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## Relation of Pre-Legal Studies and Intelligence Tests to Success in Law School

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# RELATION OF PRE-LEGAL STUDIES AND INTELLIGENCE TESTS TO SUCCESS IN LAW SCHOOL†

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SECTION	TABLE OF CONTENTS	PAGE
I. Nature of Study.....		35
II. College in Which Pre-Legal Work Taken.....		36
III. Decline From Pre-Legal Grades in Various Subjects.....		36
IV. Individual Pre-Legal Grades.....		37
V. Mental Test Scores.....		38
VI. Summary of Correlations.....		40
VII. Relative Positions in Mental Test Scores.....		40
VIII. Bibliography.....		45

## I. NATURE OF STUDY

This is a report of the results of a study of the careers in college and in the first year of law school of 520 students entering the School of Law, University of Southern California, as Freshmen, who had, prior to their admission to the law school, taken two or more years of pre-legal work at that university. Granting the existence of many other factors influencing success in legal studies, the importance of discovering any possible principles of correlation with pre-legal work is indicated by the fact that during their first year in law school 41.7 per cent. of these students received less than a *C* average. A *C* average is required for graduation, and must be approximated in order to continue in the law school; 13.5 per cent. of those studied had a *D* average or less.

The relative success of students in various aspects of their work will be expressed in terms of numerical grade point averages (G.P.A.). Each hour of work completed with a grade of *C* is granted one grade point; for each hour of *B* two grade points are awarded; and for each hour of *A* three. No grade point is awarded for a *D*—such work is figured in the computations as having a grade point of zero. For each hour of *F* one grade point is subtracted—that is, each hour of *F* may be said to result in a grade point of minus one. It is thus possible for the grade point average to vary from three to minus one. The required *C* average represents a grade point average of one. This may be expressed by saying that in order to graduate a student must have as many grade points as hours of credit.

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This study was undertaken at the instance of Dr. Albert S. Raubenheimer, Director of the Educational Program and Dean of the College of Letters, Arts and Sciences of The University of Southern California. The co-operation of the authors was suggested by Dr. R. R. G. Watt, Director of the University Junior College of The University of Southern California, and the authors desire to acknowledge their indebtedness to him for kindly and efficient counsel throughout the progress of the research.

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II. COLLEGE IN WHICH PRE-LEGAL WORK TAKEN

The results of this portion of the study, of negligible value, are set forth in the following table:

TABLE I: COMPARISON OF GRADE POINT AVERAGES OF STUDENTS FROM DIFFERENT COLLEGES

<u>College</u>	<u>Number of Students</u>	<u>Grade Point Averages in First Year Law</u>
Letters, Art and Sciences.....	409 .....	.9816
Commerce .....	106 .....	.9515
Government .....	5 .....	.7340

The five students from the College of Government may be eliminated from consideration. The difference in the work of the others is infinitesimal. By reference to Table II, *infra*, it will be seen that all students offering Commerce credits (including those from the College of Commerce) had a slightly better law school grade point average (1.03) than those who had attended only the College of Commerce.

III. DECLINE FROM PRE-LEGAL GRADES IN VARIOUS SUBJECTS

Most of the subjects studied in college were included in the seven categories shown in the following table:

TABLE II: PERCENTAGE OF DECLINE OF LAW SCHOOL GRADES FROM THOSE RECEIVED IN COLLEGE

<u>Pre-Legal Subjects</u>	<u>Number of Students</u>	<u>Average Pre-Legal Semester Hours Taken</u>	<u>Pre-Legal Grade Point Average</u>	<u>Legal Grade Point Average</u>	<u>Legal Decline in Grade Points</u>	<u>Percentage of Decline</u>
Laboratory Sciences	400	9.84	1.26	1.02	.24	.190
Accounting	130	7.30	1.12	.89	.23	.205
Foreign Languages	401	12.77	1.30	1.00	.30	.231
Commerce	322	17.01	1.39	1.03	.36	.259
Mathematics	85	4.38	1.40	.97	.43	.307
Literary	494	14.75	1.44	.98	.46	.319
Social Sciences	520	38.50	1.55	.97	.58	.374

