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Preparation for Admission to a Law School

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benevolent face and bland and dignified manners and firm administration of the whole learning of the law we become accustomed; whom our eyes anxiously, not in vain, explore when we enter the temple of justice; towards whom our attachment and trust grow even with the growth of his own eminent reputation. I would have him one who might look back from the venerable last years of Mansfield or Marshall, and recall such testimonies as these to the great and good judge: 'Because I delivered the poor that cried, and the fatherless, and him that had none to help him. The blessing of him that was ready to perish came upon me, and I caused the widow's heart to sing for joy ... I was eyes to the blind, and feet I to the lame. I was a father to the poor, and the cause which I knew not I searched out. And I brake the jaws of the wicked, and plucked the spoil out of his teeth.'

"Give to the community such a judge, and I care little who makes the rest of the constitution or what party administers it."

JOHN H. WIGMORE.

CORRESPONDENCE

PREPARATION FOR ADMISSION TO A LAW SCHOOL

To the Editors of the ILLINOIS LAW REVIEW:

I have a query concerning Professor Eagleton's paper in the February issue of the ILLINOIS LAW REVIEW ("Academic Preparation for Admission to a Law School"). If his data is interpreted in the light of the science of statistics is it not far less convincing than he assumes it to be? My assertions hereafter on the subject of statistics are solely upon information and belief, but upon the basis of my information on the laws of statistics the apparent differences which his figures disclose are more or less insignificant.

It is to be noted that his results are all in terms of averages or percentages (frequencies). A competent man in the field of statistics (Dr. Harold T. Davis) tells me that averages and percentages, from a scientific statistical standpoint, are significant only when stated in terms of probable error, and that the accepted rule on the subject is that differences which lie within the area of three times the probable error are more or less meaningless. In other words unless the differences in results lie outside of that area additional data would be expected to show tendencies in the opposite direction. One could toss a limited number of pennies and get some rather startling results, which would, however, straighten out if the process were continued.

Applying the accepted statistical formulae for probable error to the data in question the apparent differences practically disappear. The formula for probable error in the case of averages is as follows: it equals .6745 (or for convenience, 2/3) x the standard deviation over the square root of the number of items involved. Table VII shows one of the widest discrepancies in results between the three- and four-year men, as well as the two-year men. As to the three-year men the probable error is approximately .5, that is, 2/3 x 8.8 (the standard deviation, or for convenience sake, 9) over the square root of 133 (the number involved, or for convenience sake, 144). The probable error is thus 23 x 9/12 or .5. The probable error
for the four-year men, because there are only a fourth as many, would be approximately 1, and for the two-year men approximately 2. The average of the three-year men thus lies within the area of three times the probable error as to each group, with the result that from a statistical standpoint the apparent differences disappear. I have not figured the other tables but it is apparent that the same result would follow. In cases where the number involved is 6 or 7, the probable error is enormous.

In the case of percentages, or frequencies, the formula for probable error is as follows: it equals \( \frac{0.6745}{\sqrt{M}} \) (or for convenience' sake again, \( \frac{2}{3} \)) \( \times \sqrt{\frac{F(1-F)}{M}} \) where \( F \) equals the percentage, or frequency, and \( M \) equals the total number involved. The widest discrepancy on this score is in Table III, column 8. The probable error on the three-year group is approximately 6, so that three times that is 18, reducing the percentage from 71 to 65. The probable error on the four-year group is 4.7, so that three times that is 14, raising the percentage from 55 to 64. (That is, the last group could be expected, within the limits of the rule involved, to include 106 persons rather than 92.) This shows a slight difference, but the case is the most extreme one contained in the tables, where there is any appreciable number involved.

On the whole therefore it cannot be said that the data proves anything. Its consistency is of some significance, but again only slight. There is a temptation in such cases to draw unwarranted inferences. It might be urged, for example, that because the evidence does not show that a fourth year improved the product, therefore he was not improved. But the only logical conclusion is that even from the standpoint of grades the evidence shows nothing, because it is in comparison with another group that the measure is sought to be made. The evidence shows no appreciable distinction between them, but it does not follow that there is none. Apparently much additional data is necessary before any satisfactory conclusion can be drawn.

BERNARD C. GAVIT.*

A REPLY

The correspondence from Professor Gavit, which the Editors kindly referred to me for an answer, raises a problem which was seriously considered when I prepared the article to which that letter refers, viz., the desirability of including in it a close, technical statistical analysis. That article was written for readers who were not experienced statisticians. While all tables and data were carefully tested for validity, it seemed desirable to present them in non-technical form.†

Professor Gavit’s letter proves the wisdom of avoiding technical formulas. He confesses inexperience in statistics and claims to be

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†This was done as a result of the unanimous advice and approval of four leading statisticians and two experienced writers of reports of educational studies. The validity of the study is mainly due to their kindness in checking it carefully. On their advice, the standard deviation (sigma) was given in each table so that, if a statistician should happen to read it, he could easily determine, in statistical terms, the significance of each of the observations.