THE INFLUENCE OF PROFESSIONAL ROLE IDENTIFICATION UPON THE DEVELOPMENT OF INTEREST IN HORIZONTAL CAREER MOBILITY BY NURSING STUDENTS

Thesis for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY
RICHARD E. DARNELL

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This is to certify that the

thesis entitled

THE INFLUENCE OF PROFESSIONAL ROLE IDENTIFICATION UPON THE DEVELOPMENT OF INTEREST IN HORIZONTAL CAREER MOBILITY BY NURSING STUDENTS

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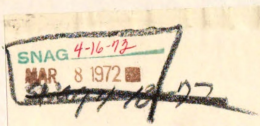
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ABSTRACT

The Influence of Professional Role Identification Upon the Development of Interest in Horizontal Career Mobility by Nursing Students

by Richard E. Darnell

In response to the present health care crisis and the subsequent development of many new service roles in intermediary positions between established health care professions, contributors to the health manpower literature have proposed the establishment of opportunities for career mobility within a given health care profession and between established health care professions.

It has been postulated that major factors influencing the development of interest by students in professions offering the possibility of career mobility toward a more highly trained profession are: (1) the professional identity associated with that new health role, and (2) the level of training of these potential practitioners. The development of the nurse physician associate, a new health care role in an intermediary position between the lesser trained profession of nursing and the more highly trained profession of medicine, presented an opportunity to study the dynamics of the development of interest by nursing students in mobility between these two major health care professions.

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This study attempted to evaluate six hypotheses. The first two hypotheses related to the effect of professional role identification upon interest development:

(1) Students training for health careers in a less highly trained profession will demonstrate a significantly greater development of interest in a new health care role after identification of that role with the less highly trained profession than will students after identification of that role with an amalgamation of the less and the more highly trained profession.

(2) Students training for health careers in a less highly trained profession will demonstrate a significantly greater development of interest in a new health care role after identification of that role with an amalgamation of the less and more highly trained profession than will students after identification of that role with the more highly trained profession.

The next three hypotheses related to the effect of professional training on interest development:

(3) Students with a high level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with an intermediate level of training in the less highly trained profession.

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significantly greater interest in a new health care role than will students with a low level of training in the less highly trained profession.

(5) Students with a low level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with a minimal level of training in the less highly trained profession.

The last hypothesis pertained to the relationship between role identification and level of training:

(6) There will be no interaction between role identification and level of training.

Three different occupational information booklets portraying the role of the nurse physician associate as: (1) an expansion of nursing, (2) an extension of medicine, or (3) an amalgamation of nursing and medicine were developed by a nursing advisory committee and a medical advisory committee, each meeting independently with the researcher. Each committee consisted of three trained practitioners in that profession. These booklets were randomly distributed during regular class periods to one hundred and ninety three nursing students enrolled as sophomores, juniors and seniors at the Michigan State University School of Nursing. Eighty seven freshmen having no class contact with the School of Nursing were randomly exposed to occupational information booklets as part of research activities sponsored by the Nursing School. Subsequent contacts with freshmen were accomplished by having the freshmen serve as paid volunteers.

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Each occupational information booklet provided a measure of: (1) preknowledge of the role of the nurse physician associate, (2) interest by the student in obtaining further information, and (3) the student's impression of interest in information seeking by her peers. It also provided an information resource sheet which identified opportunities for further information seeking by mailing a post card, speaking with a resource person or utilizing library resource materials. During a second contact occurring approximately ten days later, students were provided with additional information on the role of the nurse physician associate. During a third contact one week later, selective retention of information provided during the previous week was tested and interest by the student in a career as a nurse physician associate and the student's impression regarding the attractiveness of such a career to her peers were both assessed. Following the experimental phase, interviews were carried out with a sample of nursing students who participated in the study.

No significant difference was found in interest development in the role of the nurse physician associate as a result of differential exposure to occupational information booklets. Hypotheses (1) and (2) failed to be substantiated.

There were no significant differences in interest development between seniors and juniors. Hypothesis (3) failed to be substantiated.

Sophomores demonstrated significantly greater information seeking than did juniors. This finding was attributed to

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situational factors and was in a direction opposite to that hypothesized. Hypothesis (4) thus failed to be substantiated.

It was found that sophomores demonstrated significantly higher informational recall and stated interest in the role of the nurse physician associate as a potential career opportunity for both herself and her peers than did freshmen. Although Hypothesis (5) received statistical support, differences in sampling procedures between freshmen and sophomores, and significant freshmen mortality between contact one and contact three impaired the meaningfulness of these findings.

There was no significant interaction found between differential exposure to occupational information booklets and level of training. Hypothesis (6) was substantiated.

No differences in interest development were found between seniors who were registered nurses and seniors who were not.

Post experimental interviews revealed that interest development in the role of the nurse physician associate may more effectively occur as a function of identification of that role with a distinct new professional identity.

It was concluded that there was no evidence that students training for health careers in a less highly trained profession demonstrate significantly different development of interest in a new health care role after identification of that role with that less highly trained profession, a more highly trained profession or an amalgamation of less and more highly trained professions.

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Furthermore, level of training in a less highly trained profession does not appear to have a meaningful relationship with the development of interest in a new associated health care role.

The implications of these findings for the development of mobility between nursing and medicine, for current vocational development theory and counseling practice, and for further research were discussed.

THE INFLUENCE OF PROFESSIONAL ROLE IDENTIFICATION UPON THE DEVELOPMENT OF INTEREST IN HORIZONTAL CAREER MOBILITY BY NURSING STUDENTS

by

Richard E. Darnell

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Counseling
Personnel Services and Educational Psychology

1971

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VITA PAGE

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DEDICATION

To my wife, Nancy...

I am among all men most richly blessed

To the members of the Office of Medical Education Research and Development, College of Human Medicine, Michigan State University...

they have shown a better way.

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Chapter I

Introduction

Vocational counseling theory has expanded dramatically in the past few years in response to pressing societal needs and in recognition of the necessity to encourage diverse frameworks for understanding vocational behavior.

One such framework has taken its origin from proposed solutions to the current crisis in health care delivery in this country. It postulates career mobility occurring in two dimensions: 1) the "career ladder" or vertical dimension and 2) the "career lattice" or horizontal dimension (Perry, 1969). The concept of career ladder implies a career pattern which would make it possible for qualified individuals in health care delivery to move with relative ease from the level of aide, to the assistant, to the fully qualified professional practitioner, to more responsible professional roles in a given health profession. The theoretical implications of such movement between these levels in an upward direction have been dealt with extensively in the career development literature (Holland, 1962; Roe, 1957).

The concept of the "career lattice" or horizontal dimension of career mobility implies a career pattern which would provide a possibility for the lateral transfer between health professions. With recognition of educational and experiential

components common to several health fields, entry to a new health career would be readily achievable by such lateral movement. Current theoretical conceptualizations do not adequately provide a framework for understanding the vocational dynamics involved in horizontal mobility in health care professions.

The profession of nursing presents a significant opportunity to study the dynamics of horizontal career mobility. Until recently, career development in nursing has traditionally followed the vertical mobility pattern of other professions. Those nurses who have not chosen direct patient care as a career focus and have made contributions to teaching, administration, research and professional organizational functions have enjoyed the rewards associated with intraprofessional vertical mobility. Another form of vertical mobility has been demonstrated by those who have left nursing for higher status professional careers, beginning their preparation for those careers without being able to benefit formally from their previous educational experience in nursing.

The development of the new professional role of nurse physician associate represents a major horizontal extension of the profession of nursing. Through this new role, the nurse can benefit directly from her formal educational preparation and experience in nursing as she assumes greater responsibility and authority in the management of acute and chronic health care problems in areas which were formerly the exclusive province of medicine. The role of the nurse

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physician associate thus provides an outstanding opportunity to ascertain critical dimensions associated with horizontal mobility.

The mobility model developed by Perry for health care professions differs from the mobility model which has been developed by occupational sociologists. The concepts of vertical and horizontal mobility first appeared in the occupational sociology literature less than twenty-five years ago (Sorokin, 1947). Vertical mobility was used by Sorokin to indicate a change in rank and horizontal mobility was defined as a change in function. Seven years later, a spatial model to describe the relationship between vertical and horizontal mobility was developed (Caplow, 1954). "The position of an individual in any social system may be described by his rank in a hierarchical scheme of relationships, his functions as a participant in group life and his location in time and space...visualized as a three dimensional graph of which one horizontal axis represents function, the intersecting horizontal axis represents distance, and the vertical axis is a status scale" (Caplow, 1954, p. 59). In this mode, horizontal mobility is defined as a change of function, including both the technical and social functions which arise from group membership.

It is thus possible to perceive a membership in a new professional role such as the nurse physician associate as being any point in that three dimensional space.

If one can estimate the position of the professional nurse in the three dimensional space, it is then possible

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to draw a mobility vector between the two points which indicates both the direction and the magnitude of the mobility existing between the role of the nurse and the nurse physician associate. It is evident from this model that rarely if ever can career mobility be considered exclusively vertical or exclusively horizontal in nature. The health care mobility model thus differs from the sociological mobility model in one significant way: while the health care model permits movement to be either horizontal or vertical, the sociological model permits any interactional combination of horizontal and vertical mobility. For the purposes of this study, the role of the nurse physician associate is assumed to best be described by the health care mobility model.

The Problem

A major factor influencing the development of interest in a career opportunity is the manner of identification with that role by potential practitioners. The purpose of this study has been to ascertain the influence of role identification on the development of interest in horizontal mobility during professional training. In doing so, it attempts to address the following questions: 1) do students being trained as practitioners in a less highly trained profession develop a greater degree of interest in a new health care role after identifying that role with that less highly trained profession, or after identification of that role with a higher trained profession, and 2) does interest in

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horizontal mobility increase with the extent of training in the less highly trained profession?

The Need for the Study

This study will have several important uses. It will provide meaningful information regarding the significance of professional role development in horizontal mobility. As such, it may provide a heuristic for further theoretical conceptualizations specifically related to horizontal career mobility.

As health care education moves toward the provision of an initial common core of experiences for students in all health care professions with a planned delay in the ultimate selection of specialty area, further understanding of horizontal mobility becomes essential. The time is fast approaching. The rise of schools of allied medical professions as well as recent philosophical statements in the rehabilitation literature attest to the ultimate development of such a curriculum. More immediately, the results of this study will provide a basis for evaluating the effectiveness of various occupational information approaches in the creation of interest in horizontal mobility in nursing as a response to the current health care crisis. There is a high probability of the utilization of this data by both educators and governmental officials who see a potential reduction of the shortage of physicians by the redefinition and utilization of new professional roles of nurses and other developing health manpower categories.

In health care education, basic decisions regarding student selection, administrative control, curriculum content, faculty selection, the nature, extent and location of training facilities as well as governmental funding opportunities are often mediated by professional role identity. The results of this study may provide a more rational basis for decision making in these areas.

Hypotheses to be Investigated

There were five directional hypotheses and one non-directional hypothesis which were investigated. For the purposes of clarity, the hypotheses have been stated in the form of research hypotheses in this section.

The first two hypotheses relate to the effect of role identification upon interest development:

Ha:1 Students training for health careers in a less highly trained profession will demonstrate a significantly greater development of interest in a new health care role after identification of that role with the less highly trained profession than will students after identification of that role with an amalgamation of the less and the more highly trained profession.

Ha:2 Students training for health careers in a less highly trained profession will demonstrate a significantly greater development of interest in a new health care role after identification of that role with an amalgamation of the less and more highly trained profession than will students after identification of that role with the more highly trained profession.

The next three hypotheses relate to the effect of professional training on interest development:

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develop significantly greater interest in a new health care role than will students with an intermediate level of training in the less highly trained profession.

Ha:4 Students with an intermediate level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with a low level of training in the less highly trained profession.

Ha:5 Students with a low level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with a minimal level of training in the less highly trained profession.

The last hypothesis pertains to the relationship between role identification and level of training:

Ho:6 There will be no interaction between role identification and level of training.

Note that in this case, the null hypothesis is stated to indicate the direction of research findings which the researcher anticipates.

Definition of Terms

(1) Students -- persons enrolled in an accredited program leading to a degree or certificate in a recognized field of knowledge.

(2) Health career -- professional activity in which the tasks constitute offering direct or indirect services of a similar nature in differing situations to persons with recognized health care needs.

(3) New health care role -- the role of the nurse physician associate.

(4) Less highly trained profession -- the profession of nursing.

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(6) Level of training:

(a) High level of training -- senior class standing.

(b) Intermediate level of training -- junior class standing.

(c) Low level of training -- sophomore class standing.

(d) Minimal level of training -- freshman class standing.

(7) Identification -- establishment of a new health care role as being an integral and exclusive part of one or more professions.

(8) Interest -- student scores on measures of stated interest, manifest interest and tested interest.

Organization of the Report of the Study

The general format of this study is presented as follows: In Chapter II, pertinent literature is reviewed. Chapter III contains the independent and dependent variables, experimental design, description of the methods used in collecting the data, and statistical methods used for analysis. The findings of the study are reported in Chapter IV, along with tables to assist in clarification of the data. Chapter V contains a summary, discussion of findings, conclusions and implications. An Appendix provides material pertinent to the implementation of the experimental design.

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CHAPTER II

Review of Literature

This review of literature is undertaken not only to provide credibility and support for the hypotheses under test, but also to address the specific interests of three potential categories of readers:

I. Those primarily interested in the development of horizontal mobility in nursing through the role of the nurse physician associate.

II. Those primarily interested in changes in the characteristics of professional role identification by nursing students as a function of professional training.

III. Those primarily interested in horizontal career mobility as it relates to vocational development theory and practice.

It is hoped that this approach will both reflect the interdisciplinary concerns of the researcher and assist in making the results of this study as meaningful as possible to the widest professional audience.

The Beginning of the Development of Horizontal Mobility in Nursing through the Role of the Nurse Physician Associate

The emergence of the role of the nurse physician associate results from a complex interaction of a large number of significant variables. These can be subdivided

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into three major categories:

(1) Those factors whose major effects appear to indicate the development of the nurse physician associate as a function of the expansion of nursing.

(2) Those factors whose major effects appear to indicate the development of the nurse physician associate as a function of an extension of medicine.

(3) Those factors which appear to indicate the development of the nurse physician associate as an amalgamation of nursing and medicine.

The Nurse Physician Associate as an Extension of Nursing

Philosophical factors. Underlying the development of the nurse physician associate is: (1) the basic value that those affected with chronic illness should receive the most adequate care possible, and (2) the belief that existing professional potentialities can be cultivated. "Because the dominant trend in our civilization has been to control the environment, little has been learned of the extent to which it is possible to modify the human machine and the human mind" (Dubos, 1962, p. 116). The expansion of nurses' potentialities in horizontal mobility springs from this proposition.

Changes in methods of delivery of health care. A major focus of the role of the nurse physician associate has been in the provision of home health care. Organized home care programs have been in operation for approximately 25 years. During the latter part of that time, they have

been widely accepted by professional leaders in health services as desirable and necessary forms of care for a certain segment of the patient population (Roberts, 1960). The American Medical Association has accepted and endorsed the validity and usefulness of organized home care programs in response to developments in our society, brought about both by medical advances and social and economic factors. Some of these developments are:

First, the nature of our population has changed. People are living longer and with the conquest of many acute diseases, those living longer are developing long-term chronic illnesses.

Second, there has been a dramatic growth of community health resources, such as visiting nurses and other health agencies.

Third, many paramedical professions have expanded their skills and ability to contribute to patient care.

Fourth, the standard of living has increased with an accompanying increase in expectations regarding home care.

Fifth, hospital costs have increased precipitously.

Sixth, the home can provide irreplaceable factors of warmth and care for the chronically ill which the modern hospital often lacks.

Seventh, a general shortage of hospital beds indicates a priority for their use in the care of the acutely ill, with home care being the approach of choice for the chronically ill.

"All these changes in our society and in patterns of illness dictate a reexamination of established methods of delivering medical care..." (Cherkasky, et. al., 1960, p. 8).

This reexamination has presented a key question for the practicing physician: "How will an individual physician respond in relation to a proposed program which will treat some of his patients?" Research evidence has not been sanguine in relation to this matter. Although only 40% of practicing physicians in Wisconsin indicated that they would use an assistant in their practice, over 61% believed that they were needed and there were widely differing ideas concerning appropriate responsibilities for physician assistants (Coye and Hanson, 1969).

> "By and large, there would appear to be little physician concern and resistance to organized home care applied to patients who are receiving care at public expense. However, when we go beyond that...and also say that it should be available to those patients who need this pattern of service...we should face the fact that this is generally not acceptable today to the great bulk of practicing physicians in this country.... We must not feel that this represents backwardness on the part of physician attitude.... It represents a departure from his traditional pattern of relationships and, being new and unknown, tends to create fear of what it might do to him and to his relationship to the patient.... We should recognize that we do not have all the answers.... We must regard this as a continuing experimental area" (Roberts, 1960, p. 6).

