DOCUMENT RESUME

ED 049 283 TM 000 455

AUTHOR Nicholson, Everard
TITLE The Admission Index as a Predictor of Freshman GPA.
SPONS AGENCY Ford Foundation, New York, N.Y.
PUB DATE Feb 71
NOTE 12p.; Paper presented at the Annual Meeting of the American Educational Research Association, New York, New York, February 1971

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS Academic Ability, *Academic Achievement, Academic Performance, Academic Records, *Admission Criteria, *College Admission, College Freshmen, *Grade Point Average, Grades (Scholastic), High Achievers, Low Achievers, Motivation, *Predictive Measurement, Predictor Variables, Rating Scales, Secondary School Counselors, Success Factors
IDENTIFIERS *Admission Index, Brown University

ABSTRACT

The Admission Index, created from high school counselor ratings of academic promise and motivation, is recommended to admission officers and college counselors as a variable as good or better than those traditionally used from the cognitive domain. This index was found not only to be substantially valid and consistent as an achievement motivation scale but also in regression analysis, with a criterion of GPA for the first semester in college, it added significantly to the variance accounted for by traditional indices. Groups defined as high and low on GPA were significantly separated on the index. It discriminated between groups of overachievers and underachievers defined on the basis of national test scores of ability and achievement. It demonstrated its superiority over traditional variables such as rank in class and national test scores by establishing a clear and significant trend for groups of graduates with honors, other graduates and dropouts, the last group of whom generally look like the middle of the graduates on traditional indices. The findings support the search for rating scales calling for human judgment in lieu of grades, a search made necessary by the elimination of grades in some institutions, and de-emphasis of academic achievement as a sufficient criterion of the "success" of college students. (Author)

The Admission Index as a Predictor of Freshman GPA[1]

Everard Nicholson, Brown University

The typical prediction model for college admission purposes has a criterion of grade point average at the end of one or two semesters in college and makes use of predictors indicative of past academic success such as rank in class and grades from high school and national test scores of academic ability and achievement. Recent years have found researchers questioning this emphasis upon the grade getting potential of students, not that this is unimportant but that it is a limited dimension of success. Hoyt's review (1965) resulted in a conclusion that academic achievement in college has only modest correlation with adult success, regardless of its definition. Baird (1968) warns admission officers on the basis of his review that procedures based solely on grades and tests offer no guarantee that a college will obtain students likely to achieve outside the classroom.

De-emphasis of academic grading has become a fact of life for a number of colleges and secondary schools. For admission officers this could mean the loss eventually of either or both of criterion and predictors, compelling them to rely more heavily upon national test scores or to seek new predictors or both. In lieu of grades, one approach would be to use rating scales completed by professors and deans at the college level and teachers and guidance counselors at the secondary school level. Such scales may be expected to include the dimension of potential for academic achievement but also other dimensions as a result of the interaction between rater and student. Theoretically, therefore, such scales should be better than grades; in actual practice they will be as good as the rater is experienced and unbiased. Ideally, a high school counselor or college dean would collate the opinions of several people who have worked with a student over a period of time.

There is a lack of consensus concerning the ability of counselors to predict the "success" of students. Meehl (1957) recommended against human judgment in a

situation where a cross-validated formula exists, "unless the psychological situation is as clear as a broken leg." The high school counselor rarely has the benefit of formulas and must rely upon his own judgment when he rates a student's potential for success in college. Tyler (1961) had a very poor opinion of counselor judgments finding them not to be sufficiently accurate safely to base decisions upon them. The decade since has seen enormous professional growth in counselors who are more likely today to have the responsibility of completing such ratings concerning the secondary school experience of students applying for college. The college dean's expertise is more likely to be derived from on the job experience. Whately (1966) examined counselor confidence in their own predictions and found the most confident to be least accurate and the least confident most accurate. A year later, Whately (1967) defended the concept that to the extent that prediction is important, logically a counselor should be able to predict relatively well before he is an effective counselor but conceded that little experimental evidence supported the counselor's role in prediction.

