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ABSTRACT

The study was conducted among secondary schools in Alaskan communities where large numbers of rural native students are enrolled through the Boarding Home Program. It was assumed that village teachers often did not send student records which would have provided a basis for placing students in appropriate academic programs. It was believed that, without past achievement records, native students were often placed in lower-achievement-level classes. The group tested in the study consisted of 68 native ninth graders of Eskimo, Aleut, and Athabascan origin. It was thought that many of the rural native students were capable of more advanced academic work, according to their achievement test profile analysis, upon entering the ninth grade. It was concluded that the students achieved high scores on a relatively less culturally biased abstract reasoning test and that these students had the potential to do well in academic work. It was suggested that teachers should take more care to base their expectations on the capabilities of individual rural native students and not on stereotypes about the group as a whole. Table of statistics are appended. (EI)

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Achievement Profiles of Native Ninth Graders

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ACHIEVEMENT PROFILES OF NATIVE NINTH GRADERS

The secondary schools of many Alaskan communities are enrolling large numbers of rural Native students through the Boarding Home Program. Village teachers often have not sent student records that would provide a basis for placing students in appropriate academic programs. In the absence of past achievement records, secondary school personnel often assign rural Native students to lower achievement level classes because experience has shown them that these students generally need supplementary instruction.

An analysis of the achievement test profile of ninth grade Native Boarding Home Program students entering the Fairbanks area schools suggests the dangers of this academic placement method.[1] Rural Native students appear to vary widely in their achievement levels, and many are capable of more advanced academic work. Academic placement for rural Native students in the secondary schools should be based on the particular strengths and weaknesses of individuals rather than on group generalizations. The current general placement practice is especially likely to retard the academic progress of the group of rural Native students that the schools should carefully nurture—the academically talented. In many cases, these students are too shy to aggressively demonstrate their competence, and the placement error may not be discovered. Moreover, the teacher's mistakenly low expectations about the student's ability may depress his level of performance.

Achievement testing with culturally different children has many well-known weaknesses, and these weaknesses have led to justifiable suspicions about their use. However, it is far more serious not to test and to assume that rural Native students fall into the lowest category.

Profile of Students

The Boarding Home Student group tested consisted of 68 Native ninth graders who participated in the Fairbanks program[2] and who will be attending school in Fairbanks, Big Delta, and Nenana. The students came primarily from the smaller villages in the Interior, such as Chevak, Noorvik, Hughes, and Galena. There were more female students than male (F = 42; M = 26). The average age of the females was 15.3 years, and the average age of the males was 15.4 years. There were 45 Eskimo students, and, of these, 41 were full-blooded, one was three-quarters Eskimo and one was one-half Eskimo.[3] There were 17 Athabascan students. Of these, six were full-blooded, seven were three-quarters Athabascan, and three were one-half Athabascan. One full-blooded Aleut student was also in the group. About 85 per cent of the Eskimo students came from a home where either Eskimo alone or both Eskimo and English were spoken. About 44 per cent of the Athabascan students came from a home where either Athabascan alone or both Athabascan and English were spoken.

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[1] These achievement tests were given at the request of the Fairbanks Native Association.

[2] About 28 of the ninth grade Fairbanks area students did not attend the Boarding Home Program orientation program and did not receive achievement tests.

[3] This information was obtained from student application forms which were not complete for a few students.

Achievement Tests*

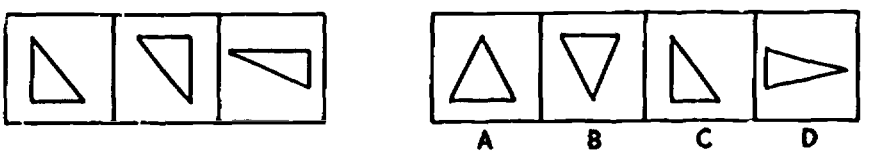
Achievement tests, when carefully interpreted, may be useful for a number of purposes. They may help to tailor academic programs to the strengths and weaknesses of individual students. They may help to identify strengths of the group as a whole that might serve as the basis for instructional strategies. And they also may help to identify areas of group weakness where additional instruction may be desirable.

The Academic Promise Test was selected because it consists of four different types of tests where each score is useful for a different purpose. One test is a relatively "culture-fair" measure that may be used to give some indication of a student's general level of ability when he comes from a non-Western cultural background. Scores on a second test, in contrast, depend heavily on familiarity with Western culture and the English language. Scores on this particular test may be very useful in determining which students are unlikely to have difficulty in an academic program that assumes such a cultural background. The other two tests measure levels of present achievement in arithmetic and English usage. While not ability tests, they are useful in determining at what point further English and arithmetic instruction should begin.

Abstract Reasoning

This test measures the ability to see relationships and to recognize concepts that are presented in diagrams or symbols rather than in words or numbers. The items consist of a series of figures, and the problem is to determine which of the answer figures is like the problem figures.

