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AUTHOR Pedrini, Bonnie C.; Pedrini, D. T.
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ABSTRACT

The study investigated the prediction of grade point average (GPA) for disadvantaged and regular freshmen at the University of Nebraska at Omaha, and the effectiveness, in terms of GPA, of an experimental program for disadvantaged students. Descriptive, variance, and correlational (single and multiple) analyses and chi square analyses related several factors (e.g., race, sex, financial aid, employment, ACT Composite scores, attrition/persistence) with GPA. Separate regression equations for various groups and subgroups resulted in greater precision. Singly or multiply, attrition/persistence and general achievement/aptitude (ACT Composite scores, corrected for restricted range when appropriate) were significant predictors of GPA for disadvantaged and regular freshmen. Additional predictors appeared unnecessary. In terms of GPA, the experimental program produced better results than the regular (control) program (however, this appeared to be an artifact of experimental courses elevating GPAs). For the ACT freshman population and for nonexperimental freshmen, GPA was significantly delineated by attrition/persistence, general achievement/aptitude, race, and sex. For experimental freshmen, GPA was significantly delineated only by attrition/persistence and general achievement/aptitude. (Author/RC)

Predicting Grades of College Freshmen: Disadvantaged and Regular

Bonnie C. Pedrini and D. T. Pedrini

University of Nebraska at Omaha

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Predicting Grades of College Freshmen:

Disadvantaged and Regular

Abstract

Investigated (a) the prediction of grade point average (GPA) for disadvantaged and regular freshmen at the University of Nebraska at Omaha, and (b) the effectiveness, in terms of GPA, of an experimental program for disadvantaged students. Descriptive, variance, and correlational (single and multiple) analyses (maximum $n = 143$) and chi square analyses (maximum $n = 1,156$) related several factors (e.g., race, sex, financial aid, employment, ACT Composite scores, attrition/persistence) with GPA. Separate regression equations for various groups and subgroups result in greater precision. Singly or multiply, attrition/persistence and general achievement/aptitude (ACT Composite scores, corrected for restricted range when appropriate) are significant predictors of GPA for disadvantaged and regular freshmen. Additional predictors appear unnecessary. In terms of GPA, the experimental program produces better results than the regular (control) program (however, this appears to be an artifact of experimental courses elevating GPAs). For the ACT freshman population and for nonexperimental freshmen, GPA is significantly delineated by attrition/persistence, general achievement/aptitude, race, and sex. For experimental freshmen, GPA is significantly delineated only by attrition/persistence and general achievement/aptitude.

Predicting Grades of College Freshmen: Disadvantaged and Regular

The prediction of college grades from traditional measures is affected by several factors (Pedrini & Pedrini, 1970, 1972a, 1972b, 1973a, 1973b, 1974). Standardized tests have been acknowledged as favorable to middle class persons. Disadvantaged (i.e., poor) and/or minority persons tend to obtain scores significantly below the mean score of the standardization population. Despite these differentials, standardized tests generally are able to measure student ability to perform in traditional colleges when no special treatment is involved. However, the accuracy of test prediction seems to be enhanced when race and sex are considered. Socioeconomic status, financial assistance, and employment, taken independently are not as potent as race or sex in affecting the predictive validity of achievement/aptitude test scores, but the research does warrant considering these factors in various combinations. Special programs, often remedial in nature, vary the prediction of achievement based on test scores. Perhaps separate regression equations developed for participants in each special program are in order.

An experimental program at the University of Nebraska at Omaha (UNO), designed for disadvantaged students, differed significantly from most other special programs because it primarily assumed the competence of students admitted and secondarily, only, considered remediation. Provided were free tuition, some special humanities and social studies courses, and extensive counseling. The program, limited in the number of students it could accommodate, had to be selective. The screening procedure, which included

reviewing standardized test scores, was intended to select persons with the greatest potential.

This investigation evaluated (a) ACT Composite scores and other factors in the prediction of cumulative grade point average (GPA) for disadvantaged and regular freshmen, and (b) the experimental program for disadvantaged students in terms of GPA.

Method

Subjects

The population for this investigation included full-time, fall, beginning UNO freshmen of the 1972-73 academic year who had taken the ACT (n = 1,214). Students who did not receive grades (n = 58) were excluded from the analyses. The resultant large sample contained 1,156 students.