Physicians in private practice presently find it financially unrewarding and extremely inefficient to make house calls, especially for chronic illness. A more efficient mode of operation is established by grouping patients in office or hospital so that larger numbers of patients can

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be seen with less travel. The cost of many of the present services provided at home are completely or partially covered by private, pre-paid health insurance which has in turn created even a greater demand for higher quality of services and a greater number of services provided at home. For example, in the six-year period between 1955-1960, the number of referrals to public health nurses for home care which were covered by the Hospital Insurance Plan of Greater New York dropped from 7.7 to 2.9 per thousand enrollees. However, the number of services per case increased from 6.5 to 12.6 per thousand enrollees (Shapiro, 1964). The same trend toward more comprehensive home care was found in a major study of 26 large U.S. cities from 1951-1960 in which there was a decrease in the number of cases by 10% while the average number of visits per case did not decrease (Stewart and Vahey, 1964). The trend toward greater utilization of supportive personnel by physicians continues to increase. While physicians in private practice increased 12% between 1955 and 1965, "physician directed" services rose by 81% (Report of the National Advisory Commission on Health Manpower, 1967). If the nurse is being asked to do more for fewer patients at home, the greater utilization of nursing personnel as nurse physician associates appear then to be a logical development of nursing in keeping with current trends of patient care management.

Factors based on previous research and demonstration projects. There is a large body of evidence from research and demonstration projects which has accumulated in the past few

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years regarding the expansion of nurses roles into areas which have been traditionally thought of as being the unique province of medicine. At New York Hospital, the nurse has been recently utilized in triage or sorting which consists of: (1) determining the nature and urgency of the patient's problem, (2) deciding how soon the patient should be seen by a doctor, and (3) assigning him to the appropriate clinic. A study of the final disposition of patients undertaken before and after introduction of the nurse's new role showed no significant change in assignments to various clinics (Ley, 1966). Nurses are teaching birth control, do multiphasic geriatric screening and have expanded their roles in child health supervision in the Oak-Chip Experiment undertaken by the Alemeda County Health Department in California (Johnson, 1965). Their effectiveness in an expanded role has also been demonstrated in an experimental program for the orthopedically disabled in New York City (Vayda, 1965). Nurses have demonstrated their usefulness in preplacement employment physical examinations. In one recent Canadian study of 12,733 cases, available physicians were involved in only 696 cases (Bews and Baillie, 1969). The utilization of nurse clinics for chronically ill patients whose disease processes are stabilized, in conjunction with a medical clinic when necessary, has provided an efficient approach to patient management (Lewis and Resnik, 1967). The widespread use of the school nurse is often viewed as an expansion of the nurses' traditional responsibilities. Industrial nursing has also relied heavily upon the professional judgment of the nurse. Recent reports have

indicated expansion of the nurse's role in the treatment of adult diabetes (Guthrie, et. al., 1964), patients with rheumatic arthritis (Gavin, et. al., 1964) and psychosomatic disorders (Lewis and Thurston, 1965). The rise of clinical nurse specialists--nurses who are specially trained to provide care for specialized groups of patients with specific diagnoses--will undoubtedly affect the relationship between the traditional roles of the physician and nurse (Johnson, 1967).

Some European countries have advanced further with innovative uses of nurses as physicians' associates. In Sweden, three highly trained experienced nurses are assigned to each doctor. The Swedish nurse has the power to admit patients to hospitals in some districts. The Swedish nurse is viewed as a colleague practitioner responsible to the physician and has the right to diagnose and treat (Richards, 1966).

A major focus of the expansion of the nurse's role in this country has occurred in the field of pediatrics. It has been found that one-half of pediatrician's time was taken up with well-baby supervision, with an additional one-fifth taken up by upper respiratory infections (Bergman, et. al., 1966). For several years, a team consisting of physicians from the Montefiore Hospital Medical Group of Hospital Insurance Plan of Greater New York and public health nurses have made joint visits to patients' homes to provide home visitation in pediatrics and obstetrical care. At the end of the first year of the program, the physicians requested a reduction in

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their visits and an increase in the nurses' visits (Ford, 1966; Seacat and Schlacter, 1968). A nurse well-baby program has also been in effect at Massachusetts General Hospital since 1963 (Connelly, 1965). In a similar program, the University of California at Berkeley and the Berkeley Health Department have successfully redefined the role of the nurse in the child health conference and in the provision of regular care. The child is seen by the nurse and the physician at the first visit and thereafter, in the absence of specific problems, by the nurse regularly and the physician at widely spaced intervals (Siegel, et. al., 1963, 1965). Here in the Lansing area, the Christo Rey Children's Clinic is also establishing vital new roles and responsibilities for the public health nurse personnel (Lindstrom, 1970). The "House Calls for Physicians" project in Lansing is another local example of the extension of the traditional role of the nurse. An important experimental study has recently demonstrated the effectiveness of using a nurse rather than a physician as a family health care management specialist (Fink, et. al., 1969).

A training program has been developed to prepare pediatric nurse practitioners at the University of Colorado School of Medicine which has resulted in a realignment of functions traditionally performed by physicians and nurses (Silver, et. al., 1967). The following description of their training indicates the broad sweep of the responsibilities which may be assumed by a competent nurse practitioner.

> "Initially, nurses receive approximately four months of intensive theory and practice in pediatrics at the Medical Center of the University in Denver where they

have assignments on various wards, clinics, and nurseries. They learn improved interviewing techniques appropriate for their expanded roles and responsibilities so that their assessment can be more perceptive and pertinent, and they become proficient in performing a complete physical examination including the basic skills of inspection, palpation, percussion, and ausculta-tion, as well as the use of such tools as the stethoscope and otoscope, in order to increase their ability to gather data on which to base decisions. In seminars conducted by the medical and nursing faculty and others, the nurses learn about various aspects of parent-child relation-ships, variations of growth patterns, physical and psychosocial development, the essentials of infant nutrition (including breast feading, the preparation and modification of formulas, intro-duction of solid foods, vitamin and other nutri-tional requirements, etc.) and immunization procedures and schedules (including modification of schedules in individualized circumstances). They review the dynamics of physical, psycho-social, and cultural forces affecting health, discuss salient features of personality develop-ment with a child psychiatrist, and develop pro-ficiency in counseling parents in child-rearing practices.

'The nurses participate in the evaluation and management of healthy children and those with a variety of acute and chronic disorders including upper-respiratory tract infections, otitis media, various skin eruptions, diarrhea, constipation, allergic manifestations, and the common contagious diseases. They evaluate hearing defects, speech difficulties, visual impairments, and various congenital and acquired orthopedic deformities, and they learn the essentials of good dental care and methods of identifying dental problems. They learn to do urinalyses, hemoglobin determinations, and to obtain various laboratory specimens. They also assist in the management of a number of emergency situations, including poisonings, acci-dents, hemorrhage, apnea, etc. So that a decision can be made regarding the illnesses which can be managed by the nurse and those that will require counsel from or referral to a physician, competence is developed in assessing the over-all status of the ill child in order to determine the acuteness and severity of disease.

'After the four-month training period at the medical center, the pediatric nurse practitioners function in the offices of pediatricians in private practice

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'Some pediatric nurse practitioners make home visits to the homes of newborn infants, a practice which physicians were formerly unable to carry out for this group of patients. Mothers of these infants recognize the increased personal attention and interest that they receive and appreciate being able to discuss with the nurse any problems that arise during the first days at home. Home visits by the nurses are also made to assess the progress of the child who has been ill, to assist mothers in carrying out instructions for the care and treatment of sick children, and to evaluate the environment of the allergic child. Home visits provide a continuity of health services which allows for better total care" (Silver, et. al., 1968, pp. 88-89).

From this program, the following findings have evolved (Silver, et. al., 1968, 1969).

(1) Analysis of the functions performed by the nurse indicates nurses are fully capable of carrying them out successfully.

(2) Nurses practicing alone in a health care station can care for approximately 75% of the children without the immediate assistance of a physician; of the remaining 25%, consultations from a physician by telephone were the only form of help necessary for another 11%.

(3) A survey of 180 cases seen by pediatric nurse practitioners and pediatricians demonstrate that significant differences in assessment occur in only 1% of the cases.

(4) Physicians in private practice report that those who utilize nurse practitioners as associates in their practice find that they can see at least one-third more patients.

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(5) Ninety-four percent of patients in a pediatrician's office report that they favored the association of pediatrician and pediatric nurse practitioner. Fifty-seven percent stated the care they received jointly from the physician and the pediatric nurse practitioner was better than they had received by the physician alone.

Increasing educational preparation in nursing. The emergence of a new breed of nurse clinical specialist who has had advanced university training in subject matter directly related to particular diagnostic classifications of patients (Johnson, et. al., 1967) has effectively laid the foundation for further expansion of the nurse's role.

Professional leadership in nursing. In response to the utilization of nurses as physician's associates, Eileen Jacobi, Executive Director of the American Nursing Association states "nurses are prepared at a highly professional level, but one of the complaints the American Nursing Association often hears from its membership is that highly qualified nurses are often not allowed to function at the level for which they have been prepared" (Medical World News, January 23, 1970, p. 27). Mary Mullane, Assistant Executive Director of the American Nursing Association feels that nurses stand as the most likely candidates for physicians' assistants and warns of complications through too narrowly trained assistants. According to Mullane, medicine has always delegated to nursing, and the central issue today is over the "quickening" of the delegation

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process (American Medical News, December 1, 1969, p. 9). Although others feel that the use of nurses as physicians' associates will only serve to compound the nursing shortage (Cornelius, 1970), the general reaction in the nursing literature is to see the nurse physician associate as a productive expansion of nursing.

The Nurse Physician Associate as an Extension of Medicine

Medical legal factors. In any new system, it is imperative as a first prerequisite to examine the whole process of delegation itself (Pellegrino, 1964). "Delegation by a physician is the key to all the new concepts of physician assistants" (Medical World News, January 23, 1970, p. 28). Delegation consists of two basic approaches: (1) "limited delegation in which the superior must retain the authority to modify or reject ideas or decisions which do not meet with his approval," and (2) "full delegation in which the superior reserves the right to decide (for himself) the decisions he must make himself, and those to be delegated. However, once the responsibility for making a decision or developing a solution has been placed in one's subordinates, the assumption is that the superior will accept or support the action regardless of whether he personally agrees with it or not. This means that subordinates are held responsible for results, not for developing solutions designed to obtain the approval of the superior" (Solem, 1956, p. 36). Full delegation has a crucial advantage in patient care in that "a superior who reserves to himself the authority to make

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final decisions may not always expect as satisfactory results as when full responsibility for solving certain problems is delegated to one's subordinates..." and "an important contribution of the full delegation attitude of the superior is that it influences subordinates toward constructive solutions of a problem on its own merits. In doing so, it helps to avoid any tendencies toward merely giving lip service to a superior's solution, of arguing with him, or of doing as directed with reduced motivation" (Solem, 1956, pp. 38-39). It would appear, however, that the type of delegation practiced by the physician is partial. Three general principles control delegation to nurses. They are:

(1) A physician can lawfully delegate to nurses only those functions, procedures or duties which do not require the exercise of his professional judgment.

(2) The nurse must have training and experience in the function, procedure or duty to be delegated by the physician.

(3) All such functions, procedures or duties must be performed under the direction or supervision or upon the prescription of a physician (Physician's Guidelines for Delegation of Duties and Functions to Nurses, Wisconsin Medical Society, 1968).

The Wisconsin Medical Society position paper points out that:

> "the 'practice of medicine' has been described as the primary professional responsibility of the physician for the total care of his patient. Under Wisconsin law, a physician is granted an unlimited license. This is legislative recognition of his

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> comprehensive training and his corresponding professional responsibility. Nurses are not granted such a license nor are they trained for such an overall responsibility. It should not be necessary to reiterate that a nurse cannot 'practice medicine,' or that a physician cannot, except in a genuine emergency, lawfully delegate the power to practice medicine to her wittingly or unwittingly. This is true even though the nurse is willing to perform a function that requires the exercise of the professional judgment of a physician" (Physician's Guidelines for Delegation of Duties and Functions to Nurses, Wisconsin Medical Society, 1968).

To the doctor, any transfer of his traditional functions may mean that responsibility is also surrendered. Unless medical responsibility is viewed as a shared one, full delegation becomes impossible (Levy, 1966).

As presently constituted, there appears to be two major areas of nursing practice: one dependent on the physician's orders and the other not requiring the specific orders of a physician (Anderson and Lesnik, 1962). Full delegation of responsibility appears impossible under present practice laws but may be wise therapeutically. The health team will become more effective to the extent that responsibility is shared and less effective to the extent that duties are assigned. It is well known that legal constraints follow rather than lead professional standards for practice (Wrenn, 1962). To the extent that new roles of health professionals are locked into highly defined disciplines mediated by state law, their evolution will be retarded. Dwight C. Wilbur, M.D., immediate past president of the American Medical Association points out the dangers of crystalizing specific duties for a physicians' assistant for other reasons: "If the law states that such an assistant can do X, Y, and Z, then there is the danger that he will set himself up in the 'private practice' of a specific area of medicine" (American Medical News, December 1, 1969, p. 9).

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Educational factors. "The nurse often feels placed in a precarious position...when required to assume new activities for which she has had no formal or inservice preparation" (Guy, 1965). The crucial educational question surrounds the issue of whether physicians' assistants should be trained as generalists who work under the direct supervision of a physician, or as specialists who have a defined area of responsibility (American Medical News, December 1, 1969). Of the thirteen programs presently training physicians' assistants in the United States, four have curriculum based upon the generalist role and nine are oriented toward the specialist function.

The use of lay personnel as physicians' assistants. In attempting to offer supportive service to the physician, a large interprofessional controversy has been stimulated: should selected nurses be more highly trained or should a new type of worker be introduced into the health team? The successful training of assistant medical officers in underdeveloped countries (Rosinski and Spencer, 1965) has received wide publicity. One of the programs which has received great attention in this country is a two-year training program at Duke University (Andreoli and Stead, 1967, and Howard, 1969) which utilizes military corpsmen returning to civilian life. This program has yielded important research data regarding acceptance of physician assistants. Virtually no patients had a negative reaction to assistance of assistants. In addition, the degree of satisfaction shown by patients diminished with both the very rich and the very poor, and increased with patient educational level. The use of such

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personnel threatens the traditional relationship between medicine and nursing. The physician associate who comes from a background other than nursing detracts from the identity of this new role as a unique expansion of the profession of nursing.

Professional leadership in medicine. The February 12, 1970 American Medical Association Newsletter reports the AMA Board of Trustees in a major pronouncement has called for implementation of a plan to use specially trained professional nurses in the fee for service practice of medicine. Among the advantages of the plan cited by the AMA president, which anticipated that "with only modest additional training, 100,000 nurses could become associated with physicians in such a way to expand markedly the physician's ability to serve his patients" (Howard, 1970), were the following: fee for service will win a new advocate, house calls will again become a reality, fewer hospitalizations and earlier discharge of those hospitalized will take place, and vertical mobility of nurses and of other related health professionals and technicians will be promoted. The response to this statement in the State of Michigan may be expected to be dramatic. According to the American Medical Association, the Michigan State Medical Society is the only association of physicians which has endorsed the idea of physician assistants and is actively trying to help colleges offer a four-year course in medicine. In addition, the Michigan State Medical Society reports that recent surveys taken of its membership indicate many Michigan pediatricians and family doctors, especially in small towns or rural areas, would happily make use of physicians' assistants (Hall, 1970).

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The Nurse Physician Associate as an Amalgamation of Both Nursing and Medicine

The blurring of professional roles. There are two interwoven elements of medical teamwork: human components and organization. Both of these elements result from two unremitting consequences of technical advance: (1) a division of labor in which complex professional role components are reduced into less demanding components, and (2) the synthesis of the resulting components into a functioning whole--the organization (MaGraw, 1968). Implicit in the role of the physician is both the "knowing" or scholar function and the "doing" or technician function (Millis, 1967). He also is a trustee "since a crucial ingredient of his role is lacking unless he uses both his own knowledge and skill and that of others in trust for the patient, in the legal sense of that phrase" (MaGraw, 1968, p. 825). There are already various combinations of "knowing and doing" among existing health professions. In the education of the physician, the major emphasis is on "knowing" while in the education of nurses the major emphasis is on "doing" (Schlotfeldt, December, 1965). Professional status and role are significant factors for individual health practitioners; however, the crucial question for society is what combination of "knowing" and "doing" performed by persons with what kind of training and experience will produce the best results for patients?

Nursing and medicine are experiencing a change in the nature and extent of their work in relation to their past, each other and the public. A growing array of new specialized

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diagnostic and therapeutic techniques have resulted in an increasing interdependence of the nurse and physician (Shep and Bachor, 1964). These have resulted in procedures and problems of judgment in medical care today which cannot be clearly designated as being solely the province of medicine or nursing. "Although physician and nurse generally exercise different means to obtain the goals they share, their collaboration in the process of arriving at a therapeutic program and the activities in which they both engage serve to blur the distinctive features of each role" (Schlotfeldt, August, 1965, p. 773).

A crucial issue at the present time is whether these professionals must vigorously define their claims on particular techniques and procedures, or whether they can work together as true professionals to determine which of them can best assume responsibility for a particular aspect of a patient's care at a given point in time (Schlotfeldt, August, 1965). This issue affects far more than the professions of nursing and medicine. "A fuller definition of new or potential roles for all other health professionals is dependent upon whatever realignment of function is made in the central triad created by the patient, the physician and the nurse" (Pellegrino, 1964, p. 110).

