A STUDY OF THE OCCUPATIONAL LEVEL SCALE OF THE STRONG VOCATIONAL INTEREST BLANK AS IT RELATES TO PREDICTION OF ACADEMIC SUCCESS IN THE SCHOOLS OF ENGINEERING AND AGRICULTURE AT KANSAS STATE COLLEGE

by

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INTRODUCTION

Purpose of the Study

The purpose of this study was to examine the hypothesis that the Occupational Level (OL) scale of the Strong Vocational Interest Blank is related to academic success, as measured by sophomore grade point average, in the schools of engineering and agriculture at Kansas State College.

Need for the Study

The use of achievement and aptitude tests to predict academic success in college has been the subject of intensive psychological research for some time. Recent research however, has failed to bring the desired increase in the predictive efficiency of achievement and aptitude tests. Many writers and research people have attempted to attribute this failure to the presence of non-intellectual traits, differential motivation, variability of the criterion, and many such nebulous and unmeasured factors (2) (9).

In lieu of academic or achievement tests which approach near-perfect prediction, many vocational and educational counselors tend to "clinically" assign predictive values to tests and indices which seem to be sampling traits that may logically be related to academic success. The Occupational Level Scale of the Strong Vocational Interest Blank, which is one attempt to quanti-

tatively measure one of these traits, falls into the "clinical" category because of lack of sufficient research.

Recent research on the OL scale has tended to support the clinical feeling that it has a low correlation with academic aptitude and a positive relationship to academic achievement as measured by grade point average (9) (10).

Although it was felt that the area covered by these studies was potentially a productive area of research, the writer would question the use of broad generalized statements made in these studies regarding the counseling of individual students (see section on Review of Related Research) and would believe that many aspects of these studies should be investigated and qualified or modified before they could be considered of positive value to psychology.

For this reason the writer considered it justifiable to repeat the general research objective of these studies as a means of testing the hypothesis of relationship in a different situation and by a different method of statistical analysis. In this manner the resultant information would provide an additional basis for generalization or limitation of generalization.

There have been many criticisms of the use of statistical analysis as applied to data used when counseling the individual student. The following quotation from Hepner (7, 191-2) is illustrative of these criticisms.

> While the statistical treatment of group data concerning entering college students has certain values, ..., these values are definitely limited, especially in relation to the individual student. Great reliance upon statistical

> findings may lead to failure to view each student as a unique personality worthy of individual and special consideration. From this point of view, specific analysis of all measures for a particular student may provide valuable information and insights concerning his nature, achievements, potentialities, and needs...The data of this investigation show that some of the most potentially able students, as indicated by all the measures applied, actually make unexpectedly and markedly inferior records in college. The data also show that some students whom the criteria distinguish as of markedly inferior promise and whose previous accomplishments and adjustments are in agreements, actually attain college records higher than those expected. It is these observations that lead to the emphasis upon the need (a) to view the individual as a distinct person, (b) to work with him with all available knowledge, and (c) to avoid the smug feeling of contentment that comes with dependence upon the general conclusions of statistical analysis...

The validity of many such criticisms is recognized, but the misuse of statistical analysis does not seem to be sufficient justification for ignoring or eliminating data which quantify or label the limitations which these criticisms point out.

REVIEW OF RELATED RESEARCH

Previous research related to this study may be classified into two general groups. The first group is research related to the prediction of success in professional schools of agriculture and engineering. This group is of interest to this study only as it provides background information. A survey which suited this purpose was the study by Stuit and others, Predicting Success in Professional Schools (14). Appropriate excerpts from this publication have been reproduced and amended to include some local studies and other research published since 1949 in Appendix Tables 9 and 10.

The second set of studies are those concerned with the Occupational Level scale of the Strong Vocational Interest Blank. This work was directly related to the purpose of this study and was reviewed in more detail.

The first study examining the relationship of the OL scale to academic achievement was done by the author of the scale. In this study Strong (13) divided 140 students from the Graduate School of Business at Stanford University into four groups on the basis of grades over a year's period. He found no significant OL differences between his highest and lowest quarters. Strong pointed out that the restricted range of ability and grades within this group could well explain his failure to find any differences.

In 1947 Kendall (9) conducted a study of this same scale. Kendall divided 300 Syracuse University freshmen into three equal groups distinguished by OL scores. One group contained students with OL scores above 139; one contained students with OL scores below 30; and the third represented those with scores in the middle 25 percent of the freshman distribution.

These three groups, when equated by covariance for academic ability as measured by the Ohio State Psychological Examination Form 21, were found to differ in academic achievement. Kendall found that he could reject the null hypothesis of no significant difference between honor point ratios of these three groups at the five percent level of confidence. Kendall concluded that extreme scores on the OL scale could be used when counseling students.

Another study similar to Kendall's was one by Ostrom (10). Ostrom's research was designed to study this same relationship between OL scores and academic achievement and his work was done with the same group of freshman students at Syracuse University that Kendall used for his study.

Ostrom divided the students into six groups according to their scores on the OSPE and the OL scale: 1. high OSPE and high OL, 2. high OSPE and middle OL, 3. high OSPE and low OL, 4. low OSPE and high OL, 5. low OSPE and middle OL, 6. low OSPE and low OL. Ostrom found by analysis of variance that OL score and academic achievement were related at the one percent level of confidence.

Ostrom (11) conducted a second study on the relationship of the OL score to academic achievement. In this study he used a group of 200 twelfth grade students. The ACE total raw score was used as a measure of academic aptitude. He found no significant relationship between OL score and high school academic grade average when academic aptitude, as measured by the ACE total score, was held constant.

Gustad (6) examined the relationship of the OL score to aptitude as measured by the Q (quantitative) and L (linguistic) scores of the ACE. In this study he divided 217 college freshmen into three groups: those students who had dominantly high Q scores, those students who had dominantly high L scores, and those students who had nearly equivalent Q and L scores. He then compared these three groups on the basis of their occupational group scores and

their non-occupational scores on the Strong Vocational Interest Blank. He concluded that the hypothesis "vocational interests are conditioned by different aptitudes" was unsubstantiated in his study. He did, however, find a significant correlation of -.167 between OL scores and Q minus L scores of the dominant Q group. He concluded that "the sign of this correlation indicates that there is a slight tendency for dominantly quantitative individuals to have somewhat lower OL scores."

Berdie (1) examined the relationship of the OL score to curriculum satisfaction as measured by the questionnaire method, and to honor point ratios for the first semester. Forty-three freshmen were used for this study. It was concluded that there was no significant relationship between OL score and either criterion in this instance.

