1939

The effect of segregating classes in commercial law.

Howard Reynolds Simons

University of Massachusetts Amherst

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THE EFFECT OF SEGREGATING CLASSES
IN COMMERCIAL LAW

SIMONS - 1939
THE EFFECT OF SEGREGATING CLASSES

IN

COMMERCIAL LAW

BY

HOWARD REYNOLDS SIMONS

THESIS SUBMITTED FOR DEGREE OF MASTER OF SCIENCE

MASSACHUSETTS STATE COLLEGE, AMHERST

1939
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INTRODUCTION
CHAPTER I.

INTRODUCTION

Scattered throughout these United States are various schools maintained by public funds for the education of boys and girls. Unlike the usual public school, these schools have segregated the pupils according to sex; the boys going to one school and the girls attending another.

(1) The Extent of Segregation—The extent of this practice is shown by the figures in Table I. taken from Draper and Roberts. In order that comparisons may be made, the figures for both the public high schools and private high schools of the United States are given.

---

**Table I.**

The Number of Segregated and Coeducational Public and Private Secondary Schools in the United States for the years 1910, 1920, and 1928.

<table>
<thead>
<tr>
<th></th>
<th>PUBLIC SECONDARY SCHOOLS</th>
<th>PRIVATE SECONDARY SCHOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BOYS (1910)</td>
<td>GIRLS (1910)</td>
</tr>
<tr>
<td>1910</td>
<td>34</td>
<td>26</td>
</tr>
<tr>
<td>1920</td>
<td>39</td>
<td>37</td>
</tr>
<tr>
<td>1928</td>
<td>64</td>
<td>54</td>
</tr>
</tbody>
</table>

These figures indicate that many more private secondary schools are segregated than is the case among public secondary schools. The reason for this may be found among the suggested causes for the segregation.

Why do we have separate boys and girls secondary schools?

Curricular Differences—Welton offers the opinion that boys and girls may be taught together up to ten years of age. The further this age is passed the more the sexes become divergent in their fields of interest and boys and girls begin to retard each others' progress. He states that segregation is the solution to this for all subjects in which collective advancement is desired. This would include at least domestic subjects for the girls and technical subjects for the boys. Grant presents the thought that the curriculum for boys and girls should not differ greatly except on the technical side. He, however, strengthens the argument for segregation by suggesting that in coeducational schools girls had to prove their ability for higher education by competition with the boys in the subjects which the boys studied, domestic subjects were pushed into the background. It is possible that these arguments do not apply so forcibly to the modern comprehensive high school with its attention to individual differences, as they do to the high school of a few years ago with its one curriculum devoted to preparation for college.

Social Reasons—The social reasons for segregation are more closely connected with the private secondary schools than with the public secondary schools. The upper classes seize upon the opportunity to send their children to private secondary schools where they will be with their financial equals and on the same social level that wealth implies. The coeducational group feels that social segregation is justifiable only if the whole result is justifiable. In the segregation of boys and girls certain sacrifices have to be made. If the end obtained outweighs the loss through segregation then segregation is desirable. The parent should

---

2 Welton, J. The Psychology of Education. Chapter V.
3 Grant, Cecil The Case for Co-education. Chapter IV.
consider this problem when he chooses between segregated private schools and coeducational public schools.

(4) Closer Supervision—The segregation of the sexes in schools leads toward smaller classes. The advantage of smaller classes lies in the opportunities for supervision of pupils' work and the increased possibility of individual attention where necessary. Private segregated schools emphasize moral supervision. The proponents of segregated schools argue also on the basis of closer supervision of school work and of moral discipline. It is a known fact that one delinquent child may poison a whole child community. In the close supervision of segregated schools and in the choice of pupils this one delinquent is likely to be eliminated. Also because of the fact that private schools usually have their pupils under supervision for twenty-four hours a day delinquency is less likely to develop while at school. In matters of discipline it is felt that in certain stages of development boys need strong masculine control and that boys rather than girls suffer from the laxity of discipline. The coeducational school argues that the moral atmosphere is much more sane and clean where boys and girls meet in natural human relationships and the contact is larger and much freer. The firmness of discipline in segregated schools is well founded. However, in coeducational schools, discipline seems easier of attainment. Boys are taught to respect the women teachers and at the same time come under the more firm control of the male teacher, providing the school is well balanced according to male and female teaching staff, thus obtaining a more balanced, natural life situation. There can be no greater mistake made in the life of a child than over regulating it. Schools in which segregation is the practice appear to have a tendency in this line.
Superior Achievement—Some think that children away from the distractions of the opposite sex will achieve more than they normally would in a coeducational school. In well regulated, segregated schools achievement is thought to be greater because of the definite schedule of study, recitation, and recreation. In the segregated schools the emphasis is not so strongly placed on marks as on achievement. Exponents of the segregated schools say that in the public coeducational school the boys do not extend themselves in attempting to secure a high mark; as long as they pass the subject they are satisfied. The other side claims that the public coeducational school is more likely to result in the type of achievement that leads toward life activities; that the pupils are living in an atmosphere that more closely connects them with the affairs of the adult citizen and their achievement is more likely to be of the practical type.

