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By- Brown, Roscoe C., Jr.; Henderson, Edward H.

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Studied were the variables in the selection process of students screened for participation in Project APEX. This project was designed to identify disadvantaged students with potential for college success who are enrolled in the noncollege preparatory general diploma high school program. Subjects were 148 male students in two New York City schools who were nominated by teachers. The variables of intellectual functioning, personality and social adjustment, and personal goals and motivation were measured by standard tests, school records, a personal data sheet, and a structured interview with a psychologist counselor. The interviewer's recommendation appears to be the major variable differentiating the selected and rejected groups of students. It is felt that a carefully developed counseling-type inventory for use with teacher-recommended students is probably the best procedure for screening disadvantaged students with college potential. Findings are presented in two tables of statistics. (See also UD 006872.) (NH)

A DISCRIMINANT ANALYSIS OF VARIABLES USED TO SELECT STUDENTS FROM DISADVANTAGED BACKGROUNDS[1,2]

Roscoe C. Brown, Jr. & Edward H. Henderson

New York University
School of Education

Introduction

This study presents the results of an analysis of the variables used to select students for Project APEX, a college program for youth from disadvantaged backgrounds, supported by the Office of Economic Opportunity and the Astor Fund.

This evaluation is based on tests administered to 148 students. This total represents the number of students from whom complete data are available. Twenty-two additional students were tested but were eliminated because it was found that although they were going to receive a general diploma, they had actually been in the academic program. Some students who were nominated dropped out of the testing or never appeared for testing.

Procedure

Since the APEX program was designed for male students who were graduating from the general curriculum (a curriculum which excludes students seeking an academic, commercial or vocational diploma), it was necessary to identify two schools with an enrollment in the general curriculum that was large enough for a systematic process of selection to be used. It was decided to select the students from Morris High School in the Bronx and Benjamin Franklin High School in East Harlem. These schools contained a large number of students in

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the general curriculum and were participants in the New York City Municipal-Cooperative Work Study Program for general curriculum students sponsored by the New York City Government. One of the members of the project staff had been involved previously in the evaluation of the Municipal Cooperative study in these schools. The total number of prospective graduates from the general curriculum in the two schools was between 400 - 450 students.

The variables that were used in the selection process and the instruments used to provide data on them are listed below:

VARIABLES	INSTRUMENT
1. Intellectual Functioning	1. School and College Aptitude Test (SCAT) developed by the Educational Testing to identify verbal and quantitative aptitude.
	2. Stanford Achievement Test (Advanced Battery) Paragraph Meaning, Arithmetic Concepts, Social Studies Study Skills.
	3. Review of school record.
2. Personality and Social Adjustment	1. Gordon Personal Profile
	2. Minnesota Counseling Inventory (modification of MMPI for high school counseling purposes.)
3. Personal Goals and Motivation	1. Life Planning Questionnaire (developed by Martin Hamburger for the Career Patterns Study, Teachers College, Columbia University).
	2. Personal data sheet
	3. One hour structured interview with a counseling psychologist.

A supervisor, testing assistants, scorers, and psychologists were hired to administer and score the tests.

The students to be tested and interviewed were identified by recommendations from teachers in the respective schools. All teachers in each school met with the APEX staff members responsible for the selection and were given explanations, orally and in writing, about the program. The teachers were asked to nominate any prospective graduate in the general curriculum whom they thought might qualify for the program. Approximately 100 students from each school were invited to be tested.

After tests were administered and scored, three members of the professional staff of APEX rated each student on the appropriate criteria using a rating form. The "responses to a "yes - no" question, "Should the student be in APEX?", was used to develop the list of students to be selected. Where three (3) "yeses" were recorded, the students were placed on an alternate list in a priority order determined by the staff. The total number of students with three "yeses" was 45 and the total with two "yeses" was 33. After screening the students for their financial eligibility (to become eligible for the Work-Study Program), family problems, health problems, and other career plans, it was necessary to select 11 alternates to replace the students who would or could not enter the program.

Results

Table 1 presents the means and standard deviations for each of the variables used in selection for the selected group (N=78) and the not-selected group (N=70). The average reading and arithmetic level of the selected

students was a grade equivalent of 7.6. The average percentile on the School and College Aptitude Test (SCAT) of the selected students was the 30.8th percentile. This percentile would be equivalent to an I.Q. of 92-94 on an intelligence test with a standard deviation of 12 to 16. Since intelligence tests cannot be administered in the New York City Public Schools, it was necessary to use a test which is not an intelligence test to assess intellectual potential. The SCAT is advantageous in that the scores are presented in percentile bands which establish the probable score range of each measure for each student. In this analysis the midpoint of the percentile band was used to establish a percentile score for each student.

