

RESIDENCE AND SCHOLASTIC ACHIEVEMENT

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INTRODUCTION

The prediction of human behavior is frequently cited as one of the major goals of the science of psychology. That individual and social welfare can be enhanced by a knowledge of what will happen under given circumstances has become nearly axiomatic.

A major area of concern regarding prediction has been to gather material which will enable individuals to assess their chances of success in projects which they are considering. Scholastic success has received a large share of the attention of investigators. The value of such attention seems to be, in general, threefold. Improvements in prediction relate directly to the welfare of society, to the welfare of colleges and universities, and to the welfare of the individual.

In an age of increasing specialization and technology, it is to the advantage of society, as a whole, to utilize human resources to the fullest. Scientists, skilled workers, technicians, and specialists of all kinds are vitally needed where they can produce to the maximum. The sooner the probability of success for any particular individual in a given endeavor can be determined, the more economical and efficient can training and placement be made.

The colleges of this country have an increasing interest in the matter of prediction of scholastic success. They, like industry, are concerned with training persons in fields appropriate to them. This stems from practical considerations as well as from concern for the welfare and satisfaction of the individual student. Increasing college enrollments suggest that

unless much larger sums of money are soon made available for higher education, more rigid selection of students will have to take place. Disregarding the principles involved, it may become physically impossible to offer a college education to all those who desire one. Selection, it would seem, will have to be made by accepting those students who seem most likely to succeed in college and in production after college.

The individual's concern over his chances of success remains as vital as ever. It is important to the student to predict his scholastic future from a practical as well as from a psychological point of view. Family sacrifices made in the interest of a college education for a son or daughter should not, if possible, end in scholastic failure. The waste in terms of preparation time is also appreciable. Finally, the change of goals involved after an unsuccessful attempt is often a very damaging experience for the individual.

An understanding of these factors for and against chances of his success can lead the individual to a realistic choice of training, which may not always be in a college. If college is his choice, he can plan and manipulate his environment, insofar as is possible, to include those factors found to be most conducive to scholastic success. Readjustment of certain factors also becomes possible for the student who is not realizing his goals after a trial period in college.

Students, aware of the importance of information regarding themselves and their chances of achievement, now crowd the counseling offices, deans' offices, and the offices of their teachers

and advisors, asking questions. Much research has been done to provide answers to these questions. To add another segment of information to that already available for the answering of these questions is the aim of this paper.

The degree to which prediction is accurate has been increased by the investigation of many factors involving the individual. A number of personal factors, such as ability and achievement, have been found to add greatly to the accuracy of prediction.

Some situational factors, such as teacher efficiency and outside work, have also been found to be related to scholastic achievement. Many others remain which have been ignored but which also appear to bear some relationship to performance in college.

One area which suggests itself as being a potentially fruitful one is that of housing. Yet, to the knowledge of this writer, the relationship between housing and scholastic achievement has not been recently or thoroughly investigated. The lack of information in this area was the primary motivation toward undertaking a study to explore this relationship. Several considerations suggested that the results might be meaningful.

All students spend part of their time in some sort of dwelling. That the dwelling has some effect on their behavior is almost certain. Whether it bears significant relationship to the grades they make is the question which this paper hopes to answer.

If a significant relationship does exist, two possible areas of application become apparent. First, another piece of information would be available to students and their counselors in planning and predicting academic futures. In addition to this, modifications in housing might be a future result. Housing is one of the

more modifiable elements involving students. In fact, deterioration and increasing numbers of students make replacement or modification mandatory periodically.

If changes are indicated, it is hoped that they will come as a result of a series of variously focussed studies, of which this is merely an introductory one.

BACKGROUND AND REVIEW OF LITERATURE

The history of prediction has been a constantly changing one. Regarding scholastic achievement, studies have ranged from those involving simple reactions to those using numerous factors and elaborate statistical techniques.

The criterion has remained nearly constant, however. Grade point average has been the index of scholastic achievement almost universally used. Challenges of it as an adequate measure of success could be easily and legitimately raised. It still remains, however, the most easily accessible and quantifiable index. In addition to this, it is a criterion and sometimes the sole criterion used by colleges, prospective employers, and others who are assessing individual achievement and promise. This makes it valuable and realistic to the student as a basis for prediction.

Categories of Prediction

Horst (13) has defined two groups of factors responsible for variation in performances of individuals. These factors he calls personal and situational. Among the personal factors he places all psychological and physiological characteristics of the individual

which are functions of his congenital equipment and its interaction with the environment.

Situational factors may include anything which affects the behavior of the person but which is external to and relatively independent of him.

The distinction between these two kinds of factors is not always easily drawn, nor is it necessary to do this in order for meaningful knowledge about them to be gathered. However, when one is concerned primarily with social control, the distinction seems useful. It is among the situational factors that one finds those most amenable to manipulation. By designating these factors, attention seems more easily focussed on them and new possibilities for their study and the study of the relationships between them become more discernible.

Bases of Prediction

Horst (13) has described, in a way which seems very useful, three general bases for the prediction of variation in performance between individuals. These are:

1. Probationary performance
2. Proficiency tests
3. Personal and social characteristics

Probationary Performance. In prediction using probationary performance, past achievement is used to estimate future performance in the same type of activity. Performance in high school has been widely utilized to predict that in college and high school rank remains the best single predictor of college achievement. By combining high school rank with a measure of scholastic aptitude, one can predict with even greater accuracy. In studies using

high school rank, the correlation coefficients between rank and college grades have averaged around .50. Multiple correlations using scholastic aptitude as well as rank have achieved coefficients of .60 or more.

Proficiency Tests. A measure of an individual's proficiency in a skill considered necessary for future performance is frequently used as a predictor. Many colleges now select or assign students on the basis of tests measuring English, mathematics or other achievements. When correlated with grades, such measures yield coefficients clustering around .45.

Personal and Social Characteristics. This category may include all other factors associated with the individual which appear to affect his performance. Intelligence, personality, interests, and background are some of the factors which suggest themselves for investigation in this grouping.

With the exception of those involving intelligence, attempts at prediction using the above factors and similar ones have been fairly recent. Some attempts to relate personality traits to college achievement were made in the 1930's and 1940's. However, Travers, (30) in an article written in 1949, criticized prediction efforts on three points, one of them being that most attempts had been merely the reworking of previous projects. He had tabulated 1000 prediction studies done in the previous 15 years and claimed that most of them had tried to refine previously used measures instead of testing new elements which might be significant. He writes:

...it should be noted that many published studies represent repetitions of studies previously carried out by numerous independent investigators, and many are original only in relatively minor details. Not only

have small investigations of the prediction of academic aptitude been undertaken without reference to previous work in the same area, but the same has often been true of large "experimental" testing programs. (26, p. 293)

...there is a need of knowledge on the extent to which commonly occurring variations in the student's environment affect the achievement of various outcomes. (30, p. 294)

Attempts at Prediction Through Use of Personal and Social Factors

Today it seems that many investigators have applied themselves to the problem of factors related to scholastic achievement. Some of the more significant of these studies will be mentioned in the following paragraphs. These studies include, among the personal factors, work on the relationship between scholastic achievement and background factors, interests and personality.

Investigations of situational factors will also be cited. These involve differences in teacher ability and curriculum, participation in extra-curricular activities, athletic participation, part-time work, and quality of study habits.

In addition, a review will be made of the limited research done in the area which is the concern of this paper, that is; housing.

Background Factors. Many studies using various background factors have been reported. Small positive relationships have generally been found between these and scholastic achievement but no evidence can yet be cited as conclusive. For example, both Dearborn (6) and Gough (9) have found relationships between socioeconomic status of parents and achievement. However, in Dearborn's study, these predictors were in combination with other proven

predictors and the study failed to show what effect socio-economic factors might have by themselves. When Gough held intelligence constant, the relationship which he had found diminished significantly.

In a factor analysis of the relationship between grade points and other factors, McQuary (18) reported two factors emerging. One included traditional items such as high school rank and scholastic ability. The other included the background items of size of community and extra-curricular participation, in combination with high school rank. McQuary suggested the possibility of a new approach here but with reservation, since his sample was not a random one.

Several studies have contrasted prediction by test results and prediction by test results plus additional knowledge about the student i.e., clinical versus actuarial. Conflicting results are reported, leaving the question an open one. Sarbin (24) reported that skilled counselors were not able to improve on actuarial predictions with the aid of knowledge of other personal factors. Smith (26) found, however, that by the use of personal documents in addition to scholastic aptitude test score, counselors were able to improve upon the prediction made by the scholastic aptitude test score alone.

Meehl (19), in an extensive review of the literature regarding the comparison of statistical and clinical prediction, concluded that clinicians using personal information in addition to test results predict no more accurately than does the test data alone.