Summary—Thus we see that in several phases of educational work there are found arguments for and against the segregation of boys and girls. The controversy is a wide one and is usually settled in the minds of the respective parties by means of opinion and argumentation. Relatively few attempts have been made to study the controversy objectively; and indeed, many of the arguments do not lend themselves to objective analysis. In the field of achievement, however, this is not the case. Here is a field which can be made the subject for objective experimentation and it is this field upon which this study seeks to throw light. In effect this study is being made to determine whether boys and girls that are segregated in different classes actually do achieve more than those which are taught in mixed or coeducational classes.
RELATED LITERATURE
CHAPTER II.
RELATED LITERATURE

This study parallels several other studies made under the heading of sex differences. Concerning these Pyle issues the warning, "In making studies of sex differences in learning capacity one must be careful about the material used that it does not favor one sex or the other. Sex comparisons should be made of children of the same age." With this warning in mind an analysis of these studies under appropriate headings is given below.

(1) Differences in Intelligence—The study of intelligence quotients of boys and girls by Terman shows a constant but slight superiority of girls from ages five to thirteen with the exception of age ten. At fourteen boys appear to be as superior to the girls as the girls were superior at five. This is shown in Graph 1.

Graph 1. Terman's Distribution of Intelligence for Boys and Girls Ages Five to Fourteen.

5 Terman, Louis M. Stanford Revision & Extension of the Binet-Simon Scale for Measuring Intelligence. Chapter IV.
Studies seem to indicate that apart from a slight superiority of the girls from five to twelve years the distribution of intelligence is much the same for the sexes. There is a possibility that the seeming superiority of the girls may be the result of a somewhat greater ease in the use of language, or their greater willingness to respond. Burt's study reports that as a result of psychological tests it is shown that in intelligence and reasoning the dissimilarity is so slight as to be all but discernible. In practically every test of the higher mental processes, insofar as it depends upon inborn capacity, the averages for the two sexes are almost identical. Moss made a comparison of the sexes in abstract intelligence using the Army Alpha Intelligence Tests on university students. He found that the median score of the women was 144 and that of the men was 142. In several other universities differences in favor of men have been found but the differences between the median scores is so small that it indicates no real difference in the mental alertness of the two sexes. Tests on social intelligence show that the median score of men is about five points lower than the median score of women. In mechanical intelligence men excel; however, in automobile driving, results indicate women are not much inferior to men. Starch concludes in his study, "That if we can judge fairly at the present time concerning the nature and amounts of differences between the sexes in mental characteristics, it would seem that the differences are so small in native intellectual abilities that they are almost wholly negligible in the education of boys and girls. So far as native abilities involved in

6Burt, Cyril How the Mind Works. Chapter XI.
7Moss, Fred A. Your Mind in Action. Chapter X.
8Starch, Daniel Educational Psychology. P.63
school work are concerned, boys and girls might as well pursue the same
courses from the first day of school to the last."

(2) Differences in General Ability—Ellis made a study of the effects
of segregation on seventh grade Junior High School pupils. He found that
the girls were more precocious than boys in mental and physical growth
although the difference was not great and there was a great overlapping.
The chief argument for separation is that girls are better workers than
boys. The experiment showed that boys did better work in separate sections
than in mixed sections. In separate sections the boys were better in
arithmetic than girls of the same intelligence but in mixed groups they were
inferior. Thompson found that women memorize more rapidly than men but
there was no difference between men and women in retention. Women have
a greater number of associations in a given length of time than men and
they cover a greater number of topics. Men have greater ability to con-
centrate the attention on one topic. Men appear to have the advantage
in one field, women in another, with no ground for any statement about
comparative intellectual ability. In tests on ingenuity men appear to
have a decided advantage; probably due to the fact that two of the five
problems were mechanical. In the remaining three non-mechanical problems
women excelled in one, were equal in one, and were excelled in one. In
general information there is no difference between men and women. Starch
showed that women and girls are superior in sensibility, memory, and in
most forms of perception, handwriting, and linguistic fluency. Men and
boys are superior in motor capacities, tapping, quickness of reaction,
arithmetical reasoning and in resistance to suggestion. He found the

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9Ellis, Robert S. The Psychology of Individual Differences. Chapter XVIII.
10Thompson, H. B. The Mental Traits of Sex. Chapter VII.
11Starch, Daniel Educational Psychology. Chapter V.
sexes to be equal in associative processes and in most school subjects.
The amount of difference was very small.