Table 2 presents the results of a discriminant function analysis of variance, a technique which identifies the relative contribution of each variable to the differentiation of the selected and not selected groups.

These data show that the major variable differentiating the two groups is the recommendation of the psychologist-counselor interviewer. When all variables are considered, four variables out of the thirty-two variables (school, ethnic background, athletic participation and interviewer recommendations) account for 60% of the factors that differentiate between the selected and not selected groups. The school and ethnic variables, however, should be discounted because they relate to sampling factors. Proportionately more students from Morris and more Puerto Rican students were selected. The reason for this is that a few more students from Franklin were included in the original selection sample. Since a larger proportion of the Franklin students were Negro, the Puerto Rican students were selected in a slightly larger proportion.

When school and ethnic background are omitted, interviewer recommendations account for 44% of the differentiation between the two groups and athletic participation accounts for 23% of the differentiation between the selected and not selected groups. This finding is not particularly surprising since selection of college students from this type of high school population is essentially subjective. No other studies have identified those variables which might improve the identification of students from disadvantaged backgrounds who have the potential to be successful in college. Our findings support the need for more creative efforts to develop different techniques for selecting students from disadvantaged backgrounds for special college programs. For the present, the data suggest that a carefully worked out counseling-type inventory used with a group of students, initially recommended by their teachers, is probably the most helpful procedure to select disadvantaged students for a special college program. This study does not, however, provide evidence on the extent to which the selection criteria predict the relative success of the students.

TABLE 1

Means and Standard Deviations of Basic Data

Variables	Selected			Not Selected		
	M	SD	N	M	SD	N
1. School (1-Morris, 2-Franklin)	1.4744	.5026	78	1.5972	.4939	72
2. Ethnic (1-Negro, 2-Puerto Rican, 3-White)	1.6667	.6580	78	1.7778	.5622	72
3. Stanford Paragraph Meaning (Grade Equivalent)	7.6189	1.7685	74	6.8352	17.915	71
4. Stanford Arithmetic Concepts (Grade Equivalent)	7.6391	1.7195	74	6.5788	16.104	71
5. Stanford Study Skills (No correct)	22.7892	4.9232	74	19.4085	5.6910	71
6. SCAT Verbal (Percentile)	36.5789	18.6392	76	25.3043	19.5157	69
7. SCAT Quantitive (Percentile)	29.9605	19.6851	76	19.1571	14.0348	70
8. SCAT Total (Percentile)	30.9342	19.5000	76	17.7286	13.6075	70
GORDON						
9. Ascendency (Percentile)	72.3056	21.8230	72	59.3437	27.2147	64
10. Responsibility (Percentile)	66.2778	23.0970	72	58.3281	24.2801	64
11. Emotional Stability (Percentile)	62.7778	23.1305	72	57.2812	27.6155	64
12. Sociability (Percentile)	59.0556	21.0939	72	49.5000	26.3505	64
MINNESOTA						
13. Validity (Percentile)	57.4853	11.5713	68	61.6452	12.0533	62

Table 1 (cont.)

	M	SD	N	M	SD	N
14. Family Relations (Percentile)	51.5441	8.8511	68	51.2258	10.7694	62
15. Social Relations (Percentile)	44.8529	6.4583	68	48.9355	7.8152	62
16. Emotional Stability (Percentile)	47.9118	8.5094	68	49.3065	11.0240	62
17. Conformity (Percentile)	49.8971	9.6415	68	48.9516	10.2836	62
18. Adjustment to Reality (Percentile)	48.4412	10.1237	68	51.4032	11.0624	62
19. Mood (Percentile)	53.2941	8.0262	68	56.6774	10.4877	62
20. Leadership (Percentile)	47.6324	8.6351	68	50.0645	8.5332	62
21. Teacher Recommendation (Number)	6.0556	3.4392	72	4.1364	2.8278	66
22. Athletics 1.-Did not Participate 2.-Did Participate	1.4400	.4997	75	1.1846	.3910	65
23. Other School Activities 1.-Did not Participate 2.-Did Participate	1.5867	.4957	75	1.3485	.4801	65
24. Family Status 1.-No Family 2.-Broken 3.-Intact	2.4026	.5680	77	2.5152	.5614	66
25. Interview Recommendation (1.-Do not Recommend to 5-Strongly Recommend)	4.3206	.7812	78	2.0152	1.3184	66
26. Part time job 1.-No part time job 2.-Part time job	1.7600	.4300	75	1.6667	.5064	66
27. Salary now Desired 1.- Low to 5, high	2.9853	1.0147	68	2.6066	1.0844	61
28. Salary Desired in 15 years 1.- Low to 5 high	4.7810	1.9928	67	4.2787	1.5398	61

Table 1 (cont.)