Strong (13) found that those persons who had occupational interests characterized by a grade of A on the occupational scales of the interest blank tended to fall at significantly different mean points on the Occupational Level scale ranging from lawyers at the top of the scale to general laborers at the bottom. Strong concluded, however, that "apparently individual diagnosis is not possible with this (the OL) scale because of the very large deviation about the average of each of these groups."

To the writer's knowledge there have been no other published experimental studies which attempted to examine this aspect of the OL scale. There have, however, been some so-called clinical definitions of the scale (2) (9) (10).

Darley (2) states that the scale is a measure of level of aspiration and, further, seems to indicate the staying power of college students. Kendall (9) states that the scale is generally accepted by counselors to be a measure of motivation. Both of these generalized statements need to be examined further. The present study was undertaken to provide evidence bearing upon these formulations.

MATERIALS USED

The Strong Vocational Interest Blank and the American Council on Education Psychological Examination (ACE) have been administered to the students at Kansas State College as parts of the freshman entrance battery since 1948.

The occupational level key of the Strong Vocational Interest Blank is one of the three so-called non-occupational scales on this test. This scale was empirically derived from the 400 items of the interest blank and is defined by Strong (13) to differentiate between professional and business men at one extreme and unskilled workmen at the other.

On the basis of the previous research cited in Appendix Tables 9 and 10, the ACE total raw score was used in preference to the Q or L scores because of the diversity of academic interests within both the engineering and agriculture schools.

The sophomore grade point average was defined and computed in the following manner.

Number of hours completed and number of grade points each

student received for each of his first four semesters in college, or those accumulated up to the time he dropped from school, were recorded. All transfers out of the schools of engineering and agriculture were included in the sample up to the time they transferred out of the schools.

It was decided to consider any student who had enrolled and carried at least 12 hours past the seventh week of the semester as a student carrying a full semester load. For the purposes of this study, freshman year was considered to be two such semesters and sophomore year was considered to be the second two such semesters, without regard to the number of hours the student failed or passed.

Grade point averages were computed on the basis of A=3, B=2, C=1, D=0 and F= -1 for each hour of credit carried. Hours enrolled in for the first two semesters were combined then divided by grade points earned for the first two semesters to obtain the freshman grade point average. The same procedure was followed for the second two semesters to obtain the sophomore grade point average. Therefore, the sophomore grade point average used was a non-cumulative average.

METHODS OF DETERMINING POPULATIONS

In order to carry out this study and examine the relation of the Occupational Level scale to grade point average at the second year level, holding academic aptitude (as measured by the ACE) constant, the research was limited to those students

who entered Kansas State College in 1948 and 1949. These two populations were the only ones for which all data were available. The writer felt that it would be desirable if the groups could be combined, thus considerably increasing the sample size. Following this objective, name, raw CL score, and ACE total raw score for every student who enrolled in the School of Agriculture in September 1948 and September 1949 was recorded. The same roster was made up for students enrolling in the School of Engineering during the same two periods.

The records for students enrolling in February and June of these two years were not adequate and these students were eliminated. It was also necessary to eliminate from the final sample students who had not taken both the ACE and the Strong Vocational Interest Blank.

Because equipment was not available to carry out all computations with raw data, the writer felt it advisable to use a grouped data method of computation. ACE data were grouped into 10-point intervals. This divided the data into 18 groups. The CL raw scores were grouped into 15-point intervals resulting in 19 groups. The grade point averages were grouped into intervals of .25 of a grade point, resulting in 17 groups for these data.

The summary of the number of students who enrolled in each school and in each year was recorded. The number of students completing the freshman and sophomore years was also recorded.

The mean, standard deviation, and standard error were computed for each of the groups by the short method demonstrated by H. E. Garrett (5).

The summary of these data which are the bases for all further computations may be found in Appendix Tables 11, 12 and 13.

In all cases where critical ratios were computed the null hypothesis of "no significant difference" was tested on the basis of the "t" values table given by Garrett (5), and the one percent level of confidence was assumed as the criteria of significance unless otherwise stated.

The writer recognized that the data in Tables 11, 12 and 13 indicated selective factors which affected the nature of this group and it could by no means be considered a random group. The elimination of students who did not take the freshman test battery and selection of those students completing the sophomore year were essential to the purpose of the study. The writer, however, recognized no selective factors which would have tended to bias the group in any particular manner.

Of the 541 students who enrolled in the School of Agriculture in September 1948 and 1949, 3 percent were eliminated because of incomplete data, 77 percent received grade point credit for completing two full semesters and 51 percent received grade point credit for completing four full semesters. Of the 496 students who enrolled in the School of Engineering in September of 1948 and 1949, 3 percent were eliminated because of incomplete data, 80 percent received grade point credit for completing two full semesters and 62 percent received grade point credit for completing four full semesters.

Combination of 1948 and 1949 Samples

Critical ratios were computed to determine whether 1948 and 1949 samples could be combined for the purpose of this study. The results of these computations are summarized in Table 1.

Table 1. Comparison of ACE total raw scores, OL raw scores, and grade point averages of 1948 and 1949 samples.

Population	Difference in means	S. E. of difference	Critical ratio
ACE total raw score			
Ag students enrolling in 1948 and completing four semesters, and Ag students enrolling in 1949 and completing four semesters	1.65	2.66	.620
Eng students enrolling in 1948 and completing four semesters, and Eng students enrolling in 1949 and completing four semesters	2.7	2.65	.98
Occupational Level raw scores			
Ag students enrolling in 1948 and completing four semesters, and Ag students enrolling in 1949 and completing four semesters	3.75	5.80	.646
Eng students enrolling in 1948 and completing four semesters, and Eng students enrolling in 1949 and completing four semesters	.87	5.24	.166
Grade point average			
Sophomore grade point average of Ag students who enrolled in 1948, and sophomore grade point average of Ag students who enrolled in 1949	.09	.08	1.12
Sophomore grade point average of Eng students who enrolled in 1948, and sophomore grade point average of Eng students who enrolled in 1949	.12	.078	1.54

Assuming the one percent level of confidence as the basis for rejecting or retaining the null hypothesis it was assumed that in all cases the two samples were drawn from the same parent population and differed only in sampling errors. It was therefore assumed that the two populations could be combined for the purpose of this study.

Differences Between Enrolling and Sophomore Populations

Critical ratios between enrolling and sophomore populations were computed for the purpose of examining the possible selectivity or variance of the distribution curves. The result of these comparisons is summarized in Table 2.

Table 2. Comparison of mean raw scores of the ACE and OL scale of enrolling and sophomore populations.