(5) Differences in Subject Matter—Thorndike reports a comparison of the two sexes in various abilities. With boys and girls from eight to fourteen years old the percentage of boys reaching or exceeding the median ability for girls is shown in Table II.

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>HIGH SCHOOL</th>
<th>COLLEGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regents exams and school marks</td>
<td>approximately</td>
</tr>
<tr>
<td>English</td>
<td>41</td>
<td>35</td>
</tr>
<tr>
<td>Mathematics</td>
<td>57</td>
<td>45</td>
</tr>
<tr>
<td>Latin</td>
<td>57</td>
<td>--</td>
</tr>
<tr>
<td>Modern Languages</td>
<td>--</td>
<td>40</td>
</tr>
<tr>
<td>History and Economics</td>
<td>60 (History only)</td>
<td>56</td>
</tr>
<tr>
<td>Mental Science</td>
<td>--</td>
<td>50</td>
</tr>
</tbody>
</table>

The table indicates that girls tend to do better in English and Modern Languages, while boys excel in Latin, History and Economics; in Mathematics and Mental Science there appears to be but little difference.

Graph 2 is a further comparison of boys and girls in subject fields.

12 Thorndike, Edward L. Educational Psychology III. P. 183
Graph 2. School Subjects Showing Those in Which Girls Excel and Those in Which They are Exelled and by How Much.

This graph bears out Table II, showing that in the essentials of English the girls excel, in mathematics the boys excel in subtraction and division, are equaled in multiplication and are excelled in addition. Girls again excel in writing and composition, and boys in handiwork and drawing ability.
Burt found that girls excelled in modern languages, especially where oral work is concerned, and in history, biological sciences, particularly in botany. Boys excelled in ancient and classical languages, geography, physical sciences, chemical sciences and engineering. He concludes, "It would appear that any real distinction must be due not so much to innate aptitude but rather to interest and mental outlook."

Pease indicates in his study in algebraic ability a slight superiority in favor of the girls. The average boy made 163.77 errors to 142.81 errors per average girl. The tests Pease used had coefficients of reliability ranging from .69 to .94 determined by correlation of chance halves and the use of Brown's formula. Some of his tests, therefore, were not very reliable.

(4) **Summary of Studies**—A summary of the studies is shown in Table III.

<table>
<thead>
<tr>
<th>BOYS SEEM TO EXCEL IN</th>
<th>GIRLS SEEM TO EXCEL IN</th>
<th>LITTLE DIFFERENCE IN</th>
<th>STUDIES DISAGREE IN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical languages</td>
<td>English</td>
<td>Mental sciences</td>
<td>History</td>
</tr>
<tr>
<td>Physical sciences</td>
<td>Modern languages</td>
<td>Mathematics</td>
<td></td>
</tr>
<tr>
<td>Chemical sciences</td>
<td>Biological sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handiwork</td>
<td>Composition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drawing</td>
<td>Spelling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography</td>
<td>Writing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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13 Burt, Cyril *How the Mind Works*. Chapter XI.
14 Pease, Glen R. *Journal of Educational Psychology*. V.21 1930
An analysis of Table III. would show that girls excel in the use of language and in oral work while the boys appear to excel in technical subjects. Invariably these studies show conclusively that there is a very slight, if any, difference between the learning capacity of boys and girls of the same age.
STATEMENT OF PROBLEM AND SUMMARY OF PROCEDURE
CHAPTER III.

STATEMENT OF PROBLEM AND SUMMARY OF PROCEDURE

This study of the segregation of the sexes is being made in an attempt to determine which of three groups, one composed of girls, one of boys, and one a mixed group, will show the highest achievement in school subjects.

(1) The Problem—Specifically the problem of this study is: do Grade XII classes that are segregated according to sex, achieve more in Commercial Law than classes that are not segregated?

(2) The Subjects—The subjects in this experiment are eighty Grade XIVA students in Commercial Law attending the High School of Commerce, Springfield, Massachusetts.

The city of Springfield dominates the western part of Massachusetts and has a population of some 160,000. Springfield may be classed as a residential city of middle class people. It is situated on the Connecticut River and forms a part of the main transportation artery of Boston to New York. Springfield supports four highly specialized high schools.

Commerce High School, as its name implies, aims to fit the youth of today for a business career. A large percentage of its students are girls training for secretarial work. Boys in the school usually prepare for careers as accountants, salesmen, and business executives. The student body is composed of about twenty-two hundred students one-third of whom are boys.

(3) The Material—The material covered in this experiment was the first nine chapters of the students textbook, The New Burgess’ Commercial Law. The work was divided into three units, each unit covering three chapters. Unit 1 dealt with Law Courts, Property, and Contracts. Unit 2
consisted of Agreements, Competent Parties, and Consideration. Unit 3 was composed of Subject Matter and two chapters on Discharge of Contracts.

