

# The Relationships of the Unisex Edition of the ACT Interest Inventory (UNIACT) and Selected Variables to Grade Point Average in a Professional Pharmacy Program

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## *INTRODUCTION*

Pharmacy school administrators have been interested for some time in selection procedures for admitting students most likely to succeed academically. They have used variables such as aptitude tests, psychological examinations, interest tests, and grade point averages to try to predict this success. Scores on the American College Test (ACT), Scholastic Aptitude Test (SAT), and Pharmacy College Admission Test (PCAT) and high school and college grade point averages are among those variables that have been investigated as predictors of academic success in schools of pharmacy (1-5). Several studies found that aptitude tests had some predictive

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ability (6, 7). However, the best specific predictor was a prepharmacy grade point average. Even this variable was limited to significantly predicting only first professional year success (8).

Interest inventory tests have not been widely used as predictors of academic success in schools of pharmacy, but at least one investigator has recommended their use (9). Studies in the 1940s concluded that interest in mathematics, the physical sciences, and English tests were suitable for predicting first-semester grades in colleges of pharmacy (10). One study used a work interest analysis to predict pharmacy students' success at the University of Kentucky. Researchers concluded that achievement, aptitude, and intelligence tests should be used more extensively in predicting academic success than interest tests (5). Other researchers came to similar conclusions (11, 12). The last study to evaluate current interest patterns of individuals selecting pharmacy as a profession was conducted in the early 1970s. While results were no different from those of the previous studies, researchers recommended that a separate test be developed for females because many women were expected to join the pharmacy profession in the near future (13).

With the advent of the prepharmacy curriculum and new standardized aptitude tests, further use of interest tests to predict academic success was abandoned. Many researchers turned their attention to the new variables (ACT, SAT, PCAT, etc.) and their predictive capabilities. Nevertheless, as the 1980s approached, some investigators mentioned the use of interest inventory scales, such as the Strong Vocational Interest Blank, and again suggested their use in developing a predictive model for academic success (14). At about the same time, the American College Testing Program introduced a new standardized interest test called the Unisex Edition of the ACT Interest Inventory (UNIACT).

### ***THE UNISEX EDITION OF THE ACT INTEREST INVENTORY (UNIACT)***

The UNIACT is an unbiased unisex edition of a vocational interest inventory. It uses sex-balanced items to minimize sex-role con-

notations. Comparisons of unisex and traditional interest scales indicated that the validity of sex-balanced reports was equal to or greater than that of sex-restrictive reports (15). The UNIACT is normally included with registration materials for the ACT. Completion of its 90-item inventory is voluntary. Results of the six basic interest scales (science, creative arts, social service, business contact, business detail, and technical) are usually reported as normalized T scores on an ACT Assessment Profile (AAP). In addition, the report includes a profile of percentile ranks plotted in the form of bands encompassing one standard error of measurement.

UNIACT scores not only provide the student with a stimulus to facilitate self/career exploration but also give a measure of interest that can be used by college counselors for career advancement. The academic community has always been concerned with advisement and placement of potential students in the college major in which they are most likely to succeed. Admissions officers are constantly searching for the optimum admissions criteria that would allow all applicants to be evaluated equally, accurately, and consistently. UNIACT might prove useful for predicting academic success in a particular college major. A model for predicting such success, in addition to its ability to measure acceptable levels of career interest, would have wide application.

Pharmacy is a unique discipline that requires specific skills, a certain level of intelligence, and a high standard of work, which, in turn, is controlled and evaluated by federal and state agencies. Students showing interest in this profession should assess their potential for success. Academic performance may be one measure of such success. Therefore, a predictive model using interest measures with wide availability, such as UNIACT, might be useful. Additionally, the literature has shown that many variables have been tested for their predictive capabilities in schools of pharmacy, and some of the variables have shown promise as predictors of academic success. However, no variable or combination of variables has shown a very strong relationship with grade point average (i.e., predict academic success).

We must continue to look for those variables that will have predictive worth. No studies have tested UNIACT scores for predicting

academic success in schools of pharmacy or success in the choice of pharmacy as a profession. Thus it might be useful to examine the potential predictive validity of the UNIACT.

### **OBJECTIVES**

This study examined the relationship of UNIACT scores and other selected variables to each other and their ability to predict grade point averages of students who were enrolled in the pharmacy program at Northeast Louisiana University (NLU), the only state-supported pharmacy program in Louisiana. NLU's five-year pharmacy program consists of two years of prepharmacy and a three-year professional pharmacy program.

Since the ACT scores (English, mathematics, natural science, and social science) and prepharmacy grade point averages of a potential study sample were readily available, the predictive value of these variables was explored in conjunction with UNIACT scores. The sex of each student involved was also available. However, this variable may be ineffective as a predictor variable of academic success (7). Thus, considering that the UNIACT also has been validated as sex-balanced, sex was discounted from any analysis.

The study was descriptive and sought only to identify any variables, particularly new variables, that may warrant further investigation as predictors of academic success. It did not attempt to draw conclusions beyond the sample employed.

