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JOURNAL TITLE: College and university

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BOS CATALOG TITLE: College and university : the journal of the American Association of Collegiate Registrars

ARTICLE TITLE: Predicting the Academic Achievement of Female Students Using the SAT and Noncognitive Variables.

ARTICLE AUTHOR: Ancis, Julie

VOLUME: 72

ISSUE: 3

MONTH:

YEAR: 1997

PAGES: 2- 8(?) C

ISSN: 0010-0889

OCLC #: BOS OCLC #: 6168802

CROSS REFERENCE ID: [TN:353056][ODYSSEY:143.215.137.35/ILL]
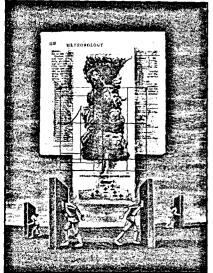
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FEATURES

This study by **Julie R. Ancis** and **William E. Sedlacek**
examined 1,930 female college students' academic perfor-
mance over 4 years. Both noncognitive variables and stan-
dardized academic measures were significantly predictive
of women's educational achievement.

Transfer students comprise more than 40 percent of the
new, degree-seeking students at the University of Missouri
System. This study, by **Mardy Eimers** and **Robert
Mullen,** investigates the key characteristics and indicators
of success of the students who began their studies at the
University of Missouri System during 1987 and 1988.

Louise Lonabocker describes how the registrar has been at
the forefront of a technological transformation that has result-
ed in better service to students and how the registrar's role has
been restored to the core of instructional management.

BOOK REVIEW

Cover design by **Scott Taylor,** *a
senior at the Milwaukee Institute
of Art and Design. Scott is the
second winner in our ongoing
C&U cover art contest.*

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Founded in 1910, AACRAO is a nonprofit, volun-
tary, professional education association of degree-
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education and further the professional develop-
ment of members working in admissions, enroll-
ment management, financial aid, institutional
research, records, and registration.

Predicting the Academic Achievement of Female Students Using the SAT and Noncognitive Variables

By Julie R. Ancis and William E. Sedlacek

Women have made many gains in higher education over the last twenty years (Shavlik, Touchton, and Pearson 1989). The majority of all students in higher education are women (Danowitz Sagaria 1988), and women are increasingly pursuing nontraditional degrees (Ossana, Helms, and Leonard 1992), allowing for access to a wider range of careers. Despite these gains, much evidence exists that women experience an academic climate characterized by both subtle and overt forms of gender bias (Ancis and Phillips in press; Brush 1991; Fitzgerald, Shullman, Bailey, Richards, Swecker, Gold, Ormerod, and Weitzman 1988; Sandler 1987), and a corresponding decrease in academic and career aspirations from freshman to senior year (El-Khawas 1980; Ossana, Helms, and Leonard 1992).

In order for educators, counselors, and student affairs staff to develop and foster learning environments which encourage women's educational success, it is critical to identify and measure those variables specifically related to women's academic achievement. Admissions offices have often relied on standardized tests, such as the SAT, to predict women's academic success despite considerable evidence that traditional measures are not as valid for women as they are for men (Gamache and Novick 1985). Standardized exams, such as the SAT, consistently underpredict women's grades (Betz and Fitzgerald 1987, Gamache and Novick 1985, Johnson 1993, Rosser 1989).

Developing valid predictors of female students' academic achievement requires consideration of women's experiences in educational settings. Much evidence exists that women students often experience vastly different academic environments from their male counterparts, characterized by discouraging comments, differential opportunities, and sexual harassment (Ancis and Phillips in press; Brush 1991; Fitzgerald, Shullman, Bailey, Richards, Swecker, Gold, Ormerod, and Weitzman 1988; Sandler 1987). Since the academic experiences of women students often differ from their male counterparts, it can be expected that predictors of their academic achievement will also differ. Faced with barriers to their educational development, female students must often possess additional skills to succeed. The SAT may therefore not fully capture those variables predictive of female students' academic achievement.