	M	SD	N	M	SD	N
29. Life Planning Would Like 1.-Non professional to 7 teacher	5.5000	1.6495	78	4.3485	2.0191	66
30. Best fitted 1.-Non Professional to 7 teacher	4.5658	2.1623	76	4.3281	2.1161	64
31. Expect 1- Non Professional to 7 teacher	4.2237	2.1823	76	3.7273	2.1379	66
32. Age	18.0000	.8220	75	18.8750	7.3541	72

TABLE 2

Results of Discriminant Analysis

Variable	Selected Group Means	Discriminant Factor	Not Selected Group Means
1. School (1.-Morris 2.-Franklin)	1.47436	.00793	1.59722
2. Ethnic (1.-Negro, 2.-Puerto Rican, 3.-White)	1.66667	.00349	1.77778
3. Stanford Paragraph Meaning (Grade Equivalent)	7.61794	.00018	6.83472
4. Stanford Arithmetic Concepts (Grade Equivalent)	7.60000	-.00016	6.57976
5. Stanford Study Skills (No correct)	22.17949	-.00024	19.40278
6. SCAT Verbal (Percentile)	36.58974	.00008	25.29167
7. SCAT Quantitive (Percentile)	29.83333	.00009	19.15278
8. SCAT Total (Percentile)	30.80769	-.00064	17.73611
GORDON			
9. Ascendency (Percentile)	72.28205	-.00004	59.30556
10. Responsibility (Percentile)	56.25641	.00004	58.29167
11. Emotional Stability (Percentile)	62.79487	-.00004	57.25000
12. Sociability (Percentile)	59.05128	-.00003	49.55556
MINNESOTA			
13. Validity (Percentile)	57.42308	.00026	61.69444

Table 2 (cont.)

Variable	Selected Group Means	Discriminant Factor	Not Selected Group Means
14. Family Relations (Percentile)	51.60256	-.00022	51.19444
15. Social Relations (Percentile)	44.87179	-.00055	48.94444
16. Emotional Stability (Percentile)	47.92308	-.00019	49.26389
17. Conformity (Percentile)	49.91026	-.00001	48.95833
18. Adjustment to Reality (Percentile)	48.38462	.00023	51.34722
19. Mood (Percentile)	53.25641	.00025	56.72222
20. Leadership (Percentile)	47.67949	-.00003	50.05556
21. Teacher Recommendation (Number)	5.97436	-.00140	4.12500
22. Athletics 1. -Did not Participate 2. -Did Participate	1.42308	-.00856	1.16667
23. Other School Activities 1. -Did not Participate 2. -Did Participate	1.60256	.00016	1.31944
24. Family Status 1. -No Family 2. -Broken 3. -Intact	2.39744	.00014	2.55556
25. Interview Recommendation (1. -Do not Recommend to 5 -Strongly Recommend)	4.32051	-.01467	2.01389
26. Part time job 1. -No part time job 2. -Part time job	1.76923	.00169	1.69444
27. Salary now desired 1. -Low to 5 high	2.98718	-.00244	2.66667

Table 2 (cont.)

Variable	Selected Group Means	Discriminant Factor	Not Selected Group Means
28. Salary Desired in 15 years 1.-Low to 5 high	4.82051	-.00152	4.23611
29. Life Planning Would Like 1.-Non professional to 7 teacher	5.50000	.00216	4.31944
30. Best fitted 1.-Non Professional to 7 teacher	4.57692	-.00051	4.29167
31. Expect 1.-Non Professional to 7 teacher	4.21795	-.00058	3.79167
32. Age	17.30769	.00055	18.01389
	N = 78*		N = 70*

Mahalanobis Square for N Variables # 3 - 20, 21, 27, 30, 31, 32

F (24, 125) = 2.51052 P < 01 (F24, 125, P < .01 = 2.33)

Mahalanobis Square
for variables numbers 1, 2, 22, 23, 24, 25, 28, 29
= 5, 91815
F (8, 141) = 26,38697 P < .01 (F8, 141, P<.01 = 4.96)

*- missing cases filled in by using mean for group