In order to achieve these objectives, the study attempted to answer the following questions:

1. What significant relationships exist between scores from the Unisex Edition of the ACT Interest Inventory (UNIACT) and the other variables used in this study (i.e., professional pharmacy grade point average, prepharmacy grade point average, and scores from the American College Test (ACT))?
2. Which combination of variables used in this study will produce the best model for predicting academic success in a professional pharmacy program?

3. Can interest inventory tests such as UNIACT prove useful for predicting academic success in the professional pharmacy program at Northeast Louisiana University (NLU)?

## **METHODOLOGY**

The sampling frame consisted of graduates who received a Bachelor of Science in Pharmacy degree from NLU from May 1982 through December 1987. All completed the UNIACT when they took the ACT. While not all graduates had taken three years to complete the professional program, it was assumed that this was not a significant factor in academic performance. A nonrandom, purposive sample was selected from this frame because the UNIACT had not been introduced with the ACT registration materials until October 1977. Because the ACT was most likely taken during the junior or senior year in high school, the first students who took the UNIACT and completed the NLU 5-year pharmacy curriculum would probably not have been graduated before 1982. Each ACT Assessment Profile (AAP) test date was examined to determine which scores were from ACTs taken in or after October 1977. Seventy-five students meeting this criterion were identified by matching their social security numbers with their AAPs. These matches also ensured that the correct ACT scores, UNIACT scores, and prepharmacy and professional pharmacy grade point averages were assigned to the students in the sample.

Prepharmacy and professional pharmacy grade point averages were calculated from each student's degree requirement check sheet. Prepharmacy grade point average was the total semester hours divided into total quality points earned on all courses listed under "Pre-Pharmacy Requirements" on the NLU School of Pharmacy degree requirement check sheet (DRCS). Professional pharmacy program grade point average was the total semester hours divided into total quality points earned on all courses listed under "Pharmacy Program Requirements" on the DRCS. Further examination revealed that the structure of the prepharmacy and professional pharmacy program had changed during the period of the

study. These changes occurred mostly in the order of required courses and not changes in the courses themselves. Thus, the overall number of semester hours required to complete the program remained unchanged. Because grade point averages were calculated using total hours earned in the program, the effect from the small changes was assumed to be insignificant. Grade inflation was not considered as a factor during the period of time covered by the study.

The following data were obtained from each student's AAP and DRCS:

1. Professional pharmacy program grade point average calculated from all courses, semester hours, and grades listed under "Pharmacy Program Requirements" on each student's DRCS
2. Prepharmacy grade point average calculated from all courses, semester hours, and grades listed under "Pre-Pharmacy Requirements" on each student's DRCS
3. Standardized ACT scores in English, mathematics, natural science, and social science
4. Standardized UNIACT interest scores in science, creative arts, social service, business contact, business detail, and technical.

The above data were entered on a data entry sheet. Each subject was arbitrarily assigned an identification number from 1 to 75. The corresponding grade point averages and standardized scores were listed following each identification number.

The data were entered in a previously designated computer file. Using the *SPSSX User's Guide* Pearson correlation program, product-moment correlation coefficients were computed for all possible pairs of variables (16). Each coefficient was then entered in a correlation matrix. Three multiple regression analyses were carried out using the SPSSX stepwise program in an attempt to produce the best predictor model from the variables used in the study (16). In all cases the predictive models used professional pharmacy grade point average as the predicted variable.

In the first analysis, only UNIACT scores (science, creative arts, social service, business contact, business detail, and technical) were introduced as predictor variables. In the second analysis,

UNIACT scores and ACT scores (English, mathematics, and natural science) were introduced as predictor variables. Finally, pre-pharmacy grade point average, ACT scores, and UNIACT scores were all introduced as predictor variables.

## RESULTS

The first analysis of the data was the calculation of correlation coefficients for all possible pairs of variables. The calculations were carried out by the *SPSSX User's Guide* Pearson correlation program. Each product-moment coefficient was then entered into a correlation matrix (Table 1).

High correlations were found between ACT social science scores and ACT English scores ( $r = .76$ ,  $p = 0.0052$ ) and between ACT social science scores and ACT natural science scores ( $r = .75$ ,  $p = 0.0067$ ). Because extremely high intercorrelations between predictor variables result in a confounding effect in multiple regression, the unique contribution of each variable becomes difficult to assess; therefore, ACT social science scores were excluded from any multiple regression analysis.

A significantly high correlation was also noted between prepharmacy grade point average and professional pharmacy program grade point average ( $r = .76$ ,  $p = 0.0048$ ). This initial finding indicated that prepharmacy grade point average would be a strong predictor variable. UNIACT scores had the lowest correlations with all other variables ( $r = .00$  to  $.20$ ).

The second part of the findings dealt with building the best predictor model from the variables in the study. Using the *SPSSX User's Guide* stepwise multiple regression program, three analyses were carried out using professional pharmacy grade point average as the predicted variable.

