in relation to the type of interage group. For example, do the achievement gains of second grade children in a 1-2 or a 2-3 interage class differ; and , do the gains of grade one children differ from grade two children in a 1-2 interage class?

This analysis is shown in Tables VII through XII. Since all of these tables are concerned with the same questions, the discussion of them will be presented as a total unit following Table XII. Particular

note should be taken of the analysis of the grade 2 and grade 5 interage children. These children were grouped in two types of interage classes. Second graders were placed in grade 1-2, and 2-3 combinations; and 5th graders were placed in grade 4-5, and 5-6 combinations. This made possible the examination of the effects of placement of these pupils in either the older or younger position in these classes. These analyses will be found in Tables VIII and XI.

TABLE VII

Means, Standard Deviations and F values for Achievement gains, grades 1-2 Interage Classes

n grade 1 =46
n grade 2 =51

Test 1 Total Reading

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
Grade 1	1.41	.38	2.69	.73	.075 N.S.
Grade 2	3.40	.74	4.09	.59	
Total	2.45	1.16	3.43	.96	

Test 2 Total Arithmetic

Grade 1	1.78	.56	2.81	.80	.072 N.S.
Grade 2	3.42	.80	4.07	.76	
Total	2.64	1.07	3.47	1.00	

Test 3 Total Language

Grade 1	1.51	.41	2.84	1.03	.016 N.S.
Grade 2	3.56	.95	4.50	.77	
Total	2.59	1.26	3.71	1.22	

Test 4 Total Achievement

Grade 1	1.55	.39	2.79	.77	3.227 N.S.
Grade 2	3.48	.73	4.21	.63	
Total	2.56	1.13	3.53	.99	

Critical values of F for 1 and 94 df are:
.05 = 3.94 *
.01 = 6.90 **

TABLE VIII

Means, Standard Deviations and F Values for Achievement gains for Interage Second Grade Children where they are the older children (grade 1-2 interage) or the younger children (grade 2-3 interage).

n Younger = 54
n Older = 58

Test 1 Total Reading

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained of Value of F
Younger	3.55	.62	4.05	.47	8.540**
Older	3.41	.74	4.07	.59	
Total	3.55	.70	4.10	.51	

Test 2 Total Arithmetic

Younger	3.73	.65	4.29	.66	14.952**
Older	3.46	.79	4.10	.73	
Total	3.70	.76	4.31	.74	

Test 3 Total Language

Younger	3.70	.75	4.56	.56	13.242**
Older	3.49	.94	4.49	.74	
Total	3.68	.87	4.59	.63	

Test 4 Total Achievement

Younger	3.66	.57	4.30	.51	20.410**
Older	3.47	.72	4.21	.61	
Total	3.64	.67	4.33	.56	

Critical values of F for 1 and 129 df are:
.05 = 3.92*
.01 = 6.84**

TABLE IX

Means, Standard Deviations and F Values for Achievement gains in grade 2-3 Interage Class

n grade 2 = 54
n grade 3 = 68

Test 1 Totaï Reading

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
Grade 2	3.55	.62	4.05	.47	44.586**
Grade 3	4.74	.91	5.34	.69	
Total	4.21	.99	4.77	.88	

Test 2 Total Arithmetic

Grade 2	3.73	.65	4.29	.66	16.117**
Grade 3	4.34	.69	5.03	.57	
Total	4.07	.74	4.70	.71	

Test 3 Total Language

Grade 2	3.70	.75	4.56	.56	9.028**
Grade 3	4.56	1.04	5.30	.74	
Total	4.18	1.01	4.97	.76	

Test 4 Total Achievement

Grade 2	3.68	.57	4.30	.51	35.645**
Grade 3	4.47	.94	5.22	.63	
Total	4.11	.89	4.82	.74	

Critical Values of F for 1 and 119 df are:
.05 = 3.94 *
.01 = 6.90 **

TABLE X

Means, Standard Deviations and F Values for Achievement gains in grade 4-5 Interage Classes.

