Validation of Two Predictors of Success in

Hospital Based Diploma Schools of Nursing

by


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Predictors of Success In Nursing

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A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
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## ABSTRACT

The purpose of this study was to validate two predictors of success in hospital based diploma schools of Nursing namely the entrance grade point average and the Jackson Personality Inventory. It was hypothesized that together the GPA and the Jackson Personality Inventory (JPI) would have predictive power in terms of whether a student was successful or unsuccessful in completing the first year of the nursing program. Success being defined as a student who completes the entire first year of the program without interruptions and unsuccessful being defined as a student who repeats any part of the curriculum and or has withdrawn from the program of studies.

Using discriminant analysis the grade point average was found to predict most of the variance followed by the Jackson Personality Inventory scales Self Esteem and Social Participation. When the JPI profiles were entered alone, Social Participation, Self Esteem, Risk Taking and Complexity were significant. For the mature student when GPA and JPI profiles were entered into the stepwise discriminant analysis only Breadth of Interest was significant at $p < .10$. For the Regular student Grade Point Average, Breadth of Interest and Complexity were significant. The linear discriminant function classified

correctly 65% of the Successful group and 61% of the non successful students.

The alternative approach of analyzing the data without the effect of the repeater students indicated that Human Anatomy and Physiology and the JPI Scale Self-Esteem were significant. When the weighted factor scores were entered into the discriminant analysis the result was that only one Factor score was entered which was Factor 2. Factor 2 was labelled "broadminded-inquisitiveness" and consists of the JPI scales - Tolerance, Breadth of Interest, and Complexity.

This study would perhaps suggest some prescriptive guidelines for nursing school administrators and admission committees particularly in respect to the selection of candidates. The study also highlights implications for school guidance counsellors and areas of further research for the disciplines of nursing and education.

## ACKNOWLEDGEMENTS

out.

Finally, I would like to thank my family, friends and colleagues for their continued support, encouragement  in this long research project. To my son, J. Stephen Blight I owe a great deal of gratitude for his assistance in computer programming. To son David C. Blight I thank him for his encouragement. To both sons I value their constant questioning which ultimately improved the quality of the research study. To my husband Bill I appreciated his steadfast patience and support.

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# CHAPTER 1

## STATEMENT OF THE PROBLEM

Prediction of successful nursing students is a concern to nursing educators and administrators, yet specific solutions to solve this multifaceted problem is still limited. This validation study is an attempt to find some way of reducing the attrition rate in hospital based diploma schools of nursing by validating two predictors which could help to identify those students most likely to complete the first year of a two year hospital based diploma program. Nursing studies have indicated that no one predictor will predict successful nursing students and it is beyond the scope of this study to investigate all of the dimensions affecting selection and retention of qualified students. However, it is the intention of this study to validate two predictors of success, namely, the entrance Grade Point Average and the Jackson Personality Inventory.

Schools of Nursing in this study have used and continue to use cognitive measures such as High School marks and standardized ability tests as well other measures taping the affective domain such as personality tests and inventories in addition to background information such as biographical data, references, essays and interviews. However, these measures

have not appreciatively reduced the attrition rate for full time students enrolled in a two year diploma program. Although, high school grade point average, is the single best predictor it does not totally account for whether a student will persist beyond the first year of the program. Personality inventories have been used to enhance the total weighted prediction formula but have met with limited success because of the limitations of these tests in measuring the richness of human personality. Another major reason why the personality inventories of the past decade met with limited success was that the early tests were often norm referenced using psychiatric subjects rather than designed for the average and above average college level student. Nor did these early tests have the advantage of scale construction enhanced by large item pools based upon explicit definitions of each scale. The Jackson Personality Inventory was developed to provide in one convenient form, a set of measures of personality reflecting a variety of interpersonal, cognitive, and value orientations likely to have important implications for a person's functioning (Jackson 1976).

Prediction studies in general provide valuable information for nurse educators as well as the guidance counsellors at a time where there is a declining applicant pool from which to select suitable candidates. The renewed interest in prediction studies in nursing to predict those

students who would complete a program of studies has been accelerated by the bottoming out of the baby boomer population. The smaller applicant pool from which to select a high calibre qualified student has been further depleted by the fact that more women are entering non traditional fields of study which have not been totally off set by the increase in males and mature students entering nursing programs. Drop outs from nursing represents a wastage in terms of economics to both the institution, the individual and society. To be able to predict those students who would more likely meet with success would benefit not only the student, nurse educators, but the guidance counsellors who attempt to assist individuals to match abilities and interest to a discipline of study and practice.

## Research Question

Does the entrance Grade Point average ( High School Grade Point Average and University grade point average) and the Jackson Personality Inventory together have predictive power in terms of whether or not a student will complete the first year of a two year nursing program?

## Limitations of Study

1. Volunteer subjects presents serious limitations

in any study as well as in this study. The use of volunteer subjects limits the generalizability of the findings.

2. Ideally it would have been appropriate for a study of this nature to have taken the measurement of success at the end of year two or as measured by the licensure examination. Because of time restraints this was not

possible.

3. The comparability of grades among many different institutions is a possible source of uncontrolled variance.

4. There may be some inconsistencies in the data collected for the mature student regarding the use of up grading courses in place of the high school grade point average or in some cases were the mature student was admitted with no comparable marks.

5. The slight differences in the pre-entrance requirements of the five hospital based schools of nursing may be a significant factor.

6. Although the number of male students enrolling in nursing is significantly smaller than the number of female  students enrolling in first year of nursing, the current percentage of male student enroling in nursing has increased, ranging from two to five percent, to ten to fourteen percent of the total population thus making it statistically significant to include the male population in this study but not significantly feasible to analyze them separately.

Throughout this paper certain terms will be used which are unique to the disciplines of nursing, general education, and Psychology, which could be interpreted in a variety of ways. To avoid confusion, the meanings intended by this author are outlined in a glossary. Terms are listed not in alphabetical order but in natural groupings.

Glossary of Terms

**Registered Nurse:** A person who has successfully completed the
registrations examinations and is in good standing
with the provincial nurses association.

**Diploma Nursing Program:** A two year nursing program leading
to Registered Nurse status upon successfully
meeting the requirements for registration. This
post secondary educational program can be Community
College or Hospital based.

**Hospital Based Diploma Nursing Program:** A diploma
nursing program situated in  and affiliated with a
hospital.

**Baccalaureate Nursing Program:** A four year university based
nursing program.

**Continuator Student or Repeater:** A student who does not
successfully complete all of the requirements in a
nursing curriculum but is permitted to remain in
the program by successfully repeating certain
courses.

**Successful Student:** A full time nursing student who has successfully completed all nursing courses and all non nursing courses taken in first year of the two year nursing program of studies in the first attempt. It includes a satisfactory clinical performance and a passing grade in all nursing courses and the two university courses Human Anatomy and Physiology and Introductory Psychology.

**Non Successful Student:** Any full time student who does not complete the entire first year of the two year hospital based diploma nursing program for any reason.

**Persister Student:** Any student who is permitted to remain in the program of studies. The same definition as for successful student.

**Non Persister Student:** A student who has completely withdrawn from the program of studies. Same definition as unsuccessful student.

**Entry to Practice:** The position taken by the Manitoba Association of Registered Nurses that by the year 2000 the minimal educational preparation for entry to practice of nursing be the successful completion

of a MARN approved baccalaureate degree in nursing.

**Regular student:** A student who has all the required pre -entrance subjects required by a school of nursing.

**Mature student:** A student who is over 21 years of age and does not have the prerequisite subjects from High School.

**Modal Profile:** A representation of an "idealized individual", or ideal type, indicative of a broader class that shares similar attributes and for which a common set of predictions might be made (Jackson 1978).

**Attrition:** Attrition is defined as drop outs from the program. They are students who withdraw from a program of studies and are no longer part of the original class.

**Attrition rate** is determined by taking the total number of students admitted to the program in a given year and subtracting number of dropouts and then finding the percentage. For example if 112 students are admitted in 1990 and at the end of 1991 there were 19 dropouts the attrition rate would be 16.96% rounded off to 17%.

## Background

The move towards a baccalaureate degree as basic requirement to practice nursing may be a factor limiting enrolment in diploma schools of nursing at the present time. The Manitoba Association of Registered Nurses (MARN) approved at a special general meeting: " that by the year 2000 the minimal educational preparation for entry to practice of nursing be the successful completion of a MARN approved baccalaureate degree in nursing". This move towards a baccalaureate degree as basic requirements places an impetus on present schools to select qualified candidates who would most likely complete a nursing program from those students who would not likely to be successful and drop out of a program. Hudepohl and Reed (1984) found that 25 percent of the failures occurred in the first year of the program of studies. This is one reason  for selecting the end of year one as an appropriate measurement time frame. There are a number of problems associated with attrition studies . One problem is the accuracy of the recorded reason cited for withdrawal.  For example, the reason recorded may not be a reflection of what precipitated the withdrawal or the actual reason. Students drop out of nursing for many reasons. The main reasons are academic failure, wrong career choice in that nursing was not what they had expected, health reasons, family obligations and in some cases financial.

Another problem found in quoting attrition rates is that they are often misleading in that they do not take into account the number of students who progressed with interruptions as opposed to those students who progressed without any interruptions in their program of studies nor do they account for the number of part time students. The terms used to describe students who progress with interruptions are: "repeater", "continuator", and more recently labelled "recycled student".

The five hospital based schools of nursing in this study are:

1. Health Sciences Centre School of Nursing

2. St. Boniface General Hospital School of Nursing

3. Misericordia General Hospital School of Nursing

4. Grace General Hospital School of Nursing

5. Brandon General Hospital School of Nursing

The first four Schools are located in the City of Winnipeg and the fifth school is located in the south west portion in the Province of Manitoba.

The **Health Science School** of Nursing is the oldest of the Schools having its first graduate in 1888. The school is associated with the Health Sciences Centre which is owned and operated by the City of Winnipeg and is the largest of the tertiary health care facilities in the province. This centre, affiliated with the University of Manitoba provides patient care, teaching and research. It has become one of the largest

medical complexes in the country. The school, affiliated with this hospital, has a policy of accepting part time students.

The **St. Boniface General Hospital** has the privilege of being the first hospital established in Manitoba (1871) with a School of Nursing which has graduated nurses since 1899. The Hospital is a corporation established by the legislature of Manitoba for the purpose of carrying out works of charity and mercy. St. Boniface General Hospital is also a tertiary care teaching and research institute affiliated with the University of Manitoba but is owned and operated by the Sisters of Charity of Montreal/ Grey Nuns of Manitoba Incorporated who have retained the moral and legal responsibilities for the hospital. Through its statement of Mission, Aims and Objectives, the Hospital expresses its commitment and dedication to strive for excellence in the health sciences within an environment that promotes respect for the whole person as well as their spiritual and physical dignity.

The **Misericordia General Hospital** is a community hospital founded by the Sisters of Misericordia in 1898 for the care of unwed mothers and fatherless children. In 1969, the Hospital became incorporated as the Misericordia General Hospital. The Corporation is composed entirely of the Misericordia Sisters of Winnipeg.

The **Grace General Hospital** is a community hospital which has its origins with the Salvation Army in 1890. In 1904, the institution was incorporated and has continued to be operated

by the Salvation Army to assist in meeting the health needs of the citizens of Manitoba. The first graduates of the Grace General Hospital School of Nursing was in 1933.

The **Brandon General Hospital** incorporated in 1883 is a community hospital located in the second largest city in the province. It is the third largest hospital complex in Manitoba serving the health needs of the south west portion of the province. **The Brandon General Hospital School of Nursing** is the second oldest school in the province having graduated five students in 1894.

A brief description of the five schools of nursing illustrates their historical place in nursing education in the Province of Manitoba. The unique positions these hospital based schools have is in their affiliation with a health care facility which controls the use of Clinical Facilities in that institution. This is in contrast to the situation in most other Canadian Provinces where hospital based schools have moved to the community college setting. Manitoba is one of the few Canadian Provinces to retain hospital based schools of nursing into the 1990's. In Manitoba, with the move towards baccalaureate in the year 2000, these schools will have a choice of three educational delivery models for achieving baccalaureate education. A discussion of the models is outside the focus of this study but the model chosen could have implications regarding autonomy over selection criteria. The Strategic Planning Committee of the MARN (1988) recommends

that standardized admission requirements equivalent to university entrance be adopted by all diploma schools by the year 1990.

Statistics Canada (1988) Admission, Enrolment and Graduation Statistics for the five hospital based schools of nursing for the class admitted in 1986 and graduated in 1988 indicates that attrition rate is 23.5%. This is considerably lower than the 1987 statistic and the 1986 statistics which indicate that attrition was 43.2% and 34.6% respectively. Researchers in other countries have found that one third of all entrants into nursing will never graduate. This is substantiated by an American study (Levitt, Lubin, Dewitt (1971), an Israeli study (Bergman, Edelstein, Rotenberg, Melamed (1974) as well as the Canadian study (Weinstein, Brown, Wahlstrom 1980). The attrition rate for all diploma nursing programs in Manitoba (including the community college) is in the range of 16.65% to 33.27% (Statistics Canada 1986,87,88) which is in keeping with the National average. Faced with the declining applicant pool some of the schools have launched strategies to attract qualified candidates by initiating mini open house sessions to inform guidance counsellors of the nature of curriculum of the program of studies or by hosting an open house for candidates to become more familiar with the scope of the particular program. To retain students already in the program individual confidential counselling services are made readily available to students.

The Community Colleges in the Province are not included in this study because of differences in admission criteria and curriculum. However, Red River Community College was the focus of a study (Wieler 1980) which showed a low degree of relationship among pre admission scores and scores achieved in the program. Wieler (1980) recommended that for this particular community college promotion policies be based on scores obtained within a the nursing program. She (1980) concluded that post admission factors predicted success more accurately than did pre admission factors.

## Selection Criteria

Selection criteria can be classified in to three main areas. One is academic using High School grades. The second is ability testing coming up with a verbal or numerical quotient. The third is testing of personality and vocational interests which measures interests, attitudes, and personality profiles in an attempt to match interests and abilities to careers areas. Dietrich (1981) went one step further and recommended for use in Allied Health Schools in the United states the inclusion of psychomotor assessment in addition to the weighted assessments for cognitive and affective domains.

Many of the studies in the past decade were univariate studies looking at each variable one at a time. The most

appropriate studies used in predicting success were the multivariate ones such as the Lamoreau and Johannsen (1977) study which analyzed cognitive, personality, attitude, and vocational interest domains.

The schools of nursing in this study use a variety of tools for assessing both the cognitive and affective domains. For the cognitive domain standardized ability tests, academic records from high school and university as well as biographical data contribute to the evaluation of the candidate. For the affective domain, letters of recommendation and interviews are conducted in addition to the applicant submitting an essay or autobiography.

The second general area of assessment is the use personality profiles. They are often included in multivariate analysis to provide an important dimension in the selection of a high calibre of candidate for nursing. Personality inventories have been used to identify characteristics or traits unique to the functioning of a nurse in complex human relationships. The ability of the nurse to communicate with a patient, in addition to having the technical knowledge, is a vital component in the practice of nursing. For example, the ability to communicate with others in expressing emotions, needs, fears or opinions has long been recognized. Communication has biological aspects, psycho-socio- cultural dimensions as well as spiritual needs (Henderson 1968). For example, in good health or in sickness, young and old have a

multitude of things to communicate to others. When a client or patient cannot for various reasons, satisfy the need for him/herself, the nurse must help the individual express what he/she wishes to express and help find new ways of communicating when formerly used modes are no longer possible. This can be a very difficult task and it underscores the importance of careful professional preparation (Adam 1990).

Furthermore, it is the nurses's concern for the totality of influences on a clients health that puts him/her in a key position (Breen & Glass 1977). At times of illness the one professional person who can be aware of the majority of things that are affecting our health is the Nurse. According to Breen & Glass, the nurse becomes "the person" who has the responsibility of co - ordinating these influences to help restore the patient's equilibrium so that the person can attain the highest level of health possible for that individual. This responsibility includes not only the knowledge and technical competency of skills, but also a high degree of insight, empathy and effective interpersonal relationships. Breen & Glass explain that it is expected that such a range of qualities can be realized only when the person involved is operating from a high level of personal development.

This need to identify high levels of personal development in nurses prompted this investigation and the selection of the Jackson Personality Inventory for validation in this study.

The Jackson Personality Inventory is not derived from any particular personality theory but is more an assessment of Murray's Personality theory of needs (Dyer 1985). However, to a large extent the inventory appears to be based on the trait theory that presumes that knowledge of an individual's personality traits will permit us to predict what the individual is likely to do in a variety of situations over time. Modern trait theory of personality (Gleitman 1981) implies more than person constancy. Trait theorists assume that a particular person can be categorized along with others whose behaviour is in some respects equivalent. The validity of personality inventories has been evaluated by using indices of predictive validity. The results show that while these tests predict, they predict not too well for their validity coefficients are relatively low. A personality test tapes behaviour in one situation while the criterion assesses behaviour in another context. Cross - situational consistency tends to be low and so are validity coefficients. When the evaluation is based on construct validity, the results look more promising (Gleitman 1981).

The concept of stable personality traits has been seriously challenged by situationism which argues that behaviour is largely determined by the situation in which an individual finds themself. Another alternative to the theory is that - what is consistent is an interaction between person and situation. A further alternative espoused by (McClelland

1985) which states that by competency analysis one can identify variables traits, schemas, and motives - which account for a large part how a person will behave in broadly equivalent situations.

The third general set of variables used in predictive research is the background information or demographic variables. In this study only age and educational level such as mature or regular student status will be addressed.

### Problems in the Measurement of Success

Criteria for success have been measured by such elements as: Completion versus non completion of a class or program or academic success as defined by G.P.A.; demonstration of technical prerequisite job skills; performance on vocational or professional licensing examinations and job performance. However, in this paper only problems associated with measuring prior academic performance will be addressed.

In predictive research, the intellectual and ability factors as determined by the high school grade point average have been demonstrated by nursing researchers (Beale, McCutcheon, 1980), Hayes, 1981) and Shwirian, 1979) that high school grade point average is the single best predictor that a nursing student will successfully complete the program. However, the high school grade point average alone is not the

ideal predictor of success  because of the uneven weight given these grades by individual schools in Manitoba. The quality of the high school GPA may vary from school to school on a yearly basis as well as within that same school. American colleges and post secondary institutions of higher learning often have access to the student's rank in the class from a high school as well as the results of ability testing which is often included on the transcripts of marks. This information, if used appropriately, could assist admission committees. However, in Canada it is not the practice for high schools to provide this information to post secondary institutions.

High school GPA, coupled with the acceptable performance on ability tests, has become the two most widely used measures of predicting success in nursing programs (Allchinie and Bellucci, 1981; Burgess et.al. 1972; Donsky & Judge 1981; Montgomery and Palmer,1976; Seither, 1980). Yet these two measures have not reduced the dropout rate significantly. The high school grade point average has not been widely nor systematically studied as a valid measure of success in hospital based diploma schools of nursing in Manitoba.  Zegil (1973) found that there was no significant difference  between High School grade point average and the results from the standardized Provincial examinations in predicting success for the first year of University  at the University of Manitoba. Dauphinais (1979) found that Grade eleven marks were a better predictor of success than grade twelve marks. The main reason

cited by the author is that students are often admitted to the program based on the grade eleven grades because they are often the only ones available at the time of application.

## Present Trends in Diploma Schools

The trend in the past decade has been for prospective applicants to diploma schools of nursing to acquire some or all of the university courses required in the nursing curriculum prior to enrolment. These university courses are often taken as upgrading courses to qualify for the nursing program in the case of the mature student or in the case of the regular student who wants to lessen the load of the academic subjects. Few studies have looked at the entrance grade point average which is composed of both high school and university grade point averages as is the case in this study.

## Purpose

The purpose of this study is to validate two predictors of success, namely, the entrance Grade Point average and the Jackson Personality Inventory (JPI). Success is measured in terms of a student completing successfully the entire first year of the nursing program. A unsuccessful student is a repeating student as well as a student who has withdrawn from the program for any reason. Also to be analyzed will be those

students classified as a repeaters as well as the mature and regular student.

## Educational Significance

Administratively, there are economic implications which make attrition an important issue for study. Budget and required faculty are frequently governed by student enrolment. If attrition is high, long range planning may be ineffective and faculties may be left with insufficient budget to provide an effective program (Pickard 1984). This is especially pertinent today with the spiralling health and educational costs which are dictating budgetary restraint.

The need to select successful students becomes more acute as educators become faced with the decline in the applicant pool from which to choose qualified candidates. Gothler and Rosenfeld's (1986) study concerning education and manpower trends has indicated that the population of available 18 year olds to begin higher education is decreasing and will continue to decrease until 1995. Therefore, knowledge of reliable predictors would assist both the High School student and the nursing selection committees in their decision making process.

Cost to the student needs to be considered as well. If an incorrect career choice is made this has economic impact as well as psychological trauma to the student.

In summary no one variable can accurately predict student outcome in such a multifaceted problem as career choice.

Therefore, it is critical that predictors of success be identified and validated which would assist nurse educators, counsellor and prospective students in the decision making process.

Historical Perspective

The idea of using selection predictors is not a new one. In the early Christian era, when monasteries were the centre of care for the sick, the nuns and monks who entered such service had to give evidence of being "free born, celibate, free-of -debts and not lepers or epileptics" (Haglund, 1978). During the 18th century the thinking that prevailed was that all people were not suited to care for the sick. Such attributes as patience, compassion, and a mild manner were desirable criteria for one considering nursing (Haglund, 1978). Nineteen century religious orders required nursing trainees to be "women, 18 years of age or older who could read and write". By the time Florence Nightingale emerged on the scene all religious criteria were dropped. By 1917, the National League for Nursing Education in the United States required high school graduation for entrance in to nursing schools (Haglund 1978).

Today, each institution sets its own admission criteria. Because most schools of nursing have limited enrolment, a minimum grade is set for each of the required subjects. The

selection procedure has become both costly in terms of money and time. The hospital based diploma schools of nursing use extensive screening  methods such as ability tests, personality tests and interviews, but how predictive are these methods when the attrition rates range from 23.5% to 43.2% for the years 1988 and 1987 (Statistics Canada 1988). Intellectual and academic factors continue to be the greater contributor to the weighted prediction formulae in selecting suitable nursing candidates. However, can knowledge of personality traits improve the overall prediction formula?

