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ABSTRACT

Seven liberal arts colleges participated in exploratory studies designed to determine the predictive value vis-a-vis freshman grades of scores from a 208-item, self-report inventory, the Personal Values Inventory (PVI). The PVI was developed to yield scores relatively independent of traditional measures of scholastic aptitude but at the same time related to academic performance in schools and colleges. Scores from several PVI scales, particularly that labelled Persistence, were moderately correlated with Freshman Average Grade in every college. The PVI scale-scores studied were relatively independent of Scholastic Aptitude Test (SAT) scores. Predictions of Freshman Average Grade based on a battery which included PVI scale-scores along with four academic predictors (SAT-Verbal, SAT-Mathematics, class rank, and the average of College Board Achievement scores) were more closely related to Freshman Grades than predictions based only on the four academic predictors. (Author/CTM)

RESEARCH BULLETIN

RB-74-29

THE VALIDITY OF A MEASURE OF "ACADEMIC MOTIVATION" FOR FORECASTING FRESHMAN ACHIEVEMENT AT SEVEN LIBERAL ARTS COLLEGES

Kenneth M. Wilson

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Educational Testing Service
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The Validity of a Measure of "Academic Motivation" for Forecasting Freshman Achievement at Seven Liberal Arts Colleges

Kenneth M. Wilson
Educational Testing Service

Abstract

Seven liberal arts colleges participated in exploratory studies designed to determine the predictive value vis-a'-vis freshman grades of scores from a 208-item, self-report inventory (the Personal Values Inventory or PVI), developed by George E. Schlesser and John A. Finger to yield scores that are relatively independent of traditional measures of scholastic aptitude but at the same time related to academic performance in schools and colleges.

Scores from several PVI scales, particularly that labelled Persistence, were moderately correlated with Freshman Average Grade in every college. The PVI scale-scores studied were relatively independent of SAT scores.

Predictions of Freshman Average Grade based on a battery which included PVI scale-scores along with four academic predictors (SAT-V, SAT-M, class rank, and the average of CEEB Achievement scores) were more closely related to Freshman Grades than predictions based only on the four academic predictors.

The Validity of a Measure of "Academic Motivation" for Forecasting Freshman Achievement at Seven Liberal Arts Colleges[1]

Kenneth M. Wilson

For several liberal arts colleges that have participated in the program of College Research Center (CRC), basic validity studies have been conducted periodically in order to determine the predictive value or validity vis-a'-vis Freshman Average Grade (FAG) of several admissions-related variables, namely, the Scholastic Aptitude Test-Verbal (SAT-V), the Scholastic Aptitude Test-Mathematical (SAT-M), the student's secondary-school class rank (SSR), and the average of scores presented by a student on College Board achievement tests (Av Ach).

As used in Center studies, the student's rank-in-class has been converted into a standard scale, with a mean of 50 and a standard deviation of 10, such that a student at the middle of the class has a scale-score of 50, with other standings having appropriate standard-scale counterparts. Applicants for admission typically have presented three or more CEEB achievement tests and a simple average of all scores presented has been used.

The Center validity studies have provided a basis for certain general conclusions about the value of these admissions variables for predicting

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[1]The colleges participating in the studies reported herein were: Hollins, Mount Holyoke, Randolph-Macon Woman's, Sweet Briar, Trinity (D.C.), Vassar, and Wheaton (Mass.). Except for Wheaton and Sweet Briar, these colleges currently are members of College Research Center, an agency for inter-institutional cooperation in institutional research formally affiliated with Educational Testing Service during the period 1970-71 -- 1973-74, and now informally associated with ETS.

freshman academic performance which, with minor qualifications, tend to be consistent for each participating college:

(a) of the four admissions variables studied, secondary-school rank-in-class (SSR) typically is most closely associated with first-year grades,

(b) the average of scores on all the CEEB achievement tests presented (Av Ach) tends to be the second-best, single predictor of freshman standing,

(c) scores on the Scholastic Aptitude Test-Verbal and Mathematical, respectively, tend to have a lower relationship to freshman-year grades within each college than either class rank or the CEEB achievement average,

(d) as is generally true, a properly weighted combination of these traditional academic predictors provides a better basis for forecasting student performance during the freshman year than any one of these factors considered alone, and

(e) accuracy of forecasts of academic performance, based on the basic academic factors cited above, tends to be slightly better for students of public school origin than for those of private school origin.