Political factors. The cultural importance of human resources as a focus of national political concern is a recent phenomenon. As the nation began to experience dramatic shortages in strategic professions, each profession "laid cool and aggressive plans to capture a bigger share of the oncoming stream of talent" (Gardiner, 1961, p. 37). As it became

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apparent that our total stream was limited, government began to explore ways to better utilize available manpower. A series of legislative acts have made a large impact on experimentation in the utilization of manpower in health delivery systems. The growth of the nurse physician associate has been a direct result of innovation in health manpower utilization. Implicit in experimentation of this nature is the concept of planned change in which "outsiders, who, on their own or as representatives of change agencies, intentionally seek to introduce new ideas in order to achieve goals they have defined" (Rogers, 1970, p. 13). This approach is in keeping with the political philosophy of August Compte and contrary to the thinking of social Darwinists such as Herbert Spencer.

It is natural to expect untoward reactions from those toward which planned social change is directed. The dilution of the quality of patient care is often cited as a problem and a danger for the introduction of supportive personnel with less than professional qualifications into professional nursing roles (Stahl, 1964, Hicks, 1965, Edelson, 1966, Carnegie, 1967) through vertical mobility. In addition, the utilization of professional nursing personnel for tasks which have usually been reserved for other professions by the introduction of horizontal mobility for nurses is also seen as threatening. These factors become additive to powerful conservative political forces in medicine. In a society which is becoming increasingly polarized regarding governmental interventions, the development of the nurse physician associate assumes political dimensions.

The general public is increasingly demanding a reduction of the physician shortage whose parameters have been defined (Stewart, 1963). In addition to the expanded use of nurses and other paramedical supportive personnel, other approaches to alleviate the problem which have been suggested are (1) importing a greater number of foreign medical graduates (a recommendation which has serious international implications), (2) increasing medical school output (Gerber, 1967), (3) increasing physician effectiveness by redistribution of physician manpower both along the generalist-specialist dichotomy as well as in geographic areas, (4) utilizing the beneficial effects of automation, and (5) education of the public toward better utilization of their health system (Weil, 1969). Nevertheless, a recent survey (Hospital Physician, April, 1969) with 344 medical school faculty responding showed over 50% indicated the best solution was the broader use of paramedical personnel. This approach received the greatest support. Expansion of medical school size received 38%, building more medical schools, 35%.

Ethical considerations. Pellegrino (1964) points out that there is nothing in the ethical codes of either the nursing or medical profession which prevents full delegation. Indeed, the "ethical codes of nursing and medicine impel both professions to explore improvement of services even if this means yielding professional prerogatives...specific ethical questions related to delegation of functions will depend on the determinants in the actual situation" (Pellegrino, 1964, p. 110). "The setting in which a person is used determines

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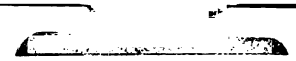
In spite of these constraints, it is certain that the trend toward nurses making more medical decisions in the absence of doctors will grow. "Will nurses gradually assume more and more of the doctor's less scientific duties? Will nurses become 'second-class doctors' in their own right? There is reason to believe that the answer to these questions will be yes because the pressures which were originally responsible for this trend, that is, rapidly increasing complexity of medical care and shortage of physicians, will undoubtedly continue" (Pratt, 1965, p. 769). On the other hand, Hershey (1965) has suggested that those activities which can be performed by nursing personnel without increasing the risk of harm to patients, even though they were formerly, customarily, or historically carried out by physicians, should be an acceptable part of nursing.

In summary, the development of the nurse physician associate is the result of interprofessional, intraprofessional and external forces. In general, however, the weight of evidence seems to favor the predominate influence of factors based in the expansion of the profession of nursing.



Changes in the Characteristics of Professional Role Identification by Nursing Students as a Function of the Level of Professional Training

The decisions that students make about career directions have their roots "in the background, the social situation, the personality and the developmental status of the individual" (Sanford, 1962, p. 193). In addition, in career opportunities for women, career-oriented goals have been found to be subordinate to the objectives of marriage and family (Bushnell, 1962). This is in keeping with recent findings that a large percentage of nursing students (75%) do not plan to seek formal educational experiences at the graduate level (Dustan, 1964).

Some indirect evidence which bears upon professional role identification in nursing can be found in the examination of withdrawal rates from collegiate nursing programs. Although withdrawal rates of nursing students do not differ significantly from women students in colleges and universities (Nikkari, 1969), approximately 40% of the total number of students who enrolled in a collegiate school of nursing do not complete the requirements of the programs in four years (Tate, 1961). Persisters in the general college population have been found to be more self-reliant and open-minded, and have a higher desire to achieve than those who withdraw (Trent and Medsker, 1968). Much of the motivation to persist in a given career direction appears to come from parents (Bloom, 1964). However, Warnecke (1966) has found that the advice of people in the medical and allied medical professions has important

consequences in influencing student nurses to persist toward their educational goals by reducing role conflict, Role perception by nursing students in diploma programs has been found to influence persistance in nursing. Persisters were found to be more realistic in their appraisal of nursing while those students which withdrew were less realistic, more concerned with immediate gratification, and had less of an interest in the welfare of others (Kilbrick, 1963). Differences have been noted in high and low ability withdrawals (Reece, 1961).

There appears to be considerable evidence that nursing students undergo developmental changes during the course of training. Nursing students have been found to be timid, to see themselves as unfeminine and to have strong guilt feelings in comparison to high school and college girls (Gynther and Geertz, 1962). Nursing students were found to be passive, non-achievement oriented, emotional, melancholy, depressed, had tense parental relationships and identified with sickness and the afflicted in comparison to student dieticians (Cleveland, 1961). The strong desire to serve others appears related to the fulfillment of personal needs by the nursing role (Furst, et. al., 1962). However, in a comparison of non-nursing students, nursing students and graduate nurses, graduates were found to be confident, emotionally stable, cheerful, optimistic, agreeable and cooperative and objective (Healy and Borg, 1951).

Such changes are in keeping with changes of women in other than nursing programs during collegiate years. Among senior women, there is a movement toward greater open-mindedness

and tolerance, a rejection of a restricted view of life, and a humanization of conscience (Korn, 1968). However, student nurses' freshman-to-senior changes have been shown to be less than changes occurring in non-nursing students. Although nursing students move toward a more liberal position as they proceed from freshmen to seniors, they still are significantly more conservative, restrictive and interested in the practical, and show a greater lack of tolerance for uncertainties than do college women in general (Nikkari, 1969). Further differences have been found between basic senior nursing students and senior registered nursing students. Basic senior nursing students have a heightened interest in ideas and reflective thought, and a slightly lowered tolerance for ambiguity and for novel ideas. This profile did not reflect strong scholarly motivations for nursing students when compared to non-nursing students (Gortner, 1968).

In summary, considerable evidence exists to support the premise that systematic changes do occur in nursing students as they proceed through colleges and universities. Such changes are discernable between freshmen and seniors, and between basic seniors and registered nursing students. An increase in receptivity and, consequently, an increased development of interest in a novel health care role can be expected as a function of increased level of training.

Implications of Health Career Horizontal Mobility for Counseling Theory and Practice

The counselor in the school. As counseling and guidance moves toward the latter half of the twentieth century, the counselor continually is aware that changes in the content and emphasis of curriculum will be increasingly necessary if education is to serve its true function in a free society. Not only must the counselor keep informed about innovations in education, but he must also be knowledgeable about their influences on students affected by them (Van Hoose and Pietrofesa, 1970, p. 6). Even those theorists who have long been identified with the developmental aspects of vocational choice are recognizing that some attention must be paid to occupational changes which set new and different limits on the choices available to different groups (Ginzberg, 1968). Lyon (1965) has emphasized that the "straight line" career is rapidly coming to an end and is being replaced with "serial" type careers in which career development occurs in phases consisting of different activities and levels as increases in maturity, experience and education occur. As such, not only does guidance become a developmental process over the life-time of the individual, it must also play a crucial role in helping increase and broaden the vocational pathways along which students move (Wolfbein, 1964). It is along these dimensions that the import of horizontal mobility in career development finds its basic meaning in counseling theory and practice.

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As service-oriented careers continue to increase, horizontal mobility in health care education becomes of crucial significance. The counselor will be called upon to exercise many of his skills in response to this development. Perry (1969) has pointed out the need for job analysis and descriptions, carefully stated behavioral objectives for educational programs and adequate counseling procedures related to assisting students in orientation to the core curriculum as well as in facilitating ultimate career choice. However, "the logic, economy and related values of the core course and core curriculum continue more as pious declarations of intent than a conviction and fact of operational curricular life" (Light, 1969, p. 119). In addition, Perry admits that the concept of horizontal and vertical mobility in health care today is mostly in the "talk" stage. However, he believes that the end result will be a comprehensive allied health educational and professional program which will provide for maximum student mobility and choice. The counselor is thus faced once again with preparing for a future which is almost upon him. An interdisciplinary educational program in the health sciences is already in operation at the University of Missouri (Taylor, 1969).

The chief benefactors of vertical and horizontal mobility will be women (Cohen, 1967). "A registered nurse, for example, can move up in her career to a supervisory position but she cannot easily move into another discipline such as physical therapy. She has to go back and start over again," (Cohen, 1967, p. 28). Cohen views many health jobs as dead end jobs.

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Rosinski indicates also that almost all health careers are terminal since once an individual selects a specific health career, he is locked into that career. The only mobility which can occur is the assignment of more responsibility in that specific career. "The present educational system is an anachronism; you cannot from one side of your mouth decry the inability to attract competent people into the health professions, and from the other side expound the virtues of a closed professional society." (Rosinski, 1967, p. 38). Allied health educators are moving rapidly to remedy this situation. In the process, new professional roles such as the nurse physician associate arise. As they do, counselors must learn to ask: "Who is sponsoring this new specialty? To what extent is the medical specialty leadership either interested in or directly involved in the development of the new specialty? It could be the innovations are sufficiently ahead of their times to permit only limited employment possibilities for their first born generation, who may wither on the vine. It could be that the first trainees have been developed to a job description which is initially unacceptable to a sufficient number of potential employers, thereby leaving the first of the new breed occupationally nowhere and requiring major overhaul of the experimental curriculum" (Light, 1969, p. 117).

The counselors' manpower responsibilities. Horizontal and vertical mobility in health care professions place the counselor in a familiar bind. Counseling as an aid to fulfilling societal manpower needs has not been an unknown

concept. The National Defense Education Act was primarily designed to fulfill such needs. Since most health care educational and operational innovations are federally supported, it is not unthinkable that health manpower needs might overshadow the counselor's responsibilities to his client. "Contemporary or even anticipated social needs such as manpower shortages cannot provide sanctions for counselors' actions since they may be highly inaccurate, may stimulate recruiting, or may generally encourage molding the counselee to fit a preconceived pattern" (Rothney, 1970). The concept of vertical and horizontal mobility reduces the danger which may result from such counselor pressure in that career choice, once made, need not be final and the student need not incur a penalty for a premature decision.

The counselor and the current social revolution.

All service professions have in the recent few years explored and begun to implement the concept of the use of aides and assistants not only to help meet these manpower needs, but also to provide meaningful employment for unskilled workers often from a culturally or socially deprived background. None of these professions has met its obligations to the trainees, obligations which include "geographic mobility, occupational mobility, competitive wage and distinctly visible membership in the health team" (Light, 1969, p. 117). The continued widespread use of aides and assistants must necessarily increase the necessity of the counselor to develop a conceptual vocational framework which includes a working knowledge of vertical and horizontal mobility.

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Integration of the Concept of Horizontal Mobility into Existing Research and Theory in Vocational Development

In addition to Caplow, several prominent vocational theorists have developed a conceptual framework which appears to have some relationship to horizontal mobility. Among the most prominent are Ann Roe, J. C. Holland, and Donald Super.

Roe's personality theory of career choice. Roe has hypothesized that early child rearing practices produce need hierarchies which influence adult behavior patterns in general and vocational selection in particular. Based upon this conception, Roe (1957) has developed a classification system consisting of two main elements: (1) occupational groups, and (2) occupational levels. Selection of an occupational group is determined by early experiences while the occupational level in terms of complexity and responsibility "is largely the product of the genetic differences between people which result in differences in intelligence and in the ways they attempt to manipulate various aspects of the environment" (Osipow, 1968, p. 21). Upon close examination, the conceptualization of Roe appears to provide too broad a framework within which to understand horizontal mobility. In the case of horizontal mobility between medicine and nursing, both professions appear in the service classification of occupational groups. Horizontal mobility between the two professions in Roe's classification scheme implies a vertical movement in occupational level, from professional and managerial level 2, to professional and managerial level 1. The specific dynamics which cause such movement remain unclarified. There appears to be no

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definitive research which indicates significant differences between physicians and nurses in relation to intelligence. Even more significantly, it is possible that Roe's theoretical formulations do not hold for service professions. Grigg (1959) failed to identify differences in childhood recollections about parental treatment between women nursing students and women mathematics students.

Holland's career typology theory of vocational behavior. Holland's approach employs the concept that career choice represents an extension of personality in which the opportunity to implement broad personal behavioral styles is sought in vocational behavior. Holland postulates six major occupational environments which offer differential patterns of relationships in keeping with personality orientations. The particular way in which these personal orientations are ordered in terms of their relative strength constitute a developmental hierarchy. There are different levels within an occupational environment. The level which a person chooses is a function of several other variables which collectively are called the level hierarchy. The level hierarchy is defined in terms of three major factors: (1) intelligence, (2) self-evaluation, and (3) self-knowledge. There is empirical data which tends to support the validity of these factors, even more so for college women than college men (Holland, 1962, Schultz and Blocher, 1961, Stockin, 1964).

In terms of providing a theoretical base for horizontal mobility, Holland's theoretical formulations are stronger than Roe's but still too broad. Holland would place both nursing

and medicine as appealing to the same personal orientation (i.e., supportive). It could be argued, however, that if the hierarchy of orientations is not well ordered beyond the first one, then the potentiality for mobility within the same personal orientation exists. Similar to that of Roe, Holland's approach implies horizontal mobility between two health professions occurs as a function of the level hierarchy. Movement from nursing to medicine would occur when a nurse is functioning at a skill level beneath her own evaluation of her abilities based upon her knowledge of her past achievements. This explanation of horizontal mobility is deficient in one major area: it fails to explain why nurses might not seek to expand their functioning by vertical mobility in nursing rather than horizontal mobility toward medicine.

Super's self-concept theory of vocational behavior. Super sees vocational choice as an implementation of a self-concept which is influenced by the stage of life development the individual finds himself in as well as social and economic determinants. Super's major contribution has been to formulate a psychology of careers in distinction to a psychology of occupations. The psychology of occupations is based on the assumption that once an individual and career are matched in accordance with the individual's pattern of interests and abilities, no further career alterations will occur. However, the psychology of careers views vocational development as basically evolutionary in nature. Based upon the work of Miller and Form (1951) and Davidson and Anderson (1937), Super formulated the concept of career patterns and defined their characteristics.

Super's formulations offer a fertile theoretical orientation within which to conceptualize horizontal mobility according to the implementation of a self-concept. Persons choosing a health career do so to implement their self-concept. This process involves the development of images of the occupational world and the comparison of these images with self-images in evolving a career. Once having made such a career choice, further expansion of their self-concept in horizontal career mobility occurs through the evaluation of such a career choice rather than choice of and adjustment to another health profession which presents an alternate route to vertical mobility.

There is some research evidence to support this conceptualization. Kibrick and Tiedeman (1961) have investigated the role of self-concept in the selection of nursing careers by comparing the vocational images of nursing supervisors and students. In testing the hypothesis that persistence in nurses training is a function of the agreement between images of nursing held by supervisors and students, the researchers were only able to demonstrate inconclusive support for their hypothesis. It was their conclusion, however, that learning through role playing of an occupational self-concept still may determine the choices which students may make in career mobility. Brophy (1959) has demonstrated that occupational satisfaction in nursing practitioners is inversely related to the discrepancy between self-concept and occupational role, ideal occupational role concept and occupational role, and self-concept and ideal occupational role concept.

In comparison to self-concept theory, Super's formulations regarding the implications of career patterns and life stages offer fewer theoretical advantages for the conceptualization of horizontal mobility. Horizontal mobility would be a concomitant of the trial period of the implementation stage (Super, 1963) or the establishment stage (Super, 1953). However, this would occur within the context of a stable career pattern which Super defines as having the qualities of early entrance and permanence.

Integration of the Concept of Horizontal Mobility in Health Care into Theoretical Concepts of Occupational Sociology

Several factors emerge: First, Wilinsky (1964) has indicated that nursing and medicine are in two different stages of the professionalization process. While medicine is seen as an established profession, nursing is classified under a professional classification entitled "others in process, some marginal." The thrust of horizontal mobility might be seen as an attempt to gain professional autonomy, a significant factor in the professionalization process of nursing. There appears to be distinct differences in the attributes of the professional model for nursing and medicine. Hall (1969, p. 83) has demonstrated that nursing feels far less autonomous than medicine, but as a profession, has extremely high belief in service to the public in comparison to medicine. There is also evidence that nurses employed in certain types of work settings have higher beliefs in self-regulation than do physicians working in similar settings.

Secondly, nursing is perceived as a "female profession while medicine is perceived as a male profession...it seems not too far fetched to say that the present demands of the neo-feminists concern a shifting of the place of what has traditionally been women's professions in the whole complex of professional services..." (Hughes, 1960, p. 66).

Thirdly, Reiss (1955) has found that "would-be professions" provide the greatest opportunity for distant upward mobility. Would-be professions "appear to provide both the greatest opportunity for increasing status and the greatest risk to existing status of all professional statuses" (Reiss, 1955, p. 693).