## Summary of Problem

In general students are admitted into Diploma Nursing program based on many factors determined by a selection committee. As has been indicated there are three main areas upon which selection criteria are based. The first criterion is to determine academic and intellectual or cognitive ability. One way of determining academic ability is to assess prior academic standing such as High School Grades or recent upgrading courses acquired either at the high school  or university level and or to give ability tests coming up with a verbal or numerical quotient.

The second major area of assessment is to test personality utilizing attitudinal, vocational interests surveys, and personality inventories.  However, Personality

tests have special problems in that their validity is seldom predictive so they need to be demonstrated as effective predictors of success in a program (Weinstein 1980).

The third general area of assessment is the background information which should be weighted as objectively as possible. The background information for review can be obtained from an interview or from a well structured questionnaire.

These assessment methods of measuring academic, personality and background information provide the conceptual framework which continues to be used to select students for nursing. But how predictive are they of success?

## The Question:

The question to be asked in this study: Is it possible to distinguish between the two groups of students, namely the successful student and the unsuccessful student by, firstly, using an appropriate personality inventory that will discriminate among those candidates who are most likely to succeed in a nursing program. And, secondly, by knowing their entrance grade point average can prediction be made as to which group the student will fall?

**CHAPTER 11**


**REVIEW OF RELATED LITERATURE**


The review of the literature provides a context for examining the current state of knowledge on attrition and prediction studies. The literature review falls under two general categories -one of attrition and the other predictive research. A review of the literature conducted in general education setting will first be presented to provide the broader background against which nursing research is set. Attrition and prediction of success in Nursing Education will then be examined.


General Education


Spady (1970) conducted an interdisciplinary review and synthesis of dropouts from higher education. His model was based on Durkheim's theory of suicide which he used as a vehicle for summarizing a large proportion of the current research as well focusing attention on the interaction between student attributes and the influences, expectations and demands imposed by various sources in the university environment. Spady (1970) considered both the academic and social systems of the university an important framework from which the dropout process must be examined. Similarly

Durkheim's theory on suicide considered social integration of the individual into society the basic framework.

Tinto (1975) concerned with predicting dropouts in institutions of higher learning looked at the degree of fit between the student and the institutional environment. His model suggests that students enroll at an institution with a range of background traits such as race, secondary school achievement, academic aptitude, family educational context and initial commitments to the goal of graduation from that particular institution attended. Tinto (1975) found that when all other factors were held constant, the stronger the individual's level of social and academic integration and the greater the student's subsequent commitment to that institution and to the goal of graduation.

Prediction research in the General Education indicates that there are three general groups of predictor variables. They are the intellectual or cognitive, non intellectual or measures of personality, and background variables. The intellectual variables include global and multifactor ability measures of past academic achievement. Non intellectual variables include measures of personality which attempt to assess interest, anxiety, achievement and motivational traits. The background variables take into consideration are usually age, sex, birth order, marital and socio economic status.

In the field of general education a comparative prediction study of first year graduate and professional

school grades in six fields-Arts and Humanities, Biology and Physical Science, Social Science, Law, Medicine and Business Baird, (1975) found that in most fields grades were predicted by academic ability and by prior achievement, self confidence and previous accomplishment in the field. Background variables predicted grades only in law and Arts and humanities. Strictly biographical information made only a small contribution to prediction in most fields as did work values.

Covert and Chansky (1975) found a moderate effect of undergraduate grade point average on the prediction of success in graduate education. Results had to be viewed with caution because little discrimination was made with regard to the quality of performance or standard to which the grades had been assigned.

The lack of comparability of grades among institutions raises the question of uncontrolled variance which occurs when using grades awarded by many different institutions. Addressing this concern, Zegil, (1973) found that there was no significant difference between High School grade point average and the results from the standardized provincial examinations in predicting success for the first year of university at the University of Manitoba.

## Nursing Education

It has been established that a wide variety of methods

have been used to screen nursing students before they enter
their chosen career. These methods have ranged from very
minimum to very extensive methods of testing and interviewing
students assessing both the cognitive and affective domains.
It is apparent that the attrition rate is not the consequence
of intellectual and academic inadequacies alone. Studies by
Levitt et al.(1971), Wilson and Levy (1978) have attempted to
look at personality factors as indicators of persistence, but
none were able to improve prediction of success significantly.
The weakness of the majority of studies done was that they
looked at univariate statistics, examining variables one at a
time, as if it were a separate predictor. Findings from such
studies as the Douglas College Study (Lamoureux and Johannsen,
1977) and the Burton Study (1972) indicated that the variables
were not independent, but some were highly correlated. Both
researchers developed techniques whereby multiple variables
could be considered and analyzed. Tests were administered to
all project subjects testing cognitive, personality / attitude
and vocational interest domains. The purpose was to identify
factors that would predict potential "persisters" and
"nonpersisters" in nursing programs. These studies have
shortcomings due to the type of tests chosen. These tests were
used for initial screening of applicants for abnormalities and
were not relevant to the functioning of a person in a wide
range of settings involving work, educational or
organizational behaviour, interpersonal situations and high

level performance.

Breen and Glass (1977) using the California Psychological Inventory (CPI), the I-E scale, the Fear of Negative Evaluation Scale, the Interpersonal Trust Scale, and the S-R Inventory of Anxiousness concluded that first year students provide a consistent personality profile irrespective of type of program and that this personality profile remains consistent in senior year nursing students. This is an important finding in light of the move to a baccalaureate degree in nursing as basic requirement for practice in the year 2000.

R. Kristjanson (personal communication, October 28, 1988) University of Manitoba, had studied three successive classes of nursing students in the Baccalaureate program and found consistent profiles using the Jackson Personality Research form (PRF) which was in some ways the fore runner to the JPI. The instrument is distinguished from the JPI both in terms of the nature of personality variables measured and in terms of the JPI representing further refinement. Although Kristjanson found that the personality profiles were surprising consistent and congruent with degree students in the clinical area he abandoned further data collection because of a change in the method of evaluating students. However, Kristjanson, plans to publish his findings at a future date.

Few studies indicate that personality tests are used on a routine basis for baccalaureate nursing students in Canada.

However, recently in the United States some baccalaureate schools of nursing have been using Critical thinking analysis reports such as the Watson- Glaser Critical Thinking Appraisal (WGCTA). Bauwens and Gerhard (1987) findings support the usefulness of using this test as a potential pre-admission predictor of nursing success. However, they caution that there is still no instrument currently available predictive of Baccalaureate nursing program completion.

Nursing research, Beale and McCutcheon (1980), Hayes (1981) and Shwirian (1974) indicates that high school grade point average is the single best predictor that a nursing student will successfully complete the program. High school GPA coupled with the acceptable performance scores on ability tests have become the two most widely used measures of predicting success in nursing programs (Allchinie and Bellucci, 1981), (Burgess et.al.,1972),(Donsky, Judge,1981), (Montgomery, Palmer, 1976), (Seither,1980). Yet these two measures have not reduced the dropout rate significantly. Because of this apparent lack of predictability Wilson and Levy (1978) concluded that no rigid pre enrolment requirements or screening should be set up, but rather, sound personal and career counselling and explicit communication should be included throughout the entire program. Munro (1980) found that educational aspirations had the strongest effect on persistence in nursing for two year students. Assessment of personality and vocational interest through various tests such

as the Minnesota Multiphasic personality inventory, the Edwards Personality Preference Schedule and Cattell's 16 PF have met with limited success in improving the prediction equation.

Dauphinais (1979) found that personality variables as represented by Cattell's 16 PF Factors, were able to offer only a small number of significant correlations with success. However, he did conclude that ability to predict a given outcome was enhanced by the inclusion of personality measures among his criterion variables.

Willett, Riffel, Breen, and Dickson (1971) using the 16 PF found that dropouts from a hospital school of nursing were much more outgoing, warmhearted, easygoing, and participating than the successful group of students. The dropout students were spending considerable time fulfilling the social aspects of their personality to the extent that not enough time was spend on studies. They concluded that the 16PF was a valuable instrument in differentiating between the groups.

Levitt et. al.(1971) found that a combination of four tests, the results from which were combined with each to form a discriminant score, was a better predictor than chance. The four tests used in this experimental research were the Kuder Outdoor Scale, Minnesota Multiphasic Personality Inventory (MMPI) "F" scale, Edwards personality preference Schedule (EPPS) Succorance scale and the Kuder Social Service Scale. Burton (1972) used the Cattell 16 PF personality test with

discriminant analysis to study the prediction of success in nursing in Britain. He cautioned against using it alone but found it a valuable adjunct to other tests.

Zgar, Arbit and Wengel (1982) found that personality scales held little promise but indicated that the EPPS and the MMPI may have some utility in counselling students after they have entered nursing but not as in screening applicants. Pickard (1984) suggests that the Jackson Personality Inventory (JPI) and the Jackson Vocational Interest Survey (JVIS), although largely untested, be used in Canadian schools as an appropriate test for prospective nursing applicants.

In the area of Academic requirements Montgomery and Palmer (1976) recommended taking chemistry and physics prior to enrolment in nursing, but correlation studies to back this, although statistically significant at the .05 level, were not strongly convincing. There is a danger here of interpreting a high correlation between predictor and criterion as implying causality, when in fact, other data could be clouding the issue (e.g. age and life experience). This study found that scores on the American College Tests were most frequently low among the 18 year old and under group, compared to the older more mature students. This lead to the recommendation of general courses at the college level prior to enroling in nursing in order to allow adjustment time to post secondary education and time for emotional maturity.

Yess (1980) studied characteristics of graduating

nursing classes, looking for correlations on a number of academic and demographic variables with cumulative grade point average. This ex post facto study was used to demonstrate a character profile of persisters, students who graduated from the program, to assist admission officers in the future selection process. This study concluded that considerable research in the area of selection predictors is needed. Although recognized as an inconclusive study, it identified some initial predictors that might be helpful in predicting suitable students for nursing. The findings indicated that, next to mathematics test scores, marital status was the next variable in importance as a predictor. The third most influential predictor seem to measure the variable called motivation.

Weinstein et al.(1980), in a commissioned study by the Government of Ontario, promised to deliver new selection procedures. These authors used discriminate analysis to identify successful and unsuccessful students. Success was defined as passing the first year of a two year diploma program. Six different admission criteria were used. The results were that 61 percent of the students failing to complete the first year of the nursing program would not have been admitted. Reduction in the attrition rate of more than one quarter would result in denying admission to forty one percent of those students who successfully completed their first year. This study concluded that the number of pure and

applied sciences courses a student completed was the best predictor of success in the discriminate analysis. Average high school English and mathematics test scores were also good predictors.

Lamoureux and Johannsen (1977) developed multiple criteria for the selection of community college nursing students at Douglas College in British Columbia. They found that discriminant scores appeared to have considerable potential ability as a basis for predicting or classifying individuals as potential persisters or as non persisters. This major Canadian study used a battery of psychometric tests and questionnaires and came up with one hundred and twenty three variables which constituted a profile of a student nurse who would complete a community college nursing program and those student nurses who would leave the program prior to completion. This study used the General Aptitude Test Battery (GATB) as an initial screening test. If the applicants obtained an acceptable score they then were eligible to take the Nelson - Denny Reading Test before proceeding to a battery of Pre-Entrance tests and questionnaires for final screening. A simple correlation of each variable with student persistence and non persistence was obtained. The correlations were used to select a subset of variables where they significantly correlated with the criterion variable. Prediction rate was at 85 % or 28 out of 35 non persisters were identified. Discriminant analysis was used to obtain weights for a

prediction equation. The authors recommend that these profiles be used by counsellors as well as administrators involved in nursing school admissions at community college nursing programs. They produced average values for persisters and for non persisters using the following variables : the Strong-Campbell Registered Nurse Scale, George Washington University Nursing Test, Nelson-Denny, whether the Student was employed before entering program, Miles travelled to school (one way), Adoph- Whaley Index and a the Discriminant score. They concluded that the discriminant score appears to have considerable utility for predicting or pre classifying individuals as potential persisters or non- persisters.

The personality inventories Cattell 16PF, MMPI, EPPS and to a less extent CPI have serious shortcomings in that they do not measure what they purport to measure. For example the Cattell 16 PF test profiles suitable for someone with a good nurse -patient relationship could be poor for leadership and administration thus any single criterion for success would be invalid. Dauphinais( 1979) found that the relationship between Nursing Term grades and the 16 PF yielded only a few significant correlates. Factor B- "the intelliative" aspect correlated significantly with several nursing courses at the r .355 and .314. Only six of the 16 PF factors produced significant correlations with the criteria. Another shortcoming is noted in the Minnesota Multiphasic Personality Inventory (MMPI) which rated interest in nursing as a feminine

indicator. What would seem to be more appropriate in Nursing today would be a combination of the so called " feminine" and " masculine " attributes. In other words specific traits that describe a successful nurse regardless of gender in any situation.

## Summary of the Review of the Literature

The review of the literature addresses both the attrition and predictive research conducted from the perspective of general educational and nursing education. Durkheim's theory on suicide forms the basis for the Spady and Tinto's model for social and academic integration for continued commitment to the institution and the individual to their educational goals.

The review of the literature surveyed the multivariate approach to predicting success in nursing programs utilizing cognitive, affective and selective background factors. The cognitive measures such as the ability tests and the high school marks are the most widely used methods for predicting success. However, personality tests, inventories and vocational interest surveys when used in conjunction with the cognitive measures can improve the prediction rate but often at the expense of denying admission to approximately 25% of those who would have been successful in the first year. Many of the personality inventories used in the past decade were often norm referenced using psychiatric populations rather than average and above average college entrance level populations. There continues to be questions with regard to the reliability and validity of personality inventories.

The above review of the literature indicates that academic standing and results of aptitude tests together

account for only a segment of the total picture that distinguishes a student who persists from a student who does not persist in the nursing program.

This review provides a basis for the framework and research decisions made with regard to the design and method in this study. The study will attempt to validate two predictors of success namely the entrance Grade Point average and the Jackson Personality Inventory scales, to determine if, together they have predictive power in distinguishing a student who successfully completes the entire first year of the program in one attempt from those students who are repeaters as well as those students who are unsuccessful and have been dropped from the program of studies.

## CHAPTER III

## CONCEPTUAL FRAMEWORK

The conceptual frame work of this research is based on concepts borrowed from the disciplines of education, psychology, and sociology. However, for the purposes of this study I will focus specifically on concepts derived from the Higgs (1984) "Model for the Study of Success in Nursing Education and Nursing Practice."(See Table 13).

Although Schwirian (1977) was the first to provide the beginnings of an organized and systematic approach to the study of the topic, Higgs (1984 ) was the first to formally develop a model for the prediction of success in nursing education and nursing practice. The Higgs model can be used as a guide to replicate studies, to determine variable placement and control in studies within or across programs, and to further the conceptual understanding of predicting success. According to Higgs one may tap into the model at various stages depending upon the purpose of the study and the problems under investigation. The three levels of variables are: Pre Major, Nursing Major and Post graduation. Only the first of Higgs three levels of variables will be used in this study as a general model. According to Higgs "Pre Major Variables" could become the focus of an investigation to determine the degree admission criteria individually and in

combination predict success in the nursing program.

Higgs found that when admission variables were used alone the prerequisite GPA consistently entered the regression analysis first as the highest predictor of each criterion variable. Students who were unsuccessful were predicted accurately in 10% of the case, students successful with interruptions at 61%, and students successful without interruptions at 53%. Discriminant analysis indicated that prediction of smooth progression has fair probability but the predictor variables do not provide an accurate or stable forecast for the progression with interruption and with the unsuccessful groups. The discriminant coefficients of predictor variables suggest that background variables account for the major contributions to the discriminant weight that predicts internal progression. Higgs suggests that since 60-80% of academic variance still remains unexplained, highlights the need to expand the search for other non traditional predictors of academic achievement.

**CHAPTER IV**

**METHOD**

This chapter describes, firstly, the pilot study conducted to determine if there were any variables which would not be identified by the main study and then, secondly, the experimental design used to predict what variables separate the successful students from the non successful students in hospital based diploma schools of nursing. The research question and hypothesis are outlined. The independent variables are identified as entrance course grades, and grade point average, and the Jackson Personality Inventory scales. The size and major characteristics of the population studied is described and rationale for the selection of instruments in terms of purpose and content is provided. The reliability and validity of the JPI scales is discussed in terms of their coefficients. The process of data collection and method of data analysis are described. Limitations of the study are acknowledged and ethical considerations are described.

## Pilot Study

In order to determine if there are any other factors which contribute to lack of success in the first year of a program which can not be measured by the instruments a pilot study was conducted using a small randomized sample of students from each of the five schools of nursing. The schools were provided with computer generated random numbers base on the enrolment of each of the first year classes in each of the five hospital based schools of nursing. Two randomly selected students from each school for a total of ten students were interviewed following informed consent( appendix H) to participate in the pilot project. The purpose was to determine their expectations and opinions as to what factors contribute to their ability to successfully complete the nursing program (appendix E). Content analysis was conducted using non frequency - counting by using open ended questions to arrive at themes. Counting need not be only a matter of quantification. There are two other forms in use (Carney 1972).

"Non Frequency counting involves qualitative assessment of the significance of a single, an intensive, or an attenuated mention. Contingency analysis works by contrasting the patternings of associational fields or syndromes (p. 34).

Analysis of the Pilot Project indicated that there were

certain recurrent themes which the students expressed as having an impact on their success in the program. The recurrent themes are as follows:

1. The students stated that they must be able to handle the academics. They regarded having completed the University courses prior to entry into a Nursing School an important factor in coping with the work load.

2. The student who enjoys being in the clinical area learns clinical skills quickly, seeks out new and varied experiences, and is not satisfied with only the minimum standards is more likely to succeed.

3. The student who has a " balanced life", that is a balance between work, study, and personal time and also has good eating and sleeping habits will, more likely remain in the program.

4. The nurse who considers nursing" a calling" is dedicated and willing to make sacrifices has a greater probability of success than a student who does not put her whole self in to the program of studies.

5. A Student who has a "Care Giver Personality" that is a person who receives personal satisfaction out of caring for others will more likely succeed than a student who does not have this type of personality.

6. A student who receives positive feedback from teachers and peers is more likely to complete the program than student who receives very little positive feedback or encouragement.

## Design

### Purpose

The purpose of the main study is to validate two predictors of success namely the Grade Point Average and the Jackson Personality Inventory (JPI). Success is measured in terms that a student completes successfully the entire first year of the nursing program. An unsuccessful student is a repeating student as well as a student who has withdrawn from the program. Also to be analyzed will be those students classified as repeaters. A repeater is any student who must repeat a course or subject for any reason and is permitted to remain in the program.

### Assumptions

For the purposes of this study the assumption was made that all students are average or above average in intelligence. This assumption was based on the pre-entrance criteria of each school. Since all of the five hospital based schools of nursing administer ability and achievement tests as part of their pre-entrance tests it can be assumed that the students participating in this study are basically alike on academic ability.

Since we cannot assume the nature of the directionality

of our hypotheses before the fact, two sided testing procedures will be employed.

Hypotheses

It is hypothesized that:

Null Hypothesis  (H)0 1:

The JPI and the  entrance GPA together have no predictive power in terms of whether an individual nursing  student  will  be  successful  or  non successful in the nursing program.

Alternative Hypothesis 1:

The  JPI  and  the  entrance  GPA  together  have predictive power in terms of whether an individual nursing student  will be successful in  the nursing program.

Null Hypothesis (H)0 2:

There  is  no  difference  between  the  GPA  for successful and non successful students.

Alternative Hypothesis 2:

There  is  a  difference  between  the  GPA  for successful and non successful students.

Null Hypothesis  (H)0 3:

There is no significant difference between the JPI scales for successful and non successful students.

Alternative Hypothesis 3:

There is a significant difference on the JPI scales for successful and non successful students.


Null Hypothesis (H)0 4:

The JPI and the entrance GPA together have no predictive power in terms of whether a **"mature student"** will successfully complete the first year of the program.

Alternate Hypothesis 4:

The JPI and the entrance GPA together do have predictive power in terms of whether a " **mature student"** will successfully complete the first year of the program.


Null Hypothesis (H)0 5:

The JPI and the entrance GPA together have no predictive power in terms of whether a **"regular student** " will successfully complete the first year of the program.

**Alternative Hypothesis 5:**

**The JPI and the "entrance GPA"** do have predictive power in terms of whether a **"regular"** student will successfully complete the first year of the program.

Operational Definitions

**Mature Student** is any student who is over the age of twenty
one who is admitted to a diploma nursing program
who does not have the required Manitoba grade 12
courses or equivalent pre requisite courses for
English, Mathematics and a science  one of which is
either Biology, Chemistry or Physics.

**Regular Student** is any student who has been admitted to a
diploma   nursing   program   who   meets   the   schools
regular   admission   requirements   which   includes
Manitoba Grade 12 or equivalent  of English,
Mathematics, and a Science  which is either Biology
, Chemistry or Physics.

**High School GPA** is the High school grade Point Average of one
or   more   of   the   required   course   taken   from   a
Manitoba Grade 12 or equivalent. In the case where
a student has only one subject that subject will be
the average.

**University GPA** is the Grade Point Average of one or more of
the   required   University   courses   Introductory
Psychology, Introductory Sociology or Anthropology
and Anatomy and Physiology of the Human body taken

by the student prior to enrollment in the Nursing program. In the case where the student has only one subject that subject will be the average.

**High Number of Subjects** is the highest number of the required subjects (English Mathematics and a Science) a student has acquired at the grade 12 level of education or equivalent. University Number is the number of the three required university subjects the student has acquired prior to entry into the nursing program.

**Grade Point Average (GPA)** is the combined average of both high school and university required subjects taken prior to enrollment.

## Subjects

The sample of this study consists of volunteers from the newly admitted class of each of the five hospital based diploma schools of nursing in the Province of Manitoba during 1989. The students were administered the JPI within a few weeks of their initial enrolment in the first year of the nursing program.

The volunteer students from each of the five schools were informed that they had the right to withdraw from the study at

any time by contacting the researcher and providing their SUBJECT CODE number. The school will retain both the subject identification code number and the name as they will be provide the researcher with transcripts of marks after a consent form for release of marks has been obtained. All findings will be reported in aggregate form thus assuring confidentiality and anonymity. The general findings will be mailed or delivered to those subjects who request the general findings (Appendix B). Group feedback sessions regarding the finding will held at each of the five schools following the defense of the thesis. The directors of the schools of nursing will receive a more detailed report or a complete report upon request.

For the purposes of this study the admission criteria are considered to be essentially the same. An entire population of volunteers will be used who are full time students from each class of the five schools of nursing so as to provide a large population sample for statistical analysis.