However, given the most effective weighting of the variables in this standard battery of academic predictors, most of the observed variation among students in academic performance (freshmen grades) during the freshman year is still not accounted for. The typical value of the coefficients of multiple correlation yielded by the standard battery is approximately R = .50, and coefficients vary among the colleges between approximately R = .30 and R = .65.

A Search for Improved Forecasting Effectiveness

In view of the importance for selection and guidance of judgments regarding the relative academic "promise" of students and prospective students, colleges participating in the Center's program have cooperated from time to time in exploratory studies designed to identify "nonintellective" attributes of students which might help to account for some of the variability in college performance that is not "explained" by the academic predictors.

This paper reports results of one series of studies involving scores from a 208 item self-report inventory, namely, the Personal Values Inventory (PVI), Student Form, Edition for Women, which was designed to yield scores that are relatively independent of traditional measures of scholastic aptitude but at the same time related to academic performance in schools and colleges.[2]

The studies reported herein involved only three of 12 scores derived from segments of the PVI, namely, those labelled Persistence, Self-Control-Deliberateness, and Home Influence, respectively, which may be described briefly as follows:

> Persistence. Several components are scored together to produce the score. These are: hard work versus idleness, self viewed as studious versus self viewed as non-studious, and concentration versus distraction. Students scoring high on this scale think of themselves as good producers in school, as studious and efficient in the production of school work. [Sample items--Does your teacher think of you as one of his hardest workers even though not necessarily one of the smartest? Do you put off your school work until the last minute?]

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[2]The PVI, developed by George E. Schlesser and John A. Finger, has been used primarily for research purposes. For information about the PVI write Colgate University Testing Service, Hamilton, N. Y. or Professor Finger, Educational Services Center, Rhode Island College, Providence, R. I. For reviews of the PVI see Buros (1972, pp. 294-296).

Self-Control--Deliberateness. The components of this score are cautiousness versus rashness, involvement versus non-involvement in thrill-producing and exciting activities, and youth culture resistance versus delinquency proneness. Students scoring low on both Persistence and SC-D will tend to be those who reject academic values and who substitute youth-culture values for them. [Sample items: Have your close friends thought of you as one who is more interested in parties and in the "adventurous life" than in hard work? Do others think of you as a serious, cautious person?]

Home Influence. Students are asked to report how parents feel toward them, how parents view students' Persistence and Self Control. [Sample items: My parents always showed trust and confidence in me. They regarded me as a hard worker. They have said that I am not serious enough.]

As suggested by the brief descriptions and the sample items, these scores reflect a rather direct self-assessment by the respondent of personal characteristics which appear logically to comprise an "academic-motivation or academic-seriousness syndrome," and they thus tend to have face validity.

Five colleges (A, B, C, D, and E) administered the Student Form to essentially all freshmen entering in fall, 1963 (the Class of 1967) and in September, 1964, these colleges plus Colleges H and J, administered the Student Form to the Class of 1968. Only women students were involved.

Group Characteristics on the Variables Studied

Shown in Tables 1 and 2 are measures of central tendency and variability for academic (basic battery) variables and PVI scores, respectively, for public and private school students in the Class of 1968, by college.[3]

[3] N's reported in Table 1 apply approximately to Table 2. Analyses of academic and PVI data, respectively, were based on all cases for which appropriate information was available so that the number of cases involved in various analyses varied slightly.

