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AUTHOR Green, James E.
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ABSTRACT

This study outlines and evaluates the admissions policies and procedures devised for evaluating applicants to the Indiana Academy for Science, Mathematics, and Humanities. The procedures utilized a holistic file review process that required applications to be evaluated in the context of their local regions. Complete student files, which included standardized test scores, grade transcripts, teacher and administrator recommendations, and student accounts of accomplishments, were evaluated and assigned a score in aptitude, achievement, and accomplishment. The file review process determined who would be invited to interview for admission. In the first 2 years of the Academy, 160 students were invited to interview. Results of statistical analysis of student records showed that: (1) the admissions procedures produced a student body that was characterized by academic excellence, geographic diversity, and ethnographic diversity; (2) the aptitude, achievement, accomplishment, and composite ratings from the holistic method were positively correlated with usual predictors such as Scholastic Aptitude Test scores, grades, and teacher recommendations and were positively correlated with academy grade point averages; and (3) canonical correlation and stepwise regression procedures do not produce results that would lead to the construction of a useful analytical model for predicting academic performance. These findings support the continued use of the holistic file review process and demonstrate that a holistic student identification method encourages attention to equity issues that usual predictors do not. (Contains 18 references.) (JDD)

EVALUATION OF A HOLISTIC METHOD FOR IDENTIFYING PUPILS FOR STATE ACADEMIES FOR THE ACADEMICALLY GIFTED

by

James E. Green, Ph.D.
Professor of Secondary Education
Teachers College
Ball State University

Evaluation of a Holistic Method for Identifying Pupils for State Academies for the Academically Gifted

Abstract

Identifying pupils for admission to state academies for the academically gifted is enigmatic. Assuring equity of educational opportunity is as important as identifying pupils with the greatest potential to succeed in an academically rigorous environment. When the Indiana Academy for Science, Mathematics, and Humanities planned its admissions policies and procedures, it devised a holistic method for evaluating applicants. In this study the procedures used by the Indiana Academy are outlined and evaluated. Results show that ratings from a holistic method for evaluating student applications are positively correlated with usual predictors such as SAT scores, grades, and teacher recommendations. Moreover, a holistic student identification method encourages attention to equity issues that usual predictors do not. The experience of the Indiana Academy's first two years supports continued use of holistic methods for identifying students for admission.

Evaluation of a Holistic Method for Identifying Pupils for State Academies for the Academically Gifted

Although barely over a decade old, the movement to establish state supported residential academies for students who are intellectually gifted continues to grow. The potential benefits espoused by the founders of these schools are beginning to be evidenced, with graduates now assuming adult responsibilities and outreach programs becoming widespread.

Among the lingering concerns, however, is how state academies admit students. Identifying students for gifted education programs has always been enigmatic, and state academies have not discovered any immunity from the same perplexing problems that face educators in other schools. Ambiguous conceptions of giftedness, misuse of tests, validity and reliability of non-standard sources of information, and fear of elitism are major apprehensions as state academies design or review admission policies and procedures. Moreover, state academies for the gifted must function in a political context. Equity issues are vital, as is the obvious purpose of identifying students who have the potential to succeed in a highly enriched educational environment. Facing these challenges, it came as no surprise that one state academy--the Indiana Academy for Science, Mathematics, and Humanities--gave careful attention to the design and implementation of its admission procedures when it planned its inaugural year.

In this article two aspects of student selection in the Indiana Academy are examined. The method itself--a holistic file review process--is explained. In addition, a statistical analysis of the results of the Indiana Academy's admissions policies and procedures for its first two years is presented. Two questions guided the research. First, can equity and excellence be compatible in student selection process for the academically gifted? And second, does the process of evaluating students' applications for the purpose of admission have predictive value for academic achievement?

Review of the Literature

Identifying pupils for gifted programs of any type is fraught with fallacies. Both the National Report on Identification (Richert, Alvino, & McDonnel, 1982) and the Richardson report (Cox, Daniel, & Boston, 1985) cited many of the faulty identification practices prevalent in schools. Among some of the more obvious problems, according to Richert (1987), include elitist or distorted definitions of giftedness, confusion about the purposes of identification, misuse and abuse of tests, and inappropriate use of multiple criteria.