After each unit an objective test constructed by the author, in the absence of standardized tests, was administered. Each test was composed of eighty questions; of these thirty were true or false, eight were multiple choice (four response), thirty were completion (one word), and four general information questions calling for three responses each. A sample of these tests is shown in Appendix 1. The reliability of these tests was determined by the odd and even correlation of test questions and the use of the Pearson Product Moment Method of Correlation. Reliability ranged from .74 to .92. The method is described in Appendix 2.

(4) The Procedure—Classes were scheduled according to the desired manner: one class of girls, one of boys, and one a mixed group. The groups were paired on the basis of intelligence, chronological age and school marks in English and History. After the completion of each unit an objective test constructed by the writer was administered. The experiment was conducted for a period of ten weeks.

(5) The Results of Grouping—The results of the grouping are shown in Table IV. In the mean intelligence of the groups the difference is again less than one point the greatest difference being between the boys group and the girls group, the difference being .92. The greatest difference in the standard deviation of intelligence is between the girls group and the mixed group, the difference being less than one point, the difference is .84. The difference in the mean age of the groups is less than one point, the greatest difference being .15 between the girls group and the mixed group. The greatest difference in the standard deviation of age is between the boys group and the mixed group the difference being .23.
The mean grade taken from the pupils English and History marks show a difference of .85 between the girls group and the boys group. The standard deviation of grades shows a difference of .79 between the girls group and the boys group.

**TABLE IV.**

Grouping Results Showing Means and Standard Deviations of Each Group in Intelligence, Chronological Age, and School Marks.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>GIRLS</th>
<th>BOYS</th>
<th>MIXED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean intelligence</td>
<td>109.8</td>
<td>108.88</td>
<td>109.32</td>
</tr>
<tr>
<td>Standard deviation of intelligence</td>
<td>7.52</td>
<td>6.92</td>
<td>6.68</td>
</tr>
<tr>
<td>Mean age</td>
<td>17.34</td>
<td>17.4</td>
<td>17.49</td>
</tr>
<tr>
<td>Standard deviation of age</td>
<td>6.72</td>
<td>6.52</td>
<td>6.8</td>
</tr>
<tr>
<td>Mean grade in English and History</td>
<td>5.62</td>
<td>7.79</td>
<td>5.53</td>
</tr>
<tr>
<td>Standard deviation of grade</td>
<td>1.55</td>
<td>.76</td>
<td>1.22</td>
</tr>
</tbody>
</table>

(6) Control of Groups—In addition to the pairing noted above, each of the three groups was taught by the same teacher who used the same material and methods in the instruction of each class. The classes met each day during the week for a period of fifty minutes. The boys group met during the second period of the day from 9:20 to 10:10 a.m.; the mixed group the fourth period from 10:50 to 11:40 a.m.; the girls group met the sixth period from 12:50 to 1:20 p.m. It was not possible to rotate the classes. It would appear, therefore, that the three groups were controlled in all major items which might have some bearing on achievement in Commercial Law except for the single variable of segregation which is being studied in this experiment. In the succeeding chapters there will be found a more detailed description of the method used to determine
the amount of achievement, of these segregated classes in Commercial Law.
ANALYSIS OF DATA
CHAPTER IV.

ANALYSIS OF DATA

The evidence for or against the segregation of classes according to sex is presented in this chapter in the form of test results. After arranging for controlled classes as described in Chapter III the classes were taught three units of Commercial Law. After each unit an objective test constructed by the author was administered. In addition, one further test was given one week after the completion of the experiment to measure the amount of retention. The results for each unit will be considered separately.

(1) **Unit 1**—This unit dealt with the particular subjects of Law Courts, Property, and Contracts. The results of the test are shown in Table V.

### TABLE V.
The Analysis of Scores Made by the Three Groups on the First Test.

<table>
<thead>
<tr>
<th>SCORES</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>MIXED</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>70</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>65</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>60</td>
<td>3</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>55</td>
<td>7</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>50</td>
<td>10</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>45</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>35</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Mean: 55.4
Standard deviation of mean: 9.2
Standard error of mean: 1.8

<table>
<thead>
<tr>
<th>Differences</th>
<th>BOYS vs GIRLS</th>
<th>BOYS vs MIXED</th>
<th>GIRLS vs MIXED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference between means</td>
<td>3.1</td>
<td>2.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Standard error of difference between means</td>
<td>2.7</td>
<td>2.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Critical ratio of difference between means</td>
<td>1.1</td>
<td>.81</td>
<td>.37</td>
</tr>
</tbody>
</table>
It will be noted that the mean for boys, girls, and mixed groups are respectively 55.4, 58.5, and 57.5. The standard deviation of the mean for each group are respectively 9.2, 11.8, and 8.5. The girls group were considerably more heterogeneous in the first test than were the other two groups. In order to discover how much significance can be placed in differences between means of this size the critical ratio procedure was utilized. For a description of this procedure one should consult Appendix 3 or any good text on statistics. The critical ratios are so small here that we can definitely state that the first test did not show significant difference either in favor of or against segregation. The critical ratio must be at least as large as 3.0 before a difference, by convention, is considered reliable in educational work.

