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ABSTRACT

In order to determine whether the use of standardized test scores as a criterion for admission was discriminatory toward applicants over 40 years of age, an investigation was made of 72 students enrolled in an associate degree nursing program at Alvin Junior College (Texas) during the fall 1974 term. The class was divided into three age groups--20-29, 30-39, and 40 or older--and four hypotheses were tested. (1) The American College Test scores proved to be significantly higher in the younger groups than in the older group. (2) The mean test scores on the National League for Nursing tests at the end of the course did not differ significantly among the age groups. (3) The final grades of the course were slightly higher in the 20-29 age group than in the older groups. However, the final grades of the older students were adversely affected because all the test grades for the course were averaged. Grades for the older groups generally improved as the course progressed. (4) Evaluations of clinical performance made by hospital instructors showed that older students were rated higher in performance, attitude, and attendance. Since older students make more progress and increase skill in test-taking after getting "back into training," the use of test scores as an entrance requirement would seem to be discriminatory. (Author/NHM)

AN INVESTIGATION INTO THE DISCRIMINATION OF STANDARDIZED TESTS FOR OLDER STUDENTS

by

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A PRACTICUM PRESENTED TO NOVA UNIVERSITY
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ABSTRACT

This investigation was undertaken in order to determine if standardized test scores used for entrance requirements to the associate degree nursing program were discriminatory toward some individuals, particularly the applicant over forty-years of age who had been "out of training" for many years.

Hypothesis number one was that the standardized American College Test (ACT) scores would be significantly higher in the younger group than in the older group. Research, using the t-test, supported this hypothesis at the 0.01 level of significance.

For hypothesis number two, scores on the National League for Nursing (NLN) standardized test were used. The results of the computation of the Pearson Product-Moment procedure revealed that there was a greater correlation for the two sets of scores in the 40-or-over age group with a correlation of 0.58. The 30-39 age group showed a correlation between the two sets of scores of 0.45, and the lowest correlation between the two variables was in the 20-29 age group with 0.39. It was noted that the tallies clustered closer to the diagonal line extending from the lower left to the upper right hand corner of the scatter diagram for the 40-or-older group than for the 30-39 age group, or for the 20-29 age group. All of these

correlations were significant at the 0.01 level.

In response to hypothesis number three, the mean scores for the final grades in the course in medical-surgical nursing were slightly higher in the 20-29 age group than in the 30-39 age group or the 40-or-over age group. It was expected that the mean scores for the older group would be adversely affected because all of the scores from the beginning of the semester were averaged. In most cases, grades improved in this group as the course progressed.

Hypothesis number four stating that clinical performances would be higher in the adult learners than in the younger learners' group was not refuted. These evaluations were made by the clinical instructors in each hospital. Results showed that the older, mature student was rated higher in performance, attitude and attendance in the hospital than the younger student.

These findings may represent discrimination against the older applicant to the associate degree nursing program. An applicant to the Associate Degree Nursing program at Alvin Junior College, Alvin, Texas, must have an ACT of 16 or above, or a grade point average (GPA) of 2.5 or more in nine hours or more in courses that are applicable to the nursing program before being considered for the program. The correlation study indicated that the older learner made more progress and increased her skill in test-taking after getting "back into training." This would tend to make test-taking for admission to a program a discriminatory practice for the older student.

Further studies, using State Board Examinations for licensure as a registered nurse, will be necessary after this group graduates to determine if practice in test-taking is, indeed, significant.

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AN INVESTIGATION INTO THE DISCRIMINATION OF STANDARDIZED TESTS FOR OLDER STUDENTS

II. THE STATEMENT OF THE PROBLEM

If the scores on the ACT (American College Test) or other standardized tests are discriminatory to the older student, then such testing may lead to wrong decisions when used as admission criteria for entrance to a community college.

Nature of the problem. The adult learner has been out of school for several years and is not accustomed to studying and taking examinations. Therefore, these older students do not do as well as the younger student on college entrance examinations, such as the ACT, or on the NLN (National League for Nursing) standardized examinations. Since applicants to Alvin Junior College's Associate Degree (ADN) program must score 16 or above on the ACT or either enroll in non-nursing courses until they earn a grade point average of 2.5 before being considered for admission to the nursing program, standardized testing may be discriminatory by keeping the older students out of nursing school. Some of these older students have a reading problem as evidenced by their scores on the Nelson-Denny Reading comprehension test, and their grasp of the material requires more time than that of students who have been in school continuously over a period of years. Using criterion-referenced evaluations,

along with appropriate teaching methods and sufficient time, are being investigated as possible solutions to the problem.

III. THE HYPOTHESIS

1. The mean test scores on the standardized ACT examination would be significantly higher in the younger group than in the older group.

2. The mean test scores on the NLN test at the end of the course would not differ significantly or would be only slightly less for the older students than for the younger students.

3. The mean scores on final grades of the course in medical-surgical nursing would be essentially the same in both groups.

4. Evaluations of clinical performances in the hospital would be significantly higher in the adult learners than in the younger learners' group.

IV. BACKGROUND AND SIGNIFICANCE OF THE STUDY

All people are not alike. We are not carbon copies of each other. At any level of cultural development, specialization itself implies a tacit assumption of differences among people. Differential psychology is concerned with the investigation and study of individual differences. It is with such factors in mind that the classroom situation must be so structured in the community college that all students, including the adult learner, will be accommodated and ego-strength may be improved.

Structuring a classroom situation to accommodate the adult learner. All that has gone in the past in each individual student's life must be considered. Individual differences must be accounted for. This includes the wide span in ages now seen in community colleges as well as the differences in ethnic, pyschological, and socio-cultural backgrounds. Ann Anastasia states that adults frequently deplore their inability to learn a new language or a new motor skill as well as they could in their younger days, but closer observation reveals that the "conditions of learning" are far from comparable at different age levels. Anastasia feels that time available for learning and distractions are often very different for the child or young person and the adult. She also states that when new learning runs counter to previous learning, it is reasonable to expect older adults to be handicapped. This may be a simple result of interference, or negative transfer, which need have no necessary connection with age as such. However, memory for newly learned material suffers somewhat more impairment with age than does memory for older material.[1]

Time available for learning as proposed by Anastasia is also included in the theories of Carroll and Bloom. Carroll views aptitude as the amount of time required by the learner to attain mastery of a learning task.[2] Bloom states that

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[1]Anne Anastasia. Differential Psychology. Third Edition. (New York: MacMillan Company, 1958), p. 256.

[2]John Carroll. "A Model of School Learning," Teachers College Record, 64 (1963): 723-733.

"implicit in this formulation is the assumption that, given enough time, all students can conceivably attain mastery of a learning task."[3]

In structuring a nursing class for adults, the curriculum and teaching methods must be adapted to fit their needs. These adult learners are demanding a more personalized systematic method of teaching rather than the traditional lecture method. Not all nursing educators agree with this. Woolley states these older students received their basic education when there was more emphasis on teaching than on learning, and she feels that learning, to many of them, means what happens automatically when one has a "good teacher" who answers more questions than she asks. Woolley also states that independent study assignments often generate more anxiety than satisfaction, and that the older students prefer to sit with "pencils poised, blank notebook paper ready, and wait quietly for classes to begin." Their attitude according to Woolley is, "You teach, I learn."[4]

The opposite type of attitude has been demonstrated by the older students enrolled in the nursing program at Alvin Junior College. Many are more knowledgeable than the younger students and have life experiences to guide them. They are not as easily frustrated or angered by change or adaptability,

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[3]Benjamin S. Bloom. "Learning for Mastery," Toward Instructional Accountability: A Practical Guide to Educational Change, John E. Roueche and Barton R. Herrscher, (California: Westinghouse Learning Press, 1973), p. 97.

