
VALIDITY OF RANK IN HIGH SCHOOL CLASS AND PSYCHOLOGICAL TEST SCORES IN PREDICT- ING ACADEMIC SUCCESS IN COLLEGE

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During recent years the faculty at North Central College has been concerned with the fact that a great many students were not doing work which was satisfactory from a scholastic point of view. A great deal of time and energy have been spent by administrative officials, class advisers, and teachers in attempting to help such students improve their scholarship. In some cases improvement followed; in many cases there was no improvement in the students' work. The question was raised whether it would not be better to refuse admission to students who would do unsatisfactory work in college, if such students could be determined at the time of their application for

admission to college. This paper is the report of a study of one phase of the problem: How valid are (1) rank in high school class, and (2) score on an intelligence test in predicting academic success in college?

As subjects for the study, the classes entering North Central College as freshmen in 1934 and 1935 were chosen. These students would normally graduate in 1938 and 1939, and the college record of each of these students was studied for as long as he remained at North Central College during the four years after admission. No attempt was made to check the record in other colleges or universities of the few students of this group

who transferred to such other institutions.

The first criterion of academic success in college whose validity was studied was the rank of the student in high school class. Of the 312 students in the group, 44 or 14 per cent were from the lowest third of their high school class; 84 or 27 per cent were from the middle third of their high school class; and 184 or 59 per cent were from the highest third of their high school class. Since most colleges prefer students who will complete satisfactorily the full four year course, it is interesting to note that the average number of semesters spent at North Central College during four years after admission was as follows: by students from the lowest third of their high school class, 4.54 semesters; by students from the middle third of their high school class, 4.80 semesters; and by students from the highest third of their high school class, 6.11 semesters. A tabulation of those receiving degrees from North Central College within four years after admission revealed the following: 11 students or 25 per cent of those from the lowest third received degrees; 28 students or 33 per cent of those from the middle third received degrees; and 100 students or 54 per cent of those from the highest third received degrees. Of the total group of 312 students, 139 or 45 per cent received degrees within four years after admission.

The three groups of students were next compared with respect to the grade index. This grade index was the average number of honor points earned for each hour of work carried, when each hour of grade A work was given three points, each hour of B two points, each hour of C one point, and grades of D and F received no points. It should be stated that a grade index of 1.00 was necessary for graduation. The median grade index for their entire course for the students from the lowest third of their high school class was .71; for the middle third 1.05; and for the highest third 1.84. These median grade indices for the entire course varied only very slightly from the grade indices for the freshman year only.

One of the most significant phases of the study had to do with the record of those students who were placed on probation or who were dropped from college because of poor scholarship. Of the 44

students from the lowest third of their high school class, 28 or 64 per cent were placed on probation for one or more probation periods (one month in length); of the 84 students from the middle third, 35 or 42 per cent were placed on probation; and of the 184 students from the highest third, 17 or 9 per cent were placed on probation. From the lowest third, 22 students or 50 per cent were dropped for low scholarship; from the middle third, 22 students or 26 per cent were dropped; and from the highest third, 8 students or 4 per cent were dropped. From the lowest third, 33 students or 75 per cent received a grade of failure in one or more courses; from the middle third, 41 students or 49 per cent received failing grades; and from the highest third, 29 students or 16 per cent received failing grades.

A consideration of these data suggests some interesting conclusions. If a college wishes to adopt a policy of admitting only those students who are almost certain of doing satisfactory work in college, the college should admit only those students who stand in the highest third of their high school class. If the college refuses admission to students from the lowest two-thirds of their high school class it will keep out almost all students who are likely to do poor work. This does not mean that all students from the lowest two-thirds of their high school class will fail to do satisfactory work; but it does mean that approximately half of such students will be placed on probation, and that one-third of such students will be dropped for low scholarship.