Insert Tables 1 and 2 about here

The selective nature of the colleges involved is suggested by the data for academic variables shown in Table 1. Both the academic data in Table 1 and the PVI data in Table 2 show rather consistent, albeit small, differences between public-school groups and private-school groups. For example:

> Mean values of SSR (Table 1) indicate that, on the "average," public school graduates ranked in the top 10 percent of their respective graduating classes (mean SSR of 63 or 64) with variation by college such that at Colleges A and B, for example, rank in class for public school graduates (mean SSR = 69 and 70) was roughly equivalent to standing at the 97th or 98th percentile. For graduates of private secondary schools, mean SSR ranged from 55 (about the 69th percentile) to 64 (92nd percentile).
>
> Public school graduates also tended to have higher averages, regardless of college of enrollment, on all PVI scales (Table 2). In most instances differences were of relatively small magnitude but the trend is relatively consistent. The only reversals in the direction of differences occur at Colleges A and J and these colleges are characterized by the smallest observed mean differences between groups on the PVI.
>
> There is a tendency for group averages on the academic variables, by college, and averages on PVI variables to be related--higher average SAT's, for example, tend to be associated with higher averages on PVI Persistence.
>
> The nature of the observed differences in group characteristics on the variables studied suggests that the public-school graduates tend to be somewhat more highly motivated for academic achievement, more highly selected on academic performance variables, and somewhat better achievers during their first year in college than their counterparts from private secondary schools.

Study Design

The studies were designed primarily to ascertain the extent of relationship between Freshman Average Grade (FAG) and scores on the PVI (i.e., Persistence, Self Control-Deliberateness, and Home Influence) and to determine whether or not adding scores from the PVI to the standard battery of academic predictors (SAT-V, SAT-M, SSR, and Av Ach) would improve predictions of Freshman Average Grade. The pattern of analysis was as follows:

(1) For each of the five colleges which administered the PVI in fall, 1963, a basic validational correlation-regression analysis was performed on all freshmen for whom complete data were available in order to determine the interrelationships of the variables and develop two regression equations for estimating Freshman Average Grade, namely, one based only on the four basic admissions scores making up the standard battery and the other based on the standard battery plus the Persistence, Self Control-Deliberateness, and Home Influence scores from the PVI, which may be said to comprise the augmented battery.

(2) For freshmen entering in 1964 (The Class of 1968) in each of the five colleges, the two equations derived in the basic, validational analysis were used to obtain for each student two estimates of Freshman Average Grade (Predicted FAG), namely, one based on the standard battery only and the other based on the augmented battery which included the PVI scores.

Findings

How closely do scores on the Personal Values Inventory correlate with Freshman Average Grade? Is the battery of "predictors" which includes PVI scores (i.e., the augmented battery) more closely related to FAG than the battery which did not include the PVI scores (i.e., the

basic or standard battery)? If so, are predictions of Freshman Average Grade (i.e., PFAG) based on the augmented battery "more accurate" than predictions based on the standard battery alone?

Data permitting answers to the first of these questions are shown in Table 3.

Insert Table 3 about here

The PVI scores studied are positively correlated with Freshman Average Grade.

Median values for coefficients of correlation (FAG versus single predictors) indicate that PVI Persistence tends to have about as high a relationship to first year performance as SSR (median, r = .37 as compared to r = .40), and, typically, a somewhat higher relationship than the Achievement Average (median, r = .32). And, the Persistence score has a relatively low correlation with aptitude measures as indicated by data in Table 4.

Insert Table 4 about here

Tentative answers to the second and third questions are provided by findings summarized in Table 5, particularly findings reported for Colleges A, B, C, D, and E.

Insert Table 5 about here

Under the heading "Class of 1967, (R's)" we find that coefficients of multiple correlation for the augmented battery were higher than coefficients for the standard battery in the basic validational sample.

Under the heading "Correlation of predicted and observed FAG in the Class of 1968" we find that in all comparisons but one, predictions of FAG (using the regression equations derived in the Class of 1967) based on the augmented battery were more closely related to actual FAG than were predictions based on the standard battery.