Instruments

Grade Point Average

The outcome of the study is to identify successful and non successful students in hospital based diploma schools of

nursing. The dependent variable is success in nursing which is defined as the successful completion of the entire first year of the program in the first attempt without any interruption.. The independent variables are high school subjects, high school grade point average, university subjects and university grade point average and the personality scales on the Jackson Personality Inventory, all of which predicts membership in one of two groups namely successful or non successful. Stepwise discriminant analysis will be performed on the JPI profiles to determine which variables splits the groups the most.

High School Grade Point Average is selected as one of the components of the independent variable entrance grade point average because of its singular best predictive ability pertaining to academic potential in a nursing program (Allchnie and Bellucci 1981). The High School Grade Point Average (GPA) is defined by taking the mean of the three required subjects completed at the 300 or 301 level of the Manitoba grade 12 or equivalent ( APPENDIX H). In all of the five schools English, Mathematics and a Science ( a choice of either Chemistry , Biology or Physics) are the required subjects. In the case of the mature student a single subject or an average of one or more up grading courses will be defined as the grade point average. If the grade assigned a subject was recorded initially in numerical form it was converted to a letter grade (Table #1).

The university grade point average score is defined as the average of one or more of the Introductory Psychology , Introduction to Sociology/ Introduction to Anthropology and Anatomy and Physiology of the Human Body. The " entrance grade point average" is defined as the combined high school and university GPA. The Grade point average is determined by assigning a value to the appropriate range of letter grades ( Table 1).

A Nonparametric Statistical procedure will be used to determine which of the JPI scales are significant as well as for the High School and University subjects.

Stepwise discriminant analysis will  be performed using the Grade Point Average and the JPI scales to determine which variables split the groups the most.

## Jackson Personality Inventory

The Jackson Personality Inventory (JPI) was developed for use in populations of average or above average ability. The inventory was designed by Dr. Jackson in 1974 for use in schools, colleges and universities as an aid in counselling. The advantage of this test is that it is norm referenced for sex and college age groups which would be appropriate for the population in this study. In addition this test would allow the limited number of male students to be appropriately tested (Pickard, 1984).

Since the numbers of male students in this study is

relatively small compared to the female numbers, the statistical analysis will not be enlightening so the male population will not be identified in discriminant analysis.

The statistical procedure employed in the construction of the JPI began in 1962. They are the most elaborate ever employed for a personality test (Dyer 1984). Starting with a very large item pool, two separate item analyses on separate samples were undertaken to further three main objectives (Jackson 1976):

i.   to maximize content saturation in relation to desirability variance;
ii.  to maximize item variance;
iii  to minimize inter-scale redundancy (p. 22)

The variables of personality assessed by the JPI are relevant to the functioning of a person in a wide range of settings including those involving work, educational or organizational behaviour, interpersonal situations and high level performance. On face validity this inventory appears to be a superior test because of the substantive psychometric and computer based strategies for scale development. However, (Goldberg 1978) suggests that for personality research the JPI is highly recommended, but for use in applied settings, not yet.

Jackson (1977) admits that his inventories are not perfect and may have some serious short comings and suggests that more research needs to be done correlating the personality profiles with occupations. Because of this short

coming of the inventory, the JPI will be used primarily as a research tool in this particular study.

The Jackson Personality Inventory is comprised of 320 true-false items, divided into sixteen 20 - item scales. One of the characteristics of the JPI which differentiates it from many of the other personality tests is that scales were constructed from large item pools based on explicit definitions of each scale (Jackson 1976). The author suggests that, although the test is best administered under supervision, it can be administered for most populations without close supervision and even administered through the mail.

The 16 personality scales used in the inventory are:

1. ANXIETY                    9. RESPONSIBILITY

2. BREADTH OF INTEREST        10. RISK TAKING

3. COMPLEXITY                 11. SELF ESTEEM

4. CONFORMITY                 12. SOCIAL ADROITNESS

5. ENERGY LEVEL               13. SOCIAL PARTICIPATION

6. INNOVATION                 14. TOLERANCE

7. INTERPERSONAL AFFECT       15. VALUE ORTHODOXY

8. ORGANIZATION               16. INFREQUENCY


According to the manual the "Best Nurse" is described as a 21 year old student nurse who received the largest number of nominations for "Best Nurse" in a study of 88 nursing students. Notable among her high scores are elevations for

breadth of interest, energy level, responsibility, self esteem, social participation and tolerance. Lowest score is in risk taking. The author cautions that there may be several different styles of effective nursing and that the above profile may only depict one of them.

The reliability for all scales range from .60 to .88 with median .795. The manual provides little validity data. Critical reviews relative to the scarcity of validity data prompted the author to publish separate reports. The two studies were a California sample of 36 males and 46 female college students, and a Pennsylvania sample of 146 males and 161 females showing internal consistency coefficients of .84 to .95 with a median of .93 for the California sample and .75 to .93 with a median of .93 for the Pennsylvania sample (Jackson 1977).

The validity data on the Jackson Personality Inventory includes analyses of two multitrait- multimethod matrices employing adjective checklist , self rating, and peer ratings. In one of these studies the median correlation of JPI scales and relevant adjective checklist variables was .70, for self rating .56 and for peer rating .38. This adjective checklist feature distinguishes this inventory from the other inventories such as the MMPI and CPI.

The JPI utilizes the concept of a modal profile which is a representation of an idealized individual or "ideal type" indicative of a broader class that shares similar attributes

for which a common set of predictions might be made. The JPI profiles are bipolar in the sense that a person may be classified as very similar to the positive pole or the negative pole of the profile.

The models can be used in the area of classical prediction. Since a person may be characterised as being differentially similar to each of the five JPI modal profiles, these indices of similarity may be used as scores in linear regression studies. The reduced number of variables increases the degree of freedom which is an advantage when the numbers of individuals is not large (Jackson,1978.p 96-97).

In this study, the sample size of 270 volunteer students will provide sufficient numbers for multivariate analysis. Since we will have sixteen variables the ratio of 20 subjects per variable will be maintained which is considered consistent with the requirements of sample size for multivariate analysis.

Procedure

Once the study had received the approval of the University of Manitoba Faculty of Education Ethical Review Committee with regard to the protection of rights of human subjects, permission to conduct the study was then obtained from the respective directors of the Schools of Nursing and their institutions namely : the Health Sciences Centre, the St. Boniface General Hospital, Misericordia General Hospital, Grace General Hospital and the Brandon General Hospital (Appendix C). Arrangements were then made with each school for a suitable time to administer the JPI as soon as possible after the initial enrolment date.

The students were given a brief verbal and written explanation of the study and informed that they had the right to refuse to participate and could withdraw from the study at any time. Each subject's participation was of free and informed consent. There was no risk to the subjects at any time as a result of the research. It had no effect on a student's status in the diploma nursing programs. The students were also informed that they would receive a copy of the general findings of the study indicating on separate blank piece of paper their name and address. At this point students who did not wish to participate could leave. At one school, one male student decided not to participate because he did not

want his past grades " dug up". Several students from each of the schools left the testing area indicating for various reason such as doctor's appointments that they did not wish to participate in the study. Their rights were respected and they did not participate. General instructions were given pertaining to the writing of the JPI such as there are no right and wrong answers and that they should answer all questions even if they are not completely sure of their answer. The completion of the inventory takes approximately 50 minutes.

The signed consent forms with ID code numbers were collected and placed in a sealed envelope and stored in a locked cabinet in the administration office. The JPI test papers contained only the ID code number, the gender and age of the subject thus maintaining confidentiality and anonymity of the student. In addition to the informed consent specific consent for the release of grades was obtained from all volunteer full time students.

The JPI test papers were machine scored by the Research Psychologist Press. A raw score was converted to a standard score. The subjects did not receive the Jackson Personality Inventory basic profile report as this is a validation study and the inventory is to be used in this situation for research purposes only. However, a group meeting with participants will be arranged and feedback on the general findings of the study will be provided. A mailed copy of the general findings will

be furnished to those candidates who indicated on a separate

blank form (to assure anonymity) their request.

Treatment of Data

## High School Scores and University Grades

The treatment of marks posed a difficult task as high school marks came from a large number of high schools in Manitoba as well as a significant number from Saskatchewan all having various grading systems. Approximately, half the grades were reported in numerical values and the other half in letter or alphabetical values. The Universities also had various grading systems which had to be standardized. In particular, the University of Winnipeg utilized a letter grade with a minus value which also had to be recognized. Table 1 demonstrates the procedure used to convert the marks to a uniform system. If the student's mark was in numerical form that grade was used. However, if the grade was a letter grade the median of the range for that grade was used. For example the range for an "A" was from 81 to 84. The mean would be 82.5. Then a grade point average value was assigned that grade. In the illustration the value for the "A" was 4.

Table 1

Grading System

| NUMERICAL RANGE | LETTER GRADE | GPA VALUE |
| --- | --- | --- |
| 77-100 | A+, A, A- | 4 |
| 65-76 | B+, B, B- | 3 |
| 57-64 | C+, C, C- | 2 |
| 50-56 | D+, D, D- | 1 |
| 0-49 | F | 0 |

## Data Analysis

The data were analyzed using both descriptive and inferential statistics. The data were coded and the SAS Statistical program (1989) Version 6 was used to produce the results for the both descriptive and inferential statistics.

Factor analysis was performed to reduce the 15 variables of the JPI into a smaller set of unified concepts. Principal component factors were then rotated using the Varimax

procedure. Graphical aid of the scree plot will also help in the decision making process on how many  components or factors to keep.

The Wilcoxon Rank Sums Non Parametric one way Statistic (NPARIWAY) was employed to compare two independent groups. The only assumption usually required for this test is that of independent observations. In practice this test is used with measurement variables that are ordinal, interval and ratio.

Stepwise Discriminant Analysis was used to find the best discriminators of the groups, in terms of separating them. The second function of the discrimination analysis was to try to obtain a good hit rate in the number of students who would be correctly classified as successful and non successful.

Discriminant Analysis which is used to predict membership in one of the two groups either the successful or non successful group based on the measure of the independent variables, grade point average  and the JPI basic personality profiles is an appropriate multivariate statistical procedure to be used when the criterion variable (dependent variable) is at the nominal rather than interval level of measurement.

Furthermore, it provides relative ranking in terms of predictive importance for a set of independent measures attempting to discriminate between distinct population groups. The two groups will be those student nurses who succeed at the end of year one and those who  are non successful. Canonical correlation will also be involved as it forms the basis of the

Jackson Personality Inventory profile.

Factor Analysis performed on the fifteen scales of the JPI was expected to reduce the number of variables to ten or fewer. These factor scores will serve as dependent measures in the discriminant analysis. The factor analysis method would identify those variables which seem to account for a large amount of the variance. These factors together with the grade point average would be used to determine whether these measures discriminate between the two groups.

The first objective of a discriminant analysis is to see whether all or some of the selected characteristics can discriminate among the groups. If the analysis indicates that the characteristics do indeed discriminate among the groups, the results may be useful for the purpose of identifying or classifying those students mostly likely to succeed in a nursing program, a second objective.

The Discriminant analysis has two nice features summarized by Stevens (1986)

> " One feature is that it has parsimony of description and second is the clarity of interpretation. There are two methods used in interpreting the discriminant functions. One method is the examination of the standardized coefficients and the other is the examination of the discriminant function- variable correlations, ie, the correlations between each discriminant function and each of the original variables".(p. 232).

Whatever the outcome of this study, it is hoped that the findings will contribute significantly to the on going

research problem of reducing attrition in schools of nursing by identifying prospective candidates who are most likely to succeed or persist in a nursing program, thus reducing both the human and economic loss to both the individual and to the institution.

**CHAPTER V**

**RESULTS**

The findings of this study are presented to facilitate the interpretation of the research question for nursing education as well as for further research. Data were analyzed using both descriptive and inferential statistics. Notable are the frequency distributions, factor analysis, non parametric one way analysis of variance and discriminant analysis. The size of the sample is discussed with explanations for the treatment of missing values. The major findings of the study are discussed which support the decisions made with respect to the hypotheses of the study. Univariate analysis will be discussed first followed by the multivariate analyzes using the SAS (1989) statistical package.

An alternative approach was introduced where the sum of the weighted five factor scores were entered into the discriminant analysis for the two groups of students successful and non successful. Then the procedure was repeated after having removed the repeater group of students from the data. This approach was introduced to see how important it was to the results if the repeater group of students( who are neither totally successful nor unsuccessful) was removed.

Description of the Sample

The initial sample size consisted of 307 students  from the newly  admitted first year classes in each of the five hospital based diploma schools of Nursing in the Province of Manitoba.  Thirty four students were dropped from the study for the following reasons. Thirteen students used the wrong identification number (they used the School of Nursing number rather the code number supplied by the researcher), eight wrote the JPI test but did not sign a consent form, three pairs had duplicate code numbers, four scored more than ten bad responses on the JPI and three students were part time students who were not taking nursing courses.

The number of female students in the sample is 243 (89%). the number of males in the sample is 30 (11%) as shown in Figure 1.
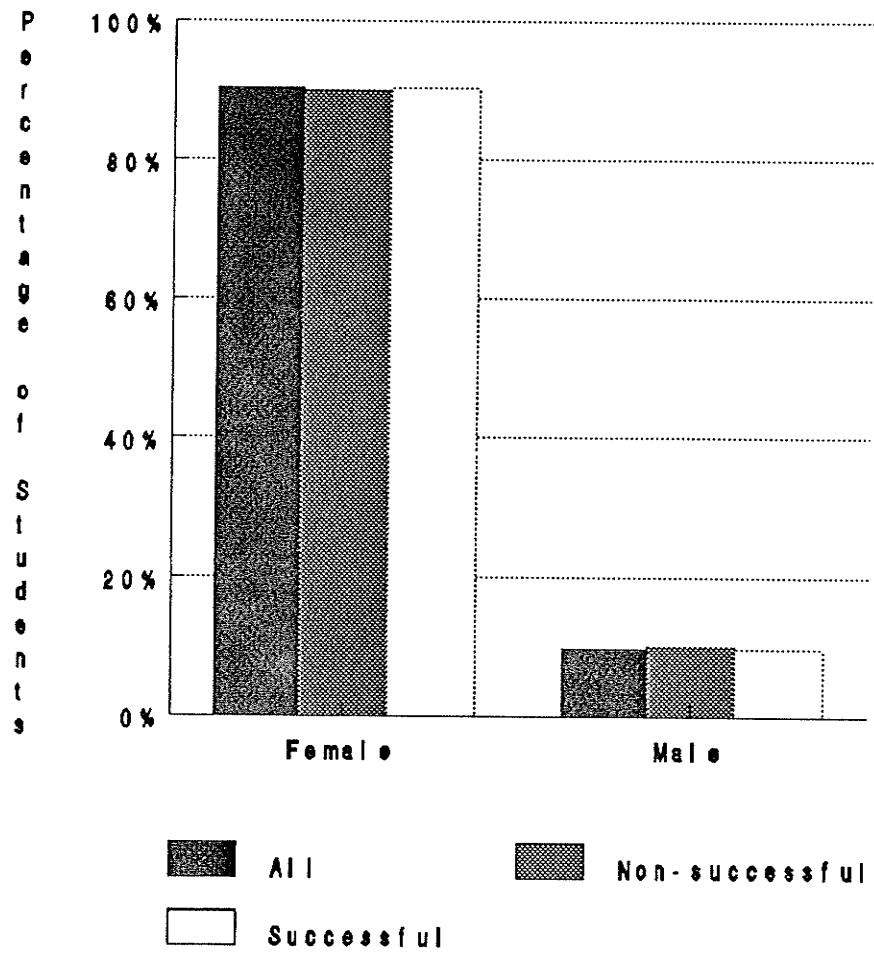
**Figure 1** Gender Distribution

Out of the total sample of 273 volunteer students 46 or 17%
were repeater students, 191 or 70% were successful and 36 or
13.2% were unsuccessful (Figure 2).
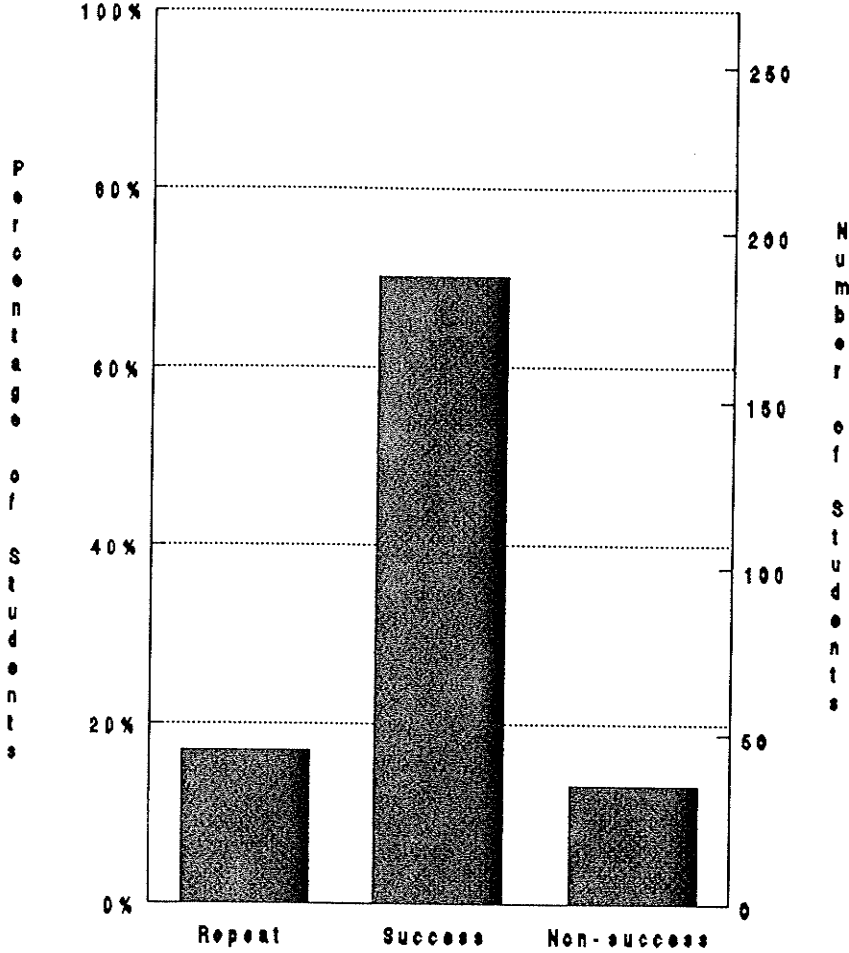
**Figure 2** Student Category by Result

Three additional students had to be dropped from the sample for the discriminant analysis procedure because of missing values. The end result was the total sample was 270 students. Since the operational definition states that the non successful includes the repeater category the distribution is 30% Non Successful students (see Figure 3).
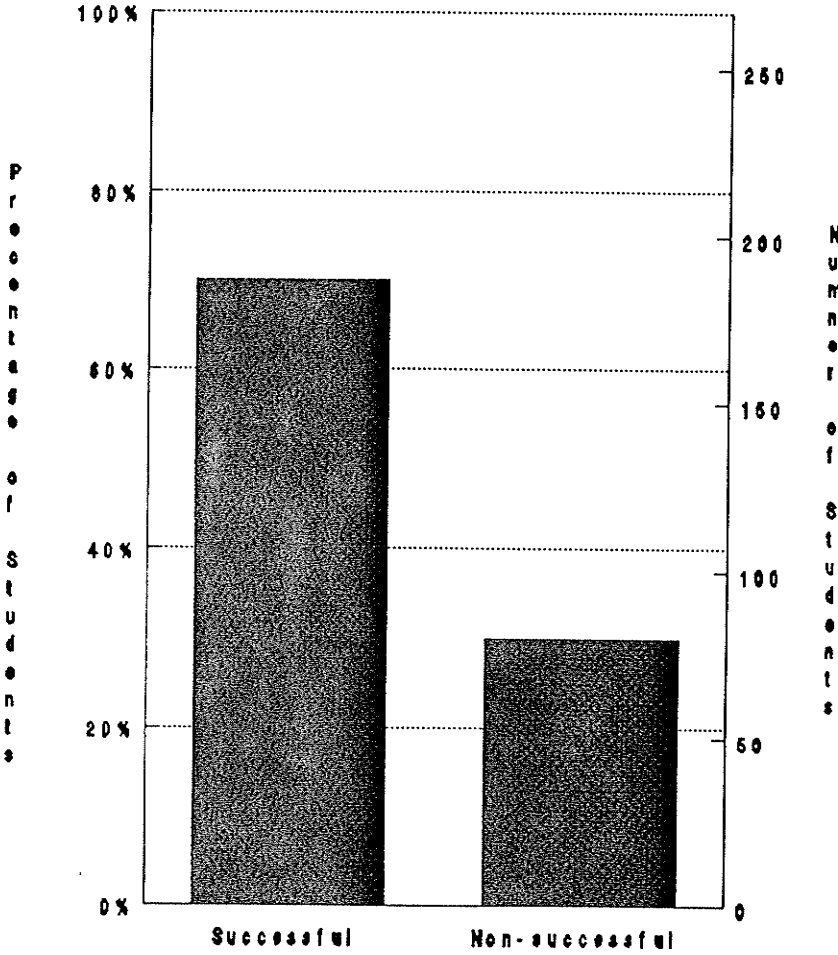
**Figure 3** Success\ Non Success
Distribution