Population	Difference in means	S. E. of difference	Critical ratio
ACE Psychological Examination			
Students enrolling in 1948 in Ag, and students enrolling in 1948 in Ag and completing four semesters	2.17	2.22	.98
Students enrolling in 1949 in Ag, and students enrolling in 1949 in Ag and completing four semesters	7.34	2.40	3.06**
Students enrolling in 1948 in Eng, and students enrolling in 1948 in Eng and completing four semesters	2.2	2.16	1.02
Students enrolling in 1949 in Eng, and students enrolling in 1949 in Eng and completing four semesters	5.9	2.64	2.23*
Occupational Level			
Students enrolling in 1948 in Ag, and students enrolling in 1948 in Ag and completing four semesters	.45	5.15	.09
Students enrolling in 1949 in Ag, and students enrolling in 1949 in Ag and completing four semesters	.15	4.92	.03
Students enrolling in 1948 in Eng, and students enrolling in 1948 in Eng and completing four semesters	3.90	4.4	.89
Students enrolling in 1949 in Eng, and students enrolling in 1949 in Eng and completing four semesters	.60	5.18	.12

**significant at the one percent level
* significant at the five percent level

Although it was realized that differences which might exist between enrolling and sophomore populations were measured by using the larger number of students (those remaining in school rather than those who dropped from school) for comparison, it was felt that this method would shed some light on the nature of the ACE and CL distributions. It was interesting to note that in both the School of Engineering and the School of Agriculture, that part of the population which enrolled in 1949 changed to a much greater extent between enrollment and completion of the sophomore year than did the populations enrolling in 1948, with the mean ACE total scores for 1948 above those for 1949.

Accepting the one percent level of confidence as a basis for rejection of the null hypothesis and the five percent level as being of doubtful positive significance, it was concluded that there was one case in which there was a significant difference between ACE populations, one case of doubtful difference and two cases in which the null hypothesis of no significant difference could not be rejected.

From this it was inferred that at least in one instance there was evidence of selective factors altering the population difference and that correlations computed on the basis of the sophomore population might seem smaller because of the narrower distribution and smaller number of students.

In relation to the CL score distributions there was only one instance in which the null hypothesis could be rejected at the 50 percent level of confidence. This lack of variability seemed

to indicate that there was little chance of a selective factor related to staying power operating in this instance, at least through the sophomore level. This conclusion would be in opposition to Darley's (2) clinical inference that a significant relationship of this type exists.

Differences Between
Freshman and Sophomore Grade Point Average

Table 3. Comparison of grade point averages of freshman populations and sophomore populations.

Population	Difference in means	S. E. of difference	Critical ratio
	Grade point average		
Freshman grades of students enrolling in Ag in 1948, and sophomore grades of students enrolling in Ag in 1948	.28	.07	4.00**
Freshman grades of students enrolling in Ag in 1949, and sophomore grades of students enrolling in Ag in 1949	.35	.10	3.5**
Freshman grades of students enrolling in Eng in 1948, and sophomore grades of students enrolling in Eng in 1948	.59	.07	8.43**
Freshman grades of students enrolling in Eng in 1949, and sophomore grades of students enrolling in Eng in 1949	.28	.10	.28

**significant at the one percent level

On the basis of this data it was evident that the null hypothesis could be rejected at the one percent level of confidence in three of the four cases. This indicated that the

assumption of differences between freshman and sophomore grades was valid and tended to support the use of sophomore grades as a measure of academic achievement at a level more specialized than the freshman level.

Differences Between Engineering and Agriculture Distributions on All Three Variables

Table 4 is a summary of the results of data computed to determine the advisability of treating total engineering and agriculture samples as separate populations or as two sub-populations from the same parent population.

Table 4. Comparison of ACE, OL and grade point average of total engineering and agriculture populations completing four semesters.

Population	Difference in means	S. E. of difference	Critical ratio
ACE Psychological Examination			
All Ag students enrolling in 1948 and 1949 and completing four semesters, and all Eng students enrolling in 1948 and 1949 and completing four semesters	12.4	1.85	6.70**
Occupational Level			
All Ag students enrolling in 1948 and 1949 and completing four semesters, and all Eng students enrolling in 1948 and 1949 and completing four semesters	4.73	3.84	1.23
Grade point average			
All Ag students enrolling in 1948 and 1949 and completing four semesters, and all Eng students enrolling in 1948 and 1949 and completing four semesters	.10	.056	1.76

**significant at one percent level

It was evident from this summary that the assumption of a difference between the means of the engineering and agriculture student distributions was acceptable at the one percent level of confidence only in the case of the ACE scores. It was felt that this difference warrented treating the groups as two distinct populations to enable an investigation of the interrelationship between the variables in the two different schools with the best degree of accuracy.

PROCEDURE

Pearson product moment correlations were computed for the agriculture sample and the engineering sample to determine the relation between ACE total raw scores and grade point averages, between OL scores and grade point averages, and between OL scores and ACE total raw scores. This also provided necessary information for partial and multiple correlations. A linear relationship was assumed in all cases on the basis of inspection of the scattergrams.

The correlation between the freshman and sophomore grade point averages of the agriculture populations was computed to determine the degree to which the two groups were related in this respect.

This was used as a method of determining the variability of the relationship of freshman to sophomore grades in the two schools.

These same correlations were computed for the engineering student sample.

The "z" test (12) to determine significance of differences between correlations was computed to find whether the agriculture and engineering correlations could be assumed to come from the same parent populations and therefore combined.

In both the engineering and agriculture samples the multiple correlations were computed as a method of examining whether the raw OL score added any predictive value beyond the zero order correlation of ACE total raw score and grade point average.

The z score values of the multiple correlation and the largest zero order correlation were computed and the t score was worked out to demonstrate the significance or lack of significance of the multiple correlation over the zero order correlation in each instance.

Partial correlations of the three variables, and the prediction equations were worked out to check further the relation between OL raw score and grade point average when ACE total raw score is held constant.

It then seemed practical to examine the OL distribution to find whether some relationship other than a linear one would increase the predictive value of the OL scale. The correlation ratio was computed to obtain an index of the linearity or nonlinearity of the OL raw score distribution, and an index of the maximum expected correlation between OL and grade point average. Method used was described by R. A. Fisher (4) and M. G. Kendall (8).

RESULTS

As a criterion by which to judge the relative effectiveness of the multiple and partial correlation coefficients and the degree of interrelationship of the two independent variables, OL score and ACE total score, Pearson product moment correlations were computed. The results are presented in Table 5.

Table 5. Intercorrelations between sophomore grade point average, raw OL scores and raw ACE total scores of those students completing four semesters in the schools of agriculture and engineering.