The leading contribution (among the PVI scores) of the Persistence score is suggested by the fact that the coefficients of multiple correlation obtained when only the Persistence score was added to the standard battery are essentially as high as those obtained when all three PVI scores were included.

Contribution of the Persistence Score

The foregoing findings indicate that factors underlying scores on the Personal Values Inventory, particularly the Persistence score, do help to account for some of the heretofore "unexplained variance" in freshman performance--i.e., the Personal Values Inventory does contribute some information of value for predicting academic performance which is independent of that provided by the standard battery. The amount of new information is not "great" and it varies from one college to another.

Some insight into the nature of the contribution may be gained by considering briefly the data in Table 6, namely, beta (standard-score regression) weights reflecting the contribution of elements in the standard battery before, and after that battery was augmented by addition of the PVI Persistence score.

Insert Table 6 about here

Considering the data for the standard battery (Table 6), we see the typically smaller beta weights for the SAT's and the typically larger

weights associated with SSR and Achievement Average, respectively. When Persistence is added to the standard battery, the major apparent result is a reduction in the weight association with Secondary School Rank and, to a lesser extent, Achievement Average.

One way of estimating the relative contribution of variables which make up a predictive composite is to express the beta weight for each variable as a percent of the sum of the weights for all variables. In order to facilitate comparisons across colleges, the percentage contribution of the respective variables was determined and is summarized in Table 7 (total percent for each college may not equal 100 due to rounding).

Insert Table 7 about here

These data point up more clearly the effect on various elements in the standard battery of adding the PVI Persistence score: essentially no change in the role of aptitude measures (SAT-V and SAT-M) but a diminished role for the secondary school performance measures (i.e., school rank and measured achievement).

This "shifting of weight" from the indices of past academic performance (i.e., the secondary school rank and measured subject-matter achievement) to a "nonintellective" measure (a measure of "academic motivation") when the latter is added to the predictive battery is an interesting phenomenon. Such a finding is consistent with the assumption that past performance, whether reflected in rank in class, high school grades, or measured achievement (and aptitude scores as well) reflects

the operation of nonintellective as well as intellective factors--that as Joshua Fishman (1963) observed:

> (T)he high school average, based as it is upon performance over an appreciable period of time, (and standardized aptitude or achievement tests, intended as they are to equalize the marking scale across high schools) are both reflections of the consequences of nonintellective factors in the applicant and in his environment.... High school grades reflect nonintellective factors to a much greater extent than has been commonly appreciated.... [They] are, in fact, a summary of a life story.

High scorers on the PVI Persistence scale, it may be recalled, are those who tend to view themselves as studious, report that they are able to be efficient in the production of school work (and) think of themselves as good producers in school with low scorers showing an opposite tendency. Thus the Persistence score is based, at least in part, on self-reported, characteristic modes of response to and attitudes toward academic situations and it is apparent that this self-report has "predictive" validity for performance during the first year in college.

Summary

The studies described above were undertaken in order to determine the validity of a self-report measure of academic motivation, the Personal Values Inventory, using the highly important albeit limited criterion of Freshman Average Grade. The findings of these studies indicate that the PVI does provide information of value for predicting Freshman Average Grade. In summary:

> The PVI scores studied exhibit a moderate degree of correlation with FAG. Of the PVI scales studied, that labelled "Persistence" is the best predictor (Table 3).

This score has a low correlation with SAT-V or SAT-M and a moderate degree of correlation with Secondary School Rank (Table 4).

When three PVI scores (namely, Persistence, SC-D, and Home) were combined with the standard battery of four academic predictors, the coefficients of multiple correlation for the augmented battery versus FAG typically were higher than those obtained for the standard battery versus FAG (Table 5). Most of the increase apparently is accounted for by the "Persistence" score (Tables 6 and 7).