The average GPA of 2.79 is based on 267 students because six students were admitted with no grades for subjects required in this study. The average grade point average for successful students is 2.87 and for unsuccessful students 2.61 ( Figure 4). However, there was a higher percentage of non successful students who had higher GPA's in the range of  3.5-4 than students who were successful.
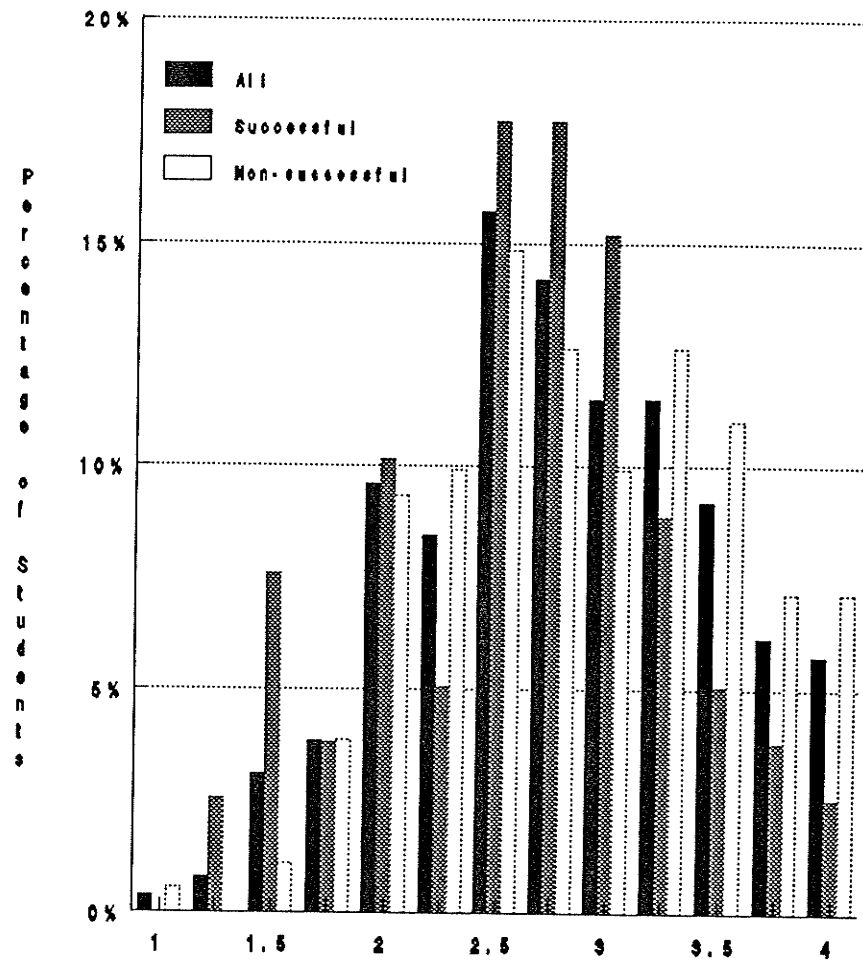
**Figure 4** GPA Distribution

On the Jackson Personality Inventory the successful group
had a higher standard (T) scores for Breadth of Interest (
Successful group 49.247, non successful group 47.788);
Complexity (successful group 43.768, non successful group
41.875); Energy Level (successful group 51.374, non successful
group 49.638); Organization (successful group 54.716, non
successful group 53.175) and Self Esteem (successful group
52.237, non successful group 50.725 but not for Anxiety (
successful group 49.790, non successful group 50.125: Risk
Taking (successful group 45.316, non successful group 47.363)
and Social Participation (successful group 51.800, non
successful group 54.413). (See Figure 5 and Supplementary
Appendix Figures 9-22).
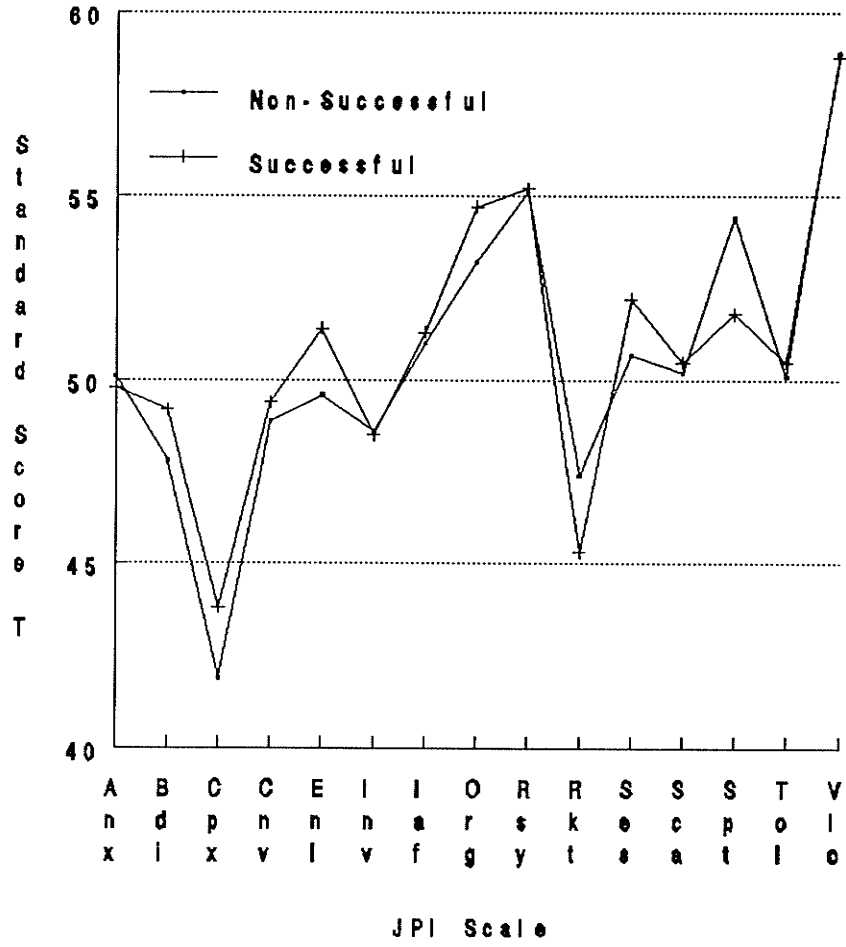
**Figure 5** JPI Plot of Standard Scores

Of the 273 students there were 47 from Location A, 66 from Location B, 62 from Location C, 43 from Location D, and 55 from Location E. Location C had the highest percentage of successful students and location E had the highest percentage of repeating students. Although the site or the location of the school was significant, $\chi2$ (8,$\underline{N}$= 270) = 25.802, $\underline{p}$< .001, it was not the purpose of this study to identify the location nor to study the factors contributing to this difference. This difference could be examined in future research.

A further breakdown of the sample was done to identify the regular student from the mature student. Of the 268 students, 28% are mature and 72.4% are regular students. Of the 28% mature students of the sample 4.5% were unsuccessful and 4.5% were repeaters. Of the 72% regular students in the sample 51% were successful and 12 % were repeaters and 9% were unsuccessful (see Figure 6).
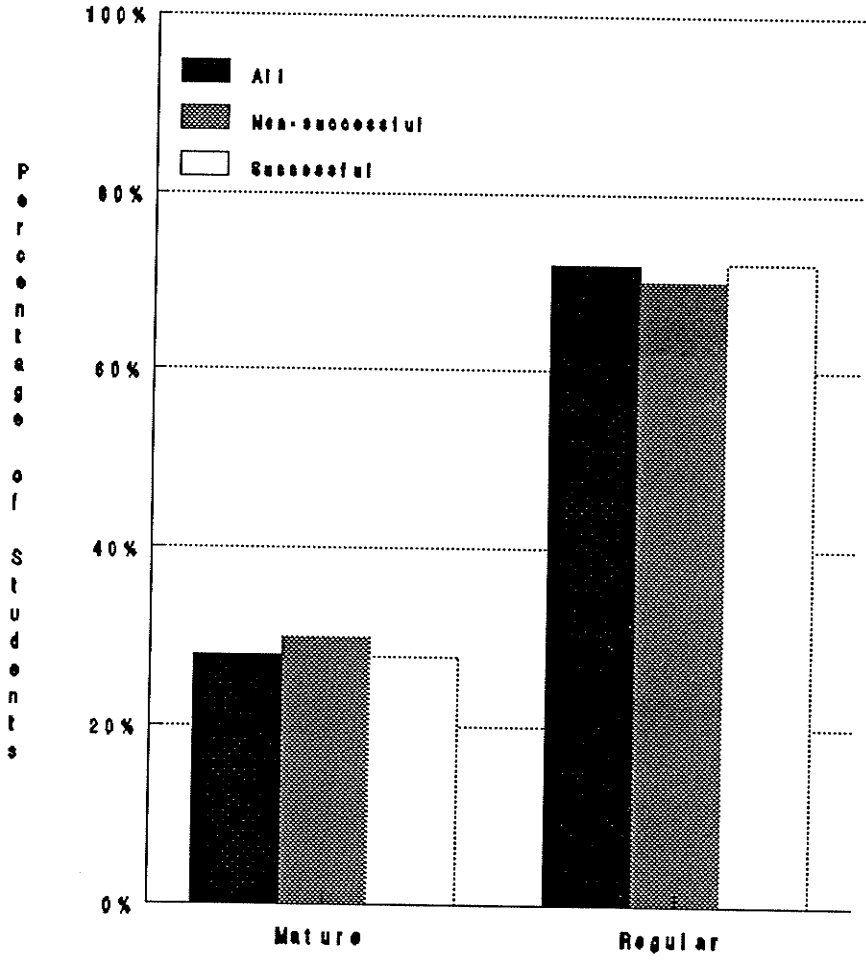
**Figure 6**   Mature   and   Regular   Student
Distribution

Non Parametric One Way Analysis of Variance

The non parametric one way analysis of variance (NPARIWAY) using the Wilcoxon Rank Sums and the Kruskal-Wallis Test was applied to individual independent variables. In practice the Kruskal -Wallis test is used for ordinal, interval, and ratio variables. Using the Wilcoxon scores (rank sums) ten variables were found to be important in that they demonstrated differences between the groups. These variables included Human Anatomy and Physiology $\chi 2$ (1,$\underline{N}$ = 93) =10.902,$\underline{p}$<.001, the overall GPA $\chi 2$ (1,$\underline{N}$ = 270) = 6.1922, p<.0129;6; Chemistry 300 $\chi 2$(1, $\underline{N}$=166) = 9.3494,$\underline{p}$<.0022; University GPA $\chi^2$ (1, $\underline{N}$ =270) 6.1709, $\underline{p}$<.0022;

Age $\chi^2$ ( 1, $\underline{N}$=267) = 8,748, $\underline{p}$<.0031; Mathematics 300 $\chi^2$ (1, $\underline{N}$ = 132),=5.4876, $\underline{p}$<.0192; English 300 $\chi^2$ (1, $\underline{N}$ =204) = 5.2361, $\underline{p}$<.0221; High School GPA $\chi^2$ (1, $\underline{N}$ =142 = 4.8892, $\underline{p}$<.0270; Introductory Psychology $\chi^2$ (1, $\underline{N}$ =142)= 4.8892, $\underline{p}$<.0285 and JPI profile Social Participation $\chi^2$ (1, $\underline{N}$ =270), =4.5982, $\underline{p}$<.0192. The Mean Scores as well were all higher on all variables for the Successful group than for the unsuccessful group with the exception of the JPI scale Social Participation. See Table 4 and Supplementary Table 10.

Table 2

## Wilcoxon Scores (Rank Sums) for Variance

| Variable | Number | Chi Sq. Approx. Kruskal/ Wallis | df | p Value (tail) |
|---|---|---|---|---|
| Anatomy & Physiology | | 10.902 | 1 | .0010* |
|     Non Success | 24 | | | |
|     Successful | 69 | | | |
| Chemistry | | | | |
|     Non Success | 51 | 9.3494 | 1 | .0022* |
|     Successful | 115 | | | |
| University GPA | | 6.1709 | 1 | .0130* |
|     Non Success | 49 | | | |
|     Successful | 125 | | | |
| Age | | | | |
|     Non Success | 80 | 8.7487 | 1 | .0031* |
|     Successful | 187 | | | |
| Math 300 | | | | |
|     Non Success | 93 | 5.4876 | 1 | .0192* |
|     Successful | 129 | | | |
| English 300 | | | | |
|     Non success | 58 | 5.2361 | 1 | .0221* |
|     Successful | 146 | | | |
| High School GPA | | | | |
|     Non Success | 74 | 4.8892 | 1 | .0270* |
|     Successful | 168 | | | |
| Intro. Psychology | | | | |
|     Non Success | 45 | 4.7975 | 1 | .0285* |
|     Successful | 190 | | | |
| Social Participation | | | | |
|     Non Success | 80 | 4.5982 | 1 | .0320* |
|     Successful | 190 | | | |
| University GPA | | | | |
|     Non Success | 74 | 6.1922 | 1 | .0129* |
|     Successful | 185 | | | |

*p<.05

The Non Parametric one way analysis of variance (NPAR1WAY) showed that the number of subjects a student had taken in high school $\chi^2$ (1, $N$=270)=.1548,$p$<.90 and university $\chi^2$ (1, $N$=270 )= 1.0200, $p$<.3125 was not significant. When English 300 and 301 were entered into the analysis as a single entry the combined results $\chi^2$ (1, $N$=233)=2.3814, $p$<.90 were also not significant. Similarly, Mathematics 300 and 301 when combined were not significant $\chi^2$ (1, $N$=211)=2.8333, $p$<.05. English and Mathematics were only significant at the 300 course level (see Table 4).

Applying the NPAR1WAY analysis of Variance to the alternate approach where analysis was made using the pure groups successful and non successful with the repeater group removed, it was found that Human Anatomy and Physiology was significant , $\chi^2$ (1, $N$=78)=6.2869, $p$<.0122, and also Self Esteem, $\chi$ (1,N=224)=4.0777,$p$<.0435.

For Chemistry 300, 69% of the successful students had a grade for this subject, 17% of the repeater students and 23% of the unsuccessful had taken the subject. For Physics 300, 74% of successful students had a grade while only 7% for the repeater and 6% for the unsuccessful student. The total number of students taking this subject was 50. When Biology 300 and 301 were combined there were 81 missing values from a sample of 192. Of this sample 70% of the successful students had

taken the subject while 15% for each of the repeater and unsuccessful students. For the university course Introductory Sociology the sample was 113 with 75% of the successful students having completed this course and 14% for the repeater students and 12% for the unsuccessful students. For the subject Human Anatomy and Physiology the sample was 94 with 74% of the successful students having a grade and 16% of the repeaters and 10% for the unsuccessful students. For University course Introductory Psychology the sample was 150 with 70% of the successful students having a successful grade and 17% for the repeaters and 19% for the unsuccessful student. For the GPA (combined high school and university GPA) there were 6 missing values. There was at least one student from each of the five locations who entered the school without comparable grades. Admission was based on other factors. Tabulation of the percentage of people with missing values was done (Table 2) because there was a concern that cell frequencies might be too low for some of the academic subjects especially in the case of the mature student.

Table 3

Percentage of people with Missing Values:

Highest Number of Subjects Taken by Results

| Highest Number Subjects Taken | Percent Repeater | Percent Success | Percent Non Success | Total |
|---|---|---|---|---|
| 0 | 1.10 | 8.06 | 1.10 | 10.26 |
| 1 | .00 | 2.56 | .73 | 3.29 |
| 2 | 2.93 | 6.23 | 2.20 | 11.36 |
| 3 | 5.49 | 16.85 | 1.47 | 23.81 |
| 4 | 5.49 | 27.84 | 5.86 | 39.19 |
| 5 | 1.83 | 8.42 | 1.83 | 12.09 |
| Total | 16.85 | 69.96 | 13.19 | 100.00 |

The average age of the sample is 23 years with a range of 17-49 years. The overall mean age for the total sample is 23.157 years (standard deviation 6.803). The mean age for the mature student is 26 years and for regular students 21 years. The mean age of the successful student is 23.668 years (standard deviation 6.245) and for the unsuccessful student the mean age is 21.963 years (standard deviation 5.543) The age distribution pattern for the sample shown in Figure 7 demonstrates the extreme positive skewness of the ages. the positive skewness indicates that values to the right of the mean are more spread out than those values to the left of the mean. There are certain dramatic peaks (modes) for especially for the unsuccessful group at the age of 26, 29 and 40 years of age.
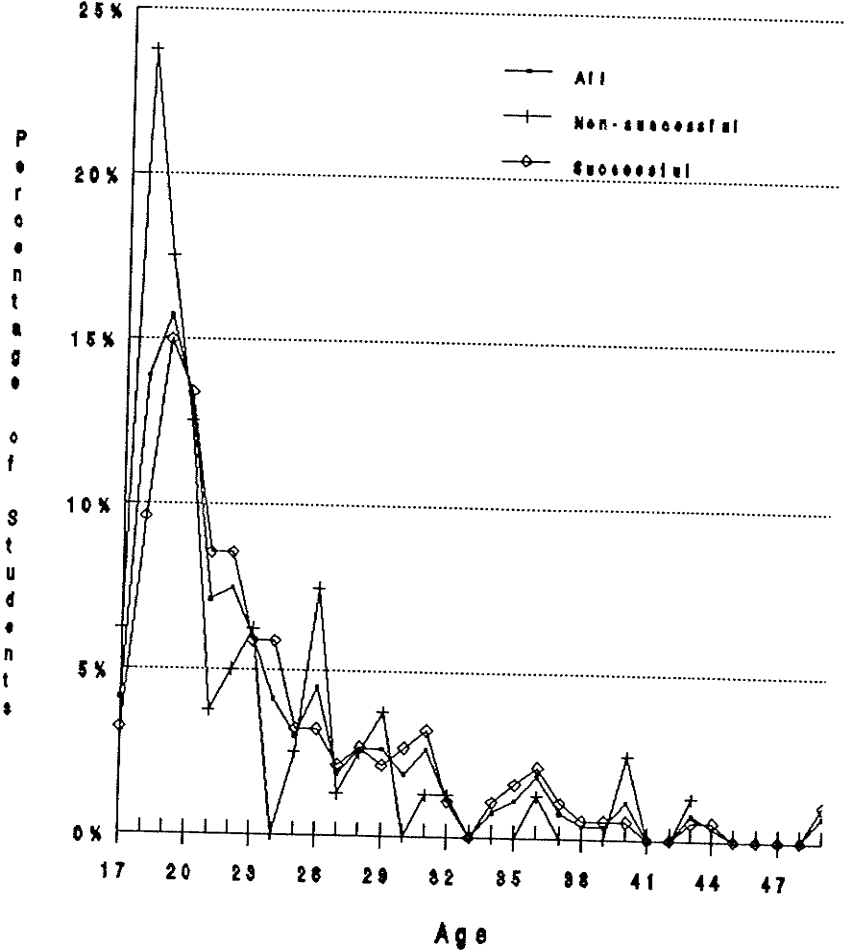
**Figure 7** Age Distribution

Factor Analysis

Factor analysis was employed as a statistical means for condensing or combining many variables into smaller numbers that are interrelated. It is a way of looking at the correlations among variables to determine if they fall into any kind of recognizable pattern to identify concepts, dimensions or factors.

The Principal Component procedure treats each principal component as a linear combination of the original variables with coefficients equal to the eigenvector of the correlation. The eginvectors are customarily taken with unit -norm (eginvalue). The principal components are sorted by descending order of the eigenvalue which are equal to the variance of the components. The first principal component has the largest variance of any of unit length of a the observed variables. the last principal component has the smallest variance of any linear combination of the original variables.

The five Principal component factors have eigenvalues accounting for 65% of the total variance. The scree plot performs the same function as the Principal Component but in addition provides a graph showing how many components to keep. The Scree Plot (see Figure 8) indicates that five factors should be kept.
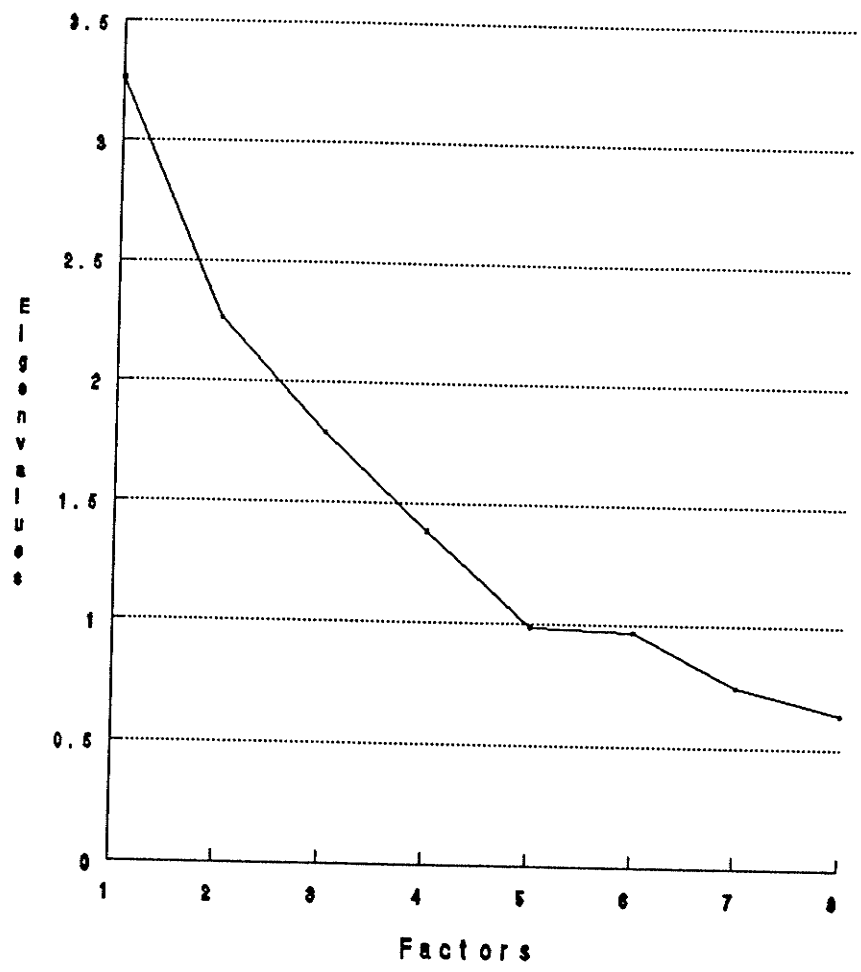
**Figure 8** Scree Plot of Eigenvalues

The five principal component factors which were retained were then rotated using the Varimax procedure. The Varimax rotation is an iterative procedure in which each factor is rotated with every other factor with the goal of maximizing the varimax criterion. After each pair of factors has been rotated once, the angles of rotation are computed and the process is repeated until the angles of rotation converge.

Factor 1 describes a person who tends to worry over inconsequential matters, modifies behavior to be consistent with standards set by others and is concerned about others. Factor 2 describes a person who is attentive and motivated to participate in a wide variety of activities, curious, and has an inquisitive mind who is open to new ideas. Factor 3 describes a person who is clever, discerning, who is motivated to seek solutions to problems and also enjoys adventure with an element of peril and who may be seen as manipulative of others but is diplomatic and has socially intelligence. Factor 4 describes a person who is confident in dealing with others, values positive interpersonal relationships who is capable of intense work for long periods of time. Factor 5 describes a person who experiences a sense of duty to others and hold a traditional set of values see Table 3. These identified factors will later be entered into the discriminant analysis.