Delineated were two research samples, experimental and control, selected from the population. The experimental group consisted entirely of disadvantaged students enrolled in the UNO experimental program. There were 76 such students identified in the population. However, one student was excluded because his registration data were not available. Thus, 75 experimental subjects were categorized for race and sex yielding 16 Black men, 19 Black women, 18 White men, and 22 White women. The control group, equated in number for race and sex with the experimental group, was a random sample of regular students drawn from the stratified population. Students who did not receive grades (two in the experimental group and five in the control group) were excluded and the resultant total for experimental and control students was 143.

However, the experimental and control groups were not representative of the UNO ACT freshman population. The experimental and control groups were 47% Black and 53% White, 45% men and 55% women. Comparable figures for the UNO ACT freshman population (including the experimental and control students) were 11% Black and 89% White, 57% men and 43% women. Interestingly, most subjects in the UNO ACT freshman population responded to the denotation of sex on registration forms, but only about three fifths responded to the denotation of race.

Materials

The basic materials used in this investigation were the American College Test (ACT) and the cumulative freshman grade point average (GPA, or grades). Specifically, the ACT Composite standard score and the cumulative freshman GPA for the fall and spring semesters were considered for each student.

Procedure

Various subsets were considered for descriptive, variance, correlational, and chi square analyses. For the descriptive, variance, and correlational analyses, the subsets referred to subjects within and between the experimental and control groups (maximum $n = 143$). For chi square analyses, the subsets referred to the UNO ACT freshman population (maximum $n = 1,156$).

In addition to race (Black; White) and sex (men; women), subsets were identified by financial aid (recipients; nonrecipients), general achievement/aptitude (subjects with below average ACT Composite scores, i.e., standard scores more than one standard deviation below the mean, based on college

bound seniors, ACT Program, 1972, p. 2; subjects with average or above average ACT Composite scores, i.e., standard scores within or above one standard deviation, based on college bound seniors, ACT Program, 1972, p. 2), college attrition/persistence (dropouts, i.e., subjects who were not continuously enrolled for the fall and spring semesters of the academic year and/or did not re-enroll for the fall semester of the following academic year; persisters, i.e., subjects who were continuously enrolled for the fall and spring semesters of the academic year and re-enrolled for the fall semester of the following academic year), race and sex (Black men; Black women; White men; White women).

For variance and chi square analyses, subjects were additionally subgrouped by instruction of financial aid recipients (special; regular), control group financial aid (assistance received; assistance not received), programs (special instruction and financial aid received; regular instruction and no financial aid received).

For correlational analyses, the experimental group, only, was subgrouped by employment, hours per week (0; 1-10; 11-20; 21-30; 31+). Employment information was not available for control subjects.

Results and Discussion

In this investigation, control group subjects, equated in number with the experimental group, were randomly chosen from a population stratified for race and sex. This procedure was used to prevent selection biases and to insure comparability between the groups. Descriptive and variance analyses were computed to test if this procedure had been successful in fulfilling its purpose.

The analyses (data not shown) revealed that the experimental and control groups manifested similar ACT patterns. That is, Blacks had consistently significantly lower scores than Whites, and their scores were restricted in range. Persons with below average grades (less than 2.0 on a 4.0 scale) had much lower ACT scores than persons with average or above average grades (equal to or greater than 2.0 on a 4.0 scale). There were no marked ACT differences between financial aid recipients and nonrecipients, between men and women, or between dropouts and persisters. Thus, experimental and control subjects were considered comparable in terms of ability to do college work. Consequently, any GPA differences occurring between the experimental and control groups could not be attributed to differences of scholastic potential.

Prediction of Grades

Single predictors. Firstly, various product moment correlations were computed (data not shown) to determine effective predictors of grades (GPAs) for the experimental group, control group, and subsets within and between these groups. Grades (G), as the dependent variable, were correlated separately with each of the following independent variables: group (U), general achievement/aptitude (T), race (R), sex (S), financial aid (F), attrition/persistence (A), and employment (E). Since the variability of Blacks' ACT scores was restricted, the T x G correlations for Blacks (men and/or women) were corrected (Wells & Fruchter, 1970; Tritchler & Pedrini, 1975).

The correlational trends implied that higher grades were very closely associated with staying in school; higher grades were closely associated with higher ACT scores; higher grades were associated with being White.

These statements could be stated conversely. Variable results were noted with regard to grades and sex. Interestingly, ACT scores (corrected for restricted range) were significant predictors of grades for experimental, but not control, Black students.