Prediction of success calls for the assessment of motivation to succeed, but this is more easily said than done. If academic success is a limited dimension, then "success" is a global concept. Unfortunately, motivation is too, and present methods of assessment are at best very crude. Krumboltz (1957) could find no single instrument that a counselor can use with confidence that he is measuring achievement motivation. Shaw (1961) found that none of three published achievement scales differentiated between achievers and underachievers in a high school sample. Uhlinger and Stevens (1960) noted that the crude state of motivational theory had failed to generate valid operations. Nicholson (1970) found that the situation was not substantially different a decade later. It is clear that only inferior measures of motivation are available to the counselor.

It is well known that the self-reporting nature of personality inventories make them susceptible to response sets such as acquiescence and faking and also

that their reliability is low. The student's ego is only indirectly involved in counselor ratings of him. A much more important consideration is that of the impression that he has created, for success broadly defined and over the long term may be as much related to the impression that is made upon those in the position to advance an individual as it is upon his past accomplishment.

The purpose of this study was to investigate the potential of an Admission Index created from high school counselor ratings of academic promise and motivation, found in the secondary school records of candidates for admission to a selective liberal arts college. One of the arguments of admission officers was that ratings of applicants to a college such as Brown University are generally so high as to be meaningless. It was hypothesized for this study not only that the Admission Index would be a valid predictor of academic success but also that it would provide a motivation variable valuable beyond its immediate need for the admission office. In other words, though counselors lack the benefit of good motivational measures, they provide in their ratings the wherewithall to make one.

Method

Subjects

The subjects of this study were all male Brown University students. The principal sample was that of all members of the Class of 1970 (entered 1966) who had completed one semester in college and had all data (N=583; 94%). Subsamples comprised those who graduated normally in four years (N=441) and those who dropped out (N=62). The remainder who for sundry reasons left and then returned for delayed graduations were of necessity eliminated.

Samples of overachievers (N=247) and underachievers (N=246) were also selected from Classes 1966-1968 inclusive, according to the definitions of Davis (1964, p. 260). Regression analysis was used to derive an equation for the prediction of the average of College Board achievement tests (CBAT) from the scholastic aptitude

variables SAT-V and SAT-M. Differences between actual and predicted CBAT in excess of one S.E. of Estimate classified the types of achievers relative to the average of all 1616 members of Classes 1966-1968 on the basis of individual ability and achievement test measures. Cross-validation was effected by applying the same formula to the Class of 1969, as if it were a real-life application of the procedure.

Measures

The Admission Index (AI) was derived from three sets of counselor ratings of academic and personal promise (rated 1-5) and a motivation scale (rated 1-9), found in the secondary school records of students at the time of their applications to Brown University (Full scale = 4-24). In addition to the College Board achievement tests' average (CBAT) and the scholastic aptitude variables (SAT-V and SAT-M), other variables used in analyses were standardized secondary school rank in class (SSR), the locally predicted grade point average for the first semester in college (PSI), actual grade point average for the first semester (GPA) and the cumulative grade point average for the purpose of classification only. All standard test scores were reduced to 2-digit form.

The writer draws attention to CBAT, deemed to be an index of maximum academic performance, since students have considerable discretion in choosing tests most favorable for them (Brown University applicants submit three or more). Experience has found CBAT often to be superior to SSR possessing independent properties that make it especially useful in prediction formulas for students from highly intensive or selective high school situations, from which ranks in class may be deceivingly low relative to those submitted from most schools.

Hypotheses

Hypotheses set forth were: (a) that groups defined as high and low on AI would significantly separate themselves on traditional variables and also on GPA for the first semester in college; (b) that AI would add significantly to the variance ed for by traditional variables in regression analysis with a criterion of

GPA for the first semester in college; (c) that AI would discriminate between overachievers and underachievers defined independently of the high school transcript and that such groups would achieve as labeled relative to the avera e of all students on the basis of GPA for the first semester in college; (d) that AI would discriminate significantly between students defined as high and low achievers on the basis of GPA for the first semester in college; and (e) when the criterion was advanced to that of graduation, not only would AI discriminate between the dropouts and those who graduate normally in four years but also demonstrate its superiority over other variables traditionally used in admission by discriminating for the non-graduate.