The divergence in percentage of decline is extreme, as shown in the last column—from .190 to .374. Statistical data, particularly in the social sciences, have no value unless some explanation can be given. It is therefore hoped that the writers will be pardoned if they suggest that the divergence may be due to differences in college standards of grading in the various fields. In so far as individual consideration is given to entering students, law school authorities could well bear this possibility in mind. While another conclusion would be possible—namely, that the laboratory sciences (for example) are so much better, as a preparation for law, that poor work in them is more beneficial than much better work in the social sciences—yet, if this were the correct explanation, the possibility that the law school grade point averages would result so uniformly would be extremely remote.

## IV. INDIVIDUAL PRE-LEGAL GRADES

TABLE III: COEFFICIENTS OF CORRELATION BETWEEN LAW SCHOOL FIRST YEAR GRADE POINT AVERAGES AND GRADE POINT AVERAGES IN FIELDS OF PRE-LEGAL STUDY

Pre-Legal Subjects	Number of Students	Coefficient of Correlation of Pre-Legal With Legal Grades	Increased Probability of Corresponding Law School Success	Probable Error in Correlation <sup>1</sup>	Average Number Pre-Legal Semester Hours Taken
Mathematics	85	.503	.135	.055	4.38
General Pre-Legal	520	.421	.092	.025	83.02
Laboratory Sciences	400	.405	.086	.028	9.84
Social Sciences	520	.381	.075	.025	38.50
Accounting	130	.328	.055	.059	7.30
Commerce	322	.307	.048	.034	17.01
Foreign Languages	401	.262	.035	.031	12.77
Literary	494	.223	.025	.028	14.75

A word of explanation should be offered in regard to coefficients of correlation. They are the universal language of scientists in comparing varying trends, and are set forth in the tables in this study. However, to a layman, coefficients of correlation are likely to convey an unwarranted sense of certainty. They are therefore translated, in the tables in this study, into terms of increased percentages of probability of corresponding law school success.

Considering the highest coefficient of correlation in the above table (.503), we see that it means that the man who secures better grades in Mathematics is only 13.5 per cent more likely to have correspondingly good grades in law school than the man who showed no superiority in Mathematics.<sup>2</sup> Considering the lowest coefficient of correlation shown above (.223 in literary subjects), we see that excellence in college increases the likelihood of securing similarly high grades in law school by only 2.5 per cent, which is less than the probable error in computation of the correlation.

Particularly when it is remembered that intellectual superiority (assuming that it can be indicated by any grades) is only one of a number of

<sup>1</sup>The probable error in correlation represents the variations due to chance occurring in dealing with materials of this sort in the quantities used in this study. The probable error is figured upon the same basis as the coefficient, that is, it expresses a percentage of the total data studied, rather than a percentage of the correlation. The probable error means, in regard to Mathematics, for example, that upon like research with other students the chances are even that the correlation would fall between .448 and .558; it is equally likely that the variation would be greater.

<sup>2</sup>Correlations of .46 and .50 between high school and college grades in Mathematics have been reported. Douglass and Michaelson, *The Relation of High School Mathematics to College Marks*, 44 *School Review*, 615-619 (1936); Garrett, *Predicting College Success on the Basis of High School Records*, 11 *Peabody Journal of Education*, 193-201 (1934).

factors determining success in any profession, it is easy to see how it would be readily possible to attach too great significance to grades secured in college.<sup>3</sup> The desirability and importance of the development by law schools, as far as possible, of independent bases for the exclusion of students, are emphasized. Of necessity, law schools, like other agencies of society, must, to a certain extent, deal with individuals as groups; but certainly the importance is manifest of as much care as possible in making classifications, so as to minimize the danger of injustice to particular individuals.