In an attempt to close the gap between what we know and what we practice, Richert (1987) has recommended several research based guidelines for identification.

First, the definitions should reflect current theories (Richert, 1987). Accordingly, definitions of giftedness that are going to be used for identification should be broad and inclusive so that they acknowledge the multi-faceted characteristics of

giftedness. Gardner (1985), Sternberg, (1985), and Renzulli (1986) all argue toward a broadened definition.

Second, test data must be used appropriately. Richert *et al* (1982) have documented many erroneous uses of tests for identifying the gifted. The key is ensuring that any test used has been established through research as appropriate for the ability being sought. The Scholastic Aptitude Test (SAT), although controversial, has been proven to be an effective predictor of scholastic aptitude for the academically gifted and talented at the middle school and secondary levels (Stanley, 1976). Richert and her colleagues (1982), however, argue against the use of cut-off scores on tests, since other reliable sources of data, such as grades or actual performance, also can be made readily available. Also essential is determining whether a test is known to discriminate against any of the disadvantaged populations (Richert et al, 1982).

If discrimination is to be avoided in an identification system, special procedures will be required. Richert and her colleagues (1982) identified students with low socio-economic status, minority races or cultures, students with minimal proficiency in English, and females (when identifying ability in mathematics) as most likely to be overlooked when tests were emphasized.

The National Report on Identification stated that appropriate use of multiple sources of data was necessary for an identification system to be equitable and inclusive. Several precautions should be taken, however, when using multiple sources

of data, warned Richert and her colleagues. Schools should avoid inserting data from different sources into a formula. The purpose of using multiple sources is not to validate one source with another; but rather, it is to have a variety of sources that complement one another so that the several indicators can reveal something that a single indicator can not. Alternative sources of information include statements by parents, ratings and written recommendations from teachers, peer nominations, self-nominations, and interviews (Richert, 1987).

Although recommendations for practice in the National Report on Identification include the appropriate use of multiple sources of data, research on specific sources suggests that no single source be given great weight by itself. Hagen (1980) reported that research has yet to establish either the efficiency or effectiveness of teacher rating scales. Students with negative behavior traits, limited language backgrounds, and handicapped students are especially vulnerable to being overlooked by teachers. Hagen (1980) also supported the use of biographical inventories, noting that they had a higher correlation between creative achievement than did tests of creativity. But, she argued against the use of personality inventories and attitude scales since their intended uses are clinical.

Information on the accomplishments of students outside the classroom should be given strong consideration. Wallach (1976) reported that tests scores and grades hold limited ability to predict adult accomplishment, whereas Mundy and Davis (1974) found

that adult accomplishments were related to comparable high school non-academic (extra-curricular) accomplishments.

Interviews with students are most frequently used in the assessment stage after a talent pool has been found, according to Richert (1987). Myslenski and Jeffery (1985) found that interviews are, at best, subjective, and empirical support for their use as a valid method of predicting success in academic programs is lacking.

Published reports on the effectiveness of specific identification systems is scant. In 1987 Bunch and Scherick studied data used in the evaluation of students' applications for admission to the North Carolina School for Science and Mathematics, comparing the data to academic achievement after enrollment in the school. Among their significant findings was the high correlation between the SAT verbal score and grade point average.

Overview of Indiana Academy Admissions Practices

Admissions to the Indiana Academy during the two year period studied was highly selective. Based on multiple criteria and multiple sources of data, the application evaluation process utilized a holistic, file review process (Green, 1990). Mathematical reasoning, scientific reasoning, verbal reasoning, interpersonal ability, and performance ability were included in the evaluation process. Applicants supplied SAT scores taken during their sophomore year, transcripts of class grades from the seventh grade through the first semester of the sophomore year, and recommendations from an English teacher, mathematics teacher,

science teacher, and either a principal, guidance counselor, or gifted education program director. The recommendations were written on academy forms so that responses to specific questions provided the academy's file reviewers with anecdotal information depicting creativity and problem solving ability, as well as other relevant attributes researchers associate with academic giftedness. Students themselves provided detailed accounts of their accomplishments and awards in order to indicate their qualities of motivation and self-discipline in addition to revealing their special talents.