Table 4

Factor Pattern: Varimax Rotation

| Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|
| Interpersonal Affect .80397 | Tolerance .73774 | Social Adroitness .73625 | Social Particpation .62139 | Value Orthodoxy .82118 |
| Anxiety .78747 | Breadth of Interest .73774 | Innovation .59084 | Energy Level .61822 | Responsibility .65055 |
| Conformity .75275 | | Risk-Taking .58701 | Self-Esteem .55109 | |
| | | Complexity .55326 | Organization .54123 | |

The alternate approach was to find the sum of the weighted factor scores and enter this equation into the discriminate analysis. Weighted Factor Scores were created multiplying the standard score of each variable by the varimax values and summed to obtain a weighted factor score for each of the five factors. The weighted factor scores for the JPI scales did not enter into the discriminant analysis. The GPA was the only variable that could be entered.

The same procedure was used to obtain weighted factor scores for two groups the truly successful group and the truly unsuccessful group by removing the repeater group of students. It is a common practice in discriminant analysis when you have the data to look at specific groups within a data set to analysis that may discriminant among them.

Table 3.1 illustrates the factor pattern from the two groups: the purely successful and the truly unsuccessful (with the repeater group of students removed).

Table 4.1

Factor Pattern For Successful/ Non successful with Repeater
Group Removed

| Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
|---|---|---|---|---|
| Inter personal Affect .82556 | Tolerance .79842 | Social Adroit ness .69456 | Organiz ation .78091 | Value Ortho doxy .84086 |
| Anxiety .78092 | Breadth of Interest .72690 | Self- Esteem .66528 | Energy Level .65066 | Respons ibility .66304 |
| Conform ity .76282 | Complex ity .58643 | Risk Taking .65395 | | |

## Stepwise Discriminant Analysis

The next procedure performed was the stepwise discriminant analysis. For the stepwise discriminant analysis there were 267 observations, 16 variables and two class levels one being the successful group and the other unsuccessful group composed of the repeaters and those students who completely withdrew from the program. The decision was made to adopt the SAS program default 10% level of significance as it is a common practice in multivariate analysis to use the program defaults because it is a more liberal test.

Hypothesis 1

Null Hypothesis H (0)1:

The JPI scales and the GPA together have no predictive power in terms of whether a student successfully completes the first year of a diploma nursing program.

The first variable to be entered in the stepwise discriminant procedure was the GPA which is significant at $p<.0048$ and accounts for approximately 3% of the total variance. The second variable to be entered was self esteem with a $p<.0033$, cumulately accounting for approximately 1.36% of the variance. The third variable to be entered is Social Participation with $p<.0008$ and accounting for 2% of the variance. The fourth and fifth steps entered were Risk Taking with $p<.0706$ and Complexity ($p<.0807$) both adding approximately 1% each to the total variance. All of these variables accounted for approximately 11% of the variance. See Table 5.

**Table 5**

Stepwise Slection Summary Testing Hypothesis H (0)1

| Step | Variable Entered | Number In | ASCC** | Prob > ASCC |
|------|------------------|-----------|--------|-------------|
| 1 | GPA | 1 | .0299 | .0048* |
| 2. | Self-Esteem | 2 | .0429 | .0033* |
| 3. | Social Partici-pation | 3 | .0619 | .0008* |
| 4. | Risk-Taking | 4 | .0706 | .0008* |
| 5. | Complex-ity | 5 | .0897 | .0006* |

* p<.10

** ASCC Average Squared Canonical Correlation

The GPA and the Jackson Personality Inventory scales Self- Esteem, Social Participation, Risk Taking and Complexity are significant at $p<.10$ and some predictive power in terms of splitting the students into two groups: successful and unsuccessful.

Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted that the GPA and JPI scales Self Esteem, Social participation, Risking Taking and Complexity have predictive power.

Hypothesis 2

Null Hypothesis (H)0 2: The null hypothesis states that there is no difference between the GPA for successful and non successful students. Since the GPA is significant at $p < .05$ reject the null hypothesis. The alternative hypothesis is accepted that there is a difference in the GPA between successful and non successful students ( see Table 6).

Testing Hypothesis 2

Table 6

Stepwise Statistical Summary for Hypothesis  H(0)2

| Step | Variable | Number In | ASCC | p Value |
|------|----------|-----------|------|---------|
| 1 | GPA | 1 | .0299 | .0048* |

* p<.10

** Average Squared Canonical Correlation

Hypothesis 3

## Testing Null Hypothesis (H)0 3

Hypothesis (H)0 3 states that there is no difference between the JPI profiles for successful students and non successful students.

The stepwise discriminant analysis indicates that social participation (p<.0376), and Self Esteem (p<.0290), Risk Taking (p<.0472) and Complexity (p<.0595) are significant. Therefore reject the null hypothesis and accept the alternative that JPI scales: Social Participation, Self-Esteem, Risk Taking and Complexity scores do make a difference and are significant and they separate the students into two groups successful and unsuccessful.

Table 7

Stepwise Statistical Summary for Hypothesis H(0)3

| Step | Variable Entered | Number in | ASCC** | p< (tail) |
|------|------------------|-----------|--------|-----------|
| 1 | Social Participation | 1 | .0160 | .0376* |
| 2 | Self-Esteem | 2 | .0290 | .0195* |
| 3. | Risk-Taking | 3 | .0290 | .0195* |
| 4. | Complexity | 4 | .0595 | .0026* |

*p<.10

** Average Squared Canonical Correlation

Hypothesis 4

Null Hypothesis (H)0 4: That these is no difference between
the GPA   and JPI scores for the Mature Student and
regular student. See Table 8.

Testing Hypothesis 4

**bTable 8**

<u>Stepwise Selection Summary Hypothesis H(0)4</u>

Mature student

| Step | Variable Entered | Number in | ASCC** | Prob< (tail) |
|------|------------------|-----------|--------|--------------|
| 1 | Breadth of interest | 1 | .0413 | .0890* |

*p<.10

** Average Squared Canonical Correlation

Breadth of interest was the only variable which was entered in the discriminant analysis for the mature student. Since JPI variable Breadth of interest is significant at the p<.05 level then reject the null hypothesis that it is false and accept the alternative hypothesis that the JPI scale Breadth of Interest scale does have predictive power in terms of separating the mature student from the regular student.

## Hypothesis 5

Null Hypothesis (H)0 5: That the JPI and the GPA do not have predictive power in terms of whether a <u>regular student</u> will successfully complete the first year of the program (see Table 9).

Table 9

Stepwise Selection Summary Testing Hypothesis  H(0)5

| Step | Variable Entered | Number in | ASCC** | p< tail |
|------|------------------|-----------|--------|---------|
| 1 | GPA | 1 | .0537 | .0012* |
| 2 | Complexity | 2 | .0929 | .0001* |
| 3 | Energy Level | 3 | .1106 | .0001* |
| 4 | Risk Taking | 4 | .1232 | .0001* |

*p<.10

** Averaged Squared Canonical Correlation

The GPA was the first variable to be entered into the discriminant analysis followed by Complexity, Energy and Risk

Taking. Together these variables account for approximately 12 -15% of the common variance. Therefore the null hypothesis is rejected and alternative is accepted that the GPA and the JPI scales Complexity, Energy and Risk Taking do make a difference and separate the regular successful students from the regular unsuccessful students.

## Research Question

Does the Grade Point Average and the Jackson Personality Inventory together have predictive power in terms of whether a student is successful or unsuccessful at the end of the first year of a diploma nursing program?

Three classification predictions will be made using the Discriminant analysis linear function. First, the two group category of successful and non successful student groups will be addressed and then the three group category of successful, non successful and repeater and finally the alternative approach of analysis where the truly successful and truly non successful with out the repeater group will be given.

The discriminant analysis classification summary for the two group category indicates that 64% of the successful group would be correctly classified as successful while 36% would be wrongly classified as successful. The non successful group

had 61% classified correctly as non successful while 39% were classified wrongly as non successful.

Discriminant Analysis for the three group category indicates that for the successful group 66% would be classified correctly and that 34% would be wrongly classified as successful. For the non successful group 69% would be correctly classified while 31% would be wrongly classified. For the repeaters 57% would be correctly classified while 20% would be wrongly classified as successful and 24% wrongly classified as unsuccessful. For the successful group 53% would be classified correctly and 24% wrongly as repeater and 24% wrongly as unsuccessful. The unsuccessful correctly classified is 60% while wrongly classified as successful at 20% and wrongly classified as repeaters at 20%.

The alternate approach of analyzing the groups without the repeater group influence results in 55% of the non successful being correctly classified and 58% of the Successful group being correctly classified.

## CHAPTER VI

## DISCUSSION AND CONCLUSIONS

The discussion of the results will focus initially on the findings of the study. Possible reasons for the relative lack of the size of the effect of the results will be discussed in conjunction with the limitations of the study and the results of the Pilot Study. The findings will also be compared with previous research on prediction of success in nursing and the implications of the findings for the nurse educator as well as the guidance counsellors will be highlighted. Finally the implications of the findings for further research will be addressed.

The discriminant analysis statistical findings indicated that the grade point average together with the JPI scales account for approximately 12-15 % of the total variance. A great amount of the variance in what separates the successful students from the non successful students is left unexplained. The GPA is significant but does not have a strong relationship to success in that it only accounts for approximately 5-6% of the total variance. The statistical results indicated that some of the individual personality profiles such as social participation and breadth of interest when analyzed together

with the GPA had some predictive power in terms of whether a mature student would be successful. Knowledge of the GPA did not improve the predictive power in terms of the mature student. The JPI together with the GPA is significant but does not have a strong relationship to success as it only accounts for 15% of the total variance.

The non parametric one way analysis of variance indicated that the only JPI scale which was significant at the $p < .05$ level was Social Participation. In addition to the academic subjects Chemistry 300, University Introductory Psychology, English 300, Mathematics 300, University Human Anatomy & Physiology, High School GPA, University GPA and combined GPA, and age were all found to be significant at the $p < .05$ level.

The use of a volunteer sample still limits the generalizability of the results. However, the large sample size which is comprised of a high percentage of students from each of the five schools does control for some of the variance.

The problem with data collection concerning the grades for both high school and university institutions is a confounding variable in that the grades are not standardized. However, with the grading system adopted in this study the grade point average became standardized.

Pilot Study Findings in Relation to Main Study

The Pilot project confirmed the importance of a number of the significant variables in the study. For example the students indicated that the number of university courses successfully completed prior to entry into nursing was a big factor in determining success as well as having at least 65% in English Mathematics and a Science course from the high school level.

The ability to handle responsibility and the maturity to deal with people and to communicate in both written and oral forms was noted as important which is consistent with significance of English 300 as prerequisite subject. All students cited the need for enough energy or endurance or strength to go along with the demands of the program. Energy level on the JPI was found to be significant in the discriminant analysis for the regular student. It was entered into the analysis on the third step. Energy was not entered into the stepwise analysis for the mature student. Motivation, the need to make sacrifices, and to be committed to the goal of graduation was a general theme in the content analysis of the student interviews. This seems to fit in with the theories in general education as espoused by Tinto (1975). Maturity in terms of ability to deal with people in diverse situations and to cope with the unexpected were recurrent themes which relate

to the JPI scales of social adroitness and responsibility.

All students spoke of the need to be able to pick up clinical skills quickly, being organized, and confident in performing skills at the highest level possible, and not being content with the minimum standard. These themes relate to the JPI scales of organization, responsibility, and self - esteem. The students of the pilot project stressed the need for a" balanced life" that is quality time spent between study, work and personal endeavors and being able to handle stress. This theme relates to the JPI scale of anxiety. The unsuccessful students had a higher mean score (50.125) on the JPI anxiety scale than did the successful students (49.789).

One element or concept that was highlighted from the interviews which seems to fit in with the JPI scale Interpersonal Affect was what the students described as "Care Giver Personality". What is meant by this phrase is that the person has a "calling" or derives personal fulfilment out of helping others. The students describe this concept as knowing you have helped someone even if means you have helped someone with the help of the teacher. The JPI scale interpersonal affect scale (Jackson 1978) describes persons who receive high scores as tending to be identifying closely with other people and their problems, valuing close emotional ties with others, and being concerned about others. The defining trait adjectives describe these people as emotional, tender, kind, affectionate, demonstrative, warmhearted, sympathetic, and

compassionate. Individuals receiving low scores sometimes have difficulty relating to people.

The alternate approach at analyzing the two groups with out the repeater group indicated that Human Anatomy and Physiology and JPI scale Self Esteem were significant. When the weighted Factor scores for these groups were entered into the discriminant analysis the result was that only one Factor Score was entered. Factor 2, which has been labelled "broad-minded inquisitiveness", consists of the JPI scales Tolerance, Breadth of Interest, and Complexity, was a discriminator.

## Conclusions

The following are the salient conclusions:

1. The GPA and the JPI scales have some predictive power in discriminating the successful student from the non successful student. These predictors predict, but not too well as they account for only approximately 12-15% of the variance. There is confidence in the reliability of the results from this study since the subject/variable ratio is large, ie., about 20 to 1 for the factor analysis and 46 to 1 for the discriminant analysis.

2. Age of the student makes a difference. The Successful group had a higher mean age of 23 years as opposed to the mean of age of 21 years for the non successful group. The difference might be related to other life experiences or something the student did in those two years or may not be related to age at all. The strange distribution of age for the non successful students which peaked at certain ages such as 26, 29 and 40 years needs to be addressed. One could speculate as to what the role influences that occur at certain ages. For example at age 26 the students may be experiencing the socio economic or personal conflicts in being a full time student and at age 29 the role expectations may be that of a young mother in addition to being a mature student, at age 40 the role expectations may be that of mature student who still has family obligations.

3. The High School Grade Point Average is significantly higher for the regular student but not for the mature student.

4. The number of subjects taken was not a significant factor for either the successful nor the non successful groups.

5. The university GPA was a significantly higher factor for the Successful group than for the unsuccessful group. However, there was a higher percentage of non successful students who had a higher GPA average than the successful students (Figure 4). This relationship should be investigated. Perhaps knowing the reason the student withdrew might explain this relationship.

6. The mean score for Chemistry 300, Mathematics 300, English 300, Introductory Psychology, and Human Anatomy and Physiology was higher for the Successful group than for the non successful group.

7. There was a higher mean score for the JPI scale "Social Participation" for the non successful group than for the successful group. This was opposite to the Jackson (1976) finding, and is of small magnitude. The difference may be spurious. However this finding was consistent with Willett et. al. (1971) who found that dropouts were much more outgoing, warm hearted, easy going and that they were spending too much time fulfilling these social aspects of their personality and not enough time was spent on their studies.

8. Using varimax rotation procedure on the principal components, five dimensions were identified as: Factor 1 describing a compassionate sincere caring person, Factor 2 describing an open minded and flexible individual, Factor 3 describing a person with intellectual curiosity as well as "social Intelligence" and Factor 4 describing an energetic, organized and self confident person who values positive interpersonal relationships. Factor 5, describes a person who has a strong obligation to be honest and experiences a sense of duty to others ,has a strong and inflexible conscience and holds traditional set of values.

9. GPA was the first variable to be entered into the Stepwise Discriminant Analysis equation thus accounting for the greatest amount of the total variance. When the JPI scales were entered Self Esteem, Social Participation, Risk Taking and Complexity, cumulatively added approximately 12-15% to the total variance.

10. Breadth of Interest was important only for the mature student and did not enter into the discriminant analysis for the regular student.

11. The GPA, and JPI scales Complexity, Energy Level, Risk Taking, Self Esteem and Social Participation correlated with the regular students in the stepwise discriminant analysis.

12. The pilot project concluded that students view the need to take the University courses prior to enrollment to "lighten the load" of the curriculum as an important measure which contributes to success. Having a "Care Giver Personality" leading a balanced life, being able to pick up skills quickly and receiving positive feedback when you know that you have helped someone even if it is with the help of a teacher, were also considered important factors for success in a nursing program.

13. The location of the school was significant at $p < .05$.

## Implications

Although 12-15% of the common variance is explained by knowing the GPA and some personality traits on the Jackson

Personality Inventory such as breadth of interest, complexity, risk taking, self esteem and social participation, a large amount of the variance still remains unexplained. Higgs (1984) comments that "the average criterion variance accounted for by achievement and aptitude predictors has peaked at about 30% to- 45%." Taking this into account there still is large segment of the variance unexplained. Perhaps non traditional methods need to be employed in order to address this problem.

The discriminant analysis classification results indicates that 64% of the successful student would be correctly classified as successful and 36% wrongly classified as successful when they were unsuccessful. Sixty one percent of the non successful were correctly classified as non successful while 39% were wrongly classified as unsuccessful when in fact they were successful. This presents an ethical problem as previous researchers Weinstein et al.( 1980) have illustrated in that this means of classifying people would deny admissions to a substantial number of potential students who would be successful.

Both Nurse Educators and Guidance counsellors would benefit from the knowledge that personality traits such as intellectual curiosity, maturity, self esteem and tolerance are important adjuncts to the whole assessment process. In addition to ability tests and prior academic achievement assessments this knowledge of the personality traits would be

of value in the counselling of the prospective student who is considering nursing as a career.

Nursing educators might adopted teaching and learning styles compatible with the students personality profile. For example, the student who scores high on complexity, innovation, and breadth of interest indicating intellectual curiosity  might learn more effectively in an environment encouraging exploration and individual projects while another group of students scoring high on conformity, Organization and Value orthodoxy might proceed at a faster pace when working under highly structured, programmed conditions. More research needs to be done in this area of relating personality traits to learning styles.

Indepth study of the relationship between various peak ages and success needs to be investigated and well as the relationship between GPA and the reasons for the student being categorized as non successful. Why are the students leaving nursing who have GPA's than those students who remain in the program.

Further research needs to be done looking at the differences between successful students and repeater students rather than the unsuccessful students and the successful categories. The continuating or repeating student category has become a significant group which needs to studied in greater depth. In addition, the differences in curriculums among the various institutions is an area which further research could

be illuminating. As we move into the 21 Century and Diploma programs are phased out and new baccalaureate programs emerge, this would still be a valuable area of investigation.

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APPENDICES

Appendix A: Consent Form

Consent for the Release of Grade 12 Marks and Participation

in the Study: "Validation of Two Predictors of Success in

Hospital Based Diploma Schools of Nursing".

CONSENT FORM

I understand that a research project, attempting to improve
the probability of predicting successful candidates for
nursing, is being conducted by Mrs. Donna Blight as part of
her studies as a graduate student in the Faculty of
Education, Department of Educational Psychology at the
University of Manitoba. The study will be under the direction
of a Registered Psychologist.
I hereby consent to participate in this research study and
give consent for the school of nursing to **release of my grade
12 marks and to provide the researcher with the information as
to whether I successfully completed the entire first year at
the end of June 1990.**
I understand that the information collected will be in
aggregate form (number coded) thus providing strict
confidentiality and anonymity. I also understand that I have
the right to withdraw from the research study at any time by
contacting the researcher.
Since the Jackson Personality Inventory is being used for
research purposes only no report will be given regarding this
test. However, group feedback will be provided for those
individuals wishing to meet with the researcher and general
findings of the study will given participant upon request.
Thank you for consenting to participate in this important
independent study aimed at benefiting future nursing students.

Date:..............
Printed name:.............................

--------------------------------------------------
Signature of Student Subject #.....

Request for a copy of the General Findings: Yes....No.....
Donna M. L. Blight RN. BNSc.
179 Edgewater Drive
Winnipeg, Manitoba R2R 2V4   256-0482 or 257 2149

Appendix B: Letter to Student

Dear Student:

On going research in Nursing education is aimed at improving the probability that candidates for a nursing career have made a suitable career choice.

This Study is being conducted as part of the requirements for a Masters degree at the University of Manitoba. The study involves not only your school of nursing but the other four hospital based schools of nursing in the Province. Your part in the study will be the taking of a 60 minute test called the Jackson Personality Inventory consisting of 320 true-false items. There are no right or wrong answers to these tests. If after you have started, you wish to discontinue, you may do so. Your responses will be kept completely confidential.

This research is an independent study and will in no way affect your current position in your school of nursing. The results of the study will be analyzed at the end of June 1990 and should you wish a report on the finding please indicate on the consent form.

Thank you for your participating in this independent study by signing the consent form. Your participation could contribute significantly to solving some of the problems facing the profession of nursing in the field of nursing education.


Sincerely

D. Blight RN. BNSc.

Principal Investigator
Graduate Student,
Department of Educational Psychology
Faculty of Education
University of Manitoba
............................
.........................

Request for results of the Study


Subject Number:

Appendix C: Director's Letter

SAMPLE LETTER TO DIRECTORS OF SCHOOLS

Director of Nursing

_____

_____

_____

_____


Dear Director:

The twelve years that I spent associated with the selection process of students has only deepened my commitment to conduct research that would help educators more accurately predict successful nursing students.

This is a letter requesting permission to conduct a study using as subjects the newly admitted class approximately soon after they have enroled in the program. Hopefully all five hospital based diploma schools of nursing will be part of this independent study which could benefit the nursing educator as well as the individual.

The purpose of the study is to determine if the Jackson Personality Inventory (JPI) together with the High School Grade Point Average will have predictive power in terms of whether or not an individual nursing student will persist in a nursing program.

I will be requiring the high school marks and whether the student has successfully completed the first year of your nursing program.

Since aggregate data will be used, please be assured that strict confidentiality and anonymity will be maintained. I will be available to meet with students before and after the administration of the inventory to answer any questions they may have. The tests will be interpreted by a Registered Psychologist.

If you require more information or details to make your decision I would be pleased to meet with you.

Donna M. Blight RN. BNSc.

Principal Investigator
Graduate Student University of Manitoba

## Appendix D: JPI Modal Types

SALIENT SCALES FOR THE JPI FEMALE MODEL TYPES

Type 1+
Complexity,    Innovation,
Tolerance

Type 1-
Conformity, Organization,
Value Orthodoxy

Type 11+
Anxiety,    Interpersonal
A f f e c t ,    S o c i a l
Participation

Type 11-
O r g a n i z a t i o n ,
Responsibility,    Value
Orthodoxy

Type 111+
Risk Taking, Self Esteem,
Social Adroitness

Type 111-
Anxiety, Complexity, Risk
Taking

Type 1V+
Energy    Level,    Risk
Taking, Self Esteem

Type 1V-
Interpersonal    Affect,
R e s p o n s i b i l i t y , V a l u e
Orthodoxy

Type V+
Anxiety,    Energy    Level,
Organization

Type V-
Risk    Taking,    Social
A d r o i t n e s s ,    V a l u e
Orthodoxy

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Psychological Assessment 4, p 94.

Appendix E: Interview Questions

1. What adjectives would you use to describe and "ideal nurse" or "best nurse"?

2. What adjectives best describe  the "worst nurse"?

3. What do you consider are the main reasons for a student to drop out of nursing?

4. What do you consider are the best predictors for success for a student to complete a nursing program?

5. What are the most significant factors that contribute to you as a nurse  in realizing your career goal in nursing?

### Appendix F: Second Letter to School Directors

Re: Master's Study: " Validation of Two Predictors of Success in Hospital Based Diploma Schools of Nursing".