On the other hand, a policy of excluding students from the lowest two-thirds or even from the lowest one-third of the high school class will result in excluding many students who would do satisfactory college work. For example, one fourth of the lowest third students, and one-third of the middle third students in this study were able to complete satisfactorily the work required for a degree. It is possible that other criteria may be employed to pick from the students in the lowest two-thirds those who will succeed in college. Rank in high school class for students in the lowest two-thirds is not by itself a very accurate basis for predicting academic success in college. In general we may conclude that a knowledge of rank in high school class may enable

a college to select students who will succeed academically in college provided the college places the necessary rank high enough; on the other hand, knowledge of rank in high school class does not enable a college to admit students on this basis without at the same time excluding many students who apparently are able to do satisfactory college work.

The second criterion whose validity for predicting academic success in college which was studied was the intelligence test score. The test used was the American Council on Education Psychological Test. It should be noted that the median score and the amount of variability on this test for the group of North Central College students were both very close to these measures on the national norms for college and university freshmen. Incidentally, while there was a positive correlation between rank in high school class and intelligence test score, the relationship was far from perfect. For example, the third quartile intelligence score for the group from the lowest third of the high school class exceeded the median score for the middle third, and it also exceeded the first quartile score for the highest third.

The 312 students included in the study were divided on the basis of intelligence test scores into five groups so that the fifth of the students whose scores were the lowest constituted the lowest group, and so on for the other groups. The average number of semesters spent at North Central College during four years after admission by these groups were as follows: by students in the lowest fifth on the intelligence test, 4.73 semesters; by students in the fourth fifth, 5.90 semesters; by students in the middle fifth, 4.89 semesters; by students in the second fifth, 6.03 semesters; and by students in the highest fifth, 6.13 semesters. The tabulation of those receiving degrees from North Central College within four years after admission resulted as follows: of the students in the lowest fifth 30 per cent received degrees; of those in the fourth fifth 50 per cent; of those in the middle fifth 34 per cent; of those in the second fifth 57 per cent; and of those in the highest fifth 52 per cent.

The comparison of these five groups with respect to grade index showed that the median grade index for students in the lowest fifth was 1.00; for those in the

fourth fifth 1.23; for those in the middle fifth 1.30; for those in the second fifth 1.91; and for those in the highest fifth 1.99.

The next phase of the study concerned itself with the record of those students who were placed on probation or who were dropped from college because of poor scholarship. Of the students from the lowest fifth on intelligence test scores 44 per cent were placed on probation for one or more periods; of the students from the fourth fifth 34 per cent were placed on probation; of the students from the middle fifth 31 per cent were placed on probation; of the students from the second fifth 6 per cent were placed on probation; and of the students from the highest fifth 13 per cent were placed on probation. From the lowest fifth 27 per cent were dropped for low scholarship; from the fourth fifth, 19 per cent were dropped; from the middle fifth 21 per cent were dropped; from the second fifth 8 per cent were dropped; and from the highest fifth 8 per cent were dropped. Of the students in the lowest fifth 54 per cent received a grade of failure in one or more courses; of those in the fourth fifth 42 per cent; of those in the middle fifth 39 per cent; of those in the second fifth 13 per cent; and of those in the highest fifth 17 per cent.

A study of the data obtained when the students were grouped according to the intelligence test score suggests conclusions very similar to those made on the basis of the data obtained when the students were grouped according to the rank in high school class. If a college wishes to establish a policy of admitting only those students who are almost certain to make a satisfactory academic record, it should accept only those students who stand in the highest two fifths on the intelligence test. Refusing admission to students from the lowest three fifths on the intelligence test will keep out almost all students who are likely to do poor work. Again, this does not mean that all students from the lowest three fifths on the intelligence test will fail to do satisfactory work; but the data reveal that approximately one third of such students will be placed on probation, and that nearly one fourth of such students will be dropped for low scholarship.

It should be pointed out in this connection that a policy of excluding stu-

dents from the lowest three fifths or even from the lowest fifth on the intelligence test will result in excluding many students who would do satisfactory college work. For example, of those students in the lowest fifth 30 per cent were granted degrees; of those in the fourth fifth 50 per cent; and of those in the middle fifth 34 per cent. We must again conclude that a college may select students on the basis of the intelligence test who will succeed academically in college provided the required score is placed high enough; but admitting on such a basis does not enable a college to select students without at the same time excluding many students who apparently are able to do satisfactory college work.