Complete student files were evaluated by a team of file reviewers, with three persons reviewing each file. For each file reviewed, at least one of the reviewers came from the region where the student resided so that the local context of the student could be considered when evaluating the information. Each file reviewer assigned a holistic score (ranging from 20 to 80) in each of three areas: aptitude, achievement, and accomplishment. Also, each reviewer assigned a composite file review score. The composite file review score could not be less than nor greater than any of the three separate sub-scores. The three file review scores from the three individual evaluators were then added, and the sum became the final file review score for the application.

The process took great care to see that scores from the reviewers were reliable. If the three file reviewers' scores deviated significantly, then additional review of the file was required. All the persons who served as reviewers were trained by Indiana Academy personnel (Freyberg, 1990).

The state was divided into 15 zones with tenth grade populations of approximately equal size. The students were ranked according to their file review scores, and then were invited according to their standing in their respective geographic zones. In the first two years of the Indiana Academy, 160 students were invited. The first 105 invited were drawn from the 15 zones, seven from each zone. The final 55 students invited came from "at large." As a result of inviting the at large applicants after the applicants from the geographic zones had been identified, the possibility that a student invited from a zone might have a final file review score lower than a student not invited was remote. Also in this fashion, geographic distribution across the state was optimized. And, because the ethnic diversity of the state has definite geographic characteristics, ethnic diversity was positively influenced.

The file review process determined who would be invited to interview for admission to the academy. The interview was placed at the end of the process so that it would occur after a student was deemed qualified. The interview itself was not designed to evaluate a student's potential giftedness. But rather, it was an opportunity for academy officials to make certain that the expectations of the academy were made clear to the candidate before the candidate decided to accept the invitation to enroll. The academy reserved the right to withhold the admissions decision until after the interview.

Research Procedure

Two central questions emerge from any discussion of the admissions policies and procedures of a state academy. First, do the procedures provide for social equity as well as identify academic giftedness? And second, do the procedures have predictive value? That is, do the procedures identify those students who are most likely to be successful in the educational program? In order to answer these questions, two stages of research were undertaken.

In response to the first question, a demographic analysis of the students who enrolled in the Indiana Academy was conducted to determine whether traditionally underrepresented populations were sufficiently represented in the first two classes.

In response to whether the file review procedures had predictive value, correlations were calculated among the usual predictors (*i.e.*, SAT-verbal; SAT-quantitative; TSWE; and recommendations from science, mathematics, and English teachers, and administrators). Next correlations were calculated among the academy's ratings (*i.e.*, holistic ratings for "aptitude," "achievement," and "accomplishment"). These correlations were to allow the investigator to observe the reliability of the various predictors. Correlations were also calculated between the usual predictors and the academy's ratings to allow the observation of relationships existing between the two sets of variables.

The subsequent analysis consisted of the calculation of canonical correlations for the two sets of variables (usual

predictors and academy ratings) and academy grade point averages in three areas: science, mathematics, and humanities.

Finally, stepwise multiple regression was performed in order to construct a predictor model for possible use in the future.

Admissions variables defined for the analyses included SAT (verbal), SAT (Quantitative), TSWE, GPA (grades 7 - 10.5 in core subjects), English teacher ratings, science teacher ratings, mathematics teacher ratings, administrator ratings, holistic rating for accomplishment, holistic rating for achievement, holistic rating for aptitude, and the final holistic file review score. Each variable was correlated with separate grade point averages: one for grades in science, one for grades in mathematics, and one for grades in humanities. Since the Indiana Academy does not maintain grade point averages for students (since it does not maintain class rank), grade point averages were calculated expressly for this study. The academy's grading scale of A,B,C, and Unsatisfactory allowed the use of a 3.00 continuous scale. Grades in certain mathematics and science courses were weighted since the curriculum expressly addressed levels of abstraction and acceleration in those subject areas. Table 1 contains averages for all the variables included in the study.