Predictions of FAG based on the augmented battery (with PVI scores included) were found to be more closely correlated with observed FAG than were predictions based on the standard battery in four of five colleges involved in cross validation analyses--in the fifth the two sets of predictions were equally accurate (Table 6).

In more operational terms, the findings which have been reviewed indicate that, on the average, high-scorers on the Persistence scale of the PVI are likely to be better academic performers during the freshman year of college than their low-scoring counterparts and that the information provided by the Persistence scale tends to supplement (and not duplicate completely) that provided by "traditional" indices of performance potential.

Thus the self-report information provided by the PVI is useful for assessing the probable academic performance of entering freshmen, hence can be valuable for purposes of identifying groups of students likely to have high incidence of "academic difficulty" and for counseling with individual students. Its value is enhanced by low correlation with scholastic aptitude test scores.

High-scorers on this scale, it will be recalled, are those who describe themselves as having been hard workers, "good producers," etc. in secondary school--i.e., as being "academically motivated." These

"self-descriptions" clearly have useful validity for predicting academic performance during the freshman year in college. When the PVI is to be administered as part of an orientation testing program or administered on an individual basis to students, and used for student counseling, the fact that it is a "self report" inventory calling for "personal information" does not pose directly problems which would be involved in use of the inventory in selection--problems which range in scope from the technical (e.g., "faking of responses") to the philosophical (e.g., "invasion of privacy").

The findings reported herein are consistent with the conclusion reached by Knapp (1972, pp. 122-123) in reviewing the PVI, namely, that the "goal of obtaining a scale significantly correlated with GPA but independent of intellectual factors is best represented in the PVI by the Persistence scale."

In more general terms, these findings are also consistent with Fishman's (1963, p. 669) review of research involving use of nonintellective measures in an effort to achieve incremental validity (over that provided by academic aptitude and achievement measures) for predicting school or college grades in which he concluded that the gain in multiple correlation is not very great, "...usually less than +.05."

At the same time, it should be noted that the type of behavior represented by this scale may have relevance for the prediction of academic performance in a variety of educational settings. For example, research reported by Smith (1961, 1967, 1969), involving both peer ratings and self-report on items reflecting "responsibility", "dependability", "conscientiousness", "persistence", and other similarly labelled traits,

revealed (a) that the single most valid trait rating (for predicting academic performance) evolved around a description of "quitting versus determined, persevering behavior"--i.e., giving up, being slipshod and the like versus seeing a job through despite difficulties, being thorough and painstaking, etc., and (b) that this pattern tended to hold for Puerto Rican high school students, nursing atudents, and students in a two-year program at a metropolitan university.

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Table 1

Measures of Central Tendency and Variability, Academic Variables, by Secondary School Origin and by College, Class of 1968

Group	FAG Mean	FAG SD	SSR Mean	SSR SD	SAT-V Mean	SAT-V SD	SAT-M Mean	SAT-M SD	Ach Av Mean	Ach Av SD	(N)
D-Public	1.7	0.5	64	7	610	58	578	74	576	49	(88)
D-Private	1.6	0.5	55	7	604	58	576	71	593	51	(107)
A-Public	7.5	1.2	70	6	651	56	647	68	641	60	(318)
A-Private	7.2	1.4	64	6	636	65	621	83	642	49	(92)
H-Public	1.5	0.6	65	6	594	69	579	76	571	56	(214)
H-Private	1.3	0.5	58	6	583	67	571	66	571	55	(58)
E-Public	1.7	0.5	63	6	602	70	569	68	569	46	(113)
E-Private	1.5	0.5	56	6	584	63	569	71	582	48	(106)
J-Public	1.6	0.5	64	7	609	65	585	82	574	66	(65)
J-Private	1.6	0.5	62	8	605	73	557	84	548	65	(172)
B-Public	2.7	0.4	69	6	653	58	629	72	635	50	(277)
B-Private	2.6	0.4	62	6	644	54	618	75	644	47	(129)
C-Public	7.4	1.6	64	5	591	56	567	73	575	46	(224)
C-Private	7.2	1.4	55	6	588	53	558	65	585	41	(180)

*Letter identification used corresponds to standard CRC code.
Variables are as follows: FAG = Freshman Average Grade; SSR = Converted Secondary School Rank; SAT-V and SAT-M = Scholastic Aptitude Test - Verbal and Mathematical, respectively; Ach Av = average of CEEB achievement tests presented by student.