n
n Grade 4 = 36
n Grade 5 = 38

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Values of F
Test 1 Total Reading					
Grade 4	5.85	.90	6.61	.97	.540 N.S.
Grade 5	6.95	1.17	7.51	1.21	
Total	6.41	1.18	7.07	1.19	
Test 2 Total Arithmetic					
Grade 4	5.72	.75	6.41	.76	2.356 N.S.
Grade 5	6.81	.78	7.47	.76	
Total	6.28	.94	6.95	.93	
Test 3 Total Language					
Grade 4	5.74	.90	6.18	.86	2.136 N.S.
Grade 5	6.61	1.05	6.97	.85	
Total	6.19	1.07	6.59	.94	
Test 4 Total Achievement					
Grade 4	5.73	.74	6.34	.67	1.028 N.S.
Grade 5	6.70	.94	7.25	.90	
Total	6.23	.97	6.81	.92	

Critical Value of F for 1 and 71 df are:
.05 = 3.98*
.01 = 7.01**

TABLE XI

Means, Standard Deviations and F Values for Achievement gains for Interage fifth grade children where they are the older children (Grades 4-5 Interage) or the younger children (Grades 5-6 Interage).

n Older = 38
n Younger = 44

Test 1 Total Reading

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Value of F
Younger	5.79	.81	6.37	.80	1.170 N.S.
Older	6.95	1.17	7.51	1.21	
Total	6.33	1.15	6.90	1.16	

Test 2 Total Arithmetic

Younger	5.90	.55	6.51	.73	1.720 N.S.
Older	6.81	.78	7.47	.76	
Total	6.32	.81	6.96	.88	

Test 3 Total Language

Younger	5.80	.68	6.22	.72	2.315 N.S.
Older	6.61	1.05	6.97	.85	
Total	6.79	.96	6.57	.87	

Test 4 Total Achievement

Younger	5.82	.59	6.31	.60	3.588 N.S.
Older	6.70	.94	7.25	.90	
Total	6.23	.89	6.75	.89	

Critical Values of F for 1 and 79 df are:
.05 = 3.96
.01 = 6.96

TABLE XII

Means, Standard Deviations and F Values for Achievement gains in Grade 5-6 Interage Classes.

n Grade 5 = 44
n Grade 6 = 61

Test 1 Total Reading

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	Obtained Values of F
Grade 5	5.79	.81	6.37	.80	3.510 N.S.
Grade 6	6.92	1.15	7.47	1.06	
Total	6.49	1.17	7.05	1.11	

Test 2 Total Arithmetic

Grade 5	5.90	.55	6.51	.73	0.419 N.S.
Grade 6	6.95	.91	7.40	.83	
Total	6.55	.94	7.06	.92	

Test 3 Total Language

Grade 5	5.80	.68	6.22	.72	0.386 N.S.
Grade 6	6.68	.86	6.92	.84	
Total	6.34	.90	6.66	.87	

Test 4 Total Achievement

Grade 5	5.82	.59	6.31	.60	2.214 N.S.
Grade 6	6.80	.91	7.26	.89	
Total	6.42	.93	6.90	.91	

Critical Values of F for 1 and 112 df are:
.05 = 3.94*
.01 = 6.90**

1. Table VII shows the comparison of achievement gains of children grouped in grades 1-2 Interage Classes. No significant differences in comparitive mean gains are noted. The F Value for total achievement approaches the .05 level. Here the gain in mean achievement is seen to be in favor of the first grade children.
2. Comparison of the achievement gains of interage second grade children in grades 1-2 Interage Classes (where they are the older) and grades 2-3 Interage Classes (where they are the younger) results, in Table VIII, in significant differences in all portions of the achievement test. The trend in the gain patterns is for the children in the grades 1-2 Interage Classes where as second graders, they are older, to achieve slightly better than the second graders in the 2-3 combinations.
3. In the grades 2-3 Interage Classes differences in achievement gains appear in each of the four test measures. In the language subtest, the gains are in favor of the grade two children. In the remaining three they are in favor of the third grade children.
4. Tables X, XI, and XII reveal no statistically significant differences in achievement gains in grades 4-5 Interage Classes, or in achievement gains of fifth grade children when they are members of 4-5 or 5-6 interage classes.

Analysis of the Social Acceptance and Anxiety Data.

In addition to the questions about the effects of Interage upon children's achievement, this study focused upon questions about children's friendship choice patterns and feelings of self confidence in their classes. The specific questions asked in the proposal were:

4. Will interage classes tend to show greater interpersonal friendliness than control groups?
5. Will interage social choice patterns shift during the school year in the direction of more choices between age levels within the interage groups?
6. Will these choice patterns differ in each grade?
7. Will levels of anxiety (taken here to mean increased level of self confidence) change in the control and interage classes to a different degree?