As the difference, in terms of probability of similar success in law school, between the highest and lowest coefficients of correlation, is only eleven percent, it is clear that the student who desires to learn in college whether he will succeed in law school is not gaining a great deal by studying Mathematics rather than Literature. Certainly any difference in the relative interest of the student in the two subjects would be a much better guide for him in selecting his college curriculum. The probable greater value to him as a lawyer of knowledge of the fact content of courses in the social sciences, if it be assumed to exist, would also be a much more important guide for him. As long, however, as the coefficient of correlation between success in college and in law school is affirmative rather than negative,<sup>4</sup> it is entitled to some weight in determining whether prospective students will succeed in law school.

#### V. MENTAL TEST SCORES

TABLE IV: COEFFICIENTS OF CORRELATION BETWEEN LAW SCHOOL FIRST YEAR GRADE POINT AVERAGES AND THREE MENTAL TESTS AND COMBINED MENTAL TEST SCORE

	Coefficient of Correlation	Increased Probability of Corresponding Law School Success	Probable Error	Number of Students
Reading Comprehension	.508	.135	.029	295
Combined Mental Test Score <sup>5</sup>	.342	.060	.034	295
Linguistic Ability	.244	.030	.036	295
Mathematical Ability	.226	.026	.037	295

<sup>3</sup>In administering the entrance requirements of the law school of The University of Southern California, the pre-legal grade point average is considered in connection with two tests given by the law school and all other available data in regard to the capacity of the applicant.

<sup>4</sup>A negative coefficient of correlation of -.40 between success in Engineering and in the Ascendance Test (A-S blank) has been reported. Holcomb & Laslett, A Prognostic Study of Engineering Aptitude, 16 Journal of Applied Psychology, 107-116 (1932).

<sup>5</sup>The Combined Mental Test Score is somewhat affected by the inclusion of two additional tests, Following Directions and General Information, which the experience of The University of Southern California indicates are of negligible value. Their inclusion in the Combined Mental Test Score used herein was in order to facilitate research in the readily available university records. The average coefficient of correlation of the three subdivisions of the test set forth in the table is .326.

The mental test scores used were those of 295 students who took the tests at The University of Southern California during their Freshman year in college.<sup>6</sup> The Reading Comprehension coefficient of correlation (.508) is practically the same as that found for grades in Mathematics (.503), as shown in Table IV, the latter relating to a much smaller group of students—85 as against 295. At the same time the coefficient of correlation with the Mathematical Ability test, as indicated above, is much lower, only .226. These results seem to be at variance, as it is hard to believe that higher grades in Mathematics do not represent greater mathematical ability. In explanation, it may be concluded either that the Mathematical Ability test is inadequate, or, less likely, that the relative grades in Mathematics of 85 students particularly interested in that subject are to be expected to yield different results from those based upon the relative mathematical ability of a larger "run-of-the-mine" group of 295 students. At any rate, if the results from the use of the Reading Comprehension test are only as good as those from grades in Mathematics, the test is more valuable in this connection, as it is relatively quick and easy to administer, and results based upon it can be secured in regard to the entire student body, rather than only those students taking Mathematics. The observations previously made as to the importance to be attached to correlations should be kept in mind here. Mental tests, in the technical sense here used, are of course relatively new, as compared with college grading in courses, and the possibilities of future development of a higher degree of correlation are probably greater. Those engaged in such research are performing a very important task.<sup>7</sup>

Since many legal problems turn upon the meaning of written language, it is not surprising that reading comprehension develops a relatively high degree of correlation. The student who quickly and accurately comprehends what he reads is displaying an ability essential to the lawyer, and it may be that reading ability is as important for the lawyer as logical thought processes or the ability to think abstractly. Reading comprehension would certainly seem to be more important from the practical standpoint of the ability to handle efficiently a multitude of details in the rush of modern law practice. Other studies have reported a high degree of correlation between

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<sup>6</sup>The same individuals comprise the groups used in connection with each test. The forms of tests used were the 1925-1930 series of the Thorndike Intelligence Examination. Tests have been administered since 1924 to entering Freshmen and to students transferring with less than 28 units.