[4]Alma S. Woolley. "Reaching and Teaching the Older Student," Nursing Outlook. Vol. 21, No. 1, (January, 1973).

but they do show more insight into the problem, and they argue their point and do not automatically take the teacher's word. The older students also use the learning resource center and media materials more often than the younger students, and they enthusiastically endorse programmed instruction such as self-paced modules.

Learning theories. These attitudes are more in keeping with the learning theories set forth by Malcolm Knowles. He states, "The adult learner has more experience and a different quality of experience to contribute to the learning situation. The adult learner is ready to learn different things than the youthful learner because he faces different developmental tasks (e.g., parenthood). The adult learner tends to be more autonomous and, therefore, less comfortable in a dependent role. The adult learner is usually interested in the immediate usefulness of new knowledge.[5] Knowles also states that adults do not respond to the traditional extrinsic rewards of the typical classroom. Many adults require something other than the usual dependency relationship between learner and teacher, such as new relationships for which neither the learner nor the teacher are adequately prepared. "The typical knowledge-centered curriculum and method has even less perceived relevance for the adult than for the child."[6]

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[5]Malcolm S. Knowles. (Ed.) Handbook of Adult Education in the United States (Chicago: Adult Association of the U.S.A., 1960), p. 82.

[6]Ibid. p. 57.

In structuring classes for these adult learners, Knowles points out that the orientation talk is important. This initial describes the behavior objectives (hoped-for outcomes) and a plan for achieving these objectives.[7]

Individual differences. All individual differences must be treated on the basis of that individuality. In any such treatment, many feel that testing becomes necessary. This is particularly true with children and youth, but some of these tests are applied to adults. The results reveal consistent differences of mean scores obtained by different age groups on the Wechsler-Bellevue subtests. According to these tests, it can be seen that the performance tests reach their peak earlier and decline more sharply with age than do verbal tests. Among the latter, vocabulary shows the least loss. This is consistent with all findings in adult testing, and for this reason, it has become common practice to utilize vocabulary scores as a rough index of a person's earlier intellectual level, against which deterioration in other functions may be measured. It has also been demonstrated that performance and nonlanguage tests yield a larger decrement than verbal tests. Among the largest age decrements are those found in tasks calling for visual perception. Such a decline is in part associated with general loss of acuity in all senses with increasing age. In motor skills, age decline is less pronounced than supposed. Moreover, older subjects tend to change their methods of performing tasks and thus to compensate for their

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[7]Ibid. p. 85.

deficiencies. It is also noted that age decrements in physical strength are not so large as is commonly believed.[8]

One of the research problems for adult education is to develop forms of measurement that will predict the success of adults in all kinds of intellectual problems and roles, not simply academic performance. Moreover, if increasing numbers of adults are to undertake study appropriate to their needs and roles, and at a time of life, much more adequate diagnostic measures will be needed than now exists so that the adult learner can place himself appropriately respecting the content and skills he will study.[9]

In 1965, when the Review of Education Research concentrated on adult education, Howard McCusky's conclusion contained the view that "adult learning still requires a special focus and attention and that more work needs to be done on an appropriate criterion of adult intelligence, and "age fair" test and a device that gets beneath the surface of the adult personality."[10] The majority of the learning force in higher education in America today is the older, more experienced adult rather than the young, single, unemployed adults who can devote their full time and attention to the four-year pursuit of a college education. Yet the institution has developed its

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[8]Anastasia. op. cit., p. 236.

[9]J.R. Kidd. "The Adult Learner," How Adults Learn. (New York: Associated Press, 1973), p. 75.

[10]Ibid. p. 33.

progress primarily for the latter.[11]

As for testing practices using instruments designed primarily for children, the implications of these tests have not added much to what is already known. Also, there have been many destructive consequences with the frequency with which results of observations of animals and children are applied to adults. Data derived from research with children are useful only if applied with care and if rigorously checked against adult experience as well as with data collected from systematic observations of adults.[12] There is growing evidence from studies with adults to indicate that educational practices should change to meet the needs of the older students. The theory and concept of lifelong education points out differences in the way adults learn which call for different teaching strategies and different evaluative instruments.

Bloom relates that individual differences in learning is a fact that can be demonstrated in many ways. Students vary, but the feeling that these variations must be reflected in learning standards and achievement criteria is more a reflection of our policies and practices than of the necessities of the case. Our basic task in education according to Bloom is to find strategies that will take individual differences into consideration but will do so in such a way as to promote the

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[11]Patricia Cross and Quentin Jones. Explorations in Non-Traditional Study. (San Francisco: Jossey-Bass, Inc., 1972), p.84.

[12]Kidd. op. cit., p. 33.

fullest development of the individual.[13]

Improving ego strength in the adult learner. McClelland states that many scholars have reasoned that there is a general kind of competence which develops with age and to a higher level in some people than in others. He speaks of a special kind of education in junior high school that moves students up the ego development scale significantly; that is, training produces results that are reflected sensitively.[14]

Erikson, in his eight stages of man, relates that a sense of initiative starts early in life in the preschool age child. He also stresses that identity vs. role confusion in the twelve to fifteen-year old (junior high school age). However, the integration now taking place in the form of ego identify is more than the sum of the childhood identifications. "It is the accrued experience of the ego's ability to integrate all identifications with the vicissitudes of the libido, with the aptitudes developed out of endowment, and with the opportunities offered in social roles."[15] Just as competence and ego strengths develops with ago so must educators move out from pedagogy and into andragogy. Malcolm Knowles list four major discernible differences between adults and children which have direct bearing on the learning process. These are differences in self-concept,

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[13]Bloom. op. cit., p. 96.

[14]David C. McClelland. "Testing for Competence Rather than for Intelligence", American Psychologist, (January, 1973), p. 12.

[15]Erik H. Erikson. Childhood and Society. Second Edition. (New York: W.W. Norton and Company, Inc., 1963), p. 261.

differences in experiences, differences in readiness to learn, and differences in orientation to learning.[16]

In designing a classroom situation for nursing students with the intention of improving ego strength, the LVN (Licensed Vocational Nurse) can be utilized as a peer teacher. This type of ego strengthening has not always been applied. The LVN was much maligned and given little recognition and no academic credit for her ability until recently. If she wanted to become a registered professional nurse (RN), she had to start all over at the beginning. This meant going through innumerable classroom sessions on such things as how to make a bed, give a bath, administer an injection, and similar introductory procedures. This is all the more ludicrous when one realizes that these same LVN's had been administering medications, performing procedures of a highly skilled nature and providing intensive nursing care to many patients over a long period of time. Not only this, but even the admittance of being an LVN was enough to bring down scorn from instructors. The LVN in nursing school today is given recognition for her abilities and is given many opportunities for demonstrating her skills. This, too, raises her self-concept.

Only a few years ago, the student over thirty was an oddity in nursing schools. Few could survive three years of feeling like an anachronism decked out in starched pinafore and cap.

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[16]Malcolm Knowles. The Adult Learner: A Neglected Species. (Houston: Gulf Publishing Company, 1973), pp. 152-53.