The analysis of the social choice and anxiety data was performed in two ways; by studying the changes in means and variances in the total control and interage schools, and by examining these changes by grades. The data for these analyses are shown in Table XIII. Two important points should be noted about these data. The administration of the social acceptance and anxiety scales proved to be very difficult for the teachers, particularly when administered to the younger children. These difficulties led to attrition of the samples in both control and interage schools. This attrition was reflected in cases of incomplete or, in other ways, unusable test results. Secondly, a change

in the scoring of the anxiety scale became necessary. The Sarason Anxiety Scale is currently undergoing modification[1]. The General Anxiety Scale has been eliminated from the test since its results correlate highly with the Test Anxiety Scale. The "Lie" or L Scale, embedded in the General Anxiety Scale (GASC), has been found to be a useful index of defensiveness. Since these attributes were of particular interest in this study as measures of children's self-confidence in school, the analysis was made of the TASC and the L Scale portions of the anxiety scale.

Table XIII presents the analyses of the pre and post test data for the social choices, TASC, and L Scale for the total interage and control schools and by grade levels. Table XIV presents the analysis of s ocial choices within interage groups to determine patterns of friendship patterns as they emerged in the interage classes.

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1 Personal communication with Seymour Sarason

TABLE XIII

Means, Standard Deviations, and F Values for Changes. Pre to Post Test in Social Choices, Test Anxiety (TASC) and Lie (L) Scale- Interage and Control Groups

	Social Choice				TASC				L Scale			
	Pretest		Post Test		Pretest		Post Test		Pretest		Post Test	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Test 1 Total School Comparison Interage and Control												
Interage n-336	29.1	6.3	27.6	6.1	7.2	7.2	7.6	7.6	4.0	2.6	5.1	2.8
Control n=375	28.9	6.1	27.2	5.3	11.1	7.3	10.4	7.2	4.7	2.9	4.1	2.6
	F = .493 N.S.				F = 2.695 N.S.				F = 28.878 **			
Test 2 Grade 1 Interage and Control												
Interage n = 36	28.9	8.1	22.7	5.7	5.6	6.2	7.9	5.8	6.1	2.8	6.0	2.6
Control n = 23	26.7	7.3	24.6	4.7	9.1	6.0	7.2	6.7	6.5	2.2	5.5	2.6
	F = 2.100 N.S.				F = 1.016 N.S.				F = 0.496 N.S.			
Test 3 Grade 2 Interage and Control												
Control n = 72	26.8	6.8	27.3	5.3	9.1	6.8	8.9	7.7	5.3	2.2	5.3	2.9
Interage n = 41 Younger of 2-3	25.3	5.4	26.0	5.7	7.0	7.9	7.3	6.1	4.8	2.1	6.3	3.3
Interage n = 49 Older pf of 1-2	27.6	6.5	26.1	6.6	6.0	6.8	8.1	7.4	5.9	2.8	5.3	3.0
	F = 0.960 N.S.				F = 0.505 N.S.				F = 1.820 N.S.			

	Social Choice				TASC				L Scale			
	Pretest		Post Test		Pretest		Post Test		Pretest		Post Test	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Test 4 Grade 3 Interage and Control												
Control 1 n=55	30.6	6.3	27.9	5.3	10.9	8.1	10.4	7.3	6.8	2.4	4.1	2.3
Interage n=12 In.1-2-3	28.4	3.4	28.8	3.8	1.9	2.9	2.8	2.2	5.0	1.9	5.6	1.4
Interage n=44 In. 2-3	27.5	5.7	27.6	5.1	6.1	6.7	6.8	6.1	3.8	2.3	5.8	2.4
	F = 1.092 N.S.				F = 1.784 N.S.				F= 2.858 N.S.			
Test 5 Grade 4 Interage and Control												
Control 1 n=27	31.4	4.3	31.1	4.4	11.2	7.1	10.0	7.2	6.0	2.9	3.9	2.0
Interage n=25	28.2	4.0	30.2	4.2	7.2	6.8	10.0	5.7	3.4	2.5	4.2	2.7
	F = 0.033 N.S.				F = 2.639 N.S.				F = 0.532 N.S.			