<sup>7</sup>A valuable test may be in existence in the Ferson-Stoddard Law Aptitude Examination, or in the Yale Legal Aptitude Test. However, these tests seem not to be too hopeful. The Ferson-Stoddard Examination produced a coefficient of only .54, which is only slightly superior to the correlation found in the present study using the Thorndike Intelligence Examination for High School Graduates Reading Comprehension Test, which is not slanted toward law. It is true that the Yale Legal Aptitude Test produced a higher correlation (.64) when combined with undergraduate grades and intelligence score, but it seems possible on the showing of the Reading Comprehension Test to develop a legal reading test which would produce a simple correlation as high or higher. Consult Crawford & Gorham, *The Yale Legal Aptitude Test*, 49 *Yale L.Jour.* 1237 (1940).

reading tests and college grades.<sup>8</sup> It is relatively easy to prevent the results of reading tests from being affected by the character of the prior scholastic work or other experiences of the particular student.

## VI. SUMMARY OF CORRELATIONS

The various coefficients of correlation which have been found fall into four groups, in relation to effectiveness, as indicated by double spacing in the following table:

TABLE V: SUMMARY OF COEFFICIENTS OF CORRELATION

(G.P.A. means Grade Point Average)	Coefficient of Correlation	Increased Probability of Corresponding Law School Success	Probable Error	Number of Students
Reading Comprehension Test	.508	.135	.029	295
Mathematics G.P.A.	.503	.135	.055	85
General Pre-Legal G.P.A.	.421	.092	.025	520
Laboratory Sciences G.P.A.	.405	.086	.028	400
Social Sciences G.P.A.	.381	.075	.025	520
Combined Mental Test Score	.342	.060	.034	295
Accounting G.P.A.	.328	.055	.059	130
Commerce G.P.A.	.307	.048	.034	322
Foreign Languages G.P.A.	.262	.035	.031	401
Linguistic Ability Test	.244	.030	.036	295
Mathematical Ability Test	.226	.026	.037	295
Literary G.P.A.	.223	.025	.028	494

## VII. RELATIVE POSITIONS IN MENTAL TEST SCORES

If any attempt is to be made to apply to individual students judgments formed upon the basis of correlation, it seems clear that this must be done by approving only those having a certain relative position of superiority in

<sup>8</sup>Terry found a coefficient of correlation of .63 between the score on the Van Wagenen Reading Scale and psychology grades and the Iowa Silent Reading Test. Terry, *The Prognostic Value of Different Types of Tests in Courses in Educational Psychology*, 18 *Journal of Applied Psychology*, 231-240 (1934). In a study at Temple University, Glatfelter discovered a coefficient of correlation of approximately .60 between college success and score on the Cooperative English Test. Glatfelter, *Value of Cooperative English Test in Prediction for Success in College*, 44 *School and Society*, 383-384 (1936). Studies by Gerberich, Morris, and by the Advisory Committee on College Testing, have produced correlations ranging from .36 to .60 between English and reading tests, and total college grades. Gerberich, *Validation of a State-wide Educational Guidance Program for High School Seniors*, 34 *School and Society*, 606-610 (1931); Gerberich, *Five Years Experience with a Remedial Reading Course for College Students*, 3 *Journal of Experimental Education*, 36-41 (1934); Morris, *Some Results Secured in Personnel Work in a Teachers' College*, 39 *School and Society*, 574-576 (1934); Report by Advisory Committee on College Testing, 13 *Educational Record*, 290-343 (1932).

terms of the correlation used. In other words, the students in the group to be judged must be arranged in terms of relative superiority in correlation, and only those in certain upper quintiles or other fractions of the group approved. The results which would have been obtained (as viewed in the light of the subsequent performance of students exempted from its application) had the correlation been applied are, therefore, the ultimate test of the effectiveness of the correlation. The following tables have been prepared in order to approach the problem from this standpoint, using only the mental test scores.