(2) Unit 2—This unit dealt with the particular subjects of Agreements, Competent Parties, and Consideration. The results of the test are shown in Table VI.

<table>
<thead>
<tr>
<th>SCORES</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>MIXED</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>75</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>70</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>65</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>60</td>
<td>2</td>
<td>7</td>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>35</td>
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</tr>
<tr>
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</tr>
<tr>
<td>25</td>
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</tbody>
</table>

Mean 47.93  58.02  55.76
Standard deviation of mean 8.81  8.7  9.48
Standard error of mean 1.91  1.86  1.97

Difference between means boys vs girls 9.69  boys vs mixed 7.83  girls vs mixed 1.86

Critical ratio of difference between means 4.6  2.93  .90

Garrett, Henry E. Statistics in Psychology and Education. P.133
The standard deviation of the mean for the boys, girls, and mixed groups are respectively 8.3, 8.7, and 9.5. It is shown by these figures that the mixed group is slightly more heterogeneous in the second test than the other two groups. The critical ratios show that in the second test there is no dependable difference between the girls group and the mixed group, but that the difference between the girls group and the boys group is quite reliable in that the critical ratio is over 3.0. It will also be noticed that the critical ratio between the mixed group and the boys group of 2.93 is fairly reliable. This would make it appear that boys by themselves do not achieve as much as when they are in a mixed group, and that girls by themselves do not achieve much more, if any, than when they are in a mixed group.

(3) Unit 3—The third unit in this experiment dealt with the particular subjects of Subject Matter, and two chapters on Discharge of Contracts.

The results of test three are shown in Table VII.

<table>
<thead>
<tr>
<th>TABLE VII.</th>
<th>The Analysis of Scores Made by the Three Groups on the Third Test.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCORES</td>
<td>BOYS</td>
</tr>
<tr>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td>75</td>
<td>0</td>
</tr>
<tr>
<td>70</td>
<td>1</td>
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<tr>
<td>60</td>
<td>3</td>
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<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>52.2</td>
</tr>
<tr>
<td>Standard deviation of mean</td>
<td>9.92</td>
</tr>
<tr>
<td>Standard error of mean</td>
<td>2.1</td>
</tr>
<tr>
<td>Difference between means</td>
<td>4.8</td>
</tr>
<tr>
<td>Standard error of difference between means</td>
<td>3.3</td>
</tr>
<tr>
<td>Critical ratio of difference between means</td>
<td>1.45</td>
</tr>
</tbody>
</table>
The mean for the boys, girls, and mixed group are respectively 52.2, 57.1, and 58.38. The standard deviation of the mean for each group are respectively 9.92, 11.60, and 7.55. As in the first test these figures show that the girls group is more heterogeneous than the other two groups. A study of the critical ratios show that the difference between the girls group and the mixed group is quite insignificant. The critical ratios also show that the difference between the girls group and the boys group, and between the mixed group and the boys group, is fairly reliable. This also gives the appearance that the girls do not do much better by themselves than when in a mixed group. The boys, however, do not do as well by themselves as in a mixed group.

(4) Retention Test—The retention test was given at the end of the tenth week and was composed of questions used in the three previous tests. The results of this test are shown in Table VIII.

<table>
<thead>
<tr>
<th>SCORES</th>
<th>BOYS</th>
<th>GIRLS</th>
<th>MIXED</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
<td>0</td>
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<tr>
<td>75</td>
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<td>1</td>
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<td>70</td>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>65</td>
<td>1</td>
<td>6</td>
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</tr>
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<td>0</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Mean: 50.26, 56.2, 56.84
Standard deviation of mean: 7.5, 9.6, 9.36
Standard error of mean: 1.5, 1.7, 2.0
Difference between means: girls vs boys 5.9, mixed vs boys 6.5, girls vs mixed .6
Standard error of difference between means: 2.6, 2.3, 2.5
Critical ratio of difference between means: 2.56, 2.6, .2
The means for the boys, girls, and mixed groups are respectively 50.26, 56.2, and 56.84. The standard deviation of the mean for each group are respectively 7.5, 9.6, and 9.36. In this particular test the girls group is slightly more heterogeneous than the mixed group. The critical ratios show in this test that the difference between the girls group and the mixed group is not very reliable; and that the differences between the girls group and the boys group, and the boys group and the mixed group is again fairly reliable. The results of this test agree with the results of tests two and three showing the girls do not do any better by themselves than in a mixed group. The boys tend to do poorer work by themselves than in a mixed group.