Interest Factors. In summarizing the relationship between interests and scholastic achievement, Super (29) uses Strong's explanation:

If a student has sufficient interest to elect a course his grade will depend far more on his intelligence industry, and previous preparation than on his interest. Interest affects the situation, however, in causing the student to elect what he is interested in and not to elect courses in which he is not interested. When a student discovers he has mistakenly elected a course in which he has little interest, he will finish it about as well as other courses but he will not elect further courses of a similar nature. (29, p. 428)

To this Super (29) adds:

When a student is compelled to take a course or to study in a field not of his own choosing, the relationship between interests and achievements will be more nearly comparable to that of intelligence and achievement. (29, p. 428)

He is able to report only one study to support this hypothesis, however.

Illustrative of some of the studies done in this area is one done at Kansas State College by Wilhoite (34) who in a study with high school seniors, used occupational interest level as measured by the Strong Vocational Interest Blank to predict grades. He found a significant relationship between level of interests and achievement. No relationships was demonstrated between high ratings on specific keys and scholarship or between scholarship and the interest maturity score.

Altender (1) found positive relationships between specific Strong keys and college grades. Young and Estabrook (35) were able to develop a "studiousness" key for the Strong, which, when combined with a scholastic aptitude test score, raised the correlation with grades to about .60.

Volsky (32), in a study at Kansas State College found no significant relationship between Occupational Level score on the

Strong and grades in engineering or agriculture with scholastic aptitude held constant. This follows the general trend as reported by Strong (28) although isolated studies (especially by Kendall and Ostrom) found significant positive relationships between occupational level score and achievement at the college level.

Personality Measures. A number of studies have been reported utilizing various personality tests and measures. Most of these have yielded negative or inconclusive results. Super (29) reports negligible results in studies for the Bell Adjustment Inventory, the Bernreuter Personality Inventory and the Minnesota Multiphasic Personality Inventory. Several investigators have developed keys which predict academic achievement but do not improve prediction made by high school rank.

A measure of persistence used by Ryans (23) yielded a correlation coefficient of .73 with grades when combined with intelligence. Unfortunately, this surprising relationship was not demonstrated in further investigations, (Hoyt 14).

The Rorschach test has been used fairly successfully in several investigations but the difficulty of its administration has turned the attention of investigators to more easily manipulated tests.

The Minnesota Multiphasic Personality Inventory has captured the attention of many of these. Gough's Ac scale (8) predicted grades for high school seniors to a significant degree (.43). When combined with aptitude and achievement measures, the multiple correlation rose to .80.

Hoyt (14), in a study using a scale which he developed from the MMPI in combination with other personality and achievement variables, reported that for his group of male college freshmen, high school rank still provided the best basis for prediction. No significant increment in predictive efficacy resulted when other achievement or personality measures were combined with this factor.

In a recent publication, Schofield (25) reported a study relating scores on MMPI scales to academic success in medical school. He found scores on the Hy, Pd and Sc scales negatively related to honor point ratio.

Situational Factors. The area of situational factors has probably been the most neglected of those areas offering bases for prediction. Numerous factors are present here which have never been subjected to investigation. Devising methods for their study would appear to challenge the imaginations of interested students. In addition, for those interested in social control and manipulation of the environment, the possibilities regarding the situational factors seem much greater than those regarding personal factors. Situational factors, in general, are vastly more amenable to change.

The few studies which have already been done on situational factors have, in general, proven to be inconclusive but suggestive of further research. Many of them suggest relationships which, under scrutiny, may prove to be of great value in counseling and prediction. Some of the significant ones will be cited in the following paragraphs.

Horst (13) cites several examples of research which has been done in this area. He reports a study by Oberholzer in which 41 percent of the difference between classes was attributed to the differences between ratings of their teachers regarding their ability to teach.

Another study by the Progressive Education Association (Bromley, 3) investigated the effect of the content of the high school curriculum on college achievement. They found that the actual content of the high school curriculum had no effect on college grades. In fact, those students who came from schools not adhering to college entrance course requirements but working toward broader educational goals, did slightly better in college than those who had been taught the courses required for entrance. This illustrates the conclusions reported in the Encyclopedia of Education Research (Monroe, 20) which states that all similar studies have found this relationship to be negligible. Regarding the relationship between scholastic achievement and extracurricular activities, the Encyclopedia of Educational Research (Monroe, 20) summarizes the findings as follows: "In general, the findings indicate that the scholarship of students participating in extracurricular activities is higher than that for students not participating." (20, p. 1345).

Fiedler (7), in a local study, found a similar positive relationship between grade point average and participation in extracurricular activities. The relationship between leadership and scholarship was closer than that between scholarship and general participation in extracurricular activities. Unfortunately, ability

was not considered in this study. It is probable that both grades and participation are a function of scholastic aptitude, and thus may have little direct relationship.

Patrick (21), in a study of athletes and non-athletes, reported a small but reliable difference in the junior spring and combined spring semester grade point averages. The non-athletes were slightly superior to the athletes. Scholastic ability was not held constant in this study, although the author states that there was no reliable difference between the abilities of the two groups.

An article reporting an investigation of the relationship between part-time work and scholastic achievement has been published by Bateman (2). He found the grade point average of the workers significantly lower than that of the non-workers. This study, however, was done with high school students and differing results might be expected with college students.¹ The most relevant available data on college students comes from housing studies which indicate consistently lower achievement for those students working for room and board. (Van Alstine, 31).

Recent investigations of study habits have been carried on by Brown and Holtzman (4) in validating their study attitudes questionnaire. They report substantial correlations (.40-.56) between grades and scores on their test of study habits and attitudes. Since they also report a negligible correlation between that test and scholastic aptitude test scores, this area may be a very promising one for further study.

1. The Placement Office at Kansas State College is now conducting a study to investigate the relationship between part-time work and scholastic success.

Housing. The last situational factor which will be mentioned here, and the one with which this paper is concerned, is that of housing. In spite of the suggestions for the possibility of variation here and the availability of data and comparative ease of quantification, this writer was able to find only a few studies focussing on various kinds of student housing as related to academic achievement.

An early study (1924) of freshmen at the University of Minnesota (Johnston, 17) compared the scholarship of fraternity and sorority pledges and non-affiliated freshmen. Ability ratings were used for each student combining intelligence and high school performance.

When the Greek and non-affiliated groups were compared, only two significant differences were revealed. Fraternity pledges were shown to be superior to independent men in ability but to function at a lower scholastic level. Sorority women, however, ranked below the independent women in ability but did better scholastically.

Another early study was done by Grote (11). Her study used only women subjects and, although we cannot generalize to male students, the study resulted in some interesting conclusions.

The subjects utilized lived in seven kinds of residences. They were compared on a number of factors: intelligence, high school record, hours of study per week, scholastic record, health scores, absences due to illness and participation in extra-curricular activities. Objective data were supplemented by interviews, observations and ratings.

Grote concluded that those women living in private homes were highest in academic achievement with those living in the dormitories second highest. The dormitories surpassed the private homes in health promotion and social activity. The lowest scholastic records were made by those women who did light house-keeping or who worked for their room and board.

At about the same time, Walker (33) did a similar study at the University of Chicago. He used subjects from four types of residences: private homes, rooming houses, residence halls and fraternity chapter houses. There were no sororities on this campus.

These housing groups were compared on various measures of scholastic success and on measures of initial characteristics.

The author sums up the results as follows:

"In the various comparisons which have been made the residence hall has been found to have the highest correspondence with success in the university. This association was apparent, whether the success was measured by the gross averages of the criteria of success by the quantitative comparison of the types of housing through the use of regression equations or by the relation of change of type of housing to university success. The home was second by the same standards for measuring the relation of housing to university success. The rooming house and chapter house had the lowest correlation of initial characteristics with university success. The men in the chapter houses were somewhat superior to the average in ability, but their success was inferior. The fraternity members in the chapter houses achieved less than did members in other types of housing. The students who changed types of housing made the lowest grades during the quarters they lived in the chapter houses. The only point on which those in the chapter houses ranked high was in the extent of participation in student activities, and even in this they were excelled by those in the residence halls and by the fraternity members in other types of housing." (33, p. 57)

Van Alstine, et al., (31) did a later study at the University of Minnesota investigating a similar problem. They drew the following conclusions from the literature available prior to their study:

1. There is considerable interest in the problems of housing of university students.
2. Group housing situations seem preferable to non-group situations.
3. Students living in college dormitories usually ranked above average in scholarship; and students who do light housekeeping or who work for their room and board usually ranked below average in scholarship.
4. Students living in fraternity or sorority chapter houses usually have average scholarship (31, p. 388).