It is to be remembered that of the 295 students for whom mental test scores were available, 125 made less than the required *C* average in first year law. Determination was made of the percentage of students in each fifth of the upper 50 per cent and in each tenth of the lower 50 per cent of the combined mental test scores of these 295 students who had a law school first year average of less than *C*. The same procedure was followed in regard to each of the following subdivisions of the combined mental test score: Reading Comprehension, Linguistic Ability, and Mathematical Ability. The results of this procedure are presented in tabular form:

TABLE VI: COMBINED MENTAL TEST SCORE

(Percentage of students having a Law School grade point average of less than 1.0 in each fifth of the upper half of the relative position in the combined Mental Test Score,<sup>9</sup> and in each tenth of the lower half.)

<u>Upper Half</u>	<u>Score</u>	<u>Number</u>	<u>Percentage</u>
1	85 — 105	7	5.6
2	82 — 84.5	6	4.8
3	78 — 81	3	10.4
4	74 — 76	9	7.2
5	72 — 73	8	6.4
			34.4
<u>Lower Half</u>			
1	71 — 71	7	5.6
2	69 — 70.5	7	5.6
3	68 — 68.4	12	9.6
4	67 — 67.7	9	7.2
5	65 — 66	4	3.2
6	64 — 64	5	4.0
7	60 — 63.7	13	10.4
8	59 — 59	9	7.2
9	53 — 58	7	5.6
10	40 — 52	9	7.2
		125	65.6

<sup>9</sup>The Combined Mental Test Score was again slightly affected by the inclusion of the additional tests referred to in footnote #5, *supra*.



TABLE VII: MATHEMATICAL ABILITY TEST

(Percentage of students having a Law School grade point average of less than 1.0 in each fifth of the upper half of the relative position in the Mathematical Ability test, and in each tenth of the lower half.)

<u>Upper Half</u>	<u>Score</u>	<u>Number</u>	<u>Percentage</u>
1	89 — 119	9	7.2
2	77 — 85	10	8.0
3	66 — 73.5	12	9.6
4	61 — 64	9	7.2
5	56 — 59	8	6.4
			<hr/> 38.4
<u>Lower Half</u>			
1	53 — 55	7	5.6
2	50 — 52	5	4.0
3	47.5 — 49	9	7.2
4	45.5 — 47.5	8	6.4
5	43 — 45.5	11	8.8
6	40 — 42	5	4.0
7	37 — 39	9	7.2
8	33 — 36	6	4.8
9	26 — 32	9	7.2
10	13 — 25	8	6.2
			<hr/> 61.6

TABLE VIII: READING COMPREHENSION TEST

(Percentage of students having a Law School grade point average of less than 1.0 in each fifth of the upper half of the relative position in the Reading Comprehension test, and in each tenth of the lower half.)

<u>Upper Half</u>	<u>Score</u>	<u>Number</u>	<u>Percentage</u>
1	185 — 226	3	2.4
2	155 — 170	11	8.8
3	144 — 154	10	8.0
4	131 — 143	18	14.4
5	117.5 — 130	12	9.6
			<hr/> 43.2
<u>Lower Half</u>			
1	113 — 116	8	6.4
2	109 — 112	5	4.0
3	104 — 107	10	8.0
4	98 — 102	4	3.2
5	89 — 97	6	4.8
6	81 — 88	9	7.2
7	74 — 80	8	6.4
8	65.5 — 73	7	5.6
9	53 — 64	8	6.4
10	32 — 52.5	6	4.8
			<hr/> 56.8

TABLE IX: LINGUISTIC ABILITY TEST

(Percentage of students having a Law School grade point average of less than 1.0 in each fifth of the upper half of the relative position in the Linguistic Ability test, and in each tenth of the lower half.)

