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Differences between selected variables and entering student persistence, nonpersistence and withdrawal in higher education

John Lawrence Romano

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Differences between selected variables and entering student persistence, nonpersistence and withdrawal in higher education

by

John Lawrence Romano

A Thesis Submitted to the Graduate Faculty in Partial Fulfillment of the Requirements for the Degree of

MASTER OF SCIENCE

Major: Industrial Education and Technology

Signatures have been redacted for privacy

Iowa State University
Ames, Iowa
1987

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As Demitroff (1974) noted, the period between 1950-1970 was a period of unparalleled enrollment growth at nearly every institution of higher education in the United States. Contrary to this enrollment trend, Sidney P. Marland, the United States Commissioner of Education, indicated that only 33 percent of those enrolled in post secondary education graduate (Johansson & Rossman, 1973). Similarly, Gekowski and Schwartz (1961) estimated that approximately 50 percent of all students entering a four year college will leave before earning a degree, most of which will drop out their first year. McNeely in 1937, and Iffert (1957) also indicated approximately 45-50 percent will leave the college setting never earning a degree. Iffert also contends that nearly 28 percent of the students discontinue their studies in their freshman year. Chase (1970), notes these failures represent great cost on behalf of the university as well as the student. They also represent exploded aspirations, frustrations, and disappointments. Tinto (1975), in his review of dropouts and attrition in higher education has noted that over approximately the last 100 years the dropout rate from higher education has been strikingly constant.

As stated by Lin (1985), in spite of the extensive literature on hand in higher education, the research has not clearly disclosed which factors influence students to leave
or how these factors might be controlled by those with an interest in preventing students from leaving. Similarly, Tinto (1975) states:

Despite the very extensive literature on dropout from higher education, much remains unknown about the nature of the dropout process. In large measure, the failure of the past research to delineate more clearly the multiple characteristics of the dropout can be traced to two major shortcomings; namely, inadequate attention given to the questions of definition and to the development of theoretical models that seek to explain, not simply to describe, the processes that bring individuals to leave institutions of higher education (p. 89).

Statement of Problem

It was observed through the literature search that extensive research has been conducted in the area of student attrition. However, little has been done investigating the significance of these variables. Thus, this study was designed to investigate the differences between persisters, nonpersisters, and withdrawers in the department of Industrial Education and Technology within the College of Education at Iowa State University between 1981-1985.

Statement of the Purpose

The purpose of this study was to investigate factors affecting student persistence, nonpersistence and withdrawal in the department of Industrial Education and Technology within the College of Education at Iowa State University to:
1. Determine what differences, if any exist between the persisters, nonpersisters, and withdrawers in:
   a. levels of parental education
   b. American College Testing composite scores
   c. high school rank
2. Develop for administrators and educators a data base that could be studied and potentially helpful in the selection of entering students.

Need for the Study

In past research conducted on predictors of academic success, such factors as ACT composite, SAT scores, socio-economic status and high school GPA were focused upon predominantly. By looking at American College Testing Composite score, high school rank, and an added variable, highest level of parental education, will help to fill the gap when addressing academic success or withdrawal.

Questions of the Study

Research questions of the study were answered through the data drawn from the 1981-1985 entering students at Iowa State University in the department of Industrial Education and Technology. Answers were obtained through running a one-way analysis of variance (ANOVA) comparing the various
means of persisters, nonpersisters, and withdrawers in an attempt to answer the following questions.

1. Is there a difference in levels of parental education between the groups?
2. Is there a difference in American College Testing composite scores between the groups?
3. Is there a difference in high school rank between the groups?

Hypotheses

1. There is no significant difference in the levels of parental education between the persisters, nonpersisters, and withdrawers.
2. There is no significant difference in high school rank between the persisters, nonpersisters, and withdrawers.
3. There is no significant difference in American College Testing composite scores between the persisters, nonpersisters, and withdrawers.

Assumptions of the Study

The following assumptions were made with regard to this study:

1. The procedure used for selecting the research subjects was valid and adequate for making
inferences for the general population.

2. All information was accurately gathered on the research subjects.

3. Parents were willing to provide accurate information on highest level of parental education.

4. The Registrar and Human Subjects Committee were willing to approve the data release and collection process.

Delimitation of the Study

1. This study was delimited to the entering students who were enrolled at Iowa State University between 1981-1985 in the department of Industrial Education and Technology within the College of Education.

Limitations

1. The population of this study was limited to those students with an ACT composite score, HSR, and permanent mailing address.

2. The parental responses were limited to accessibility and availability of phone numbers.
Definition of Terms

**American College Testing (ACT) Composite Score**
Mean composite score on the four tests of educational development (English, mathematics, social studies, and natural science) of the American College Testing Program.

**Grade Point Average (GPA)**
The cumulative grade point average (A=4.00, B=3.00, etc.) earned.

**High School Rank (HSR)**
High school percentile rank of student as reported on the transcript supplied for the purpose of admissions, where 1 is the highest, and 99 the lowest.

**Nonpersisters**
Students who do not meet the minimum academic standards set forth by the university and/or terminate study at the university with below a 1.99 cumulative grade point average.

**Persisters**
Students who meet the academic standards set forth by the university and continue in the department of Industrial Education and Technology or graduate with a Bachelor's of Science degree.
Withdrawers

Students who left the university or transferred out of the department of Industrial Education and Technology before earning a Bachelor's of Science degree with a cumulative grade point average of 2.00 or higher.

Procedure of the Study

The procedure of the study included the following steps:

1. A review and synthesis of findings from the existing student persistence, nonpersistence and withdrawal literature in higher education.
2. Identification of the population of the study. The 1981-1985 entering students at Iowa State University were identified as the population of the study.
3. The selection and identification of the sample from the population. The sample was obtained from the population of students who enrolled in the department of Industrial Education and Technology within the College of Education.
4. The development of the parental phone survey.
5. Verification of appropriateness of constructed survey items. Assistance was obtained from the researcher's committee members at Iowa State
6. Revisions were based on committee members suggestions and the pilot study results.

7. The collection of the data. Data were gathered from student records housed in the registrar's computer files. Highest level of parental education was not available on record and was obtained through a phone interview, follow up calls were made when necessary.

8. Data collected on subjects were coded for computer processing.

9. Analysis of data.

10. Based on the results of the data analysis conclusions were drawn.

11. A report of the research was written.
CHAPTER II. REVIEW OF LITERATURE

The purpose of this chapter is to examine the literature and research related to student attrition, persistence and withdrawal at the college level. The review of literature is divided into four major areas which include:

1. Attrition in higher education
2. Factors associated with attrition
3. The college environment
4. Traits of persisters, nonpersisters and withdrawers

Overview of Attrition in Higher Education

Between 1950-1970 was a period of unparalleled growth in nearly every college and university in the United States. Few institutions had concerns maintaining enrollment. Most schools, in anticipation of the future, were developing policies and procedures aimed at limiting enrollment to current or projected capacity. However, enrollment trends are dramatically changing this picture (Demitroff, 1974).

Gekowski and Schwartz (1961) note, since the launching of Sputnick I, the emphasis on science education has masked other important problems in American education. One of these pressing problems is student mortality. It is estimated that approximately 50 percent of all students
entering a four year college will not have earned a degree in that time, and most will drop out their first year.

As stated by Iffert (1955), in a study of student mortality in twenty-five universities, McNeely in 1937 reported approximately 62 percent of the students left the original institution without a degree. In the same report he stated that 45 percent did not graduate from any college during the four year period. Similarly, Iffert (1957), found that less than 50 percent of those who enter successfully complete college within four years. Of these, 28 percent withdrew during or at the end of their freshman year, while an additional 15 percent withdrew before the registration date of their junior year. According to Chase (1970), by the close of the junior year half of all students who began three years ago will have dropped out. These figures represent great cost on behalf of the university as well as the student. They also represent exploded aspirations, frustrations, and disappointments.

In a speech by Sidney P. Marland, the United States Commissioner of Education, indicated that on a nation-wide basis, only 33 percent of the students who enroll for postsecondary education eventually graduate (Johansson & Rossmann, 1973).

They also stated:

Institutions of higher education are concerned with retention of their entering students.
Whether for fiscal, humanitarian, or other reasons, four-year colleges and universities are interested in maximizing the number of entering freshman who receive a baccalaureate degree four or five years later (p. 1).