Example:



This test is less culturally biased than most other measures, and similar tests (such as Raven Progressive Matrices) are frequently used in cross-cultural testing as a measure of general academic potential. However, it is probably a mistake to consider this test "culture-fair." Different cultures may have different notions of what makes things similar. For example, a student from one cultural background may consider a series of these figures alike because all are circular, while a student from another cultural background may consider a different set of figures to be alike because all are small. It is very difficult to determine to what extent these differences in cultural categories exist and to what extent, therefore, such tests are actually subtly culturally biased.

*All examples in this section and in tables 3 and 4 are illustrative and do not appear in the Academic Promise Test.

Numerical

This test measures understanding of numerical relationships. Since most of the items are conventional arithmetic textbook problems, this test should probably be considered primarily a measure of arithmetic achievement. Many of the problems, however, are verbal formulations, so the Boarding Home Program student from a non-English language background may be at a disadvantage.

Example: How much more would a radio cost by paying $3.50 every month for a year than by paying $37.50 in cash?

A. $2.00
B. $2.75
C. $4.50
D. None of these

Verbal

This test measures understanding of word meanings and the ability to use words in reasoning. Scores on this test are highly dependent upon cultural background as the example illustrates:

Example: LETTER is to ENVELOPE as PILLOW is to

A. Head
B. Pillowcase
C. Bed
D. Blanket

While scores on this test should *not* be considered a measure of academic potential, they may be useful to indicate which students are likely to do well in courses that assume familiarity with Western culture.

Language Usage

This measure is essentially an English usage achievement test and assesses skills in spelling, punctuation, capitalization, etc.

Example: When you have decided which part has an error, fill in the space under that letter on the answer sheet.

The people decides / who is elected / when they vote.
A B C

Interpretation of Test Scores

A student's score on each of these tests is expressed in terms of his percentile rank. Test norms have been developed that are based on the scores of over 34,000 students in grades 6-9 throughout the United States. A student who receives a percentile score of 90, for example, has scored higher than approximately 90 per cent of the students in his norm group for his grade, while approximately 10 per cent of these students scored above him.[4]

The percentile ranks available for the Academic Promise Test are based on test performance in the second semester of the year. The Boarding Home Program students were tested after the end of the second semester of the 8th grade but before the beginning of the 9th grade year. This raised the problem of whether to use 8th or 9th grade test norms. Since students had not yet received any 9th grade instruction, 8th grade norms were used. While this difficulty means that the placement of a student's score in the appropriate percentile zone may be slightly in error, the basic interpretation of test results should not be much influenced.

Teachers should keep in mind that these tests may not be accurate for certain students. For example, a student may have mistakenly skipped an answer blank and continued on the test. Such an error would result in a test score far below his ability. A student may also have been ill or tired on the morning of the test. Because of the late arrival of the testing materials, these tests were given to Boarding Home Program students on the morning following a late dance. That fatigue may depress test scores, therefore, is not unlikely. Teachers should regard these scores not as definitive measures but rather as probable indicators of a student's performance.

Results

Achievement Test Scores

Perhaps the most interesting result is the high scores of rural Native students in the area of abstract reasoning. These students as a group score about as high in abstract reasoning skills as the national student average (see Table 1).[5] A number of students appear to be highly gifted in abstract reasoning ability; seven of the 68 students scored at the 90th percentile or above.

The high level of Boarding Home Program students' performance in abstract reasoning calls into question certain unfortunate stereotypes about Native students' ability to abstract. The abstraction difficulty to which teachers refer may be based not on ability to abstract,

[4] A percentile rank should be viewed as a zone of ability rather than a precise point. For specification of this zone and conversion of these scores into stanines, see *Academic Promise Test: Directions for Administration and Scoring and Norms*, The Psychological Corporation, New York, New York.

[5] It is difficult to make exact comparisons between the scores of Boarding Home Program students and other groups because of the problem of whether 8th or 9th grade percentiles should be used. Even if 9th grade percentiles had been used on this test, however, results probably would not have differed to any large extent, since the 8th and 9th grade norms on this test differ by only about one point in each percentile range.

but rather on cultural differences in beliefs about the kinds of things it is appropriate to generalize about and a limited knowledge of English vocabulary referring to abstract concepts. More study of this question is needed.

Boarding Home Program students' skills in reasoning with diagrammatic figures suggest that instructional strategies that permit students to exercise these abilities may substantially increase learning.[6] Teachers may find that presentations of subject matter using graphs, diagrams, or word and letter patterns may be especially effective for students with special strength in this area.