A third criterion for selecting students may be found in the combination of rank in high school class and intelligence test score. How accurate is a prediction of success or failure which would be based on the exclusion of students who were in both the lowest third of their high school class and the lowest fifth on the intelligence test? Although the number of the students in this study who fell into both of these groups was but 19, it is interesting to note certain facts about them. Of this group of 19 students, 63 per cent were placed on probation, 53 per cent were dropped, and 26 per cent were able to earn degrees. The accuracy of prediction for this group is almost exactly the same as for the entire group who were from the lowest third of their high school class.

It is very interesting to compare the relative accuracy in predicting success in college scholarships of these two criteria of rank in high school class and of intelligence test score. It so happened that the number of students from the lowest two thirds of their high school class

(128) was almost the same as the number of students from the lowest two fifths on the intelligence test score (125). It was of course also true that the number of students from the highest third of the high school class (184) was practically equal to the number of students in the highest three fifths on the intelligence test score (187). If we refer to these groups as the lower and higher groups on the intelligence test score and lower and higher groups in high school rank, we may compare the lower group on the intelligence test score directly with the lower group in high school rank, and the higher group on the intelligence test score directly with the higher group in high school rank. Of the lower group in high school rank, 30 per cent were granted degrees, 49 per cent were placed on probation, and 34 per cent were dropped; while of the lower group on the intelligence test score, 40 per cent were granted degrees, 39 per cent were placed on probation, and 23 per cent were dropped. Of the higher group in high school rank, 54 per cent were granted degrees, 9 per cent were placed on probation, and 4 per cent were dropped; while of the higher group on the intelligence test score, 48 per cent were granted degrees, 17 per cent were placed on probation, and 12 per cent were dropped. It is therefore apparent that rank in high school class separates more sharply those students who will do satisfactory work from those who will not do satisfactory work than does the intelligence test score. Rank in high school class as measured among students entering North Central College, is appreciably more accurate in predicting academic success in this college than is the intelligence test score. Tabulations were as found in table I.

TABLE I.—VALIDITY OF RANK IN HIGH SCHOOL CLASS AND OF PSYCHOLOGICAL TEST SCORES IN PREDICTING ACADEMIC SUCCESS IN COLLEGE

1. Number and Percent from Each Third of the High School Class				
	Number	Percent		
From lowest third of H. S. Class.....	44	14.1		
From middle third of H. S. Class.....	84	26.9		
From highest third of H. S. Class.....	184	59.0		
Total.....	312	100.0		
2. Median American Council on Education Psychological Test Score				
	Q ₁	Q ₂	Q ₃	
Lowest third of H. S. Class.....	102	138	170	
Middle third of H. S. Class.....	125	162	187	
Highest third of H. S. Class.....	167	201	225	
3. Median Grade Index				
	Freshman Year	Entire Course		
Lowest third of H. S. Class.....	.68	.71		
Middle third of H. S. Class.....	1.10	1.05		
Highest third of H. S. Class.....	1.81	1.84		
4. Average Number of Semesters Spent at North Central College During Four Years After Admission				
By students from lowest third of H. S. Class.....			4.54	
By students from middle third of H. S. Class.....			4.80	
By students from highest third of H. S. Class.....			6.11	
5. Number and Percent Receiving Degrees from North Central College within Four Years after Admission				
	Number	Percent		
By students from lowest third of H. S. Class.....	11	25.0		
By students from middle third of H. S. Class.....	28	33.3		
By students from highest third of H. S. Class.....	100	54.3		
Total.....	139	44.6		
6. Students Placed on Probation for Low Scholarship				
	Number on Probation	Percent on Probation	Av. Number of times on Probation	
From lowest third.....	28	63.6	2.4	
From middle third.....	35	41.7	1.0	
From highest third.....	17	9.2	0.2	
7. Students Dropped for Low Scholarship				
	Number Dropped	Percent Dropped		
From lowest third.....	22	50.0		
From middle third.....	22	26.2		
From highest third.....	8	4.3		
8. Number of Hours of Grades of Failure Received				
	Number Receiving Such Grades	Percent Receiving Such Grades	Average No. of Hrs. of Such Grades	
By lowest third.....	33	75.0	7.4	
By middle third.....	41	48.8	3.9	
By highest third.....	29	15.8	0.8	
9. Comparison of Standing in High School with Standing on Intelligence Test				
Intelligence Test Score	Lowest Third	High School Middle Third	High School Highest Third	Total
Highest fifth.....	2	10	51	63
Second fifth.....	2	8	52	62
Middle fifth.....	9	21	32	62
Fourth fifth.....	12	19	31	62
Lowest fifth.....	19	26	18	63
Total.....	44	84	184	312
10. Median Grade Index				
	Freshman Year	Entire Course		
Lowest fifth on intelligence test.....	.88	1.00		
Fourth fifth on intelligence test.....	1.10	1.23		
Middle fifth on intelligence test.....	1.34	1.30		
Second fifth on intelligence test.....	1.85	1.91		
Highest fifth on intelligence test.....	1.94	1.99		