Many decided the discomfort and degradation just was not worth it, and it was a relief to a traditional faculty to see them go. This attitude no longer exists, but in order to reach the older student, the transactions among instructors and students must be what Berne called adult-adult and not adult-child.[17] Students who are parents and grandparents are quickly turned off by condescension. Their feelings of worth and dignity must be sustained. The instructor has to learn to appreciate the rewards and pleasures of teaching the adult learner. Experiences in the clinical area (hospital) can become shared experiences where the students not only have much to give each other but to the instructor as well. If students do not regard her as a threatening parental figure but as a person who is likely to appreciate a bit of humor in an otherwise serious situation, then she can relax and enjoy reaching and teaching the older student.[18]

The development of lifelong education which is lending impact and consequences for the educational effort encounters a serious obstacle, that of selection. The situation is well known: through the operation of examinations and diplomas a sorting out takes place at various stages of education and even more sharply in its concluding phase. Failure and success are thus institutionalized in a manner which is generally

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[17]Eric Berne. Games People Play. (New York: Grove Press, Inc., 1964), p. 30.

[18]Woolley. op. cit., Vol. 1.

irrevocable.[19] Until new instruments are available, it seems an injustice to continue to administer tests which place students in categories or keep them from pursuing their goals. Testing for the older student may not be an appropriate means of evaluating ability or achievement.

Enough evidence has been gained to cause questioning about present educational practices and to stimulate experimentation among those engaged in adult education. This study is being undertaken as an effort to better understand and serve the older adult students. Since many of the students in nursing are older and more experienced, it seems to lend significance to the study.

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[19]Paul Lengrand. An Introduction to Lifelong Education. (Switzerland: Unesco, 1970), p. 51.

V. DEFINITION OF TERMS

As used in this practicum, the following definitions apply to terms used.

ACT - American College Test

ADN - Associate Degree Nursing

Adult Learner - A person over thirty years of age who is attending an institution of higher learning

Andragogy - The art and science of teaching adults

Attitudes toward learning - The overt and covert manifestations of the affective domain of students toward the learning process

Auto-tutorial materials - audio-visual tapes and films, self-paced modules, or any programmed study guides that a student may self-administer

Behavior modification - Regulation environment in order to modify or change an organism's behavior

Clinical area - hospital

Clinical evaluations - written appraisals by clinical instructors of students' performances in the hospital

Clinical instructor - Nurse educator who supervises students in the hospital and also assists with lectures in classroom theory on the college campus.

Developmental Psychologists - Psychologists who are concerned with the description and explanation of changes in an individual's behavior as a result of growth and experience

Drives - An inner urge that stimulates a response, inciting or repressing action

GPA - Grade point average

Learning process - A continuing development involving many changes, generally a number of steps or operations

Long-term memory - Memory which persists over days, months, or years

LRC - Learning Resouce Center containing library, audio-visual aids and the multi-media center

NLN - National League for Nursing, the national professional organization for nurse educators

Pedagogy - The art and science of teaching children

VI. LIMITATIONS

This study was limited to students enrolled in Alvin Junior College during the fall term, 1974. It was also limited to students from this group who were enrolled in medical-surgical nursing during this time.

This study was further limited by the fact that the number of subjects in each group was different. The ACT, at present an admission requirement for all students, was not required of transfer students at the time the class under study was admitted; therefore, only those that took the ACT for entrance purposes was considered. This number totaled 72 students from a class of 120.

VII. BASIC ASSUMPTIONS

The expectations of the study were that the older student, the 40-or-over age group, would not perform as well on the admission ACT tests as the younger students. Increasingly, evidence has been growing to support the view that a critical factor in many tests used for adults is the amount of practice of the particular task. When people "keep in training" in intellectual as well as physical tasks, their capacity is maintained. The amount of schooling modifies considerably the performance in such tests.

It was also expected that these adult learners in the 40-or-over age group would improve their test-taking skills which would be revealed by their scores at the end of the medical-surgical nursing course and on the NLN standardized tests administered following the course. However, since

grades from the beginning of the semester were to be averaged at the end of the course, the adult learners were expected to score slightly less or only equal to the scores of the younger students. Evidence of learning was expected to be shown by the adult learner from grades and scores being closer together between the groups at the end of the semester than they were on the ACT at the beginning of the semester before the adults were back in "training."

VIII. PROCEDURES FOR COLLECTING DATA

Data for this research study were collected during the spring semester, 1975. These were from NLN standardized test scores on Medical-Surgical Nursing taken by the class under study in the fall, 1974, from the ACT scores that were taken as college entrance requirements, from the Nelson-Denny reading comprehension test administered in the fall, 1974, and from the final course grades for the medical-surgical nursing class for the fall semester, 1974.

IX. PROCEDURES FOR TREATING DATA

A histogram was made from the scores of the Nelson-Denny reading test to show the differences in the competencies of the 20-29, 30-39, and 40-or-over age groups, particularly those scoring below the tenth grade reading level. This reading test was given to the same group that had taken the ACT test as an entrance requirement. Another histogram was made showing the percentage of the entire group for each of the reading test scores.

Scores taken from the ACT test were subjected to a t-test to ascertain if those in the 20-29 age group were higher at 0.05 level of significance than those in the 40-or-over age group. Tables were constructed on these ACT scores for each of the three age groups--20-29, 30-39, and 40-or-over--to show the frequency distribution of each score.

The entire class was divided into three age groups--20-29, 30-39, and 40-or-over--and a correlation coefficient computation for the final course grade and the NLN scores was accomplished with the Pearson Product-Moment Method. This procedures also provided the means of these two sets of scores for each of the age groups were devised showing performance of each student on the NLN and the course grade. The outcomes of these correlations for each of the age groups were shown with figures.

X. DATA RESULTING FROM THE STUDY

The results of the Nelson-Denny reading comprehension test showed that 30 percent of the 118 students taking the test scored below the tenth grade reading level. (Figure 1). However, the greatest percentage to score below the tenth grade level was seen in the 40-or-over age group. (Figure 2). There were 37.5% in this older group scoring belowing the tenth grade level, with 33% in the 30-39 age group and only 24% in the 20-29 age group.

This may represent disrimination, particularly against the older group, in that reading comprehension could account

