



COGNITIVE AND NON-COGNITIVE CHARACTERISTICS OF MINORITY MEDICAL SCHOOL APPLICANTS*

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There has been increasing concern about the criteria used to choose among applicants to medical schools. In the past, major emphasis has been placed on the Medical College Admission Test (MCAT) scores and grade point averages (GPA). However, the validity of these criteria in predicting success in the clinical years of medical school and in medical practice is not established. With the increasing concern for admitting more qualified minority students, the limited usefulness of cognitive measures has become even more evident. Minority students score lower on such measures yet many have become successful medical students and physicians.

The Association of American Medical Colleges is directing considerable effort toward defining the usefulness of non-

cognitive measures to supplement the cognitive ones now employed in the MCAT. The Medical College Admissions Assessment Program Task Force is especially interested in the use of non-cognitive criteria in regard to minority applicants¹. As part of an ongoing study of non-cognitive predictors of success in medical school, cognitive and non-cognitive differences between successful and unsuccessful applicants to Baylor College of Medicine were examined in minority and non-minority applicants.

PROCEDURE

Five hundred twenty-three (82%) of the 640 applicants for the class entering in 1974 who were interviewed at the College agreed to participate in this study. Of these, 66 participants were black or Mexican-American. Because the number of female minority participants was too small for meaningful statistical analysis, this report is limited to the 23 black, 30

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TABLE 1. MEAN SCORES OF ACCEPTED
AND REJECTED MALE APPLICANTS ON COGNITIVE
AND BIOGRAPHIC VARIABLES

	<i>NonMinority Accepted (N = 132)</i>	<i>NonMinority Rejected (N = 220)^p</i>	<i>Mexican-American Accepted (N = 14)</i>	<i>Mexican-American Rejected (N = 16)^p</i>	<i>Black Accepted (N = 13)</i>	<i>Black Rejected (N = 10)^p</i>
Medical College Admissions Test						
Verbal	620.61	589.82 < .001	522.86	491.88 < .10	524.23	454.00 < .05
Quantitative	655.08	632.32 < .001	595.71	520.63 < .01	545.77	522.00 NS
General Information	614.85	577.73 < .001	535.71	496.88 < .10	535.00	447.00 < .01
Science	655.00	622.64 < .001	584.29	503.75 < .001	540.38	505.00 NS
Grade Point Average						
Cumulative	3.63	3.53 < .001	3.09	3.03 NS	2.88	2.87 NS
Science	3.62	b 3.52 < .01	3.04	2.82 < .10	2.91	2.70 NS
Non-Science	3.63	3.52 < .001	3.27	3.11 NS	2.96	3.08 NS
Birth Order	1.61	1.75 NS	1.57	1.94 < .05	1.85	2.30 NS
Age	21.02	21.48 < .05	21.21	22.25 < .01	22.77	21.40 NS

TABLE 2. MEAN SCORES OF ACCEPTED AND REJECTED MALE APPLICANTS ON NON-COGNITIVE VARIABLES

	<i>NonMinority Accepted (N = 132)</i>	<i>NonMinority Rejected (N = 220)^p</i>		<i>Mexican-American Accepted (N = 14)</i>	<i>Mexican-American Rejected (N = 16)^p</i>		<i>Black Accepted (N = 13)</i>	<i>Black Rejected (N = 10)^p</i>
Edwards Personal Preference Schedule								
Achievement	17.32	17.78 NS		15.21	16.56 NS		15.54	18.60<.05
Order	8.76	9.44 NS		7.43	10.88<.01		12.46	10.10 NS
Intracception	17.87	17.09 NS		15.50	18.81<.01		17.15	17.90 NS
Succorance	11.61	10.94 NS		11.43	8.19<.10		9.85	9.60 NS
Dominance	15.43	16.21<.10		15.64	17.50 NS		14.54	13.70 NS
Change	15.06	14.91 NS		15.00	14.25 NS		14.00	16.40<.10
Endurance	13.07	14.24<.05		13.14	15.25 NS		15.62	15.20 NS
Aggression	11.55	11.44 NS		13.36	9.69<.01		13.15	12.80 NS
Consistency	11.24	10.86<.05		10.29	10.75 NS		10.62	10.90 NS
Minnesota Multiphasic Personality Inventory								
Ego Strength	50.47	50.02 NS		49.25	52.88<.05		50.01	50.18 NS
California Psychological Inventory								
Capacity for Status	21.70	21.04<.10		19.79	22.19<.01		20.77	19.30 NS
Tolerance	24.00	23.77 NS		20.64	22.94<.10		23.23	19.70<.05
Sociability	27.26	26.56<NS		25.00	29.25<.01		28.69	26.70<.10
Eysenck Personality Inventory								
Extroversion	11.64	11.06 NS		10.86	13.25<.05		11.84	10.90 NS
Lie	2.89	2.91 NS		2.43	3.25<.05		2.31	2.40 NS
Kaplan Self-derogation	12.29	12.24 NS		12.57	11.31 NS		11.23	12.80<.10
Birkman Attitudes^a								
Toward others -Materialism	66.46	66.82 NS		76.29	64.94<.10		75.15	80.90<.10
-Sociability	35.12	34.05 NS		31.57	46.94<.10		31.69	43.00 NS
-Depression	63.26	59.79 NS		75.00	63.44<.05		60.77	58.70 NS
Toward self -Individuality	74.88	75.71 NS		72.14	75.25 NS		79.38	91.90<.05
-Insistence	75.38	76.28 NS		70.71	83.31<.05		80.85	71.50<.10
-Sociability	56.67	51.38 NS		35.43	77.31<.001		74.23	64.60 NS
-Energy	61.51	62.93 NS		57.21	71.87<.10		70.46	50.60 NS
-Indecision	24.87	23.52 NS		30.93	21.12 NS		17.85	34.50<.10
-Depression	37.17	34.44 NS		57.29	35.06<.01		35.15	30.50 NS
Birkman Vocational Interests								
Scientific	80.49	79.81 NS		78.29	76.37 NS		77.23	89.80<.10
Artistic	65.41	65.62 NS		61.07	73.50<.10		62.31	60.10 NS
Literary	61.81	55.87<.10		55.00	56.88 NS		79.00	59.10<.01
Musical	73.09	70.57 NS		68.93	69.00 NS		73.31	78.80<.10