	Social Choice				TASC				L Scale			
	Pretest		Post Test		Pretest		Post Test		Pretest		Post Test	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Test 6 Grade 5 Interage and Control												
Control n=116	29.3	5.9	26.8	5.8	12.0	6.9	11.5	6.6	4.2	3.1	3.9	2.6
Interage n=35 Younger of 5-6	32.3	6.1	28.3	6.1	11.2	8.2	9.6	7.6	2.7	2.2	4.0	3.1
Interage n=31 Older of 4-5	29.7	4.1	30.4	4.7	8.6	7.0	6.6	5.7	2.6	1.7	5.2	2.2
	F = 6.295*				F = 3.811 N.S.				F = 3.795 N.S.			
Test 7 Grade 6 Interage and Control												
Control n=82	29.0	5.1	26.8	4.0	12.0	7.6	11.4	7.3	2.6	2.1	3.1	2.0
Interage n=63	32.4	5.4	29.4	6.1	8.2	6.7	7.1	6.8	2.5	1.7	3.8	2.2
	F = 2.138 N.S.				F = 3.427 N.S.				F = 4.608*			

N.S. = Not Significant * = Significant at .05 level ** = Significant at .01 level

TABLE XIV

Means, Standard Deviations, and F Values for Social Choices In Interage Groups. Choices for own age group, choices for other age groups, and total choices.

n Grade 1=28
n Grade 2=44

	Protest Mean	Protest S.D.	Post Test Mean	Post Test S.D.	F	
Interage Grade 1-2 Choices Own Age Group						
Grade 1	29.5	9.6	23.0	7.2	2.226	N.S.
Grade 2	25.5	7.0	25.2	7.0		
Interage Grade 1-2 Choices Other Age Group						
Grade 1	27.8	10.0	23.1	7.1	4.922*	
Grade 2	30.0	7.9	27.2	6.9		
Interage Grade 1-2 Total Choices						
Grade 1	28.6	9.2	23.0	6.7	3.985*	
Grade 2	27.6	6.7	26.0	6.6		

N.S. = not significant, * = significant at .05 level
** = significant at .01 level

n Grade 2=37
n Grade 3=40

Interage Grade 2-3 Choices Own Age Group

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	F
Grade 2	23.9	5.9	25.3	5.2	0.008 N.S.
Grade 3	24.6	6.2	25.4	5.6	

Interage Grade 2-3 Choices Other Age Group

Grade 2	27.2	7.0	26.9	7.1	1.587 N.S.
Grade 3	30.5	7.5	29.8	6.6	

Interage Grade 2-3 Total Choices

Grade 2	25.7	5.8	26.1	5.8	0.390 N.S.
Grade 3	27.3	6.1	27.3	5.4	

n Grade 4=25
n Grade 5=25

Interage Grade 4-5 Choices Own Age Group

Grade 4	28.2	4.5	29.8	4.0	0.344 N.S.
Grade 5	27.2	4.6	28.8	4.7	

Interage Grade 4-5 Choices Other Age Groups

Grade 4	28.3	5.2	30.8	5.6	0.040 N.S.
Grade 5	32.5	5.2	33.2	6.4	

Interage Grade 4-5 Total Choices

Grade 4	28.2	4.0	30.2	4.2	0.007 N.S.
Grade 5	29.8	4.1	30.9	4.8	

N.S.= not significant, *= significant at .05 level

**= significant at .01 level

n Grade 5=40
n Grade 6=47

Interage Grade 5-6 Choices Own Age Groups

	Pretest Mean	Pretest S.D.	Post Test Mean	Post Test S.D.	F	
Grade 5	35.4	8.2	30.4	7.0	1.000	N.S.
Grade 6	30.7	5.3	30.5	9.9		

Interage Grade 5-6 Choices Other Age Group

Grade 5	32.6	7.5	30.0	9.7	0.245	N.S.
Grade 6	36.7	7.4	31.1	6.1		

Interage Grade 5-6 Total Choices

Grade 5	33.8	7.2	30.0	7.5	0.519	N.S.
Grade 6	33.5	5.8	30.6	7.1		

N.S. = not significant, *= significant at .05 level

**= significant at .01 level

Social Acceptance

The discussion of results will consider changes in social acceptance first. In Table XIII the analysis of the social choice data shows the shifts in mean values of sociometric choices given by the children in the interage and control school classes. It should be noted that a decrease in mean value of social choices from Pre to Post Test represents an increase in level of choices given by the children. Every child made a friendship choice about every other child in his class on a scale from 1 to 5, one representing the highest and five representing the lowest choice. Thus in the total school comparison, for example, a shift from 29.1 to 27.6 for the interage school and from 28.9 to 27.3 for the control school represented a slight, though insignificantly different increase in the values friendship choices given by children for their peers.