Multiple predictors, attrition/persistence excluded. Secondly, stepwise multiple correlations were computed to determine the best predictors, excluding attrition/persistence, of cumulative GPA for the experimental group, control group, and subsets within and between these groups. Multiple correlations were based on the corrected correlations (for restricted range) when appropriate. Corrections for multiple correlations (resulting in cRs) and for standard errors (resulting in cSEs) were required because of the relatively large number of predictor variables employed with small samples (Guilford & Fruchter, 1973, pp. 366-367). The variables and sample sizes; significant multiple correlations, uncorrected and corrected; multiple regression equations; standard errors of multiple estimates, uncorrected and corrected; and stepwise correlations are listed in Table 1. (Insignificant multiple correlations are not presented in this paper.)

Insert Table 1 about here

Confounded variables U (group: experimental, control) and F (financial aid: assistance received, assistance not received) were not considered in the same regression equations. Hours of employment (E) pertained only to experimental subjects. Thus, only multiple predictors which considered experimental students exclusively included variable E.

The separate multiple correlations were not necessarily independent of each other. But in cumulating the results, trends were important.

T (ACT scores) was the first variable in 18 of 19 significant corrected multiple correlations. In each of the 18 multiple predictors there appeared to be no significant difference between ACT as a single predictor and ACT as part of a multiple predictor of grades. For example, in the first row of Table 1, the correlation between T and G (grades) was .45 and accounted for approximately 20% of the grade variance; the corrected multiple correlation for grades was .45 and accounted for approximately 20% of the grade variance. ACT Composite scores were the prime predictors of grades. And, generally, ACT scores alone were adequate for the significant prediction of grades.

One of the 19 significant multiple predictors could not consider T as a predictor variable because the subjects were identified according to their ACT scores (see row 12, Table 1). In this multiple correlation, group (U) was the first variable contributing to the coefficient. In other words, for subjects identified as having average or above average ACT scores, group accounted for the plurality of the grade variance. However, the correlation for these subjects was appreciably enhanced by the addition of race (R).

Other trends for subjects were noted. The grades of experimental subjects, Whites, women, and students with higher ACT scores were more predictable than the grades of control subjects, Blacks, men, and students with lower ACT scores, respectively. In other words, multiple predictions of grades for the former were higher than for the latter. Restricted ranges were not implicated.

Only one of the corrected multiple correlations was significant for

Blacks. Surprisingly, for experimental Blacks, there was no significant multiple predictor of grades, but ACT scores as a single predictor had been significant (as mentioned previously). For control Blacks, there were no significant single (when attrition/persistence was excluded) or multiple correlations between grades and other variables. None of the corrected multiple correlations were significant for students with below average ACT scores. There was little difference in the predictability of grades for financial aid recipients and nonrecipients.

Generally, in terms of subjects, going from a single category to a double category to a triple category did not necessarily increase the multiple correlations of grades. But, specifically, it did increase the corrected multiple correlations for experimental subjects, Whites, and women. In other words, the significant multiple predictions rose in going from a single category (experimental subjects, or Whites, or women) to a dyadic category (experimental Whites, or experimental women, or White women) to the triadic category (experimental White women).

In predicting grades, the corrected multiple correlations for all subjects (top two rows of Table 1) were .45 and the range of significant correlations was from .34 to .71. Thus, it was apparent that considering various sets and subsets was more efficacious than arbitrarily considering all subjects together.

To test the efficiency of the regression equations with large samples, actual grades (GPAs) were compared with predicted grades (developed from the regression equations) for all subjects and for financial aid recipients. Arbitrarily using a predicted cumulative GPA of 2.00 as the cutoff point

(i.e., scores below 2.00 were designated as below average grades, scores equal to or above 2.00 were designated as average or above average grades), predictions for all subjects were accurate approximately 69% of the time (using either multiple regression equation, top two rows, Table 1). That is, overall accuracy of predicted GPAs was about 69%. However, predicted average/above average GPAs were accurate for about 73% or 78% of the subjects depending on the equation used, F included or U included, respectively. Analogously, predicted below average GPAs were accurate for about 63% (with F) or 51% (with U). Comparable figures for financial aid recipients (overall accuracy, accuracy for average/above average grades, accuracy for below average grades) were 72%, 76%, and 63%.