Results

Table 1 includes univariate statistics for the data of approximately equal groups of the Class of 1970 defined as "high" with a score of 22 or more on AI and "low" with a score of 21 or less. Clearly the groups were different and indicative of a strong correspondence between the ratings of counselors and the scores made by students on traditional indices. That the groups manifested such strong separation when the dichotomy was declared at a point so high lends considerable support to the discriminating property of counselor ratings. Since the population was that of accepted students in a situation where only about one in nine are chosen, AI had a limited range and a negatively skewed distribution like rank in class. To get a score of 21, which placed a student in the "low" group, he would have to have close to maximum ratings, indicating for him possible hesitancy on the part of the counselor to go all the way. Such hesitancy was sufficient to categorize students as may be seen from the results of the analysis of GPA for the first semester found in Table 1, supporting the validity of AI and subsequently of counselor ratings of the academic promise of students applying for college. The consistency of AI, and therefore of counselor ratings, is demonstrated in the correlation patterns for AI with traditional variables in several replications [illegible] in Table 2.

The next step was to examine AI as a potential contributor to a prediction equation. AI was added to the four basic academic variables, SSR, SAT-V, SAT-M and CBAT, for analysis by stepwise multiple regression with a criterion of GPA for the first semester in college. AI was third in the order of contribution after SSR and CBAT but ahead of both SAT-V and SAT-M. A multiple correlation of .53 was derived for SSR, CBAT and AI, and the following equation for the prediction of PSI: (PSI'= .0245(SSR) + .0227(CBAT) + .0384(AI) - 1.4143). The overall F for the equation was significant (F=11.23), and a Standard Error of Estimate for PSI' of .5294 determined. AI added significantly to the variance accounted for by SSR and CBAT (F=10.85). This finding supports not only that a variable created from counselor ratings has the potential for being a valuable contributor but also that it has properties uniquely different from rank in class and the academic achievement average CBAT.

A further examination of the validity of AI was made by declaring groups of students as overachievers and underachievers independent of the high school transcript on the basis of the scholastic aptitude variables, SAT-V and SAT-M, and the College Board achievement average, CBAT. The reader who finds difficulty living with such classifications should note that for this paper, high and low achievers are defined by high and low achievement regardless of ability. Overachievement is considered to be the situation which exists when, relative to the average of his group, a student achieves better on a test of achievement than on a test of ability and vice versa for the underachiever. Such individual classification makes for the factoring out of ability as may be seen in Table 3, the univariate statistics of which clearly show that the two types of achievers would be on opposite ends of an achievement scale. GPA for the two groups and replications are also found in Table 3. Not only were group GPA means significantly different, but when individually they were compared with statistics for the total samples (1966-1968 Mean [illegible].31; S.D.= 0.67; N=1616); (1969 Mean GPA = 2.43; S.D.= 0.67; N=680), the

probability that an underachiever would have a GPA for the first semester as high as the mean for all students and that an overachiever would have a GPA as low as the mean for all students was only about one in three for both. It would seem not only that the defined groups would achieve compared with their peers in college according to the labels attached to them but also, since AI significantly discriminated between the overachievers and underachievers, that counselor ratings do contain the dimension of the motivation of students.

High and low achievers in the Class of 1970 were defined by the attainment of 3.00 or better and 2.00 or lower on GPA for the first semester in college. The results of one-way analysis of variance of AI for the two groups found in Table 4 strongly support both the predictive and motivational property of the variable.

Nicholson (1970) has questioned the sufficiency of a criterion of success as early as the first semester in college, and so for this study the criterion was advanced to that of graduation for the Class of 1970. Would AI discriminate between those graduated normally in four years and those who fall away? The results of one-way analysis of variance found in Table 5 support that an admission officer who uses counselor ratings as an integral part of the admission process is operating with a variable that is sensitive to the academic success of students four years beyond its immediate use.