The subjects used in this study were students enrolled in six professional colleges within the university. These were the Colleges of Medicine, Law, Pharmacy, Engineering, Business and Education. Therefore, many of the subjects had been enrolled in College courses for a minimum of two years. Only those in engineering had entered directly from high school. These subjects were living in four types of residences. These were: home, private residence, college dormitory and fraternity and sorority chapter houses.

The authors point out that the use of only freshman data here would have attacked the problem of housing more directly. By using those students who have survived college to the professional school level they have excluded all those who, for any number of reasons, dropped out of college. Unsatisfactory housing may have been a cause in many of these cases but this would be impossible to identify. After a minimum of two college years, the authors have

left those of high ability and those who have adjusted to or manipulated conditions in their environment which they found unsatisfactory in their first years of study.

The measure of scholastic ability in this investigation was the high school average. College grade average was also obtained and these data were subjected to analysis of variance and covariance. Ability was held constant and the attempt was made to determine whether a significant amount of the variation in grade average could be ascribed to differences in place of residence.

Only in the college of Pharmacy did significant differences appear. Freshmen in private residences made significantly better grades than did the dormitory group. They also surpassed the fraternity group and the group who lived at home.

The tentative conclusions drawn by the authors of this study are that in the Colleges of Medicine, Law, Engineering, Business, and Education, place of residence made no appreciable difference as far as academic achievement was concerned. In the College of Pharmacy, living in a private residence seemed to be an advantage in getting high grades. The authors point out that the samples used in this study were quite small (95 in the College of Pharmacy) and therefore render the findings inconclusive. The numbers in the samples were decreased because only those who remained in the same housing category throughout the experiment were considered. This fact suggests that the samples may not have been truly representative of the population from which they were drawn.

A study somewhat similar to the one above was done at the University of California, College of Agriculture, at Davis, by

Peterson (22). He used matched groups from the various housing categories, equating them for sex, major field of study, amount of educational background, scholastic aptitude, and college attendance in the same semester of the same year. These students lived in five types of housing: home, dormitories, fraternities, rooming houses, and cooperatives.

The arithmetic -mean grade-point averages were computed for the different matched groups and the reliability and significance of the differences determined.

From this treatment the authors concluded that at Davis the various types of living quarters may be listed according to their desirability for producing conditions conducive to high scholastic attainment. In decreasing order of desirability they are: dormitory, cooperative, rooming house, home, and fraternity.

The most recent of the housing studies known to this writer was done by Halbower (12) at Kansas State College. He studied sorority and unaffiliated women regarding a number of characteristics which were thought might differentiate the two groups. Halbower reports that no differentiating characteristic emerged. In regard to scholastic achievement he found a small but non-significant difference in favor of the sorority group.

One disadvantage of this investigation is that the subjects were all upperclassmen with varying periods of college attendance. Therefore, it is likely that differences in performance due to housing conditions may have been obscured by adjustment throughout the college career or by dropouts from college.

These studies of the effect of housing type on scholastic achievement point out some relationships which might very well

have value for the whole field of the prediction of college success. It was felt that a current study of this relationship might be valuable. In the 12 years since the last of the intensive studies was made, many characteristics of college students and college life have changed. The current study is planned to give us a more realistic picture of the housing-scholarship relationship as it exists today.

A picture of the situation at Kansas State College is also felt to be valuable for use in counseling in the local setting. Each college is unique and the differences between Kansas State College and the University of Minnesota are particularly striking.

The background experiences of the two student populations are very different. The students at Minnesota are predominantly from urban backgrounds while those at Kansas State are mostly from farms and very small towns.

Kansas State College is approximately one-fourth the size of the University of Minnesota and, in addition, has very few students living in their own homes. Almost half of the students at the University of Minnesota are residents of the Twin Cities. Population differences are even more striking; the Twin Cities claim a population of over one million, compared to the less than 20,000 in Manhattan. One can reasonably infer great differences in extra-classroom behavior from this fact alone.

Differences in results of research might be anticipated from the dissimilarities in size, location, and student background.

In addition, an attempt has been made to overcome certain weaknesses in the experimental design of earlier studies. The following are felt to be weaknesses:

1. The measures of ability used are not always objective or collected under the same conditions. Possibly unreliable ratings or high school averages obtained from dissimilar schools are used in several of the studies. (11, 17, 31, 33)

2. The design of several studies made impossible the use of an entire population or a random sample of the population. (22, 31)

3. Course load is not considered in any of the studies. The amount of work which a student is attempting to complete may have considerable effect on his success. (11, 12, 17, 22, 31, 33)

4. Some of the previous studies were restricted to students in a very narrow range of curricula. In one of the intensive studies they were all students in professional schools and in the other they were all attending college of agriculture. (22, 31)

5. The previous studies used subjects who had had varying periods of attendance in college. It is felt that those who had had practice in adjusting to college and environmental conditions would not be reacting maximally to the conditions existing in their housing situation. (11, 12, 22, 31, 33)

6. In the California study there were included some freshmen women who were required to live in the college dormitory their first year. The fact that they had no choice of housing may have minimized the differences that were found. (22)

7. Married students were not considered in any of the studies cited. This category has undoubtedly become large enough for consideration only in the years since these studies were completed. Its importance in the current academic picture seems to warrant its inclusion now. (11, 12, 17, 22, 31, 33)

PURPOSE

With the foregoing investigations and possible modifications in mind, three purposes for this study were enumerated.

First, it is desirable to describe the various housing groups in terms of their scholastic success, their ability and their course loads.

Next, it is of interest to note the relationships of these factors to one another.

The third and major goal was to investigate, in a current setting, the nature of the relationship which might exist between place of residence and academic success. The previous studies suggested that such a relationship did exist, and it was hoped to add to the data already collected about this relationship in a different setting and with certain modifications.

The hypothesis set up to be tested is as follows stated in the null form:

With scholastic aptitude and course load held constant, no differences in scholastic achievement as measured by grade point average will emerge among the various housing groups.

PROCEDURE

The procedure employed in this study was very similar to that used in the more fruitful studies already cited. Cognizance was taken of the weaknesses of these investigations and an effort made to improve upon their design. The following modifications were made:

1. The measure of ability used was an objective test score obtained from each student under identical conditions and at the same time.
2. For three housing groups the entire population was used. Random samples were utilized for the other two.
3. The course load of each student was utilized in the computations involved in this study.
4. Students enrolled in all curricula offered at Kansas State College were included in this study.
5. Only first semester freshmen were included as subjects.
6. Only those students who had a choice in their place of residence were included in the investigation. This choice is only relatively free since all men who wish to join fraternities may not be accepted. Similarly, the college dormitory cannot accept all applicants.
7. Married students were considered as a separate housing group.

Sample

The sample in this study consisted of men enrolled as freshmen at Kansas State College in the fall semesters of 1953 and 1954. These men, to the knowledge of the investigator, had never attended any college before. Their entrance records indicated no previous credits earned at Kansas State or any other college. Excluding error, none had had any "practice" at doing college work. Freshmen were selected for this reason and the study was restricted to men since women have no choice of housing at Kansas State College in their freshman year but are required to live in college dormitories.

Four types of housing are available to men students:

1. They may stay in a college owned and operated dormitory which supplies room but not meals.
2. They may elect to join a fraternity and live in one of 21 fraternity houses which supply both room and board.
3. Nine organized independent houses are in operation, some of which provide board as well as room.
4. Numerous rooming and boarding houses are privately operated near the campus. A small number of students also live with parents or other relatives. All these categories were designated as private housing.

In addition to these categories, another was defined for the purposes of this study. All married freshmen men were treated in a separate category since unsystematic observation had suggested that differences might be particularly significant here. It was assumed that all these men maintained a separate residence unit with their wives and children.

The men residing in each type of housing were identified from lists maintained by the college housing office. All married freshman men (25 in 1953 and 35 in 1954) and all those freshmen living in the dormitory (72 in 1953 and 80 in 1954) and organized houses (30 in 1953 and 71 in 1954) were used in this study. A random sample of 100 for each year was taken from each of the fraternity and private categories.

Variables

The criterion for scholastic achievement chosen was the grade point average for the fall semester. These averages were obtained from the Registrar's Office and had been computed on the basis of grade points assigned for each semester hour completed. Grade points had been assigned as follows: A, three points; B, two points; C, one point; D, no points; F, minus one point.

The total raw score on the American Council on Education Psychological Examination, Form 1952, (A.C.E.) was used as a measure of scholastic ability. This test is administered routinely as a part of the orientation battery to all entering students at Kansas State College. It has been shown to correlate significantly with grade point average in each of the schools within Kansas State College (15).