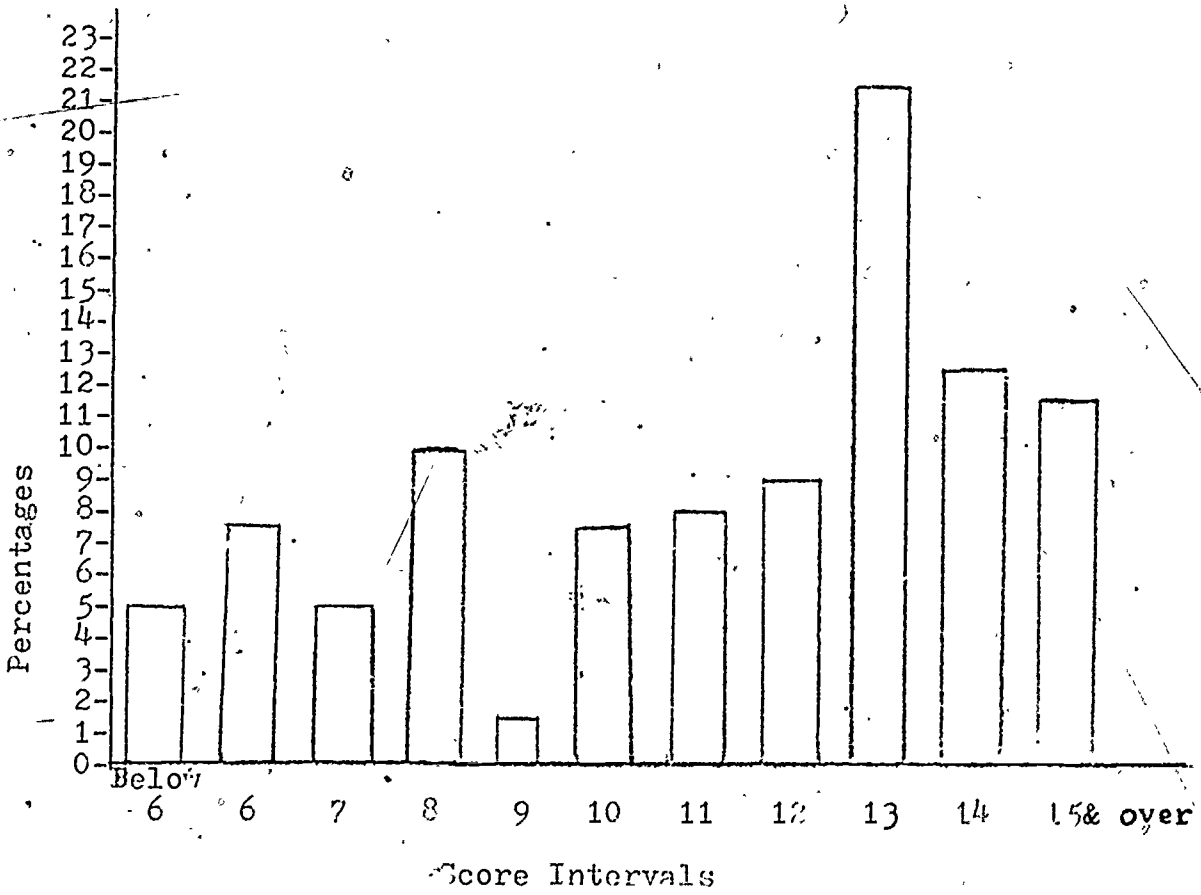

Figure 1. Results of the Nelson-Denny Reading Test Taken By the 118 Students That Also Took the ACT Test in the Associate Degree Nursing Program at Alvin Junior College, Alvin, Texas, (Spring, 1975).

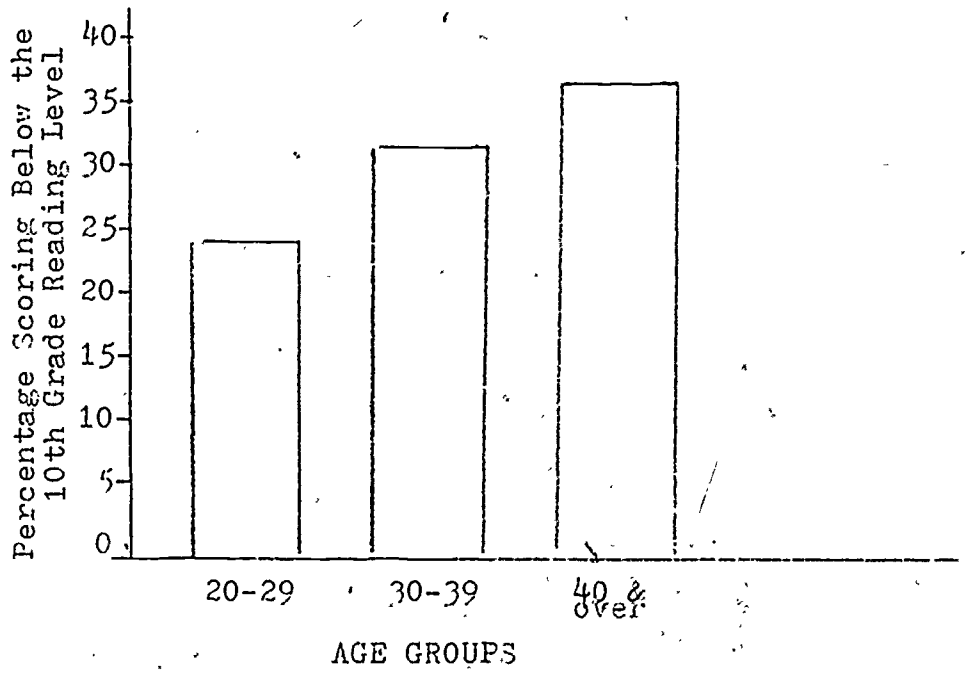

Figure 2. Histogram of Nelson-Denny Reading Test Showing Percentages by Age Groups of Those Scoring Below the 10th Grade Reading Level

in part for the low scores on the ACT which is now used as criteria for admission to the nursing program. Applicants to the program that have an ACT score below 16 must enroll in nine or more semester hours of academic courses that are applicable to the nursing program and obtain a GPA of 2.5 or more before being considered for the nursing program.

Of the 72 students in the medical-surgical nursing course under study that took the ACT, 26 were in the 20-29 age group, 21 in the 30-39 group, and 25 in the 40-or-over group. The frequency distribution of the ACT test scores of these age groups can be seen in Tables 1, 2, and 3, respectively.

The data obtained in response to hypothesis number one showed that the mean test scores on the ACT examination were significantly higher in the younger group, 20-29 group, than in the older group, 40-or-over group, when using a t-test at the 0.05 level of significance. The critical value of t was 1.678 for the directional test and the calculated value of t was 3.08. The means, standard deviations, and numbers of both age groups can be seen in Table 4. Raw data for this can be found in Appendix A.

For hypothesis number two and three, scores for the NLN and the final course grades for the entire class were used. The results of the computation of the Pearson Product-Moment procedure revealed that there was greater correlation for the two sets of scores in the 40-or-over age group with a correlation of 0.58. The 30-39 age group showed a correlation between the two sets of scores of 0.45 and the lowest correlation between

TABLE 1

FREQUENCY DISTRIBUTION OF ACT TEST SCORES FOR THE 20-29 YEAR AGE GROUP

SCORE INTERVAL	FREQUENCY
25-29	4
20-24	4
15-19	7
10-14	8
5-9	3
TOTAL	26

TABLE 2

FREQUENCY DISTRIBUTION OF ACT TEST SCORES FOR THE 30-39 YEAR AGE GROUP

SCORE INTERVAL	FREQUENCY
25-29	0
20-24	2
15-19	7
10-14	6
5-9	6
TOTAL	21

TABLE 3

FREQUENCY DISTRIBUTION OF ACT TEST SCORES FOR THE 40 YEAR OLD AND OLDER AGE GROUP

SCORE INTERVAL	FREQUENCY
25-29	0
20-24	2
15-19	4
10-14	13
5 -9	6
TOTAL	25

TABLE 4

MEANS, STANDARD DEVIATIONS, NUMBERS, df, AND THE DIFFERENCE BETWEEN THE MEAN AND THE CALCULATED t ON SCORES ON THE ACT

	AGE	$\bar{X}$	S	N
GROUP I	20-29 YEAR OLDS	16.8	6.1	26
GROUP II	40 YEAR & OVER	12.1	4.9	25

$\bar{X}_1 - \bar{X}_2 = 4.78$

$t = 3.08^*$

$df = 49$

*Significiant at the 0.01 level

the two variables was in the 20-29 age group with 0.39. It will be noted that the tallies cluster closer to the diagonal line extending from the lower left to the upper right hand corner (Figure 3) fro the 40-or-over age group than for the 30-39 age group (Figure 4) or for the 20-29 age group. (Figure 5). All of the correlations are significant at the 0.01 level.