(5) Summary—By studying Tables V, VI, VII, and VIII it is noticed that in the first there is no apparent advantage for any of the groups; however, it is noticed that between the girls group and the mixed group there is no apparent difference, but between the boys group and the girls group, and between the boys group and the mixed group, a fairly reliable difference is shown between the means of the groups expressed in terms of the critical ratio. Conclusions in regard to this difference will be found in Chapter V.
CONCLUSIONS, LIMITATIONS
AND DISCUSSION
CHAPTER V.

CONCLUSIONS, LIMITATIONS AND DISCUSSION

The conclusions in this chapter are based entirely upon the test results shown in Tables V, VI, VII, and VIII. Those results were obtained by means of objective tests composed and administered by the author.

(1) Statement of Problem—The problem of this study is: do classes that are segregated according to sex achieve more in Grade XII Commercial Law than classes that are not segregated?

(2) Conclusions—After a careful analysis of Tables V, VI, VII, and VIII it seems apparent that:—1. Boys tend not to achieve as much in Commercial Law when segregated as when they are non-segregated. 2. Girls do not achieve more in Commercial Law when segregated than when non-segregated. 3. A group composed of boys and girls achieves as much as a group of girls and tends to achieve more than a group of boys. 4. As far as achievement in Commercial Law is concerned this study finds no significant value in the segregation of the sexes.

(3) Limitations—This experiment has several limitations:—1. The experiment was limited to a period of ten weeks. A longer period of time might have made some difference in the results. 2. The number of pupils involved in the experiment was limited to three classes, the total number of pupils tested was eighty. 3. In this experiment it was impossible to rotate the classes. This may have given one class an advantage which the other two classes did not have. 4. While the reliability of these tests was high, standardized tests made by experts in the field might have yielded different results.

(4) Discussion—The tests given in this experiment did not measure all pertinent factors, the tests measured information only. Some pertinent
factors that may have effected test results are; home environment, interest, attitude toward subject and experiment, and the influence of the period preceding the period of testing. If the period preceding was a study period for one class but not for the other two groups the preparation of the class may have been more complete. Previous studies indicate that girls memorize more rapidly than boys and are more interested in obtaining a high mark in subject matter. This would tend to justify the results of this experiment in that the test followed the textbook closely and while avoiding textbook language memory may have entered into the results.
APPENDICES

(1) The Sample Test
(2) The Method of Finding Reliability
(3) The Critical Ratio Method
Directions: If you believe a statement, on the whole, to be true place a (T) before the number of the statement; if false place a (F).

(F) Example: All subject matter is valid.

(T) 1. Subject matter in restraint of marriage is valid.
(T) 2. Authorities differ in regard to the manner of presenting consideration and subject matter.
(T) 3. Freedom of contract is a constitutional right.
(T) 4. There are five classes of prohibited subject matter.
(T) 5. Law does not recognize the right of buyers and sellers to compete freely.
(T) 6. A contract limiting a person in time, place, or manner for five years is void.
(T) 7. Attempts to make pecuniary gain from marriage are legal.
(T) 8. If a contract is induced or brought into existence by fraud the agreement is void.
(T) 9. A contract to do that which the law forbids will not be held good.
(T) 10. Contracts may be in all respects valid but by law they are void.
(T) 11. A condition in which one party must perform his obligation first is known as a concurrent condition.
(T) 12. The existence of a subsequent condition is a matter of defense.
(T) 13. Conditions in a contract must be performed in a reasonable length of time.
(T) 14. If the date of performance falls on a Sunday the contract must be executed on Sunday.
(T) 15. A tender is an offer to buy.
(T) 16. Bank notes are legal tender.
(T) 17. Silver coins exceeding ten dollars are not legal tender.
(T) 18. Subsequent impossibility relating to the delivery of goods excuses performance.
(T) 19. Agreement to discharge a contract is in itself a contract.
(T) 20. Creation of a merger discharges the contract by operation of law.
(T) 21. A person in financial difficulties is bankrupt.
(T) 22. An involuntary bankrupt is allowed no exemptions.
(T) 23. Death discharges all contracts.
(T) 24. In bankruptcy all creditors are treated alike.
(T) 25. A divisible contract is a series of separate contracts.
(T) 26. If a contract be divisible a breach operates to discharge the contract.
(T) 27. Damages are always measured in money.
(T) 28. Loss is measured by the net value of the contract.
(T) 29. Damages construed as penalties will be enforced by the courts.
(T) 30. Courts will not order specific performance on oral contracts to buy land.
Directions: In the parenthesis before each number place the letter of the word or words in the list which correctly completes the statement.