From Table XIII it can be seen that comparitive changes in mean values of friendship choices in interage and control schools were very small. It appears that the levels of friendship remained stable from Pre to Post Test in both schools. The analysis of covariance reveals no significant differences in the total school friendship choices patterns between the experimental and control schools. Similar results occured when these data were analyzed by grade. The single exception is in the 5th grades. A difference significant at the .05 level appeared between control 5th graders and experimental group fifth graders in the 4-5 and 5-6 interage classes. Examination of the changes in means indicates that the 5th graders in the 5-6 classes gave less high level friendship

choices at the beginning of the year than at the end, the shift being from 32.3 to 28.3. The control groups 5th graders gave higher friendship choices at the post test, whereas the 5th graders in the 4-5 interage classes gave lower choices.

The answer to question 4, then, is that interpersonal friendliness as inferred from sociometric friendship choices is stable in both interage and control classes and that friendliness is not different in interage and control group children either on the basis of a total school comparison or when the comparison is made by grade levels.

Table XIV presents the data related to questions 5 and 6. This table shows the changes from pre to post test in the mean values of friendship choices made within the interage classes. The table presents by interage class level the choices made by an age group for itself (own), by the age group for the other age group (other), and the total change from pre to post test. To illustrate, in interage 1-2, choices, own age group, means friendship choices made by 1st graders for 1st graders, and by 2nd graders for 2nd graders. Choices, other age group, mean choices made by 1st graders for 2nd, and by 2nd for 1st.

Inspection of the table reveals some changes in means of friendship choices from pre to post test, but only in interage 1-2 do these changes differ significantly. Grade 1 children give more friendship choices to grade 2 children at the beginning of the study than grade 2 children give to grade 1, as seen from the means of 27.8 and 30.0. Both groups shift toward more friendship choices, but the 1st graders shift slightly more. This shift is also revealed in the total choice means for interage 1-2.

The answer to question five appears to be that children of differing age or grade levels in interage classes do make friendship choices for themselves and for children of the other age or grade levels, that these friendship choice patterns do not differ within or between grade levels, and that the pretest to post test choice patterns are stable.

Question six asked whether choice patterns would differ in each grade. With few exceptions, the trends in friendship choice pattern in all grades from 1 through 6 were toward more, or higher levels of friendship choices to be given in the post test sociometric test. In the grade 4-5 interage group post test means indicated slightly lower friendship choices toward own, other, and total groups.

Anxiety

To answer question 7, which asks whether levels of anxiety (interpreted as a measure of the child's self confidence in school) changed in the control and interage schools, reference is made to table XIII under the sections TASC (Test Ansicety Scale for Children), and L, (the Lie Scale). The items in the TASC are closely related in content to feelings of concern by children about their ability to perform well in school. The L Scale consists of 11 items designed to determine the tendency of the child to falsify his true feelings about himself. Sarason has recently redefined the lie concept to mean generalized defensiveness.

Examination of the TASC section of Table XIII reveals that the control and interage school in total, and by grade, did not differ significantly in their responses to the TASC. On the L Scale, however,

there are significant differences of means between the interage and control schools in the total school comparison. These differences are in favor of the control school, the pretest to post test means for the control school becoming smaller. Conversely, the interage school mean uses from 4.0 to 5.1 indicating a higher level of defensiveness. The covariance analysis also shows that interage children in grade six were significantly more defensive. Their L Scale mean went up from 2.5 to 3.8. In the remainder of the grade levels the analysis revealed no differences between the interage and control classes in their responses to the L Scale.

The answer to question 7 in this study is that, as far as children's feelings of self confidence for performing well in school can be inferred from the TASC, there are no differences on this variable between the control and interage schools taken as a whole or when studied by grade level. As determined from the L Scale, the interage school, taken as a total unit, and the interage sixth graders taken alone, were significantly more defensive at the time of the post test.