Terenzini and Pascarella (1979), describe the attrition situation as follows:

It seems clear that the attrition process is a far more complex phenomena than we have tended to think it is, and certainly the bulk of the dropout research fails to take into account the web-like network of relations to which the studies described have begun to point. Unless the designs of future studies are sensitive to these considerations, they are unlikely to meet the expectations of either researchers or administrators. At best they will yield only partial an oversimplified picture of what seems to be a highly complex set of dynamics (p. 12).

Numerous studies have differentiated persisters and dropouts on the basis of academic aptitude, achievement and biographical data. Ikenberry (1961), showed in his study of persisters that it was possible to differentiate groups of college students simultaneously classified according to persistence status, grade point average (GPA) and gender (Prediger, 1965).

Conclusions drawn from Prediger's 1965 study of persistence prediction indicates biographical data may have very little to offer to the prediction of persistence among college males when ability and achievement are controlled. In deed ability and achievement appear to foretell persistence only because they predict grades a student will receive. Prediger developed a regression equation based on
high school rank (HSR) and SCAT total to predict first semester GPA for entering freshmen males.

Demitroff (1974), is now in the process of developing an analytic instrument to identify, in advance of enrollment, the potential dropout based upon the results of the research to date. It is hoped that the formula, with appropriate weightings, can be developed from certain preadmission data (high school class rank, academic major) and from questions asked as a part of the American College Tests (educational and vocational plans, study habits, motivation, etc).

Conversely, Summerskill (1962), notes tabulation of reasons into neat, mutually exclusive categories (e.g., X% academic reasons + Y% financial reasons + Z% medical reasons = 100% of dropouts) simply do not cope with the realities of college dropouts and are of little value.

Reimanis (1973), states repeated observations over the past years show that at our colleges student attrition is related to low self-concept of academic ability, high debilitating anxiety, low internal reinforcement control, and lack of goal and value clarity. College aptitude SAT or ACT scores have not been effective predictors of academic attrition.
Conceptual models of attrition

Spady (1970), put forth the following relationship between Durkheim's theory of suicide and student attrition.

Although dropping out is clearly a less dramatic form of rejecting social life than is suicide, we assume that the social conditions that affect the form parallel those that produce the latter; a lack of consistent, intimate interaction with others, holding values and orientations that are dissimilar from those of general social collectivity, and lacking a sense of compatibility with the immediate social system. However, since the student's academic role has many parallels with his future occupational role, it would not be inappropriate to extend this analogy a step farther. Poor performance in one's occupational role (viz. low grades) and inadequate identification with the norms of the occupational group (viz. low intellectual development) are also plausible additions to this system. The elementary Durkheimian model that we propose, then, consists of five independent variables, four of which influence the fifth, so integration, which in turn interacts with the other four to influence attrition. We would like to suggest further, however, that the link between social integration and dropping out is actually indirect. Intervening are at least two critical variables that flow from the integration process: satisfaction with one's college experiences, and commitment to the social system (i.e. college), (p. 78).

Meerdink (1977), advocated that rejection of social life occurred through suicide when a person was not integrated into common life of that society. Although dropping out of college is a less extreme break of social ties, Spady illustrated that parallels between the two processes could be drawn (Meerdink, 1977).
Tinto (1975) theorized that attrition results from a cultural and social interaction between the dropout and others inside and outside the college and community over a period of time. And that the student is no longer socially integrated with those others or hold the dominant values reflected in the institution's functioning. Tinto's model is reproduced in Figure 1. This model conveys an ongoing longitudinal process of interactions between the individual and both the academic and social systems within and around the institution.

Factors Associated With Attrition

Since persistence, attrition and withdrawal all appear to be a part of the interaction between the college/university environment and the student, the literature pertaining to those factors will be under the broad heading of student characteristics and college environment.

Student rank

Chase (1970), in his paper on the college dropout, looked at selected characteristics of high school students in an effort to locate traits which are associated with early college departure. Chase feels if ability can not be tagged as the basic cause for student dropouts in colleges and universities, then possibly personal history including
FIGURE 1. A Conceptual Schema for Dropouts From College. (Tinto, 1975, p. 5)
high school accomplishments can shed light on the problem.

Blanchfield (1971), found in his Utica college study on dropout identification, that high school rank proved significant while high school GPA did not. However, he felt high school rank is a biased measure in that a good student in "stiff competition" may have lower rank than a poorer student in a less competitive situation. The high school average should account for this, however, but this proved not significant in his analysis.

Fuller (1978), notes numerous studies have suggested the best pre-college predictor is academic performance in high school. He contends that if a student has met the competition in the past they they are likely to do so in the future. Some relationship between academic aptitude (e.g., SAT or ACT scores) and persistence is also identifiable, but it is not nearly as strong as that between achievement and persistence. He also contends that socio-economic status is positively related to college completion, but level of parental education may be more important than income level.

Iffert (1955), states the prospects of graduating are about twice as good for students who were in the top fifth of their high school class as for those who were in the second fifth of their high school and about eight times as good as for those from the bottom fifth.
In a 1972 Iowa Regents Study, high school rank appeared to be the most effective discriminator of those who withdrew or persisted from the college setting. It was also stated that high school rank is the only variable that can be defended as a basis for administrative decisions. Similarly, Meerdink (1977), notes that high school rank generally is considered the best single predictor of college success.

Size of high school

The relationship between high school size and academic achievement has frequently been studied, but the influence of high school size on college completion has been examined less frequently.

Anderson (1974), conducted a study investigating the relationship between high school size and incidence of college completion. He states that some research has indicated that graduates of small high schools may be less likely to complete college programs. Other investigations have indicated little correlation between high school size and college completion (Bayer, 1968), while still other statistical evidence has indicated lack of direct relationship between high school size and college completion (Lathrop, 1960).

Slocum (1956), states the size of the high school attended does not appear to be associated in any way with
academic survival. Altman (1959), examined the effects of high school size on academic achievement and found high school size to be unrelated to college performance. In contrast, Hoyt (1959) noted after controlling for intelligence, that graduates from smaller high schools tend to have lower grades. Chase (1965), concluded after studying a group of 75 dropouts from the Fall 1961 entering class of freshmen that the number in the high school graduating class did not distinguish between persisters and dropouts.

According to Cope (1972), students are more likely to become dropouts if they come from smaller communities or high schools. The important factor isn't small size, it's the "size-relationship" that exists between the former community and the new college or university setting. Also, Alexander and Woodruff (1940), and Summerskill (1962) support the belief that larger high schools produce better prepared college students.

In Cope's study of 586 dropouts and 745 persisters at a large midwestern university, he concluded that both male and females who lived most of their lives in towns/communities of less than 50,000 population were more likely to be among the dropouts. His study also suggests that a "breaking point" is reached at community population at about 50,000, i.e., below 50,000 population for both sexes the dropout
percentages are higher than persistence percentages. He also concluded that institutions could have different break-even points, depending on their size.

Through statistical analysis Anderson (1974), indicates that students coming from a high school with 20 graduates or fewer annually are not likely to complete programs of higher education as are students from larger schools. There may be several factors contributing to this phenomenon, including limited curricula often offered at smaller schools as well as lack of stimulation fostered by continual association with the same few peers in the same small setting. Anderson's study also indicated that students from schools with 20-99 graduates fare as well in overall college completion as do graduates from larger schools.

Anderson (1974), contends that graduating from the smallest rural schools can be seen as a portent of future difficulties. Institutions of higher education should be alerted to possible problems of small school graduates. Small rural schools may be hardy, but they are not necessarily effective in preparing their graduates for college success.

**Academic performance**

According to Bertrand (1955), previous literature indicated the relationship of high school grades to academic success in college has shown high school grade point average
to be the most important single predictive factor of college academic success. However, Bertrand contends aptitude scores are more reliable than are high school grades as a single indicator of students who may be dropped for scholastic deficiency or who may be placed on scholastic probation.

Summerskill (1962), found that in ten out of eleven studies on college dropouts that persisters had higher high school grades than did the dropouts. Conversely, Slocum (1956), notes high school grades are not highly correlated with intellectual ability. According to Astin (1973), the odds increase to 70 percent among students who had an "A" average in high school and drop to as low as 25 percent for students who had a "D" average.

