ACT RESEARCH REPORT

No. 23

23

February 1968

THE EFFECTS OF SELECTING COLLEGE STUDENTS BY VARIOUS KINDS OF HIGH SCHOOL ACHIEVEMENT

L. L. Baird
J. M. Richards, Jr.

PUBLISHED BY THE RESEARCH AND DEVELOPMENT DIVISION

THE AMERICAN COLLEGE TESTING PROGRAM

P. O. BOX 168, IOWA CITY, IOWA 52240

Summary

This study examined at 35 diverse colleges the use of academic and nonacademic achievement in the selection of college students. Selecting solely on academic achievement in high school admitted many students who obtain satisfactory (C or higher) college grades and excluded many dropouts but also excluded the majority of college nonacademic achievers. Selecting solely on high school nonacademic achievement admitted students who achieved in nonacademic areas in college but also admitted many academic failures and dropouts. A combined strategy of first requiring a C average in high school and then selecting on high school nonacademic achievement admitted the majority of college nonacademic achievers and excluded the majority of academic failures and dropouts, but also excluded many students who earned college grades of C or above. Combining a B average in high school with nonacademic achievement excluded most college achievers in all areas. Thus any admissions strategy will have costs as well as gains.

The results confirm our correlational studies showing that academic and nonacademic achievement are largely independent, and that both academic and nonacademic achievement can be predicted to a useful degree.

THE EFFECTS OF SELECTING COLLEGE STUDENTS BY VARIOUS KINDS OF HIGH SCHOOL ACHIEVEMENT

Leonard L. Baird and James M. Richards, Jr.[1]

American College Testing Program

In previous research, we have shown that many nonacademic accomplishments are independent of academic accomplishment (Holland & Richards, 1965, 1967); that nonacademic accomplishment can be assessed with moderate reliability (American College Testing Program, 1965; Richards, Holland, & Lutz, 1967a); and that both academic and nonacademic accomplishment can be predicted with moderate success (Holland & Nichols, 1964; Richards & Lutz, in press). These findings imply a need to re-examine college admission policies, since colleges are, or should be, concerned with finding students who will do outstanding things outside the classroom and in later life as well as students who will get satisfactory grades in college.

But what would be the consequences of using measures of nonacademic accomplishment in the selection of college students? This question cannot be answered unequivocally from our previous studies because the nonacademic achievement scales are often highly skewed and almost dichotomous. It is possible, therefore, that our correlations and multiple correlations are distorted, although the consistency and meaningfulness of our results suggest that such distortion is unlikely (Holland &

---

[1] Dr. Richards is at the University of California, Los Angeles.

Richards, 1967). In order to examine the efficiency of these scales in the selection process, we must study the effect of their use in detail. In addition, an important consequence of any selection rule is the quality of students eliminated as well as the students admitted. The purpose of the present study, therefore, is to examine as directly as possible the consequences of several alternative procedures for selecting college students.

Method

The basic procedure for this study was to compute for various selection scores on academic and nonacademic achievement the percentage of (a) admitted students who achieve in various areas in college and (b) college achievers in the same areas who would be eliminated. This applies, in a real life sample, the statistical concepts of the effects of various selection strategies (See Meehl & Rosen, 1955, and Cronbach & Gleser, 1957). Data were obtained as part of a comprehensive follow-up of the Student Profile Section, which is a part of the assessment of college applicants administered nationally by the American College Testing Program, (1965, 1966). The Student Profile Section is a short biographical inventory which contains the kind of information often requested on college application blanks, but which collects and reports this information in a more systematic fashion than do similar institutional forms. Specifically, it gives the student an opportunity to tell his prospective college about his aspirations, goals, anticipated personal needs (such as housing and financial aid), and nonclassroom achievements.

Follow-up data for students who had taken the ACT tests one year

earlier were collected on a special questionnaire so designed that students could mark their answers to questions directly on the questionnaire booklet. The entire booklet was then run through an optical-scanner scoring machine.[2] The follow-up questionnaire elicited information about each college student's achievements, goals, satisfactions, living circumstances, and self-evaluated change since entering college.

The Sample

The Student Profile Section Follow-up was administered in the spring of 1966 to students at 35 colleges--14 two-year colleges and 21 colleges offering four years of undergraduate education. These colleges were chosen from institutions participating in ACT's 1966 Class Profile Research Service (American College Testing Program, 1966).

For each college, the investigators chose a group of students to be included in the follow-up. The total number of students surveyed was 8,908. Complete follow-up data were obtained for 5,695 freshmen (3,267 males and 2,428 females). Students with missing follow-up data included both 1,441 students who left college and 1,772 students still enrolled in college who failed to complete the questionnaire.

We have presented elsewhere (Richards & Lutz, in press) a more detailed description of the sample, a description of the environments of the

---

[2]The layout of these forms was planned and the scoring was performed by National Computer Systems, Minneapolis, Minnesota.

sample colleges, and comparisons of students with and without follow-up data. These comparisons suggested that the sample colleges were more representative of ACT colleges than of American colleges in general and that a wide range of talent was present in the groups with follow-up data. In view of the latter finding, it seems unlikely that the present results were seriously distorted by differences between students with and without follow-up data.