It should be noted that cutoff points can be arbitrarily chosen to maximize predictive efficiency--for overall grades, for lower grades, or for higher grades. But a cumulative GPA of 2.00 is necessary for graduation. Consequently, students with cumulative GPAs of 2.00 or better might be considered potential graduates and students with cumulative GPAs less than 2.00 might be considered potential non-graduates.

Multiple predictors, attrition/persistence included. Thirdly, stepwise multiple correlations were computed to determine the best predictors, including attrition/persistence, of cumulative GPA for the experimental group, control group, and subsets within and between these groups (data not shown). That is, the previous procedures were duplicated with attrition/persistence as an additional predictor variable. The separate multiple correlations were not necessarily independent of each other. But, as before, trends were important in cumulated results.

A (attrition/persistence) was the first or second variable in 32 or 8 of the 40 significant corrected multiple correlations, respectively. That is, in each of the significant multiple predictors (data not shown) attrition/persistence was the primary or secondary predictor of grades.

Analogously, T (ACT scores) was the second or first variable in 20 or 8 of the 34 significant corrected multiple correlations, respectively. Six of the 40 significant multiple predictors could not consider T as a predictor variable because subjects were identified according to their ACT scores. Thus, in 28 of 34 significant multiple predictors, ACT scores were the secondary or primary predictors of grades.

Generally, although A accounted for the plurality of grade variance, correlations were appreciably enhanced by the addition of T. Similarly, when T was the first variable, A was always the second variable and added appreciably to the correlation. And for most of the significant multiple predictors (where A and T were available, 28 out of 34), A + T or T + A accounted for the majority of grade variance making additional predictor variables appear unnecessary. That is, typically attrition/persistence and ACT scores, together, were adequate for the significant prediction of grades.

Other trends were noted for subjects. When attrition/persistence was a predictor, the grades of experimental subjects, financial aid recipients, women, and persons with below average ACT scores were more predictable than their counterparts. Restricted ranges were not implicated. For subjects, going from a single category to a double category to a triple category did not necessarily increase the multiple correlations of grades.

In predicting grades, the corrected multiple correlations for all

subjects (two equations) were .65 and the range of significant correlations was from .44 to .85. Thus, considering students according to various sets and subsets proved more efficacious than considering all subjects together.

The efficiency of the regression equations was tested with larger samples. For all subjects and for financial aid recipients, actual GPAs were compared with predicted GPAs (developed from the regression equations). As before, a predicted GPA of 2.00 was the arbitrary cutoff point. And since F and U were confounded (discussed previously), two regression equations (one which included F, financial aid, as a variable; one which included U, group, as a variable) had to be computed for all subjects (n = 143); GPA = - .31 + .97A + .05T - .17F + .12R + .02S, cR = .65, cSE = .72; GPA = - .25 + .97A + .05T - .16U + .11R + .03S, cR = .65, cSE = .72. Using either equation, predicted GPAs were accurate for about 72%. Alternatively, predicted average/above average GPAs were accurate for about 77%. However, predicted below average GPAs were accurate for about 65% or 59% of the subjects depending on the equation used, F included or U included, respectively. For financial aid recipients (n = 96, GPA = - .78 + 1.19A + .06T + .10R - .05S, cR = .70, cSE = .71), comparable figures (overall accuracy, accuracy for average/above average grades, accuracy for below average grades) were 72%, 79%, and 55%.

Summary. For the single prediction of grades, attrition/persistence (r = .53, n = 143, p < .01) or ACT scores (r = .45, n = 143, p < .01) were adequate. Race was related to grades, but less notably.

For the multiple prediction of grades excluding attrition/persistence as a variable, ACT scores accounted for the plurality of grade variance.

Furthermore, grades were predicted well for the majority of groups and subgroups using ACT scores alone. That is, developing multiple predictors often did not appear necessary. The grades of experimental subjects, Whites, or women were more predictable than for their contrasts. For experimental subjects, Whites, or women, multiple predictions increased going from a single category (of group or race or sex), to a dyadic category, to the triadic category. The grades of subjects with below average ACT scores could not be predicted better than chance. Predicting the grades of Blacks was problematic at best. Developing separate regression equations for groups and subgroups produced varied and more precise results (range of c$\underline{R}$s from .34 to .71). The overall accuracy of the regression equations for the prediction of grades of persons in large samples (c$\underline{R}$ = .45, $\underline{n}$ = 143) was about 69% (using a predicted cumulative GPA of 2.00 as the cutoff point).