The correlation study seems to indicate, as was expected, that the older learner made more progress due to practice and increased skill in test-taking. This would tend to make the use of a test based on reading and test-taking skills for admission to a program a discriminatory practice for the older student.

In response to hypothesis number three, the mean scores for the final medical-surgical nursing course grade were slightly higher in the 20-29 age group than in the 30-39 or 40-or-over age groups. It was expected that the averages for the older students would be adversely affected because all of the test grades were averaged. In most cases, grades improved for this group as the course progressed. The mean scores for the NLN standardized test did not differ significantly between the three age groups. These scores can be seen in Tables 5, 6, and 7.

Hypotheses number four stating that clinical performances would be significantly higher in the adult learners than in the younger learners' groups was not refuted. These evaluations were made by the clinical instructors in each hospital. Results showed that the older, mature students was rated higher

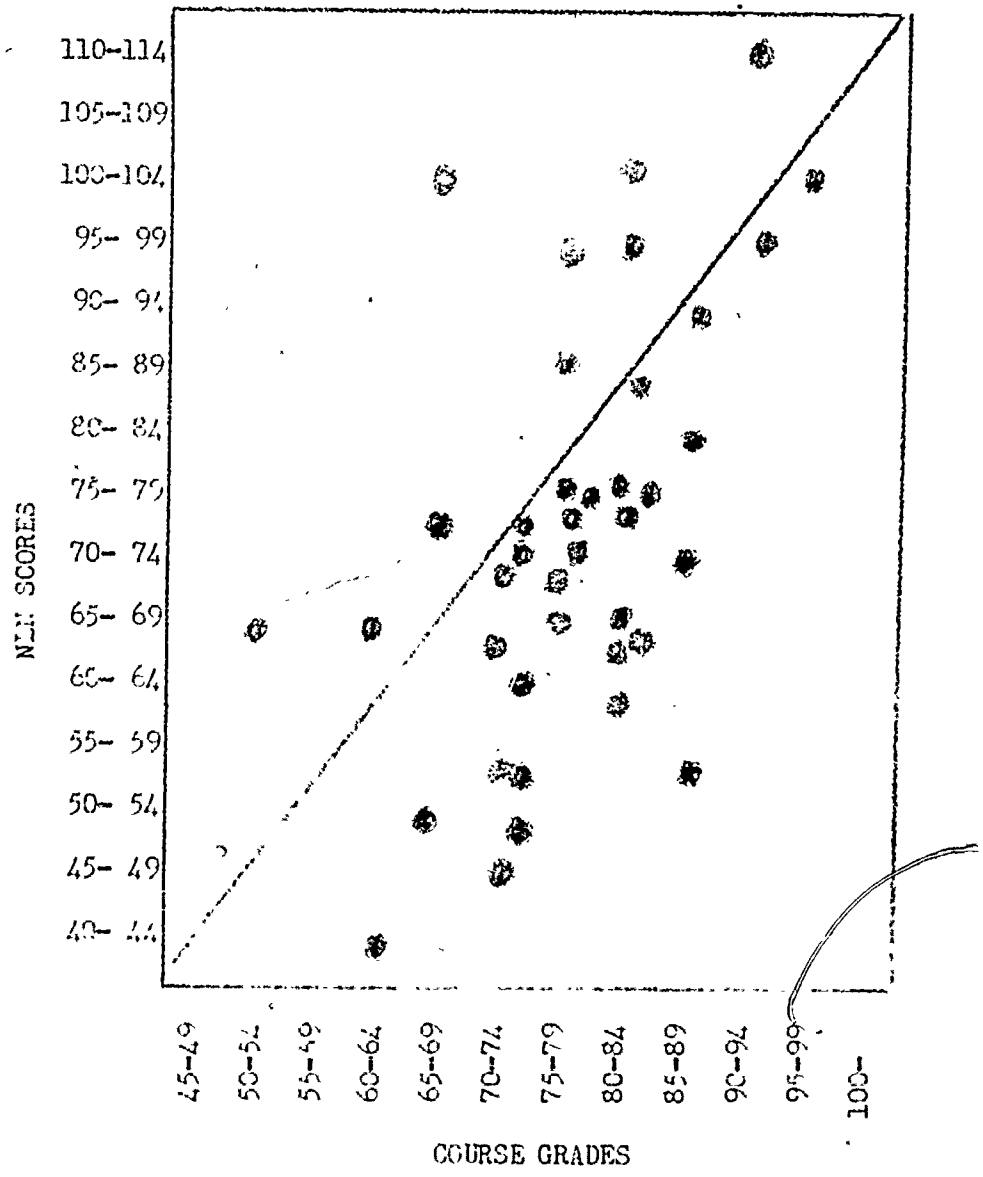

Figure 3. The Scores of 40 Persons of Age 40 or Over on NLN Achievement Tests and the Final Course Grades. Computation of Coorelation of the Two Sets of Scores Shows 0.58.

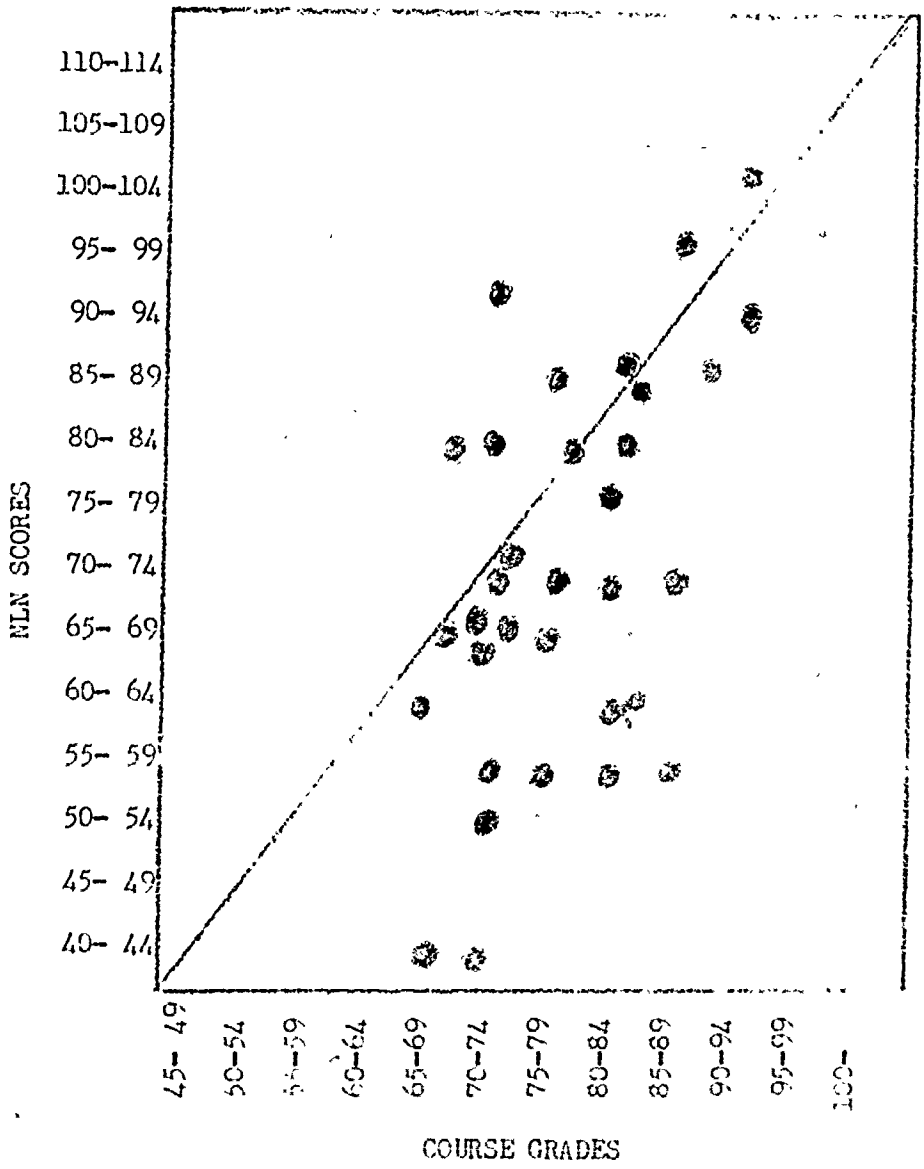

Figure 4. The Scores of 33 Persons of 30-39 Age Group on NLN Achievement Tests and the Final Course Grades. Computation of Correlation of the Two Sets of Scores Shows 0.45.