TABLE 1

MEANS AND STANDARD DEVIATION FOR ADMISSIONS VARIABLES (N = 500)

VARIABLE	MEAN	STANDARD DEVIATION
SAT VERBAL	505.82	85.33
SAT QUANTITATIVE	576.42	97.97
TSWE	50.96	7.29
GPA RECALCULATED	3.64	0.39
SCIENCE TEACHER RATING	4.61	0.97
MATH TEACHER RATING	4.58	1.02
ENGLISH TEACHER RATING	4.60	1.05
ACCOMPLISHMENT RATING	54.63	11.21
ACHIEVEMENT RATING	50.95	16.25
APTITUDE RATING	50.53	13.79
FILE REVIEW SCORE	158.44	38.48

Profile of the First Two Classes

The results in the first two years revealed that the first two classes were distinguished by their academic qualifications and characterized by their diversity (Green, 1991). The mean composite SAT score for students enrolled in the first year was 1140 and the mean TSWE was 54 (IASMH Profile Enrolling Juniors, 1991). In the second year the mean composite SAT was 1130 and the mean TSWE was 52 (IASMH Class of 1993 Profile, 1992). And the

average cumulative grade point average at the time of admission was 3.90 on a 4.00 scale for the first class, and 3.80 for the second class. In both of the first two classes, over a quarter of the students enrolling ranked first in their respective home schools when they enrolled in the academy, and their average class rank was fourth. Of the 144 students in the inaugural class who took the PSAT in October, 1990 (the inaugural year), 29 were recognized as National Merit Scholarship semi-finalists, representing 20 per cent of the graduating class and 7 per cent of all National Merit semi-finalists from Indiana (IASMH School Profile, 1991).

Enrollment Equity

Moreover, the classes for the first two years represented all of Indiana. In the first two years of admissions experience, 75 of Indiana's 92 counties have been represented, and 169 of the state's high schools. In the first year, 49 per cent of the class was female and 51 per cent was male. In the second year, 59 per cent of the incoming class was female and 41 per cent was male. In the first class, over 13 per cent of the students came from minority populations, and in the second class the percentage exceeded 17 per cent--proportions that exceeded the minority population of the comparable state-wide age group (IASMH Profile Enrolling Juniors, 1991; IASMH Class of 1993 Profile, 1992.)

The academic and demographic characteristics of the first two classes provide convincing evidence that academic excellence and demographic equity can be achieved simultaneously.

Academic Performance

The academic performance of the inaugural class proved to be quite satisfactory in a curriculum designed to accelerate and intensify the study of traditional liberal arts and sciences. When the inaugural class graduated, over three fourths of the students earned grades that were classified as "Outstanding" or "Superior." Five per cent or less of the grades were "Unsatisfactory." Tables 2 through 4 contain the grade distributions for the inaugural class' two years at the Indiana Academy.

Table 2

Humanities Grade Distribution of the Class of 1992 of the Indiana Academy for Science, Mathematics, and Humanities

Humanities

	90-91	91-92
English:		
A-Outstanding	52%	47%
B-Superior	34%	49%
C-Satisfactory	12%	4%
U-Unsatisfactory	2%	0%
History:		
A-Outstanding	48%	46%
B-Superior	46%	43%
C-Satisfactory	6%	10%
U-Unsatisfactory	0%	0%
Foreign Language:		
A-Outstanding	52%	52%
B-Superior	32%	30%
C-Satisfactory	11%	15%
U-Unsatisfactory	5%	3%

Table 3

Science Grade Distribution for the Class of 1992 of the Indiana Academy for Science, Mathematics, and Humanities

	90-91	91-92
A-Outstanding	49%	68%
B-Superior	38%	22%
C-Satisfactory	13%	8%
U-Unsatisfactory	0%	1%

Table 4

Mathematics Grade Distribution for the Class of 1992 of the Indiana Academy for Science, Mathematics, and Humanities

	90-91	91-92
A-Outstanding	35%	29%
B-Superior	40%	38%
C-Satisfactory	23%	28%
U-Unsatisfactory	2%	4%