High School Achievements

High school grades. As a regular part of the ACT assessment high school students report the most recent grade they have received in each of four areas: English, mathematics, social studies, and natural science. Research by Davidsen (1963) indicated that, in a large sample, such self-reported grades correspond closely to high school transcripts. A re-analysis of Davidsen's data yielded a correlation of .92 between student-reported and school-reported grades. The measure used in the present study was the overall average on a five-point scale (F = 0, D = 1, etc.) of all grades reported.[3] In another study by Hoyt (1963) the predictive efficiency of average self-reported grades equaled the predictive efficiency of the student's rank in class

---

[3]Although only high school grades are reported here we made the same computations using the ACT tests of academic potential. Nearly identical results were obtained.

obtained from his high school transcript.

Nonacademic achievement scales. A checklist of extracurricular accomplishment yielded scores in the following areas: leadership, music, drama and speech, art, writing, and science. Each scale consisted of eight items ranging from common and less important accomplishments to rare and more important ones. For example, science items included such accomplishments as "performed an independent scientific experiment" or "won a prize or award of any kind for scientific work or study." In general, the accomplishment involved public action or recognition so that, in principle, the accomplishments could be verified by comparing student self-reports with public records. We assumed that the possibility of verification would lessen student exaggeration.

The score on each scale was simply the number of accomplishments the student marked "Yes, applies to me." Students with high scores on one or more of these simple scales presumably had attained a high level of accomplishment which required complex skills, long-term persistence, or originality. These scales are described more fully in other reports (American College Testing Program, 1965; Holland & Richards, 1967).

College Achievement

College grades. The measure of academic accomplishment in college used for the present study was obtained by having each student report his grade average in his last college term by checking one of the

following alternatives: "D or lower, " "D+," "C," "C+," "B," "B+," or "A or A+." Scores from 1 to 7 were assigned to these alternatives so that a high score indicated high grades. In the present sample, there was a high correlation between student-reported and college-reported GPA (.84 for men and .87 for women). This suggests that most students give a frank and accurate account of their accomplishments.

Nonclassroom achievement record. We used a checklist of non-academic accomplishments to measure college achievement in the following areas: leadership, music, speech and drama, art, writing, and science. Each scale consisted of 10 items and was, in a sense, a criterion or standard of accomplishment in an important area of human endeavor. In responding to the items, the student marked "yes" for those accomplishments which he had achieved during college and "no" for those which he had not. The score on each scale was simply the number of "yes" responses. Detailed accounts of the rationale, development, and statistical characteristics of these scales is presented elsewhere (Richards et al., 1967a, 1967b; Richards & Lutz, in press).

Items ranged from common and less important accomplishments to rare and more important ones. For example, music accomplishments included "composed or arranged music which was publicly performed," "publicly performed on two or more music instruments," "attained a first division rating in a state or regional solo music contest." The other scales consisted of similar items with content appropriate to the

various areas of achievement. Like the high school scales, most accomplishments involved public action or recognition so that, in principle, they could be verified.

Infrequency Scales

Since the nonacademic achievement scales rested on student self-reports, the memory and honesty of students were important. In particular, we had to check the effect of a student's exaggerating his achievements. Therefore, we developed two special Infrequency Scales, one for high school achievements and one for college achievements. The rationale for these scales is that a student who is exaggerating his achievements is likely to claim rare accomplishments in several different areas. Accordingly, by combining male and female data, we identified the item on each achievement scale claimed least frequently. The score on the Infrequency Scale was simply the number of these very rare achievements claimed by the student. Earlier results (Holland & Richards, 1967; Richards & Lutz, in press) suggested that the tendency of a few students to exaggerate their accomplishments may have changed some of the details of the relationships among various kinds of achievement, but it did not change the main patterns of such relationships. However, eliminating high Infrequency students appeared to reduce error somewhat. Accordingly, we eliminated high Infrequency students (49 male and 29 female) from the computations for the present study.

Results

We will discuss the results in three sections. In the first section, we will examine the college achievements of students who would be admitted if we used some simple selection rules based on their records of academic and nonacademic achievement in high school. In the second, we will examine the proportion of college achievers who would be eliminated by the use of these rules. In the third section, we will examine the effects of using some combined selection strategies.

1. Simple Selection Rules: What kinds of students would be admitted? What would be the results if we admitted students solely on the basis of grades? Table 1 shows the college achievements of students who obtained various GPAs in high school. For example, Table 1 shows that among the men with C averages in high school who were still enrolled in college, 26.9% had college GPAs below C, 10.9% had 2 or more college achievements in art, etc. The trends in this table indicate that, as high school grades increase, the proportion of students who have college GPAs below C decreases and the proportion with college GPAs of A or A+ increases. There is a slight tendency for students with higher high school grades to have more college leadership achievements and fewer college art achievements, but if we compare students with high school averages of C with students with high school averages of A, we see that the differences in the percentage of achievements in nonacademic areas are very small. This confirms

Table 1

The Relation of Academic and Nonacademic Achievement in College to Academic Achievement in High School

Percentage of College Survivors Who Have...	High School Grade Point Average											
	Men						Women					
	D	C	C+	B	B+	A	D	C	C+	B	B+	A
College GPA below C	36.8	26.9	17.4	12.4	6.5	0.0	13.4	19.8	12.2	6.1	2.3	0.7
College GPA of A	0.0	0.3	0.5	0.6	4.0	14.0	0.0	0.0	0.2	1.0	3.3	17.4
2 or More Clg Achs in Leadership	9.8	9.9	7.6	10.2	10.0	16.9	8.6	12.1	10.9	13.8	14.3	15.6
2 or More Clg Achs in Art	10.9	10.9	9.6	8.2	9.5	6.5	18.6	14.4	13.7	14.7	9.8	8.0
1 or More Clg Achs in Science	7.5	11.8	11.2	14.4	13.9	15.2	4.3	4.2	3.6	5.4	5.5	4.9
1 or More Clg Achs in Music	12.1	13.9	9.2	11.9	8.7	7.4	7.1	10.5	12.8	12.2	10.5	9.7
2 or More Clg Achs in Writing	2.9	4.1	5.0	6.1	4.2	4.3	5.7	9.0	7.5	7.3	7.8	10.1
2 or More Clg Achs in Speech & Drama	5.2	7.0	6.1	5.2	5.2	3.5	5.7	7.1	6.1	8.7	6.3	7.6
Percentage of Those Admitted Who Are No Longer Enrolled	34.3	22.0	18.7	12.8	10.8	5.3	22.2	18.3	15.6	11.3	7.4	5.0