Johansson and Rossmann (1973), analyzed the differences in ability between persisters and withdrawers using SAT and grade point average data. And the results indicated there was no consistent precollege differences in ability (SAT scores) and achievement (high school rank) between persisters and voluntary withdrawing. However, precollege differences were apparent between withdrawing and failures; the male failures did not achieve as well in high school while the female failures scored lower on ability tests.

Astin (1973), stated that students past academic record and ability was by far the greatest predictive factor of
attrition. However, a number of studies have detected no significant differences in high school GPA or high school rank between dropouts and persisters. Marks (1967), notes scholastic measures are the best predictor of potential attrition (or persistence) yet they are limited in scope and power.

**Education and occupation of parents**

In Slocum's (1956) study at the State College of Washington, it was found that the family background factor that had considerable bearing on the chances of academic survival was the education of the parents. Typically, the higher the educational level of the parents, the higher the probability of survival. He also noted a significantly higher rate of survival for students whose fathers were employed in professional, or technical work, whereas the highest academic mortality was observed among those whose fathers were employed in service occupations and as manual laborers.

Zehner (1981), states the key element for survival in today's technological society is the family and the role it plays in educating its members. Cropley (1977), supports this view by proclaiming the family as the most powerful agency society has to guide, modify, and develop the child psychologically as well as educationally. He also felt that serious decisions regarding marriage, careers, and education
are to a great extent family influenced or family decisions, subsequently educational choices are greatly influenced by level of parents education, cultural level and family tradition.

Bowen (1977) has identified eight variables in which he describes the value of education to the family. The most important of the eight variables identified are: Higher education in the family increased achievement by children, and the college educated devote more time, money, and energy to the rearing of their children. Zehner (1981), found parental support played an important role in the students decision to obtain a higher educational degree. It was noted that 71.6 percent of the parents thought it was important for their children to obtain a degree. In the same study it was concluded that students who received parental assistance with homework appeared to follow the national trend. He states:

Assistance is correlated with the educational level of parents. Those parents with the most education appear to find more time to assist their children with their homework. In a recent survey by Gallup Poll for CBS News, most parents indicated they have enough time to devote to helping their children with homework. But one-third said they did not help with homework. The portion of parents who indicated that they lack time varied by educational background. Those with less education said they have less time. Almost half of the parents with only a grade school education indicated they could not devote enough time to assisting with their child's homework. Only one-fourth of college educated parents cited a lack of time (p. 11).
Educational attainment is closely linked to family background. Children tend to gain levels of education similar to, if not higher than, those of the family heads, and educational levels appear to be transferable from parent to child. Also, the higher the educational level of the parents the higher the achievements of the child. It has also been found that the mothers influence is particularly important in the educational level obtained by the child or adult (Zehner, 1981).

Astin (1973) notes, chances of completion will be increased 10 percent if the student's mother has a graduate degree and decrease 5 percent if her educational level has surpassed grammar school.

As has been true in other areas of educational performance, the likelihood of an individual dropping out of college has been shown to be related to the characteristics of the family. Stated in more general terms, the families socioeconomic status appears to be inversely related to dropping out (Tinto, 1975). Sewell and Shah (1967), note specifically children from lower status families exhibit higher rates of dropout than do children of higher status families even when intelligence has been taken into account. Hence, it would appear that college persisters are more likely to come from families whose parents are more educated.
Hakanson (1967) states the relationship between low socioeconomic status and low levels of scholastic achievement was established by sociologists as early as 1944.

Chase (1970) notes the following about levels of parental education:

It is widely believed that the educational level of the parents has considerable influence on the child's eventual level of academic attainment. The studies at Indiana University did indeed indicate that children of mothers with college level work were more persistent at all stages than children of mothers with an education below college level. The hand that rocks the cradle appears to have a large influence on the child's attitudes toward the value of education (p. 68).

Savicki, Schumer, and Stanfield (1970), state students who receive more parental support for their vocational strivings and who can less afford to endanger this support, may find a meaning for college by passive acceptance of parental expectations.

Of those characteristics of individuals shown to be related to the dropout, the more important pertain to: the characteristics of his/her family, the characteristics of the individual, his/her educational experiences prior to college entry, and his/her belief concerning future educational attainment (Tinto, 1975).

However, in contrast to much previous research, Rossmann and Kirk (1970), found no differences were reported in family income, father's or mother's education or
occupation, parent's level of aspiration for child, or parent's reactions to child's achievements.

**Employment and financing of college expenses**

Considerable discussion on the effects of part-time employment on college academic performance has taken place. A summary of studies done in this area indicates that up to a reasonable work load, most students who work part-time perform as well as those who do not work part-time (Henry, 1963). In a study conducted by Henry (1967), also indicated that there was no significant difference between the academic achievement of workers and that of nonworkers. However, disregarding this, the University of Missouri Student Financial Office makes it policy to caution students about working, especially if they are first semester students. The caution goes out to the new students because of conjecture that the students need that time to adjust to college life and the new academic routine. This advice is particularly stressed on students who did not rank in the upper one-third of their high school class. According to him:

> It would appear that financial aid officers and counselors can advise entering freshmen who need financial assistance to seek part-time employment up to 15 hours per week without fear of the students' sacrificing academic achievement. This evidence is in contradiction to much advice given to high school seniors and has significance for the current emphasis upon seeking out needy students who may be helped through the Federal
Work Study Program (p. 259).

Hay and Lindsay (1969), Kaiser and Bergen (1968), and Bryant (1961) also contend that employment of not more than 15 hours per week is not detrimental to academic achievement, hence suggesting that work as a type of financial aid should become increasingly more important (Fields & LeMay 1973).

The primary findings of a study conducted by Fields and LeMay (1973), was that aid awards enable financially needy students to attend college. These needy students are such that would probably not attend college without financial aid. The fact that students have their financial needs met with one type of aid or another allows them to attend and compete favorably with other students in terms of academic achievement and persistence through the freshmen year. It also appears that programs of student financial aid are effective in promoting equality of educational opportunity (Fields & LeMay, 1973).

Fields and LeMay (1973), also stated that the freshmen year is a critical one and that financial aid awarded for this year has greatest potential for affecting the educational decisions of prospective college students.

According to Blanchfield (1971), successful students have higher percentage of grants than unsuccessful students. One is tempted to assume that the result follows from the
fact that grants are typically awarded to more successful students. He feels a more likely explanation is that awarding grants provides some degree of security to the student, hence, providing more incentive to remain in college.

Mercer (1943) and Alexander and Woodruff (1940) showed self-support was related to better academic performance. However, Summerskill (1962) concluded that self-support and attrition have no relationship. Astin (1973), noted if the student's financial support came in the form of grants or scholarships his/her chances of completion were increased by 15 percent (Astin, 1973).

Religious affiliation

Puzzullo (1978), noted in a 1973 retention study of 16 major junior colleges that religious affiliation was found to be related to attrition; specifically that Protestants were characterized as most likely to withdraw, Catholics to persist, and Jews to transfer. Astin (1973) noted, Jewish as opposed to non-Jewish students stand a better chance getting a degree.

Marital status

Astin (1973), noted students reporting a good possibility of getting married while in college had a poorer chance of completing a degree than those not (only women
were effected). Similarly, Brunner, Packwood and Wilson (1978) state single individuals are more likely to return to college than are married individuals, especially married females.

**Summary of student characteristics**

According to Marks (1967), the only reliable conclusion emerging from the mass of research on academic achievement is that students with poor high school preparation or lower scholastic aptitude have higher incidences of college withdrawal.

Chase (1970) notes, how the student attacks his/her high school scene definitely is a portent of his/her persistence in college. Not only is this true of academic affairs, as shown by high school rank, but also of extracurricular activities.

The significance of college attrition is demonstrated by the dropout rate for four year colleges which has remained close to 50 percent over the past half century. Reasons for the high rate of attrition are not clear. Historically the most appealing conjecture has been that attrition is directly related to academic difficulty. Many students who dropout do have lower high school ranks, standardized test scores, and grade point average (Maudal, Butcher, and Mauger (1974). Supporting this, Marks (1967) notes the dropout tends to demonstrate both lower post-
secondary ability and poorer high school performance.

College Environment

As Meerdink (1977), noted investigations of attrition have typically focused on aspects of the college environment including college grade point average, curriculum, time of withdrawal, college residence, and college faculty and services.