Results of Research: Relationship of Usual Predictors to Academy Ratings

Procedures for determining whether the academy's file review process have value for predicting academic success began with an analysis of the relationship of the usual predictors to ratings used by the academy. Usual predictors included the SAT (verbal); SAT (quantitative); Test of Standard Written English (TSWE); grade point average (GPA); and the average rating on recommendation forms for English teacher, mathematics teacher, and science teacher. The GPA was recalculated by the academy so that it only included academic subjects (English, mathematics, science, social studies, foreign languages, computer literacy) and included grades

seven through ten (first semester). The academy ratings included holistic scores for aptitude, achievement, accomplishment, and a holistic composite score--the file review score. A total of seven usual predictors and four academy ratings were included in the analysis, with a total of 500 observations available for the analysis. Table 1 contains the list of the variables with their mean values and standard deviations.

First, correlations among the usual predictors were calculated. Table 5 contains the correlation statistics. As expected, positive correlations among the SAT-verbal, SAT-quantitative, and TSWE were high ($r > .50$). The correlations for the teacher recommendations also were positive, but notably weak. Simple observation of these correlations corroborates that standardized tests are more reliable than teacher recommendations on forms used to identify academic giftedness.

TABLE 5

CORRELATIONS AMONG THE USUAL PREDICTORS
(N = 500)

	SAT VERBAL	SAT MATH	TSWE	GPA RECALCULATED	SCIENCE TEACHER RATING	MATH TEACHER RATING	ENGLISH TEACHER RATING
SAT VERBAL	1.00	0.52	0.65	0.29	0.20	0.11	0.18
SAT MATH	0.52	1.00	0.52	0.36	0.21	0.20	0.18
TSWE	0.65	0.52	1.00	0.39	0.20	0.15	0.20
GPA RECALCULATED	0.29	0.36	0.39	1.00	0.33	0.33	0.32
SCIENCE TEACHER RATING	0.20	0.21	0.20	0.33	1.00	0.30	0.38
MATH TEACHER RATING	0.11	0.20	0.15	0.33	0.30	1.00	0.31
ENGLISH TEACHER RATING	0.18	0.18	0.20	0.32	0.38	0.31	1.00

Next, correlations among the academy ratings were calculated. Table 6 contains the correlation statistics. Notably, all the correlations were positive ($r > .60$ in all cases), indicating the file review process produced reliable ratings for the factors of aptitude, achievement, and accomplishment.

TABLE 6

CORRELATIONS AMONG ACADEMY RATINGS
(N = 500)

	ACCOMPLISHMENT RATING	ACHIEVEMENT RATING	APTITUDE RATING	FILE REVIEW SCORE
ACCOMPLISHMENT RATING	1.00	0.72	0.65	0.91
ACHIEVEMENT RATING	0.72	1.00	0.61	0.84
APTITUDE RATING	0.65	0.61	1.00	0.83
FILE REVIEW SCORE	0.91	0.84	0.83	1.00

Correlations between the usual predictors and the academy ratings were also calculated. (See Table 7.) Positive correlations were noticeable between accomplishment and GPA ($r = .50$); accomplishment and English teacher recommendation ($r = .51$); and accomplishment and science teacher recommendation ($r = .56$). Positive correlation was strong between achievement and GPA ($r = .74$). Positive correlations were strong between aptitude and SAT-verbal ($r = .74$); aptitude and SAT-quantitative ($r = .72$); and aptitude and TSWE ($r = .67$). Most importantly, positive correlations were noticeable between the file review score (the composite holistic academy rating) and all the usual predictors.

The correlations between the file review scores and the SAT-verbal scores, the SAT-quantitative scores, the TSWE's, and the GPA's were r = .55, r = .57, r = .55, and r = .60 respectively. These positive correlations establish a strong positive relationship between Indiana Academy's holistic file review process and the usual prediction measures.