Fall semester course load was also determined for each of the 650 subjects. It was felt that this was an important variable which should be held constant in studying the variation in achievement. Some students were found to be enrolled for as little as one hour while others were carrying loads of 18 and 19 hours.

A report prepared and distributed by the Dean of Academic Administration (10) suggested another method of determining course difficulty. This report showed the grade point averages earned in each department of the college. There were great differences here, indicating that it is much more difficult to earn a high grade in some departments than in others. In those courses enrolling freshmen students, average grades point averages varied from .90 in English to 2.18 in music.

These freshman courses were separated into five groups and weights per credit hour were assigned to each of them, the most difficult receiving a weighting of five and the easiest a weighting of one.

A total weighted load was then computed for each subject on the basis of the credit hours which he was carrying in each category of difficulty. A great spread of weighted loads was again observed here. They ranged from a weighted score of four to ones of 78.

This weighting system was, therefore, constructed to correlate negatively with grade point average. However, an inspection of the zero order correlation between the difficulty index and grade point average indicated that the two were positively related.

Obviously, by combining the weighting system with number of hours, we had confounded two dissimilar indices. A check on the relationship of number of credits to grade point average confirmed this suspicion. Number of credit hours was uniformly correlated positively with achievement.

Since the investigation had already progressed too far to allow for alteration of this index, the "pure" variable, number of credit hours, was used as an alternate measure of difficulty.² It would be desirable to repeat the investigation using a pure measure of load difficulty uncontaminated by the number of credit hours.

Method

These data were subjected to an analysis of variance and covariance.

2. The two variables, difficulty index and number of credit hours, are referred to later in the paper as "course load" variables.

RESULTS AND DISCUSSION

Description of the Groups

An initial survey of the distributions of the variables among the various housing groups indicated several general trends. These findings are summarized in Table 1.

Table 1. The unadjusted means and their standard deviations for grade point average, ACE score, course difficulty and number of credit hours.

<u>1953 Sample</u>									
Group	GPA		: ACE Score		: Difficulty		: Credit Hours		
	M	S.D.	M	S.D.	M	S.D.	M	S.D.	
Frat. (N=100)	.78	.72	96.17	23.69	56.07	11.55	14.38	2.07	
Priv. (N=100)	1.01	.77	103.06	25.66	58.16	10.74	15.01	2.12	
Dorm. (N=72)	.95	.75	100.14	26.55	58.49	11.02	15.06	1.96	
Org. (N=30)	.95	.68	101.93	21.54	54.50	10.02	14.53	2.01	
Marr. (N=25)	1.37	.82	109.16	23.45	51.68	13.53	13.40	2.43	
<u>1954 Sample</u>									
Frat. (N=100)	.96	.99	105.69	23.14	58.99	15.49	14.65	2.54	
Priv. (N=100)	1.01	.82	103.31	24.90	55.83	13.66	14.41	2.88	
Dorm. (N=80)	.87	.70	100.35	22.28	52.64	12.17	13.90	2.74	
Org. (N=71)	1.09	.78	102.44	24.17	57.46	11.64	14.90	2.11	
Marr. (N=35)	1.30	.71	105.57	20.24	58.29	9.01	15.17	1.52	

The married group showed a noticeably higher grade point average in both samples. In the 1953 sample the private group ranked next highest, followed by the dormitory and organized groups, whose averages were identical. The fraternity group was lowest. However, the order was changed in the next year's sample, with organized second highest, private next, fraternity next, and dormitory at the bottom. The fraternity group in the second year's sample showed a particularly high standard deviation.

A great shift is noticeable in the ACE scores of the fraternity group from 1953 to 1954. This group has the lowest average score on the first sample but the highest on the second. The married group, which is highest in the 1953 sample is second highest in 1954, followed by the other three groups whose averages are very similar.

Shifts between the two years of several points in the difficulty index are also discernible. The average index of the fraternity, organized and married groups increased, while the others showed a decrease. These trends were paralleled by the averages of the number of credit hours. In the first year's sample, the highest difficulty index was held by the dormitory. In decreasing order, the others were held by private, fraternity, organized and married. This order changed in the second sample. The decreasing order was: fraternity, married, organized, private and dormitory.

With the exception of grade point average of the married groups, mean differences between groups on all variables are slight, and overlapping is great. Nevertheless, an analysis of variance showed significant differences among groups on all variables except the ACE in 1953. In 1954, only mean scores on the difficulty index were statistically non-homogeneous. As noted earlier, trends on all variables from 1953 to 1954 are inconsistent, and thus difficult to interpret.

Relationships Among the Variables

Intercorrelations among the various factors by housing groups indicated positive relationships between each factor and all the other factors. These relationships are seen in Table 2.

vary from .25 to .49, with the exception of the coefficients for the married group in the 1953 sample. This coefficient is much lower than any of the others (.10).

Small positive correlations also obtain between grade point average and credit hours, indicating a tendency for those students earning higher grades to carry more hours of course work. These coefficients range from .27 to .49.

The coefficients derived from the correlation of ACE scores and credit hours, are positive, although, in general, not as high as those between ACE scores and difficulty. This might suggest that there is more choice of course of study on the basis of course difficulty than on the basis of number of credit hours alone. All but one of the coefficients fall between .16 and .46. The correlation between these factors for the 1953 organized group is unusually low, yielding a coefficient of only .04.

In Table 3, comparison between the two samples in terms of

Table 3. The intercorrelations between the various factors within total yearly groups*

	ACE	:	GPA	:	Difficulty	:	Hours
ACE	---		.60		.26		.20
GPA	.50		---		.34		.32
Difficulty	.40		.36		---		**
Hours	.35		.41		**		---

*Correlations above the diagonal are for the 1953 sample, those below are for the 1954 sample.

**The correlation between difficulty and hours was not computed. correlational trends can be observed. In general, it appears that the ACE correlates higher with grade point achievement in 1953 than

in 1954, whereas the reverse is true of the other predictors (difficulty and credit hours). However, the ACE also appears to be more independent of the latter two measures in 1953 than in 1954 so that no general statement regarding the predictability of grades for the two years can be made on the basis of cursory inspection of the data.

As in the case of Table 1, differences noted in Tables 2 and 3 are, for the most part, small. Tests of statistical significance were not made except indirectly as a test of one of the assumptions underlying the statistical method used to test the major hypothesis.

Test of the Major Hypothesis

As stated earlier, the major hypothesis, in the null form, was that grade point achievement between housing groups is homogeneous when scholastic ability and indices of difficulty of course load are held constant.

The statistical tool chosen to test this hypothesis was the analysis of covariance. Several assumptions underly the use of this technique. Experimental errors are assumed to be normally distributed about zero with equal variance and covariance within the several groups. In addition, homogeneity of partial regression coefficients is assumed.

As a check on the assumptions regarding normality of distributions, each measure was plotted for each group. No statistical tests were performed, but, by inspection, the data appeared to be relatively normally distributed in each instance. Grade point average did appear to be somewhat skewed positively, but not

seriously so. Surprisingly, number of credit hours yielded a distribution very close to the theoretical normal curve.

The hypothesis regarding the homogeneity of variances and covariances was tested by the Welch-Nayer L_1 test (27). For the 1953 sample, this hypothesis was accepted at all states i.e., for unadjusted data, for data adjusted for ACE, and for data adjusted for both ACE and difficulty or credit hours. However, the hypothesis was rejected for the 1954 group in all instances where adjustments were made. Inspection of the adjusted variances suggested that the fraternities were considerably more variable than other groups in the grade achievement when ACE and/or the "course load" variables were controlled. This finding is discussed later on in this report.

How serious is the failure to meet this assumption? No definite answer can be given. Cochran (5, p. 28) has this to say.

..there will be as a rule a loss of efficiency in the estimates of treatment effects. Similarly, there will be a loss of sensitivity in tests of significance. If the changes in the error variance are large, these losses may be substantial. The validity for the F-test for all treatments is probably the least affected.

Though these words are not entirely encouraging, it is some consolation to note that the overall F-test with which it was planned to test the major hypothesis is probably least affected by this anomaly in our data.

Tables summarizing the L_1 test computations are provided in the appendix.

In testing the assumption regarding the homogeneity of the partial regression coefficients, a similar difficulty was encountered. Thus, while the hypothesis of homogeneity was accepted for the

1954 sample, it was rejected ($05 > P > .01$) for the 1953 groups. Table 4 lists the regression coefficients for each group and each year.