**College grade point average**

According to Thayer (1973), there has been a great deal of interest in the general effects of failure and success, and some early research suggested that for some people failure (failing grades) is not an incentive toward greater effort. He also states that reinforcement is an excellent means of modifying behavior. And punishment, while it modifies behavior, may have a negative effect.

With this in mind, one might ask the question; "Do low or failing grades cause college students to give up?" Thayer (1973), states this question must be answered both yes and no. Students who receive low grades (Ds and Fs) are more likely to drop out than those students who receive higher grades (As, Bs, and Cs). However, if students receiving low grades do not drop they will not do more poorly on subsequent exams; they may actually do better. Also, students receiving the highest grades initially,
appearance to do even better on later exams. Hence the superior later performance of students encourages favorable consideration of a grading system which optimizes the opportunity of students to receive high grades.

Blanchfield (1971), concluded that first semester college grade point average is a significant predictor of success. He concludes there is nothing like a good academic beginning to give a student confidence. On these grounds Blanchfield questions whether or not high school grades and achievement tests deserve the attention they get from admission counselors as entrance criteria.

Tinto (1975), notes academic dismissal is most closely associated with grade performance, dropping out in the form of voluntary withdrawal is not. Supporting this view Knickerbocker (1972) found in analyzing the importance of college grade point average (GPA) a significant difference in GPAs of dropouts and persisters, transfers and persisters but not between dropouts and transfers (Meerdink, 1977).

Such withdrawal appears to be associated with lack of congruence between the individual and both the intellectual climate of the instruction and the social system composed of his/her peers. It would appear, however, that students academically dismissed are often lacking in both intellectual and social development or are socially integrated to an extreme.
One can not conclude that academic difficulties are the only thing that provokes a student to dropout. Summerskill (1962), noted that only approximately one third of college dropouts are due to academic difficulties.

**Educational plans and expectations**

In terms of the prediction of college dropouts, there is a significant relationship between a student's expectancy of, and his actual attrition behavior. Marks (1967) notes, if you want to know whether a student is a potential college dropout, a good starting place is simply to ask him/her. Barger and Hall (1965), state upon entrance to college 20 percent do not expect to finish.

Rossmann and Kirk (1970), suggest that approximately one in every four students who voluntarily withdrew from Berkeley after one year came with the intention of leaving before graduation. Others leave, at least overtly, for reasons of marriage, health, or finances, and at least some of these eventually graduate. Other factors associated with student attrition are low-self concept of ability, high debilitating anxiety, low internal reinforcement control, and lack of goal and value clarity (Puzzullo, 1978).

Slater (1957), explained that students with high occupational goals (Vocational) and/or self-enlightenment goals (Intellectual) would not become satiated with course work. Then too, students who put extracurricular enjoyments
before school work will not achieve well.

Starr, Betz and Menne (1972), in their study of student satisfaction at Iowa State University, conclude that withdrawers, although maintaining adequate grades were significantly less satisfied with the academic offerings and requirements of the university, faculty and staff competence and helpfulness, and the amount of time required to meet the demands of the university. Also, lack of satisfaction regarding academics of the university separated withdrawers from persisters. It would appear that this lacking of satisfaction did not result from difficulty in meeting the performance requirements of the university. This might suggest that pupil satisfaction is an important factor in student retention.

Starr, Betz and Menne (1972), also state satisfaction is directly related to remaining in college. They also note if a student is to remain in college, he/she must be fulfilling the requirements of that environment (performing satisfactorily) and the college environment must be meeting the needs of the student (leading to satisfaction).

Similarly Pantages and Creedon (1978), noted the degree to which the attitudes and values of the student correspond with those of the institution is also the degree to which the student is likely to persist at that institution.
Astin (1973) notes research has shown the effectiveness of personalized education in minimizing attrition. The more contact students have with the faculty members, department chairmen and administrators, the more likely they are to be satisfied with their education and to remain in school.

Housing

A review by Pantages and Creedon (1978) suggested that where the student lives while attending college and what type of housing the student lives in affect attrition. Housing is a significant factor, but it is unlikely that it is the primary factor in attrition.

Regarding distance from college, Mehra (1973), and Strodahl (1967), noted greater distances from college related to higher withdrawal rates; student often gave as their reason for transferring to another college a desire to be closer to home (Lin, 1985). Johansson and Rossmann (1973), state home proximity is not significantly related to attrition. Iffert (1957) indicates students living on campus appear to be less likely to dropout than commuting students living with parents or other relatives. McCormick (1971) noted a general inclination for persisters and withdrawers to change college residency from dormitory to off-campus housing during the four years.
Assistance from university personnel before withdrawal

Hannah (1969), concluded the following as a result from his longitudinal study of student attrition. Discussions about withdrawal are held principally with friends and parents, college personnel are less frequently consulted than parents and peers. Hence, concluding college personnel are minimally involved in consultation. Most frequently friends of the same sex are consulted first, father and mother next, and then friends of the opposite sex. Faculty and other college personnel when they were consulted, enter the process, after the decisions been made.

Barger and Hall (1965), report that end of the semester times of anxiety about hard work, examinations, completion of papers, and other course work requirements provoke thoughts of withdrawal. Hannah (1969) noted that 77 percent of the decisions to withdraw from college are made during vacations or when school is not in session.

Hannah (1969), indicates that college personnel are little involved with leavers during the process of withdrawal and that they participate frequently in discussions through which the final decision is made. Furthermore, when they are brought into the process it is after considerable thinking and decisions have taken place, after ideas have hardened.
According to Barger and Hall (1965), the differences between early and late dropouts in reasons given for withdrawal and in the duration of the problem seem to point to the possibility that for many of the early dropouts a tentative decision had been made to drop out during or after completing the previous term. Many of these students, if identified early enough, might be counseled to remain out of school for a period of time to take care of the difficulty. Others could avoid dropping out if reached in time by someone in the counseling or advising system.

**Reasons for withdrawal**

According to Iffert (1955), reasons students give for discontinuing college attendance are many and varied but the weightiest is academic difficulties followed by financial difficulties. Iffert also states, that for first year drop-outs nearly one-fourth of the weight is given to academic difficulties, and about one-seventh to financial difficulties but for later drop-outs only one-seventh of the weight is given to academic difficulties and one fourth to financial. This shift might be a gesture to reconsider scholarship and financial aid policies and practices as they affect college-controlled funds as well as those not under the control of the college.

In a study of 816 freshmen registered at Temple University, the psychology department set out to find how
students leaving college differed from those who remained to complete their work. Of this group 32 percent (262 students) did not register the following September. This study yielded that test scores of the withdrawers and persisters differed significantly on the scholastic aptitude test, the reading test, and the social adjustment portion of the personality test. In all of these cases the withdrawers scored lower.

When questioned concerning the chief reason for withdrawing from college the withdrawer group responded as follows:

Change of interest or plans ...............21%
Dissatisfaction with courses and/or university .........................16%
Financial difficulties .................12%
College adjustment problems ..........12%
Job interference-to go to work .........12%
Health ....................................9%
Low grades ................................9%
Entering armed forces ..................5%
Commuting problems or other ..........4%

When the withdrawers were asked what the university might have done to prevent the students from leaving school, the responses were as follows:

Nothing .....................................41%
More guidance-counseling ..............27%
Improved courses and instruction ......11%
More personal attitude toward student..............................5%
Financial aid
(scholarship, job, etc.) ................5%
Other and "Don't know" .................11%
It is significant that approximately 50 percent of the withdrawers felt some action on the part of the university might have been instrumental in keeping them in school (Gekowski & Schwartz, 1961). Early identification of students with these symptoms coupled with appropriate action taken might save many students who might otherwise leave school.

Figure 2 graphically depicts various factors which usually determine whether a student will continue in college until the completion of his/her educational goals.

Since students live simultaneously in two overlapping environments, the community and the college, certain forces that will impinge on his/her life as a student can be identified. The students' expectations, goals, abilities, etc., are depicted as the central focus of the environmental forces. Since the degree of educational success is the result of a combination of these forces, the campus must make every effort to increase the creation of an environment in which the students can most effectively function (Flannery, J., Asbury, C, Clark, C., Eubanks, D., Kercheval, B., Lasak, J., McWorth, J., Skellings, L., Smith, D., & Sutton, C., 1973).
Figure 2. Factors Affecting a Student's Persistence in College. (Flannery et al., 1973, p. 6)
Traits of Persisters, Nonpersisters and Withdrawers

Research on college student attrition as Summerskill (1962) has noted, has covered a period for approximately the last forty years. Barger and Hall (1965) note despite the extensive research, there have been few studies which have attempted to delineate different kinds of dropouts, so that more appropriate methods of investigation and counseling could be used. Savicki, Schumer, and Stanfield (1970), also contend that research on college withdrawal has been confused with imprecise and global definitions of attrition and persistence.