Population	Correlation	Significant at 5 percent level of confidence	Significant at 1 percent level of confidence
School of Agriculture			
ACE scores and grade point average	.353	yes	yes
ACE scores and OL	.119	no	no
OL scores and grade point average	.084	no	no
Freshman grade point average and sophomore grade point average	.78	yes	yes
School of Engineering			
ACE scores and grade point average	.393	yes	yes
ACE scores and OL	.428	yes	yes
OL scores and grade point average	.157	yes	yes
Freshman grade point average and sophomore grade point average	.697	yes	yes

It was evident from the information in Table 5 that in the School of Agriculture the relationship between OL score and the other two variables, ACE and grade point average, could not be accepted as correlations that would not occur by chance. It was possible that if the scores had been regrouped in different intervals and recomputed, the correlation might have changed in either the direction of more significance or less significance.

It was felt that because of this fact it was advisable to investigate further the nature of the OL scale before any conclusions were advanced.

In Table 5 it was indicated that there was a small, yet significant, relationship between OL score and grade point average in the School of Engineering and a correlation between OL and ACE that could be accepted with confidence.

A Test of Same or Different Parent Populations

Table 6 summarizes results of computations done in order to examine the level of confidence at which it could be stated that the preceding correlations were drawn from the same parent populations.

Table 6. A summary of determinations of significant differences between zero order correlations.

Population	z factor for: agriculture population	z factor for: engineering population	t value
Ag ACE and grade point average, and Eng ACE and grade point average	.372	.42	.8135
Ag ACE and OL, and Eng ACE and OL	.12	.458	5.7288**
Ag OL and grade point average and Eng OL and grade point average	.085	.172	1.475
Ag freshman grade point average and sophomore grade point average, and Eng freshman grade point average and sophomore grade point average	1.046	.862	3.172**

**significant at the one percent level

On the basis of the information in Table 6 it was concluded, at the one percent level of confidence, that although the linear relationship between OL scores and grade point average was significant in the engineering school and not in the School of Agriculture, the differences between these two correlations was not great enough to conclude that the two correlations were drawn from two different parent populations.

Multiple and Partial Correlations

The data in Table 7 resulted from computations to determine the predictive value of the OL score when academic aptitude as measured by the ACE was held constant.

Table 7. Means, standard deviations and Pearson product moment correlations between sophomore grade point averages, OL scores and ACE total raw scores in the School of Agriculture.

Population	N	(1) grade point averages	(2) OL scores	(3) ACE scores
School of Agriculture	271	$M_1=1.32$	$M_2=1.63$	$M_3=96.3$
		$SD_1=0.66$	$SD_2=48.15$	$SD_3=21.74$
		$r_{12}=0.08$	$r_{13}=0.353$	$r_{23}=0.119$

Based on data in Table 7 the following information was computed: 1. Partial coefficients of correlation:

$r_{12.3}=0.045$

$r_{13.2}=0.349$

$r_{23.1}=0.095$

2. Partial standard deviations:

$SD_{1.23}=0.618$

$SD_{2.13}=47.19$

$SD_{3.12}=20.23$

3. Partial regression coefficients:

$b_{12.3}=.0006$

$b_{13.2}=.011$

4. Regression equation:

$\overline{X} = .0006\ X_2 + .011\ X_3 + K$

5. Standard error of estimate:

$SD\ (est\ X_1) = .618$

6. Coefficient of multiple correlation:

$R_{1(23)}=.353$

From the computation of t by Snedecor's z factor method it was evident that the partial correlation between grade point average and occupational level raw score, with academic aptitude as measured by the ACE total raw score held constant, was not significant at the five percent level of confidence.

It was also noted that the multiple correlation between OL score and ACE score with grade point average as the dependent variable was not larger than the product moment correlation between ACE total raw score and grade point average.

Table 8. Means, standard deviations and Pearson product moment correlations between sophomore grade point averages, OL scores, and ACE total raw scores in the School of Engineering.

Population	N	(1) grade point averages	(2) OL scores	(3) ACE scores
School of Engineering	304	M_1=1.22	M_2=6.35	M_3=108.7
		SD_1=0.69	SD_2=44.25	SD_3=22.51
		r_{12}=0.157	r_{13}=0.393	r_{23}=0.428

Based on the data in Table 8 the following information was computed:

1. Partial coefficients of correlation:

   $r_{12.3}$= -.137

   $r_{13.2}$= 0.366

   $r_{23.1}$= 0.402

2. Partial standard deviations:

   $SD_{1.23}$= 0.632

   $SD_{2.13}$=39.43

   $SD_{3.12}$=18.84

3. Partial regression coefficients:

   $b_{12.3}$= -.002

   $b_{13.2}$= 0.012

4. Regression equation:

   $\overline{X}_1$ = -.002 X_2 + .012 X_3 + K

5. Standard error of estimate:

   SD (estX_1) = .632

6. Coefficient of multiple correlation:

   $R_{1(23)}$= .402

By testing the largest zero order correlation (.39 between ACE score and grade point average) against the multiple correlation .402 by Snedecor's z factor, it was concluded that there was no significant difference between the two correlations at the five percent level of confidence. It was evident from the partial correlation that while a significant zero order correlation existed between OL score and grade point average in the engineering school, the fact that the partial correlation is negative and not significant at the five percent level of confidence indicates the major portion of this relationship was accounted for by the ACE score when both variables were used for multiple correlation.

The Correlation Ratio

The correlation ratio (eta) was computed between OL raw scores and grade point average for students who had completed four semesters in the School of Agriculture.

It was found that while the product moment correlation was only .084, the value for the correlation ratio (eta), which was essentially the maximum expected correlation, was .264. This value for eta was considerably larger than the simple correlation and it might have been assumed that what relationship existed might be better described by a non-linear relationship. However, this difference from zero was not significant when tested by analysis of variance (12).

It should be noted that eta squared equaled .07 indicating that only seven percent of the variation in grade point average was associated with change in OL scores.

SUMMARY AND CONCLUSIONS

The results of this study could not be compared directly with the previous studies in the same area by Kendall and Ostrom. The use of the ACE instead of the OSPE might bring about significant differences. The different methods used, also limited the comparability of results. However, in such general terms as the relationship of the OL score to academic achievement with academic aptitude held constant, general trends of the studies could be compared.

In any general comparison of results of this study done with Kansas State College engineering and agriculture students with other studies in the same area of interest, it was essential to recognize population differences between the local norms and Strong's OL scale norms for college freshmen. The mean raw score for Stanford freshmen was slightly above 62. The mean raw score for Kansas State freshman engineers was 4.61 and for Kansas State agriculture freshmen, 1.80.