Dear Director:

Thank you for your initial response to my Master's research study. In your letter of August 28, 1988 you raised questions which I will answer in the second part of this letter.

I have decided to wait until August of 1989 to begin the data collection. However, one of my thesis committee members has suggested that I conduct a small number of interviews with students already in the program. For this pilot project I will require the name and address of two students selected randomly from each of the five hospital based diploma schools of nursing. If this is agreeable with you I will provide the random numbers so that you can furnish me with the name and address of the student. The interviews will take approximately thirty minutes. I would prefer to conduct the interviews at the school of nursing. These randomly selected students will be introduced to the project as described in the appended letter (Appendix X).

In my initial letter of August 28,1988 I had indicated that I would like to use both the Jackson Personality Inventory and the Jackson Vocational Interest Survey. Since it was not practical in terms to time to administer both tests I have elected to use only the Jackson Personality Inventory (JPI). The two predictors to be validated are the High School Grade Point Average the Jackson Personality Inventory. I will require the High School marks from your schools of nursing. For your approval I have enclosed a copy of the consent form for the release of grade 12 marks and participation in the study as well a general letter of information for the participant. At the end of June of 1990 I will require information as to whether the student had successfully completed the entire first year of your programme of studies. Part time students not registered in nursing courses will be excluded from the study. Mature students who do not have the required high school subjects will be included in the study based on the average of two recent upgrading courses required by the school of nursing. It is hoped that a large number of students will volunteer to participate in this validation study as a large sample size is required for the discriminate analysis statistic. The findings would be of interest to both the Nursing Educator as well as the guidance Counsellor.

This part of my letter will address some of the concerns that

you may have regarding the details of the study.

1. The plan of the research proposal is to have the students sign a consent form for the release of grade twelve marks and for information as to whether successfully completed the first year of the nursing program. Your school will then release this information to me.

2. I would appreciate fifteen minutes allotted from the class schedule in August to come to your school to explain the research project to the students and to have them sign the consent form.

3. The researcher would return to the school to administer the Jackson Personality Inventory which would take approximately one hour. Preferably I would like class time if it can be worked into the time table. If this is not feasible I would then opt for
after school hours.

4. <u>Students participating in the study will not receive feedback on the results of the inventory as I am using it for research purposes only.</u> However I will provide a free general counselling and referral service upon request. I have certification with the Canadian Guidance and Counselling Association and have completed all required courses for individual and group counselling. Participates will receive a report on the general findings of the study. No class time will be required for providing feedback to the students.

5. Anonymity will be maintained by the following procedure. The participant's test paper will have attached to it two pieces of paper. The first paper will provide the student with their subject number. The second paper will indicate subject number and name of student. This paper will be kept by the school. The test paper will provide the researcher with only the subjects number. The participants name and subject number will be the property of the schools of nursing as well as the signed consent forms for the release of marks.

Since aggregate data will be used pleased be assured that strict confidence and anonymity will be maintained.

I hope that I have addressed your concerns and questions. I would be willing to meet with you at your convenience to further discuss the proposed study. I look forward to hearing from you as soon as possible regarding the pilot project.

Thank you for your genuine and continued interest in Nursing Research.

Sincerely,
Donna M. L. Blight

Graduate Student
University of Manitoba


encs. Appendix A: Consent Form
Appendix B: Letter to Student
Appendix X: Project letter and reply form.
Random numbers

Appendix G: Consent Form Pilot Study

**Interview consent form**

I_____ agree to participate in a pilot

project to determine student perceptions of factors that

contribute to a student's " success" in completing a nursing

program.

Name :

Address:

Phone No.:

Date  of Interview:
Place:

Appendix H: Letter to Student Re Pilot Study

Dear Student:

As part of the requirements for a master's degree at the University of Manitoba I am conducting a small pilot project involving interviews with a few students from each of the five hospital based diploma schools of nursing in Manitoba. Your name has been randomly selected from the class list.

I hope that you will agree to participate in this pilot project which is part of a study titled " Validation of Two Predictors of success in Hospital Based Diploma Schools of Nursing ". I will require approximately thirty minutes of your time for the interview which will be arranged at your convenience to be held at the school of nursing. Please be assured that complete anonymity and confidentiality will be maintained.

I will be contacting you soon to gain your consent and to arrange a time for the interview.

Thank you for your valuable contribution to nursing research.

Sincerely

Donna M. L. Blight RN. BNSc.
Graduate Student
University of Manitoba

Appendix I: Content Analysis Interviews: Pilot Study

STUDENT INTERVIEWS

CONTENT ANALYSIS OF TEN RANDOMLY SELECTED INTERVIEWS CONDUCTED
AT THE FIVE HOSPITAL BASED DIPLOMA SCHOOLS OF NURSING IN
MANITOBA.

QUESTION #1. WHAT ADJECTIVES OR CHARACTERISTICS WOULD YOU USE
TO DESCRIBE AN "IDEAL NURSE OR "BEST NURSE"?

THE BEST NURSE IS:

1. The best nurse is skilful and caring having mastery of the
clinical skill who is able to apply knowledge learned to
direct patient care. This person is good at clinical practice
and takes initiative for learning and seeks out of new and
varied experiences. Thus picks up clinical skills quickly.


2. The ideal nurse who is caring, accepting, attending, a good
listener who picks up important clues about the client who
enjoys working with people is patient, gentle, genuine,
honest, friendly, open minded ( open to different situations)
is accessible and responsive to patients, tolerant ( can't be
a racist) has empathy and understanding and is organized.

3. A nurse who is hard working, dedicated motivated who
considers that nursing is a" calling". Has a care giver
personality that is finds personal fulfilment out of caring
for others. Knows the type and quality of care that the nurse
is capable of providing.


4. Able to cope with stress and avoids burn out. Has strength
and endurance and is not a quitter.

5. Has confidence and is sure of self( patients can sense
anxiety). Realizes the importance of role responsibility , is
observant and can analyze observations has the ability to
process input and act appropriately. The nurse is like a
computer who can input everything and then put everything in
its right place.

6. A person who can take control of a situation, who is
versatile and can handle a crisis situation and take
control.The best nurse is directive and is prepared for the
unexpected as well as being perceptive.
The nurse should not be afraid to give information but not

things which are in conflict with the patients values eg. sex education.

7. Has a balanced life between study, work and personal time.

8. The best nurse maintains proper eating and sleeping habits.

QUESTION #2

WHAT ADJECTIVES DESCRIBE THE WORST NURSE?

1. The worst nurse is disorganized, onere, grumpy, grouchy, pushy, rude, loud, yells at the patient, slap hash, inconsiderate, self centred, sharp, short tempered, abrupt, aggressive, condescending, and careless.

2. The worst nurse is uncaring, unsympathetic, unresponsive (doesn't answer call bells) cold, and shows lacks of humanism, insensitive , can't relate to people and can't work under stress, unskilful, lacks motivation ( is there for the money)

3. Non communicative and is uncooperative with the "team", doesn't assess the patient is unobservant and often states that "Doesn't have the time".

4. The worst nurse lacks confidence and doesn't take responsibility and is ignorant of life itself.

QUESTION # 3

WHAT ARE THE MAIN REASONS THAT STUDENTS DROP OUT OF NURSING?

1. Students find that nursing is not what they want to do.They find out that nursing is not what they expected and that it is not as glorious as what television portrays. They discover that nursing takes time, is demanding and is hard work. Students who drop out find the clinical too stressful. They are usually students who can't apply themselves to clinical practice and have trouble developing personal relationships with people. They find that what they expected and what they experienced are two different things. They see what nursing really is like and consider it physically repulsive.

2. Students leave because of marks. The curriculum weeds out those students who have to leave because of the academics. Often these students don't realize the amount of knowledge they have to acquire. They under estimate the amount of studying time required.Students who don't have the required university courses completed before they enrol in the nursing course have a greater chance of dropping out of the program.

3. Personal life and student life not compatible. It is an overwhelming change in their life style. They are unable to balance work hours, study hours and personal time. These student lack energy and find nursing tiring. There may be family obligations which prevent them from putting the work into the program of studies. On occasion there has been incidence where there has been pressure on the student to quit by the school when the student is not performing well or is pregnant. In some cases where students have quit where there has been lack of support from teachers and peers.

QUESTION # 4

WHAT ARE THE BEST PREDICTORS FOR A STUDENT TO COMPLETE A NURSING PROGRAM ?

1. The best predictors that a student will complete a nursing program is the ability to handle the academics and to be a skilled professional. A good predictor is the student who is university prepared that is the person has taken the university courses before enroling in nursing and is usually a person who has 65 % or better in English, Mathematics and Science. Another important predictor is the student who enjoys being on the clinical area and is good at clinical practice, enjoys learning on the wards and is able to quickly learn and apply skills. The student must know why they are performing interventions An important factor is having the interested in wanting to succeed. Lack of knowledge shows up in the clinical area. Knowing that you are performing the skills better than just satisfactory is important. The student who is motivated from within and who seeks out new and varied experiences and who gets involved in the program will more likely succeed than a student who is satisfied with just the minimum requirements.

2. The successful student must be prepared to study a lot and to be able to communicate both in oral and written forms.

3. Maturity which is thought of in terms of the ability to deal with people thereby helping them to  cope with their problems  is an important predictor. Whereas those students who demonstrate immaturity - that is they can't deal with responsibility and do not get personal fulfilment out of caring for others are the least likely to succeed in a nursing program. Students who are not prepared to work independently and are not prepared to make sacrifices to reach their goal usually will not succeed. Maturity and experience in dealing with people is required. Having a health related job prior to entry into to nursing would help and would also help to form a realistic outlook of what they perceive nursing to be.

4. The successful student must be an alert person  who has ambition, determination and enough strength to go along with the demand (take the rolls with the punches).

5. Ability to handle responsibility

6. Support from family

QUESTION  # 5

WHAT ARE THE MOST SIGNIFICANT FACTORS FOR ATTAINING SUCCESS IN NURSING?

Success in nursing is to have:

1. Mastery of the mechanics of nursing skills. To be organized and to enjoy being in the clinical area. To train my senses to operate in such a way that I am able to analyze what I am experiencing  in order to make the appropriate decision and take the necessary actions.

2. To obtain success in nursing the person must really want to graduate, one who studies hard and is not satisfied with just a  passing  grade  and  takes  the  initiative   for  getting experiences.

3. The curriculum  should be presented in such a manner that I can expand my horizons and knowledge so that I can be assisted in my  achievement of the highest level of job performance.

4. It is important to receive positive feedback from teachers especially when the performance was above average.

5. Maturity - the willingness to put your whole effort into the program.

6.Helping someone -- knowing that you are there for the duration. Knowing that you have helped someone even with the assistance of the teacher.

7. Not to get stressed out - knowing how to avoid burn out. Take the middle of the road approach - a balanced outlook.

8. Desire not to a quitter.

9. A person who knows the kind of quality of care she can give.

10. Motivation  having a calling  to help people.

11. Confidence in self so that you are able to help patient cope.

12. Financially secure - being on good terms with parents.

Appendix J: Operational Definitions

Mature Student is any student who is over the age of twenty one who is admitted to a diploma nursing program who does not have the required Manitoba grade 12 courses or equivalent pre requisite courses for English, Mathematics and a science which is one of either Biology, Chemistry or Physics.

Regular Student is any student who has been admitted to a diploma nursing program who meets the schools regular admission requirements which includes Manitoba Grade 12 or equivalent of English, Mathematics, and a Science which is either Biology , Chemistry or Physics. from the Manitoba Grade 12.

High Score is the High school grade Point Average of one or more of the required course taken from a Manitoba Grade 12 or equivalent. In the case where a student has only one subject that subject will be the average.

University Score is Grade Point Average of one or more of the required University courses Introductory Psychology, Introductory Sociology or Anthropology and Anatomy and Physiology of the human body taken by the student prior to enrolment in the Nursing program.. In the case where the student has only one subject that subject will be the average.

High Number of Subjects is the number of the required subjects ( English Mathematics and a Science) subjects a student has acquired at the grade 12 level of education or equivalent.

University Number is the number of the three required university subjects the student has acquired prior to entry into the nursing program.

Appendix K: Jackson Personality Inventory, Scale Description

| Scale | Description of High Scorer | Defining Trait Adjectives of High Scorers |
|---|---|---|
| ANXIETY | TENDS TO WORRY OVER INCONSEQUENTIAL MATTERS: MORE EASILY UPSET THAN THE AVERAGE PERSON: APPREHENSIVE ABOUT THE FUTURE. | worried, tense, nervous, preoccupied, anxious, edgy, distressed, agitated, fearful |
| Breadth of interest | Is attentive and involve; motivated to participate in veda wide variety of activities;interested in learning about a diversity of things | Curious, interested, inquiring, involved, inquisitive, seeking , exploring. |
| COMPLEXITY | Seeks intricate solutions to problems; is impatient with over simplication; is interested in pursuing topics in depth regardless of their difficulty; enjoys abstract thought;enjoys intricacy. | Complex, contemplative, clever, discerning, intellectual, thoughtful, analytical. |

| CONFORMITY | I susceptible to social influences and group pressures; tends to modify behavior to be consistent with standards set by others; follows suit; fits in. | Compliant, agreeing, acquiescent, adapting, accommodating, cooperative, concurring, emulating. |
|---|---|---|
| ENERGY LEVEL | Is active and spirited;possess reserves of strength;does not tire easily;capable of intense work or recreational activity for long periods of time. | Lively,vigorous, active, perserving, industrious, tireless, dynamic, enthusiastic, eager. |
| INNOVATION | A creative and inventive individual,capable of originality of thought; motivated to develop novel ideas; likes ti improvise. | Ingenious, original, innovative, productive, imaginative. |
| INTERPERSONAL AFFECT | Tends to identify closely with other people and their problems;values close emotional ties with others; concerned about others. | Emotional, tender,kind, affectionate, demonstrative, warm-hearted, sympathetic, compassionate. |

| ORGANIZATION | Makes effective use of time;completes work on schedule; is not easily distracted. | Orderly, disciplined, planful, tidy, consistent, methodical, precise,neat, meticulous, systematic. |
|---|---|---|
| RESPONSIBILIT Y | Feels a strong obligation to be honest and upright; experiences a sense duty to other people; has a strong and inflexible conscience. | Responsible, honest,ethical, incorruptible, scrupulous, reliable,stable, straightforward. |
| RISK TAKING | Enjoys gambling and taking a chance; willingly exposes self to situations with uncertain outcomes; enjoys adventures having an element of peril; takes chances; unconcerned with danger. | Reckless, bold, impetuous, intrepid, enterprising, incautious, venturesome, daring, rash. |
| SELF ESTEEM | Confident in dealing with others; no easily embarrassed or influences by others;shows presence in interpersonal situations; possesses aplomb. | Self-assured, composed, egotistical self- possessed, poised,self sufficient. |

| SOCIAL ADROITNESS | Is skilled at persuading others to achieve a particular goal, sometimes by direct means; occasionally may be seen as manipulative of others, but is ordinarily diplomatic; socially intelligent. | Shrewd, sophisticated, tactful, crafty, influential, subtle, persuasive, discreet, worldly. |
|---|---|---|
| SOCIAL PARTICIPATION | WILL EAGERLY JOIN A VARIETY OF SOCIAL GROUPS; SEEKS BOTH FORMAL AND INFORMAL ASSOCIATION WITH OTHERS; VALUES POSITIVE INTERPERSONAL RELATIONSHIPS; ACTIVELY SOCIAL. | Sociable, friendly, gregarious, outgoing," joiner", convivial, companionable, fun loving extrovert, congenial, cordial, good natured. |
| TOLERANCE | Accepts people even though their beliefs and customs may differ from his own; open to new ideas; free from prejudice; welcome dissent. | Broadminded, open-minded, unprejudiced, receptive, judicious, impartial, dispassionate, lenient, indulgent. |

| VALUE ORTHODOXY | Values traditional customs and beliefs; values may be seen by others as "old fashioned" takes a rather conservative view regarding contemporary standards of behavior; opposed to change in social customs. | Moralistic, conventional , strict, prim, devout, prudish, puritanical, righteous, rigid. |
|---|---|---|
| INFREQUENCY | Responds in implausible or apparently random manner , possible due in carelessness, poor comprehension, passive, non compliance, confusion or gross deviation. | |

TRAIT DESCRIPTION FOR THE JACKSON PERSONALITY INVENTORY
DESCRIPTION OF LOW SCORER AND DEFINING ADJECTIVES

| Scale | Description of Low Scorer | Defining Trait Adjectives of Low Scorer |
|---|---|---|
| ANXIETY | Remains calm in stressful situations; takes things as they come without worrying; can relax in difficult situations; usually composed and collected | Easy- going, patient, calm, serene, tranquil, relaxed, contented, placid, imperturbable. |
| BREADTH OF INTEREST | Has narrow range of interests, remains uninterested when exposed to new activities; has few hobbies; confined tastes. | Inflexible, unobservant, narrow, insular, uninvestigative. |
| COMPLEXITY | Prefers concrete to abstract interpretations; avoids contemplative thought; uninterested in probing for new insight. | Uncomplicated, unreflective, straightforward, predictable, matter- of-fact. |
| CONFORMITY | Refuses to go along with the crowd;unaffected and unswayed by others' opinions; independent in thought and action. | Individualistic, self-directed, self reliant, unyielding, nonconforming, unrestrained, contradicting, disagreeing. |

| ENERGY LEVEL | Tires quickly and easily; avoids strenuous activities; lacks stamina; requires a great deal of rest; slow to respond. | Passive, listless, drowsy, lazy, languid. |
|---|---|---|
| INNOVATION | Has little creative motivation; seldom seeks originality; conservative thinker, prefers routine activities. | Unimaginative, deliberate, practical, sober, prosaic, literal, uninventive, routine. |
| INTERPERSONAL AFFECT | EMOTIONALLY ALOOF; PREFERS IMPERSONAL TO PERSONAL RELATIONSHIPS; displays little compassion for other people's problems; has trouble relating to people; is emotionally unresponsive to those around him. | Unresponsive, distant, head-hearted, taciturn, unsentimental, indifferent, cold. |

| ORGANIZATION | Frequently procrastinates; easily distracted; falls behind in assignments or duties; often loses things; personal effects frequently in disarray; handles situations in an unsystematic unpredictable way; rarely plans before doing things. | Disorganized, inefficient, orderless, absentminded, forgetful. |
|---|---|---|
| RESPONSIBILITY | Apathetic about helping others; frequently breaks a promise, takes little interest in community projects;can't be relied on to meet obligations; refuses to be held to answer for his actions. | Unreliable, indifferent , unfair, remiss, neglectful, thoughtless, negligent, inconsiderate, self-centred. |

| RISK-TAKING | Cautious about unpredictable situations; unlikely to bet, avoids situations of personal risk, even those with great rewards; doesn't take chances, regardless of whether the risks are physical, social, monetary or ethical. | Cautious, hesitant, careful, wary , prudent, discrete, heedful, unadventurous, precautionary, security-minded, conservative. |
|---|---|---|
| SELF-ESTEEM | Feels awkward among people, especially strangers; ill at ease socially; prefers to remain unnoticed at social events; has low opinion of himself as a group member: lacks self-confidence; easily embarrassed. | Self-depreciating, timid, unassuming, modest, shy, humble, self conscious. |
| SOCIAL ADROITNESS | Tactless when dealing with others; socially naive and maladroit; speaks in a direct, straightforward manner; insensitive to the effects of his behavior on others. | Direct, frank, tactless, candid, unpolished, undesigning, outspoken, impolite, blunt, naive. |

| | | |
|---|---|---|
| SOCIAL PARTICIPATION | Keeps to himself , has few friends;avoids social activities. | Nonparticipant, solitary, "loner", unsociable, retiring, uncommunicative, withdrawn. |
| TOLERANCE | Entertains only opinions consistent with his own; males quick value judgments about others, feels threatened by those with different ethnic backgrounds; identifies closely with those sharing his beliefs. | Intolerant , cocksure, dogmatic, opinionated, narrow minded, prejudiced, uncompromising. |
| VALUE ORTHODOXY | Critical of tradition; liberal or radical attitudes regarding behavior;questions laws and precedents; acts in an unconventional manner; believes that few things should be censored. | Modern, radical, liberal, unorthodox, contemporary, permissive. |
| | | |

Jackson, D.N. **Jackson Personality Inventory Manual,(1976)**
Research Psychology Press,Inc. New York.p 10-11.