Note. Students (N = 78) with high infrequency scores have been omitted from this analysis and all other analyses and tables.

our correlational results (Richards & Lutz, in press) and indicates that the low correlations are not artifacts of skewed distributions. The bottom row shows the percentage of admitted students who later dropped out for any reason. Those with higher high school grades were much less likely to drop out. These results show the kinds of students that would be admitted if we based our selection of students solely on high school grades. If we accepted only students with A or B+ averages in high school, we would obtain students who would be less likely to drop out or be on probation, but we would not obtain students who would be especially likely to achieve in nonacademic areas.

Who would be admitted if we used high school nonacademic achievements as a basis for selection? Table 2 shows the relation between nonacademic achievement in high school and college outcomes for different groups of students.[4] For example, 3.7% of male students with no art achievements in high school had 2 or more achievements in

---

[4]In the present paper we did not consider the relationships between different areas of nonacademic achievement. For example, we do not report the high school leaders who are college science achievers. Our correlational study showed that in most cases high school achievement in the same area is the only predictor contributing much to the multiple correlation with college achievement. Since little information is added and our tables are already quite complex, we decided to disregard inter-area relationships.

Table 2

The Relation of College Outcomes to Nonacademic Accomplishment in High School
(the Percentage of students with Each Collegiate Outcome)

Area of Ach in High School and college outcome	Number of h. s. achievements							
	Men				Women			
	0	1, 2	3, 4	5+	0	1, 2	3, 4	5+
Leadership								
2 or more lead ach	4.1	7.0	13.3	22.9	6.9	9.7	16.0	24.9
GPA below C	20.1	16.2	15.5	11.8	13.4	9.0	9.9	8.8
No longer enrolled	26.4	21.0	16.9	14.4	17.0	12.7	13.5	14.7
Art								
2 or more art ach	3.7	20.6	34.4	52.8	1.8	10.9	28.4	46.7
GPA below C	16.3	12.4	25.5	16.7	8.4	13.2	11.4	10.0
No longer enrolled	19.3	23.4	22.2	27.8	13.1	14.0	20.5	26.7
Science								
1 or more sci ach	5.3	17.8	29.6	35.6	2.5	6.8	17.3	19.0
GPA below C	19.9	14.2	14.3	13.7	9.6	11.9	2.5	0.0
No longer enrolled	21.3	20.9	15.3	12.3	14.6	12.5	11.1	9.5
Music								
1 or more mus ach	1.7	10.7	25.6	38.1	1.4	8.1	18.9	35.9
GPA below C	16.6	14.8	15.3	15.8	12.0	9.1	8.9	7.4
No longer enrolled	21.7	18.0	17.9	16.3	16.4	13.1	13.2	12.0
Writing								
2 or more writ ach	1.9	8.5	15.8	34.6	3.7	8.7	26.4	47.2
GPA below C	17.2	13.9	13.8	11.5	11.2	8.1	9.6	11.1
No longer enrolled	21.6	18.9	13.8	15.4	14.6	14.0	13.0	11.1
Speech & Drama								
2 or more sp and dr ach	1.6	6.6	13.4	52.5	2.3	6.0	12.5	26.0
GPA below C	16.9	14.0	18.0	10.7	10.9	8.9	9.7	9.4
No longer enrolled	22.6	18.2	20.3	14.7	13.5	13.9	14.7	15.6

art in college, while 52.8% of male students with 5 or more achievements in art in high school had 2 or more achievements in art in college. The percentages in each row of Table 2 confirm that high school nonacademic achievement forecasts college nonacademic achievement. Note also that it is unlikely that students who had not achieved in a given nonacademic area in high school would achieve in that area in college. Records of high school nonacademic achievement appear to be very useful measures for selecting college achievers in nonacademic areas.

If we compare the percentage of collegiate nonacademic achievements for students who had 5 or more nonacademic achievements in high school with similar outcomes for students who had "A" grades in high school in Table 1, we see that the student with 5 or more nonacademic achievements in high school is much more likely to have a number of nonacademic college achievements than is a student with an A average. In short, grades would be a very inefficient basis for selecting students who are likely to show nonacademic achievement in college, especially when they are compared to past records of nonacademic achievement.

Who would be admitted if records of high school nonacademic achievements were used to select students for college <u>academic</u> achievement? Table 2 shows the percentage of students with various numbers of achievements in high school who had college GPAs below C. These results indicate that, except for slight associations with leadership for men and science for women, there is little relation between high school

nonacademic achievement and college GPA. This is further confirmation of our earlier correlational analysis. When we use the criterion of the percentage of high school achievers who are no longer enrolled in college, however, we see that, with the exception of achievers in art, students who had many high school achievements are somewhat less likely to have dropped out than students with no high school achievements. However, in general, admitting students by their records of high school nonacademic achievement would form a poor basis for selecting college academic achievers.