Similarly, Rossmann and Kirk (1970), feel many studies have failed to differentiate between students who were in academic difficulty at the time of withdrawal and those who were in good academic standing.

Persisters

Astin (1973), presented data taken from a four-year longitudinal study of freshmen who entered college in the Fall of 1966 and were followed up in 1970. There were 200 plus institutions in the sample which were randomly selected, representing two-year, four-year, nonaccredited, and accredited colleges. The measure (criteria) used in
this study was simply whether or not the student was able to complete his/her baccalaureate degree in four years. From this, Astin defined the "typical student" as graduating from a public high school with accumulative grade point average of about a B-. This student has variable mathematical scores on college board of about 500 each (American College Testing score of about 23 composite). With respect to the family background, the typical student is a white male from a Christian family with a mother who completed high school but did not attend college. At entrance to college, the student tends to take at least some graduate work and reports that there is very little chance of getting married while in college. This student will enroll in a public, coeducational college or university with moderate selectivity. This typical student will live in a dormitory during his first undergraduate year, and will receive a bulk of his/her financial support from their parents.

If a student possesses these traits he/she will have a 50-50 chance of completing a baccalaureate degree in four years. These odds can vary tremendously when one deviates from the "typical student" description.

The odds go up to 70 percent among students who had a "A" average in high school and drop to as low as 25 percent for students who had a "D" average. If the student attended a private high school, his/her chances of completing a
degree in four years is increased 8 percent. Chances of completion will be increased 10 percent if the student's mother has a graduate degree and decrease 5 percent if she has never surpassed grammar school. Pupils reporting a good chance of getting married while in college also had a poorer chance of completing (only women were effected). If the student's financial support came in the form of grants or scholarships his/her chance of completion were increased by 15 percent. If the student attends a privately controlled non-coeducational institution odds of completion will increase, however, if a student attends a junior college then a four-year college chances of completion will be reduced. Mexican-American students' chances of getting a degree will be substantially reduced (Astin, 1973).

Maudal, Butcher, and Mauger (1974) suggest the following about collegepersisters. They are students who aspire to accomplish difficult tasks, are able to work toward distant goals, do not particularly seek out or enjoy exciting activities, and tend to be more inwardly inclined than their dropout counterparts. In contrast, students who dropout exhibit a relatively greater enjoyment of new and different experiences and adapt more readily to changes in the environment. Also, persisters can be characterized as passive and conforming.
Differences in personality and interest characteristics of 211 students who successfully completed a secondary teacher preparation program and 84 students who did not complete the program were identified. The Edwards Personal Preference Schedule (EPPS) and Strong Vocational Blank (SVIB) were used for assessment (Belcastro, 1979).

Belcastro (1979), noted in a comparison of male and female completers and noncompleters the following. Male completers were more conventional, more accepting of responsibility and obligations, more considerate of the other persons opinion, but less critical of those in authority, less likely to seek encouragement from others or to be helped by others when depressed, and less likely to have the same interests as successful blue collar workers such as carpenter and farmers than male noncompleters. Female completers enjoyed being with the opposite sex more and voluntarily came into contact with material and talk about sex more, had more feminine interest, were more likely to have the same interests as successful English teachers, were less likely to have the same interests as successful life insurance saleswoman, and earned a higher grade point average than female noncompleters.

He also found completers were more conforming, less accepting of sympathy, and had interests less like successful workers in the skilled trades than male
noncompleters. He also concluded female completers had a more adequate sex adjustment, were higher academic achievers, were more interested in literary arts, and had more feminine interest than female noncompleters.

Withdrawers/Transferrers

Maudal, Butcher, and Mauger (1974) suggest the following about college transfer students. Transfer students appear to be more like persisters than dropouts. And also personality variables are stronger predictors in the case of transfer students than are academic variables. Transferrers should be described in terms of their mean score as well as their position on their discriminant relative to persisters and dropouts. Transferrers have the lowest mean score among the groups on Social Introversion and Needs for Harmavoidance and Achievement, and are about the same as dropouts on Need for Impulsivity.

If Demitroff (1974), were to define the typical student who cancelled their registration in the Fall 1972 semester it would be as follows. The student would most likely be a freshman undecided upon their major with no specific vocational plans. This student would be one who lacks motivation and has less confidence in the effectiveness of their study habits and in their ability to complete a baccalaureate degree.
According to Iffert (1955), very few transferrers indicate a single reason for transferring, but rather they express general dissatisfaction and stress changes in curricular interests, size of institution, desire to be near home, necessity to attend a less expensive institution, lack of interest in program, and low grades, in that order.

Rose and Elton (1966), found that voluntary withdrawals, were more hostile and tended to be more maladjusted and less interested in scholarly activities than the persisters. Suczek and Alfert (1966), concluded that students who withdrew at Berkeley are less conventional and submissive to authority than students who persisted. They also found the failing withdrawers scored significantly higher than the persisters or the voluntary withdrawers on the Impulse Expression scale of the Omnibus Personality Inventory. This indicated their actions tended to be determined more by personal feelings and inclinations than by objective conditions. Their results also indicated that the voluntary withdrawers tend to be more sophisticated and complex than either the failures or persisters (Rossmann and Kirk, 1970). Tinto (1975) also states, voluntary withdrawers tend to be somewhat, more able to exhibit higher levels of intellectual development than do persisters, they also tend to be of somewhat higher social status than the average persisters.
Nonpersisters

Summerskill (1962) notes the attrition rate in college has not changed appreciably in the past forty years. It appears that the college dropout exhibits less ability for college work than persisters. However, there is a conspicuous overlap in ability between the two groups. Tinto (1975) states, academic dismissals tend to exhibit both lower aptitude and levels of intellectual development and to be of somewhat lower social status.

According to Smith (1964), lighter credit loads are typically associated with dropouts. Schmid and Reed (1966), found dropouts tended to carry five semester hours less than persisters.

Slocum (1956), supports the belief that dropouts participated in fewer activities than do persisters. Lin (1985) also concluded that high school extracurricular activities were highly correlated with first semester college grades. Slocum also notes, most dropouts identify more than one problem as being instrumental in the cause of their leaving. However, it appears that enrolled students (persisters) have the same type of problems as the dropouts. Similarly, Grace (1957), found dropouts to be more dependent than persisters.

Lenning, Beal, and Sauer (1980) summarize from their review of research on nonpersisting college students the
following demographic characteristics:

1. Age. Some studies indicate student dropout proneness above the average age of 22; however, enough conflicting evidence indicates that age is NOT a primary factor.

2. Sex. Some early studies indicate a greater attrition rate for women; however, sex is NOT significantly related as a primary variable.

3. Socioeconomic status. Results of studies are mixed. The best conclusion may be that students of distinctly disadvantaged status are more prone to attrition but the operating variables may be level of family aspiration, educational level of parents, personal educational aspirations, and involvement with the college.

4. Ethnicity. Students of Spanish-speaking background were found to be more dropout prone than other ethnic groups regardless of ability. Without controlling for ability, Native Americans and Blacks had a lower probability of graduation than Whites. However, once high school ranks and scholastic aptitude were controlled, retention rates for Blacks were significantly higher than for Whites.

5. Hometown location and size of high school.
Results of studies are mixed and more research is needed to show definite relationships to persistence. Indications are, however, higher retention rates for students from larger high schools in large communities and for students from private schools.

Starr, Betz and Menne (1972), in their study of student satisfaction at Iowa State University conclude that withdrawers, although maintaining adequate grades were significantly less satisfied with the academic offerings and requirements of the university, faculty and staff competence and helpfulness, and the amount of time required to meet the demands of the university. Also, lack of satisfaction regarding academics of the university separated withdrawers from persisters. It would appear that this lack of satisfaction did not result from difficulty in meeting the performance requirements of the university. This might suggest that pupil satisfaction is an important factor in student retention.