The means for both Kansas State College freshman groups fell more than one standard deviation below Strong's Stanford norms. This fact in itself introduces a variable which limits any comparison of results. Inasmuch as no significant differences were found between mean OL scores of enrolling freshman and sophomore distributions (the sophomore mean for ag was 1.63 and for eng was 6.35) at Kansas State College, this same difference was assumed to exist at the sophomore level. It was significant to note that the mean OL score for entering freshmen in the

School of Agriculture was 1.4 and in the School of Engineering was 4.2. The fact that there is no significant difference between the distributions of entering freshmen and those students completing four semesters would seem to indicate that these data would not support Darley's clinical assumption that the "OL score seems to be related to staying power."

The purpose of this study was to examine the hypothesis that OL score was related to academic success after the completion of four semesters. The zero order relationship between OL score and sophomore grade point average in the engineering school was .157. This relationship was significant at the one percent level of confidence.

The Pearson product moment correlation between these same two variables in the School of Agriculture was .084. This relationship could not be accepted as significant at the five percent level of confidence.

The multiple correlation in the School of Engineering between OL raw scores and sophomore grade point averages, holding ACE total raw score constant, was .402. The zero order correlation between ACE total raw scores and sophomore grade point average was .393. Testing the significance of the difference between these two correlations, it was found that no significant difference between the two figures could be assumed. The partial coefficient of correlation between OL score and sophomore grade point average holding ACE constant was -.137, indicating that the ACE score accounted for the predictive value of the OL score.

These computations indicated that a relationship between OL score and grade point average is doubtful in this instance and that the OL raw score adds no increment of significance to the prediction of academic success, as measured by grade point average and predicted by ACE total raw score, in the School of Engineering at Kansas State College. This would indicate that the OL score is of little value in this respect to the educational counselor at Kansas State College.

The multiple correlation between OL raw score in the School of Agriculture and sophomore grade point averages, holding ACE total raw score constant, was .353. The zero order correlation between ACE total raw score and sophomore grade point average was .353. This indicated, as was expected, that in this instance the OL score, when used as a linear predictor of success in the School of Agriculture at Kansas State College, adds nothing to the prediction of academic success as measured by grade point average.

To examine the possibility that correlations based on a non-linear assumption would better describe the relationship between OL scores and grade point averages, the writer, by visual examination, picked the scattergram which seemed to offer the best possibility of curvilinear relationship for examination by means of correlation ratio (eta).

The distribution of OL raw scores for students who completed four semesters in the School of Agriculture had a correlation ratio of .264 with sophomore grade point average, which was

essentially the maximum expected correlation. Inasmuch as this value for eta was much larger than the zero order correlation of .084, it would seem that what relationship existed might better have been represented by a non-linear relationship. The difference between these two values, however, when tested by analysis of variance, was not significant.

The fact that eta squared equalled .07 indicated that only seven percent of the variation in grade point average was associated with change in OL raw score. Therefore, we could not expect to find a large predictive relationship between OL score and grade point average in this instance. On the basis of this examination it was felt that expectation of significant differences between the zero order correlation and the correlation ratio in the School of Engineering was unreasonable and that what relationship existed between the two variables could be assumed to be linear.

The writer realized that by regrouping these scores and recomputing values, it was possible that higher or lower correlations might have been found. However, it was felt that the trend of the present data indicated that the OL score was of little value for predicting success in either the engineering or agriculture school at Kansas State College when used for multiple correlation prediction or when holding or ruling out ACE total raw score values.

SUGGESTIONS FOR FURTHER RESEARCH

The differences between Kansas State College norms and Strong's Stanford norms on the OL scale is probably the most outstanding point to appear in the research for this paper. The writer is aware that the Kansas State College norms and Kansas University norms are substantially in agreement. A study of these differences would be a significant contribution to our knowledge of the Strong Vocational Interest Blank.

A follow-up study of engineering and agriculture groups using those students completing the four-year curriculums might lend itself to more significant results by holding ability constant and comparing the surviving population with the drop-out population by year.

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APPENDIX

Table 9. A summary of coefficients of correlation showing the relationship between certain predictive indices and success as measured by grades in engineering training.

Source	Predictive Index	Criterion	N	r
		High school records		
*3	Percentile rank, high school class	First year honor point ratio	154	.56
*8	Rank in high school class	First semester grades	132	.60
*10	Total high school average	First year average	---	.50
*20	Decile rank, high school graduating class	First semester grades	215	.58
*12	High school average	Second year average	(a)	.42 (mdn)
		Between introductory and advanced stages of engineering training		
*7	First semester average	Four year grade point average	104	.91
*12	First year average	Four year grade point average	73	.85
*36	First year honor point ratio	Honor point average for all courses taken beyond first year	107	.61
		Scholastic aptitude test scores		
*7	Thorndike Intelligence examination	Four year grade point average	(b)	.43
*8	ACE Psychological Examination	First semester grades	333	.52
*12	ACE Psychological Examination	First year average	328	.47

Table 9. (cont.)

Source	Predictive Index	Criterion	N	r
*32	ACE Psychological Examination	First semester grades	252	.47
*12	ACE Psychological Examination	Second year average	215	.34
A	ACE Psychological Examination	First year average	204	.43
	Subject matter areas			
*12	Iowa Placement Examination, Mathematics Test	Second year average	(c)	.36
*29	Cooperative Mathematics Test	Second year average	4,900	.52
*12	Cooperative English Test	Second year average	(d)	.20
*29	Cooperative English Test	Second year average	4,900	.37
B	Cooperative English Test	First year average	249	.41
	Special aptitude test scores			
*7	Revised Minnesota Paper Form Board Test	Four year grade point average	104	.43
*34	Yale Scholastic Aptitude Test: Spatial Visualizing	First year grade point average	643	.31
*26	Thurston-Jones Sketching Test	First year average	132	.31
*26	Thurston-Jones Card Test	First year average	132	.33
*7	O'Connor Wiggly Block	Four year grade point average	104	.27

Table 9. (cont.)

Source	Predictive Index	Criterion	N	r
*6	Engineering and Physical Science Aptitude Test	Final grades, 5 introductory engineering subjects, summer session	188	.73
	Interest tests			
*3	Strong Vocational Interest Test for Men, Revised: Engineering Key	First year honor point ratio	154	.13
*9	Strong Vocational Interest Test for Men, Revised: Engineering Key	First year grades	270	.18
*19	Strong Vocational Interest Test for Men, Revised: Engineering Key	First year grades		.32
*20	Strong Vocational Interest Test for Men, Revised: Engineering Key	First year grade point average	229	.23
*20	Strong Vocational Interest Test for Men, Revised: Mathematician Key	First year grade point average	229	.23
*20	Strong Vocational Interest Test for Men, Revised: Chemist Key	First year grade point average	229	.33
	Multiple correlation coefficients			R
*7	Columbia Research Bureau Chemistry Test, Physics Test, Algebra Test, and Plane Geometry Test	Four year grade point average	(b)	.58

Table 9. (concl.)