2. Simple Selection Rules: What proportion of college achievers would be eliminated? So far we have shown how students admitted with different high school records achieve in college. It is also important to examine the number of nonacademic college achievers who would be eliminated if we used these various records as a basis for admission to college. Table 3 shows this information for different levels of high school GPA. Only accepting students with average grades of A or B+ clearly would eliminate the majority of nonacademic achievers in both sexes. Even lowering the cutting score to B or above would eliminate, on the average, over half of the male achievers and 40% of the female achievers. These results may have been expected from the previous findings. The same kind of result also holds for college grades--if only college students with high school grades of B or higher are admitted, about half the male and 40% of the female students who have college GPAs of C or above are eliminated. However, using a score of B or above would eliminate the majority

Table 3

The Percentage of Achievers in Each Area Who Are Eliminated by Accepting Only Students at Given Grade Levels or Higher

	High School Grade Point Average									
	Men					Women				
Area of Clg Ach	C	C+	B	B+	A	C	C+	B	B+	A
College GPA of C or Above	4.7	22.9	49.8	74.2	90.2	2.4	14.6	37.4	66.7	85.9
Leadership	6.1	26.9	47.7	71.7	86.0	2.1	15.2	34.8	64.8	84.5
Art	7.2	31.6	59.3	79.8	94.3	4.6	20.4	45.6	78.2	91.9
Science	3.7	23.2	47.2	74.0	89.8	2.9	15.2	33.3	65.7	86.7
Music	6.9	34.0	57.1	82.8	94.4	2.0	15.1	41.7	72.2	88.9
Writing	3.7	21.6	50.0	79.9	92.5	2.3	18.1	40.1	66.1	83.6
Speech & Drama	5.7	31.4	60.4	81.8	95.0	2.5	16.3	36.3	70.6	86.3
Percentage of Dropouts Eliminated	15.4	43.5	73.3	89.5	97.8	6.4	28.6	59.6	85.0	95.2

of students who drop out of college.

Table 4 shows the percent of college nonacademic achievers eliminated when cutting scores are based on high school nonacademic achievements. The cutting scores have different effects in different areas. For example, using cutting scores of three or above would only eliminate about a third of the achievers in leadership and music, but would eliminate the majority of achievers in other areas. Table 4 shows the percentage of students with C grades or higher in college who would be eliminated by using various numbers of high school achievements as admission criteria, and the percentage of dropouts eliminated by the same procedure. Table 4 again indicates that nonacademic achievements are poor predictors of academic achievement. The percentage of dropouts eliminated is high, but this is because the base rate--the number of students who have at least one or more achievement in a particular high school nonacademic area--is low. Thus, because these rules eliminate much of the sample, they also eliminate most of the dropouts. Apparently, the use of cutting scores much beyond C+ or B on academic measures and beyond one achievement in nonacademic areas generally results in the elimination of more achievers than are admitted.

3. Combination Rules: Who is admitted and who is eliminated when two criteria for selection are used together? Since academic and nonacademic achievement are independent, selection strategies which combined several selection rules might be useful. To evaluate

Table 4

Percentage of College Students with Various Outcomes Eliminated by Accepting Students with a Given Number or more of H.S. Achievements

(a) Percent of College Achievers in the Same Area Eliminated

Area of H.S. and College Achievement	Men			Women		
	Number of H.S. Achievements					
	1+	3+	5+	1+	3+	5+
Leadership	9.0	34.8	69.7	10.4	40.1	74.6
Art	33.6	76.3	91.0	33.9	77.8	92.7
Science	24.7	68.7	90.5	4.7	60.5	90.7
Music	9.1	36.0	72.0	4.3	30.3	66.2
Writing	23.3	72.5	92.5	17.2	57.4	89.9
Speech & Drama	14.3	54.4	85.7	12.6	48.1	81.5

(b) Percentage of Students with College GPA of C or Higher Eliminated

Area of H.S. Achievement	Men			Women		
	Number of H.S. Achievements					
	1+	3+	5+	1+	3+	5+
Leadership	21.2	58.8	85.6	18.6	58.5	86.7
Art	76.9	95.3	98.6	72.5	93.9	98.4
Science	56.4	87.4	96.6	73.4	93.5	98.6
Music	53.2	78.5	92.7	32.7	68.2	89.4
Writing	61.9	92.2	98.8	42.1	86.4	98.0
Speech & Drama	48.5	83.1	95.8	37.2	77.2	95.2

(c) Percentage of Dropouts Eliminated

Area of H.S. Achievement	Men			Women		
	Number of H. S. Achievements					
	1+	3+	5+	1+	3+	5+
Leadership	27.5	64.5	85.6	23.3	59.2	86.2
Art	73.6	94.0	98.0	67.7	90.1	97.0
Science	60.0	91.2	98.0	76.9	95.4	99.2
Music	57.5	79.9	92.3	38.9	71.6	91.2
Writing	67.2	94.7	99.2	44.9	87.8	98.4
Speech & Drama	54.2	84.2	97.2	36.3	75.8	94.7

such strategies, we calculated the effect of first selecting students with high school GPAs of C or above, and of B or above, and then selecting on the basis of nonacademic achievement.[5] Results are summarized in Table 5. Table 5 shows in a single table the kind of information that has been presented before in separate tables. That is, it describes the kind of student body that would result from using a particular selection strategy and the proportion of college achievers who would be admitted.