Barger and Hall (1965), state despite the extensive research, there have been few studies which have attempted to delineate different kinds of dropouts, so that more appropriate methods of investigation and counseling could be used.
In any broad scale consideration of academic mortality, it should be noted that many college students are not fully mature adults but are immature in respect to their personal-social development. Also, ample justification exists for raising entrance requirements so as to exclude individuals who are not of college caliber. No useful service is rendered by allowing an inadequately prepared, poorly motivated, or incompetent person to enter an institution with high scholastic standards (Slocum, 1956).
CHAPTER III. METHODOLOGY

This chapter contains a description of the methodology used in the study. The following headings were addressed: definition of the population and the sample, development of the instrument, variables and hypotheses of the study, and methods of statistical analysis.

Definition of Population and Sample

This study was designed to investigate student persistence in the department of Industrial Education and Technology within the College of Education at Iowa State University. The population of the study was selected from students entering the department of Industrial Education and Technology between the years of 1981-1985. For a student to be considered a part of the population a complete set of data containing the following information was necessary: ACT composite score, high school rank, and permanent address. From that listing the sample was categorized under three descriptions: persisters, nonpersisters, and withdrawers. These classifications were made based on the definitions found in Chapter 1. The sample was randomly drawn. A summary of the sample size by group, as well as the percentages drawn from each category are listed in TABLE 1.
TABLE 1. Sample Size by Group

<table>
<thead>
<tr>
<th>Category</th>
<th>Pop. Size</th>
<th>Sam. Size</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persisters</td>
<td>278</td>
<td>45</td>
<td>16.19</td>
</tr>
<tr>
<td>Nonpersisters</td>
<td>55</td>
<td>45</td>
<td>81.82</td>
</tr>
<tr>
<td>Withdrawers</td>
<td>47</td>
<td>45</td>
<td>95.74</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>135</td>
<td>35.53</td>
</tr>
</tbody>
</table>

It is important to note that 278 of the 380, or 73.16 percent were persisters, 14.47 percent nonpersisters, and 12.37 percent were withdrawers.

The actual sample distribution of the students where ACT composite, high school rank, and highest level of parental education obtained is summarized in TABLE 2. This table indicates the sampling distribution.

Similarly, TABLE 3 reflects the sample size compared to the frequency in each cell. It is interesting to note 72.59 percent as the total response rate of the study.

Instrument Development

The data were collected using a phone interview and by accessing student records available through the registrar's office at Iowa State University. Subsequent sections address the procedures.
TABLE 2. The Sampling Distribution Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persisters</td>
<td>37</td>
<td>37.8</td>
</tr>
<tr>
<td>Nonpersisters</td>
<td>29</td>
<td>29.6</td>
</tr>
<tr>
<td>Withdrawers</td>
<td>32</td>
<td>32.7</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>100.0</td>
</tr>
</tbody>
</table>

TABLE 3. Response Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Sam. Size</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persisters</td>
<td>45</td>
<td>37</td>
<td>82.22</td>
</tr>
<tr>
<td>Nonpersisters</td>
<td>45</td>
<td>29</td>
<td>64.44</td>
</tr>
<tr>
<td>Withdrawers</td>
<td>45</td>
<td>32</td>
<td>71.11</td>
</tr>
<tr>
<td>Total</td>
<td>135</td>
<td>98</td>
<td>72.59</td>
</tr>
</tbody>
</table>

Phone Interview

A review of the relevant literature was conducted to identify previous instruments and procedures used to investigate persistence and determine levels of parental education as related to student performance. A tentative list of questionnaire items was developed from these

After examining examples the researcher developed the questionnaire found in Appendix A. The questionnaire was designed to be administered to the parents or guardians of the subjects in the form of a phone interview. This interview was designed to determine the highest level of parental education found in the home where the subject was raised.

The initial draft of this questionnaire was reviewed for content validity as well as appropriateness by the researcher's committee. Revisions were made based on the member's recommendations. After the submission and acceptance of the survey by the Human Subjects Committee (Appendix B), a pilot survey was conducted to test the instrument. The pilot survey was administered to the parents of eleven students enrolled in a Spring, 1987, I Ed. & T 130 class. The pilot study results suggested that the instrument was adequate.

**Student Record Form**

A letter was written (Appendix C), and meetings held with the registrar (John Sjoblom) and the assistant registrar (Dean Nelson) at Iowa State University to gain access to data on the following continuous variables: ACT composite, and high school rank (HSR). A form was designed
by the researcher to facilitate the gathering of the data from the source.

Data Collection Procedure

Before data collection began, a copy of the research proposal and methodology was submitted to the registrar's office. Sjoblom and Nelson assessed the feasibility of the study, made recommendations, and made their office available to help complete the data collection. After determination of the feasibility of this study, the procedure listed below was followed:

1. Identification of the population (Defined as entering students enrolled in the Department of Industrial Education and Technology between the years Fall 1981 - Spring 1985). A list of those students was provided by Al Sherick (Professor/Head Advisor in the Department of Industrial Education and Technology at Iowa State University).

2. Development of the instrument to be used in the phone survey.

3. Submission of proposal to the Human Subjects Committee to conduct this research, and carry out the phone survey.

4. Submission to Dean Nelson (Assistant Registrar)
the list of students in the population to obtain the following on each subject: ACT composite, high school rank, parents address.

5. Pilot tested the phone survey on the parents of eleven students not identified in the population.

6. Identification of the sample.

7. Conducted survey.

8. Analyzed data.


Variables of the Study

The following dependent and independent variables were included in this study.

**Dependent variables**

1. American College Testing composite score
2. high school rank
3. level of parental education

**Independent variables**

The independent variables of this study were classified by student performance and included:

1. persisters
2. nonpersisters
3. withdrawers
Hypothesis of the Study

Three hypotheses were tested in this study. They include.

**Null Hypotheses 1**

There is no significant difference in the levels of parental education between the persisters, nonpersisters, and withdrawers.

**Null Hypotheses 2**

There is no significant difference in high school rank between the persisters, nonpersisters, and withdrawers.

**Null Hypotheses 3**

There is no significant difference in American College Testing composite scores between the persisters, nonpersisters, and withdrawers.

Method of Statistical Analysis

This section summarizes the data treatment techniques used to investigate the three research hypotheses of the study.

After the data were collected, coded and entered into the Iowa State University Computation Center's computer by the researcher. Data analysis was carried out by employing the Statistical Package for Social Sciences (SPSSx). To
test hypotheses 1 through 3, a one way analysis of variance (ANOVA) technique was employed. The one way analysis of variance was run on the dependent variables on the basis of the independent variables. When a significant difference was found between the groups, a Scheffé Test was run to determine the significance of the relationship between the dependent variables.
CHAPTER IV. RESULTS AND FINDINGS

The purpose of this chapter is to report the results and findings of this study. This chapter is divided into the following three sections:

1. Procedure of study
2. Hypothesis testing
3. Summary of data

Procedure

The procedure identified in the previous chapter (Chapter 3) was employed in the subsequent data analysis. The procedure of the study was composed of the following stages:

1. Identification of the population.
2. Development of the phone survey.
3. Conducted a pilot study on the instrument.
4. Identification of sample.
5. Collection of data.
6. Analysis of data.

Hypothesis Testing

Research hypothesis 1

There is no significant difference between the mean levels of parental education between the persisters, nonpersisters, and withdrawers.
The One-Way Analysis of Variance (ANOVA) statistical procedure was employed to test the research hypothesis. The mean, standard deviation, minimum value, and maximum values are found in TABLE 4. It is important to note that there was greater variability among nonpersisters.

TABLE 4. Level of Parental Education Summary (N=98)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Sta. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persisters</td>
<td>14.68</td>
<td>2.60</td>
<td>12.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Nonpersisters</td>
<td>14.71</td>
<td>3.55</td>
<td>3.0</td>
<td>21.0</td>
</tr>
<tr>
<td>Withdrawers</td>
<td>14.63</td>
<td>2.86</td>
<td>10.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Total</td>
<td>14.67</td>
<td>2.96</td>
<td>3.0</td>
<td>21.0</td>
</tr>
</tbody>
</table>

Reported in TABLE 5 are the degrees of freedom, mean squares, sum of squares, F ratio, and F probability. The analysis yielded there was no significant difference between the mean levels of parental education between the persisters, nonpersisters, and withdrawers. Hence, accepting the null form of the hypothesis. The null form of hypothesis #1 would be stated as follows: There is no significant difference between the mean levels of parental education between the persisters, nonpersisters, and withdrawers.
TABLE 5. One-Way ANOVA for Level of Parental Education

<table>
<thead>
<tr>
<th>Group</th>
<th>D.F.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F rat</th>
<th>F prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>.1052</td>
<td>.0526</td>
<td>.0059</td>
<td>.9942</td>
</tr>
<tr>
<td>Within Groups</td>
<td>95</td>
<td>851.8667</td>
<td>8.9670</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>851.97199</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Research Hypothesis 2

It was hypothesized that there is no significant difference between the mean ACT composite scores between the persisters, nonpersisters, and withdrawers.