Appendix L: Description GPA Subjects

DESCRIPTION OF SUBJECT COMPONENT OF ENTRANCE GRADE POINT AVERAGE

| | |
|---|---|
| ENGLISH 300 | HIGHEST LEVEL TAKEN AT THE HIGH SCHOOL (TWO CREDITS) |
| ENGLISH 301 | SUBJECT TAKEN AT HIGH SCHOOL LEVEL (ONE CREDIT) |
| MATHEMATICS 300 | HIGHEST LEVEL TAKEN AT HIGH SCHOOL (ONE CREDIT). |
| MATHEMATICS 301 | HIGH SCHOOL LEVEL COURSE (ONE CREDIT) |
| CHEMISTRY 300 | HIGHEST LEVEL COURSE TAKEN AT HIGH SCHOOL (ONE CREDIT) |
| BIOLOGY 300 | HIGHEST LEVEL TAKEN AT HIGH SCHOOL (ONE CREDIT). |
| BIOLOGY 301, 305 | TAKEN AT HIGH SCHOOL LEVEL (ONE CREDIT) |
| PHYSICS 300 | HIGHEST LEVEL TAKEN AT HIGH SCHOOL (ONE CREDIT) |
| INTRODUCTION TO PSYCHOLOGY | UNIVERSITY LEVEL (6 CREDIT HOURS) |
| INTRODUCTION TO SOCIOLOGY | UNIVERSITY LEVEL ( 6 CREDIT HOURS) |
| INTRODUCTION TO ANTHROPOLOGY | UNIVERSITY LEVEL ( 6 CREDIT HOURS) |
| ANATOMY AND PHYSIOLOGY OF THE HUMAN BODY | UNIVERSITY LEVEL COURSE (6 CREDIT HOURS WITH LAB). |

Appendix M Supplementary Tables

Table 10

Variable Means and Standard Deviations For Total Sample

| Variable | Number | Mean | Standard Deviation |
|---|---|---|---|
| Age | 267 | 23.157 | 6.083 |
| GPA | 264 | 2.796 | .659 |
| Anxiety | 270 | 49.889 | 9.209 |
| Breadth of Interest | 270 | 48.815 | 9.573 |
| Complexity | 270 | 43.208 | 8.355 |
| Conformity | 270 | 49.270 | 9.212 |
| Energy Level | 270 | 50.859 | 9.683 |
| Innovation | 270 | 48.500 | 9.231 |
| Interpersonal Affect | 270 | 51.233 | 7.565 |
| Organization | 270 | 54.359 | 8.269 |
| Responsibility | 270 | 55.144 | 8.893 |
| Risk Taking | 270 | 45.922 | 9.694 |
| Self Esteem | 270 | 51.789 | 8.673 |
| Social Adroitness | 270 | 52.574 | 9.441 |
| Social Pariticipation | 270 | 52.574 | 9.440 |
| Tolerance | 270 | 50.378 | 10.128 |
| Value Orthodoxy | 270 | 58.819 | 8.10 |

Table 11

Variable, Means and Standard Deviation  for Non Successful

Group

| Variable | Number | Means | Standard Deviation |
|---|---|---|---|
| Age | 80 | 21.963 | 5.542 |
| GPA | 79 | 2.622 | .638 |
| Anxiety | 80 | 50.125 | 8.821 |
| Breadth of Interest | 80 | 47.788 | 8.976 |
| Complexity | 80 | 41.875 | 8.171 |
| Energy Level | 80 | 49.638 | 10.271 |
| Innovation | 80 | 48.600 | 9.102 |
| Interpersonal Affect | 80 | 51.013 | 6.990 |
| Organization | 80 | 53.175 | 7.635 |
| Responsibility | 80 | 55.063 | 10.370 |
| Risk Taking | 80 | 47.363 | 10.214 |
| Self- Esteem | 80 | 50.725 | 7.855 |
| Social Adroitness | 80 | 54.425 | 8.252 |
| Social Participation | 80 | 54.425 | 8.252 |
| Tolerance | 80 | 50.063 | 9.753 |
| Value Orthodoxy | 80 | 58.915 | 8.063 |

Table 12

Variables, Means and Standard Deviation for Successful Group

| Variable | Number | Means | Standard Deviation |
|---|---|---|---|
| Age | 187 | 23.668 | 6.245 |
| GPA | 185 | 2.870 | .655 |
| Anxiety | 190 | 49.790 | 9.388 |
| Breadth of Interest | 190 | 49.247 | 9.804 |
| Complexity | 190 | 43.768 | 8.389 |
| Conformity | 190 | 49.416 | 8.966 |
| Energy Level | 190 | 51.373 | 9.405 |
| Innovation | 190 | 48.458 | 9.309 |
| Interpersonal Affect | 190 | 51.326 | 9.405 |
| Organization | 190 | 54.715 | 8.499 |
| Responsibility | 190 | 55.179 | 8.361 |
| Risk Taking | 190 | 45.316 | 9.428 |
| Self- Esteem | 190 | 52.327 | 8.985 |
| Social Adroitness | 190 | 50.500 | 9.916 |
| Social Participation | 190 | 51.800 | 9.816 |
| Tolerance | 190 | 50.511 | 10.304 |
| Value Orthodoxy | 190 | 58.779 | 8.150 |

Table 13
## Model for the Study of Prediction of Success in Nursing Education and Nursing Practice

| PRE MAJOR VARIABLES | NURSING MAJOR | POST GRADUATION |
|---|---|---|
| Intellectual ability /aptitude Intelligence tests aptitude tests locally constructed tests Tests of Creativity/critical thinking/ learning style | | |
| Scholastic performance High School Rank High School GPA High School Grades by Subject gpa on previous College Course work Prerequisite GPA Bio Physical Science GPA GPA on Course/ Subjects Late Bloomers Probation/ patterns of grades Previous Degree Total # Elective credits | Progression/ Completion/ Attrition Yearly Terminal LEVEL OF ACHIEVEMENT Individual courses, term, Yearly Terminal Major/ Degree GPA Categories used as categorical data PERFORMANCE CRITERIA Clinical Behaviors Course ,Yearly Terminal | CAREER Performance: Self/Supervisor Advancement Satisfaction APTITUDE TESTS: GRE STATE BOARD TEST SCORES Individual, Composite Level of Achievement- interval data Pass/Fail- Categorical data ORGANIZATIONAL VARIABLES IN WORK SETTING |
| DEMOGRAPHICS age, Sex, Marital Status Number of Dependents | NLN EXAMS Individual composite ORGANIZATIONAL VARIABLES Curriculum Design Teaching/Strategies Content/ learning experiences | |
| PERSONAL\PERSONALITY Interest/occupational preference Motivation/ Parents\Students Style introversion, Locus of Control Self concept/Self Esteem Study Habits Personality Inventories Anxiety Scales Interview Data Letters of Reference | | |
| SOCIOLOGICAL- SITUATIONAL/ INTERACTIONAL ethnicity Socioeconomic Status Parent's Education/ occupation Educational Aspirations: Student/ Parent Religion Urban/Rural Size/ type of previous school Student--teacher Role expectations Social Academic integration | | |

Higgs, Z.R. (1984) Predicting Success in Nursing: From Prototype to Pragmatics, Western Journal of Nursing Research, 6(1),p 81.

Table 14

Discriminant Analysis Classification

Number of Observation & Percent Classified into Success

No Repeater Group

| From Success | Non Success | Success | Total |
|---|---|---|---|
| **Non Success** | | | |
| Number | 18 | 15 | 33 |
| Percent | 54.55 | 45.45 | 100 |
| **Successful** | | | |
| Number | 77 | 108 | 185 |
| Percent | 41.62 | 58.38 | 100 |
| Total | 95 | 123 | 218 |
| Percent | 43.58 | 56.42 | 100 |

Table 15

Number of Observations & Percent Classified into Success

| From Success | Non success | Success | Total |
|---|---|---|---|
| Non success | | | |
| Number | 48 | 31 | 79 |
| Percent | 60.76 | 39.24 | 100 |
| . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . | | | |
| Successful | | | |
| Number | 66 | 119 | 185 |
| Percent | 35.68 | 64.82 | 100 |
| Total | | | |
| Number | 114 | 150 | 264 |
| Percent | 43.18 | 56.82 | 100 |

TABLE 16

Number of Observations & Percent Classified into Success using

Weighted Factor Scores

| From Success | Non success | Successful | Total |
|---|---|---|---|
| Non Success | | | |
| Number | 45 | 35 | 80 |
| Percent | 56.25 | 43.75 | 100 |
| | | | |
| Succesful | | | |
| Number | 85 | 105 | 190 |
| Percent | 44.74 | 55.26 | 100 |
| | | | |
| Total | 130 | 140 | 270 |
| Percent | 48.15 | 51.85 | 100 |

Appendix N Supplementary Figures
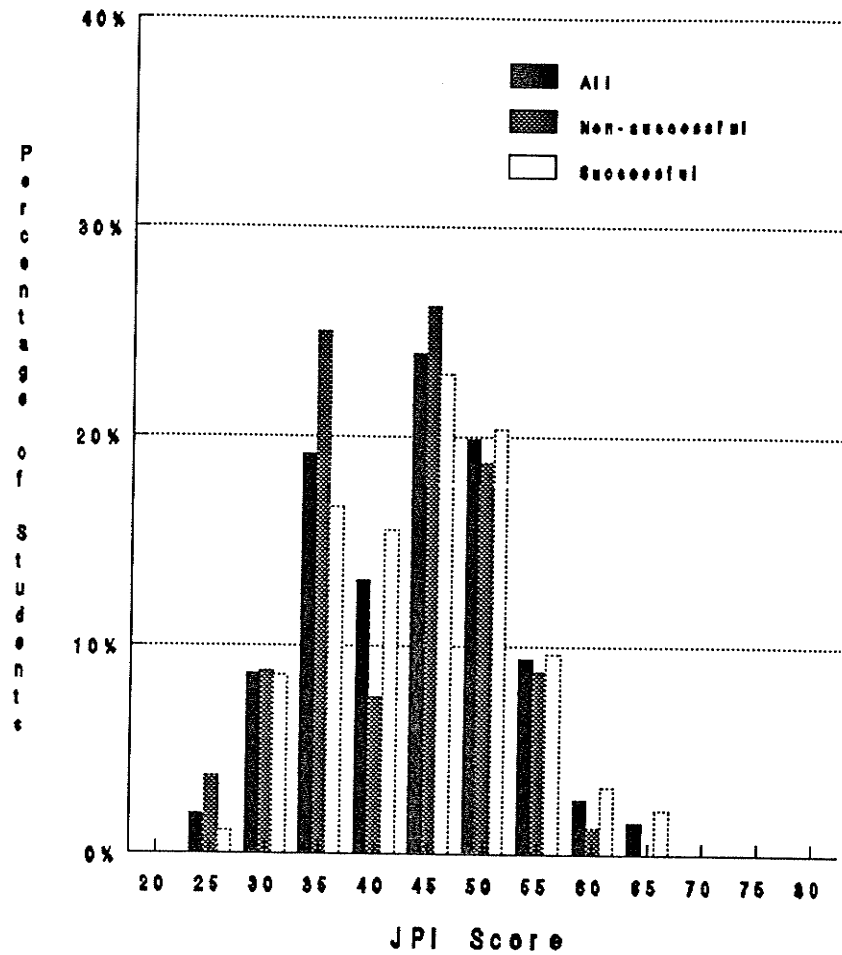
**Figure 9** JPI Complexity Scale: Scores for
Total     Sample,    Non
S u c c e s s f u l     a n d
Successful Groups
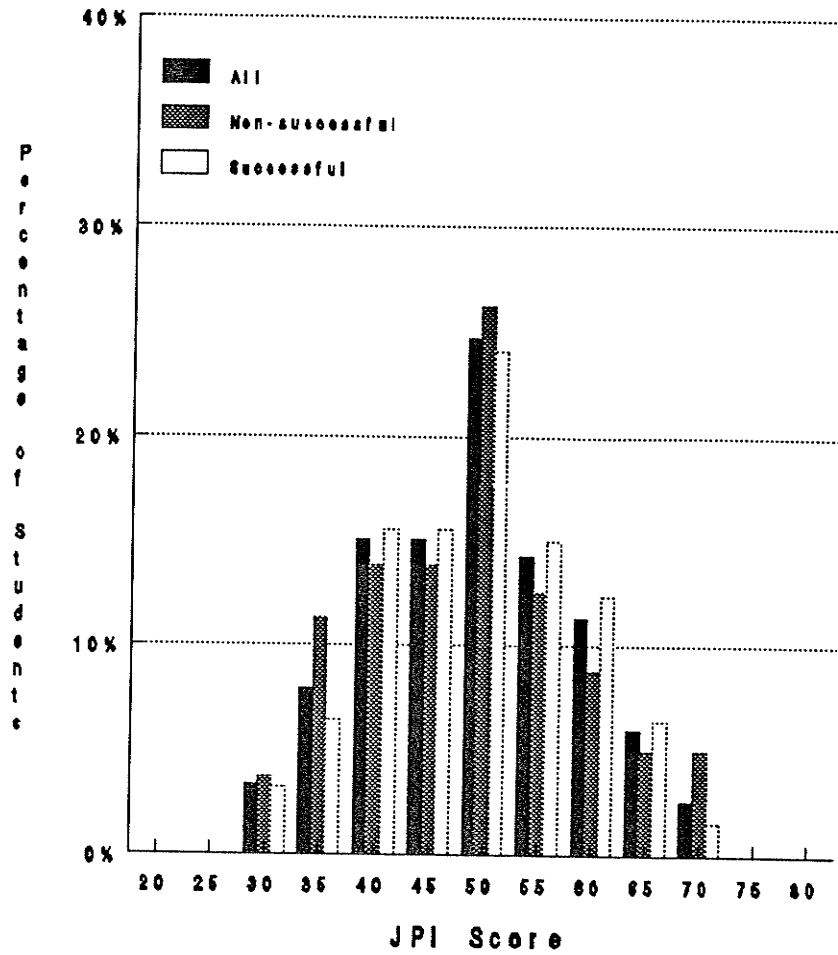
**Figure 10** JPI Scale Conformity: Standard
Scores for Total Sample, Non
Successful and Successful Groups
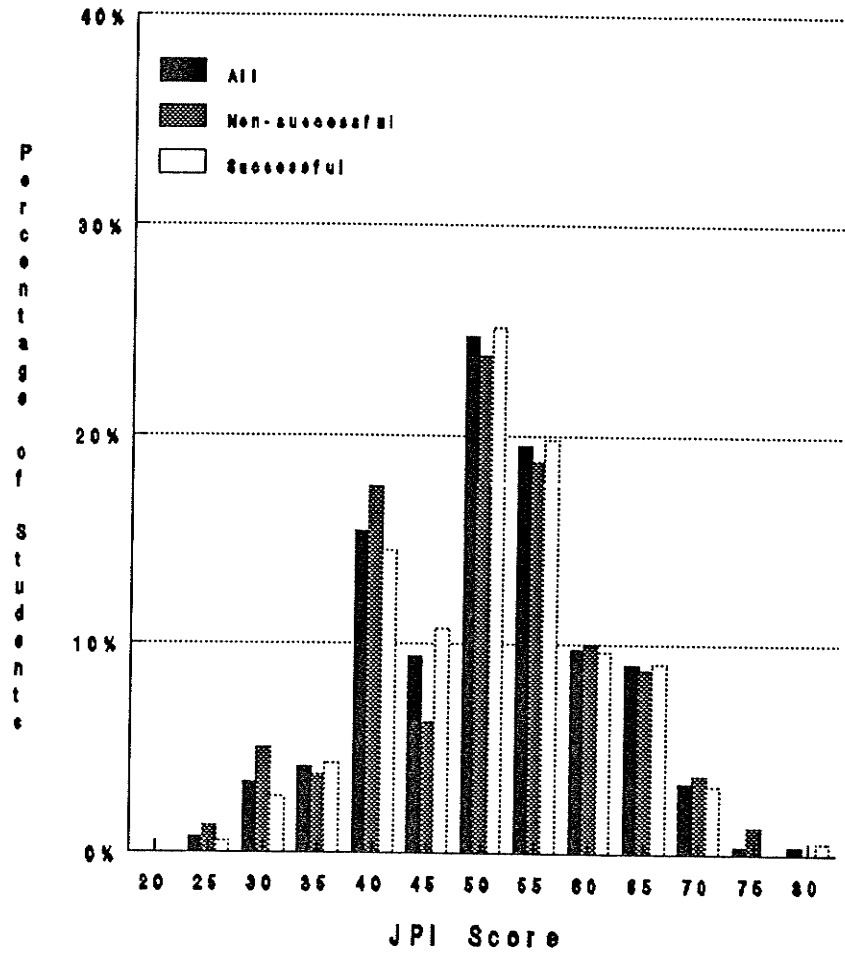
**Figure 11** JPI Scale Social Adroitness:
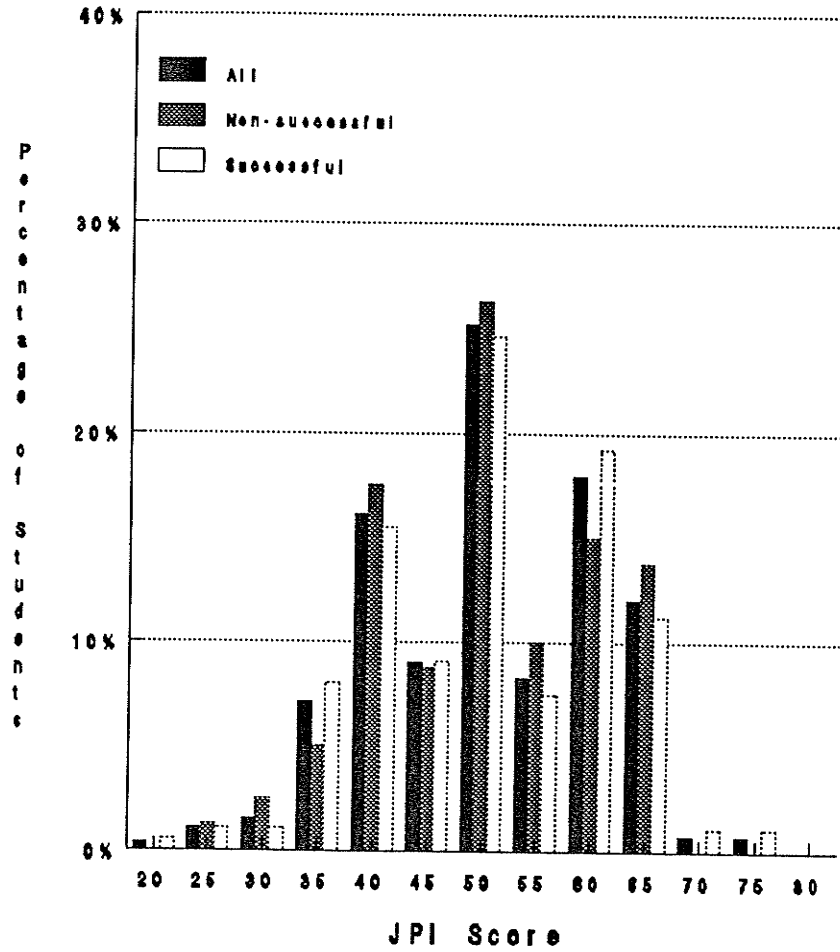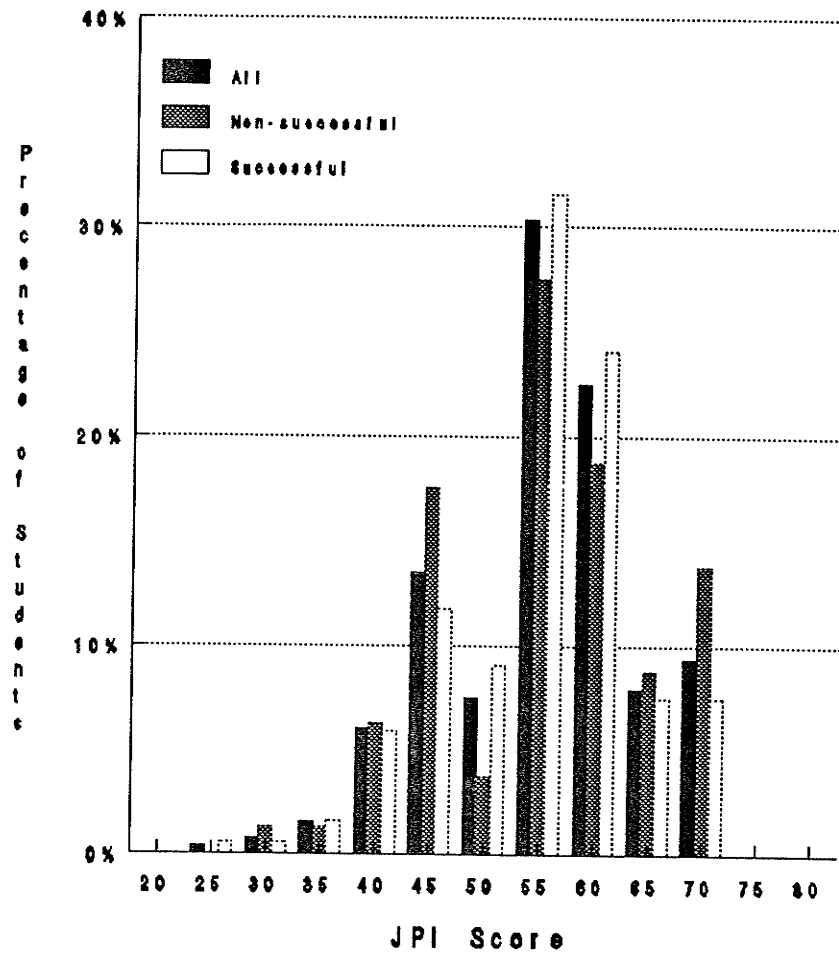Standard Scores For total Sample,
Non Successful and Successful
Groups
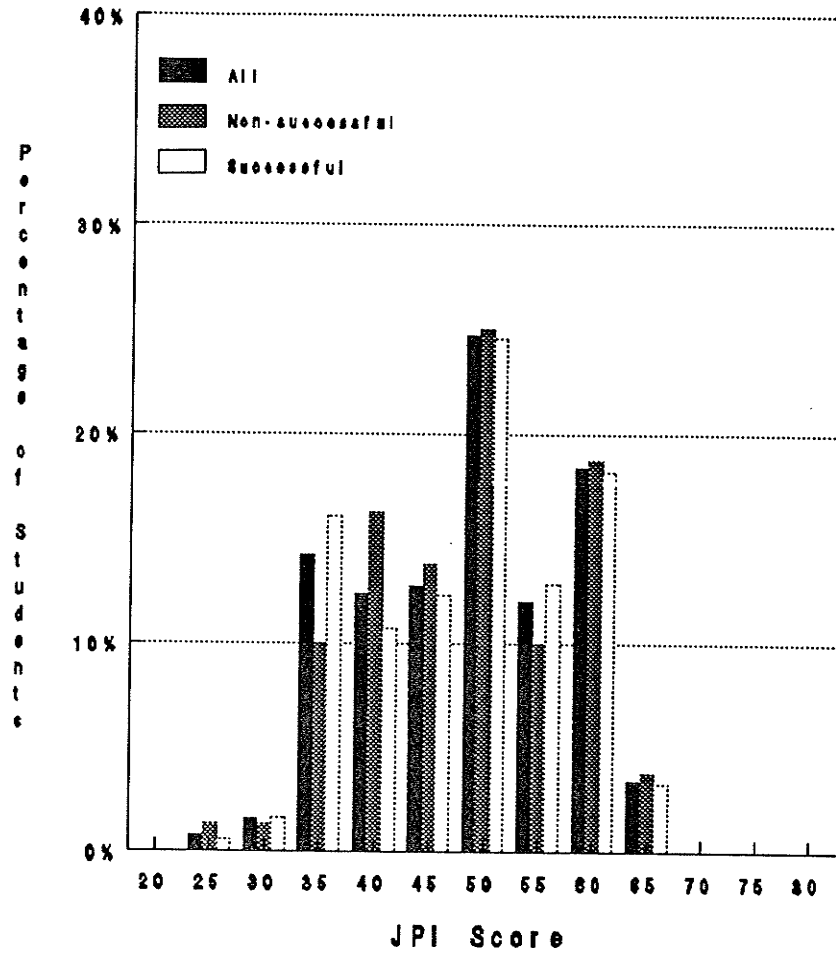
**Figure 12** JPI Scale Innovation: Standard
Scores for Total Sample, Non
Successful and Successful Groups.
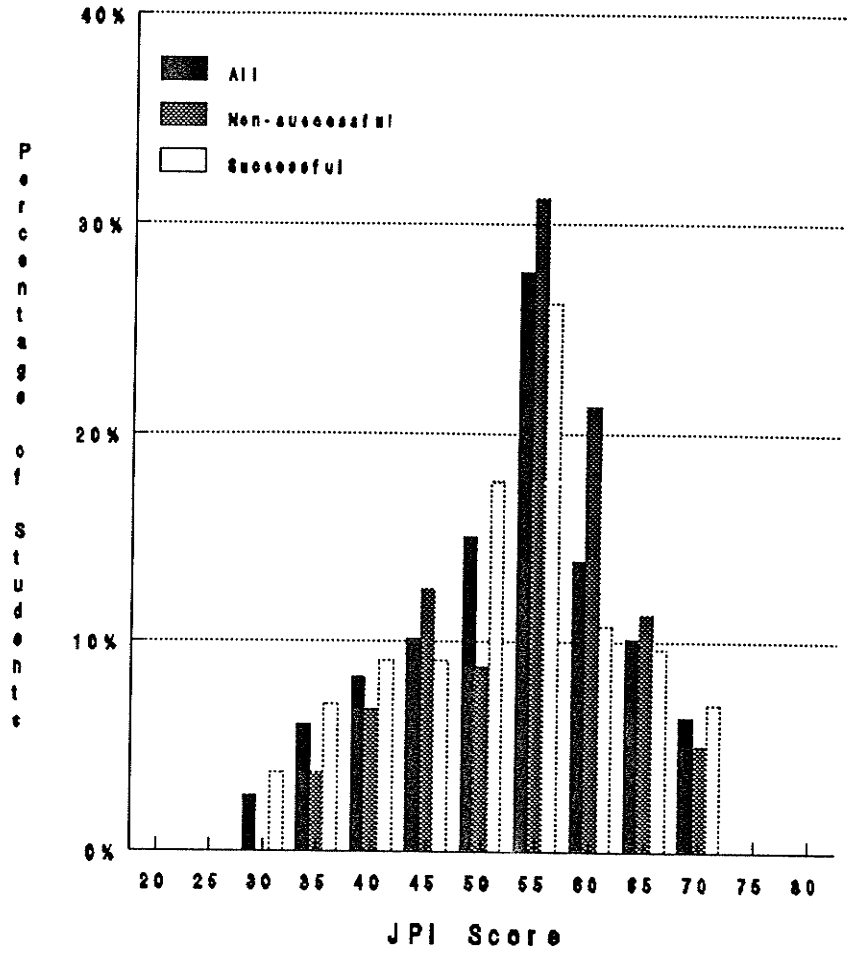
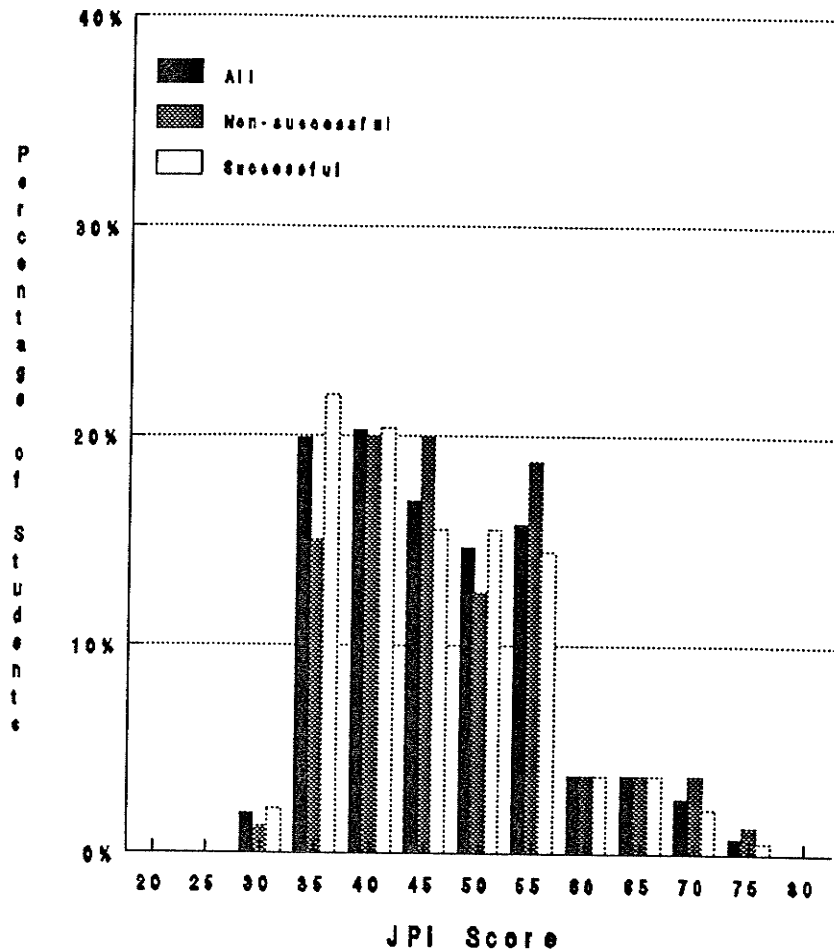**Figure 13** JPI Scale Social Participation:
Standard Scores for Total Sample,
Non successful and Successful
Groups.
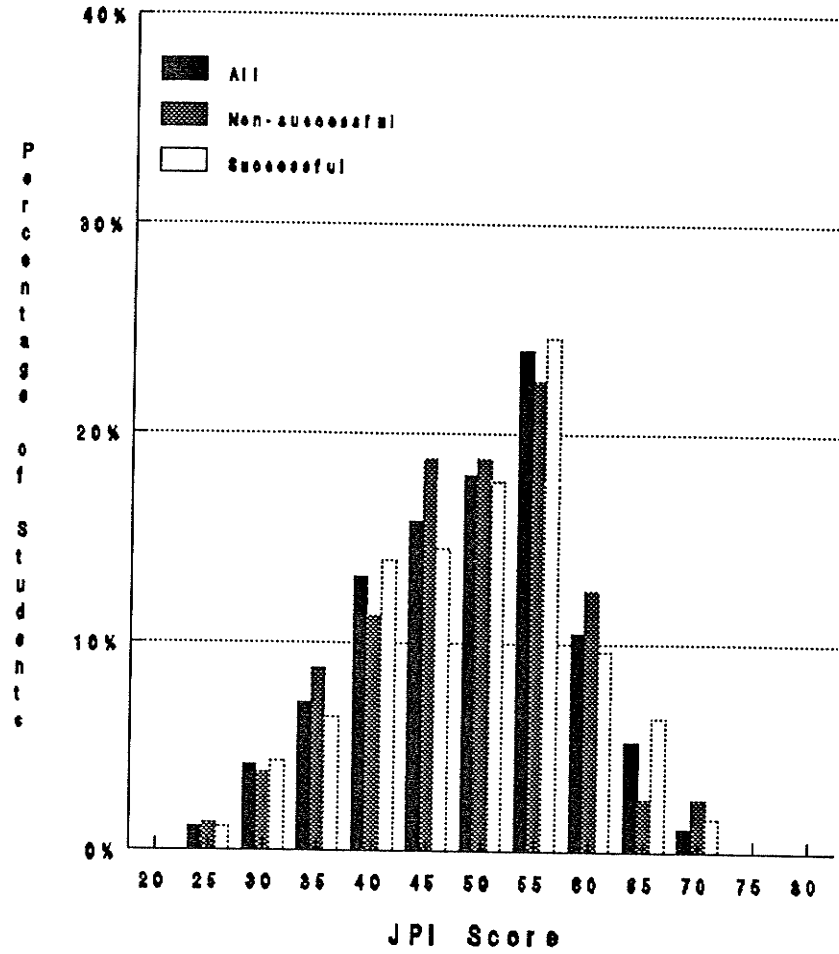
**Figure 14**  JPI Scale Breadth of Interest:
    Standard Scores for Total Sample,
    Non   successful   and   Successful
    Groups.
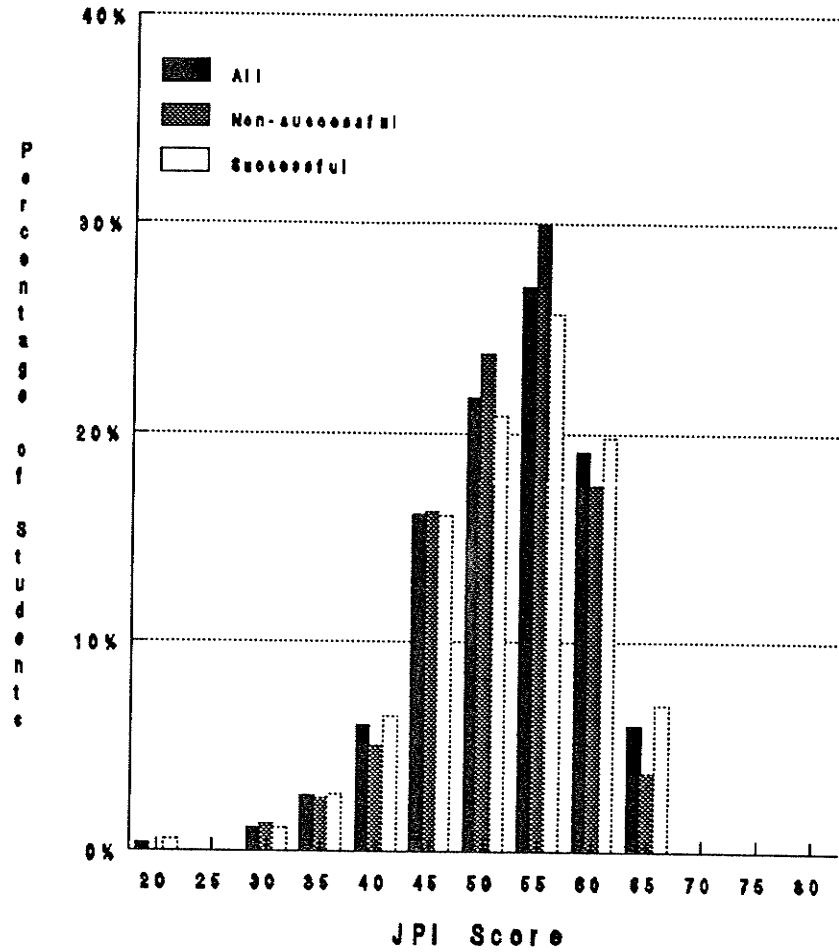
**Figure 15** JPI Scale Interpersonal Affect:
    Standard Scores for Total Sample,
    Non   Successful   and   Successful
    Groups.
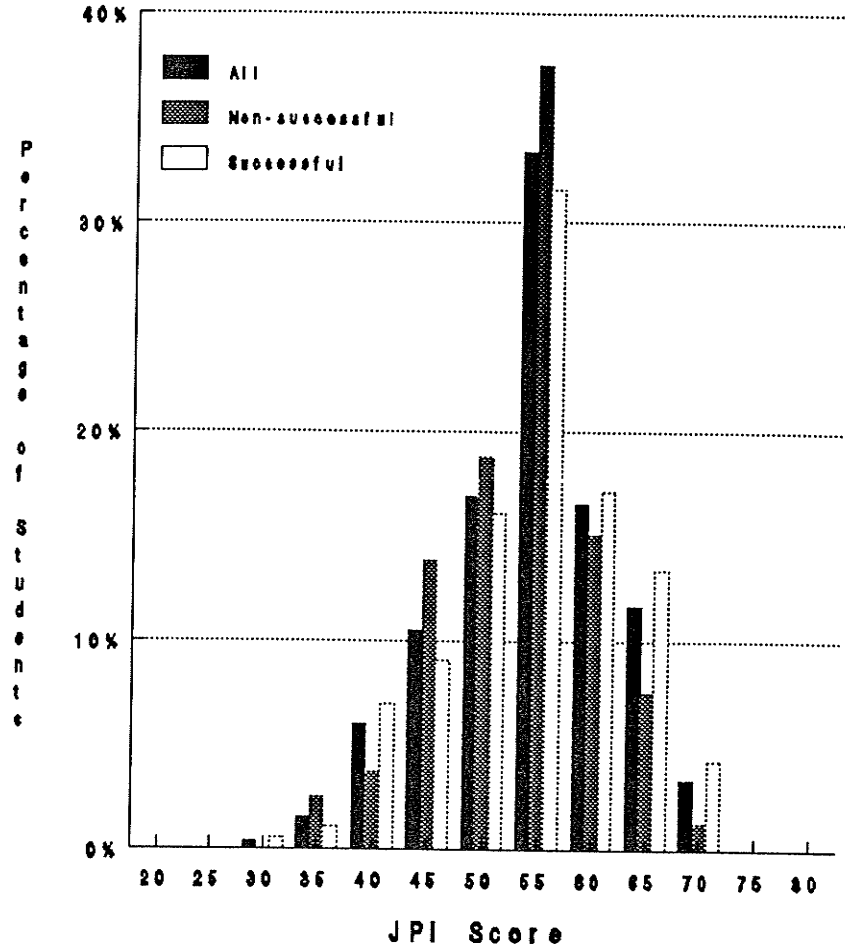
**Figure 16** JPI Scale Organization: Standard
Scores for Total Sample, Non
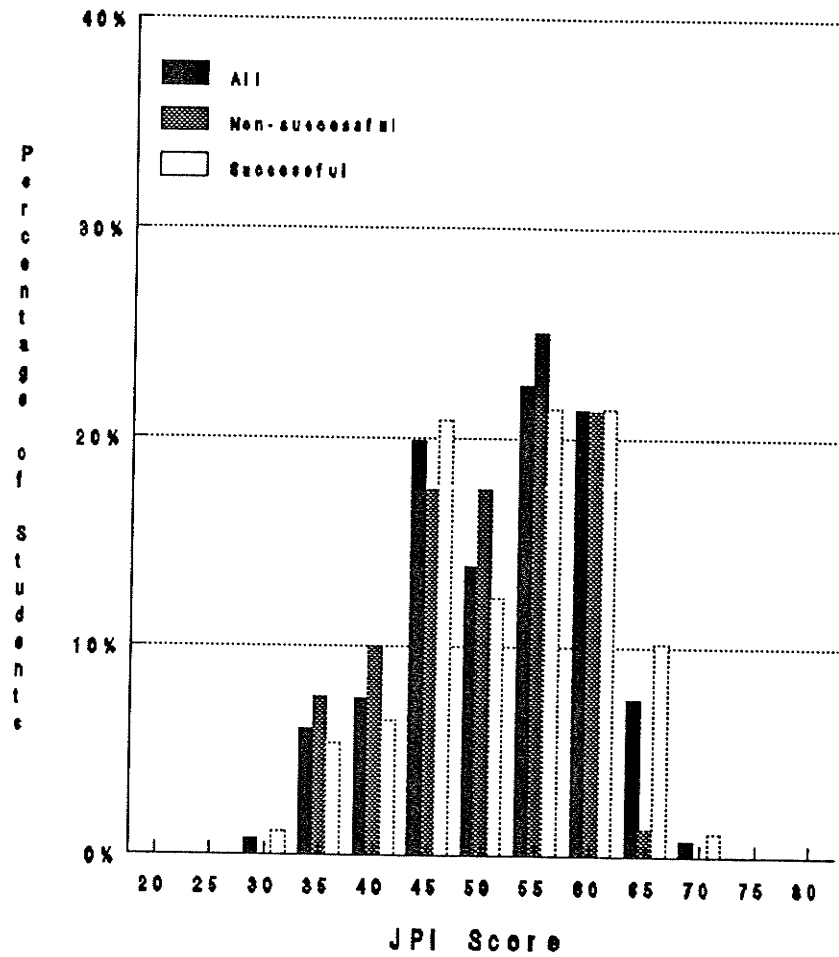Successful and successful Groups.