Table 2

Measures of Central Tendency and Variability, Personal Values Inventory Scores, by Secondary School Origin of Students, Class of 1968

College and school category	Persistence		Self Control		Home	
	Mean	SD	Mean	SD	Mean	SD
D-Public	21.0	6.5	13.1	2.9	14.3	2.8
D-Private	17.3	7.1	12.5	3.1	14.3	2.9
A-Public	23.5	6.5	14.1	3.1	15.7	2.5
A-Private	23.8	7.1	14.1	3.5	15.3	2.8
H-Public	20.8	6.2	13.4	2.8	14.9	2.8
H-Private	18.7	7.3	12.7	3.0	14.3	3.0
E-Public	21.6	5.8	13.4	2.4	14.7	3.0
E-Private	19.8	5.7	13.1	2.4	14.4	2.9
J-Public	20.5	7.0	13.4	2.9	14.7	3.1
J-Private	20.0	7.6	13.2	3.1	14.6	3.2
B-Public	24.4	6.4	14.4	2.5	15.4	2.8
B-Private	23.1	5.8	13.8	2.7	15.4	2.7
C-Public	20.8	7.1	13.7	2.6	14.6	2.8
C-Private	18.8	6.2	12.5	2.8	14.3	3.3

Table 3

Correlation of Selected Variables with FAG

College and Class*	N	Standard battery				Personal Values Inventory		
		SSR r	SAT-V r	SAT-M r	Ach. Av. r	Persistence r	Self Control r	Home r
A-67	(379)	.43	.19	.18	.32	.39	.26	.33
A-68	(411)	.31	.18	.13	.32	.34	.24	.27
B-67	(394)	.39	.28	.17	.39	.32	.22	.22
B-68	(417)	.39	.20	.20	.36	.34	.22	.24
C-67	(255)	.25	.07	.08	.14	.28	.17	.24
C-68	(404)	.29	.10	.07	.19	.39	.25	.32
D-67	(153)	.38	.08	.17	.23	.45	.27	.37
D-68	(196)	.47	.13	.00	.25	.47	.36	.24
E-67	(193)	.41	.28	.30	.37	.46	.27	.34
E-68	(219)	.48	.18	.24	.26	.35	.12	.24
H-68	(272)	.46	.28	.23	.36	.30	.20	.18
J-68	(239)	.62	.35	.42	.48	.46	.32	.42
Median "r"		(.40)	(.18)	(.18)	(.32)	(.37)	(.24)	(.26)

*Without regard to secondary school origin

Table 4

Intercorrelations, by College and Secondary-School Origin, of Selected Variables, for Freshmen in the Class of 1968