Table 4. Table of partial beta weights

1953				1954				
Group:	ACE(X ₁)	:	ACE(X ₁)	:	ACE(X ₁)	:	ACE(X ₁)	
:	and	:	and	:	and	:	and	
:	Diff.(X ₂)	:	Hours (X ₃)	:	Diff.(X ₂)	:	Hours (X ₃)	
	$b_{yX_1.X_2}$	$b_{yX_2.X_1}$	$b_{yX_1X_3}$	$b_{yX_3.X_1}$	$b_{yX_1.X_2}$	$b_{yX_2.X_1}$	$b_{yX_1.X_3}$	$b_{yX_3.X_1}$
Frat.	.0189	.0067	.0189	.0464	.0198	.0067	.0136	.0946
Priv.	.0135	.0147	.0141	.0719	.0143	.0143	.0152	.0700
Dorm.	.0141	.0140	.0132	.1260	.0074	.0166	.0083	.0935
Org.	.0107	.0426	.0153	.2514	.01980	.0128	.0197	.0673
Marr.	.0267	.0225	.0259	.1014	.0184	.0154	.0186	.1620

By inspection, it is clear that the coefficient associated with the ACE is unusually large for the married group in 1953, whereas those associated with the difficulty index and credit hours were inflated for the organized houses. That similar trends did not occur in 1954 suggests that this finding is not necessarily inherent in housing differences, but may be unique to the particular year and sample available in 1953. To speculate further regarding this finding is unwarranted without additional information regarding the housing groups and the environmental conditions prevailing in 1953.

What effect does failure to fulfill this assumption have? No precise statements have been found in the statistical literature. The decision was made to go ahead with the analysis of covariance with the realization that reservations regarding the final test must be made due to the inability to completely satisfy the statistical assumptions.

Tables summarizing the computation basic to the test of this assumption are included in the appendix.

Having checked the assumptions underlying the statistical technique which was desired to test the major hypothesis, that test became the next problem. In brief, the results were as follows: For the 1953 samples, the hypothesis was rejected; grade point averages were not homogeneous among the various housing groups when both ACE and either of the "course load" variables was held constant. For the 1954 groups, however, the hypothesis was accepted. Tables summarizing the complete analysis of variance and covariance are included in the appendix.

Tables 5 and 6 have been prepared as an aid to the interpretation of these findings. Three major results emerge from an examination of these tables. (1) The achievement of married students

Table 5. The means of the grade point averages and their deviations by housing groups adjusted for scholastic ability and course difficulty

Group	1953 Sample		1954 Sample	
	Mean	S.D.	Mean	S.D.
Frat.	.86	.54	.90	.89
Priv.	.95	.66	1.00	.68
Dorm.	.93	.61	.97	.65
Org.	.96	.45	1.08	.55
Marr.	1.32	.40	1.25	.57

even when adjusted for ability and course load, remains relatively superior to that of students in other groups. It appears obvious that the statistical significance found in 1953 is due in large part to that group. (2) Excepting married students, the average adjusted achievements of other groups are very close together. (3) Despite

Table 6. The means of the grade point averages and their standard deviations by housing groups adjusted for scholastic ability and number of credit hours

Group	1953 Sample		1954 Sample	
	Mean	S.D.	Mean	S.D.
Frat.	.87	.53	.92	.88
Priv.	.94	.66	1.03	.67
Dorm.	.93	.58	.97	.62
Org.	.94	.48	1.06	.55
Marr.	1.34	.44	1.21	.55

the apparent homogeneity of adjusted means, a consistent hierarchy in terms of adjusted achievement results. In each instance, the groups are ordered in terms of their achievement in the following manner: married, organized, private, dormitory and fraternity. A minor exception occurs in the 1953 sample when AGE and number of credit hours are controlled. Here, organized and private groups are tied for second rank.

Although this hierarchy is consistent throughout the samples and with various measures considered, the differences among the housing groups (other than married) are slight and not statistically significant. Thus, while a trend does emerge, the magnitude of the differences defining this trend is so small that statistical significance is lacking.

Certain similarities obtain between these findings and several of the other studies cited previously. Two of the studies done at the University of Minnesota as well as the one done at Davis and at the University of Chicago found the fraternity group at the bottom of the hierarchy, as did this one. Private rooming houses in the Davis study were found to occupy a middle position as in the present

study although a slight tendency was noted in the earlier Minnesota study for them to be more desirable than indicated at Davis or at Kansas State College.

A striking difference is discernible in the position dormitory occupies in the present investigation as opposed to the other studies. In the others it has been placed at or near the top in the order of apparent desirability for academic success. In this study, it is found to be next to the lowest group.

Consideration of the above data suggested that first semester grade point average may not be the only variable associated with housing differences. Whether or not a student was able to persist over a period of time was thought to be an equally important question. Even though this question is tangential to the major purposes of this study, it was thought to be worthy of preliminary investigation. Tabulations were subsequently made of the students from both years' groups who were still enrolled at Kansas State College in the fall semester of 1955, and are presented in Table 7.

Table 7, Percentages of students in each housing category still in school after one and two year intervals

Group	Number: in : 1953 :No. in 1955:Percentage:			:Number: : in : 1954 :No. in 1955:Percentage:		
Frat.	100	50	50	100	70	70
Priv.	100	58	58	100	74	74
Dorm.	72	37	51	80	50	63
Org.	30	18	60	71	52	73
Marr.	25	22	88	35	29	83

It was hypothesized that a hierarchy established on the basis of percentage of students remaining in college might yield different

results from one based on grade point average alone. Some groups conceivably might generate satisfactions with college life aside from those of earning high grades. For example, the identification with group believed to be present in the fraternity and organized groups might add enough to satisfaction with college so as to cancel out the lack of satisfaction with grades.

The tabulation did not seem to bear out this hypothesis. Table 7 indicates that a rank order based on students entering Kansas State College in 1953 and still enrolled in 1955 is identical to that derived from adjusted grade point averages.

The rank order derived from tabulations of those entering in 1954 and still enrolled in 1955 differs slightly from the order of adjusted grade point average means. In this order the married group is still at the top, followed by private and organized whose percentages remaining differ by only one percentage point. Fraternity moves up one rank to fourth instead of fifth and dormitory is at the bottom.

Any conclusions drawn from this tabulation must be very tentative ones since there is so much information about these 1953 and 1954 freshmen that is not available.

It is not known, for instance, how many of them may have transferred to other colleges and how many are actually out of college at this time. Some of those who transferred may have done so because of dissatisfaction with housing whereas some may have done so for reasons entirely extraneous to the housing situation.

Similarly one has no way of knowing how many of these students changed their place of residence at Kansas State College. Those

who did so may have changed very soon after the initial tabulations were completed. It is possible that the bulk of college experience did not occur in the place of residence cited initially.

No data were available on the numbers of these students who may have been called into the armed services during their enrollment at Kansas State. Since many of the married students have already served their time, there would be less likelihood of them dropping from school for this reason.

Finally, one must note that no other information was included in this tabulation other than that of being in or out of school. Inclusion of a control on ACE scores and difficulty indices might change the picture considerably.

The results of the investigation of the major hypothesis may be summarized as follows:

1. A hierarchy may be established at Kansas State College for the desirability of housing arrangements as regards scholastic achievement. This hierarchy was: married, organized, private, dormitory and fraternity.

2. The differences in scholastic achievement among the various housing groups were consistent but not statistically significant, especially when married students were ignored.

3. The results of this study agreed partially with those of other investigations in that the fraternity groups were consistently at the lowest rank in the hierarchy.

4. The main disparity between this and the other studies is in the position which the college dormitory occupies. In this study it was found to be close to the bottom in order of desirability regarding scholastic success while in the others it was at or near the top.

Discussion

There are several trends which cannot now be stated as results or findings but which suggest interesting speculations and perhaps beginnings for further research along the same line.

The superior achievement of the married students demonstrates a situation long observed by those engaged in higher education. Several possible reasons for their academic success suggest themselves.

Maturity, usually felt to be related to age and/or military service might be found to account for both their academic success and their assumption of the responsibilities of marriage.

Age could well be a factor here. There was no attempt to control that factor in this study or in any other with which the writer is familiar. Since many married students were veterans, this factor might likewise be worthy of investigation.

High motivation stemming perhaps from a combination of these factors plus inspiration from the marriage partner, could probably be discovered in these students, if a way to measure it could be found.

The relatively high performance of the organized groups as opposed to the low performance of the fraternity groups suggested an interesting kind of investigation. The structure of these groups was similar with the exception of the strong tradition and ritual present in the fraternity situation and the more highly organized social life.

A concomitant of the ritual and tradition of fraternities was the position of the pledge. Although study hours were maintained

for pledges, these students were also subjected to extra tasks and duties as well as study of the fraternity laws, history, etc. All of the fraternity subjects in this study would be pledges so that this status might well affect their scholastic performance.