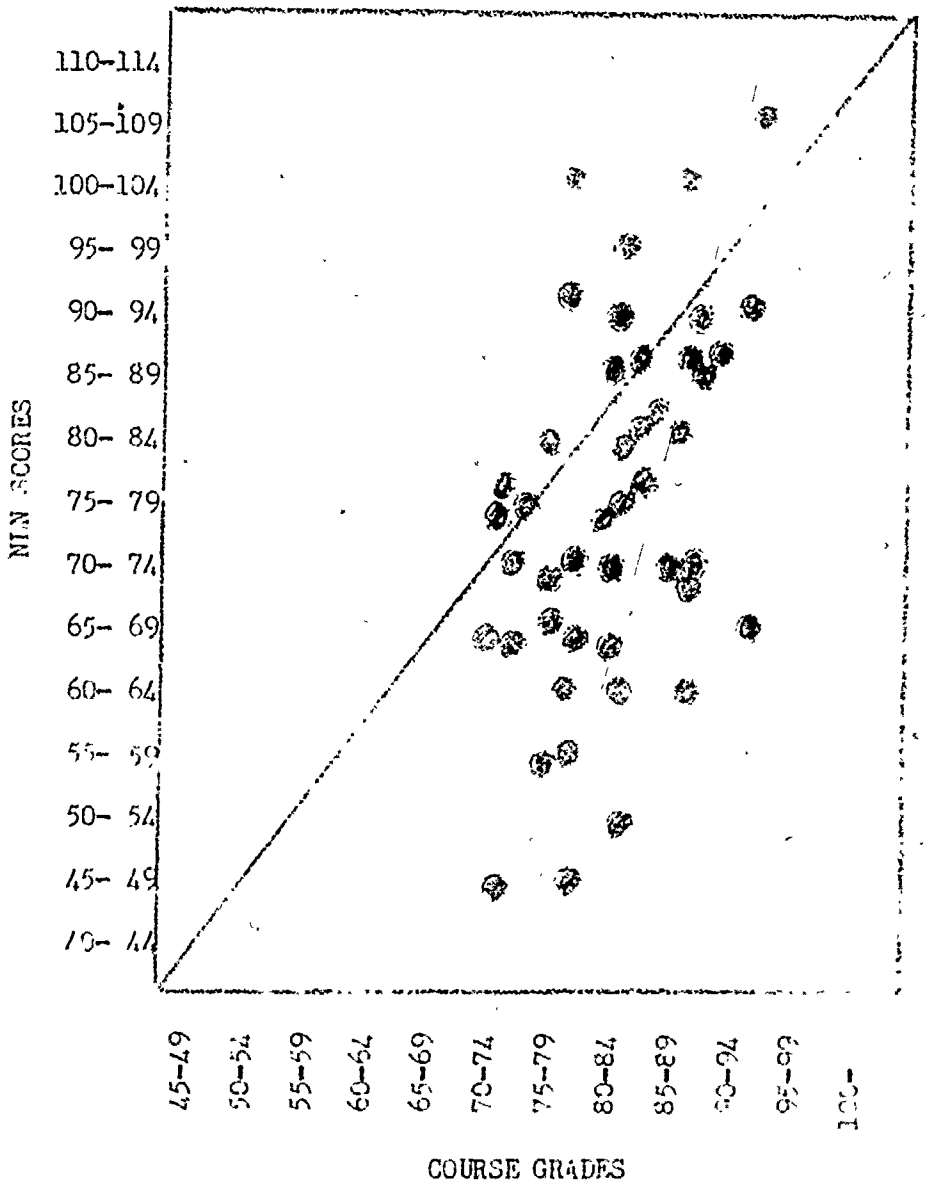

Figure 5. The Scores of 45 Persons of 20-29 Age Group on NLN Achievement Tests and the Final Course Grades. Computation of Correlation of the Two Sets of Scores Shows 0.39.

in performance, attitude and attendance in the hospital than the younger student. A copy of the evaluation form can be found in Appendix B.

XI. SIGNIFICANCE OF THE DATA

The data collected and analyzed for this study indicated that the ACT score required for admission to the ADN program in Alvin Junior College may not be an adequate predictor of capabilities for all students and may be eliminating many very capable students from the program. These findings should be helpful in effecting a cognizance of the problems of the older students which would lend impetus for further comparative studies for different age groups.

XII. FURTHER STUDIES AND RECOMMENDATIONS

Inasmuch as the data from this investigation showed enough evidence to consider this a problem for further attention, the following recommendations are suggested for consideration:

1. Proceed with follow-up statistical analysis for the subjects in this study with State Board examination grades using comparison between the three age groups.

2. Implement continued evaluation of the admission practices as they affect the ADN program.

3. Initiate further comparative studies for different age groups on normative and criterion-referenced testing.

4. Utilize the scores on admission tests as diagnostic tools and provide means for students to eliminate their deficiencies.

5. Encourage subsequent investigations for study of the older student with testing practices extending them to include the whole population of the college, thus increasing the number of subjects.

TABLE 5. COMPUTATION OF PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENT FOR 20-29 AGE GROUP ON NLN (X) AND COURSE GRADES (Y)