The final analysis was concerned not only with the validity of AI as a discriminator between those who graduate and those who drop out of college but also with the property of motivation. Griffin (1965) observed that when students were classified by levels of cumulative academic average at graduation, and the traditional academic data of non-graduates were compared, that non-graduates looked like the middle of the graduates, suggesting that such data were poor predictors of non-graduation. Nicholson (1970) replicated this finding. Four groups were classified by graduation averages of 2.75 or above, 2.25-2.74, below 2.25, and s. Although F-statistics for SSR, SAT-V, SAT-M and CBAT for the four groups

were generally significant, a descending order of means did not continue into the non-graduates, who looked better by these data than the lowest group of graduates. Further, when AI was analyzed for the same groups, the overall F-statistic was also significant, a descending order of means corresponded to the levels of graduation, and the trend continued into the dropouts. AI performed as GPA would perform in the real-life situation of actual achievement in college.

For this paper, the criterion was modified to meet the local need of a college which has eliminated grades. Three groups of the Class of 1970 were defined; those who graduated in four years with honors, those who graduated in four years without honors, and those who dropped out. It is assumed that those who graduated with honors (cum, magna cum and summa cum laude, honors in major areas of study, Phi Beta Kappans and Sigma Xis) were highly motivated to achieve such distinctions. Again the miscellaneous group of those with delayed graduations due to temporary separations were eliminated. The results of analysis of variance of traditional data, GPA for the first semester, and AI, are found in Table 5. Four of the five traditional pre-admission variables, SAT-V, SAT-M, CBAT and PSI, which is a function of CBAT, replicated the lack of trend. In other words, the traditional academic data were all right for finding highly achieving students (who are probably obvious anyway) but worthless for discriminating between those who graduate regularly and those who drop out of college.

AI, on the other hand, performed as hypothesized, demonstrating its potential not only for discriminating between groups defined by academic achievement but also its ability to rank them identically similar to that of GPA for the first semester, the foresight of which the admission officer does not possess. This finding suggests that, for example, in multiple discriminant analysis which maximizes the power of variables to separate groups, AI could be a valuable variable for prediction purposes. Nicholson (1970) reported the results of such an analysis where the total [illegible] comprised students accepted with scores below the means of their classes.

Table 1

Univariate Statistics for Groups High and Low on the Admission Index: Class of 1970

Variable	Rated High N = 299		Rated Low N = 284		F
	Mean	S.D.	Mean	S.D.	
SSR (Std)	68.09	6.70	62.24	6.91	107.54**
SAT-V	66.21	6.62	62.49	6.40	47.61**
SAT-M	69.34	7.11	65.49	7.05	43.03**
CBAT	66.44	6.11	61.97	6.35	74.82**
PSI	2.69	0.36	2.35	0.35	133.63**
GPA	2.65	0.62	2.26	0.56	62.57**

** $P < .01$

Table 2

Replications of Correlational Analyses: of the Admission Index and Academic Variables

Variable	Groups		
	Classes 1966-1968	Class of 1970	Class of 1971
	N = 1616	N = 583	N = 689
SSR	.47	.47	.48
SAT-V	.25	.30	.28
SAT-M	.27	.31	.32
CBAT	.34	.40	.38
PSI	.44	.51	.47
GPA	.30	.37	.29

Table 3

Analyses of Pre-Admission Data and GPA for Underachievers and Overachievers of Classes 1966-1968 and the Class of 1969

Variable	Classes 1966-1968					Class of 1969				
	Underachievers N = 246		Overachievers N = 247		F	Underachievers N = 76		Overachievers N = 141		F
	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.	
SSR	62.05	7.25	65.39	7.40	25.51**	63.09	7.01	66.50	7.80	9.99**
SAT-V	60.73	7.22	60.48	7.82	0.14	62.01	6.50	62.06	6.56	0.00
SAT-M	64.99	7.02	65.00	8.76	.01	67.76	6.25	66.33	8.99	1.52
CBAT	53.62	5.35	67.02	5.79	753.07**	55.33	4.40	68.46	4.90	377.35**
AI	18.90	2.73	20.30	2.56	34.40**	19.79	2.95	21.06	2.20	12.68**
PSI#	1.96	0.32	2.64	0.36	503.99**	2.08	0.28	2.75	0.35	209.61**
GPA	2.05	0.56	2.54	0.67	75.51**	2.15	0.62	2.57	0.68	20.15**

** $P < .01$

PSI is a function of SSR and CBAT which defined the samples.