11. Average Number of Semesters Spent at North Central College During Four Years After Admission
- | | |
|--|------|
| By students in lowest fifth on intelligence test..... | 4.73 |
| By students in fourth fifth on intelligence test..... | 5.90 |
| By students in middle fifth on intelligence test..... | 4.89 |
| By students in second fifth on intelligence test..... | 6.03 |
| By students in highest fifth on intelligence test..... | 6.13 |
12. Number and Percent Receiving Degrees from North Central College Within Four Years After Admission
- | | No. | % |
|--|-----|------|
| By students in lowest fifth on intelligence test..... | 19 | 30.2 |
| By students in fourth fifth on intelligence test..... | 31 | 50.0 |
| By students in middle fifth on intelligence test..... | 21 | 33.9 |
| By students in second fifth on intelligence test..... | 35 | 56.5 |
| By students in highest fifth on intelligence test..... | 33 | 52.4 |
| Total..... | 139 | 44.6 |
13. Students Placed on Probation for Low Scholarship
- | | No. on Probation | % on Probation | Av. No. of Times on Probation |
|-------------------------|------------------|----------------|-------------------------------|
| From lowest fifth..... | 28 | 44.4 | 1.3 |
| From fourth fifth..... | 21 | 33.9 | 1.0 |
| From middle fifth..... | 19 | 30.6 | .8 |
| From second fifth..... | 4 | 6.5 | .1 |
| From highest fifth..... | 8 | 12.7 | .3 |
14. Students Dropped for Low Scholarship
- | | Number Dropped | Percent Dropped |
|-------------------------|----------------|-----------------|
| From lowest fifth..... | 17 | 27.0 |
| From fourth fifth..... | 12 | 19.4 |
| From middle fifth..... | 13 | 21.0 |
| From second fifth..... | 5 | 8.1 |
| From highest fifth..... | 5 | 8.1 |
15. Number of Hours of Grades of Failure Received
- | | Number Receiving Such Grades | Percent Receiving Such Grades | Av. No. of Hrs. of Such Grades |
|-----------------------|------------------------------|-------------------------------|--------------------------------|
| By lowest fifth..... | 34 | 54.0 | 4.8 |
| By fourth fifth..... | 26 | 41.9 | 3.0 |
| By middle fifth..... | 24 | 38.7 | 3.0 |
| By second fifth..... | 8 | 12.9 | .8 |
| By highest fifth..... | 11 | 17.5 | 1.2 |
16. Comparison of Accuracy of Rank in High School Class with Intelligence Test Score in Predicting College Success
- | | Lowest two fifths in intelligence (125) (Percents) | From lowest two thirds of H. S. Class (128) (Percents) |
|-----------------|--|--|
| Degrees | 40 | 30 |
| Probation | 39 | 49 |
| Dropped | 23 | 34 |
- | | Highest three fifths in intelligence (187) (Percents) | From highest third of H. S. Class (184) (Percents) |
|-----------------|---|--|
| Degrees | 48 | 54 |
| Probation | 17 | 9 |
| Dropped | 12 | 4 |