For the multiple prediction of grades including attrition/persistence as a variable, attrition/persistence typically accounted for the plurality of grade variance. Furthermore, grades were predicted well for the majority of groups and subgroups using attrition/persistence and ACT scores. That is, additional predictor variables often appeared unnecessary. The grades of experimental subjects, financial aid recipients, women, and persons with below average ACT scores were more predictable than for their contrasts. Although multiple predictions did not necessarily increase when subjects were differentially subgrouped, the results were varied and more precise (range of c$\underline{R}$s from .44 to .85). The overall accuracy of the regression equations for the prediction of grades with large samples (c$\underline{R}$ = .65, $\underline{n}$ = 143) was about 72% (again using a predicted cumulative GPA of 2.00 as the cutoff point).

Evaluation of Experimental Program

Descriptive data. Firstly, descriptive data were collated in order to compare and contrast the academic performance of the experimental and control groups and the subsets within and between these groups. Specifically, the means and standard deviations of cumulative GPAs were determined. For experimental subjects, cumulative GPAs were also distinguished by the kinds of courses taken. That is, experimental students took regular courses and special, experimental program courses. Consequently, the grades of experimental students were considered in three ways: total GPA (which combined regular and special course grades); experimental GPA (which considered only special course grades); regular GPA (which considered only regular course grades). Twelve experimental subjects took the special, experimental program courses on a credit/no credit basis. Consequently, these students had grades only in regular courses.

The cumulative GPA descriptive data (not shown) revealed that experimental subjects did consistently better academically than their control counterparts, especially students with average or above average ACT scores, White men, Black women, and Blacks. However, special program courses tended to elevate experimental student GPAs (total GPA $\underline{M}$ = 2.3194, experimental GPA $\underline{M}$ = 2.8730, regular GPA $\underline{M}$ = 2.0996). Consequently, the GPA differences between the groups may have been an artifact related to special program courses since there was little difference between regular GPAs (experimental student regular GPA $\underline{M}$ = 2.0996, control student regular or total GPA $\underline{M}$ = 2.0559). Between and within the experimental and the control groups, other GPA trends were noted: (a) dropouts had extremely lower mean cumulative

GPAs than persisters, (b) persons with below average ACT scores and Blacks (men and/or women) had consistently lower mean cumulative GPAs than persons with average or above average ACT scores and Whites (men and/or women), respectively, and (c) the mean cumulative GPAs of financial aid recipients and nonrecipients, and of men and women were not very different.

Analyses of variance. Secondly, analyses of variance were computed to determine if the groups and subgroups of students were significantly different in terms of academic performance and to identify factors which could discriminate between high and low performing students. Each analysis used a four (2x2x2x2) or five (2x2x2x2x2) factor, unweighted means solution. Four-factor analyses of variance had to be used in some instances to avoid an excessive number of blank cells. In any analysis of variance, there were no more than two blank cells and these did not appear in the same array column or row. Winer's (1971, pp. 487-490) formula to estimate missing data was used to fill blank array cells.

For any of the analyses of variance, if there were significant main effects the interpretations were straight forward (as each factor had only two levels). If there were significant interactions, further tests of simple effects were computed using Kirk's (1968, pp. 179-182) technique to determine critical values.

Grades, as array inserts, were denoted with a one or a two indicating that a student's GPA was below average (less than 2.0 on a 4.0 scale) or average/above average (equal to or greater than 2.0 on a 4.0 scale), respectively. Actual student GPAs could not be inserted in the arrays since the distribution of GPAs did not meet the assumptions of the analysis of variance,

i.e., the departure from normality and symmetry were extreme (Norton, cited by Lindquist, 1953, pp. 78-86). Analyses I-VII (summarized in Table 2) considered various factors--R (race: Black, White), S (sex: men, women), G (group: experimental, control), I (instruction of financial aid recipients: special, regular), C (control group financial aid: assistance received, assistance not received), P (programs: special instruction and financial aid received, regular instruction and no financial aid received), A (attrition/persistence: dropouts, persisters), T (general achievement/aptitude: below average, average or above average).