These figures show the effects of accepting students with a GPA above a certain point and with one or more achievements in a given area in high school, except that for women, we used two or more high school achievements in music and in speech and drama. The outcomes used are the percentages achieving in the same area in college(two or more college achievements in art, writing, speech and drama, and leadership; one or more achievement in science and music); obtaining a GPA of C or better in college; obtaining a GPA below C; and dropping out.

The first column in Table 5 shows the outcomes for all the students who would be admitted by accepting students with C averages or better in high school and <u>one</u> or more high school achievements in the area indicated on the left. For example, 11.7% of all men who had a high

---

[5]We also made those calculations for high school GPAs of A. Since selecting A students eliminated over 90% of the achievers in every area, these data are not shown.

Table 5

The Results of Admitting Only Students with C, B, or Higher High School Averages Who Also Had One High School Achievement in a Given Area

Area of H. S. Achievement And College Outcomes	Men					
	C or higher			B or higher		
	% of admitted group with outcome	% of excluded group with outcome	% of total with outcome admitted	% of admitted group with outcome	% of excluded group with outcome	% of total with outcome admitted
Leadership						
2 or more clg ach	11.7	6.7	73.8	13.2	8.6	43.4
C or above in clg	85.7	75.6	65.5	86.8	79.9	36.4
Below C	14.3	18.6	56.4	8.7	20.1	17.8
Dropout	14.7	31.3	44.0	10.2	26.9	16.0
Art						
2 or more clg ach	26.3	4.4	58.3	23.2	7.1	24.6
C or above in clg	86.6	83.5	19.5	92.0	83.2	9.9
Below C	13.4	16.6	16.0	8.0	16.8	4.6
Dropout	18.0	20.8	17.0	12.8	21.0	5.8
Science						
1 or more clg ach	21.9	6.9	64.0	22.6	9.7	36.7
C or above in clg	86.0	82.6	36.8	92.6	81.7	22.0
Below C	14.0	17.4	31.0	7.4	18.3	9.1
Dropout	14.8	23.4	26.2	10.2	22.8	10.1
Music						
1 or more clg ach	19.7	3.8	76.7	17.7	8.1	34.2
C or above in clg	85.7	83.1	39.7	91.7	82.3	21.0
Below C	14.3	16.9	35.2	8.3	17.7	10.0
Dropout	13.7	24.4	26.4	9.2	22.8	8.8
Writing						
2 or more clg ach	8.7	3.0	62.5	10.3	4.0	35.0
C or above in clg	88.9	79.8	40.0	91.6	82.5	18.9
Below C	11.1	20.2	25.6	8.4	17.5	9.1
Dropout	13.0	24.4	23.8	11.1	22.2	9.5
Speech and drama						
2 or more clg ach	9.0	3.1	68.7	7.3	5.1	29.9
C or above in clg	81.0	83.0	43.6	91.5	82.0	24.9
Below C	14.3	17.0	38.6	8.5	18.0	12.2
Dropout	14.7	24.8	30.8	10.2	23.6	11.3

Table 5 con't.

Area of H. S. Achievement And College Outcomes	Women					
	C or higher			B or higher		
	% of admitted group with outcome	% of excluded group with outcome	% of total with outcome admitted	% of admitted group with outcome	% of excluded group with outcome	% of total with outcome admitted
Leadership						
2 or more clg ach	14.5	8.3	83.2	15.3	10.8	56.1
C or above in clg	92.3	83.3	75.9	95.7	84.7	50.5
Below C	7.7	16.7	56.9	4.3	15.3	20.2
Dropout	11.3	21.8	59.5	8.6	19.0	28.9
Art						
2 or more clg ach	29.7	7.4	57.7	28.9	10.3	33.5
C or above in clg	89.6	90.6	25.2	93.7	89.7	15.7
Below C	10.4	9.4	27.3	6.3	10.3	9.8
Dropout	12.8	14.2	23.6	10.5	14.5	11.4
Science						
1 or more clg ach	9.2	0.3	90.7	9.8	1.1	62.8
C or above in clg	90.8	89.8	25.2	94.9	89.5	16.9
Below C	7.8	10.4	20.0	5.1	10.5	8.5
Dropout	10.7	13.0	18.9	8.6	14.9	10.1
Music[a]						
1 or more clg ach	22.6	1.3	93.5	19.8	7.4	52.8
C or above in clg	92.5	88.3	46.7	95.9	87.8	31.3
Below C	7.5	11.7	35.0	4.1	12.2	12.1
Dropout	1.1	16.7	35.8	7.3	17.0	15.2
Writing						
2 or more clg ach	13.3	5.3	72.8	11.7	8.2	43.8
C or above in clg	92.9	87.5	53.3	95.6	87.4	37.4
Below C	7.1	12.5	37.9	4.4	12.6	16.1
Dropout	11.3	17.3	41.3	8.6	17.3	21.3
Speech and drama[a]						
2 or more clg ach	12.8	3.0	71.9	14.6	4.5	48.1
C or above in clg	92.9	88.5	39.0	95.3	88.7	23.4
Below C	7.1	11.5	27.4	4.7	11.3	10.7
Dropout	12.7	14.8	34.5	11.4	14.7	18.1

[a]Two or more high school achievements were used as admission criteria in the case of music and speech and drama for women.

school average of C or better and were high school achievers in leadership had two or more college leadership achievements. The second column shows the characteristics of all the students who would be eliminated by using the same rule. The third column shows the percentage of all people with a given characteristic or outcome in college who would be admitted by using the rule. For example, of all male students who had two or more college achievements in leadership, 73.8% would have been admitted by using the rule.