Fourthly, relationships among occupational groups have certain expectations from which arise: (1) accommodative relationships, (2) avoidance relationships, and (3) competitive relationships (Hall, 1969, Chapter 7). The nature and extent of horizontal mobility in the health care professions may be seen as the complex interaction of these factors.

Fifthly, horizontal mobility in a free society is particularly sensitive to the politics of the professional groups concerned. "As might be expected, professionals seem to be little different than other men in this regard: where they see their interests to be in accord with the perceived interests of the 'establishment' in a society they support the status quo; where they perceive a divergence of occupational interests from the interests of the ruling class, professionals are likely to seek ways and means to promote social and political change" (Hall, 1969, Chapter 9, p. 291).

Sixthly, nursing and medicine differ dramatically in social status and financial reward (Hall, 1969, p. 275). Such considerations can be expected to play a role in career mobility.

These sociological considerations influence the theoretical aspects of health career patterns. However, the concept of the trial period in career development is derived from an industrial sociology model of career development (Miller and Form, 1951) and is insufficient to conceptualize horizontal mobility in the health professions. A more analytic approach to the nature of medical career patterns is offered by other theoreticians.

Theoretical contributions of Thompson, Avery and Carlson. Thompson, Avery and Carlson note that most careers are a gradual expansion of skills, training and experience. According to this formulation, careers have three bases: (1) the competence of the individual, (2) the aspirational patterns of the individual, and (3) the structure of the opportunities made available to the individual (Thompson, et. al., 1962, pp. 5-6). They define four basic career strategies: (1) the heuristic strategy in which one is oriented toward advancement without regard to occupational or organizational boundaries, (2) the occupational strategy in which the person is sensitive to opportunities within his occuaption and does not consider organizational boundaries to be important, (3) the organizational strategy is concerned with opportunities within the employing institution, and (4) the stability pattern where the advantages of the present position exclude

the possibility of mobility (Thompson, et. al., 1962, pp. 12-14). Interacting with these basic career strategies are four basic career patterns:

(1) The enterprise defined--early ceiling career which involves little advance preparation and minimal skill and aptitude expectations, e.g., the factory worker.

(2) The enterprise defined--late ceiling career which is typified by the executive who has advanced formal education and who changes jobs as he looks for the best opportunities for his skills to be utilized. He reaches his potential late in his career.

(3) The colleague defined--early ceiling career in which skills can be transferred from organization to organization, but which are rather standardized in terms of potential rewards. Ceiling is reached early in the career through a strategy of stability; further advancement is sought in the form of unions or professional associations.

(4) The colleague defined--late ceiling career exemplified by the physician.

Utilizing these theoretical formulations, horizontal and vertical mobility in the health professions can be more adequately conceptualized. A nurse who chooses vertical mobility in nursing does so as a result of an occupational strategy within a colleague defined-early ceiling career. A nurse who chooses lateral mobility adopts either a heuristic or an occupational strategy in seeking a colleague defined-late ceiling career. In this theoretical conceptualization,

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a heuristic strategy would be supported by student nurses developing interest in the role of the nurse physician associate as an expansion of medicine and the concept of an occupational strategy would be supported by student nurses developing interest in the role of the nurse physician associate as an expansion of nursing. A greater level of interest displayed by nursing students with more training would also tend to support the occupational strategy.

In summary, career choice can be viewed as the implementation of a self-concept. Although there is a paucity of experimental evidence on vertical and horizontal mobility in the literature, current vocational theory is adequate to conceptualize these processes. Super's theoretical position would appear to support the development of interest in the role of the nurse physician associate by nursing students through an implementation of their self-concepts as potential nurses and therefore by identification of that new role as a nursing function. The theoretical contributions of Thompson, Avery and Carlson add further dimensions in understanding horizontal mobility.

Chapter III

Design of the Study

Research and Null Hypotheses

There were five directional hypotheses and one non-directional hypothesis which were investigated. The hypotheses have been stated in both the null and research form:

The first two hypotheses relate to the effect of identification upon interest development:

Ho:1 There will be no significant difference in the development of interest in a new health care role by students training for health careers in a less highly trained profession after identification of that role with the less highly trained profession, or with an amalgamation of the less and more highly trained profession.

Ha:1 Students training for health careers in a less highly trained profession will demonstrate a significantly greater development of interest in a new health care role after identification of that role with the less highly trained profession than will students after identification of that role with an amalgamation of the less and the more highly trained profession.

Ho:2 There will be no significant difference in the development of interest in a new health care role by students training for health careers in a less highly trained profession after identification of that role with an amalgamation of the less and more highly trained profession or with the more highly trained profession.

Ha:2 Students training for health careers in a less highly trained profession will demonstrate a significantly greater development of interest in a new health care role after identification of that role with an amalgamation of the less

and more highly trained profession than will students after identification of that role with the more highly trained profession.

The next three hypotheses relate to the effect of professional training on interest development:

Ho:3 There will be no significant difference in the development of interest in a new health care role by students with a high level of training in the less highly trained profession and students with an intermediate level of training in the less highly trained profession.

Ha:3 Students with a high level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with an intermediate level of training in the less highly trained profession.

Ho:4 There will be no significant difference in the development of interest in a new health care role by students with an intermediate level of training and students with a low level of training in the less highly trained profession.

Ha:4 Students with an intermediate level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with a low level of training in the less highly trained profession.

Ho:5 There will be no significant difference in the development of interest in a new health care role by students with a low level of training in the less highly trained profession and those with minimal level of training in the less highly trained profession.

Ha:5 Students with a low level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with a minimal level of training in the less highly trained profession.

The last hypothesis pertains to the relationship between role identification and level of training:

Ho:6 There will be no interaction between role identification and level of training.

Ha:6 There will be interaction between role identification and level of training.

Population Utilized

Nursing students were selected because of the development of the nurse physician associate as a major significant example of horizontal mobility in health care professions. Nursing students were also selected because of their accessibility and because nurses in practice would more likely be exposed to situational variables which might be confounded with treatment main effects.

The population for this study consisted of students associated with the School of Nursing, Michigan State University. The student body of the Michigan State University School of Nursing is comprised of the following: 90 sophomores, 90 juniors and 90 seniors, the seniors representing both senior nursing students with no professional work experience and seniors who are registered nurses who have returned to obtain the B.A. degree. Approximately 160 students who have expressed an interest in a nursing major upon entry at Michigan State University comprise the freshman class. These students take no formal nursing course work during the first year, and their programs are not controlled by the School of Nursing.

Independent Variables

There are two factors under test, Factor T having three levels representing treatment and Factor L having four levels and representing level of training.

Factor T.

Level 1--occupational information in booklet form representing the nurse physician associate as an expansion of the physician role. (See Appendix A.)

Level 2--occupational information in booklet form representing the nurse physician associate as an expansion of the nurses role. (See Appendix B.)

Level 3--occupational information in booklet form representing the nurse physician associate as an amalgamation of the role of nursing and medicine. (See Appendix C.)

Factor L.

Level 1--freshman who have expressed an interest in a nursing career.

Level 2--nursing students in the sophomore year.

Level 3--nursing students in the junior year.

Level 4--nursing students in the senior year.

Experimental design matrix. The design of this experiment utilized a two way factorial approach:

FIGURE I

EXPERIMENTAL DESIGN

Factor	T_1	T_2	T_3
L_1			
L_2			
L_3			
L4			

Covariable

Extent of previous exposure to the role of the nurse physician associate was ascertained prior to exposure to the experimental treatment and used as a covariable in the analysis of data. (See Face Page, Appendix A, B, and C.)

Dependent Variables

Six dependent variables were employed in the following order:

(1) Early stated interest by student--the student's response to a six level question regarding his interest in seeking further information on the role of the nurse physician associate (see Appendices, A, B, and C).

(2) Early stated interest assumed held by others--the student's response to a six level question regarding the level of his peers' interest in seeking further information on the role of the nurse physician associate (see Appendices, A, B, and C).

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(3) Manifest interest--the student's response to the opportunity to obtain extra information by making a request with a postcard (see Appendices A, B, and C), by the utilization of library material made available for that purpose (see Appendix D), and by speaking with a resource person on the role of the nurse physician associate (see Appendix E).

(4) Tested interest--the student's response to a twenty item, four-choice multiple choice test (see Appendix G) on factual knowledge given to him in the form of an information sheet (see Appendix F) during the preceding class meeting.

(5) Late stated interest by student--the student's response to a six level question regarding her interest in seeking a career opportunity as a nurse physician associate (see first page, Appendix G).

(6) Late stated interest assumed held by others--the student's response to a six level question regarding the level of his peers' interest in seeking a career opportunity as a nurse physician associate (see first page, Appendix G).

Experimental Methodology

Sophomore, junior and senior nursing students. One class was selected at random from the two available to sophomore nursing students on day one and day two of the experimental methodology (see Figure II). Each of the three experimental treatments was distributed at random to students enrolled in the class, one-third of the students receiving one form of

the occupational information booklet (see Appendix A), one-third of the students receiving a second form of the occupational information booklet (see Appendix B), and one-third of the students receiving the third form of the occupational information booklet (see Appendix C). Each occupational information booklet consisted of, in order of presentation, the covariable, the independent variable, measures of early stated interest by student, measures of early stated interest assumed held by others, and an information sheet containing details of how further information could be obtained by meeting with a resource person, utilizing library resource material or mailing a postcard which was provided in the booklet for each subject. When possible, the booklets were distributed to classes meeting at the same time in order to avoid confounding of the experimental treatment by a student receiving more than one type of informational booklet due to her presence in both class sessions. Confounding of the experimental treatment was also controlled by having the student return the occupational information booklet after exposure to it and allowing the student only to retain the informational sheet describing the availability of information seeking activities. A similar procedure was followed with junior and senior subjects with the exception that three junior and three senior classes were randomly selected because of smaller class size.

During days one through five, all sophomore, junior and senior subjects had available to them the resource person. This person was stationed in a central location in the Nursing School, this location being identified by a large 18" x 24" sign stating

"Nurse Physician Associate Resource Person." From days one through nine, reading materials were placed in the Nursing School library, these materials being also identified by an 8" x 12" sign stating "Nurse Physician Associate Resource materials here." Day ten was the last day that postcards received postmarked on that day or earlier were counted as an information seeking response.

On the first class meeting approximating day ten, an information sheet on the role of the nurse physician associate (see Appendix F) was given to each subject. The student was asked to read the sheet for content and offer his opinion as to the effectiveness of the content and organization of the material. He was asked to return the information sheet at the next class meeting.

This information sheet was utilized to equalize the level of knowledge obtained through individualized information seeking. Equalization of knowledge had two essential purposes:

(1) To alleviate misunderstandings and biases regarding the role of the nurse physician associate which may have been fostered by exposure to one of the independent variables.

(2) To build upon previous information seeking behavior as an advanced organizer thus allowing the measurement of selective retention of the contents of the information sheet to serve as a dependent variable in the study.

On the second class meeting after day ten, the amount of information retained by each subject was tested using a twenty-item, multiple choice cognitive recall test (see Appendix G) which served as the measure of tested interest

in this study. At this time, a measure was obtained of late stated interest by student and late stated interest assumed held by others (see Appendix G).

On days fifteen through nineteen, informal personal interviews were held with a sample of three subjects selected at random from each of the cells of the experimental design. Each of the thirty-six subjects was interviewed according to an open-ended interview format (see Appendix H). The major purposes of the interviews were to ascertain the extent of positiveness which subjects felt toward the informational program on the role of the nurse physician associate and to ascertain if they engaged in information seeking behaviors other than those which were explicitly measured as dependent variables. The assessment of the likelihood of certain contaminating variables was also made possible by the interview procedure. Those persons whom it was impossible to contact personally were contacted by phone. Since research has indicated that interviewers often record the answer they expect to hear rather than the answer actually given (Smith, 1950), two independent interviewers other than the researcher were utilized to collect interview data.

Freshman nursing students. A freshman sample was an extremely difficult one to obtain because freshman nursing students have no official contact with the School of Nursing and do not take any nursing courses during their first year. In addition, time demands on freshmen, who were more affected by mid-term schedules, were different from those made upon sophomores, juniors and seniors whose availability was

influenced by professional workshops and conferences. In order to allow maximum participation, it was necessary to conduct the study at a separate time for freshmen while the study for sophomores, juniors and seniors was conducted simultaneously. The study for freshmen was initiated seven days earlier than the study for sophomores, juniors and seniors, and involved a different methodology for securing subjects.

The past experience of faculty members of the School of Nursing in obtaining freshman nursing students for research purposes mediated against attempting to obtain a freshman sample in formal freshman classroom settings. Inability to locate the subjects, reluctance of instructors offering general courses to relinquish class time for research efforts directed toward a particular discipline, large lecture sections and small recitation sections whose student constituencies are constantly in flux were offered by members of the faculty of the School of Nursing as strong reasons why a freshman nursing sample should not be obtained during regular class hours. An alternative approach was, however, possible. Despite the possibility of exerting differential experimental influence on freshmen as compared to sophomores, juniors and seniors, this alternative approach was utilized by the researcher as part of the research methodology because it appeared it was the only reasonable option which was available to him.

Through the auspices of Dr. Isabelle Payne of the School of Nursing, the first contact session, consisting of exposure to the experimental treatments, was held in an evening

meeting which was called by the School of Nursing in order to gain demographic and psychological data from the freshmen. The second contact session in which the nursing students received the information sheet was structured by informing the student at the first contact session (see Appendix J) that he could pick up an envelope on the ninth or tenth experimental day containing information which might be of interest to him and which would also contain one dollar. Included in that envelope was a notice (see Appendix K) that an additional two dollars could be obtained by making contact number three, held on the twelfth or thirteenth experimental day, when responses to the cognitive recall test and late interest measures were obtained. The experimental treatments were applied to these persons in exactly the same manner as sophomore, junior and senior students. This was insured by the same introduction of the experimental treatment to all experimental subjects through the utilization of a standardized statement to all subjects (see Appendix I). The dependent variables were also collected in similar fashion as those obtained from sophomore, junior and senior students.

Development of Independent and Dependent Variables

Independent variables. The first draft of the experimental treatments was constructed by the researcher. This draft included written content, photographs, diagrams and format layout. When this was accomplished, a medical advisory committee consisting of three physicians associated with the

FIGURE II

EXPERIMENTAL METHODOLOGY

Day	Day Number	
Monday	1	Exposure to occupational information booklets (Group contact #1)
Tuesday	2	Resource person available Library resources available
Wednesday	3	Resource person available Library material available
Thursday	4	Resource person available Library material available
Friday	5	Resource person available (last day) Library material available
Saturday Sunday	6 7	
Monday	8	Library material available
Tuesday	9	Library material available (last day)
Wednesday	10	Last day post cards will be counted as response (criteria-postmark) Information sheet given to subjects at end of class period. Group contact #2
Thursday	11	Amount of information retained tested in next class period (tested interest). Group contact #3
Friday	12	
Saturday Sunday	13 14	
Monday	15	Interviews with students
Tuesday	16	Interviews with students
Wednesday	17	
Thursday	18	Interviews with students
Friday	19	Interviews with students

Office of Medical Education Research and Development served to make modifications and suggestions regarding additions and deletions to each of the occupational booklets. Their major focus, however, was on the booklet representing the role of the nurse physician associate as an extension of medicine. The utilization of their professional medical judgments regarding the nuances being reflected in the booklets served to validate the independent variables by members of the profession of medicine and, thus, served to add legitimacy to the study for the profession of medicine. Soon after, a nursing advisory committee was formulated composed of three members of the faculty of the School of Nursing, Michigan State University. These nurses served a function similar to the medical advisory committee. However, they concentrated their efforts on the occupational information booklet representing the role of the nurse physician associate as an extension of nursing, and legitimated the study for the profession of nursing. Each committee operated independently of the other, and the integration of their suggestions and comments into the final form of the booklets was made by the researcher. This product was then referred to a media specialist who produced the final version of the booklet in an attractive and professional appearance. The booklets were finally prepared by a commercial printer.

Dependent variables. The initial versions of the dependent variables were constructed by the researcher. Suggestions regarding modifications were made by members of the research committee. A field test of the measure of tested interest was

undertaken. The multiple choice test was first given to ten laymen in order to determine items which would be unreliable because they were interrelated with other items on the test. As a result of this procedure, one item which yielded the correct answer to another item was rewritten. The results of this procedure indicated that uninformed subjects scored no better than chance on the dependent variable. However, in order to increase the reliability of this measure, the number of items was increased from fourteen to twenty. This larger number of items would permit a more efficient calculation of a split-half reliability coefficient after the experimental methodology was completed. Face validity for the measure of tested interest was assumed because each item was carefully constructed to measure exactly one and only one independent informational segment of the information sheet as a simple recall of information task.

Control of Confounding Variables

In any experimental study, a biased estimate of treatment main effects can be obtained by the introduction of a confounding variable which exerts a differential influence on subjects exposed to one specific experimental treatment. Control of this possibility becomes a major consideration in the development of the internal validity of an experimental study.

Control of contamination in this study was attempted by the following approaches:

The selection of the experimental design. The experimental design employed in this study was a sophisticated

version of the post-test-only control group design (Campbell and Stanley, 1963, p. 25). This design controls the major sources of internal invalidity such as history, maturation, testing, instrumentation, regression, selection, mortality and the interactive effects of selection with other sources. Its major weakness, as with the best of experimental designs, is that it does not control for the effects of unique inter-session history without a replication of the experimental procedure.