Insert Table 2 about here

Grades were differentiated by group (G) and by programs (P). That is, experimental subjects tended to receive significantly higher grades than control subjects, Analysis I, F (1, 111) = 7.89, $p < .01$; and special instruction financial aid recipients (experimental) tended to receive significantly higher grades than regular instruction nonfinancial aid recipients, Analysis VI, F (1, 104) = 6.82, $p < .05$. In this section (analyses of variance), these statements and others could be stated conversely. However, special courses tended to elevate the GPAs of experimental subjects. Furthermore, experimental subjects did not receive significantly higher grades than regular instruction financial aid recipients. That is, when financial aid was controlled (in Analyses II and III), grades were not differentiated by instruction (I). Thus, one might assume a tendency for grades to be differentiated by financial aid rather than by instruction. But this relationship

was not clear either, especially since factor C did not distinguish between students with higher grades or lower grades. That is, when instruction was controlled (in Analyses IV and V), grades were not differentiated by financial aid.

Attrition/persistence delineated grades in every analysis of variance which included A. Persisters tended to get significantly higher grades than dropouts, Analysis I, F (1,111) = 16.38, $p < .01$; Analysis III, F (1, 80) = 16.82, $p < .01$; Analysis V, F (1, 54) = 10.18, $p < .01$; Analysis VII, F (1, 104) = 22.92, $p < .01$. This was especially true for men, Analysis III, A at S_1, F (1, 80) = 19.64, $p < .01$, and for control men financial aid recipients, Analysis V, A at C_1S_1, F (1, 54) = 12.77, $p < .003$.

Factor T, general achievement/aptitude, discriminated between students with below average grades and students with average or above average grades. In other words, students with higher ACT scores tended to get higher grades and students with lower ACT scores tended to get lower grades, Analysis II, F (1,80) = 5.33, $p < .05$; Analysis VI, F (1, 104) = 4.40, $p < .05$. This relationship was significant for women in one analysis (I). Women with lower ACT scores tended to get significantly lower grades than women with higher ACT scores, T at S_2, F (1,111) = 7.91, $p < .01$. Analyses of the IRST and RST interactions (Analysis II and IV, respectively) revealed no significant simple effects according to the criteria ($p < .001$ and $p < .003$, respectively) denoted by Kirk (1968, p. 181).

Generally, neither race nor sex differentiated grades. R as a significant overall main effect occurred once in seven analyses--Whites had significantly higher grades than Blacks, Analysis VII, F (1, 104) = 6.26,

$p < .05$. And R as a simple effect in two interactions did not reach significance. Thus, the relationship between race and grades could not be considered viable. S did not occur as a significant main effect nor was S significant as a simple effect in five interactions. It should be understood that the significances or nonsignificances were due, in part, to codifications and sample sizes.

Summary. The grades of experimental and control students were significantly different, in favor of the former. However, experimental subject GPAs appeared to be elevated by special courses. Attrition/persistence and general achievement/aptitude were potent distinguishers of grades--dropouts and persons with lower ACT scores had significantly lower grades than persisters and persons with higher ACT scores. Blacks had consistently lower grades than Whites, but generally the differences were not significant. Grades were not differentiated by instruction, financial aid, or sex.

Population Analysis

Chi squares. Proportional differences (2 by 2, fourfold contingency tables) were computed to determine if significant relationships existed between grades and other variables for the UNO ACT freshman population and for subsets (experimental subjects, nonexperimental subjects) within the population. Grades (G'), as the dependent variable, were contrasted with each of the following independent variables: U' (group: experimental, nonexperimental), I' (instruction of financial aid recipients: special, regular), P' (programs: special instruction and financial aid received, regular instruction and no financial aid received), F' (financial aid: assistance received, assistance not received), R' (race: Black, White), S' (sex: men,

women), T' (general achievement/aptitude: below average, average/above average), A' (attrition/persistence: dropouts, persisters). Significances, determined by two-tailed tests, are summarized in Table 3.

Insert Table 3 about here

Approximately three fifths (n = 699) of the UNO ACT freshman population denoted race on registration forms. For this select sample, Whites tended to get average/above average grades but Blacks tended to be evenly divided between below average grades and average/above average grades. For nonexperimental subjects, Whites tended to receive higher grades and Blacks tended to receive lower grades. More important was the lack of significant relationship between race and grades for experimental subjects. In this instance, experimental subjects, both Blacks and Whites, tended to receive average/above average grades (without significant proportional differences, for an n of 73). But, as previously mentioned, the GPAs of experimental subjects included special course grades which tended to be higher than regular course grades.

Considering the relationship between sex and grades, for the population and for nonexperimental freshmen the proportion of women receiving average/above average grades was significantly greater than the proportion of men receiving average/above average grades. Whereas, for experimental students, the proportional relationships for men and women tended to be the same, that is, both sexes tended to be overrepresented by higher grades and to the same extent. As stated previously, special program courses tended to increase

experimental student GPAs.