Relatedly, several authors have described the relationship between nonacademic variables, such as self-esteem (Stericker and Johnson 1977), exposure to role models (Tidball 1986), and leadership experiences (Astin 1977) and women's educational achievement (Betz and Fitzgerald 1987). Whereas the SAT and other standardized tests tend to measure what Sternberg (1985, 1986) refers to as componential intelligence, the ability to interpret information in a hierarchical and taxonomic fashion in a well-defined and unchanging context, research findings suggest that individuals who experience bias tend to demonstrate their abilities through experiential and contextual intelligence—Sternberg's second and third types of intelligence. Experiential intelligence involves the ability to interpret information in changing contexts; whereas contextual intelligence refers to the ability to adapt to a changing environment.

Similarly, it has been demonstrated that noncognitive variables, measured by the Noncognitive Questionnaire (NCQ) (Tracey and Sedlacek 1984), predict the academic achievement of students who often experience inequities in university settings. This includes African-American (Tracey and Sedlacek 1985, 1989), Hispanic (Fuertes and Sedlacek 1994), and international students (Boyer and Sedlacek 1988). These same noncognitive variables may help predict women students' academic achievement as they also encounter discouraging educational environments and often require additional competencies to succeed.

The purpose of this study was to determine the validity of the NCQ

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and SAT in predicting women's academic achievement throughout college. Participants' Grade Point Average (GPA) served as the criterion.

Method

Procedure

The NCQ (Tracey and Sedlacek 1984) was administered to random samples of entering female freshmen attending orientation at a large, mid-Atlantic university over a ten-year period from 1979 to 1988 (n = 1,930). More than 90 percent of all entering freshmen attended the orientation program. Each student's cumulative grade point average (CGPA) over a seven-semester period following matriculation was obtained from university records. Asian-Americans composed 6 percent of the sample; African Americans, 12 percent; Hispanics, 4 percent; and European-Americans, 78 percent.

Instrument

The NCQ (Tracey and Sedlacek 1984) is designed to assess the following eight noncognitive variables: (1) Positive Self-Concept or Confidence (strong sense of competence, determinism, and independence), (2) Realistic Self-Appraisal (accurate self-assessment of one's academic abilities wherein one recognizes his/her strengths as well as limitations and commits to self-development), (3) Understands and Deals with Racism (recognizes racism and has developed a method for responding assertively and resourcefully), (4) Prefers Long-Range Goals to Short-Term Goals (motivated to defer gratification), (5) Availability of a Strong Support Person (presence of an individual who supports one's pursuit of a college education and is available to provide advice), (6) Successful Leadership Experience (demonstrated ability to organize and influence others),

(7) Demonstrated Community Service (active in community activities), (8) Nontraditional Knowledge (nonacademically related ways of obtaining information and demonstrating knowledge).

The NCQ consists of 23 items: 18 Likert-type items pertaining to educational expectations and self-estimates ranging from strongly agree (1) to strongly disagree (5), two nominal items which assess educational aspirations, and three open-ended items pertaining to present goals, past accomplishments, and involvement in community and leadership activities.

A median coefficient alpha reliability estimate of .83 has been obtained in previous investigations (Sedlacek and Adams-Gaston 1992). Test-retest reliability estimates over a two-week period have ranged from .70 to .94 for each item, with a median test-retest of .85 (Tracey and Sedlacek 1984). Adequate construct validity for the dimensions of the NCQ has been established by factor analysis (Tracey and Sedlacek 1984).

Analyses

Stepwise multiple regressions were performed with NCQ variables and SAT Verbal and Math scores as predictors, and grades (GPA) as the criterion over seven semesters. NCQ variables were entered first, followed by SAT Verbal and Math scores. This allowed for an assessment of the relationship between noncognitive variables and grades before SAT scores were added as predictors. Tracey and Sedlacek (1981) recommend this procedure for investigations involving more established measures, such as the SAT, and less established measures such as the NCQ.

Results

Table 1 (page 4) presents significant zero-order correlations between NCQ and

SAT scores and cumulative GPA per semester. Table 2 (page 5) presents significant predictors of cumulative GPA per semester using multiple regression. The NCQ variables Demonstrated Community Service, Realistic Self-Appraisal, and Nontraditional Knowledge emerged as significant predictors of cumulative GPA in semesters 1, 3, 5, and 7. Successful Leadership Experience significantly predicted cumulative GPA in semester 5 only. Availability of a Strong Support Person was significantly predictive of cumulative GPA in semester 7 only. A significant negative relationship was found between Positive Self-Concept and GPA in semesters 1, 3, 5, and 7. Finally, SAT scores significantly predicted grades in all semesters.

Discussion

The results suggest that both noncognitive and academic variables are significantly related to female students' GPA throughout their university experience. This study was unique in allowing for the concurrent investigation of traditional and nontraditional predictors of women's scholastic achievement. Moreover, the findings provide further evidence for the predictive validity of the NCQ and support the need for more comprehensive models of women's educational success.

Both verbal and mathematical skills seem to predict the academic success of college women. Among the NCQ variables, Demonstrated Community Service before college emerged as the strongest predictor of grades in semesters 1, 3, 5, and 7. Community service activities may provide female students with the skills and resources needed to achieve in a challenging environment. For example, community service activities may facilitate the development of interpersonal skills, such as instrumentality, which are positively related to women's educational and career development (Betz and Fitzgerald 1987; Orlofsky and Stake 1981).

Table 1. Significant* Zero-Order Correlations Between NCQ and SAT Scores and Cumulative GPA Per Semester

	Variable	r
Semester 1	Positive Self-Concept	-.08
	Realistic Self-Appraisal	.12
	Support Person	.05
	Leadership Experience	.08
	Community Service	.13
	Nontraditional Knowledge	.08
	SAT Verbal	.27
	SAT Math	.27
Semester 3	Positive Self-Concept	-.07
	Realistic Self-Appraisal	.15
	Handling Racism	.05
	Support Person	.07
	Leadership Experience	.08
	Community Service	.15
	Nontraditional Knowledge	.10
	SAT Verbal	.26
	SAT Math	.29
Semester 5	Realistic Self-Appraisal	.16
	Handling Racism	.05
	Support Person	.07
	Leadership Experience	.11
	Community Service	.16
	Nontraditional Knowledge	.12
	SAT Verbal	.25
	SAT Math	.28
Semester 7	Realistic Self-Appraisal	.12
	Handling Racism	.07
	Support Person	.10
	Leadership Experience	.09
	Community Service	.15
	Nontraditional Knowledge	.12
	SAT Verbal	.18
	SAT Math	.22

Note: NCQ = Noncognitive Questionnaire, SAT = Scholastic Assessment Tests, GPA = Grade Point Average.
* $p < .05$.

Table 2. Significant* Predictors of Cumulative GPA Per Semester Using Multiple Regression

	Predictors by Semester	R	Standardized Beta
Semester 1	Community Service	.13	.13
	Realistic Self-Appraisal	.17	.11
	Positive Self-Concept	.22	-.14
	Nontraditional Knowledge	.23	.06
	SAT Verbal	.36	.18
	SAT Math	.36	.16
Semester 3	Community Service	.15	.15
	Realistic Self-Appraisal	.21	.14
	Nontraditional Knowledge	.24	-.14
	SAT Verbal	.37	.15
	SAT Math	.37	.18
Semester 5	Community Service	.16	.16
	Realistic Self-Appraisal	.21	.14
	Positive Self-Concept	.24	-.11
	Nontraditional Knowledge	.25	-.09
	Leadership Experience	.26	.05
	SAT Verbal	.36	.13
	SAT Math	.36	.18
Semester 7	Community Service	.15	.15
	Realistic Self-Appraisal	.18	.11
	Nontraditional Knowledge	.20	.09
	Support Person	.21	.07
	Positive Self-Concept	.22	-.07
	SAT Verbal	.30	.09
	SAT Math	.30	.14

Note: SAT Verbal and SAT Math scores were entered together at the same step.
* $p < .05$.

Realistic Self-Appraisal was also demonstrated to significantly predict grades. Realistic self-appraisal is particularly important for women students who often receive faulty feedback regarding their academic performance. This feedback includes disparaging comments from faculty regarding women's commitment or scholastic achievement, the favoring of male contributions in class, and inattentiveness when women students do participate (Hall and Sandler 1982; Huntington 1986). Women students who are able to accurately appraise their abilities as well as recognize challenges in the system despite negative or inaccurate external feedback may be at a significant advantage.