Pupil	X	Y	x	y	x^2	y^2	xy
1	70	77	- 6	- 4	36	16	+ 24
2	81	81	+ 5	0	25	0	0
3	74	83	- 2	+ 2	4	144	- 24
4	48	78	-28	- 3	784	9	+ 84
5	77	73	+ 1	- 8	1	64	- 8
6	71	77	- 5	- 4	25	16	+ 20
7	66	74	-10	- 7	100	49	+ 70
8	66	84	-10	+ 3	100	9	- 30
9	90	94	+14	+13	196	169	+ 182
10	86	80	+10	- 1	100	1	- 10
11	91	83	+15	+ 2	225	144	+ 30
12	82	85	+ 6	+ 4	36	16	+ 24
13	97	80	+21	- 1	441	1	- 21
14	74	84	- 2	+ 3	4	19	- 6
15	87	80	+11	- 1	121	1	- 11
16	83	84	+ 7	+ 3	49	9	+ 21
17	85	89	+ 9	+ 8	81	64	+ 72
18	45	70	-31	-11	961	21	+ 341
19	84	77	+ 8	- 4	64	16	- 32
20	103	88	+27	+ 7	729	49	+ 189
21	101	78	+25	- 3	625	9	- 75
22	56	78	-20	- 3	400	9	+ 60
23	74	72	- 2	- 9	4	81	+ 18
24	84	86	+ 8	+ 5	64	25	+ 40
25	75	82	- 1	+ 1	1	1	- 1
26	75	73	- 1	- 8	1	64	+ 8
27	79	80	+ 3	- 1	9	1	- 3
28	67	86	- 9	+ 5	81	25	- 45
29	108	91	+32	+10	1024	100	+ 320
30	69	70	- 7	-11	49	121	+ 77
31	73	89	- 3	+ 8	9	64	- 24
32	84	83	+ 8	+ 2	64	4	+ 16
33	61	85	-15	+ 4	225	16	- 60
34	69	75	- 7	- 6	49	36	+ 42
35	53	83	-23	+ 2	529	4	- 46
36	71	86	- 5	+ 5	25	25	- 25
37	94	87	+18	+ 6	324	36	+ 108
38	64	78	-12	- 3	144	9	+ 36
39	60	80	-16	- 1	256	1	+ 16
40	69	77	- 7	- 4	49	16	+ 28
41	51	75	-25	- 6	625	36	+ 150
42	92	78	+16	- 3	256	9	- 48
43	66	79	-10	-11	100	121	+ 110
44	69	90	- 7	+ 9	49	81	- 63
45	86	89	+10	+ 8	100	64	+ 80
Sum	3410	3645			9144	1865	1634
Mean	75.77 (76)	81					

σ_x=14.25 σ_y = 6.43

Correlation (rxy) = 0.39

TABLE 6. COMPUTATION OF PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENT FOR 30-39 AGE GROUP ON NLN (X) SCORES AND COURSE GRADES (Y)

Pupil	X	Y	x	y	x^2	y^2	xy
1	95	86	+23	+ 8	529	64	+ 184
2	80	69	+ 8	- 9	64	81	- 72
3	61	80	-11	+ 2	121	4	- 22
4	92	92	+20	+14	400	196	+ 280
5	85	83	+13	+ 5	169	25	+ 65
6	70	77	- 2	- 1	4	1	+ 2
7	57	81	-15	+ 3	225	9	- 45
8	62	69	-10	- 9	100	81	+ 90
9	103	93	+31	+15	961	225	+ 465
10	80	77	+ 8	- 1	64	1	- 8
11	79	72	+ 7	- 6	49	36	- 42
12	73	80	+ 1	+ 2	1	4	+ 2
13	56	72	-16	- 6	256	36	+ 96
14	94	71	+22	- 7	484	49	- 154
15	71	88	- 1	+10	1	100	- 10
16	72	73	0	- 5	0	25	0
17	89	85	+17	+ 7	289	49	+ 119
18	67	74	- 5	- 4	25	16	+ 20
19	66	73	- 6	- 3	36	9	+ 18
20	83	81	+11	+ 3	121	9	+ 33
21	67	74	- 5	- 4	25	16	+ 20
22	78	83	+ 6	+ 5	36	25	+ 30
23	43	65	-29	-13	841	169	+ 377
24	69	65	- 3	-13	9	169	+ 39
25	62	83	-10	+ 5	100	25	- 50
26	58	85	-14	+ 7	196	49	- 98
27	65	76	- 7	- 2	49	4	+ 14
28	57	75	-15	- 3	225	9	+ 45
29	82	73	+10	- 5	100	25	- 50
30	52	74	-20	- 4	400	16	+ 80
31	87	78	+15	0	225	0	0
32	43	72	-29	- 6	841	36	+ 174
33	86	84	+ 4	+ 6	16	36	+ 24
Sum	2384	2563			6962	1599	1526
Mean	72.24	77.66					
	(72)	(78)					

$$\sigma_x = \sqrt{\frac{6962}{33}} = \sqrt{210.96} = 14.52 \qquad \sigma_y = \sqrt{\frac{1599}{33}} = \sqrt{48.45} = 6.96$$

$$r_{xy} = \frac{1526}{(33)(14.52)(6.96)} = \frac{1526}{3334.95} = 0.45$$

TABLE 7. COMPUTATION OF PEARSON PRODUCT-MOMENT CORRELATION COEFFICIENT FOR 40+ AGE GROUP ON NLN (X) SCORES AND COURSE GRADES (Y)

Pupil	X	Y	x	y	x^2	y^2	xy
1	75	66	0	-11	0	121	- 0
2	53	74	-22	- 3	484	9	+ 66
3	58	71	-17	- 6	289	36	+ 102
4	57	86	-18	+ 9	324	81	- 162
5	77	78	+ 2	+ 1	4	1	+ 2
6	77	74	+ 2	- 3	4	9	- 6
7	71	75	- 4	- 2	16	4	+ 8
8	110	93	+35	+16	1225	256	+ 560
9	60	71	-15	- 6	225	36	+ 90
10	103	95	+28	+18	784	324	+ 504
11	94	86	+19	+ 9	361	81	+ 171
12	72	81	- 3	+ 4	9	16	- 12
13	88	78	+13	+ 1	169	1	+ 13
14	96	79	+21	+ 2	441	4	+ 42
15	76	80	+ 1	+ 3	1	9	+ 3
16	79	79	+ 4	+ 2	16	4	+ 8
17	70	77	- 5	0	25	0	0
18	68	79	- 7	+ 2	49	4	- 14
19	77	75	+ 2	- 2	4	4	- 4
20	71	71	- 4	- 6	16	36	+ 24
21	67	83	- 8	+ 6	64	36	- 48
22	68	54	- 7	-23	49	529	+ 161
23	53	66	-22	-11	484	121	+ 242
24	93	86	+18	+ 9	324	81	+ 162
25	81	87	+ 6	+10	36	100	+ 60
26	49	72	-26	- 5	676	25	+ 130
27	102	83	+27	+ 6	729	36	+ 162
28	72	71	- 3	- 6	9	36	+ 18
29	100	67	+25	-10	625	100	+ 250
30	65	83	-10	+ 6	100	36	- 60
31	89	82	+14	+ 5	196	25	+ 70
32	62	84	-13	+ 7	169	49	- 91
33	67	80	- 8	+ 3	64	9	- 24
34	77	82	+ 2	+ 5	4	25	+ 10
35	69	63	- 6	-14	36	196	+ 84
36	70	86	- 5	+ 9	25	81	- 95
37	43	62	-32	-15	1024	225	+ 480
38	58	74	-17	- 3	289	9	+ 51
39	97	93	+23	+16	529	256	+ 368
40	62	70	-13	- 7	169	49	- 91
Sum	2986	3096			10047	3060	3254
Mean	74.65 (75)	77.4 (77)					

$$\sigma_x = \sqrt{\frac{10047}{40}} = \sqrt{251.17} = 15.84 \qquad \sigma_y = \sqrt{\frac{3060}{40}} = \sqrt{76.5} = 8.74$$

$$r_{xy} = \frac{3254}{(40)(15.84)(8.74)} = \frac{3254}{5523.68} = 0.58$$

XIII.

INDIVIDUAL SUMMARIES OF PARTICIPANTS

SUMMARY STATEMENT

by Elsie Haywood

A person who desires to learn something special would go to the logical place to accomplish this goal--a school--perhaps only to be turned away because he does not possess the necessary academic skills, the kind which are learned in a school. The question would arise, "Where does one go to learn enough to enter this school?" If a school only admits those who have already learned instead of those who need to learn, this point to incongruity between the purposes of education and the actual practice.