In instances involving general achievement/aptitude and grades, persons with average or above average ACT scores tended to get average or above average grades. The relationships for persons with below avera ACT scores were not as clear cut. Population and nonexperimental subjects with lower ACT scores tended to be overrepresented with lower grades, whereas, experimental subjects tended to be evenly divided between lower grades and higher grades. Thus, for students engaged in the UNO special program, below average ACT scores were not necessarily related to below average grades. Again, remember, experimental GPAs appeared elevated by special course grades.

In every instance involving attrition/persistence and grades, persisters were overrepresented with average/above average grades. Interestingly, for the population and for nonexperimental subjects, dropouts were evenly divided between below average and average/above average grades. But, experimental dropouts were overrepresented with below average grades.

Summary. Racial differences with regard to grades (Blacks lower) appeared for freshmen and nonexperimental freshmen but not for the experimental freshmen. That is, the experimental treatment (including higher special course grades) seemed to neutralize the relationship between race and grades. Sex differences with regard to grades (men lower) appeared for freshmen and nonexperimental freshmen but not for the experimental freshmen. That is, the experimental treatment (including higher special course grades) seemed to neutralize the relationship between sex and grades. Generally, ACT scores were closely related to grades--persons with higher test scores had a greater proportion of average and above average grades than persons with

lower test scores; and conversely, persons with lower test scores had a greater proportion of below average grades than persons with higher test scores. The latter relationship was negated for experimental subjects. Attrition/persistence differences with regard to grades appeared for the population and subsets within the population. Persisters consistently had a greater proportion of higher grades than lower grades. But, the relationship between lower grades and dropping out was pertinent, only, for experimental subjects.

Major Findings

1. In the prediction of cumulative grade point average (GPA) for experimental (disadvantaged) and control (regular) freshmen, attrition/persistence was the primary, significant, single predictor.

2. In the prediction of GPA for disadvantaged and regular freshmen, general achievement/aptitude (ACT Composite scores, corrected for restricted range when appropriate) was the secondary, significant, single predictor.

3. In the prediction of GPA for disadvantaged and regular freshmen, race was the tertiary, significant, single predictor.

4. In the prediction of GPA for disadvantaged and regular freshmen, attrition/persistence and general achievement/aptitude (ACT Composite scores, corrected for restricted range when appropriate) were the significant multiple predictors and made additional predictors, for example, race, appear unnecessary.

5. Developing separate correlations and regression equations for the experimental and control groups and subsets within and between these groups was efficacious. That is, taking into account the heterogeneity of the data

(rather than assuming homogeneity when it was unwarranted) produced significantly higher or lower correlations and therefore greater precision.

6. In terms of freshman GPA, the experimental students did better as a group than the control students. However, this appeared to be an artifact of experimental courses elevating GPAs. There was no significant GPA difference between the groups for regular courses.

7. For the ACT freshman population and for subgroups within this population (experimental freshmen, nonexperimental freshmen), GPA was significantly delineated (proportion and mean differences) by attrition/persistence and by general achievement/aptitude.

8. For the ACT freshman population and for the nonexperimental freshmen (but not for the experimental freshmen), GPA was significantly delineated (proportion differences) by race and by sex.

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Table 1

Multiple Predictions (Excluding Attrition/Persistence) with Grades as Criterion

Subjects	n	R	SE	Regression Equation[a]	Correlation w/ Add. Variables[b] r	Rw/2	Rw/3	Rw/4	cR	cSE
All	143	.47**	.83	1.36 + .07T - .26F + .03S + .03R	.45	.47	.47	.47	.45**	.84
All	143	.47**	.83	1.54 + .06T - .28U + .05S + .02R	.45	.47	.47	.47	.45**	.85
Exp.	73	.55**	.81	1.21 + .10T - .39R + .43E + .02S	.53	.55	.55	.55	.51**	.83
Fin. Aid Rec.	96	.47**	.87	1.29 + .07T - .07U - .04R - .03S	.47	.47	.47	.47	.45**	.89
Fin. Aid Nonrec.	47	.48*	.77	.66 + .05T + .17S + .19R	.46	.47	.48		.42*	.80
Blacks	64	.39*	.88	1.38 + .08T - .32U	.35	.39	S[†]		.35*	.89
Whites	79	.46**	.77	1.24 + .07T - .25F + .11S	.43	.45	.46		.42**	.78
Whites	79	.44**	.77	1.12 + .07T - .13U + .11S	.43	.43	.44		.40**	.79
Men	65	.40*	.85	1.80 + .04T - .38F + .20R	.34	.39	.40		.35*	.87
Women	78	.57**	.80	1.14 + .10T - .17F - .20R	.56	.56	.57		.55**	.82
Women	78	.57**	.80	1.19 + .10T - .15U - .21R	.56	.56	.57		.54**	.82
A & AA ACT	85	.38**	.74	2.07 - .46U + .40R + .25S	.27	.35	.38		.34*	.76
White women	44	.68**	.60	.26 + .11T - .04F	.68	.68			.66**	.61
White women	44	.68**	.60	.10 + .11T + .07U	.68	.68			.66**	.61