The ANOVA statistical procedure was employed to test the research hypothesis. The mean, standard deviation, minimum value, and maximum value level are reported in TABLE 6.

Reported in TABLE 7 is the degrees of freedom, mean squares, sum of squares, F ratio, and F probability. The analysis yielded there was a significant difference at the .05 level. Hence, accepting the alternate hypothesis form. The alternate form of hypothesis #2 would be stated as follows: There is a significant difference between the mean ACT composite ranking between the persisters, nonpersisters, and withdrawers. Due to the lack of
TABLE 6. ACT Composite Summary (N=98)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Sta. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persisters</td>
<td>22.68</td>
<td>4.19</td>
<td>9.0</td>
<td>28.0</td>
</tr>
<tr>
<td>Nonpersisters</td>
<td>20.07</td>
<td>4.64</td>
<td>9.0</td>
<td>27.0</td>
</tr>
<tr>
<td>Withdrawers</td>
<td>22.50</td>
<td>4.45</td>
<td>11.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Total</td>
<td>21.85</td>
<td>4.52</td>
<td>9.0</td>
<td>30.0</td>
</tr>
</tbody>
</table>

TABLE 7. One-Way ANOVA for ACT Composite Score

<table>
<thead>
<tr>
<th>Group</th>
<th>D.F.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F rat</th>
<th>F prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>130.7339</td>
<td>65.3670</td>
<td>3.3531</td>
<td>.0392</td>
</tr>
<tr>
<td>Within Groups</td>
<td>95</td>
<td>1851.9702</td>
<td>19.4944</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>1982.70419</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

sensitivity of the Scheffé test, the significantly differing group or groups were not identified.

Research Hypothesis 3

There is no significant difference in the mean high school rank (HSR) between the persisters, nonpersisters, and withdrawers.
The ANOVA Statistical procedure was employed to test the research hypothesis. The mean, standard deviation, minimum value, and maximum value are reported in TABLE 8.

TABLE 8. HSR Distribution Summary (N=98)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Sta. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persisters</td>
<td>24.46</td>
<td>18.49</td>
<td>1.0</td>
<td>79.0</td>
</tr>
<tr>
<td>Nonpersisters</td>
<td>39.86</td>
<td>19.04</td>
<td>15.0</td>
<td>85.0</td>
</tr>
<tr>
<td>Withdrawers</td>
<td>33.03</td>
<td>17.35</td>
<td>3.0</td>
<td>73.0</td>
</tr>
<tr>
<td>Total</td>
<td>31.82</td>
<td>19.19</td>
<td>1.0</td>
<td>85.0</td>
</tr>
</tbody>
</table>

Reported in TABLE 9 is the degrees of freedom, mean squares, sum of squares, F ratio, and F probability.

TABLE 9. One-Way ANOVA for High School Rank

<table>
<thead>
<tr>
<th>Group</th>
<th>D.F.</th>
<th>S.S.</th>
<th>M.S.</th>
<th>F rat</th>
<th>F prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>2</td>
<td>3927.0877</td>
<td>1963.5438</td>
<td>5.8656</td>
<td>.0040</td>
</tr>
<tr>
<td>Within Groups</td>
<td>95</td>
<td>31801.6062</td>
<td>334.7537</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>35728.6939</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The analysis yielded there was a highly significant difference at the .01 level between the groupings. Hence, accepting the alternate hypothesis form. The alternate form of hypothesis #3 would be stated as follows: There is a highly significant difference between the mean HSR between the persisters, nonpersisters, and withdrawers.

Data Summary

An analysis of the data gathered suggested the following about level of parental education, ACT composite score, and high school rank (HSR) as related to the following classifications of entering students in the Department of Industrial Education and Technology at Iowa State University between the years 1981-1985:

1. Persisters
2. Nonpersisters
3. Withdrawers

No significant differences were found between the mean levels of parental education of the three groups. However, there was a significant difference (.05 level) between the mean ACT composite scores between the three groupings. This difference would suggest that a student's ACT composite score is a significant factor in academic achievement and withdrawal. The results also concluded that there was a highly significant difference (.01 level) in the mean high
school rank between the groups. This highly significant difference was found only between the persisters and nonpersisters. Implying once again that high school rank is also a highly significant factor in academic achievement but not withdrawal. Thus, high school rank and ACT composite appeared to be significant factors associated with academic success for students entering the department of Industrial Education and Technology at Iowa State University between the years 1981-1985, while highest level of parental education did not.
CHAPTER V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to summarize, present conclusions, and list recommendations for further research based on the procedures and analysis performed in this study.

Summary

This section provides a summary based on the preceding chapters.

Restatement of the Problem

This study was designed to investigate the relationship between persistence and selected variables (i.e., ACT composite score, high school rank, and highest level of parental education). Persistence has been divided into the following three categories: Persisters, Nonpersisters, and Withdrawers.

Restatement of the Purpose

The purpose of this study was to investigate factors affecting student persistence, nonpersistence, and withdrawal in the department of industrial education and technology within the college of education at Iowa State University. This was conducted to determine what differences if any exist between thepersisters, nonpersisters, and withdrawals in:
1. Level of parental education
2. ACT composite score
3. High school rank

Literature Review

As noted by Sidney P. Marland, the United States Commissioner of Education, only 33 percent of those enrolled in post-secondary education graduate (Johansson and Rossmann, 1973). Chase (1970), notes these failures represent great cost on behalf of the institution as well as the pupil. Of the variables reported significant in past research on persistence are: high school rank, mother's level of education, first semester college grade point average, finances, age, and distance from home to mention a few.

Method of Data Collection

A list of all entering students between 1981-1985 in the department of Industrial Education and Technology was provided by Albert Sherick (Professor/Advisor). From that list an Iowa State University employee accessed university computer records noting only those students with a high school rank, ACT composite score, and permanent address to be included in the population. From that list a sample was selected based on the definitions in Chapter 1. After the sample was drawn, the phone survey was conducted, followed
by analysis of the data.

**Analysis of the Data**

A sample of 135 students was drawn from the 1981-1985 entering students in the department of Industrial Education and Technology at Iowa State University. A one-way analysis of variance (ANOVA) was run on ACT composite score, high school rank, and highest level of parental education between the persisters, nonpersisters, and withdrawers. The analysis yielded no significant difference between the mean levels of parental education between the groups. However, the analysis did show there was a significant difference (.05 level) between the mean ACT composite scores of the groups. Similarly, there was a highly significant difference (.01 level) between the mean high school ranks of the groupings. The Scheffé statistical procedure yielded this significant difference between the persisters and nonpersisters only.

**Conclusions**

**Research Hypothesis 1**

It was hypothesized that there was no significant difference between the mean levels of parental education between the persisters, nonpersisters, and withdrawers.
Conclusions

It was found that there was no significant difference between the mean levels of parental education between the persisters, nonpersisters and withdrawers. It was concluded, based on this finding that the alternate hypothesis should be rejected at the .05 level.

The results of this study drawn from the sample indicated that the average level of parental education for the persisters was 14.68 years, 14.71 years for the nonpersisters, and 14.63 years for the withdrawers. The nonpersisters experienced only a slightly greater mean level of parental education by approximately .03 years. The mean level of parental education for persisters, nonpersisters and withdrawers combined was 14.67 years, slightly below that of the nonpersisters. There was a greater variability among the withdrawers than persisters or nonpersisters.

Hypothesis 2

It was hypothesized that there is no significant difference between the mean ACT composite scores between the persisters, nonpersisters, and withdrawers.

Conclusions

It was found that there was a significant difference between the mean ACT composite scores between the persisters, nonpersisters, and withdrawers. It was
concluded that the null hypothesis should be rejected at the .05 level.