Typically, the "admitted" groups would have about three times as great a proportion of achievers as the "eliminated" groups but about half as great a proportion of dropouts. The "admitted" groups would also have smaller proportions of below C students. When the absolute numbers of college achievers, dropouts, etc. are considered, this strategy also seems reasonably efficient, as shown in the third column. Approximately 70% of achievers would be admitted (between 58.3 and 73.8% of the male achievers and between 57.7 and 93.5% of the female achievers). Furthermore, this strategy would eliminate about two-thirds of the students who would have college GPAs below C and about two-thirds of the dropouts (since, as the table shows, the strategy would admit about one-third of these two groups). Approximately 60% of the students who would obtain C averages or above

would also be eliminated.[6] In other words, even such a minimal selection procedure eliminates many students who are successful in college. Of course, any selection procedure involves some errors, but the personal and social costs of eliminating a student who would be successful may be high indeed. Certainly, one cannot automatically conclude that the gains outweigh the costs. Since many colleges use a much more stringent selection procedure than this, such questions of social cost are most important.

The next three columns of Table 5 show the results of a second strategy, requiring a high school GPA of B or above and one or more high school achievements (again with the exception of two high school achievements in music and speech and drama for women). Raising the GPA requirement did not increase the proportion of those admitted who achieved in college. However, the proportion of admitted students who had college GPAs below C or dropped out was decreased. In absolute number of achievers, as shown in the last column, the strategy would

---

[6] This figure considers only one area of achievement at a time. If we had used the strategy of admitting students with a C average in high school and at least one achievement in any nonacademic area, far fewer students with C averages in college would have been eliminated. Of course, more students who would dropout or have college averages below C would also be admitted.

admit about one-third of the male achievers and about half of the female achievers (this is due to the greater proportion of women with high school GPAs of B or above). The strategy would also typically eliminate between 80 and 90% of students who would have GPAs below C or drop out. It would also eliminate about three-quarters of the students who would have a college GPA of C or above. Thus the chief effect of raising academic criteria for admissions would be to improve the academic success of admitted students. However, the nonacademic success of admitted students would be almost unchanged, and if we considered the absolute numbers of achievers admitted or eliminated, the strategy would be less efficient than the previous one.[7]

Discussion

The principal results of this study--that academic and other kinds of achievement are relatively independent and that the use of records of these independent kinds of achievement in admissions would yield different kinds of student bodies--support and extend many other studies. A series of studies of National Merit Scholarship students (Holland, 1961, 1964; Nichols & Holland, 1963, 1964; Holland & Nichols, 1964) and

---

[7]One possible objection to our present results is that they result from combining data from students in many diverse colleges. However, an examination of the results within each of the participating colleges showed that the same pattern of results held on individual campuses.

of the more representative students examined in the studies of the American College Testing Program (Holland & Richards, 1965, 1967; Richards, Holland, & Lutz, 1967; Richards & Lutz, in press) demonstrated that there is little relation between academic and nonacademic achievement. And the finding of these studies holds true for high school students, college freshmen, sophomores, and seniors, bright students, average students, and students in various major fields. Similar results have been found among grade school children (Flescher, 1963; Wallach & Kogan, 1965; Cicirelli, 1965); scientists, writers, mathematicians, and architects (Taylor, 1958; MacKinnon, 1961, 1962; Taylor, 1961; Barron, 1963; Taylor & Ellison, 1967); and most areas of adult achievement (see Hoyt's 1966 review of 46 such studies). In short, many dimensions of excellence are independent.

This independence has several implications for college admission policies. The most important implication is that a college cannot have everything and cannot be fair to everybody. There are many ways to select an incoming class, but any one will have disadvantages as well as advantages. The usual method of selection by measures of academic performance and potential does reduce the rate of academic failure, but it also had disadvantages. Many achievers in nonacademic areas are lost when stringent academic criteria are used for admission, and this seems a severe price to pay for the elimination of some students who will be academic failures (Benezet, 1963).

The several selection strategies suggested by our results offer a number of alternatives to the traditional strategy. For example, an innovative and courageous college could select on the basis of high school achievements alone, thereby obtaining a group of students most likely to achieve in nonacademic areas. A freshman class selected in this way would probably produce a very lively campus, but the rates for both dropout and academic failure would be high. If such a college were both innovative and resourceful, of course, it could prevent many of these failures and dropouts by adapting its curriculum and methods of evaluation to the characteristics of its students (using different, not lower, standards).

Another strategy would be to use multiple criteria, as we have shown in examples of the use of both academic and nonacademic cutting scores. On the basis of the present results one of the most efficient of such strategies (efficient in the sense of gaining many achievers, while losing a minimum of achievers and also eliminating students likely to drop out) would be to consider only students who had made a C average or above in high school. This would eliminate a considerable proportion of those who would later drop out or have averages below C in college. Then, from this group, base further or final selection upon high school achievements. So long as colleges remain much the same as they are today, this strategy would satisfy several criteria. First, it would be an efficient way to carry out the legitimate attempt by the college to decrease the number of students who

will drop out and save the college's and the students' time and resources. Second, it would obtain a freshman class with unusual potentials for achievement in a variety of areas. A college could decide which areas of achievement it wished to emphasize; that is, whether it preferred more or fewer students with potentials for achievement in leadership or science, art or writing, speech and drama, or music. Or the college might want to try to develop a "mix" which included achievers from many areas. It should be emphasized again that selection of high school students with grades above B seems to result in more loss of achievers and students who will make passing grades than the college gains.