TABLE 7

CORRELATIONS AMONG THE USUAL PREDICTOR AND ACADEMY RATINGS (N = 500)

	ACCOMPLISHMENT RATING	ACHIEVEMENT RATING	APTITUDE RATING	FILE REVIEW SCORE
SAT VERBAL	0.38	0.36	0.74	0.55
SAT MATH	0.44	0.40	0.72	0.57
TSWE	0.39	0.41	0.67	0.55
GPA RECALCULATED	0.50	0.74	0.40	0.61
SCIENCE TEACHER RATING	0.56	0.45	0.31	0.51
MATH TEACHER RATING	0.43	0.36	0.20	0.36
ENGLISH TEACHER RATING	0.51	0.42	0.28	0.46

In addition, canonical correlation coefficients were calculated for the usual predictors and the academy ratings. Table 8 contains the standardized canonical correlation coefficients for the usual predictors and the academy ratings. Inspection of these coefficients reveals three important observations. First, students who scored high on both the SAT-quantitative and SAT-verbal tended to have high academy ratings

for aptitude and, to a lesser degree, a high academy file review score. Second, students who had a high recalculated GPA and who scored low on the SAT-verbal tended to have high academy achievement ratings and low academy aptitude ratings. Third, students who had low recalculated GPA's and high recommendations from science, mathematics, and English teachers tended to have high academy accomplishment ratings, but low academy achievement ratings and low academy file review scores. These canonical correlations tend to validate the academy's holistic rating system.

TABLE 8

STANDARDIZED CANONICAL COEFFICIENTS FOR THE USUAL PREDICTORS AND THE ACADEMY RATINGS (N = 500)

USUAL PREDICTORS				
SAT VERBAL	0.42	-0.35	-0.08	0.06
SAT MATH	0.41	-0.29	0.15	-0.65
TSWE	0.20	-0.16	-0.05	0.57
GPA RECALCULATED	0.13	0.76	-0.88	-0.07
SCIENCE TEACHER RATING	0.12	0.29	0.51	0.38
MATH TEACHER RATING	0.01	0.16	0.38	-0.73
ENGLISH TEACHER RATING	0.10	0.20	0.42	0.35
ACADEMY RATINGS				
ACCOMPLISHMENT RATING	-0.11	0.48	2.02	-2.00
ACHIEVEMENT RATING	0.03	0.97	-0.79	-1.63
APTITUDE RATING	0.78	-0.97	0.15	-1.76
FILE REVIEW SCORE	0.32	-0.05	-1.16	4.83

Results of Research: Relationship of Admissions Variables to Academic Performance

For the purpose of this study, academic performance was defined in terms of semester grades earned. As previously noted, the Indiana Academy did not report grade point averages because class rank was not considered a relevant statistic in a population comprised exclusively of academically gifted students. However, for this investigation grade point averages were calculated for the three areas in the curriculum: science, mathematics, and humanities. Both classes were included in the study. Weighted grades were used in mathematics and science because in those subject areas the level of abstraction and acceleration were distinguished in the design of the curriculum.

Observation of the correlations between the usual predictors and academy ratings and the academy grade point averages was revealing. There were six instances of positive correlations between the holistic academy ratings and academy GPA's exceeding .40 (achievement rating and math GPA, file review score and math GPA, achievement rating and science GPA, file review score and science GPA, achievement rating and humanities GPA, and file review score and humanities GPA). However, there was only one instance of a positive correlation between a usual predictor and academy GPA's exceeding .40--the recalculated GPA from previous schools and academy math GPA. Table 9 contains correlations among GPA's for science, mathematics, and humanities areas. Table 10 contains all the correlations for the 12 original variables and academy GPA's.