The results of this study drawn from the sample indicated that the average ACT composite score for persisters was 22.68, 20.10 for nonpersisters, and 22.50 for withdrawers. There was an obvious significant difference between the persisters and nonpersisters. The average ACT composite score for the sample was 21.85.

**Hypothesis 3**

It was hypothesized that there was no significant difference in the mean high school rank (HSR) between the persisters, and withdrawers.

**Conclusion**

It was found that there was a significant difference in High School Rank (HSR) between persisters and nonpersisters. No significant difference was found between the withdrawers-persisters, or withdrawers-nonpersisters groups. It was concluded that the null hypothesis should be rejected at the .01 level.

The results of this study drawn from the sample indicated that the mean high school rank was 24.46 for the persisters, 39.68 for the nonpersisters and 33.03 for the withdrawers. The average level for all three groups was 31.82.
Discussion

The results of this study indicated that the average level of parental education was 14.63 years. The level of parental education for students identified in the sample was approximately 2.50 years of post-secondary education. As noted by Zehner (1981), children tend to gain levels of education similar to, if not higher than that of the family heads. Also, the higher the educational level of the parents, the higher the achievement of students. After noting the mean levels of parental education for the persisters, nonpersisters, and withdrawers, one could speculate based on Zehner's research that most of the students in the sample will complete at least 2.50 years of post-secondary education successfully. However, no significant difference was found between the mean levels of parental education between the groups reflecting the same results as Rossmann and Kirk (1970).

When looking at ACT composite score, the average between the groups was 21.85. This average is slightly less than the approximate average at Iowa State University of 23.32 (Wielegna, J., Kelso, P.C., Sjoblom, J.V., Jones, K., Dallam, J., & Hansen, M., 1982).

Numerous studies as mentioned by Fuller (1978) suggest that the best pre-college predictor of academic success is academic performance in high school. He continues, there is
some relationship between ACT composite and persistence in college. Similarly, Wielegna, J., Kelso, P.C., Sjoblom, J.V., Jones, K., Dallam, J., & Hansen, M. (1982), note ACT composite score for freshmen entering directly from high school has a direct relationship with the likelihood the student will earn a bachelor degree.

The results of this study indicated that the average high school rank for the groups was 31.82 percent. Iffert (1955) states the prospects for graduating are twice as good for students who were in the top fifth of their class as compared to those who were in the bottom fifth. In the 1972 Iowa Regents Study, high school rank appeared to be the most effective discriminator of those who persisted or withdrew from the college setting. In this study the persisters on the average came from the top 25 percent of their graduating class while the nonpersisters came from the bottom 60 percent, while the withdrawers range fell between that of the persisters and nonpersisters in the 33 percent range. Approximately 80.61 percent of the sample was in the top 50 percent of their graduating class, 44 percent were in the upper 25 percent, and 13 percent were in the top 10 percent.

The following can be concluded with regard to the 1981-1985 entering students in the department of Industrial Education and Technology at Iowa State University:

1. The average level of parental education was 14.67
years, approximately 2.50 years of post-secondary education.

2. The mean ACT composite was 21.85.

3. The average high school rank of the subjects was in the upper 40 percent of their graduating class.

The hard data should only be used as a partial criteria for selection or retention of students. Hence, future research should not overlook the intangibles of subjective judgement when selecting students for admission into a four year college program.

Recommendations

Based on the findings of this study, the following recommendations are made for future research. It is recommended:

1. That the level of education for each parent or guardian be focused upon to determine if there is a significant difference in the contribution on each.

2. That other variables such as: size of home town, size of graduating high school class, distance between hometown and college, high school grade point average, socio-economic status, choice of housing (Greek, Dormitory, Apartment, etc.),
source of funding for college, and age be looked at to determine their level of significance in investigating academic achievement and withdrawal.

3. That the instrument found in Appendix A be revised into survey form to be mailed and contain other variables such as those mentioned in recommendation 2.

4. That a correlation be run between the variables to determine their magnitude and direction of their relationship.

5. That a regression procedure be run to derive an equation to be used in mathematically predicting persistence.

6. That such information as that mentioned in recommendation 2 be obtained upon entry to the University and recorded on permanent file to be used in a longitudinal study of academic achievement or withdrawal.

7. That such a study be conducted at a number of universities so as results could be compared and used in advising.
REFERENCES


Risch, T. J. (1970). The relationship between students' expectations for the college environment and the level of formal education completed by their parents. ERIC ED 039 547.


APPENDIX A

Hi. My name is John Romano, I'm calling you from Iowa State University. Am I speaking with the father/mother of [student's first name].

If "no" then:

May I speak with his/her father or mother?

If "no" then:

Thank you for your time and have a good day/evening.

If "no they aren't home" then:

Thank you for your time, and I'll try to reach them later.

If "yes" then:

I'm contacting you and other parents of students who have attended Iowa State University to obtain some information for my Master's of Science degree. The research project consists of looking at some characteristics of entering students. No names will be used in reporting this information, and all responses will be treated with confidentiality. Would you be willing to provide answers to three short questions?

If "no" then:

Thank you for your time and have a good day/evening.

If "yes" then:

1. Roughly, what is the approximate population of the town where [student's first name] lived in
when he/she graduated from high school?

2. Did he/she enter college the summer or fall term after graduating from high school?

3. In the home where [student's first name] was raised what is the highest level of education in years attained by either you or your spouse?

That will be all, thank you for your time and support and have a good day/evening.
March 4, 1987

Dr. John Sjoblom
Registrar
107 Beardshear
Iowa State University
Ames, Iowa 50011

Dear Dr. Sjoblom:

John L. Romano is currently conducting a study that requires information about students that have enrolled at Iowa State University and the University of Northern Iowa. This research effort will be a part of his degree requirements for the Masters of Science degree in Industrial Education and Technology.

This study was designed to investigate student persistence (Defined as: Students who meet the academic standards set forth by the universities and continue in college or graduate.) for 1981-1984 entering students in the department of industrial education and technology at Iowa State University, and the department of industrial technology at the University of Northern Iowa. We are requesting the release of the following information for the use in the study:

1. ACT composite
2. High school rank
3. High school grade point average
4. The names and addresses of the students to obtain through a phone survey the highest level of parental education in the home which the student was raised.

The release of this data could greatly help both institutions gain a better understanding of student achievement at the college level.

Within a few days after this letter is received, John will contact you regarding the status of this request. If you have questions, please contact me by calling (515) 294-8341 or write:

John L. Romano
Industrial Education I
Iowa State University
Ames, Iowa 50011

Sincerely,

Dr. John Dugger, Associate Professor
Industrial Education & Technology
Title of project (please type): Relationship Between selected variables and entering student persistence, nonpersistence, and withdrawal in higher education.

I agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects are properly protected. Additions to or changes in procedures affecting the subjects after the project has been approved will be submitted to the committee for review.

John L. Romano
Typed Name of Principal Investigator
200 I Ed. & T1
Campus Address

Date
Signature of Principal Investigator

Date
Relationship to Principal Investigator

Date
Major Professor

ATTACH an additional page(s) (A) describing your proposed research and (B) the subjects to be used, (C) indicating any risks or discomfort to the subjects, and (D) covering any topics checked below. CHECK all boxes applicable.

☐ Medical clearance necessary before subjects can participate
☐ Samples (blood, tissue, etc.) from subjects
☐ Administration of substances (foods, drugs, etc.) to subjects
☐ Physical exercise or conditioning for subjects
☐ Deception of subjects
☐ Subjects under 14 years of age and/or
☐ Subjects 14-17 years of age
☐ Subjects in institutions
☐ Research must be approved by another institution or agency

ATTACH an example of the material to be used to obtain informed consent and CHECK which type will be used.

☐ Signed informed consent will be obtained.
☐ Modified informed consent will be obtained.

Anticipated date on which subjects will be first contacted:

Anticipated date for last contact with subjects:

If Applicable: Anticipated date on which audio or visual tapes will be erased and/or identifiers will be removed from completed survey instruments:

Signature of Head or Chairperson

Date
Department or Administrative Unit

Decision of the University Committee on the Use of Human Subjects in Research:

☐ Project Approved
☐ Project not approved
☐ No action required

Name of Committee Chairperson

Date
Signature of Committee Chairperson