D. The Conclusions and Their Implications

In this section the conclusions related to achievement, social acceptance, and anxiety will be summarized and discussed. Their implications for further research will be examined.

1. School Achievement Control v.s. Interage. In the rationale for this study it was argued that interage classes should obtain greater achievement gains than traditionally grouped classes. This finding did not uniformly result. The following conclusions about achievement are made:

a. There were no significant differences in achievement gains when comparisons were made for the total experimental and control schools.

b. Achievement gains from the pretest to post test were significantly higher in the interage first grade group in arithmetic ($p. < .05$), language ($p. < .05$), and total achievement ($p. < .01$).

c. Achievement gains from the pretest to the post test were significantly higher in the interage 5th grade group in reading ($p. < .05$), arithmetic ($p. < .01$), and total achievement ($p. < .01$).

d. No significant differences were found in achievement gains in grades 2 or 6.

2. School Achievement Within Interage Classes: The comparitive achievement gains of children within interage classes were studied. It was anticipated that differences in achievement gains would not appear in interage classes since the interage or nongraded setting should be equally beneficial for all children whether they are the older or younger children in an interage class. The results of the analysis indicated that this expectation was only partially upheld.

   a. No statistically significant differences in achievement gains were found for either settof children grouped in grade 1-2, 4-5, or 5-6 interage classes. Both older and younger sets of children in these interage classes appeared to have achieved in s imilar ways.

b. In the grade 2-3 interage classes achievement gains differ significantly for the 2nd and 3rd grade children in all four of the achievement test measures. The gains favor the grade 2 children in the language subtest; in reading, arithmetic, and total achievement the gains are greater for the 3rd grade children.

c. Comparisons of achievement gains of grade 2 children in grade 1-2 interage classes and in grade 2-3 interage classes indicate significantly different achievement gains in all four achievement measures favoring 2nd graders who are in the grade 1-2 interage classes.

d. There are no differences in achievement gains by 5th grade children placed in grade 4-5 and 5-6 interage classes.

3. Social Acceptance. A sociometric measure of social acceptance was used as an index of interpersonal friendliness or cohesiveness in this study. It was expected that more shifts would occur in the direction of increased interpersonal choices in the interage than control groups and that within the interage classes there would be an increased rate of choices across age level lines. The results of the study showed:

   a. No significant differences in shifts of interpersonal choices levels between the interage and control schools

emerge when considered in total. Pre to post test choices appeared to remain stable in both schools. Friendliness between children is not different in interage and control group children.

b. When analyzed by grade, social choice patterns were not significantly different from pre to post test. One exception occured. Fifth grade children in the 4-5 and 5-6 interage classes gave less interpersonal choices at the post test.

c. When friendship choice pattern within interage groups are examined, it reveals that children of differing age levels do make choices within their own age levels in their classes and for children of the other age or grade level in their interage classes. Friendship choice patterns do not differ within or between age levels in interage classes and pretest to post test choice patterns are stable. One exception to this finding is that 1st grade children in 1-2 interage classes end to give more friendship choices to grade two children.

d. In general, children in both control and interage schools tend to show increased rates of friendship choices from pretest to post test.

4. Anxiety. In this study anxiety as a measure for the child's feeling of personal security in school was expected to reduce in the interage classes. This expectation was held in particular for the TASC measures in that test anxiety is particularly germane to school experience. In the modification of the L Scale, a measure of defensiveness similar shifts, favoring the interage classes, would have been predicted. The results of the analysis showed that:

   a. There were no significant differences between the interage and control children in their pre and post test responses to the TASC. This finding was consistent in all of the analyses.

   b. There was a significant difference in the change in mean from pre to post test in the L Scale in the total interage v.s. control school comparison. This difference also occurred in the 6th grade when analyzed alone. In each case the L or defensiveness score increased in the interage group. In the other grades there were no significant differences between control and interage groups in change in the defensiveness measure.

Discussion and Implications for Further Study

While there were some gains in academic achievement that favored the interage as compared to the control school, these were neither consistent throughout the study nor dramatic. This study does present evidence that children in interage classes certainly are not hampered in their academic achievement growth. It is quite possible that shifts in academic growth

develop more gradually than is detectable in a period from October to April in one school year. This may also be the case with the development of social acceptance patterns, and is very likely in the case of the interage programs having an effect on expressed anxiety state. For this reason the plan to engage in a longitudinal program of research in the state wide study of Nongraded Programs is well advised.