^aBirkman scores are percentiles based on general population norms.

Mexican-American and 352 non-minority males who completed the tests.

The non-cognitive test battery included: the Edwards Personal Preference Schedule²; a self-derogation scale³; an impulsivity scale⁴; the depression, psychopathic deviate and ego strength scales from the Minnesota Multiphasic Personality Inventory⁵; the capacity for status, tolerance, intellectual efficiency and sociability scales from the California Psychological Inventory⁶; the Eysenck Personality Inventory⁷; and the Birkman Method which measures vocational interests and attitudes toward self and others⁸. In addition, the following cognitive and biographic data was obtained for each of the participating applicants: MCAT scores; undergraduate GPAs; number of medical schools applied to; educational level; birth order; age; and father's occupational level.

The significance of differences between mean scores for accepted and rejected male applicants within each racial group were analyzed for each of the variables by the t-test for non-minority males. Since the number of minority subjects was relatively small, the non-parametric Mann-Whitney U

Test⁹ was used for these groups. Because of the exploratory nature of this research, a probability level of .10 was accepted as significant for all variables.

RESULTS

The differences between accepted and rejected male applicants in each of three racial groups on the cognitive and biographic variables are shown in Table 1. There is a highly significant difference ($p < .001$) on all four MCAT subscores between accepted and rejected non-minority applicants. The difference is less for Mexican-American applicants, while there is no significant difference on the quantitative and science subtests for black applicants. Similarly, the accepted-rejected differences on GPAs are highly significant for non-minority men, while there are no significant GPA differences among blacks. Accepted and rejected Mexican-American students differed only on the science GPA. These results indicate clearly that the usual cognitive criteria for determining acceptance to medical school has limited usefulness among the minority group males in this sample.

The only biographic variables distinguishing between accepted and rejected applicants were age and birth order. Accepted non-minority and Mexican-American applicants were younger but among blacks it was the older applicants who were accepted. More of the accepted Mexican-American applicants were first born or second born than were the rejected applicants of this minority. A similar non-significant trend was evident among the non-minority and black applicants.

The non-cognitive variables for which there were significant accepted-rejected applicant differences in any of the three racial groups are presented in Table 2. There were many more non-cognitive differences between accepted and rejected minority group men applicants than for the non-minority men applicants. Significant differences between accepted and rejected white male applicants were found on only five of the 59 personality test variables measured, a number not exceeding chance. For the Mexican-American group there were 18 such differences, and 12 of the non-cognitive variables showed differences between accepted and rejected black applicants.

The pattern of these differences in the minority groups is of interest. Accepted Mexican-American applicants score lower on the needs for order, intraception (empathy) and higher on succorance and aggression than do rejected applicants. They also score lower on ego strength, capacity for status, sociability and extroversion and lower on a validity scale. They also believe others to be more materialistically oriented, less sociable and more depressed than do rejected applicants. They think themselves less insistent, sociable and energetic and more depressed than do rejected applicants. In the vocational interest area, they are less interested in artistic areas than are rejected applicants. The pattern among black applicants appears in many ways to be the reverse. Accepted black applicants report lesser needs for achievement and change, are more tolerant and sociable, are less self-derogating, think others to be less materialistically oriented, themselves to be less indecisive than rejected black applicants. Accepted black applicants score lower on interest in musical vocations and higher on literary interests than do rejected applicants.

DISCUSSION

These results must be interpreted cautiously until they are replicated on additional samples of minority applicants. Many of the differences are small, they reflect differences among the applicants to only one medical school and reflect the decision process in only one admissions committee. In addition, they say nothing concerning a possible relationship between non-cognitive variables and performance in medical school and in practice.

With these qualifications, the results do underscore the

importance of non-cognitive variables and the relative lack of importance of cognitive variables in the selection process. They also suggest that non-cognitive variables may operate differentially within minority groups. If the results are confirmed by research on a new sample now in progress, and if they prove to be related to later performance, non-cognitive variables may be useful in the selection of minority group applicants¹⁰.

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