( ) 1. If a contract is induced or brought into existence by fraud, the agreement is:
   a. void
   b. voidable
   c. valid
   d. unenforceable

( ) 2. Gambling contracts should be avoided because they are:
   a. void
   b. voidable
   c. valid
   d. unenforceable

( ) 3. A concurrent condition is one which must be performed by one party:
   a. before the other party
   b. after the other party
   c. at the same time with the other party
   d. after the contract has been discharged

( ) 4. Wood orally promised to give Peck $2,000 if Peck would marry his daughter. This contract is:
   a. void
   b. voidable
   c. valid
   d. unenforceable

( ) 5. Divisible contracts are contracts that:
   a. are divided among a group of people
   b. contain several promises
   c. involve the dividing of real estate
   d. are discharged in parts

( ) 6. Legal tender is:
   a. gold coin and silver dollars
   b. bank notes
   c. copper and nickel coins over 50 cents
   d. postage stamps

( ) 7. If a person becomes bankrupt of his own will and act he is known as:
   a. involuntary bankrupt
   b. receiver of bankruptcy
   c. voluntary bankrupt
   d. creditor of bankruptcy

( ) 8. Kane charges Haynes with stealing money. Kane promises not to prosecute Haynes if he pays him $500. The contract is:
   a. void
   b. voidable
   c. valid
   d. unenforceable
Part C.

Completion

Directions: In the parentheses at the right-hand side of the page place the word or words which are needed to correctly complete the sentences.

Example: Subject matter is that which forms the basis
          of the ...........
          (agreement) Ex.

1. Subject matter must be definite in nature, lawful and ...........
   (____________________) 1

2. Subject matter which is against public policy is not ..........
   (____________________) 2

3. The most frequently occurring contracts against public policy are in obstruction of justice, restraint of marriage and restraint of ...........
   (____________________) 3

4. Contracts that tend to raise prices and are detrimental to the public at large are in restraint of ...........
   (____________________) 4

5. The law upholds certain restrictions of marriage for protection, as infancy and ...........
   (____________________) 5

6. Contracts which promote dishonesty and lying are classed as ........... contracts.
   (____________________) 6

7. Falsifying on the witness stand is known as ...........
   (____________________) 7

8. The courts will not enforce contracts which are against ...........
   (____________________) 8

9. Laws regulating child labor, explosives, intoxicating liquors, etc. are thought to be just and right for the ...........
   (____________________) 9

10. Contracts in which the employee agrees not to sue the employer in case of injury are ...........
   (____________________) 10

11. When two competent persons contract they create rights on the part of one and on the other ...........
    (____________________) 11

12. The simplest manner of discharging a contract is by ...........
    (____________________) 12

13. When a party has discharged his part of the contract he is freed from further ...........
    (____________________) 13

14. A condition imposed by which one party must perform before the other party is known as a ........... condition.
    (____________________) 14

15. The occurrence of some fact which the parties have agreed shall destroy the contract if it happens is known as a ........... condition.
    (____________________) 15

16. The conditions in a contract must be performed with ........... time.
    (____________________) 16

17. When the date of performance falls on Sunday parties may wait until ...........
    (____________________) 17
18. A penalty to pay may be avoided by actual transfer of the thing to be paid or tender of .............
19. Payment and tender are matters of ....
20. A mutual relinquishment of all rights created by a contract is termed a ..........
21. If the assignor is released from the liabilities by substituting another person it is called ............
22. Discharge by operation of law may occur in four ways; wrongful alteration, creation of a merger, death and .............
23. When bankruptcy proceedings are brought by creditors the debtor is called ........
24. The debtor is allowed to keep certain things which are called his ............
25. A contract consisting of a number of promises to perform is known as a ........... contract.
26. Breach in a divisible contract gives rise only to action for ............
27. Specific performance applies usually to contracts relating to the sale and purchase of ............
28. If the courts in construing damages find the sum fixed in the contract reasonable it is called ........... damages.
29. If the courts find the sum unreasonable it is construed as a ............
30. Damages are always measured in ............

Part D.

Directions: Answer the following in the space provided.

1. What are the three kinds of contracts most commonly occurring against public policy?
   a. 
   b. 
   c. 

2. What are the three classifications of time in performance of contracts?
   a. 
   b. 
   c. 

3. What are the three forms of discharge by agreement?
   a. 
   b. 
   c. 

4. In breach of contract to what three things is the injured party entitled to?
   a. 
   b. 
   c. 

The method of finding the reliability of these tests was the odd and even correlation of the test questions by the Pearson Product Moment Method. The following steps were used.

1. Score tests by number of even questions right plus odd questions right.
2. Make a scatter diagram using scores of odd and even questions.
3. Compute $C_x$ and $C_y$. The formula $\frac{S_{ed}}{N}$
4. Compute the standard deviation of odd and even questions. The formula $\sigma = \sqrt{\frac{\sum \epsilon^2}{N} - \left(\frac{\sum \epsilon}{N}\right)^2}$
5. Compute for $r$. The formula $r = \frac{\frac{\sum xy}{N} - C_x C_y}{\frac{\sum x^2}{N}}$  
6. Compute for $r_x$. The formula $\frac{S_{xy}}{\sqrt{N} \cdot 16}$

Below is an example.