10

Table 4

Analysis of Variance of the Admission Index for Groups defined as High and Low on GPA for the First Semester in College

	Class of 1970			
Source	SS	d.f.	MS	F
Between	407.06	1	407.06	85.59**
Within	1526.69	321	4.76	
Total	1933.75	322		

	Univariate Statistics of Groups			
	Rated High on GPA 3.00 or higher N = 152		Rated Low on GPA 2.00 or lower N = 171	
	Mean	S.D.	Mean	S.D.
AI	22.40	1.73	20.15	2.50

** P < .01

Table 5

Results from Analyses of Variance of the Admission Index and Traditional Data of Graduates with Honors, Graduates without Honors and Dropouts

	Class of 1970						
Variable	Graduates with Honors N = 149		Graduates without Honors N = 292		Dropouts N = 62		F
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
SSR	68.17	7.17	64.16	6.71	63.16	8.50	18.67**
SAT-V	66.63	6.41	63.12	6.79	64.95	6.66	13.87**
SAT-M	69.34	7.06	66.38	7.14	67.63	6.95	8.58**
CBAT	67.01	6.32	62.48	6.37	64.79	6.68	25.04**
AI	21.95	1.89	20.94	2.30	20.64	2.71	12.16**
PSI	2.73	0.38	2.42	0.35	2.49	0.44	35.01**
GPA	2.96	0.50	2.33	0.51	1.98	0.63	100.12**

** P < .01

References

Baird, Leonard L., "The Achievements of Bright and Average Students," Educational and Psychological Measurement, Volume 28, 1968, pp. 891-899.

Davis, Frederick B., Educational Measurements and their Interpretation, Belmont, California: Wadsworth Publishing Company, Inc., 1964, pp. 253-261.

Griffin, Celeste F., The Prediction of College Graduation from Aptitude, Achievement and Personality Variables by Multiple Discriminant Analyses, Unpublished Dissertation for the Degree of Master of Arts, Providence, Rhode Island: Brown University, 1965.

Hoyt, Donald P., "The Relationship Between College Grades and Adult Achievement: A Review of Literature," ACT Research Report, No. 7, September, 1965.

Krumboltz, J. D., "Measuring Achievement Motivation--A Review," Journal of Counseling Psychology, Volume 4, No. 3, 1957, pp. 191-198.

Meehl, Paul E., "When Shall We Use Our Heads Instead of the Formula," Journal of Counseling Psychology, Volume 4, No. 4, 1957, pp. 268-273.

Nicholson, Everard, Success and Admission Criteria for Potentially Successful Risks, Providence, Rhode Island: Brown University, 1970.

Shaw, Merville, "Need Achievement Scales as Predictors of Academic Success," Journal of Educational Psychology, Volume 52, No. 6, 1961, pp. 282-285.

Tyler, Leona E., The Work of the Counselor, New York: Appleton-Century-Crofts, 1961, p. 209.

Uhlinger, Carolyn and Stephens, Mark W., "Relation of Achievement Motivation to Academic Achievement in Students of Superior Ability," Journal of Educational Psychology, Volume 51, No. 5, 1960, pp. 259-266.

Whately, Donivan, "Counselor Variability in Making Accurate Predictions," Journal of Counseling Psychology, Volume 13, No. 1, 1966, pp. 53-62.

Whately, Donivan, "Counselor Predictive Skill and Rated Counselor Effectiveness," Personnel and Guidance Journal, Volume 45, 1967, pp. 579-584.

Footnote

[1]This research was developed from one part of a broad analysis of success and admission criteria, which was supported by a grant from the Ford Foundation.