Table 1 (continued)

Subjects	n	R	SE	Regression Equation[a]	Correlation w/ Add. Variables[b] r	Rw/2	Rw/3	Rw/4	cR	cSE
Exp. Whites	40	.58**	.78	.39 + .11T + .05E - .08S	.58	.58	.58		.53**	.81
Exp. Women	39	.64**	.79	1.37 + .12T - .75R + .09E	.58	.63	.64		.60**	.82
Con. Women	39	.55**	.80	.74 + .06T + .40R - .16F	.53	.54	.55		.49*	.84
Exp. White Women	22	.74**	.71	-.45 + .13T + .17E	.72	.74			.71**	.78
Con. White Women	22	.66**	.41	1.19 + .08T - .16F	.64	.66			.61*	.69

[a]Independent (predictor) variables are denoted with letters: T (general achievement/aptitude: ACT scores), F (financial aid: assistance received, assistance not received), S (sex: men, women), R (race: Black, White), U (group: experimental, control), E (employment, hours per week: 0, 1-10, 11-20, 21-30, 31+). The dependent (criterion) variable is cumulative GPA.

[b]A variable not included in a regression equation because it was insufficient to add to the multiple correlation is designated by †.

*p < .05. (two tailed test)

**p < .01. (two tailed test)

Table 2

Analyses of Variance with Grades as Criterion

Analysis:	I	II	III	IV	V	VI	VII
Factors:	U	I	I	C	C	P	P
	R	R	R	R	R	R	R
	S	S	S	S	S	S	S
	T	T	A	T	A	T	A
	A						
Significant Main Effects:	U**	T*	A**		A**	P*	R*
	A**					T*	A**
Significant Interaction Effects:	ST*	IRST*	SA*	RST*	CSA*		
Total n:	143	96	96	70	70	120	120
experimental n:	73	73	73	0	0	73	73
control n:	70	23	23	70	70	47	47

Note. Factors are denoted with letters: U (group: experimental, control), I (instruction of financial aid recipients: special, regular), C (control group financial aid: assistance received, assistance not received), P (programs: special instruction and financial aid received, regular instruction and no financial aid received), R (race: Black, White), S (sex: men, women), T (general achievement/aptitude: below average ACT scores, average and above average ACT scores), A (attrition/persistence: dropouts, persisters). Grades, as criterion, were delineated as below average, average and above average.

*$p < .05$.

**$p < .01$.

Table 3

Chi Squares with Grades as Criterion

UNO ACT Freshman Population			Experimental Freshmen			Nonexperimental Freshman		
Variables	N	p	Variables	n	p	Variables	n	p
U' x G'	1,156	ns						
I' x G'	239	ns						
P' x G'	990	ns						
F' x G'	1,156	ns				F' x G'	1,083	ns
R' x G'	699	< .01	R' x G'	73	ns	R' x G'	626	< .01
S' x G'	1,156	< .01	S' x G'	73	ns	S' x G'	1,083	< .01
T' x G'	1,156	< .01	T' x G'	73	< .01	T' x G'	1,083	< .01
A' x G'	1,156	< .01	A' x G'	73	< .01	A' x G'	1,083	< .01

Note. Variables were denoted by letters: U' (group: experimental, nonexperimental), I' (instruction of financial aid recipients: special, regular), P' (programs: special instruction and financial aid recieved, regular instruction and no financial aid received), F' (financial aid: assistance received, assistance not received), R' (race: Black, White), S' (sex: men, women), T' (general achievement/aptitude: below average ACT scores, average and above average ACT scores), A' (attrition/persistence: dropouts, persisters), G' (GPAs: below average, average and above average).