This design has greater deficiencies in external validity, or the range of generalization one may infer from experimental treatments. Although it controls for the interaction of testing and treatment, the possibility of interaction between selection and treatment and reactive arrangements exists. In addition, the utilization of multiple dependent variables with this design, without randomization of the order of exposure of experimental subjects to them, constitutes a subtle form of multiple treatment interference.

The specific experimental methodology employed. The experimental methodology employed attempted to control for the possibility of experimental treatments being confounded by subjects being exposed to more than one experimental treatment. It reduced this threat to internal validity by attempting to apply the experimental treatment to all subjects at the same time period, by asking subjects to refrain from accepting more than one booklet if the opportunity arose, by ascertaining whether or not subjects had indeed received more than one booklet, and by removing the independent

variable after subjects were exposed to it. However, to the extent that subjects communicated the nature of the focus of the booklet they received to their peers, confounding effects did occur. These effects were probably greater the higher the degree of reactivity caused by the carrying out of the experiment and could be expected to influence levels of T and levels of L equally.

Minor differences in experimental methodology caused by differential application of the experimental treatments to members of different classes and differential availability of dependent variables to members of different classes also constituted sources of potential internal invalidity. However, to the extent that these did occur, they would exert a confounding influence on levels of L and not effect levels of T. Some control was provided to reduce this possibility for experimental treatments by utilizing standardized instructions for introducing them to subjects.

One of the most serious potential contaminating variables was inherent in the resource person. This variable had two potential deleterious components: (1) role, and (2) identity.

The role component of this contaminating variable was based upon the fact that it was impossible to envision a person with enough information on the role of the nurse physician associate who was not a nurse, a physician or someone who had not received training in a health care role. This professional identity could not help but provide subtle nuances in information giving which could constitute experimental bias.

The identity component of this contaminating variable was based upon the fact that although many individual physicians and nurses on campus were professionally equipped to act as the resource person, all had been exposed to the researcher's proposal in either an advisory or informational fashion and then would introduce a subtle form of experimentor bias. In addition, the nature and extent of their normal responsibilities made their availability questionable. Although there was some temptation for the researcher to act as the resource person, this constituted such a crass introduction of experimentor bias that this possibility was abandoned.

It was therefore decided to concurrently employ and train two professional actors to function on alternate days as resource persons. One male and one female were chosen in order to equalize a sexual identification bias associated with the predominately female profession of nursing and the predominately male profession of medicine. Each was briefed extensively on the role of the nurse physician associate and had several dress rehearsals where simulated nursing students met with them to seek information. The actors were not informed of the nature of the research project they were engaged in and were told to portray experts on the role of the nurse physician associate rather than to assume any particular professional identity.

The construction of independent and dependent variables. Hints as to the underlying purpose of the study were not made available to the experimental subjects by the instrumentation used. The subjects were not aware of the experimental methodology in advance of procedures being carried out, and

all independent and dependent variables were constructed to approximate the field testing of occupational information booklets.

Some subjective estimate of any contaminating variables which were operating in this study was made through the use of the interview procedures.

Experimental data analysis. Where contaminating effects did occur because of differential availability of the dependent variables because of unavoidable differences in class schedules, experimental data was examined to ascertain if the nature and extent of such contamination offered a plausible rival hypothesis for the effects observed.

Statistical Methodology Employed

For many years, experimental research in the social sciences has utilized the statistical procedures developed by Fischer in which the differential effects of two or more independent variables on one dependent variable has been assessed by an analysis of variance (ANOVA). In those cases in which more than one dependent variable was present, a separate analysis of variance was carried out for each dependent variable. There was one major difficulty with this approach. One of the assumptions to which analysis of variance is not robust is the assumption of independence. Multiple variables, such as those employed in this study, are rarely independent of each other. Until recently, this problem was usually "swept under the rug" because a more viable approach was not readily available.

With the advent of modern computer science and recent breakthroughs in theoretical statistics, a new approach to alleviating the problem of multiple interrelated dependent variables has been developed. The statistical approach is known as multivariate analysis of variance (MANOVA). ANOVA yielded an F ratio for each factor in the experimental design and an F ratio for each order interaction with the dependent variable under test. Furthermore, this statistical approach indicated whether or not the given F ratio was statistically significant at a given level of alpha.

However, the MANOVA computer program developed by Finn yields two types of F ratios. One type is known as a multivariate F ratio and the other is called a univariate F ratio. The multivariate F ratio indicates whether or not all dependent variables are simultaneously statistically significant at a given alpha level for a given hypothesis examined by the experimental design. This study will yield a multivariate F for each of the hypotheses under test. It will also yield univariate F ratios for each of the dependent variables associated with each of the five hypotheses under test. The univariate F ratio indicates whether or not a given dependent variable is statistically significant at a given alpha level for a given hypothesis examined by the experimental design assuming that dependent variable is independent of every other dependent variable in the study. Because this assumption is a tenuous one, one must be extremely cautious in interpreting reports of statistical significance for univariate F ratios. Such care is necessary because violation of the

assumption of independence elevates the alpha level to an unknown degree. The most productive approach in dealing with the univariate F is probably to ignore it, and deal with alternate statistical approaches in which alpha can be stabilized.

Four different alternative statistical sets of criteria have been developed to overcome the deficiencies of the univariate F ratio. They are Hotelling's trace criterion procedure, Roy's largest root, Wilk's lambda procedure and the use of the step-down F ratio.

In this study, the step-down F ratio will be utilized. Three factors mediate the interpretation of the step-down F ratio.

(1) The individual step-down F ratios for each of the dependent variables examined by a hypothesis under test can have their exact alpha level determined prior to the statistical analysis of the data. This calculated alpha level determines the probability of a type 1 error as it exists adjusted for the effect of other dependent variables. In this study, six dependent variables are utilized, and the calculated appropriate alpha level for each is equal to the alpha level of the multivariate F ratio divided by the number of dependent variables or .01/6 or .00166. This indicates that the null hypothesis should not be rejected as it relates to any dependent variable unless the value of the obtained step-down F ratio exceeds the tabled value of F at alpha equal to .00166.

(2) The step-down F ratio is also highly dependent on the order dependent variables are presented to the computer. The computer proceeds to examine each dependent variable so that three or less possibilities are present for a given dependent variable depending on its order of consideration:

(a) The dependent variable is not significant at a given alpha level.

(b) The dependent variable is significant at a given alpha level.

(c) The dependent variable is not testable.

Let us use, as an example, this study which utilized six dependent variables. The computer examines the first variable presented and finds it either significant or not. Should it find the first variable significant, then any variable which is examined afterward is not testable. Should it find the first variable not significant and proceed to the second and find it significant, then any variable examined after is not testable. In other words, once significance is ascertained for one variable, all other following variables are not testable because they violate the assumption of independence. It thus becomes imperative that the researcher assign the order of his dependent variables with care, utilizing his intuition regarding the importance of their respective contributions. The present research utilized the dependent variables

in the following selected order of presentation in terms of their potential significance:

Early stated interest by student.

Late stated interest by student.

Early stated interest assumed held by others.

Late stated interest assumed held by others.

Tested interest.

Manifest interest.

It has been suggested by some that perhaps all possible ordering arrangements of dependent variables be attempted to determine maximum significance. However, this approach makes the true alpha level of the resultant combination elevated to an unknown degree. To partially overcome the problem of inability to determine significance through the ordering process, tables of intercorrelations between dependent variables and post hoc comparisons provide meaningful clues as to their respective contributions to treatment main effects.

(3) The step-down F ratio can be made more powerful by the utilization of covariables. Multivariate analysis of covariance (MANCOVA) utilizes one or more covariables to ascertain whether or not the covariable influences dependent variables. The effect of the covariable is ascertained by a series of regression analyses.

A question often arises as to the relationship between a multivariate F ratio for a given hypothesis and the step-down F ratios associated with each of the dependent

variables for that hypothesis. If one of the step-down F ratios is significant, it follows that the multivariate F ratio will generally be significant. If none of the step-down F ratios for a given hypothesis are significant, it follows that the multivariate F ratio will generally not be significant. It is, however, theoretically possible for a multivariate F ratio to be significant with none of the associated step-down F ratios significant, as well as a multivariate F ratio not to be significant when the step-down F ratios associated with it are statistically significant. This confusing situation exists because the statistical procedures for determining the multivariate F ratio and the step-down F ratio are independent of each other and have slightly different powers under different circumstances to reject the null hypothesis. It should be recalled, however, that under certain circumstances, more than one of the step-down F ratios for a given hypothesis could be in theory significant, but this possibility is not testable with a constant and known alpha level utilizing our present theoretical understanding of inferential statistics.

MANCOVA represents a significant breakthrough in statistical methodology for research in the social sciences. Its advantages far outweigh its limitations in this present study. Note should be taken that because MANCOVA is employed, only one experimental hypothesis has been written for all dependent variables measuring that hypothesis.

Chapter IV

Analysis of Results

Sample

Two hundred and eighty-three subjects participated in the study and were distributed as indicated in Table I.

Mortality of Freshmen Sample

A total of eighty-seven freshmen were exposed to experimental treatments and measures of previous exposure to the role of the nurse physician associate, early stated respondent interest, early stated interest assumed held by others and manifest interest were obtained. However, only thirty-six of these freshmen participated in both contact number two and contact number three under the experimental conditions outlined previously. This loss of subjects represented an experimental mortality of 58.7% and a loss of power for the testing of experimental main effects with late stated respondent interest, late stated interest assumed held by others and tested interest. A chi-square test for independence did not reveal statistically significant differences in mortality as a function of exposure to experimental treatments (see Table II).

Cell Means

Cell means for each treatment combined with each level were obtained for all dependent variables and for preknowledge

which served as a covariable (see Table III). The means for pooled manifest interest represent a scale from 0-3, in which each subject was assigned a score of one for each evidence of manifest interest he demonstrated. Table IV portrays differentiated cell totals for manifest interest.

Effect of Utilization of Preknowledge as a Covariate

Visual inspection of the correlations between the dependent variables and the covariate yielded no meaningful relationships (see Table V). A chi-square test for association between dependent variables and covariable was not significant (chi-square = 6.16, d.f. = 6, p = 0.40). Furthermore, an examination of multiple regression data utilizing the covariate yielded no significant effect of the covariable upon the dependent variables with the exception of some minor potential effect on early stated respondent interest (see Table VI). It was therefore decided to reanalyze the data after eliminating the covariable in order to increase power.

Test of Hypotheses

Hypotheses relating to treatment effects associated with professional role identification. Multivariate analysis of variance indicated no main effect caused by exposure to occupational information booklets. Both the multivariate F ratio and all six step-down F ratios did not yield significant differences (see Table VII). Ho: I and Ho: II failed to be rejected.

Ho: I There will be no significant difference in the development of interest in a new health care

TABLE I

DISTRIBUTION OF EXPERIMENTAL SUBJECTS BY TREATMENT AND LEVEL

	T_1 (Medicine)	T_2 (Nursing)	T_3 (Health Care)	
L_1 (Freshmen)	28	30	29	87
L_2 (Sophomores)	28	26	29	83
L_3 (Juniors)	22	17	18	57
L_4 (Seniors)	17*	20**	19***	56
	95	93	95	283

* Includes 4 registered nurses with clinical experience
** Includes 7 registered nurses with clinical experience
*** Includes 1 registered nurse with clinical experience

TABLE II

CHI SQUARE FOR DIFFERENTIAL MORTALITY OF FRESHMEN SAMPLE

	T_1 (Medicine)	T_2 (Nursing)	T_3 (Health Care)	
Number of Freshmen completing contact # 1 only	15	18	18	51
Number of Freshmen completing all three contacts	13	12	11	36
	28	30	29	87

d.f. = 2
chi square = 0.395
(not significant at p = .05)

TABLE III

CELL MEANS

Cell Identification	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Late Stated Respondent Interest	Late Stated Interest by Others	Pre-knowledge
Medicine--Freshmen	4.286	4.036	0.464	5.607	1.893	1.786	1.679
Medicine--Sophomores	4.357	3.714	0.643	10.214	4.071	3.714	2.107
Medicine--Juniors	4.227	3.818	0.228	10.318	3.455	3.455	2.091
Medicine--Seniors	4.412	3.882	0.412	8.941	3.176	2.765	2.882
Nursing--Freshmen	4.700	4.133	0.633	4.900	1.800	1.533	1.933
Nursing--Sophomores	4.500	3.654	0.808	7.846	3.923	3.308	1.962
Nursing--Juniors	4.059	3.882	0.176	9.471	3.824	3.706	1.706
Nursing--Seniors	4.200	3.700	0.400	9.150	3.500	3.100	2.650
Health Care--Freshmen	4.551	4.034	0.448	4.897	1.862	1.621	2.103
Health Care--Sophomores	4.379	3.517	0.517	8.724	3.586	3.172	1.552
Health Care--Juniors	4.722	3.944	0.444	9.611	4.333	3.833	1.725
Health Care--Seniors	4.053	3.842	0.368	8.474	3.158	2.842	2.894

TABLE IV

CELL TOTALS OF THE NUMBER OF EXPERIMENTAL SUBJECTS DISPLAYING DIFFERENTIAL MANIFEST INTEREST

Cell Identification	Utilization of Library Resources	Utilization of Resource Person	Utilization of Postcard
Medicine--Freshmen	1	0	13
Medicine--Sophomores	0	0	18
Medicine--Juniors	0	0	5
Medicine--Seniors	0	1	5
Nursing--Freshmen	1	1	18
Nursing--Sophomore	2	1	18
Nursing--Juniors	1	1	2
Nursing--Seniors	0	1	8
Health Care--Freshmen	0	2	10
Health Care--Sophomore	0	0	14
Health Care--Juniors	1	1	7
Health Care--Seniors	0	0	6
TOTAL	6*	8**	124
Percentage of total sample	2.1%	2.8%	46.6%

*In addition, two sophomore nursing students not exposed to experimental treatments and one member of the nursing faculty availed themselves of the written materials in the library.

**In addition, five members of the nursing faculty visited the resource persons.

TABLE V

CORRELATION MATRIX OF DEPENDENT VARIABLES AND COVARIABLE

	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Late Stated Respondent Interest	Late Stated Interest by Others	Pre-knowledge
Early Stated Respondent Interest	1.000						
Early Stated Interest by Others	0.408	1.000					
Pooled Manifest Interest	0.325	0.069	1.000				
Tested Interest	0.071	-0.020	0.218	1.000			
Late Stated Respondent Interest	0.276	0.046	0.238	0.683	1.000		
Late Stated Interest by Others	0.118	0.059	0.158	0.695	0.858	1.000	
Pre-knowledge	0.110	0.062	-0.050	-0.003	0.039	0.041	1.000

Variable	Variance	Standard Deviation
Early stated respondent interest	1.002	1.001
Early stated interest by others	0.660	0.812
Manifest interest	0.299	0.546
Tested interest	33.164	5.759
Late stated respondent interest	4.131	2.032
Late stated interest by others	2.846	1.687
Preknowledge	0.976	0.986

role by students training for health careers in a less highly trained profession after identification of that role with the less highly trained profession or with an amalgamation of the less and more highly trained profession.

Ho: II There will be no significant difference in the development of interest in a new health care role by students training for health careers in a less highly trained profession after identification of that role with an amalgamation of the less and more highly trained profession or with the more highly trained profession.

Hypotheses related to level of training effects.

The multivariate F ratio was equal to 5.8410 and this was significant at the .0001 level of confidence indicating a main effect for level (see Table VIII). Examination of the step-down F ratios demonstrated that early stated respondent interest was not significant, and that late stated respondent interest was significant at the .0001 level of confidence. Because of the statistical characteristics of the multivariate analysis of variance, the significance related to each of the dependent variables ordered below late stated respondent interest could not be directly ascertained. However, inspection of both univariate F and step-down F ratios indicated that late stated interest held by others, tested interest and manifest interest may have also contributed heavily to the level effect. To assess their contributions and to ascertain

TABLE VI

MULTIPLE REGRESSION UTILIZING COVARIABLE

Variable	Square Mult. R	Mult. R	F	P Equal To	Step Down F	P Equal To
Early Stated Respondent Interest	0.012	0.110	3.300	0.070	3.300	0.070
Late Stated Respondent Interest	0.002	0.039	0.420	0.518	0.024	0.877
Early Stated Interest by Others	0.004	0.062	1.056	0.305	0.108	0.743
Late Stated Interest by Others	0.002	0.041	0.448	0.504	0.365	0.546
Tested Interest	0.000	0.003	0.003	0.956	0.339	0.561
Manifest Interest	0.003	0.050	0.671	0.413	2.073	0.151

Degrees of Freedom for Hypothesis = 1

Degrees of Freedom for Error = 270

TABLE VII

F RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS FOR MAIN EFFECTS ASSOCIATED WITH PROFESSIONAL ROLE IDENTIFICATION

F-ratio for multivariate test of equality of mean vectors = 0.653

d. fs. = 12 and 532,000 p equal to 0.797

Variable	Between Mean SQ	Univariate F	P Equal To	Step-Down F	P Equal To
Early stated respondent interest	0.384	0.383	0.6825	0.383	0.6825
Late stated respondent interest	0.005	0.001	0.9989	0.038	0.9630
Early stated interest by others	0.052	0.079	0.9238	0.294	0.7455
Late stated interest by others	0.760	0.267	0.7658	0.629	0.5338
Tested interest	37.626	1.135	0.3231	1.415	0.2450
Pooled Manifest interest	0.286	0.959	0.3848	1.165	0.3134

Degrees of Freedom for Hypothesis = 2
Degrees of Freedom for Error = 271

TABLE VIII

F RATIO FOR MULTIVATIATE TEST OF EQUALITY OF MEAN VECTORS

FOR MAIN EFFECTS ASSOCIATED WITH LEVEL OF TRAINING

F-ratio for multivariate test of equality of mean vectors = 5.841
d. fs. = 18 and 752,845 p equal to 0.0001

Variable	Between Mean SQ	Univariate F	P Equal To	Step-Down F	P Equal To
Early stated respondent interest	1.118	1.116	0.3432	1.116	0.3432
Late stated respondent interest	72.213	17.480	0.0001	20.444	0.0001
Early stated interest of others	2.820	4.275	0.0058	3.050	0.0292
Late stated interest by others	68.259	21.886	0.0001	3.755	0.0113
Tested interest	337.043	10.163	0.0001	0.946	0.4190
Pooled manifest interest	1.739	5.824	0.0008	6.198	0.0005

Degrees of Freedom for Hypothesis = 3
Degrees of Freedom for Error = 271

what levels contributed most to the between level variance, an examination of least square estimates of mean differences and the standard errors of the least square estimates (see Table IX) was undertaken and Scheffe post hoc comparisons constructed (see Table X). The Scheffe method of post hoc comparisons was chosen because it has a stable alpha level, is applicable to groups of unequal sizes and is relatively robust to lack of normalcy or equality of variance. Examination of the comparisons indicated that main effects were caused almost entirely by sophomores having a significantly higher degree of late stated respondent interest, late stated interest assumed held by others and tested interest than did freshmen. In addition, sophomores demonstrated significantly greater manifest interest than did juniors, a finding directly opposite to that hypothesized. Analysis of principal components of the correlation matrix confirmed that late stated respondent interest, late stated interest assumed held by others and tested interest contributed in large measure to the variance across levels (see Table XI).