The finding of differential gains in achievement within some of the interage classes was unexpected. While most of the gains did not differ between grades within interage classes, and this had been expected, the inconsistency of these findings certainly warrants further study.

The findings of no significently different changes in social acceptance patterns in the interage classes, no significantly different changes in the TASC, and significant changes in the means for L or defensiveness scale in the direction of less defensiveness in the control group were unexpected. There are limitations in the study that may have affected these results.

1. The Social Acceptance and Anxiety Scales were administered by the teachers. The teachers found these scales difficult to administer. This was especially true with the primary grade children. Some of the results of this testing were found to be unusuable at a point where it was impossible to retest. These cases were discarded as were those cases where there was incomplete data or where the pretest or post test was not completed.

2. The anxiety scales may be insensitive to limited changes in children's expressed anxiety states.
3. Shifts in class mean sociometric friendship indices maybe contaminated by changing classroom structures based on social psychological factors unrelated to the experimental program.

It should be pointed out that in the experimental, or interage. school the teaching of classes organized into interage classes was new to about half of the teachers. While it is recognized that intensive in-service training and supervisory aid were made available to these teachers, it is also important to note that the multiple leveled instructional program aimed for in these interage classes requires complex and novel teaching skills. It is likely that these skills develops slowly, and mature with extensive practice. Here, again, a more reliable test of the complex of effects of interage or nongraded instruction would ensue from a longitudinal study.

Finally, from the perspecfive of one who observes interage classes in action there develops a strong feeling that experiences of great value occur to children in these classes that are not tapped by general achievement, anxiety, or social acceptance measures, important as these may be. In informal observations, and from reports expressed by teachers, some of these factors tend to recur.

1. Children tend to use their time unusually well in self directed activity, and they express great satisfaction with their experiences in school.

2. The breadth of learning activities taking place in the curriculum during each school day makes possible more opportunities for each child to have successful learning activities.
3. Children tend to be oriented toward helping each other with their work.
4. Teachers report that their perspectives about the range of differences in children's ability to learn increase. Some are startled for example, to find first grade children at some point in the school year quite able to undertake study of materials normally thought appropriate for third grade children. This occurs, for instance, in arithmetic but it also appears in other ways. First grade children in 1-2 or 1-2-3 interage classes can learn to read and write cursive writing without formal instruction. The awareness of these differences in learning ability frequently leads the teacher to see the need for greatly expanding her expectations of what children can learn and to arrange classroom activities to capitalize on the children's interests and abilities.

We do not feel that these informal observations are invalid, though we recognize the risks entailed in subjective involvements when one observes. These effects of interage experiences do occur but instruments tapping such factors as satisfaction with school, breadth or richness of experiences in the classroom, feeling of helpfulness toward others, and the profitable use of time in self directed activity are not available at

least in such form that they could be used in a study involving sufficient sample sizes. In the present study we were not equipped to examine these possible outcomes of the interage program yet these may be some of the most important variables to be considered.

E. Plans for Future Study

The Interage program in Plainedge will be incorporated into the total state wide study of the Nongraded Primary School. Some observations about difficulties experienced in the present study might be of value in considering the state wide study.

The first has to do with testing. The administering of three batteries of tests in a pretest and post test schedule imposed a burden on both teachers and children. Excessive testing would soon be resented for the time and effort it takes from classroom teaching. If, additionally, teachers are asked to administer these tests, further resentment can occur; and especially in the instance of opinion or attitude scales, questions of reliability of the obtained data should be raised.

Secondly, the teachers involved in the interage school are interested in research, and its results; but in the face of managing the tasks of effective teaching, they would wish more research attention to be focused upon problems involved in the teaching task itself rather than upon external measures of change.

Finally, there is a problem of the deadlines set for research reports. Studies of the type reported here make almost mandatory the use of computer facilities in the analysis. If post tests are used, and these post tests are administered near the end of the school year serious problems arise

in completing the analysis soon enough to submit the report by August 1st. Preparing the data for card punching, finding key punchers when they are needed, card verifying, being able to get the computer to test the programs and final ly to run the analysis all consume time rapidly. The attempt to compress all of this activity into a short time carries with it the risks of using inaccurate data and of performing incomplete analysis of data often containing extensive amounts of important information.

LIST OF TABLES

LIST OF TABLES