<u>Upper Half</u>	<u>Score</u>	<u>Number</u>	<u>Percentage</u>
1	116 — 146	8	6.2
2	106 — 114.5	8	6.4
3	98 — 104.5	8	6.4
4	91 — 96.5	13	10.4
5	84 — 90	18	14.4
			43.8
<u>Lower Half</u>			
1	81 — 83.5	6	4.8
2	78 — 80.5	8	6.4
3	74.5 — 76	4	3.2
4	71.5 — 74	8	6.4
5	68.5 — 70.5	3	2.4
6	66 — 68	6	4.8
7	62 — 65	6	4.8
8	58 — 61	11	8.8
9	50 — 56	6	4.8
10	14 — 49.5	12	9.6
		125	56.0

In Table X (following) is shown the ranking position of both the 170 students making an average of *C* or better and the 125 students averaging less than *C*. Of the 295 students taking the mental tests, 57.7 per cent made an average of *C* or better in law school, and 42.3 per cent averaged less than a *C*. If satisfactory and unsatisfactory students in law school were evenly dispersed throughout the various ranks upon the mental tests, we would expect to find these same percentages of passing and failing students in each rank. On the basis of cumulative rankings on the three tests, we have computed the per cent of the particular rank who had *C* or above, or below *C*, in first year law. Each case where the percentage in a particular rank is greater than the percentage expected in an even dispersion we have indicated by a plus sign; each case approximating the even dispersion is marked by a plus sign underlined; and each case having a lower per cent is marked minus.

TABLE X: DISTRIBUTION OF STUDENTS MAKING SATISFACTORY AND UNSATISFACTORY (LESS THAN 1.0) AVERAGES IN FIRST YEAR LAW

(Position of 170 students receiving C or better in first year law in each fifth of the upper half and each tenth of the lower half of the relative position in combined mental test score;<sup>10</sup> and position of 125 students making less than C in first year law.)

<u>Upper Half</u> (170 Students C or better, 57.7% of 295 students with combined mental test scores)			<u>Upper Half</u> (125 Students less than C, 42.3% of 295 students with combined mental test scores)		
Fifths	No. of Cases	% of Cases in that position upon com- bined mental test score who made a C average in Law School.	Fifths	No. of Cases	% of Cases in that position upon com- bined mental test score who made <i>less</i> than a C average in Law School.
1	68	77.3+	1	20	22.7—
2	59	67.1+	2	29	32.9—
3	58	66.0+	3	30	34.0—
4	48	54.6—	4	40	45.4+
5	50	56.9±	5	38	43.1±

  

<u>Lower Half</u>			<u>Lower Half</u>		
Tenths	Cases	% of Cases	Tenths	Cases	% of Cases
1	23	52.1—	1	21	47.9+
2	26	59.1±	2	18	40.9±
3	21	47.8—	3	23	52.2+
4	24	54.6—	4	20	45.4+
5	24	54.6—	5	20	45.4+
6	24	54.6—	6	20	45.4+
7	21	47.8—	7	23	52.2+
8	20	45.4—	8	24	54.6+
9	21	47.8—	9	23	52.2+
10	18	40.9—	10	26	59.1+

In conclusion, it is to be noted that students making less than the required C average in first year law are to be found in all ranking classifications in the total mental test score and in each part of the mental tests. These students are found more frequently below the median score for the whole test or its subdivisions.

In the total mental test score, two-thirds of the unsatisfactory group were below the median for the whole group. The most popular rank for

<sup>10</sup>The Combined Mental Test Score was again slightly affected by the inclusion of the additional tests referred to in footnote #5, *supra*.

the below *C* students, ascertained by combining the ranking frequencies on the three parts of the test, was found to be the lowest tenth of the lower half of the frequency distributions. It should be recalled, however, that some of the students making a *C* average or above also ranked in the bottom tenth of the lower half in some or all of the mental tests. Observation of the ranking positions of both satisfactory and unsatisfactory first year law students in mental test score distributions demonstrates that, while the tests have some slight prognostic value, extreme caution is needed in attempting to apply the findings of mental tests to the selection of students until the mental tests are refined, or until we have more adequate measures of other factors which contribute to success.

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