Variable	College	SAT-V		SAT-M		Ach Av		Persistence		Year 1 Average	
		Pub	Pvt	Pub	Pvt	Pub	Pvt	Pub	Pvt	Pub	Pvt
School Rank (SSR)	D	00	00	02	07	16	18	56	39	54	41
	A	06	-05	10	14	-01	18	32	28	27	41
	H	22	-06	36	-06	37	08	43	43	55	08
	E	06	21	25	16	18	07	44	31	53	43
	J	27	43	56	44	49	53	66	48	61	63
	B	01	25	22	24	21	05	50	31	42	21
	C	-04	00	05	-09	16	-06	41	38	35	28
SAT-V	D			16	15	43	25	16	05	13	13
	A			15	09	35	44	12	05	16	20
	H			25	26	63	54	22	-02	25	40
	E			10	15	54	42	06	00	00	36
	J			37	47	55	67	04	20	27	39
	B			23	16	40	22	-02	-04	20	19
	C			22	20	37	26	-07	-03	10	12
SAT-M	D					34	49	06	-05	05	-04
	A					25	42	-01	-12	13	11
	H					44	60	20	-05	23	21
	E					25	47	07	-05	21	27
	J					64	63	23	25	49	40
	B					40	38	10	-01	21	12
	C					39	30	-12	-12	17	-10
Ach Av	D							23	16	27	31
	A							09	-08	32	36
	H							31	04	36	37
	E							11	-05	27	30
	J							23	38	43	51
	B							22	-10	42	26
	C							03	02	24	14
Persistence	D									56	40
	A									35	34
	H									33	16
	E									46	21
	J									46	46
	B									37	23
	C									39	37

*Decimal points have been omitted for ease of presentation. Thus for example, first row should read as follows: .00, .00, .02,..., .41.

Table 5

Results of Correlational Analysis, Class of 1967, and Cross-Validational Analysis, Class of 1968

College	Class of 1967 (R's)		Correlation of predicted and observed FAG in Class of 1968#	
	Standard battery*	Standard battery plus PVI**	Prediction based on standard battery* (r's)	Prediction based on standard battery plus PVI** (r's)
D	.44	.55 (.53)[a]	.50	.53
A	.52	.59 (.58)	.45	.53
H	.52	b	.52	##
E	.53	.62 (.62)	.52	.52
J	.65	b	.64	##
B	.50	.53 (.52)	.50	.53
C	.30	.38 (.36)	.36	.47

*The standard battery was comprised of SAT-V, SAT-M, Converted Secondary School Rank (SSR) and the average of CEEB achievements (AA).

**Variables above, plus Persistence, Home, and Self Control from the Personal Values Inventory.

[a]Entries in parentheses indicate R's when only the Persistence score was added to the standard battery.

[b]This analysis was not performed for the Class of 1967.

#Equations developed for total sample, Class of 1967, were used to predict a freshman average grade for each student in the Class of 1968. The predictions were then correlated with actual first-year averages.

##This analysis was not performed.

Table 6

Effect on Weighting of Standard Academic Predictors When the PVI Persistence Score is Added to the Battery, Class of 1967

Predictors employed*	Beta weights for designated predictors					Multiple correlation (R) with FAG**
	SAT-V	SAT-M	SSR	AA	"Persistence"	
College A						
Standard battery	.04	.02	.40	.27		(.52)
With "Persistence"	.06	.04	.29	.26	.28	(.58)
College B						
Standard battery	.12	-.04	.28	.33		(.50)
With "Persistence"	.12	-.03	.20	.31	.19	(.52)
College C						
Standard battery	.04	.03	.27	.14		(.30)
With "Persistence"	.04	.06	.18	.12	.21	(.36)
College D						
Standard battery	-.08	.03	.37	.24		(.44)
With "Persistence"	-.06	.09	.22	.15	.33	(.53)
College E						
Standard battery	.08	.10	.34	.25		(.53)
With "Persistence"	.14	.09	.17	.21	.36	(.62)

*The standard battery of predictors was comprised of SAT-V, SAT-M, Converted Secondary School Rank (SSR) and the Average of CEEB Achievement tests.

**The criterion was Freshman Average Grade (FAG)

Table 7

Relative Contribution of Elements in the Standard Battery of Predictors Before, and After, Addition of the PVI Persistence Score

College	Standard battery		Augmented battery		
	SAT-V and SAT-M %	SSR and AA %	SAT-V and SAT-M %	SSR and AA %	PVI Persis-tence %
A	8	92	11	59	30
B	21	79	18	60	22
C	15	85	16	50	34
D	15	84	17	44	39
E	23	76	24	40	37
Average (mean)	16	83	17	51	32