In the first analysis, only UNIACT scores (science, creative arts, social service, business contact, business detail, and technical) were introduced into an equation. At the .05 level of significance, no score entered the equation. In the second analysis, UNIACT scores and ACT scores (English, mathematics, and natural science) were introduced as predictor variables. The following equation was produced:

TABLE 1. PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENTS

	Grade Point Averages		ACT Scores			
	Pro. Ph. (PHGPA)	Pre-Ph. (PPGPA)	English (ACTE)	Math (ACTM)	Soc. Science (ACTSS)	Nat. Science (ACTNS)
PHGPA**		.76*	.38*	.47*	.29	.40*
PPGPA			.44*	.51*	.31*	.29
ACTE				.48*	.76*	.59*
ACTM					.52*	.35*
ACTSS						.75*
ACTNS						
UNIS						
UNICA						
UNISS						
UNIBC						
UNIBD						
UNIT						

\*Significant at  $p \leq 0.05$

\*\*Professional Pharmacy Grade Point Average

$$Y' = 1.43182 + (.03559) \times \text{ACT mathematics score} + (.02565) \times \text{ACT natural science score}$$

$$\text{Multiple R} = .53259 \quad \text{Level of significance} = .05$$

$$R^2 = .28365$$

Again, no UNIACT scores entered the equation. The moderate correlations between ACT scores and the predicted variable (Table 1) did, however, account for some variance in the regression as shown by the two scores that entered this equation.

In the third analysis, UNIACT scores, ACT scores, and prepharmacy grade point average were introduced as predictor variables. The following equation was produced:

$$Y' = -.11273 + (1.79652) \times \text{Prepharmacy grade point average} + (.01823) \times \text{ACT natural science score}$$

$$\text{Multiple R} = .78414 \quad \text{Level of significance} = .05$$

$$R^2 = .61487$$

## UNIACT Scores

Science (UNIS)	Com. Arts. (UNICA)	Soc. Service (UNISS)	Bus. Com. (UNIBC)	Bus. Detail (UNIBD)	Tech. (UNIT)
.17	.06	-.01	.09	.10	.06
.13	.01	.04	.06	.16	-.01
.00	.21	.04	.02	-.06	-.06
.10	.05	.00	.02	.05	.16
.15	.16	-.07	.00	-.15	-.03
.20	.16	-.14	-.01	-.18	.00
	.09	.10	.20	.32*	.29
		.23	.18	.00	.27
			.50*	.28	.28
				.53*	.30
					.41*

Prepharmacy grade point average, which had shown a very high correlation with the predicted variable, accounted for 58% of the variance in the regression. Once again, no UNIACT scores entered the equation.

### CONCLUSIONS

Based on the study sample and the findings of this study, the following conclusions can be drawn:

1. UNIACT scores alone or with other variables appear to have no usefulness for predicting academic success in the NLU School of Pharmacy when a three-year professional pharmacy program grade point average is the predicted variable.
2. ACT scores appeared to have moderate potential in predicting academic success in the NLU School of Pharmacy when combined with other variables.

3. Prepharmacy grade point average and the ACT natural science score produced the best equation for predicting academic success in the NLU School of Pharmacy when a three-year professional pharmacy program grade point average was the predicted variable. Total variance accounted for was about 61.5%.
4. Prepharmacy grade point average was the best single predictor variable for the best regression model, accounting for 58% of the variance; therefore, it has strong potential for being an accurate predictor of academic success in the NLU School of Pharmacy when a three-year professional pharmacy program grade point average is the predicted variable.

### **DISCUSSION**

UNIACT scores do not appear to be a useful means by which counselors and admissions officers can predict academic success in the NLU School of Pharmacy; therefore, it is recommended that counselors and admissions officers in other schools of pharmacy use these scores with caution for similar predictions. The same recommendation may be valid for other disciplines, as the UNIACT may yield similar results when tested for predicting success in other curriculums. Obviously, additional studies are needed to determine this. For the present, it appears that UNIACT should continue to be used to facilitate self/career exploration.

Some may argue that pharmacy needs to focus on more social aspects of the work, especially as it relates to job satisfaction and performance (17). For this reason, interest tests may be able to predict an applicant's ability to relate to and to communicate with "fellow health professionals, patients and other clients" (9). Further research is needed to determine if UNIACT scores might have potential for measuring sociological factors important to the profession of pharmacy.

Certain ACT scores may be useful in combination with prepharmacy grade point average to predict academic success in the NLU School of Pharmacy program. Such combinations appear to enhance the accountability of variance, thereby increasing the usefulness and predictive validity of such a model. This study also reem-

phasizes and supports prepharmacy grade point average as a significant variable for use by counselors and admissions officers to predict academic success in schools of pharmacy.

It appears that this study has produced a predictive tool that counselors and admissions officers can use for choosing students for a professional pharmacy program. Particularly in those situations where student selection choices are apt to be more stringent (e.g., an oversupply in the profession, fiscal constraints, changes in accreditation policies), this model could provide valuable assistance in making these choices. Additionally, such an improved forecasting tool could result in more effective and efficient advising by counselors and admissions officers seeking to help those students interested in pursuing pharmacy as a career.

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