Source	Predictive Index	Criterion	N	R
*7	Thorndike Intelligence Examination for High School Graduates, Columbia Research Bureau Algebra Test, Cox Mechanical Aptitude Models, and Minnesota Interest Analysis Blank	Four year grade point average	(b)	.59
*13	Iowa High School Content Examination, Iowa Silent Reading Test, Iowa Placement Examination Series: Mathematics Aptitude Test, English Training Test	Four year grade point average	99	.77
*24	ACE Psychological Examination, Cooperative English Test	First year grade point average	383	.57
*28	ACE Psychological Examination, Purdue Placement Test in English, Iowa Placement Examination Series: Mathematics Training Test	First semester grade point average	1,113	.72
*28	ACE Psychological Examination, Iowa Placement Examination Series: Mathematics Training Test	First semester grade point average	1,113	.72

* Source number refers to D. B. Stuit and others, Predicting Success in Professional Schools.
(a) Three groups used, Ns ranged from 139 to 214
(b) Ns ranged from 77 to 160; median 127
(c) Three groups used, Ns ranged from 134 to 214
(d) Five groups used, Ns ranged from 192 to 298
A By the writer, Kansas State College, 1950.
B Smith, E. G., Unpublished study, Kansas State College, 1948.

Table 10. Summary of a survey of research related to the prediction of success in professional schools of agriculture.

Source	Predictive Index	Criterion	N	r
	High school records			
*7	High school percentile rank	First year honor point ratio	68	.46
*7	High school percentile rank	First year honor point ratio	162	.50
*15	High school percentile rank	Sophomore honor point ratio, non-cumulative	40	.54
*15	High school percentile rank	Sophomore honor point ratio, accumulative	40	.72
*7	High school percentile rank	Two year honor point ratio	70	.53
*22	High school average	First year grade point average	60	.66
	Scholastic aptitude test scores			
*5	Ohio State University Psychological Test	Cumulative point-hour ratio of last record	120	.54
*5	Ohio State University Psychological Test	Cumulative point-hour ratio of last record	24	.36
*22	Ohio State University Psychological Test	First year grade point average	60	.35
*26	ACE Psychological Examination	First year average		.42
A	ACE Psychological Examination	First semester grade point average	224	.56

Table 10. (cont.)

Source	Predictive Index	Criterion	N	r
A	ACE Psychological Examination, Q Score	First semester grade point average	224	.49
A	ACE Psychological Examination, L Score	First semester grade point average	224	.53
*26	ACE Psychological Examination	Second year average		.33
*18	ACE Psychological Examination	First year grade point average	199	.34
*24	ACE Psychological Examination	Three year honor point ratio	49	.36
	Scientific information test			
*7	Johnson Science Application Test	First year honor point ratio	162	.50
*7	Johnson Science Application Test	First year honor point ratio	68	.54
*7	Johnson Science Application Test	Two year honor point ratio	68	.50
	Mathematics tests			
*18	Cooperative Mathematics Test, Form P	First year grade-point ratio	199	.27
*7	Cooperative Algebra Test	First year honor-point ratio	68	.42
*7	Cooperative Algebra Test	First year honor-point ratio	162	.45
*7	Cooperative Algebra Test	Two year honor point ratio	70	.46

Table 10 (concl.)

Source	Predictive Index	Criterion	N	r
	Strong Vocational Interest Blank			
*22	Farmer Key	Freshman grade point average	60	.22
	Subject matter areas			
B	Cooperative English Test	First year grade point average	306	.44
	Multiple correlation coefficients			R
*5	Ohio State Psychological Test, Entrance Board's estimate of high school record	Cumulative point hour ratio of test record	120	.59
*7	High school percentile rank, Johnson Science Application Test	Freshman honor-point ratio	68	.60
*18	ACE Psychological Examination, Cooperative English Test, Form OM, Cooperative Mathematics Test Form P	Freshman point average ratio	199	.41
*22	OSPE, Strong Vocational Interest Blank for Men (Farmer Key)	Freshman grade point average	60	.41
*22	OSPE, Strong Vocational Interest Blank for Men (Farmer Key), high school average	Freshman grade point average	60	.67
*22	Strong Vocational Interest Blank for Men (Farmer Key), high school average	Freshman grade point average	60	.65

* Source numbers refer to D. B. Stuit and others, Predicting Success in Professional Schools.

A By the writer, Kansas State College, 1950

B Smith, E. S., Unpublished Study, Kansas State College, 1948.

Table 11. A summary of grouped ACE data of those students who enrolled in engineering and agriculture in September 1948 and September 1949 at Kansas State College.

ACE total raw score	Enrolled in 1948	Enrolled in 1948 and completed 2 semesters	Enrolled in 1948 and completed 4 semesters	Enrolled in 1949	Enrolled in 1949 and completed 2 semesters	Enrolled in 1949 and completed 4 semesters	Total completing 4 semesters
			Agriculture students				
0: 9	0	0	0	0	0	0	0
10: 19	0	0	0	0	0	0	0
20: 29	1	1	0	0	0	0	0
30: 39	1	0	0	4	1	1	1
40: 49	4	2	1	9	2	2	3
50: 59	11	8	6	7	4	0	6
60: 69	25	22	13	26	16	10	23
70: 79	28	20	14	37	28	11	25
80: 89	42	34	22	45	32	16	38
90: 99	49	38	29	57	49	34	63
100: 109	40	32	20	42	33	18	38
110: 119	34	26	19	21	20	15	34
120: 129	24	21	18	10	7	5	23
130: 139	5	4	3	7	7	7	10
140: 149	3	3	2	3	3	3	5
150: 159	1	1	0	2	2	2	2
160: 169	0	0	0	0	0	0	0
170: 179	0	0	0	0	0	0	0
N	368	212	147	270	204	124	271
Mean	93.42	94.31	95.59	89.90	93.60	97.15	96.30
SD	22.2	22.10	21.35	22.16	20.20	22.15	21.74
SE	1.36	1.52	1.76	1.35	1.41	1.99	1.32

Table 11. (concl.)