A study of group cohesiveness and the effect of group standards stemming from this cohesiveness suggests itself as another area of possible investigation.

In regard to the preceding the great variability of the fraternity group in the second year's sample is noted. Since this variability did not occur in the 1953 sample, there is a suggestion of the possibility that group cohesiveness and loyalty prompted some, but not all, of the fraternities to attempt to raise their group scholastic performance by selection of new members on the basis of academic promise. Concern over group performance in 1953 may have caused them to alter the nature of the group through the selection process available to them.

A study of the social structure of the fraternity and organized groups as well as their incidence of social participation and the nature of the participation might also be enlightening regarding the disparity in their academic achievement.

The data reported on "college persistence" of members of different housing groups is not particularly encouraging regarding the effect of a variable such as cohesiveness. However, as noted earlier, these data need much supplementary information before they can be meaningfully interpreted.

The disparity between the findings involving the college dormitories in this study and in others seems to reflect very vividly

the current situation at Kansas State College. The men's dormitory was very inadequate physically. It was located in the football stadium and crowded conditions prevail. The rooms were small and four or six men live in each room.

There were no study rooms provided so that all studying done in the dormitory took place in the sleeping rooms. The noise between rooms was very great since there was no insulation in the walls or floors to deaden the sound. Similarly, the noise from the recreation areas was very noticeable in the rooms. Recreation included television, ping pong and cards.

In addition, meals were not served in the dormitory. This would appear to cut down on the interpersonal contacts and might limit group cohesiveness and loyalty. There was, however, a house government and various social events were held during each semester.

Plans for a new men's dormitory are now in progress and it would be interesting to study the effect residency in the new building might have on the academic performance of the residents.

SUMMARY

Three purposes were defined for this investigation regarding the relationship of housing to scholastic achievement at Kansas State College.

The first objective was to describe the various housing groups in terms of scholastic success, scholastic ability, and course load. Secondly, the relationships between these factors were to be noted.

The major purpose was to demonstrate the relationship between place of residence and academic success. The hypothesis set up

to be tested was: With scholastic aptitude and course load held constant, no differences in scholastic achievement as measured by grade point average will emerge among the various housing groups.

The samples used were composed of male students enrolled as freshmen in the fall semesters of 1953 and 1954. Five housing groups were defined: fraternity, private, dormitory, organized houses, and married. Total populations or random samples were used for each of these groups.

Measures of grade point average, scholastic ability and course load were obtained for each subject and these data were subjected to an analysis of variance and covariance. Although the assumptions underlying the use of this statistical tool were not entirely satisfied, the analysis was continued with the realization that the interpretation of the results would have to be tentative.

Within the limits of the samples used, and with reservation regarding the appropriateness of the statistical treatment, the following conclusions appear warranted:

1. The major hypothesis was rejected for the first sample; grade point averages were not homogeneous when scholastic ability and course load were held constant. The hypothesis was accepted for the second year's sample.
2. A hierarchy may be established at Kansas State College for the desirability of housing arrangements as regards scholastic achievement. This hierarchy is: married, organized, private, dormitory, and fraternity.
3. The differences in achievement among the various housing groups were consistent but not statistically significant, especially when the married group was ignored.

4. The achievement of married students, even when adjusted for ability and course load, was relatively superior to that of students in the other housing groups.

5. The results of this study agree partially with those of others in that the fraternity group is consistently at the lowest rank in the hierarchy.

6. The main disparity between this and other studies is in the position in the hierarchy which the college dormitory occupies. In this study it was found to be close to the bottom in order of desirability regarding scholastic success while in the others it was at or near the top.

Several implications of these results immediately present themselves.

The low position of the fraternity groups in the hierarchy raises many questions, especially in regard to the difference in position between them and the organized groups, which are superficially very like them in structure. The results suggest that though fraternities may fulfill very vital functions in the lives of college students, they cannot point to academic stimulation as justification for their existence. Although study hours are enforced for fraternity pledges, there are apparently other conditions present in fraternity chapter house life which are not conducive to high scholastic attainment.

The position of the dormitory groups in this study as contrasted to the position in other investigations illustrates very clearly the situation in the men's dormitory at Kansas State College. While at other colleges group living in a physically adequate

dormitory apparently stimulates students toward scholastic success, here inadequate physical conditions seem to inhibit scholastic attainment. It would be important to note what changes a new dormitory with adequate rooms, study areas and the elimination of excess noise will make in the position of this group.

The superior performance of the married group is no surprise to those acquainted with the current college picture. There are many possible reasons for this superior performance, few of which seem very amenable to measurement. Maturity, probably resulting in part from age and veteran status, could undoubtedly be demonstrated to exist to a high degree among these students if a measure of maturity could be made.

The presence of another person vitally interested in scholastic success is possibly an important factor. Although it is foolish to suggest marriage to those desiring scholastic success, this finding does present many speculations as to the optimum time in life for getting the maximum benefit from college. One may wonder whether it is immediately following high school, the time when the majority of students now enter college. One may also wonder whether it is before or after military service. Similarly, the age at which students enter college may be of importance regarding their success or failure.

These are at present only questions, the answers to which will have to emerge from further research and study. The differences noted between the two years' samples in this study indicated the need for the consideration of more than one year's group when

investigations of this type are made. The dynamic nature of groups and the great changes which may occur from one year to the next makes generalization from only one year's sample very unreliable.

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BIBLIOGRAPHY

1. Altender, L. E. "The Value of Intelligence, Personality, and Vocational Interest Tests in the Guidance Program." Journal of Educational Psychology, 1940, 31:449-459.
2. Bateman, Richard M. "The Effect of Work Experience on High School Students' Scholastic Achievement." Occupations, 1950, 28:353-356.
3. Bromley, Dorothy D. "Education for College or for Life?" Harpers Magazine, March 1941, 182:407.
4. Brown, William and Wayne Holtzman. "A Study-Attitudes Questionnaire for Predicting Academic Success." Journal of Educational Psychology, February, 1955, 46:75-83.
5. Cochran, W.G. "Some Consequences when Assumptions for the Analysis of Variance are not Satisfied." Biometrics, 1947, 3:22-38
6. Dearborn, Walter F. "The Student's Progress in Relation to School Success." The Measurement of Student Adjustment and Achievement, (edited by Wilma T. Donahue, Clyde M. Coombs, and Robert M.W. Travers), Ann Arbor, University of Michigan Press, 1949
7. Fiedler, Everett L. The Relationship Between Scholastic Achievement and Social Participation in College. Unpublished M.S. thesis, Kansas State College, Manhattan, Kansas, 1943.
8. Gough, H. G. "Factors Related to the Academic Achievement of High School Students." Journal of Educational Psychology, 1949, 40:68-78.
9. Gough, H. G. "The Relationship of Socio-Economic Status to Personality Inventory and Achievement Test Scores." Journal of Educational Psychology, 1946, 37:527-40.
10. Grade Point Averages by Department. Unpublished report issued by Dean of Academic Administration, Kansas State College, Manhattan, Kansas, September 7, 1953.
11. Grote, Caroline. Housing and Living Conditions of Women Students in the Western Illinois State Teachers College at Macomb. Contributions to Education, No. 507, Teachers College, 1932.
12. Halbower, Charles C. A Study of Developed Differences in Personality, Intelligence, and Scholastic Achievement Between Sorority and Unaffiliated Women. Unpublished M.S. thesis, Kansas
13. Horst, Paul. The Prediction of Personal Adjustment. Social Science Research Council Bulletin, 1941, 48.

14. Hoyt, Donald P. On the Improvement in Prediction of College Grades by Use of Measures of Non-intellectual Factors. Unpublished colloquium paper, University of Minnesota, Minneapolis, Minnesota, 1950.
15. Interpreting Scholastic Aptitude Test Scores for Kansas State College Freshmen. Unpublished study by Student Counseling Center, Kansas State College. (mimeo.) 1955, 10 pp.
16. Johnson, Palmer O. Statistical Methods in Research, New York, Prentice-Hall, Inc. 1949.
17. Johnston, J. B. "Predicting Success or Failure in College at the Time of Entrance." School and Society, 1924, 20:27-32.
18. McQuary, John P. "Some Relationships Between Non-intellectual Characteristics and Academic Achievement." Journal of Educational Psychology, 1953, 44:215-228.
19. Meehl, Paul E. Clinical versus Statistical Prediction. Minneapolis: University of Minnesota Press, 1954.
20. Monroe, Walter S., Editor. Encyclopedia of Educational Research. New York, The Macmillan Co., 1950.
21. Patrick, Gerald H. A Comparative Study of Scholastic Aptitude, Scholastic Achievement and Personal Adjustment of Male Athletes and Male Non-athletes at Kansas State College. Unpublished M.S. thesis, Kansas State College, Manhattan, Kansas, 1950.
22. Peterson, Basil H. "The Scholarship of Students Housed in Various Living Quarters." School and Society, February, 1943, 57:221.
23. Ryans, David G. "A Study of the Observed Relationships Between Persistence Test Results, Intelligence Indices, and Academic Success." Journal of Educational Psychology, 1938, 29:573-580.
24. Sarbin, Theodore R. "A Contribution to the Study of Actuarial and Individual Methods for Prediction." American Journal of Sociology, 1943, 48:593-602.
25. Schofield, William. "A Study of Medical Students with the MMPI: III. Personality and Academic Success." Journal of Applied Psychology, 1953, 37:47-52.
26. Smith, Ellen Yeo. Clinical Judgments versus Prediction by Single Tests. Unpublished M.S. thesis, Kansas State College, Manhattan, Kansas, 1956.
27. Snedecor, George W. Statistical Methods. Ames, Iowa: Collegiate Press, Inc., 1938.