From the scatter diagram the following figures were obtained;

$N = 75$ $S_{xy} = 81$ $S_{xy} = 657$ $S_{xy} = -140$ $S_{xy}^2 = 916$ $\sum xy = 477$

$C_x = \frac{-40}{75} = -.53$  
$C_y = \frac{-40}{51} = 1.09$

$\sigma_x = \sqrt{\frac{116}{75} - (-.53)^2} = 3.2$

$\sigma_y = \sqrt{\frac{657}{75} - (1.09)^2} = 2.7$

$r = \frac{-227}{75} = .47$

$\frac{-227}{75} \cdot \frac{.57}{7} = .77$

$\frac{2 x .77}{1 + (2 - 1) .77} = 1.544 \approx \sqrt{8.6} = .92$
APPENDIX III.
THE CRITICAL RATIO METHOD

The "critical ratio" of the difference between means is found by dividing the difference by its standard error. The following steps are used.

1. Compute the two means by the short method. The formula \( \bar{M} = \frac{\Sigma x_i}{N} \)

2. Compute the two standard deviations. The formula \( \sigma = \sqrt{\frac{\Sigma x_i^2}{N} - \left(\frac{\Sigma x_i}{N}\right)^2} \)

3. Compute the two standard errors of means. The formula \( \sigma_M = \frac{\sigma}{\sqrt{N}} \)

4. Compute the standard error of the difference. The formula \( \sigma_D = \sqrt{\sigma_1^2 + \sigma_2^2} \)

5. Compute the critical ratio of the difference. The formula \( C.R. = \frac{D}{\sigma D} \)

Below is an example.

<table>
<thead>
<tr>
<th>Scores</th>
<th>( f )</th>
<th>( d )</th>
<th>( f d )</th>
<th>( f d^2 )</th>
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<td>42</td>
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</table>
| 39     | 1      | -6     | -39    | 56     | Balanced Table

\( \bar{M} = \frac{58.5 + \frac{-5}{31} \times 3}{3} = 58.02 \)

\( \sigma = \sqrt{\frac{\Sigma x_i^2}{31} - \left(\frac{\Sigma x_i}{31}\right)^2} \times 3 = 8.7 \)

\( \sigma_M = \frac{8.7}{\sqrt{31}} = 1.56 \)

Suppose for another group we had these figures:

\( \bar{M} = 47.93 \)

\( \sigma = 8.31 \)

\( \sigma_M = 1.81 \)

Then

\( \sigma_D = \sqrt{1.56 + 8.1} = 2.39 \)

and

\( C.R. = \frac{11.09}{2.39} = 4.6 \)
The books that are included in this brief bibliography are, in the opinion of the writer, the most valuable sources for information and reference concerning experiments of this type. The books are listed alphabetically according to the author's name.


The chapter sums up the results of psychological tests of boys and girls in intelligence and acquired attainments.


In this chapter the results of an original experiment are explained with teachers reactions to experiment.


Statistical procedure in education.

Grant, Cecil The Case for Co-Education London. Grant Richards 1913 pp 1-325

The book sets forth the arguments for co-educational schools.


This book attempts to find the moral side of education and has arguments for and against segregation.


McCall, W. A. Measurement New York. The Macmillan Co. 1939 pp XIV and 535


Reports the study of intelligence on university students.
Pease, Glen R. "Sex Differences in Algebraic Ability" in Journal of Educational Psychology 1930 v.21 pp 712-714

A study of the difference between boys and girls in algebra.


The chapter makes a comparison of the differences in learning capacity of boys and girls.

Starch, Daniel "Sex Differences" in Educational Psychology New York. The Macmillan Co. 1924 pp IX and 473, Chapter V.

Tells of the educational significance that may be placed in sex differences.


Shows a scale of intelligence for boys and girls between five and fourteen years of age.

Thompson, H. B. The Mental Traits of Sex Chicago. The University of Chicago Press 1903.

A comparison of the general ability between the sexes.


This chapter shows the differences caused by sex and race by graphs and explanatory notes.


Gives the arguments for segregation of the sexes in school.
The writer, wishes to express his sincere appreciation to
Dr. A. W. Purvis of Massachusetts State College for his
advice in the planning and growth of this thesis for which
he gave so generously; to Mr. James Clancy of the High School
of Commerce, Springfield, Massachusetts who cooperated in
making this study possible; and to my wife for her constant
encouragement and freely given time.
Approved

Albert W. Curtis

Raymond L. Parkhurst

David W. Grant

Graduate Committee

Date ____________________