Many of the short program in the trades and professions do have standards to meet and must require prerequisite abilities. Many of these requirements are not because of policies of the school but those required by agencies extrinsic of the school. To meet the requirements for licensure or certificates or evaluations from these agencies, the student must be able to read with comprehension, perform skills, and take tests. A high failure rate among students places the school in jeopardy with the agencies for accreditation and, of course, for continued funding. Therefore, although it violates community college philosophy, a screening must be devised for admission to the program, but not to the college.

The administration of tests--aptitude, achievement, personality--is the traditional method used to measure these

criteria. This would be an excellent and objective means if these tests measured what was intended. However, recent studies suggest that the use of normative testing may be a discriminatory practice for the adult learner. The norms for tests available for measuring aptitude and achievement in use are based on scores from younger students. There is still a need for "age fair" tests for mature students.

Selection practices have become an obstacle for the adult learner in accomplishing his desired goals. Testing for admission to a program in a "sorting out" practice which seems discriminatory to the older student. Since the change in the academic population has placed the older age group in the majority, it seems that this group should have their educational needs considered and met.

This study of the mature student in the Associate Degree of Nursing program in Alvin Junior College shows that the older group scored lower on admission tests than the other groups, however, they seemed to achieve as well as the other groups considering their lack of skills. Also, the correlation studies indicated that their progress was consistent in that their course grades and achievement scores were more closely correlated than those of the other age groups. This evidence does suggest that the admission testing is not fair to this group. This evidence is not conclusive due to limitations of the study; however, it does indicate the need for further comparitive studies for the different age groups.

SUMMARY STATEMENT

by Elise Hoffman

Admission to most nursing programs requires that certain criteria be met. While most community colleges adhere to the open-door policy, nursing programs within these colleges usually require that certain scores be achieved on one or more standardized tests in order for the applicant to be admitted to the program. This presents an impediment to some of the older applicants who have been "out of training" for many years.

The nursing programs do have to meet standards set by their state boards of nurse examiners and by the hospitals that employ their graduates. This is necessary in order to receive accreditation for the nursing program, for remaining open, for funding, and for graduates to be allowed to write the licensure examination and to practice nursing. Also, the student must be able to put theory into practice if she is to become a safe, skilled, nurse practitioner. A problem arises when one is quite adept at test-taking but inept in the hospital setting. The opposite type of problem occurs when one is quite good in the hospital but cannot pass written examinations. Inasmuch as all states require that one must take and pass a written standardized examination before being allowed to practice professional nursing, nursing programs must try to meet the needs of both types of individuals.

Some individuals never get the chance to demonstrate their ability in the hospital setting because they cannot pass the required examinations used for admission criteria.

This study was undertaken in order to determine if standardized test scores used for entrance requirements to the Associate Degree Nursing program at Alvin Junior College, Alvin, Texas, were discriminatory toward the older applicant over forty-years of age who had been "out of training" for many years.

The hypotheses were that the older applicant would not do as well on these entrance examinations as the younger applicant but with practice in test-taking would improve as the course progressed. It was also hypothesized that these older, mature women could perform better in the hospital setting. Results did not refute these hypotheses.

This would tend to make test-taking for admission to the nursing program a discriminatory practice for the older applicant. However, further studies are necessary before the results can be considered conclusive.

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XV.

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XVI.

APPENDICES

APPENDIX A

ACT SCORES

AGES 40 or over

$$S_x = \frac{1}{n}\sqrt{n\Sigma x^2 - (\Sigma x)^2}$$

$$= \frac{1}{25}\sqrt{25(4279) - (303)^2}$$

$$= \frac{1}{25}\sqrt{106975 - 91809}$$

$$= \frac{1}{25}\sqrt{15166}$$

$$= \left(\frac{1}{25}\right)(124)$$

$$S_x = 4.96$$

AGES 20-29

$$\frac{1}{26}\sqrt{26(8381) - (439)^2}$$

$$= \frac{1}{26}\sqrt{217906 - 192721}$$

$$= \frac{1}{26}\sqrt{25185}$$

$$= \left(\frac{1}{26}\right)(158.7)$$

$$S_x = 6.10$$

$H_o: \bar{X}_{20} = \bar{X}_{40}$

$H_a: \bar{X}_{20} > \bar{X}_{40}$

$\alpha = .05$

df $= 25 + 26 - 2 = 49$

t crit = 1.678 for a 1-tailed test

Reject H_o and accept H_a if $t > 1.678$

$$t = \frac{\bar{X}_{20} - \bar{X}_{40}}{\sqrt{\frac{S_{x_{20}}^2}{n_{20}} + \frac{S_{x_{40}}^2}{n_{40}}}}$$

$$t = \frac{16.88 - 12.1}{\sqrt{\frac{(6.1)^2}{26} + \frac{(4.96)^2}{25}}}$$

$$= \frac{4.78}{\sqrt{\frac{37.21}{26} + \frac{24.60}{25}}}$$

$$= \frac{4.78}{\sqrt{1.43 + .98}}$$

$$= \frac{4.78}{\sqrt{2.41}}$$

$$= \frac{4.78}{1.55} \qquad t_{cal} = 3.08$$

Accept $H_a: \bar{X}_{20} > \bar{X}_{40}$

APPENDIX A (CON'T)

40-OR-OVER AGE GROUP		ACT 30-39 AGE GROUP		20-29 AGE GROUP	
x	x^2	w	w^2	y	y^2
10	100	17	289	12	144
01	01	17	289	14	196
11	121	9	81	13	169
13	169	13	169	9	81
11	121	10	100	10	100
23	529	10	100	27	729
17	289	9	81	24	576
7	49	23	529	25	625
18	324	13	169	16	256
11	121	9	81	29	841
10	100	20	400	19	361
13	169	18	324	18	324
10	100	17	289	12	144
8	64	9	81	21	441
11	121	10	100	16	256
12	144	18	324	7	49
9	81	7	49	26	676
24	576	18	324	13	169
10	100	6	36	24	576
15	225	15	225	16	256
9	81	10	100	19	361
10	100			20	400
19	361			17	289
13	169			7	49
8	64			13	169
				12	144
$\Sigma x = 303$	$\Sigma x^2 = 4279$	$\Sigma w = 278$	$\Sigma w^2 = 4140$	$\Sigma y = 439$	$\Sigma y^2 = 8381$
$n = 25$		$n = 21$		$n = 26$	
$\bar{x} = 12.1$		$\bar{x} = 13.2$		$\bar{x} = 16.88$	
$Sx = 4.96$		$Sx = 4.5$		$Sx = 6.10$	

MEDICAL-SURGICAL NURSING EVALUATION FORM

AREA TO BE EVALUATED	DATE	DATE	DATE	DATE
I. Ability to select nursing action on basis of patient needs.				
II. Skill in providing nursing care completely and safely.				
III. Ability to communicate verbally and non-verbally				

AREA TO BE EVALUATED	DATE	DATE	DATE	DATE
IV. Ability to employ interpersonal techniques				
V. Understanding techniques of evaluating nursing care.				
VI. Ability to function and accept responsibility as health team member.				
VII. Ability to function in the preventative, therapeutic and rehabilitative realsm of nursing.				
ABSENCES				

INSTRUCTORS ADDITIONAL REMARKS	DATE	DATE	DATE	DATE
	STUDENT'S SIGNATURE AND COMMENTS	STUDENT'S SIGNATURE AND COMMENTS	STUDENT'S SIGNATURE AND COMMENTS	STUDENT'S SIGNATURE AND COMMENTS