ACE total raw score	Enrolled in 1948	Enrolled in 1948 and completed 2 semesters	Enrolled in 1948 and completed 4 semesters	Enrolled in 1949	Enrolled in 1949 and completed 2 semesters	Enrolled in 1949 and completed 4 semesters	Total completing 4 semesters
			Engineering students				
0: 9	0	0	0	0	0	0	0
10: 19	0	0	0	0	0	0	0
20: 29	0	0	0	1	1	1	1
30: 39	0	0	0	1	0	0	0
40: 49	0	0	0	2	1	0	0
50: 59	4	1	1	4	1	0	1
60: 69	9	6	4	13	8	2	6
70: 79	19	14	11	23	20	11	22
80: 89	26	21	16	21	14	8	24
90: 99	45	35	32	30	26	20	52
100: 109	52	44	33	35	28	21	54
110: 119	43	36	29	35	32	25	54
120: 129	36	30	26	26	24	13	39
130: 139	26	23	18	15	12	11	29
140: 149	7	6	5	1	1	1	6
150: 159	7	5	5	3	3	2	7
160: 169	7	6	6	3	3	3	9
170: 179	0	0	0	0	0	0	0
N	281	227	186	213	174	118	304
Mean	107.6	108.5	109.8	101.2	103.8	107.1	108.7
SD	23.10	22.60	22.60	24.40	23.40	22.30	22.51
SE	1.38	1.50	1.66	1.67	1.77	2.05	1.29

Table 12. A summary of grouped OL scores of those students who enrolled in engineering and agriculture in September 1948 and September 1949 at Kansas State College.

OL raw score	En-rolled in 1948	Enrolled in 1948 and completed 2 semesters	Enrolled in 1948 and completed 4 semesters	En-rolled in 1949	Enrolled in 1949 and completed 2 semesters	Enrolled in 1949 and completed 4 semesters	Total completing 4 semesters
			Agriculture students				
-149: -135	0	0	0	1	1	0	0
-134: -120	1	1	1	0	0	0	1
-119: -105	1	1	1	0	0	0	1
-104: -90	5	4	2	6	5	3	5
-89: -75	8	5	5	6	5	3	8
-74: -60	10	9	6	9	8	4	10
-59: -45	21	17	13	18	14	12	25
-44: -30	23	16	12	38	29	16	28
-29: -15	25	21	13	22	18	12	25
-14: 0	29	26	17	37	29	21	38
1: 15	34	30	16	39	33	15	31
16: 30	31	23	18	29	20	14	32
31: 45	22	17	13	17	13	6	19
46: 60	15	14	10	19	13	10	20
61: 75	14	12	7	11	9	7	14
76: 90	10	7	7	6	5	3	10
91: 105	4	2	2	4	2	1	3
106: 120	4	4	4	2	2	2	6
121: 135	2	0	0	2	2	1	1
136: 150	0	0	0	0	0	0	0
N	259	209	147	266	208	130	277
Mean	2.90	2.15	3.35	-.55	1.75	-.40	1.63
SD	44.05	47.46	50.38	45.69	46.28	46.20	48.15
SE	3.05	3.28	4.15	2.80	3.20	4.05	2.89

Table 12. (concl.)

OL raw score	En- rolled in 1948	Enrolled in 1948 and completed 2 semesters	Enrolled in 1948 and completed 4 semesters	En- rolled in 1949	Enrolled in 1949 and completed 2 semesters	Enrolled in 1949 and completed 4 semesters	Total completing 4 semesters
			Engineering students				
-149: -135	2	2	1	0	0	0	1
-134: -120	0	0	0	0	0	0	0
-119: -105	2	2	0	1	1	0	1
-104: -90	3	2	2	2	2	1	3
-89: -75	4	3	2	2	2	2	4
-74: -60	17	13	10	10	9	7	17
-59: -45	18	12	10	14	12	11	21
-44: -30	21	18	16	13	9	6	22
-29: -15	22	18	16	27	22	6	22
-14: 0	35	28	24	24	22	17	41
1: 15	33	27	20	34	26	21	41
16: 30	34	28	22	27	21	14	36
31: 45	27	25	23	20	17	11	34
46: 60	24	22	19	12	10	8	27
61: 75	16	15	12	9	9	8	20
76: 90	7	5	4	2	2	1	5
91: 105	2	2	2	8	5	4	6
106: 120	1	1	1	2	2	1	2
121: 135	0	0	0	0	0	0	0
136: 150	1	1	1	1	0	0	1
N	269	224	186	208	171	118	304
Mean	2.75	5.15	6.65	5.30	4.10	5.90	6.35
SD	46.65	46.95	45.75	45.60	44.10	44.55	44.25
SE	2.84	3.14	3.36	3.16	3.37	4.10	2.54

Table 13. A summary of grouped grade point averages of those students who enrolled in engineering and agriculture in September 1948 and September 1949 at Kansas State College.

Grade point average	Enrolled in Sept. 1948			Enrolled in Sept. 1949			
	Freshman g.p.a. of all students completing 2 semesters	Freshman g.p.a. of all students completing 4 semesters	Sophomore g.p.a. of all students completing 4 semesters	Freshman g.p.a. of all students completing 2 semesters	Freshman g.p.a. of all students completing 4 semesters	Sophomore g.p.a. of all students completing 4 semesters	Total sophomore & more sample
Agriculture students							
-1.00	0	0	0	0	0	0	0
-.99: -.75	0	0	0	0	0	0	0
-.74: -.50	0	0	0	0	0	0	0
-.49: -.25	7	1	0	4	0	0	0
-.24: -.00	12	3	4	13	2	1	5
.01: .25	15	9	5	21	10	4	9
.26: .50	21	12	7	16	7	8	15
.51: .75	29	20	14	25	12	10	24
.76: 1.00	30	20	17	27	14	19	36
1.01: 1.25	20	18	20	27	21	13	33
1.26: 1.50	22	18	29	19	17	18	47
1.51: 1.75	18	16	15	21	16	16	31
1.76: 2.00	16	12	15	12	12	17	32
2.01: 2.25	11	9	6	13	11	7	13
2.26: 2.50	6	4	9	3	2	6	15
2.51: 2.75	4	4	2	1	1	5	7
2.76: 3.00	1	1	2	3	3	3	5
N	212	147	145	205	128	127	272
Mean		1.01	1.29		1.03	1.38	1.32
SD		.74	.65		.70	.67	.66
SE		.05	.05		.05	.06	.04

Table 13. (concl.)