While it must be remembered that a number of students did well on this test, scores on the numerical test are the lowest of the test group. In order to determine in what specific arithmetical areas students had difficulty, the types of problems that over half of the students missed were examined (see Table 3). Like many students, Boarding Home Program students had most difficulty in arithmetical problems that are stated verbally or that require that verbal expressions of quantity be translated into numerical expressions. Students also made frequent errors in problems involving mixed fractions, decimals, percentages, and the computation of area. For some Boarding Home Program students, supplementary work in arithmetic may be required. Village teachers may also wish to provide more instruction in this area. More emphasis should probably be placed on the use of arithmetic in everyday problem situations where language is also involved.

As would be expected from the obvious cultural bias of the test, these students frequently had low scores on the verbal test. Again, however, several individual students did quite well and surpassed the national student average.

In view of the fact that English is a second language for most of the students, scores on the English language usage tests were rather high. Boarding Home Program students as a group scored higher than about 35 per cent of the national student group. Examination of the types of language usage items that over half of the group missed suggests several areas that might be emphasized by English teacher in urban and village schools (see Table 4). Boarding Home Program students, like many other students, tend to make errors in such areas as quotations, double negatives, the use of a singular verb when a plural phrase follows a singular subject, etc.

Group Variability

Different Boarding Home Program students vary widely in their achievement on each test. While a number of students have achievement test scores below the 10th percentile in arithmetic and English language usage and would probably benefit from preparatory classes in these areas, many other Boarding Home Program students score at or above the national student average and should have few if any academic problems. Educators should be careful to guide individual Boarding Home Program students into the appropriate classes and not assign the students to an instructional program as a group.

[6] These cognitive strengths and their implications for instruction are discussed more fully in the forthcoming paper, "Cognitive Strengths of Eskimos and Implications for Education," Institute of Social, Economic and Government Research.

Within-Student Differences

These rural Native students evidenced much wider differences in scores on different types of achievement tests than are usually found in high school students (see Table 2). About 85 per cent of the Boarding Home Program students show a difference of 20 percentiles or more in their scores on two of the achievement tests. About 40 per cent of the students show the extremely large difference of 50 percentiles or more. These wide variations on different types of tests make a single, composite achievement score highly misleading. Rather than categorizing students as "academically talented" or not, teachers might find it much more useful to plan an instructional program on the basis of the individual student's *areas* of academic strength and weakness.

Conclusion

The high scores of many Boarding Home Program students on the relatively less culturally biased abstract reasoning test suggest that these students have the potential to do well in a ninth grade program. Some Boarding Home Program students, along with many other students in the Fairbanks area schools, might benefit from preparatory work in certain academic areas where previous instruction has been inadequate. However, other students are performing at average levels or well above average and have no need for this type of program. An impressive amount of educational research suggests that teachers' expectations about a student's abilities are an important cause of his level of performance in school.[7] If a teacher mistakenly believes that a student has low ability, he may treat the student in ways that result in a level of performance far below the level that the student would have otherwise achieved. Teachers should be careful to base their expectations on the capabilities of individual rural Native students and not on stereotypes about the group as a whole.

TABLE 1

Achievement Test Scores
of Boarding Home Program Students

PERCENTILE:	Abstract Reasoning	Numerical	Verbal	Language Usage
0 - 20	19	38	36	21
21 - 50	18	21	25	32
51 - 80	21	7	5	15
81 - 100	10	2	2	0
AVERAGE	49.4	23.9	25.5	35.2
STANDARD DEVIATION	21.83	23.96	23.21	23.18

[7] Robert Rosenthal and Lenore Jacobsen, *Pygmalion in the Classroom*. New York: Holt, Rinehart and Winston, 1968.

TABLE 2.

Achievement Test Pattern
of Boarding Home Program Students

Abstract Reasoning	Numerical	Verbal	Language Usage	Academic Promise Test TOTAL
95	85	85	65	85
95	75	25	55	65
95	55	45	75	75
90	65	80	75	85
90	30	35	50	55
90	10	25	25	35
90	15	10	20	30
85	65	35	55	65
85	50	40	30	55
85	30	35	40	25
80	10	55	55	50
80	20	30	45	40
75	75	65	35	65
75	10	30	5	25
75	50	50	50	6
75	15	30	25	35
70	35	20	55	50
65	1	20	35	20
65	5	5	15	15
65	3	30	45	30
65	35	10	40	40
65	50	10	20	20
65	15	25	25	30
60	25	10	45	35
60	25	10	45	35
60	35	50	45	50
60	15	10	35	25
60	97	85	75	90
60	30	10	60	40
60	50	75	25	55
55	60	20	55	50
55	5	40	50	35
50	10	45	55	35
50	10	35	25	30
50	25	5	10	20

TABLE 2 (continued)