28. Strong, Edward K. Vocational Interests 18 Years After College. Minneapolis, University of Minnesota Press, 1955.
29. Super, Donald E. Appraising Vocational Fitness. New York, Harper and Brothers, 1949.
30. Travers, Robert. "Prediction of Achievement." School and Society, 1949, 70:293-294.
31. Van Alstine, Frank L., Earl R. Douglas and Palmer O. Johnson. "The Relationship Between the Housing of Students and Their Scholarship." School and Society, October, 1942, 56:388.
32. Volsky, Theodore C. A Study of the Occupational Level Scale of the Strong Vocational Interest Blank as it Relates to Prediction to Academic Success in the Schools of Engineering and Agriculture in Kansas State College. Unpublished M.S. thesis, Kansas State College, Manhattan, Kansas, 1952.
33. Walker, E. T. "Student Housing and University Success." School and Society, 42:575-77.
34. Wilhoite, Fred L. A Study of Vocational Interest, Scholastic Aptitude and Achievement. Unpublished M.S. thesis, Kansas State College, Manhattan, Kansas, 1951.
35. Young, C. W. and G. H. Estabrooks. "Report on the Young-Estabrooks Studiousness Scale for Use with the Strong Vocational Interest Blank for Men." Journal of Educational Psychology, 1937, 28:176-187.

APPENDIX



Table 1. Test of homogeneity of variances
and residual variances (1953)

$$H_1 : \sigma^2 = 0$$

fs	ns	θ 's	$\log \theta$'s
99	100	50.9821	1.70742
99	100	59.0145	1.77095
71	72	39.6492	1.59823
24	25	16.0370	1.20512
29	30	13.5611	1.13230
$N=327$		$\sum ns \log ns = 612.9899$	$\sum ns \log \theta$'s = 527.00656

$$\log N = 2.51455$$

$$\log \sum \theta$$
's = 2.25345

$$\log L_1 = 9.99815 - 10$$

$$L_1 = .9957$$

$$: k=5.$$

$$d.f.=45$$

$$P > .05$$

$$\text{Accept } H_1$$

$$H_1' : \sigma_{ys} \cdot x_1 = \sigma_{y.x.}$$

fs	ns	θ_s '	$\log \theta_s$ '
98	100	28.4559	1.45417
98	100	44.3016	1.64642
70	72	27.4353	1.43832
23	25	5.7019	0.75602
28	30	10.3227	1.01379
		$\sum ns \log \theta_s$ ' = 116.2174	462.93224

$$\log L_1 = 9.99038 - 10$$

$$L_1 = .9781$$

$$\log \sum \theta_s$$
' = 2.06527

$$K=5;$$

$$d.f.=44$$

$$\text{Hyp : Accept } P > .05$$

$$H_1'' : \sigma_{ys} \cdot x_1 x_2 = \sigma_{y.x_1 x_2}$$

fs	ns	θ_s''	$\log \theta_s''$
97	100	27.9501	1.44638
97	100	42.0043	1.62329
69	72	25.8501	1.41246
22	25	3.4902	0.54285
27	30	5.3628	0.72939
		$\sum ns \log \theta_s''$ = 104.6575	444.11707

$$\log \sum \theta_s'' = 2.01977$$

$$\log L_1 = 9.97835 - 10$$

$$L_1 = .951$$

$$K=5;$$

$$d.f. 43$$

$$\text{Hyp : Accept } P > .05$$

Table 1. (concl.)

$$H_1'' : \sigma_{y_s \cdot x_1 x_3} = \sigma_{y \cdot x_1 x_3}$$

fs	ns	θ_s''	$\log \theta_s''$
97	100	27.6281	1.44135
97	100	42.0716	1.62399
69	72	23.4195	1.36958
22	25	4.2963	0.63309
27	30	6.2977	0.79918
		$\sum \theta_s''$	$\sum ns \log \theta_s''$
		103.7132	442.54887

$\log \sum \theta_s'' = 2.01583$
 $L_1 = .950$
 $h=5$; $d.f.=43$ Hyp : Accept $P > .05$

Table 2. Homogeneity of regression coefficients (1953), $x_1 x_2$

Group	DF	SS	DF
Frat.	99	27.9501	97
Private	99	42.0043	97
Dorm.	71	25.8501	69
Marr.	24	3.4902	22
Org.	29	5.3628	27
		104.6575	312

Analysis of variance table (1953), X_1, X_2

	SS	df	MS	F
Deviations from average regression within groups	110.1754	320		
Deviations from indiv. group regressions	104.6575	312	.3354	
Differences among group regression	5.5179	8	.6897	2.056 057 F701

Table 2. (concl.)

Tests of homogeneity of regression coefficients (1953), X_1 , X_3

Group	DF	SS	DF
Prat.	99	27.6281	97
Private	99	42.0716	97
Dorm.	71	25.4195	69
Marr.	24	4.2963	22
Org.	29	6.2977	27
		<u>103.7132</u>	<u>312</u>

Analysis of variances table (1953), X_1 , X_3

	SS	df	MS	F
Deviations from average regression within groups	103.0364	320		
Deviations from indiv. group regressions	103.7132	312	.3324	
Differences among group regressions	5.3232	8	.6654	2.002 05 > P.701

Table 3. Tests of homogeneity of variances and residual variances (1954)

$H_1: \sigma_s = \sim$			
fs	ns	θ_s	$\log \theta_s$
99	100	97.7533	1.9081332
99	100	66.9285	1.8256110
79	80	39.2083	1.5933813
34	35	17.5480	1.2390700
70	71	42.7977	1.6314170
		<u>264.0358</u>	<u>667.2364</u>
		$\sum ns \log \theta_s$	

$\log N = 2.58659$ $\log \theta's = 2.421659636$ $1/386 = .00259067357$
 $\log L_1 = 9.98231 - 10$
 $L_1 = .9601$

Harmonic mean of $F_s = \frac{5}{1/99 + 1/99 + 1/79 + 1/34 + 1/70} = \frac{5}{.07856} = 65.31$

$K=5$ d.f.=65 Hyp : Accept P.7.05

Table 3. (concl.)

$H_1' : y_s \cdot x = y \cdot x$			
fs	ns	Θ_s'	$\log \Theta_s'$
98	100	80.23252	1.9043526
98	100	46.99003	1.6720103
78	80	35.05482	1.544748
33	35	10.74470	1.021016687
69	71	21.49053	1.33224
		<u>194.51230</u>	<u>611.54074</u>

 $\sum ns \log \sum \Theta_s =$ $\log \sum \Theta_s = 2.28895$ $L_1 = .9348 \quad K=5; \quad d.f.=64 \quad \text{Hyp : Reject} \quad P < .01$

$H_1'' : y_s \cdot X_1 X_2 = y \cdot X_1 X_2$			
fs	ns	Θ_s''	$\log \Theta_s''$
97	100	75.5944	1.87848
97	100	43.4409	1.63790
77	80	30.0434	1.47775
32	35	9.6652	0.98521
68	71	20.5913	1.31370

 $\Theta_s = 179.3354 \quad \sum ns \log \Theta_s'' = 597.61305$ $\log \sum \Theta_s'' = 2.25366$ $L_1 = .933 \quad \text{Hyp : Reject.} \quad P < .01$ Table 4. Tests of homogeneity of regression coefficients (1954) X_1, X_2

Group	DF	SS	DF
Frat.	99	76.3100	97
Private	99	43.7947	97
Dorm.	79	32.1510	77
Marr.	34	10.2469	32
Org.	70	20.3061	68
		<u>182.8088</u>	<u>371</u>

Table 4. (concl.)