Grade point average	Enrolled in Sept. 1948: Freshman: g.p.a. of all students completing 2 semesters	Enrolled in Sept. 1948: Freshman: g.p.a. of all students completing 4 semesters	Enrolled in Sept. 1948: Sophomore: g.p.a. of all students completing 4 semesters	Enrolled in Sept. 1949: Freshman: g.p.a. of all students completing 2 semesters	Enrolled in Sept. 1949: Freshman: g.p.a. of all students completing 4 semesters	Enrolled in Sept. 1949: Sophomore: g.p.a. of all students completing 4 semesters	Total sophomore sample:
			Engineering students				
-1.00	0	0	0	0	0	0	0
-.99: -.75	0	0	0	0	0	0	0
-.74: -.50	0	0	0	0	0	0	0
-.49: -.25	3	1	3	5	2	1	4
-.24: -.00	6	4	1	14	2	3	4
.01: .25	8	4	9	10	7	4	13
.26: .50	15	7	17	16	7	6	23
.51: .75	18	12	25	18	12	14	37
.76: 1.00	28	24	25	23	18	19	44
1.01: 1.25	37	32	25	17	13	14	39
1.26: 1.50	29	27	18	22	19	16	34
1.51: 1.75	24	19	21	15	12	16	37
1.76: 2.00	22	21	16	7	5	10	26
2.01: 2.25	7	7	11	8	8	9	20
2.26: 2.50	15	15	5	10	9	3	8
2.51: 2.75	8	8	7	3	3	3	10
2.76: 3.00	5	5	5	2	0	0	5
N	207	186	186	170	118	118	304
Mean		1.30	1.22		1.04	1.22	1.22
SD		.75	.72		.78	.64	.69
SE		.05	.05		.06	.06	.039

A STUDY OF THE OCCUPATIONAL LEVEL SCALE OF THE STRONG VOCATIONAL INTEREST BLANK AS IT RELATES TO PREDICTION OF ACADEMIC SUCCESS IN THE SCHOOLS OF ENGINEERING AND AGRICULTURE AT KANSAS STATE COLLEGE

by

THEODORE C. VOLSKY, JR.

ABSTRACT
OF A
THESIS

Department of Psychology

KANSAS STATE COLLEGE
OF AGRICULTURE AND APPLIED SCIENCE

1952

PURPOSE AND NEED

The purpose of this study was to examine the hypothesis that the Occupational Level scale of the Strong Vocational Interest Blank is related to academic success, as measured by sophomore grade point average, in the schools of engineering and agriculture at Kansas State College.

Because of the acceptance of the OL scale by many clinical and educational counselors as a measure of "level of aspiration" and "motivation" related to academic success, and because of the conflicting research reports related to this scale, the writer considered further research justifiable as a means of providing additional bases for generalization or limitation of generalization about use of the OL scale in educational counseling at Kansas State College.

PROCEDURES AND FINDINGS

Determining Populations

Strong Vocational Interest Blank and ACE Psychological Examination scores of students enrolling in engineering and agriculture in September 1948 and September 1949 were obtained from Counseling Bureau records. Students with incomplete test records were eliminated, and those transferring out of the two schools were retained in the sample only up to the time of transfer.

Non-cumulative freshman and sophomore grade point averages were obtained from the records of the college registrar.

Critical ratios were computed between students entering college in 1948 and those entering in 1949 on the basis of ACE total raw scores, OL raw scores and non-cumulative sophomore grade point averages. No significant differences were found at the five percent level of confidence for any of the three variables and it was assumed valid to combine the two populations. The resultant sophomore samples were 271 students in the School of Agriculture and 304 in the School of Engineering.

Critical ratios were computed between enrolling and sophomore populations on the basis of OL score and ACE score as a means of determining whether those scores were related to staying power in the two schools. Critical ratios of 3.06 and 2.23 in the agriculture and engineering schools respectively, on the basis of mean ACE scores, indicated significant differences at the one and five percent levels of confidence. On the basis of mean OL scores no significant differences were found.

Significant differences were found between freshman and sophomore grade point averages in both schools. On this basis it was assumed justifiable to use the sophomore average as a measure of academic achievement more specialized than at the freshman level.

Critical ratios computed between agriculture and engineering populations indicated that a significant difference between mean ACE scores was the only basis on which the two school populations could be assumed to be drawn from different parent populations.

Determining Results

In the School of Engineering, zero order correlations of .393 between ACE total raw score and sophomore grade point average, and .157 between CL raw score and grade point average were found. Both of these correlations were significant at the one percent level of confidence.

In the School of Agriculture, a correlation of .353 was found between ACE score and grade point average, significant at the one percent level of confidence. A correlation of .084 between CL score and grade point average was not significant at the five percent level of confidence.

Using Snedecor's z factor method to determine whether these correlations in the two schools were drawn from different parent populations, it was concluded that the assumption of different parent populations could not be made.

Computation of multiple correlation indicated that the CL score added no significant increment of predictive value to the zero order correlation between ACE score and sophomore grade point average in either school.

The partial correlation showed no significant relationship between CL score and sophomore grade point average in either school. A partial correlation of -.137 in the engineering school indicated that the ACE score accounted for most of the zero order predictive value of the CL score.

Inspection of scattergrams indicated that the relationship between CL score and sophomore grade point average in the School

of Agriculture might better be described by a non-linear relationship. The correlation ratio was computed to investigate this possibility.

The computed correlation ratio (eta) of .264 was assumed to be the maximum expected correlation. Though much larger than the zero order correlation, when tested by analysis of variance, the difference from zero was not significant. It should be noted that eta squared indicated that only seven percent of the variation in grade point average was associated with change in OL score.

CONCLUSIONS

On the basis of this study, it was concluded that in this instance:

1. A small but significant zero order relationship existed between OL score and sophomore grade point average in the School of Engineering. However, when ACE was ruled our or held constant by multiple or partial correlation, the hypothesis of a significant relationship was not supported.

2. In the School of Agriculture, assuming the five percent level of confidence as the criteria of significance,

a. zero order correlation indicated no significant relationship between raw OL scores and non-cumulative sophomore grade point average.

b. multiple and partial correlations indicated no significant relationship between raw OL score and non-cumulative sopho-

more grade point average when ACE total raw score was held constant or ruled out.

c. The critical ratio indicated no significant non-linear relationship between OL raw score and non-cumulative sophomore grade point average.

3. The data would not support Darley's clinical assumption that OL score is related to staying power in college.

4. The data would not indicate that the OL score significantly differentiates between agriculture and engineering students at Kansas State College.

5. Because in both the engineering and agriculture schools at Kansas State College, the mean OL scores fall more than one standard deviation below Strong's Stanford freshman norms, the writer would be dubious of any comparison made between results of this study and any other study computed on the basis of non-Kansas State populations.