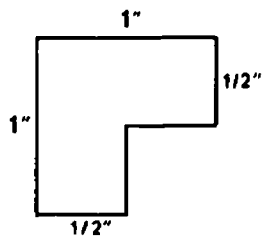
Abstract Reasoning	Numerical	Verbal	Language Usage	Academic Promise Test TOTAL
50	1	35	30	25
50	25	50	40	45
45	25	25	55	40
45	40	50	75	55
40	5	20	35	20
40	25	25	55	35
35	30	10	3	15
30	15	10	15	10
30	5	5	15	10
30	5	5	10	5
25	10	20	35	15
25	5	5	10	5
25	10	40	35	20
25	5	10	15	10
25	10	3	10	5
20	10	3	30	10
20	20	80	35	30
20	15	5	10	5
20	10	40	70	30
20	1	5	50	10
20	5	20	45	20
15	20	15	10	5
15	5	15	3	3
15	5	5	3	3
10	25	15	40	15
10	5	5	3	3
10	1	5	5	1
10	30	20	30	25
10	20	45	30	20
5	25	20	35	15
5	15	10	10	5
5	10	3	1	1
5	75	3	3	3
5	25	15	40	15

TABLE 3

Areas of Difficulty in Numerical Test

		*PERCENTAGE OF STUDENTS IN ERROR
1.	Verbal Problems How much more would a radio cost by paying $3.50 every month for a year than by paying $37.50 in cash? (A) $2.00 (B) $2.75 (C) $4.50 (D) None of these	64%
2.	Square Units of Measure How many square inches are in a square yard? (A) 36 (B) 216 (C) 1296 (D) None of these	62%
3.	Translation of Verbal to Numerical Expressions of Quantity Which is less than one-hundredth of a yard? (A) .255 yd. (B) .125 yd. (C) .002 yd. (D) None of these	66%
4.	Mixed Fractions 2 2/5 x 4 3/8 = (A) 7 (B) 11 3/8 (C) 20 11/13 (D) None of these	68%
5.	Number Series 21 28 23 26 25 24 -- What is the next number? (A) 27 (B) 29 (C) 30 (D) None of these	86%
6.	Percentages What per cent of the figure is shaded in? (A) 20% (B) 25% (C) 33 1/3% (D) None of these	72%
7.	Equations If M stands for Mike's age and S for his sister's age, which shows that Mike is 6 years older than his sister? (A) M + S = 6 (B) M + 6 = S (C) M — 6 = S (D) None of these	57%

TABLE 3 (continued)

	*PERCENTAGE OF STUDENTS IN ERROR
8. Decimals $.03\overline{)8.46}$ = (A) 15.65 (B) 282 (C) 560 (D) None of these	59%
9. Area What is the area of this figure?  (A) 8 sq. in. (B) 10 sq. in. (C) 12 sq. in. (D) None of these	79%

*Percentage of students in error was calculated by dividing students who erred on item by number of students who attempted it. A number of students did not reach the last items of the test. However, those students who did attempt these last items are likely to be the better students. When more than half of them missed it, the item is likely to be difficult for the group as a whole.

TABLE 4

Areas of Difficulty in Language Usage Test

Decide which part of the sentence has an error, fill in the space under that letter on the answer sheet.	*PERCENTAGE OF STUDENTS IN ERROR
1. Double Negative It won't do no / good to argue / A B if she is not listening. C	75%
2. Predicate Adjective After Linking Verb Sue's brother was / sick, but I / A B thought he looked finely. C	57%
3. Use of Semi-Colon and Colon By 11.40 A.M., / the sun was overhead / A B in the sky. C	82%
4. Verb Agreement When Singular or Plural Subject is Followed by a Phrase containing a Singular or Plural Noun Each of the boys / were trying to / A B win the game. C	81%
5. Verb Agreement When Sentence Begins With "There" Anyone could see that / there was too many / A B rotten apples in the carton. C	65%

TABLE 4 (continued)

		*PERCENTAGE OF STUDENTS IN ERROR
6.	Use of Apostrophe with a Contraction but not with a Plural	
	The pictures / should have been developed / two week's ago. (A, B, C)	84%
	Its going / to be very cold / by the end of the week. (A, B, C)	81%
7.	Capitalization and Punctuation with a Quotation	
	Mr. Shake said, / "put the boots / in the hall." (A, B, C)	63%
	She asked / "When does the plane / arrive in Seattle?" (A, B, C)	89%
8.	Use of Compound Words	
	Every one I talked to / was going / to the picnic. (A, B, C)	89%
9.	Use of Who and Which with Appropriate Antecedent	
	The sled who has / a broken runner / is in the shed. (A, B, C)	89%
10.	Use of Apostrophe with Possessive Plural Noun	
	The girls / dresses were / all green. (A, B, C)	89%

*Percentage of students in error was calculated by dividing students who erred on item by number of students who attempted it. A number of students did not reach the last items of the test. However, those students who did attempt these last items are likely to be the better students. When more than half of them missed it, the item is likely to be difficult for the group as a whole.