A college's choice of a particular selection strategy is a function of the outcomes it values most. Colleges must choose the relative value of obtaining (a) a group of students who will attain high grades (b) a group of students who will achieve in nonacademic areas (c) a group of students who will not drop out, or (d) some other group of students which the college values. While a college can obtain a student body which will show various proportions of these outcomes, it would be hard pressed to find an incoming group of students which is desirable in every way. On the other hand, a college can obtain a group of students who will fit the college's purposes and goals to a reasonable extent. The present results show that it is possible to have entering classes with many diverse talents without eliminating too many of the kind of students colleges now value.

There are some additional practical implications of the present findings, as well. Most scholarships are presently awarded on the basis of academic aptitude alone. While this policy rewards one kind of socially-valued talent, it does not effectively reward other kinds of talent that may be more valuable. In effect, this policy, by awarding most of the scholarship money available to academic achievers, penalizes many achievers in nonacademic areas. A number of studies of the recipients of scholarships (e.g., Nichols & Holland, 1964) have implied that they were not awarded to people who were more likely to be achievers in nonacademic areas. Perhaps more scholarships could be awarded to people who had outstanding promise for nonacademic achievement.

Grading practices might be altered to incorporate the kinds of achievements we have called nonacademic, because grades do not usually reflect high levels of achievement in many significant areas of excellence. At the very least, transcripts might include, along with a record of courses and grades, a report of nonacademic participation and achievement.

In summary, the present article has suggested some possible decision rules for using records of academic and nonacademic achievement in admissions and has shown the outcomes when these rules are applied. Other research has shown that reliable and accurate methods for assessing nonacademic achievement exist and that these methods

are valid predictors (e.g., Richards, Holland, & Lutz, 1967). We have outlined some of their possible uses. What remains is for others to test these ideas in the actual admission process. And perhaps all that is required is for deans, counselors, and admission officers to be willing to act on the fact that there is not one kind of excellence, but many.

References

American College Testing Program. ACT technical report. Iowa City: Author, 1965.

American College Testing Program. Interpretive guide for ACT Research Services, 1966-67 edition. Iowa City: Author, 1966.

Barron, F. Creativity and psychological health. Princeton, N. J.: Van Nostrand, 1963.

Benezet, L. T. The trouble with excellence. In P. Woodring & J. Scanlon (Eds.), American education today. New York: McGraw-Hill, 1963.

Cicirelli, V. G. Form of the relationship between creativity, I.Q., and academic achievement. Journal of Educational Psychology, 1965, 56, 303-308.

Cronbach, L.J., & Gleser, G. C. Psychological tests and personnel decisions. Urbana, Ill.: University of Illinois Press, 1957.

Davidsen, O.M. Reliability of self-reported high school grades. Unpublished research report, American College Testing Program, 1963.

Flescher, I. Anxiety and achievement of intellectually gifted and creatively gifted children. Journal of Psychology, 1963, 56, 251-268.

Holland, J. L. Creative and academic performance among talented adolescents. Journal of Educational Psychology, 1961, 52, 136-147.

Holland, J. L. The selection of students for special scholarships. Journal of Higher Education, 1964, 35, 32-37.

Holland, J. L. & Nichols, R. C. Prediction of academic and extra-curricular achievement in college. Journal of Educational Psychology, 1964, 55, 55-65.

Holland, J. L. & Richards, J. M., Jr. Academic and nonacademic accomplishment: Correlated or uncorrelated? Journal of Educational Psychology, 1965, 56, 165-174.

Holland, J. L., & Richards, J. M., Jr. Academic and nonacademic accomplishment in a representative sample of students taking the American College Tests. College and University, 1967, 43, Fall, 60-71.

Hoyt, D.P. Three years of research in the American College Testing Program. Paper read at Iowa Psychological Association, Des Moines, 1963.

Hoyt, D. P. The relationship between college grades and adult achievement: A review of the literature. The Educational Record, 1966, Winter, 70-75.

MacKinnon, D. W. Characteristics of the creative person: Implications for the teaching-learning process. In Current issues in higher education. Washington, D. C.: National Education Assoc., 1961, Pp. 89-92.

MacKinnon, D. W. The nature and nurture of creative talent. American Psychologist, 1962, 17, 484-495.

Meehl, P. E., & Rosen, A. Antecedent probability and the efficiency of psychometric signs, patterns, or cutting scores. Psychological Bulletin, 1955, 52, 194-216.

Nichols, R. C., & Holland, J. L. Prediction of the first year college performance of high aptitude students. Psychological Monographs, 1963, 77 (7, Whole No. 570).

Nichols, R. C., & Holland, J. L. The selection of high aptitude high school graduates for maximum achievement in college. Personnel and Guidance Journal, 1964, 43, 33-40.

Richards, J. M., Jr., Holland, J. L., & Lutz, S. W. The assessment of student accomplishment in college. Journal of College Student Personnel, 1967, 8, 360-365.

Richards, J. M., Jr., Holland, J. L., & Lutz, S. W. The prediction of student accomplishment in college. Journal of Educational Psychology, 1967, 58, 343-355.

Richards, J. M., Jr., & Lutz, S. W. Predicting student accomplishment in college from the ACT assessment. Journal of Educational Measurement, in press.

Taylor, H. C., & Russell, J. T. The relationship of validity coefficients to the practical effectiveness of tests in selection. Journal of Applied Psychology, 1939, 23, 565-578.

Taylor, C. W. Some variables functioning in productivity and creativity. In C. W. Taylor (Ed.), The Second University of Utah Research Conference on the Identification of Creative Scientific Talent. Salt Lake City: University of Utah Press, 1958.

Taylor, C. W. A tentative description of the creative individual. In Human Variability and Learning. Washington, D. C.: Assoc. for Supervision and Curriculum Development of the NEA, 1961.

Taylor, C. W., & Ellison, R. L. Biographical predictors of scientific performance. Science, 1967, 155, 1075-1080.

Wallach, M. A., & Kogan, N. Modes of thinking in young children: A study of the creativity-intelligence distinction. New York: Holt, Rhinehart, and Winston, 1965.

ACT Research Reports

This report is the twenty-third in a series published by the Research and Development Division of the American College Testing Program. The research reports have been deposited with the American Documentation Institute, ADI Auxiliary Publications Project, Photoduplication Service, Library of Congress, Washington, D. C. 20540. (ADI Document numbers and prices are given below.) Photocopies and 35 mm. microfilms are available at cost from ADI; order by ADI Document number. Advance payment is required. Make checks or money orders payable to: Chief, Photoduplication Service, Library of Congress. Printed copies are available from the Research and Development Division, American College Testing Program.

Reports preceded by an asterisk (*) in the list below are available only from ADI.

*No. 1 A Description of American College Freshmen, by C. Abe, J. L. Holland, S. W. Lutz, & J. M. Richards, Jr.
(ADI Doc. 8554; photo, $8.75; microfilm, $3.00)

*No. 2 Academic and Nonacademic Accomplishment: Correlated or Uncorrelated? by J. L. Holland, & J. M. Richards, Jr.
(ADI Doc. 8555; photo, $3.75; microfilm, $2.00

*No. 3 A Description of College Freshmen: I. Students with Different Choices of Major Field, by C. Abe, & J. L. Holland
(ADI Doc. 8556; photo, $7.50; microfilm, $2.75)

*No. 4 A Description of College Freshmen: II. Students with Different Vocational Choices, by C. Abe, & J. L. Holland
(ADI Doc. 8557; photo, $7.50; microfilm, $2.75)

*No. 5 A Description of Junior Colleges, by J. M. Richards, Jr. L. M. Rand, & L. P. Rand
(ADI Doc. 8558; photo, $3.75; microfilm, $2.00)

*No. 6 Comparative Predictive Validities of the American College Tests and Two Other Scholastic Aptitude Tests, by L. Munday
(ADI Doc. 8559; photo, $2.50; microfilm, $1.75)

No. 7 The Relationship Between College Grades and Adult Achievement: A Review of the Literature, by D. P. Hoyt
(ADI Doc. 8632; photo, $7.50; microfilm, $2.75)

No. 8 A Factor Analysis of Student "Explanations" of Their Choice of a College, by J. M. Richards, Jr. & J. L. Holland
(ADI Doc. 8633; photo, $3.75; microfilm, $2.00)

ACT Research Reports (con't.)

No. 9 Regional Differences in Junior Colleges, by J. M. Richards, Jr., L. P. Rand, & L. M. Rand
(ADI Doc. 8743; photo, $2.50; microfilm, $1.75)

No. 10 Academic Description and Prediction in Junior Colleges, by D. P. Hoyt, & L. Munday
(ADI Doc. 8856; photo, $3.75; microfilm, $2.00)

No. 11 The Assessment of Student Accomplishment in College, by J. M. Richards, Jr., J. L. Holland, & S. W. Lutz
(ADI Doc. 8955; photo, $3.75; microfilm, $2.00)

No. 12 Academic and Nonacademic Accomplishment in a Representative Sample taken from a Population of 612,00, by J. L. Holland, & J. M. Richards, Jr.
(ADI Doc. 8992: photo, $3.75; microfilm, $2.00)

No. 13 The Prediction of Student Accomplishment in College, by J. M. Richards, Jr., J. L. Holland, & S. W. Lutz
(ADI Doc. 9020; photo, $5.00; microfilm, $2.25)

No. 14 Changes in Self-Ratings and Life Goals Among Students at Colleges with Different Characteristics, by R. W. Skager, J. L. Holland, & L.A. Braskamp
(ADI Doc. 9069; photo, $3.75; microfilm, $2.00)

No. 15 Can Computers Write College Admissions Tests? by J. M. Richards, Jr.
(ADI Doc. 9174; photo, $2.50; microfilm, $1.75)

No. 16 Changes in Self-Ratings and Life Goals as Related to Student Accomplishment in College, by R. W. Skager, & L. A. Braskamp
(ADI Doc. 9214; photo, $2.50; microfilm, $1.75)

No. 17 Family Income and the Characteristics of College-Bound Students, by L. L. Baird
(ADI Doc. 9378; photo, $3.75; microfilm, $2.00)

No. 18 Predicting a Student's Vocational Choice, by J. L Holland, & S. W. Lutz
(ADI Doc. 9433; photo, $2.50; microfilm, $1.75)

No. 19 The Educational Goals of College-Bound Youth, by L. L. Baird
(ADI Doc. 9472: photo, $5.00; microfilm, $2.25)

No. 20 Who Goes Where to Junior College? by J. M. Richards, Jr., & L. A. Braskamp
(ADI Doc. 9571; photo, $3.75; microfilm, $2.00)

ACT Research Reports (con't.)

No. 21 Predicting Student Accomplishment in College from the ACT Assessment, by J. M. Richards, Jr., & S. W. Lutz
(ADI Doc. 9594; photo, $6.25; microfilm, $2.50)

No. 21 The Undecided Student: How Different Is He? by L. L. Baird
(ADI Doc. 9812; photo, $3.75; microfilm, $2.00)