**Figure 17** JPI Scale Value Orthodoxy:
Standard Scores for Total Sample,
Non Successful and Successful
Groups.

**Figure 18** JPI Scale Responsibility: Standard
Scores for Total Sample, Non Successful
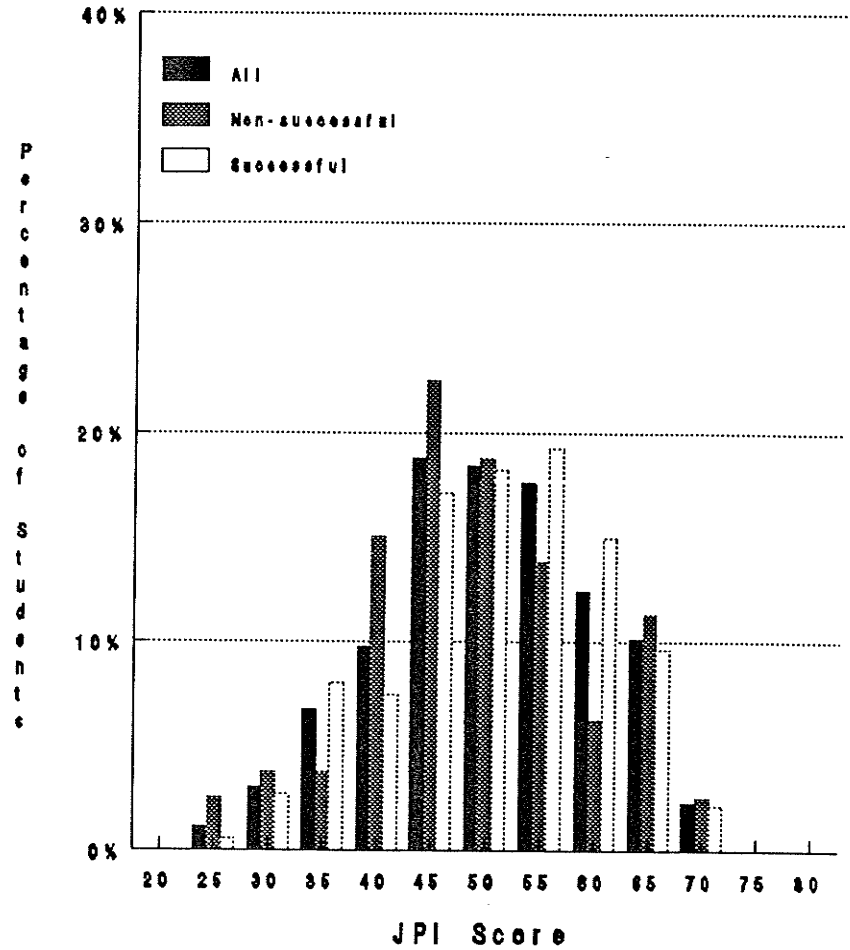and Successful Groups.

**Figure 19** JPI Scale  Risk Taking: Standard
Scores  for  Total  Sample,  Non
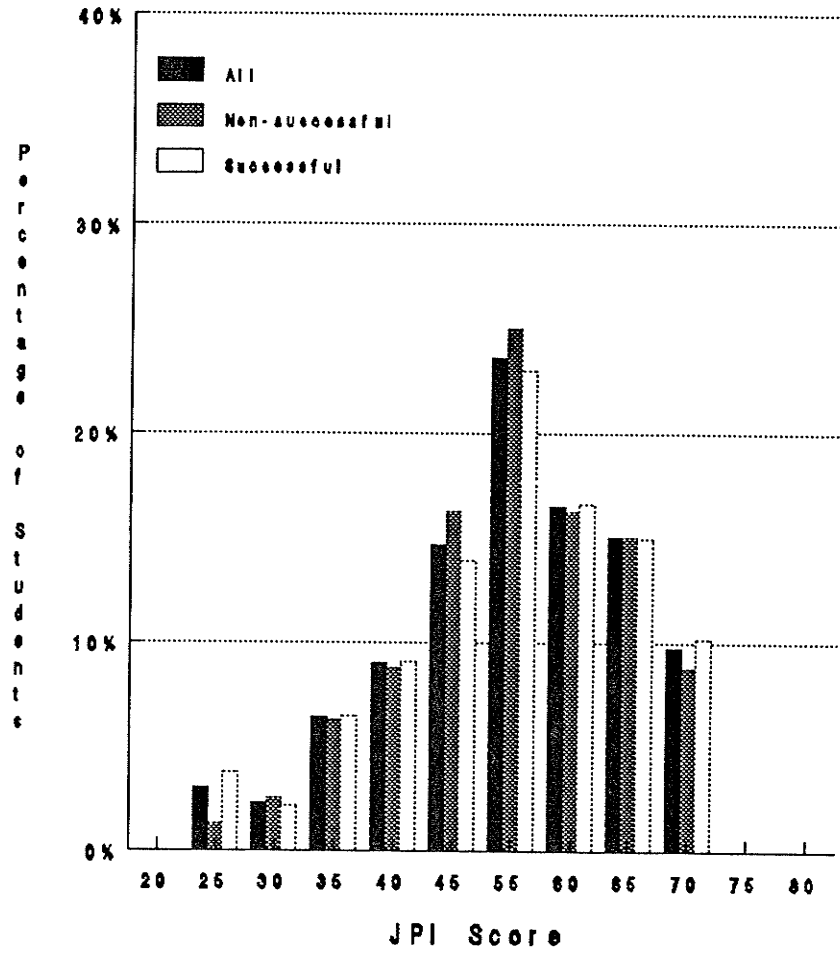Successful and successful Groups.

**Figure 20** JPI Scale Self- Esteem: Standard
Scores for Total Sample, Non
Successful and Successful Groups.

**Figure 21** JPI Scale Energy Level: Standard
    Scores for Total Sample, Non successful
    and Successful Groups.

**Figure 22** JPI Scale Anxiety: Standard Scores
for Total Sample, Non successful and
successful Groups.

Appendix O: Ethical Review Committee Approval

7

**ETHICAL APPROVAL OF RESEARCH AND EXPERIMENT DEVELOPMENT PROJECTS
INVOLVING HUMAN SUBJECTS**

This form is to be completed in accordance with the Faculty of Education policy on ethical review. This policy requires that Committee members take into account the relevant standards of the discipline concerned as well as, where appropriate, the standards specified by certain external funding bodies.

Project identification

(to be filled in by investigator)

Investigator(s) Donna M. L. Blight

Title        Validation of Two Predictors of Success in Hospital
             Based Diploma Schools of Nursing

If applicant is a student, name and SIGNATURE of faculty member supervising the proposed research
                    WINSTON   E.   RAMPAUL

This is to certify that the Review Committee has examined the research and experimental development project indicated above and concludes that the research meets the appropriate standards of ethical conduct in research with human subjects.

Date: Sept 22-88        · Signature of Chairperson: