

Can Non-Traditional Predictor Variables (Academic Comfort, Study Habits/Attitudes, and Perceptual Modality Preference) Enhance the Discrimination of Academically Successful and Non-Successful Athletes: A Research Proposal

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Abstract

This article emphasizes the importance of broadening the theoretical domain of variables used to predict college athlete's academic success to include salient individual factors (beyond aptitude and achievement measures) as well as institutional factors which may influence college performance. Moreover, the authors urge the adoption of an interactive perspective in developing a suitable model of academic performance in higher education. Also included is the description of a proposed study of the possibility of improving the predictability of the student-athlete's academic success at the University of Houston by comparing the predictive power of traditional academic criteria with the predictive power of a battery of measures that includes both the traditional academic predictors and three non-traditional predictor variables (academic comfort, study habits/attitudes, and preferred perceptual modality).

While Bylaw 5-1-(j) represents a clear commitment on the part of inter-collegiate athletics to improve the probability that student-athletes will possess the minimum standards of achievement and academic preparedness necessary to succeed in college, its implementation does not mitigate the importance of ongoing research designed to enhance the predictability of the student-athlete's retention/attrition in college. In fact, the current controversy over the proposal (particularly the controversy over the relative effectiveness of SAT/ACT cutoff scores as predictive criteria) actually dramatizes the pressing need to improve our overall prediction of college success by identifying additional salient variables that discriminate between those athletes who graduate and those who do not. College student personnel have long been faced with the dilemma posed by the fact that predictive indexes which include only academic indicators (college board scores and high school grades) still leave a large portion (50-75%) of the variance in academic performance unaccounted for. Recent research (Weitzman, 1982; Pascarella & Chapman, 1983; Baird, 1984) has demonstrated that the relative validity of SAT/ACT scores and high school performance in predicting college grades is clearly dependent on a multitude of factors--some statistical variables, some individual social and educational variables, and some institutional variables (related to the relative heterogeneity of the college experience itself). A systematic and collaborative research effort among athletic advisement personnel throughout the country is required if we wish to refine and enrich our understanding of both the scope and the relative importance of the range of factors that appear to influence student-athlete success.

In order to enhance our prediction of college success/non-success for student-athletes, it is imperative that we improve our understanding of both the student characteristics and the institutional characteristics which appear to interact to influence academic performance. Until a comprehensive theoretical model of college academic performance clarifies all the salient variables and the interactive effects of the student-athlete and institutional factors on actual achievement, it is critical to approach the predictive task from both a theoretical and a practical perspective. In addition to appreciating the practical value of developing localized (institution-specific) predictive indexes when using traditional academic predictors, we need to be addressing the following research questions in order to broaden our theoretical understanding of the factors that influence student-athlete success in any given setting:

1. What other variables of personality, attitude, and learning style predict the student-athlete's academic performance in college?
2. What institutional variables (e.g., relative heterogeneity of college curriculum, percentage of students in residence, availability of academic support service, etc.) influence the student-athlete's academic performance in college?

3. What are the interactive effects of individual learner characteristics and institutional characteristics on actual college performance?

These research questions indicate the enormity of the theoretical task that still confronts us before we can significantly improve our predictive potential for discriminating between academically successful and non-successful student-athletes. The University of Houston Athletic Department (Division of Academic Advisement) has currently proposed a research project which will primarily address the first of the research questions posed above. The purpose of the study is to identify a discriminant function by which the probability of long-term academic retention of student-athletes can be predicted at this university. In addition to including the traditional academic predictor variables, we plan to assess whether the inclusion of several non-intellective variables (academic comfort, study habits/attitudes, and preferred perceptual modality) will enhance the discrimination of successful and non-successful athletes. By attempting to assess the relative discriminatory power of the classical academic profile versus an index that includes additional attitude and learning style variables, we hope to accomplish two purposes: 1) to improve the predictive and selective function at this particular institution; and, 2) to contribute to the growing body of theoretical research designed to identify additional individual difference variables that influence a student-athlete's achievement in any college setting. Our current study does not endeavor to address all of the vital research questions posed above; we encourage our colleagues to design related studies which address each of these questions. Only through such a collaborative effort can we hope to enhance our theoretical understanding of the critical interaction between student and institutional variables that affect academic success.

Review of Related Research

The relation between classic academic predictor variables and college grades is well-documented; the correlations between SAT/ACT scores and college performance consistently average about .50 (Cattell, 1968) while high school grade-point (or class rank) manifests an even stronger correlation (mean .65) with college grades (Cattell, 1986). Many theoreticians suggest that high school grades emerge as the best single predictor of college achievement because these data reflect a variety of personality and social factors in addition to aptitude (Forehand & McQuitty, 1959; Lavin, 1965). Furthermore, the wide variability in the size of correlations (.20-.70) between both verbal and math aptitude scores and actual college performance in different settings appears to demonstrate that the predictive validity of college aptitude scores is influenced

by both individual and institutional (college) characteristics (Baird, 1984). Overall, the research suggests that the classic academic profile still leaves a large portion of the variance in college performance unaccounted for.

Before 1975, the lack of a comprehensive theoretical model of academic behavior in higher education and the absence of non-intellective variables in predictive batteries probably limited the ability of earlier studies to identify additional salient factors that would enhance the predictive function (Tinto, 1975; Blustein et al, 1986). Furthermore, the failure to acknowledge the probable interaction effect of certain personality, sociological, and institutional factors may have seriously hampered the generalizability of many studies which attempted to measure single-variable associations (Lavin, 1965; Baird, 1984). When the first theoretical model of college academic behavior (Tinto, 1975) was empirically tested, the studies demonstrated that college retention was, as Tinto predicted, a function of a student's "academic and social integration" into the institution; moreover, the effects of the individual's academic and social integration clearly varied as a function of institutional characteristics, but not as a function of student age (Pascarella & Terrenzini, 1980; Pascarella & Chapman, 1983). In addition to highlighting the importance of enriching our theoretical understanding of relevant predictor variables, the research being conducted to test this model has suggested the importance of developing predictive batteries which measure a broader scope of salient variables for given student in various given settings.

Tinto's academic integration component suggests the importance of including measures of individual difference beyond aptitude variables; specifically, he recommends including measures of study habits/attitudes, learning style preferences, and motivational factors in indexes which endeavor to predict college success. Few studies have attempted to test Tinto's construct of academic integration by utilizing predictive batteries that combine classic academic predictors with measures of attitudinal and/or cognitive style variables, although the literature does suggest that a relation exists between some of these variables and school performance. Research has demonstrated a clear association between study habits/attitudes and college achievement (Brown & Holtzman, 1967; Kirschenbaum & Perri, 1982; Blustein et al, 1986). Another related attitudinal factor that reflects school attitudes (and possibly educational aspirations) is one defined by Campbell & Hansen (1981) as "academic comfort"; as measured on the Strong Vocational Interest Inventory, this subscale score has successfully discriminated between students who pursue graduate study, students who finish college, students who drop out of college, students who never attend college, etc. (Cambell & Hansen, 1981). Of the twenty dimensions of cognitive style identified in a review of related research by Messick (1976), Keefe (1979) has concluded that perceptual modality preference for learning new information is one of four cognitive style dimensions which shows genuine

potential for improving our understanding of the learning process. Canfield (1977) has demonstrated that four distinct sensory receptive channel preferences continue to persist in college-age student: these are cognitive preferences for learning by listening, by reading, by visual imagery, or by direct experience. Significant reading deficits have been observed in children with one dominant (non-verbal) receptive channel preference, especially when that dominant preference is for tactual/kinesthetic learning (Domino, 1970; Dunn and Dunn, 1978; Nieman & Smith, 1978; Carbo, 1980; Weinberg, 1983). While the reliability and validity of many of the growing number of cognitive style diagnostic tests is still open to question, the existing literature suggests that an individual's preferred receptive channel for processing information, especially when that preference is extreme or when the preference for kinesthetic learning is strong, may impact upon achievement and school attitudes if learning conditions represent an unusually poor "match". In light of the restrictive instructional methodology of most college classrooms (primarily verbal and auditory activities), Canfield (1977) suggests that receptive channel preferences may help to discriminate between students who achieve Tinto's academic integration and those who do not. Since the experience of personnel who comprise the academic support services at the University of Houston has led them to suspect that student-athletes enrolled in that program have a disproportionate preference for non-verbal learning, this cognitive style variable may have interesting implications both for predicting the probability of academic success and for selecting the diagnostic/prescriptive interventions of learning support service personnel.

In light of research reviewed here, it appears that one useful approach to enhancing the predictive potential for distinguishing college success/attrition for student-athletes at this institution (and possibly at others as well) would be to assess the relative discriminatory power of the traditional academic predictor variables compared to the discriminatory power of a predictive battery that includes measures of study habits/attitudes, academic comfort, and perceptual modality preference. The theoretical rationale for the study (improving predictive potential) has practical ramifications for the recruitment of prospective student-athletes as well. In addition to providing an empirical and realistic assessment of probable academic risk (and likelihood of graduation) among entering student-athletes, the results of this study impact upon the cost-effectiveness of recruitment decisions, the rate of attrition of student-athletes, and the nature and scope of learning support services required to address the preventive and remedial needs of student-athletes.

Hypotheses for the Proposed Study

We predict that all four traditional academic predictor variables (verbal aptitude, math aptitude, high school rank, and high school curriculum) will discriminate between academically successful and non-successful athletes. Furthermore, we postulate that the discrimination function can be enhanced by the addition of three non-traditional predictor variables. Specifically, we expect that more positive school attitudes and greater knowledge of study habits will effectively discriminate between academic success and attrition. In addition, we anticipate that greater academic comfort, as well as a mixed preference for perceptual processing of new information, will increase the likelihood of academic success in college; a single, non-verbal dominant perceptual preference (especially if the dominant preference is for tactual/kinesthetic learning) is anticipated to decrease the probability of college success.

Methodology in the Proposed Study

For the purpose of establishing a discriminant function based upon traditional academic predictors, the following data will be gathered for a three-year sample of student-athletes (excluding transfers and foreign students) who entered the University of Houston between August, 1984 and August, 1986 (N = 187):

1. SAT verbal and/or English score, (a statistical adjustment will be made for use of separate scores.)
2. SAT math and/or ACT math score, (a statistical adjustment will be made for the use of separate scores.)
3. High school rank (expressed in quartiles.)
4. High school curriculum designation (criteria will categorize the preparation as maximum college-prep, minimum college-prep, or general.)

For the purpose of determining the enhanced discriminant function using the additional variables (study habits, preferred perceptual modality, and academic comfort), only freshmen entering August, 1987 (and thereafter) will be studied; the rationale for this is that the additional variables can be measured prior to subjects beginning their first semester at the university. In this phase of

the investigation, academic comfort will be measured by the subscale of the same name on the SVII (Campbell & Hansen, 1981). Study habits and attitudes will be measured by the overall "study orientation" score on the Brown-Holtzman Survey of Study Habits and Attitudes, Form C, college level (Brown-Holtzman, 1967). The subjects' preferential or customary mode of processing auditory stimuli on the Edmonds Learning Style Exercise will be postulated to measure the subjects' preferred perceptual channel for internalizing new information regardless of the source or nature of the stimulus; scores falling within the bands of +3, +4, -3, and -4 on the stanine chart will be interpreted as strong or weak preferences for visual, verbal, auditory, or tactual/kinesthetic learning.

The procedure for administering the instruments used to measure the non-traditional predictor variables in the second sub-sample will be rigidly standardized to minimize possible contamination from extraneous factors that could systematically influence results (time, conditions of administration, and exposure to learning support service interventions). An internal reliability index will be calculated for each instrument used.

Data analysis will consist of a series of discriminant function analyses to determine:

1. Whether the student-athletes designed as successful (earning a G.P.A. greater than or equal to 1.7 after 3 semesters and 1.9 after five semesters) can be distinguished from those who were unsuccessful based upon their scholastic aptitude scores, high school rank, and high school curriculum.
2. Whether those athletes designated as successful (after three and five semesters, using the same criteria) can be distinguished from those who were unsuccessful based upon the three academic predictor variables in combination with the non-traditional variables of study orientation, academic comfort, and perceptual modality preference.
3. The relative weight of the discriminant potential provided by each of the seven measured.

Univariate F ratios, Wilks' lambda, and discriminant weights will be obtained for each variable. A chi square and Wilks' lambda will be computed to determine the significance level of the function.

Conclusion

In addition to the possibility of improving our predictive potential to discriminate between academically successful and non-successful student-athletes at the University of Houston, we hope that our study will also make a theoretical contribution by suggesting additional individual predictor variables which may account for some of the variance in college performance. Even if some of these non-traditional predictors do demonstrate a significant capacity to distinguish college success/attrition on our campus, the ability to generalize the findings to student-athletes at other institutions will be severely limited; other individual difference factors unique to our student-athlete population as well as unidentified institutional characteristics (that probably influence academic performance) will be contributing to the outcome. This caution serves to remind us of the critical importance of conducting prediction research that is both situation-specific and theoretically relevant. In the long run, we can only hope to improve our predictive potential to the extent that we can identify all of the individual and institutional characteristics which impact upon the student-athletes's college success and integrate these into a theoretical model that acknowledges the interactive effects of both individual learner variables and learning environment factors. In order to achieve this theoretical integration, a systematic and collaborative effort on the part of athletic advisors across the country is imperative.

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