TABLE 9

CORRELATIONS AMONG THE ACADEMY GPA'S

	MATH GPA	SCIENCE GPA	HUMANITIES GPA
MATH GPA	1.00	0.69	0.57
SCIENCE GPA	0.69	1.00	0.57
HUMANITIES GPA	0.57	0.57	1.00

TABLE 10

CORRELATIONS AMONG THE HS & ACADEMY PREDICTORS &THE ACADEMY GPA'S

	MATH GPA	SCIENCE GPA	HUMANITIES GPA
SAT VERBAL	0.23	0.29	0.27
SAT MATH	0.33	0.40	0.05
TSWE	0.23	0.32	0.33
GPA RECALCULATED	0.41	0.37	0.38
SCIENCE TEACHER RATING	0.23	0.17	0.24
MATH TEACHER RATING	0.14	0.08	0.14
ENGLISH TEACHER RATING	0.25	0.26	0.36
ADMINISTRATION RATING	0.23	0.21	0.24
ACCOMPLISHMENT RATING	0.29	0.32	0.35
ACHIEVEMENT RATING	0.42	0.40	0.43
APTITUDE RATING	0.28	0.35	0.20
FILE REVIEW SCORE	0.38	0.44	0.40

In addition, canonical correlation coefficients were calculated for the academy GPA's and 12 original admissions variables. Table 11 contains the standardized canonical coefficients for the 12 original admissions predictors and academy GPA's. Analysis of Table 11 reveals two important findings. First, students who had high academy achievement ratings, high SAT-verbal scores, and high English teacher recommendations tended to have high GPA's in humanities; and, to a lesser extent, they had high GPA's in science and mathematics. Second, students who had low SAT-quantitative scores but had high TSWE scores tended to have high GPA's in humanities and low GPA's in both science and mathematics.

TABLE 11

CANONICAL CORRELATION COEFFICIENTS
FOR USUAL AND ACADEMY PREDICTORS
AND ACADEMY GPA'S
(N = 255)

USUAL PREDICTORS			
SAT VERBAL	0.29	0.18	0.02
SAT MATH	0.20	-1.02	0.16
TSWE	0.21	0.47	0.56
GPA RECALCULATED	0.21	-0.24	-0.71
SCIENCE TEACHER RATING	0.06	-0.00	-0.47
MATH TEACHER RATING	-0.06	0.10	-0.31
ENGLISH TEACHER RATING	0.27	0.11	0.24
ADMINISTRATION RATING	0.02	0.17	-0.12
ACADEMY RATINGS			
ACCOMPLISHMENT RATING	0.21	0.07	-0.42
ACHIEVEMENT RATING	0.35	0.13	-0.16
APTITUDE RATING	-0.26	-0.23	-0.56
FILE REVIEW SCORE	0.01	0.09	1.23
GRADE POINT AVERAGES			
MATH GPA	0.25	-0.54	-1.31
SCIENCE GPA	0.39	-0.69	1.21
HUMANITIES GPA	0.52	1.16	0.03

The canonical correlations among the original admission variables and the academy GPA's tend to suggest that the academy's holistic rating system for achievement, combined with SAT-verbal scores, TSWE scores, and the English teacher recommendation, is a valid predictor of academic performance in the academy.

Results of Research: Model for Predicting Academic Success in the Academy

Since the canonical correlations among the original admissions variables and the academy GPA's suggested that the academy's holistic achievement rating, the SAT-verbal score, the TSWE, and the English teacher recommendation all have value for predicting grade point averages in the academy, the stepwise regression procedure was performed, using the composite academy GPA as the dependent variable. The analysis was conducted for the purpose of determining whether an academic performance prediction model could be constructed.

In the first step of the procedure, when the academy's holistic achievement rating was entered into the formula, 24% of the variance of the composite GPA was explained by the academy's holistic achievement rating. In the second step of the procedure the TSWE variable was entered, and an additional 4% of the variance was produced. In the third step of the procedure the English teacher recommendation was entered into the formula, and an additional 4% of the variance was produced. In the fourth and final step of the procedure, the variable for SAT-verbal score was entered in the formula, which added another 1% to the explanation for the variance. All in all, only 33% of the variance of the

composite GPA was explained by the academy's holistic achievement rating, TSWE, English teacher recommendation, and SAT-verbal score. The summary of the stepwise regression procedure is contained in Table 12.