Nontraditional Knowledge also emerged as a significant predictor of grades. Women who seek alternative venues for obtaining knowledge and expressing themselves, such as participating in community or nonacademic activities, seem to be more likely to succeed than those who do not seek such opportunities. This is particularly true

for women who pursue personally meaningful knowledge or information of direct relevance to their lives as women's contributions and perspectives have been relatively absent from traditional curriculum (Thorne 1989).

Successful Leadership Experience and Availability of a Strong Support Person emerged as significant predictors of grades in semesters 5 and 7, respectively. The significant relationship between leadership experiences and grades is consistent with prior research demonstrating the importance of leadership experiences to women's self-esteem and learning (Astin and Kent 1983; Pascarella and Terenzini 1991). The significant relationship between Availability of a Strong Support Person and grades is consistent with the demonstrated importance of role models to women's educational and career success (Tidball 1986, 1989). The fact that these two noncognitive variables emerged as significant predictors only in later semesters requires further investigation.

Finally, the significant negative relationship between Positive Self-Concept and GPA was unexpected and certainly warrants additional study. Additional psychological variables not measured here may be related to these findings. For example, the Impostor Phenomenon, "a psychological syndrome or pattern based upon intense, secret feelings of fraudulence in the face of achievement tasks and situations" (Harvey and Katz 1985), has been identified among high-achieving high school students, college women, and career women (Clance and Imes 1978; Cromwell, Brown, Sanchez-Hucles, and Adair 1990). Previous research has demonstrated that individuals who experience the Impostor Phenomenon tend to be self-doubting and self-rejecting (Cromwell et al. 1990), and thus may present with a negative self-concept.

Limitations

Several methodological limitations exist. The aggregating of participants across years assumes similarity of academic environment and student's experience across those years. Educational gains for women in academia from 1979 to 1988 may have contributed to the variance in GPA. However, this technique allowed for a larger and more statistically stable sample. Second, the participants represent a select sample as they have already been admitted to a university. The restricted range of scores, particularly on the SAT, may have contributed to lower correlations between predictor scores and the criterion. Third, grades may be viewed as only one component of women's academic achievement. Other variables such as quality of interpersonal relationships or the development of autonomy may certainly be considered indicators of achievement. However, grades often affect women's educational and career opportunities through eligibility for grants and scholarships, admittance to graduate programs, and admittance to special educational training programs.

Implications

The results have significant implications for predicting women's academic success and for developing educational interventions. As past research indicates that SAT scores tend to underpredict women's grades, the inclusion of noncognitive variables as predictors provides for a more accurate and complete understanding of women's educational development. The continued overreliance on the SAT to make academic decisions may limit women's educational and career opportunities by decreasing their chances of obtaining financial aid awarded by private companies, government agencies and foundations; restricting their admission to many colleges and universities, and restricting their opportunity to participate in special

education programs reserved for talented high school students (Rosser 1987). Moreover, overreliance on the SAT as a predictor of academic achievement may negatively influence academic advisors' expectations of female students' success and related encouragement toward the pursuit of academic scholarships and potentially valuable professional opportunities.

Both pre- and postadmission interventions are indicated to prepare female students for the challenges they may face in institutions of higher learning, as well as develop educationally facilitative learning environments. For example, as demonstrated community service involvement before college emerged as an important predictor of women's grades, universities may develop linkages with high schools and community agencies to expose students to a range of applied skills and support persons. Support systems may also be established through college mentor programs whereby first-year students receive help and advice from an encouraging individual (Hall and Sandler 1983, Martin and Samels 1993). In order to facilitate female students' realistic self-appraisal in the face of faulty performance feedback, as well as foster competency-related self-estimates, pre/post admissions/counseling efforts (Seidman 1991) may be established.

The creation of environments which foster the personal and academic growth of female students requires further research on valid predictors of educational achievement. This research must attend to the multiplicity of variables which impact students' academic success.

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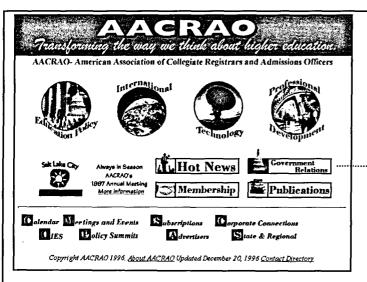
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