Analysis of variance table (1954), X_1 , X_2				
	SS	DF	MS	F
Deviations from average regression within groups	190.0785	379		
Deviations from indiv. group regressions	182.8088	371	.4927	
Differences among group regressions	7.2697	8	.9087	1.844 $P > .05$

Tests of homogeneity of regression coefficients (1954), X_1 , X_3

Group	DF	SS	DF
Frat.	99	75.4941	97
Private	99	43.4409	97
Dorm.	79	30.0434	77
Marr.	34	9.6652	32
Org.	79	20.5918	68
		<u>179.3354</u>	<u>371</u>

Analysis of variance table (1954), X_1 , X_3

	SS	DF	MS	F
Deviations from average regression within groups	182.1150	379		
Deviations from indiv. group regressions	170.3354	371	.4634	
Differences among group regressions	2.7796	8	.3475	--- $P > .05$

Table 5. Data for complete analysis of variance
and covariance (1954)

	$\sum y^2$	=	264.0358
	$\sum x_1^2$	=	209,409.0300
	$\sum x_2^2$	=	66,154.4100
	$\sum x_3^2$	=	2,445.4190
Within	$\sum x_1 y$	=	3,710.1463
	$\sum x_2 y$	=	1,498.1203
Groups	$\sum x_3 y$	=	325.2490
	$\sum x_1 x_2$	=	46,279.0000
	$\sum x_1 x_3$	=	7,819.8690
	$\sum y^2$	=	5.1682
	$\sum x_1^2$	=	1,426.8600
	$\sum x_2^2$	=	2,036.0500
	$\sum x_3^2$	=	58.8220
Between	$\sum x_1 y$	=	43.9857
	$\sum x_2 y$	=	53.4813
Groups	$\sum x_3 y$	=	14.9775
	$\sum x_1 x_2$	=	1,656.3400
	$\sum x_1 x_3$	=	232.2210
	$\sum y^2$	=	269.2040
	$\sum x_1^2$	=	210,835.8900
	$\sum x_2^2$	=	68,190.4600
	$\sum x_3^2$	=	2,504.2410
	$\sum x_1 y$	=	3,754.1320
Total	$\sum x_2 y$	=	1,551.6016
	$\sum x_3 y$	=	340.2265
	$\sum x_1 x_2$	=	47,935.3400
	$\sum x_1 x_3$	=	8,052.0900

Table 6. Data for complete analysis of variance
and covariance (1953)

	$\sum y^2$	=	179.2439
	$\sum x_1^2$	=	197,440.9878
	$\sum x_2^2$	=	40,548.3761
	$\sum x_3^2$	=	1,397.7945
Within	$\sum x_1 y$	=	3,457.8493
	$\sum x_2 y$	=	996.3675
Groups	$\sum x_3 y$	=	176.1250
	$\sum x_1 x_2$	=	24,648.5189
	$\sum x_1 x_3$	=	3,581.3911
	$\sum y^2$	=	7.5232
	$\sum x_1^2$	=	5,102.4309
	$\sum x_2^2$	=	1,256.5184
	$\sum x_3^2$	=	71.5266
Between	$\sum x_1 y$	=	177.7163
	$\sum x_2 y$	=	-34.0390
Groups	$\sum x_3 y$	=	-6.6156
	$\sum x_1 x_2$	=	-926.2712
	$\sum x_1 x_3$	=	-155.9232
	$\sum y^2$	=	186.7571
	$\sum x_1^2$	=	202,542.5137
	$\sum x_2^2$	=	41,805.3945
	$\sum x_3^2$	=	1,469.3211
	$\sum x_1 y$	=	3,635.5661
Total	$\sum x_2 y$	=	962.3285
	$\sum x_3 y$	=	169.5094
	$\sum x_1 x_2$	=	23,722.2477
	$\sum x_1 x_3$	=	3,425.5679

Table 7. Adjusted analysis of covariance holding
ACE and difficulty index constant (1953)

Source	DF	SS	MS	F	Hypothesis
Within	320	110.1754	.344		
Between	4	3.9587	.990	2.878	Reject ($P < .05$)
Total	324	114.1341			

Table 8. Adjusted analysis of covariance holding
ACE and number of credit hours constant (1953)

Source	DF	SS	MS	F	Hypothesis
Within	320	109.0364	.3407		
Between	4	5.0977	1.2744	3.741	Reject ($P < .01$)
Total	324	114.1341			

Table 9. Adjusted analysis of covariance holding
ACE and difficulty index constant (1954)

Source	DF	SS	MS	F	Hypothesis
Within	379	190.9785	.5015		
Between	4	3.7741	.9435	1.881	Accept ($P > .05$)
Total	383	193.8526			

Table 10. Adjusted analysis of covariance holding
ACE and number of credit hours constant (1954)

Source	DF	SS	MS	F	Hypothesis
Within	382	182.1150	.4767		
Between	4	2.6030	.6508	1.365	Accept ($P > .05$)
Total	386	184.7180			

RESIDENCE AND SCHOLASTIC ACHIEVEMENT

by

Audrey Katherine Patterson

B. A., University of Minnesota, 1948

AN ABSTRACT OF A MASTER'S THESIS

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Three purposes were defined for this investigation regarding the relationship of housing to scholastic achievement at Kansas State College.

The first objective was to describe the various housing groups in terms of scholastic success, scholastic ability, and course load. Secondly, the relationships between these factors were to be noted.

The major purpose was to demonstrate the relationship between place of residence and academic success. The hypothesis set up to be tested was: With scholastic aptitude and course load held constant, no differences in scholastic achievement as measured by grade point average will emerge among the various housing groups.

The samples used were composed of male students enrolled as freshmen in the fall semesters of 1953 and 1954. Five housing groups were defined: fraternity, private, dormitory, organized houses and married. Total populations or random samples were used for each of these groups.

Measures of grade point average, scholastic ability and course load were obtained for each subject and these data were subjected to analysis of variance and covariance. Although the assumptions underlying the use of this statistical tool were not entirely satisfied, the analysis was continued with the realization that the interpretation of the results would have to be tentative.

Within the limits of the samples used, and with reservation regarding the appropriateness of the statistical treatment, the following conclusions appear warranted:

1. The major hypothesis was rejected for the first sample; grade point averages were not homogeneous when scholastic ability

and course load were held constant. The hypothesis was accepted for the second year's sample.

2. A hierarchy may be established at Kansas State College for the desirability of housing arrangements as regards scholastic achievement. This hierarchy is: married, organized, private, dormitory, and fraternity.

3. The differences in achievement among the various housing groups are consistent but not statistically significant, especially when the married group is ignored.

4. The achievement of married students, even when adjusted for ability and course load, is relatively superior to that of students in the other housing groups.

5. The results of this study agree partially with those of others in that the fraternity groups is consistently at the lowest rank in the hierarchy.

6. The main disparity between this and other studies is in the position in the hierarchy which the college dormitory occupies. In this study, it is found to be close to the bottom in order of desirability regarding scholastic success while in the others it is at or near the top.

Several implications of these results immediately present themselves.

The low position of the fraternity groups in the hierarchy raises many questions, especially in regard to the difference in position between them and the organized groups, which are superficially very like them in structure. The results suggest that though fraternities may fulfill very vital functions in the lives

of college students, they cannot point to academic stimulation as justification for their existence. Although study hours are enforced for fraternity pledges, there are apparently other conditions present in fraternity chapter house life which are not conducive to high scholastic attainment.

The position of the dormitory groups in this study as contrasted to the position in other investigations illustrates very clearly the situation in the men's dormitory at Kansas State College. While at other colleges groups living in a physically adequate dormitory apparently stimulates students toward scholastic success, here inadequate physical conditions seem to inhibit scholastic attainment. It would be important to note what changes a new dormitory with adequate rooms, study areas and the elimination of excess noise will make in the position of this group.

The superior performance of the married group is no surprise to those at all acquainted with the current college picture. There are many possible reasons for this superior performance, few of which seem very amenable to measurement. Maturity, probably resulting in part from age and veteran status, could undoubtedly be demonstrated to exist to a high degree among these students if a measure of maturity could be made.

The presence of another person vitally interested in scholastic success is possibly an important factor. Although it is foolish to suggest marriage to those desiring scholastic success, this finding does present many speculations as to the optimum time in life for getting the maximum benefit from college. We may wonder whether it is immediately following high school, the time when the

majority of students now enter college. We may also wonder whether it is before or after military service. Similarly, the age at which students enter college may be of importance regarding their success or failure.

These are at present only questions, the answers to which will have to emerge from further research and study. The differences noted between the two years' samples in this study indicated the need for the consideration of more than one year's group when investigations of this type are made. The dynamic nature of groups and the great changes which may occur from one year to the next makes generalization from only one year's sample very unreliable.