TABLE 12

SUMMARY OF STEPWISE PROCEDURE FOR COMPOSITE GPA

STEP	VARIABLE ENTERED	NUMBER	PARTIAL R^2	MODEL R^2	F	PROBABILITY > F
1	ACHIEVEMENT RATING	1	0.24	0.24	79.96	0.00
2	TSWE	2	0.04	0.28	14.24	0.00
3	ENGLISH RATING	3	0.04	0.32	13.57	0.00
4	SAT VERBAL	4	0.01	0.33	5.09	0.03

While the results of the stepwise regression procedure indicated that a noticeable proportion of the variance of composite GPA in the Indiana Academy were explained by the academy's holistic achievement rating, TSWE, English teacher recommendation, and SAT-verbal score, the formula would not be useful as a model for predicting academic performance in the academy. Other factors, undefined by statistical models, contributed more to variance of composite GPA's.

Summary and Conclusions

Identifying students for admission to state academies for the academically gifted remains enigmatic. Students must be selected on the basis of their potential for succeeding in an academically rigorous environment; but, the only means we have for predicting future performance is observing past and present performance. Many educators, however, are aware that traditional methods for observing past and present performance--such as standardized tests and previous grades--are inadequate by themselves for identifying academically gifted students. The issues of gender and race bias are well known, and the tests themselves are one dimensional--they do not adequately assess multiple intelligences. However, alternative methods have been less than convincing when their reliability are carefully scrutinized. Although they allow for the inclusion of evidence that standardized tests do not allow, they are susceptible to individual rater bias.

Moreover, equity in educational opportunity is as important as identification of ability and achievement when identifying students for state academies. Educators have solid evidence that academic giftedness can be overlooked in conditions that are prevalent in many schools: poverty, prejudice, inferior programs. If state academies strive to identify the most qualified students, then their policies and procedures must allow for the social and cultural context of an applicant's record to be a meaningful part of the evaluation process.

When the Indiana Academy for Science, Mathematics, and Humanities was planned, the admissions policies and procedures were designed with the explicit goals of identifying students who were characterized by their academic ability and achievement and creating a student body that represented the entire state. The resulting procedures utilized a holistic file review process that required the applications to be evaluated in the context of their local regions. This investigation was conducted as an evaluation of the initial admissions policies and procedures. Two questions were central. Did the procedures used by the academy achieve diversity in its student body? Second, did the holistic file review process show signs that it was both reliable and valid as a method for identifying students?

The research procedures consisted of several stages. First, class profiles that summarized the demographic characteristics of the student body and their academic performance were reviewed. Next, statistical analyses were conducted in order to determine the validity of the academy's rating system. Canonical correlation was performed among the usual predictors of academic performance (SAT scores, previous grades, and teacher recommendations) and the academy rating system (holistic scores for aptitude, achievement, accomplishment, and composite). In addition, canonical correlation was performed among the usual predictors and academy GPA's and the academy's holistic ratings and GPA's. Finally, stepwise regression was performed in order to attempt to construct a model for predicting academic performance.

The results of the investigation allow the following general conclusions:

1. The admissions policies and procedures of the Indiana Academy for Science, Mathematics, and Humanities used to select the inaugural class produced a student body that was characterized by academic excellence, geographic diversity, and ethnographic diversity for the state from which the applications were drawn.

2. The aptitude, achievement, accomplishment, and composite ratings from the holistic file review process used by the Indiana Academy were positively correlated with the usual predictors of SAT scores, TSWE scores, grades, and teacher recommendations.

3. The aptitude, achievement, accomplishment, and composite ratings from the holistic file review process used by the Indiana Academy were positively correlated with academy GPA's.

4. Canonical correlation and stepwise regression procedures do not produce results that would lead to the construction of a useful analytical model for predicting academic performance in the academy.

The general conclusion to be drawn from the investigation supports the continued use of the holistic file review process by the Indiana Academy for Science, Mathematics, and Humanities. The method allows flexibility for the social, cultural, and educational contexts that pertain to an individual's application to be considered, and it is proven to be valid in comparison to usual predictors that oftentimes do not permit for this flexibility. The holistic file review process used by the Indiana Academy for Science, Mathematics, and Humanities succeeds in demonstrating that policies designed to promote equity in educational opportunity are compatible with policies that demand educational excellence.

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