On the basis of the post hoc comparisons:

Ho: III and Ho: IV failed to be rejected.

Ho: III There will be no significant difference in the development of interest in a new health care role by students with a high level of training in the less highly trained profession and students with an intermediate level of training in the less highly trained profession.

TABLE IX

LEAST SQUARE ESTIMATES OF MEAN DIFFERENCES AND STANDARD ERRORS

Means	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Late Stated Respondent Interest	Late Stated Interest by Others
Medicine minus health care	-0.116	0.040	0.009	0.902	-0.022	0.118
Nursing minus health care	-0.012	0.031	0.100	-0.128	0.057	0.044
Freshmen minus sophomores	0.106	0.442	-0.136	-3.807	-2.007	-1.753
Sophomores minus juniors	0.079	-0.249	0.369	-0.845	0.011	-0.246
Juniors minus seniors	0.128	0.072	-0.107	0.903	0.562	0.731

Standard Errors	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Late Stated Respondent Interest	Late Stated Interest by Others
Medicine minus health care	0.145	0.118	0.079	0.836	0.295	0.245
Nursing minus health care	0.146	0.119	0.078	0.840	0.297	0.246
Freshmen minus sophomores	0.154	0.125	0.084	0.884	0.312	0.259
Sophomores minus juniors	0.172	0.140	0.094	0.991	0.359	0.290
Juniors minus seniors	0.189	0.153	0.103	1.085	0.383	0.318

TABLE X

SCHEFFÉ POST HOC COMPARISONS FOR DEPENDENT VARIABLES ASSOCIATED WITH LEVEL EFFECTS

Dependent Variable	Comparison	Least Square Estimate of Mean Difference	Standard Error	Scheffé* p = .01	Interval	Significant
Late Stated Respondent Interest	Freshmen minus Sophomores	-2.007	0.312	3.360	-2.007 ± 1.048	Yes
Late Stated Interest Assumed held by Others	Freshmen minus Sophomores	-1.753	0.259	3.360	-1.753 ± 0.087	Yes
Tested Interest	Freshmen minus Sophomores	-3.807	0.884	3.360	-3.807 ± 2.970	Yes
Manifest Interest	Freshmen minus Sophomores	-0.136	0.084	3.360	-0.136 ± 0.2822	No
Late Stated Respondent Interest	Sophomores minus Juniors	0.011	0.349	3.360	0.011 ± 1.172	No
Late Stated Interest Assumed held by Others	Sophomores minus Juniors	-0.249	0.290	3.360	-0.249 ± 0.974	No
Tested Interest	Sophomores minus Juniors	-0.845	0.991	3.360	-0.845 ± 3.329	No
Manifest Interest	Sophomores minus Juniors	0.368	0.094	3.360	0.368 ± 0.315	Yes

TABLE X (cont'd.)

Dependent Variable	Comparison	Least Square Estimate of Mean Difference	Standard Error	Scheffé* p = .01	Interval	Significant
Late Stated Respondent Interest	Seniors minus Juniors	0.561	0.383	3.360	0.561 ± 1.287	No
Late Stated Interest Assumed held by Others	Seniors minus Juniors	0.731	0.318	3.360	0.731 ± 1.068	No
Tested Interest	Seniors minus Juniors	0.903	1.085	3.360	0.903 ± 3.662	No
Manifest Interest	Seniors minus Juniors	-0.107	0.103	3.360	-0.107 ± 0.346	No

* $S = \sqrt{(J-1)\ (F_{J-1,\ N-J}}$

$S = \sqrt{(3)\ (3.78)}$

$S = \sqrt{11.34} = 3.360$

Ho: IV There will be no significant difference in the development of interest in a new health care role by students with an intermediate level of training and students with a low level of training in the less highly trained profession.

Ho: V was rejected and Ha: V was accepted.

Ha: V Students with a low level of training in the less highly trained profession will develop significantly greater interest in a new health care role than will students with a minimal level of training in the less highly trained profession.

Hypothesis relating to interaction effects. No main effects for interaction were obtained (see Table XII). Ho: VI failed to be rejected.

Ho: VI There will be no interaction between role identification and level of training.

Comparison of Interest Development by Senior Nursing Students and Senior Nursing Students Who are Registered Nurses

In order to explore the possibility that the twelve senior students who are registered nurses constituted a different level of interest development than those 48 senior nursing students who had not had previous professional responsibility, the data was recalculated with those two groups of senior nursing students differentiated (see Table XIII). Since a level effect for level of training had been established previously, a table of least square estimates of mean differences and standard errors was constructed (see Table XIV) and post hoc comparisons employed for each dependent variable (see Table XV).

TABLE XI

PRINCIPAL COMPONENTS OF CORRELATION MATRIX

	1	2	3	4	5	6
Early stated respondent interest	-0.371	-0.775	0.029	-0.491	0.132	0.058
Late stated respondent interest	-0.925	0.125	-0.082	-0.147	-0.195	-0.248
Early stated interest of others	-0.156	-0.737	-0.514	0.408	-0.023	-0.030
Late stated interest by others	-0.894	0.238	-0.178	0.013	-0.239	0.236
Tested interest	-0.823	0.282	-0.011	0.158	0.468	-0.000
Pooled manifest interest	-0.406	-0.389	0.773	0.279	-0.089	0.006

Vector	Eigen Value	Percent of Variation
1	2.659	44,317
2	1.446	24,095
3	0.902	15,028
4	0.533	8,876
5	0.340	5,660
6	0.121	2,025

TABLE XII

F RATIO FOR MULTIVARIATE TEST OF EQUALITY OF MEAN VECTORS

FOR MAIN EFFECTS ASSOCIATED WITH INTERACTION

F-ratio for multivariate test of equality of mean vectors = 0.558
d. fs. = 36 and 1170,849 p equal to 0.9845

Variable	Between Mean SQ	Univariate F	P Equal To	Step-Down F	P Equal To
Early stated respondent interest	1.250	1.247	0.2826	1.247	0.2826
Late stated respondent interest	2.073	0.502	0.8070	0.468	0.8325
Early stated interest of others	0.199	0.302	0.9356	0.326	0.9229
Late stated interest by others	1.236	0.434	0.8556	0.151	0.9888
Tested interest	6.833	0.206	0.9748	0.435	0.8555
Pooled manifest interest	0.327	1.093	0.3667	0.750	0.6101

Degrees of Freedom for Hypothesis = 6

Degrees of Freedom for Error = 271

TABLE XIII

CELL MEANS FOR COMPARISON OF SENIOR NURSING STUDENTS

AND SENIORS WHO ARE REGISTERED NURSES

Cell Identification	N	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Eate Stated Respondent Interest	Late Stated Interest by Others
Medicine--Seniors	13	4.231	4.000	0.462	8.154	3.077	2.769
Medicine--RN Seniors	4	5.000	3.500	0.250	11.500	3.500	2.750
Nursing--Seniors	13	4.308	3.538	0.462	10.000	4.385	3.692
Nursing--RN Seniors	7	4.000	4.000	0.286	7.571	1.857	2.000
Health Care--Seniors	18	3.944	3.778	0.389	8.278	3.056	2.722
Health Care--RN Seniors	1	6.000	5.000	0.000	12.000	5.000	5.000

TABLE XIV

LEAST SQUARE ESTIMATES AND STANDARD ERRORS FOR SENIOR NURSING STUDENTS AND SENIORS WHO ARE REGISTERED NURSES

Means	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Late Stated Respondent Interest	Late Stated Interest by Others
Seniors minus Seniors with RN	-0.379	-0.136	0.215	-0.512	0.819	0.551

Standard Errors	Early Stated Respondent Interest	Early Stated Interest by Others	Pooled Manifest Interest	Tested Interest	Late Stated Respondent Interest	Late Stated Interest by Others
Seniors minus Seniors with RN	0.327	0.266	0.180	1.896	0.662	0.551

TABLE XV

SCHEFFÉ POST HOC COMPARISONS FOR DEPENDENT VARIABLES ASSOCIATED WITH SENIOR NURSING STUDENTS AND SENIORS WHO ARE REGISTERED NURSES

Dependent Variable	Least Square Estimate of Mean Differences	Standard Error	Scheffe p = .01	Interval	Significant
Late stated respondent interest	0.819	0.662	3.360	0.819 ± 2.224	No
Late stated interest held by others	0.551	0.551	3.360	0.551 ± 1.851	No
Tested interest	-0.512	1.896	3.360	-0.512 ± 6.350	No
Manifest interest	0.215	0.180	3.360	0.215 ± 0.604	No

Comparisons for each dependent variable between the two levels of senior nursing students revealed no significant differences between these levels.

Reliability of Instrumentation

In the absence of treatment main effects, an assessment of the reliability of dependent variables was considered. The reliability of measures of stated interest was supported by the lack of threat regarding the experimental program reported by the two interviewers who carried out the post experimental survey. The reliability of measures of manifest interest was inferred because their referents were behavioral in nature. The reliability of tested interest was examined by calculation of Kuder Richardson reliability coefficients (see Table XVI). Reliability of the measure of tested interest fell within acceptable limits.

TABLE XVI

KUDER RICHARDSON RELIABILITY COEFFICIENTS

FOR MEASURE OF TESTED INTEREST

Entire sample pooled r = .81	
Freshmen	r = .85
Sophomores	r = .83
Juniors	r = .75
Seniors	r = .80

Post Experimental Survey

Thirty-nine experimental subjects (three from each cell in the experimental matrix) as well as three additional seniors who were registered nurses were interviewed shortly after the experimental phase of the study. The interviews were conducted by two independent interviewers other than the researcher utilizing a structured interview format (see Appendix H). The pertinent findings were as follows:

(1) Fifty-three percent of those subjects interviewed indicated a positive impression of the orientation program to which they had been exposed. Forty-three percent were negative in their overall impressions while 4% were noncommital. Of those responding negatively, a majority indicated that they felt that the information they had received did not justify three class contacts, and was too vague and general and often incomplete. Some of those whose general impressions were positive also expressed similar reservations. Many of those informational gaps expressed related to specific working responsibilities in various working situations and specific details of the number, type and curricula of schools training nurse physician associates. The need for these informational inputs was more often expressed by upper classmen. Other negative aspects also mentioned were (in order of frequency) resistance to being a subject in a research program, intrusion into organized classes by persons carrying out the study, and the resource person's lack

of complete information about local projects utilizing nurses in unique roles.

(2) Fifty-two percent of those persons interviewed felt that other opportunities to learn about the role of the nurse physician associate would have appealed to them. Of these, almost 80% indicated their desire to hear a nurse physician associate speak. Other informational resources mentioned (in order of frequency) were different media presentations of occupational information and classroom discussion.

(3) Eighty-seven percent of experimental subjects interviewed did not obtain information regarding the role of the nurse physician associate through any other means than those provided in the experimental methodology. Two upper classmen obtained additional information from a current nursing periodical and two seniors undertook position papers on the subject for class credit. One student evaluated some classroom discussion on the role of the nurse physician associate.

(4) Eighty-five percent of those subjects interviewed were not aware that different students received different occupational informational booklets. Those who were aware identified differences in "pictures or diagrams" but could not identify the basic nature of the differences in the experimental treatment.

(5) Seventy-four percent of those experimental subjects interviewed indicated that they felt the nurse physician associate represented a new professional identity.

Thirteen percent felt that this role reflected the practice of nursing, and thirteen percent indicated that the role of the nurse physician associate is obliterating the distinction between nursing and medicine. None of those interviewed felt that the role of the nurse physician associate represents the practice of medicine. Of the five subjects perceiving the role of the nurse physician associate as an expanded role of nursing, all were seniors, two of whom were registered nurses. Of the five subjects perceiving the role of the nurse physician associate as obliterating the distinction between nursing and medicine, two were freshmen and three were juniors. For all subjects interviewed, examination of the data indicated that there was no meaningful relationship between the experimental treatment to which the subject had been exposed and his responses to this item on professional role identification.

Chapter V

Summary of Results, Discussion of Results, Conclusions and Implications

Summary of Results

Occupational information booklets portraying the nurse physician associate with professional role identification associated with nursing, with medicine or with health care did not produce differential development of interest in the nurse physician associate role by nursing students. Interest development was not significantly affected by the extent of preknowledge of the role of the nurse physician associate. Sophomores demonstrated a significantly higher level of tested interest and late stated interest than did freshmen and a significantly higher level of information seeking than did juniors. There was no significant difference in interest development between seniors who were registered nurses and seniors who were not.

Post experimental interviews indicated that subjects reporting both positive and negative attitudes toward the experimental methodology felt the information supplied on the role of the nurse physician associate was too general in nature. There was no meaningful evidence of information seeking regarding the role of the nurse physician associate through any other means than those provided in the experimental methodology. A majority of those interviewed indicated they

would have preferred to have a nurse physician associate speak formally. There was no indication that subjects were aware of the nature and extent of the different experimental treatments they had received. Three out of four experimental subjects interviewed felt that the role of the nurse physician associate represented a new professional identity rather than the practice of nursing, the practice of medicine or obliterating the distinctions between medicine and nursing.

Discussion of Results

Treatment effects. The lack of treatment main effects brings to question the general effectiveness of the experimental treatments in the promotion of interest. Although the hypotheses examined addressed themselves to the differential development of interest according to professional role identification, with respect to the question of effectiveness of experimental treatments, a nontreatment control group would have been extremely helpful and would have allowed a direct examination of this issue. However, the difficulty in constructing an "identification free" occupational information booklet, the effect of further loss of power by increasing the percentage of the sample utilized for control, and the potential increase in reactive arrangements all mediated against its use. In addition, indirect evidence is present to support the assumption of the effective promotion of interest:

(1) Nursing and medical advisory boards certified the independent variables as appropriate vehicles for the development of interest from their professional perspectives.

(2) There was a generally high level of information seeking behavior through the utilization of post cards.

(3) Subjects expressed the felt need for further information as a result of exposure to the occupational information booklets, both in the measure of early stated respondent interest and in the post experimental interviews.

However, it should be noted that there was a rapid erosion over time of treatment effects as indicated by a lack of any meaningful correlation between experimental treatment initially received by the subject and role identification associated with the nurse physician associate indicated by the subject in the post experimental interview.

There appeared to be no contamination of experimental data by subject knowledge of the nature and extent of independent variables other than that received by the subject.

Minor differences in experimental methodology caused by differential application of independent variables to members of different classes and differential availability of dependent variables did not appear to constitute major sources of internal invalidity. In addition, there was no meaningful attempt on the part of experimental subjects to obtain information by any other means than those provided in the experimental methodology. In general, it appeared that the experimental methodology, with regard to treatment main effects, was reasonably free of sources of internal invalidity.

A most startling result of the post experimental methodology was a strong indication that the independent variables were incompletely conceptualized. Although there was

a logical possibility of the role of the nurse physician associate being viewed as a new and distinct professional identity, this suggestion did not appear at all in the voluminous literature emanating from nursing and medical sources. A distinct professional identity of physician assistant had been frequently reported in the literature; however, the candidates for this role were nonprofessional persons who were narrowly trained in most cases. The literature appeared to present a natural cleavage between the physician assistant and the nurse physician associate. The finding that 75% of those nurses interviewed believed the role of the nurse physician associate represents a new professional identity is a serendipitous finding of major significance, and casts doubt upon the conceptual basis of the experimental treatments employed.

Level of training effects. There was a significant main effect for level of training. However, the meaningfulness of this main effect is open to serious question. Two factors specifically present themselves.

(1) The finding that sophomores demonstrated significantly greater late stated respondent interest, late stated interest assumed held by others, and tested interest than did freshmen can be explained by a plausible hypothesis relating to differences in the experimental methodology occurring between freshman and sophomore samples. It is to be recalled that a large freshman mortality occurred in the freshman sample after contact number one. Although there were no differences

in experimental mortality according to experimental treatments, those who continued were encouraged to do so by payment of one dollar for contact number two, and two dollars for contact number three. The dependent variables, which are significantly lower in freshmen as compared to sophomores, correspond exactly to those dependent variables collected in freshman contact number three. As such, the difference probably represents the biasing effect of freshmen who had only monetary motives for presenting a data base.

(2) The finding that sophomores demonstrated significantly greater manifest interest than did juniors is in a direction opposite to that hypothesized and can be explained by a unique characteristic of the sophomore sample at the time of experimentation.

At the time the study was conducted, the sophomore nursing students had been in the official nursing school program a little more than five weeks, having spent their freshman year with no course contact with the school of nursing. Such a situation could reasonably be expected to produce a high degree of enthusiasm for information seeking. The degree of enthusiasm appears independent of amount of preknowledge. This hypothesis is partially supported if one examines the effect of the preknowledge covariable upon the differences in means of the sophomore and junior sample. The differences in means are not eroded by the introduction of the preknowledge covariable.

Further support for this position is found in the fact that level differences were not found between juniors and seniors, and between seniors and seniors who were also registered nurses.

It is the considered opinion of this researcher that the significant level effects found in this study are not meaningful and probably represent the effect of situational variables as sources of internal invalidity.

Interaction effects. Although no main effect for interaction of professional role identification and level of training demonstrated itself, an interesting trend established itself in the post workshop interviews. Of the 39 subjects interviewed, those five who saw the role of the nurse physician associate as an expansion of nursing had high levels of training, and those five who saw the role of the nurse physician associate as an amalgamation of medicine and nursing had lower levels of training. This appears to indicate the possibility that within an established profession, a new health care role may be more specifically seen as the province of that particular profession as level of training increases.

Conclusions

No evidence was obtained to support the contention that students training for health careers in a less highly trained profession demonstrate significantly different development of interest in a new health care role after identification of that role with that less highly trained profession, a more highly trained profession, or an amalgamation of less and more

highly trained professions. Furthermore, level of training in a less highly trained profession does not appear to have a meaningful relationship with the development of interest in a new associated health care role. There is some indication that interest development in a new health care role intermediate between a less highly trained established profession and a more highly trained established profession may possibly occur as a result of identification of that new health care role as a distinct new professional identity.

Implications

> There was once a man who desired to walk a road that no man had ever walked before. He knew that the road would be very dark and that he would not be able to see. Perhaps he would fall and hurt himself. His friends, interested in his welfare, asked him plainly, "Why do you choose to walk down a road that you cannot clearly see?" He replied, "It is often that only by risking a fall that one may discover the contours in the road."
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> --Bedtime story told to Ian Michael Darnell November 21, 1970

The implications of the findings of this study are presented in three categories: (1) implications for nursing and medicine, (2) implications for vocational theory development and counseling practice, (3) implications for further research.

Implications for nursing and medicine. The absence of significant treatment and meaningful level effects in this study makes any discussion of the implications of the findings of this study somewhat tenuous. However, a reexamination of the literature in light of the findings of this study presents several significant perspectives.

The absence of treatment main effects may indicate that professional role identification by nursing students associated with interest development in the role of the nurse physician associate appears to be in the process of evolution. This evolution is accompanied by deep conflicts and strains within nursing regarding a definition of the nursing role in today's society. It is interesting to note an official statement by the Office Nurses Section of the American Nurses Association issued in "Guidelines for the Office Nurse in Determining Her Relationship to the Medical Assistant" (1965). These guidelines state that "Though the medical assistant may be performing selected nursing tasks, which, in other instances may be performed by nurses, the performance of these selected tasks by the medical assistant does not constitute the practice of nursing." It appears as if nursing perspectives of nursing roles have deteriorated into the abyss of "nursing is as nursing does."

The profession of nursing as traditionally constituted appears to be squeezed by pressures which tend to constrict the role of nursing from below and pressures which tend to expand the traditional role of nursing above. At a lower level, community aides, trained nurses aides, and graduates of two-year programs exert stress on the traditional role of the registered nurse. From above, the graduates of four-year programs in nursing, and graduate programs in clinical and administrative aspects of nursing and a whole host of clinical specialities add to the problems of defining the "typical role" of the nurse. Little (1967) points out that "specialization in

nursing is no longer confined to a field of practice--public health, industry, hospital or to a function--teaching, supervision, administration or to a subspecialty such as intravenous or inhalation therapy. With the growing complexity of medical therapy, such forms of specialization are multiplying at an alarming rate." Eight present categories of specialization have been identified--organs and body systems, age of client, degree of illness, length of illness, field of knowledge, subrole, professional goal and clinical service (Peplau, 1956)--and more have been predicted. Among this array of career potentialities, this study has cast the role of the nurse physician associate. The failure of nursing students to identify with this individual role as an expansion of nursing is, therefore, quite understandable. This uncertainty regarding role is also reflected in nursing education to a large degree. With regard to the question of the utilization of nurses for medical care, the National Student Nurses' Association recently (1970) adopted a resolution at its national convention which dramatically portrays the nursing students' present dilemma with regard to interest development in the role of the nurse physician associate.

> "The critical questions with regard to the new American Medical Association thrust toward the sharp increase in the utilization of nurses for medical care must be raised by nursing and answered in discussion with physicians so that the full intent and meaning of the AMA proposals can become clear and be understood by nursing before a firm decision is declared; therefore be it
>
> Resolved, that the National Student Nurses' Association continue to promote communication between the American Medical Association and nursing and participate in all efforts which would enable the American Nurses' Association,

> National League for Nursing and the National Student Nurses' Association to speak with one voice to this matter." (Imprint, September-October, 1970, p. 11).

Part of the cause of such uncertainty certainly rests in the proliferation of many new titles designating specialized functions in nursing, one of which is represented by the nurse physician associate. But more likely, this present reaction has deeper historical roots. Traditionally, forces within medicine, nursing and society have restricted the nurse's role to tasks delegated by medicine with the result that the ability of the profession of nursing and the students it trains to deal with questions of mobility have been seriously impeded. The relationship between nursing and medicine appears to be "characterized by medical authoritarianism on the one hand, and nursing acceptance of dependence or even deferment on the other" (Bates, 1970, p. 131). Experimental proof of this view has been reported in which 21 of 22 nurses prepared to give an excessive dose of an unknown drug ordered by an unknown telephone caller alleging to be a physician (Dalrymple, et. al., 1968). In light of this ethic, and the recent evolution of the role of the nurse clinician or the nurse clinical specialist, as well as the expanded role of the nurse in specialty and subspecialty areas, it is not unreasonable that interest development in the role of the nurse physician associate should be undifferentiated at the present time according to professional role identification.

The lack of meaningful level of training effects upon the development of interest in the role of the nurse physician associate also has similar implications for nursing and nursing

education. Although this study indicates that initial entrance into a formal course of study in nursing may be a more favorable time for the introduction of occupational information on new health care roles, it appears to make little difference in terms of what more advanced level of training occupational information is introduced.

In discussing evidence demonstrating the inability of nurses with different levels of training to effectively communicate with each other, it has been pointed out that the causal factor for such inability may stem from the very nature of the origin of nursing (Cecala, et. al., 1970). The first organized nursing efforts were under the auspices of military and religious groups. This historical legacy has had a lasting effect on nursing education itself. Likewise, the rigid, authoritarian character of nursing as it pursues traditional forms of vertical mobility does not appear to permit level of training to have a meaningful relationship with the development of interest in unique forms of mobility by nursing students.

The implications of this study thus provide a significant challenge for the profession of nursing. There is great potential for nursing education in formulating where it is, where it has been, and where it is going by reflecting and comparing nursing with functionally changing or emerging occupations (Rubin, 1966). An equal challenge presents itself for the profession of medicine. Medical educators have paid relatively little attention to the role of the nurse in medical education (Nordmann, et. al., 1963). The Report of

the Citizens Commission on Graduate Medical Education (1969) has stated that physicians should be given greater training for cooperative effort, not only for productive interaction with other medical specialists, but also with members of other health professions. In this study, interviews revealed that there appears to be no expressed desire for the nursing students or registered nurses to usurp the physician's role by moving into the practice of medicine. There appears to be no intent to foster the professional erosion of medicine by nursing, a fear commonly expressed by physicians.

Whether or not this challenge will be met is questionable:

> "The technology of health care is making enormous demands upon medicine and, through medicine, upon nursing. Despite their complexity, technical aspects of patient care are often more manageable than the psychosocial and interpersonal. They may also be more remunerative, more exciting and less personally disturbing. Whether, amid these pressures and lures, nursing can acquire sufficient knowledge and strength to develop and maintain its own role is a question for the future. Whether medicine can facilitate this process and learn to work more effectively with nursing is an equally important issue. The search for answers to these questions will impinge upon sensitive areas within both professions. Decisions must be carefully weighed by all those involved. They should be based upon experimentation, reasoned judgment, and joint planning, rather than on traditionalism, self-protectiveness and professional prestige" (Bates, 1970, p. 133).

Implications for vocational theory development and counseling practice.

(1) Implications for vocational theory development.

(a) In the population studied and with the experimental methodology employed, there was no evidence obtained to support the concept of the "career lattice" or horizontal dimension hypothesized by Perry. The lack of treatment main effects casts doubt upon

professional role identification as a critical variable in determining movement in terms of interest development across a horizontal dimension. Although it is possible that the critical components of the lattice are defined by other parameters such as ethical values or situational variables, the lack of treatment main effects does call into serious question the health care model of career development employing both ladder (vertical) and lattice (horizontal) components in terms of conceptualizing interest development in new health care roles.

(b) There was no evidence to support the contention that professional self-concept as portrayed by professional role identification is a critical variable in the development of interest in new health care roles intermediary between two established health care professions. Alternative modes of conceptualizing the growth of new intermediary health care professions may be necessary before the basic dynamics of interest development in these new roles can be established. Interest development in new health care professions may be the result of interaction with specific work settings rather than with stereotypic professional role identifications. Roles may be negotiated in the clinical situation rather than defined by professional organizations or contributors

to professional journals. Occupational sociologists often see work situations and particular institutions as arenas for new role development.

> "The work situation and the institution itself are not simply places where people of various occupations and professions come together and enact standard occupational roles, either complimentary or conflicting. These locales constitute the arenas wherein such roles are forged and developed" (Bucher and Straus, 1961, p. 333).

It is within such a context that the emergence of interest in the provision of assistive support for physicians takes on a different basis from that employed in this study. Rather than such functions being viewed as an expansion of the existing profession of nursing, a desire to enter into the profession of medicine or an amalgamation of the traditional roles of nursing and medicine, the work situation may be the arena in which new professional identities are actually forged. The results of this study appear to support such a view. In addition, experienced nurses will often say of "new" nursing roles with new associated titles, "Oh...but I have been doing that for years...unofficially, of course." Furthermore, recent developments in the field of health manpower appear to be in keeping with this perspective. There is presently an American Association of Medical Assistants which has developed, in conjunction with the American Medical Association, an accredited educational program which formalized the role of medical

assistants in the clinical situation (Report of the Council on Medical Education, 1969). Clarification of the medical legal responsibilities governing the practice of physician assistants has begun at Duke University (Bulletin of Duke University, p. 3). There have also been recent attempts to propose classification systems for the physician assistant (Report of Ad Hoc Panel, National Academy of Sciences, 1970).

An established authority on nursing manpower is Eli Ginzberg, a leading developmental theorist whose name has been associated with the Ginzberg, Ginsburg, Axelrad and Herma Theory. This theory views the essential dynamics of vocational choice as a series of irreversible compromises the individual makes between his wishes and his possibilities. With regard to the identification of distinct roles at various levels of nursing practice, he has stated:

> "I do not believe there is any possibility of the professional nursing associations drawing the boundaries around each of (these) different groups of nurses and maintaining them in fixed positions. Today the boundaries differ in the same city: they differ from one hospital to another: they differ in terms of the qualities of nursing services provided. They simply cannot be set once and for all time: there are too many variables" (Ginzberg, 1967, p. 28).

Ginzberg's view is basically in keeping with the theoretical contributions of Thompson, Avery and

Carlson (see Review of Literature, pp. 43 through 45). The findings of this study suggest that interest development in new health care professions cannot be simplistically viewed as identifications with stereotypic roles, but rather more productively a complex interaction of the four basic career strategies and the four basic career patterns established by Thompson, Avery and Carlson with specific work settings affording differential possibilities.

(2) Implications for counseling practice. The lack of treatment main effects in this study places a particular responsibility on counselors engaging in career counseling with the client interested in the professions of nursing and medicine. An addition to addressing himself to the student's awareness of educational requirements and traditional roles of medicine and nursing, it is necessary to assist students in cultivating the skills and attitudes which will facilitate productive function in health care settings. Students preparing for careers in medicine and nursing must be aware that their professional responsibilities will include:

> "(1) ability to contribute to defining the profession's role as it evolves in various settings, (2) acceptance of the qualifications of colleagues in other disciplines to contribute to such a role definition, (3) understanding the desirability of some overlap of functions as between disciplines, (4) capacity (and willingness) to contribute to the definition of colleagues' responsibilities" (Horwitz, 1970, p. 139).

As the percentage of serial careers increases and as new and different health care roles evolve in response to social stresses and technological advances, to do less with the client is to seriously impair his potential professional effectiveness.

An interesting additional finding in this study pertains to the relationships obtained between measures of stated, manifest and tested interest. Examination of correlations between these measures (Table V) indicates meaningful positive relationships occurring early between early stated respondent interest and early stated interest assumed held by others as well as between early stated respondent interest and manifest interest. Later in the process of interest development, there appears to be even a more meaningful relationship between late stated respondent interest and tested interest, late stated interest assumed held by others and tested interest, and late stated respondent interest and late stated interest assumed held by others. It is thus possible to tentatively hypothesize that early in the development of interest in a health care role, interest in that role is associated with information seeking and projection of that interest upon others. As the process of interest formation continues, interest in a health care role becomes even more meaningfully associated with increased information possessed on that role and an increasing

projection of that interest upon others. This may provide a meaningful insight into patterns of interest development in new health care roles other than the nurse physician associate.

Implications for further research. Failure to confirm the major hypotheses in this study leads to the possibility that a type II error has occurred. The major causes of a type II error are a conservative alpha level, inadequate sample size and excessive population variance in the trait being measured. Examination of the data does not appear to indicate that an increase in alpha level would have affected the results significantly. However, the two other factors mentioned above appear to indicate that a replication of the experimental design appears appropriate. In addition, such replication with a sample drawn from a different nursing school would decrease the probability of a selection treatment interaction and increase generalizability. Replication of this experimental methodology would also allow a sequential refinement of treatment. A reasonable question exists as to whether the lack of experimental main effects is due to the lack of effect of professional role identification in stimulating interest differentially or whether the nature and extent of the medium utilized to provide these role identifications, in this case, occupational information booklets, was an appropriate choice.

As discussed previously, it appears that some attempt to assess the dynamics of interest development in the role of the nurse physician associate should take place in

specific work settings permitting the practice of such a role or in educational settings which provide maximal training contacts with different professional personnel. In addition, it appears that additional research is necessary to clarify some of the parameters which would allow the resolution of some of the controversy surrounding the role of the nurse physician associate and, thus, facilitate the presentation of occupational information in a more meaningful fashion in future research in interest development. The Council on Health Manpower in 1970 utilized consultants to define researchable problems related to the physician assistant. Among these are:

(1) Determination of the duties, functions and responsibilities which can be transferred from the physician to the physician assistant.

(2) Determination of the need for a new occupation versus role expansion among existing occupations.

(3) Determination of whether physician assistant programs should be organized on a generic basis or according to medical specialities.

(4) Determination of educational settings in which the physician assistant should be trained.

(5) Determination of potentials for career development, i.e., horizontal, vertical and geographical mobility.

(6) Identification of potential sources for candidates.

(7) Possible effects on cost of medical care.

(8) Anticipated degree of acceptance by the consumer.

(9) The legal implications, both civil and criminal, in utilizing such personnel.

(10) The degree of independence allowable in various care settings and the degree of medical supervision necessary in each.

In one sense, the research needed to promote and assess interest development with regard to the physician assistant relates not only to transfer between professions, but also to the entire area of vertical mobility within professions, a relatively unexplored subject which assesses the opportunities and problems in connection with the movement of persons from one level of practice to another (Hiestand, 1966). In most nonmedical fields, recruitment from the next lower level on the basis of experience is often as important as formal training for the position. Hiestand points out that alternative routes into the various health care fields have often been obstructed by tight control of training requirements for licensure or by professional groups. He states, however:

> "Research, including experimental programs, should investigate ways to encourage upgrading and transfers among the health occupations. The need for such mobility is likely to increase as a greater degree of differentiation occurs in nursing and other health occupations. Research would probably disclose that advancement by stages is a sensible course for those with limited means and uncertain ambitions and opportunities; that is, that it reflects some very normal exigencies of life. Research also ought to further illuminate the effects current practices in upgrading of health personnel are having on recruitment and retention of personnel.
>
> More specifically, research needs to be done on the qualities of nursing, technical and paramedical personnel at each level to see whether new sources of manpower for the next higher level might be

> found. Can ways be found to elevate experienced nurse's aides to the practical nurse level, short of having them take the entire practical nurse program? Can experienced practical nurses be similarly upgraded to the associate or diploma nurse level? How can associate and diploma school graduates be most effectively upgraded to the bachelor nurse level? How can laboratory helpers be upgraded to technicians, and technicians to technologists? Research might indicate ways in which new occupations in patient care and diagnosis might develop between the physician and the bachelor level nurses and technologists.
>
> Crucial policy questions are involved here. The practice is so common in other fields, however, that upgrading might become a major source of manpower in each of the various levels of nursing, technical and paramedical service. In a similar vein, Kissick points to the need to explore the opportunities for lateral transfer among the various paramedical occupations. He also suggests the need for experiments in core courses in the various health occupations, not only to conserve educational resources, but also to encourage both vertical and lateral mobility" (Hiestand, 1966, p. 165).

This study has been an attempt to answer the call for research of this type. But like most initial research attempts in a relatively unknown area, it raises more questions than it answers. Among these are:

(1) Do persons preparing for health care professions demonstrate different dynamics in the development of interest in horizontal mobility than persons in other professions or occupations?

(2) Are there different dynamics operating in the development of interest in horizontal mobility by nursing personnel presently functioning at different vertical levels in professional practice settings?

(3) Do health care personnel in professions different from nursing have similar dynamics of interest development in horizontal mobility?

(4) What is the relationship of sexual identification associated with specific health care roles to the development of interest in horizontal mobility. Are there differences in the dynamics of interest development in horizontal mobility from (a) male dominated professions to male dominated professions, (b) female dominated professions to female dominated professions, (c) male dominated professions to female dominated professions, and (d) female dominated professions to male dominated professions.

(5) What is the relationship between the short term dynamics of interest development in horizontal mobility and longitudinal components measured over a period of years?

It is possible to conceptualize a new research strategy to determine the relationship of professional role identification to the development of interest in the nurse physician associate. It seems that medicine and nursing appear to both complement and substitute for each other. If an occupational information program, such as the one employed in this study, were conducted in areas of the country where physician shortages are acute, one would expect a high level of interest by nurses in the role of the nurse physician associate if nursing is a substitute for medicine, and a low level of interest in the role of the nurse physician associate if nursing is complementary to medicine. On the other hand, in areas of the country where physician shortages are relatively minor, we would expect to find a high level of

interest in the role of the nurse physician associate if nursing is complementary to medicine, and a low level of interest in the role of the nurse physician associate if nursing is a substitute for medicine. If one concedes that a substitutionary posture on the part of nursing represents an identification with medicine and a complementary posture represents role identification with nursing, a viable research approach presents itself in which sociological variables which have been sources of contamination in the past could now serve as covariables to increase the possibility of demonstrating treatment main effects.

This study has found its impetus and direction from a crucial and yet unsolved problem of American society: high aspirations and low fulfillment of health care needs. Rather than utilize an analytic method to assess the dimensions of assistive support for physicians, this study was based on a synthetic approach in which a model was created to study interest development by nursing students in providing such assistance. Although the model appears to have been found wanting, the synthetic method still seems to provide the best hope we have to enable research in social science to address itself to the issues which affect our lives as a people while seeking truth which, like infinity, is forever being sought but never achieved.

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APPENDIX A

Occupational Information Booklet--

Physician Role

(Including covariable,
measures of early interest,
resource information sheet
and post card.)

OCCUPATIONAL INFORMATION VALIDATION PROCEDURE

We would appreciate your assistance in helping us determine the effectiveness of occupational information about a new therapeutic role: the nurse physician associate. **Please be assured that your contributions will be kept confidential.**

I. Please write your name here _____

II. Please respond to the following by circling the number of the item which best describes your present degree of awareness of the role of the nurse physician associate.

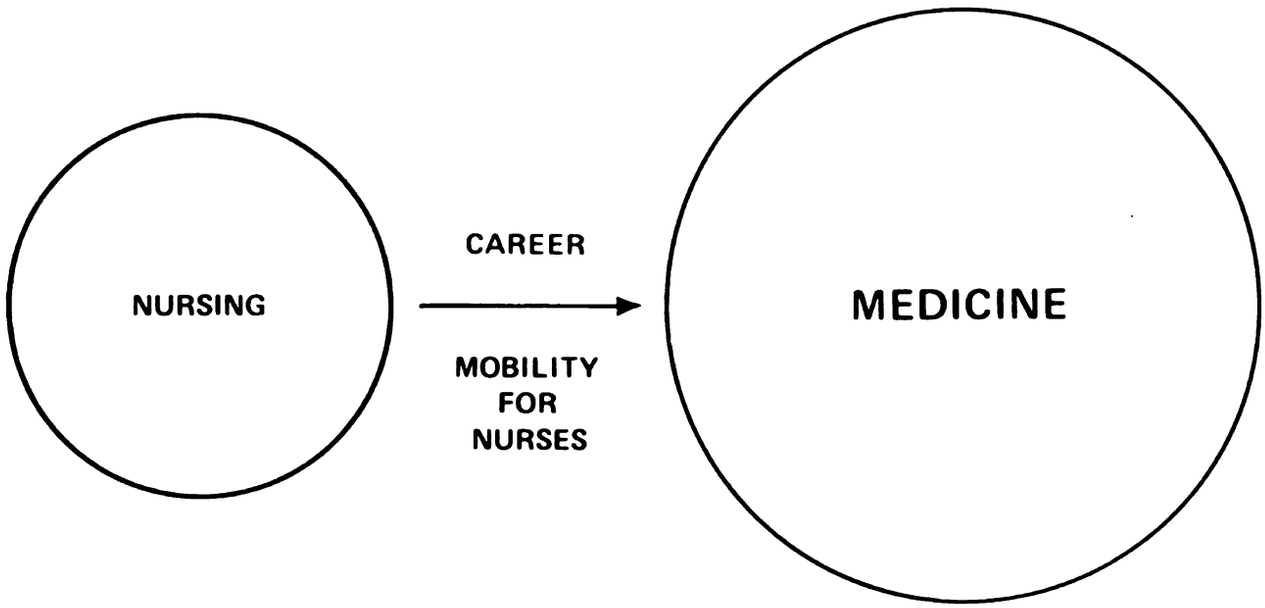
1. Have never heard of nurse physician associate
2. Have heard the role mentioned, but no factual knowledge of training and responsibilities
3. Have minimal awareness of role function, training programs, effectiveness in patient care
4. Have moderate awareness of role function, training programs, effectiveness in patient care
5. Have great awareness of role function, training programs, effectiveness in patient care
6. Consider myself authority on this subject

III. Turn the page and read the booklet carefully. **Be sure to answer the questions at the end of the booklet.** Note that with this booklet is a **Resource Information Sheet** which should be retained by you to inform you of the resources which are available to acquaint you with the role of the nurse physician associate.

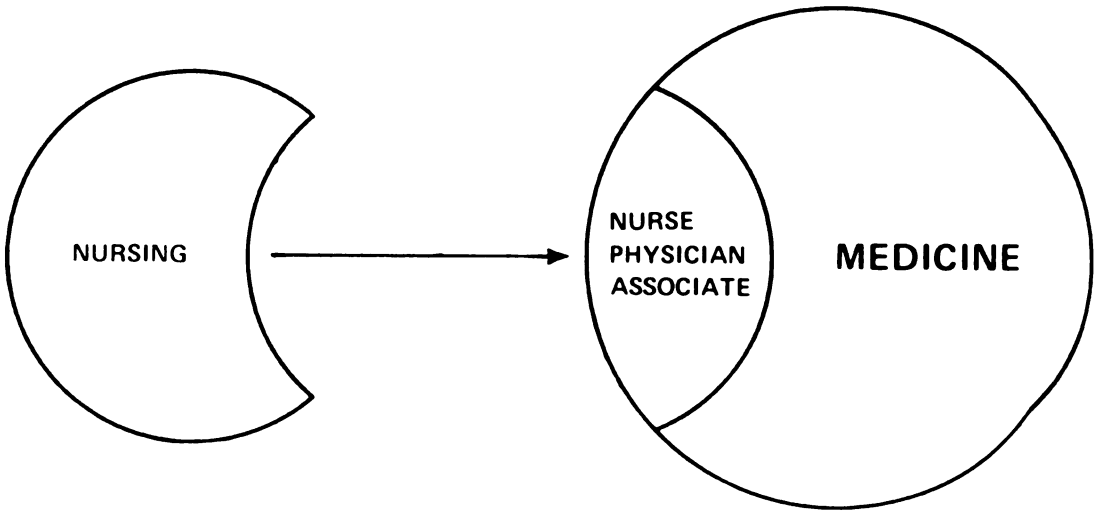
INTRODUCING A REWARDING NEW **MEDICAL** ROLE:

THE NURSE PHYSICIAN ASSOCIATE

The role of the nurse physician associate represents a major development in the structure of medicine. Innovative professional leadership in medicine has in effect opened the doors of this profession to qualified registered nurses who seek to develop their competencies beyond those gained in the practice of nursing.



It is anticipated that further changes in the legal regulations governing the practice of medicine will make it possible for the nurse physician associate to continue to expand her medical functions. In addition, multiple entry points being anticipated for many medical schools will allow nurses who wish to do so to gain complete professional certification in medicine. There is a large body of knowledge from research and demonstration projects which has accumulated in the past few years regarding the increased efficiency and effectiveness of patient care as qualified nurses begin to undertake the practice of medicine. These successes have led to the development of the nurse physician associate.



Examples of such demonstrated competency in the practice of medicine include the use of the nurse physician associate in taking a complete patient history, doing a thorough physical examination, deciding what preliminary laboratory tests should be ordered for a patient, authorizing issuance of certain types of drugs and making judgments as to when medical specialists should be called in as consultants.

In order to help meet the tremendous shortage of physicians' services, informational resources are being made available to acquaint you with the education preparation, responsibilities and effectiveness of the nurse physician associate (see resource information sheet). You are encouraged to avail yourself of these opportunities to consider future changes in the direction of your professional growth.

I. Please circle the number of the item which best describes **your** present degree of interest in the role of the nurse physician associate.

1. Not interested in obtaining further information
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested in obtaining further information
5. Extremely interested in obtaining further information
6. Extremely interested in obtaining further information, would seriously consider becoming a nurse physician associate

II. Please circle the number of the item which best describes what **you feel are your classmates'** present degree of interest in the role of the nurse physician associate.

1. Not interested in obtaining further information
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested in obtaining further information
5. Extremely interested in obtaining further information
6. Extremely interested in obtaining further information, would seriously consider becoming a nurse physician associate

III. How do you feel this booklet could be improved?

Content:

Organization:

Illustrations:

RESOURCE INFORMATION SHEET

(Please remove from Booklet and retain)

1. A resource person will be available to you to answer any questions you may have about the role of the nurse physician associate between the hours of 9 a.m. – 12 noon, 1 p.m. – 4 p.m., Monday through Friday in 348 Baker Hall.

2. Reading material on the role of the nurse physician associate will be available to you between the hours of 8 a.m. to 11 p.m., daily, in the MSU Library, in Science Library, assigned reading desk, ground floor – west.

3. You may mail the attached postcard for further information on the role of the nurse physician associate.

POSTCARD

Please send me further information on the role of the nurse physician associate and training programs currently available.

Name _____

Local Address _____

City _____ State _____ Zip _____

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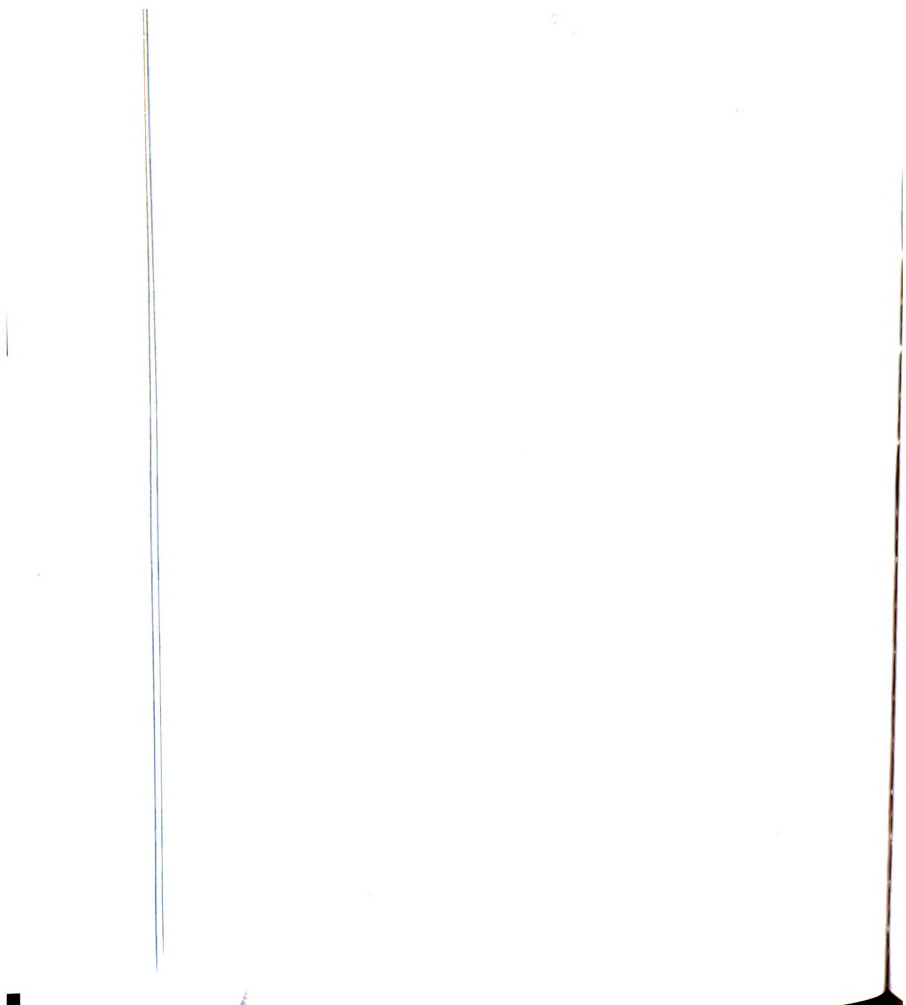
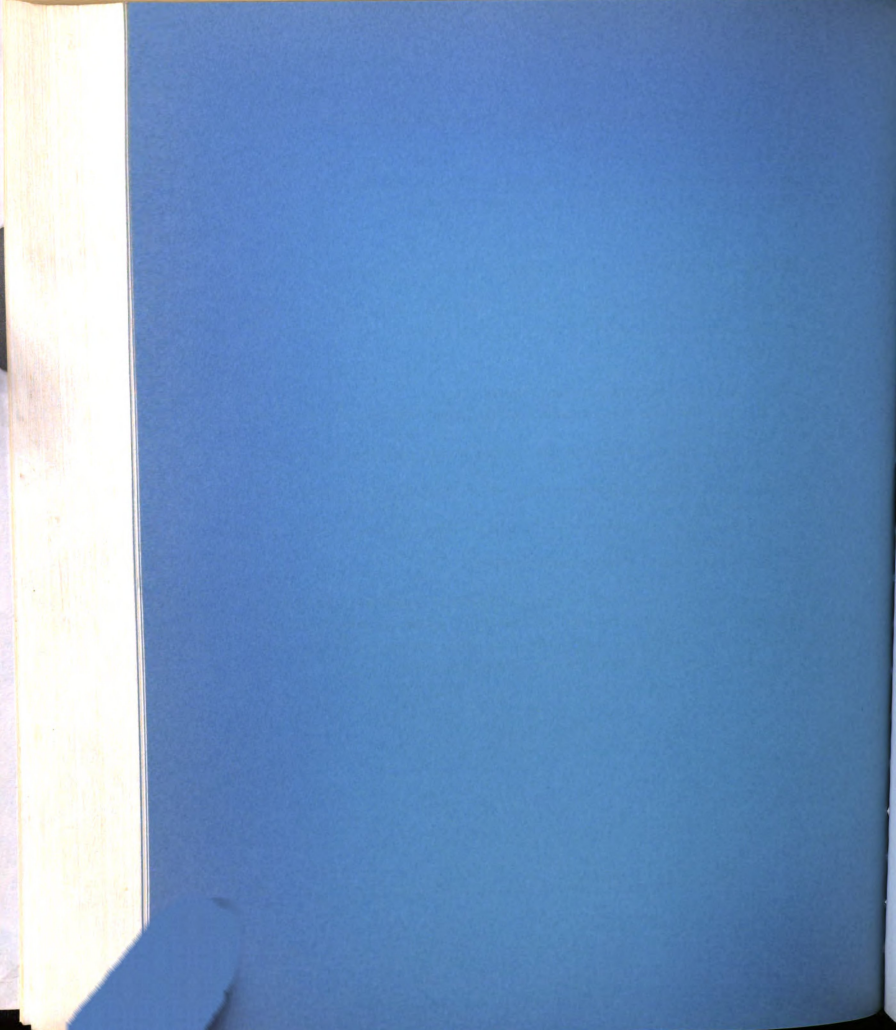
APPENDIX B

Occupational Information Booklet--

Nursing Role

(Including covariable,
measures of early interest,
resource information sheet
and post card.)





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OCCUPATIONAL INFORMATION VALIDATION PROCEDURE

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I. Please write your name here _____

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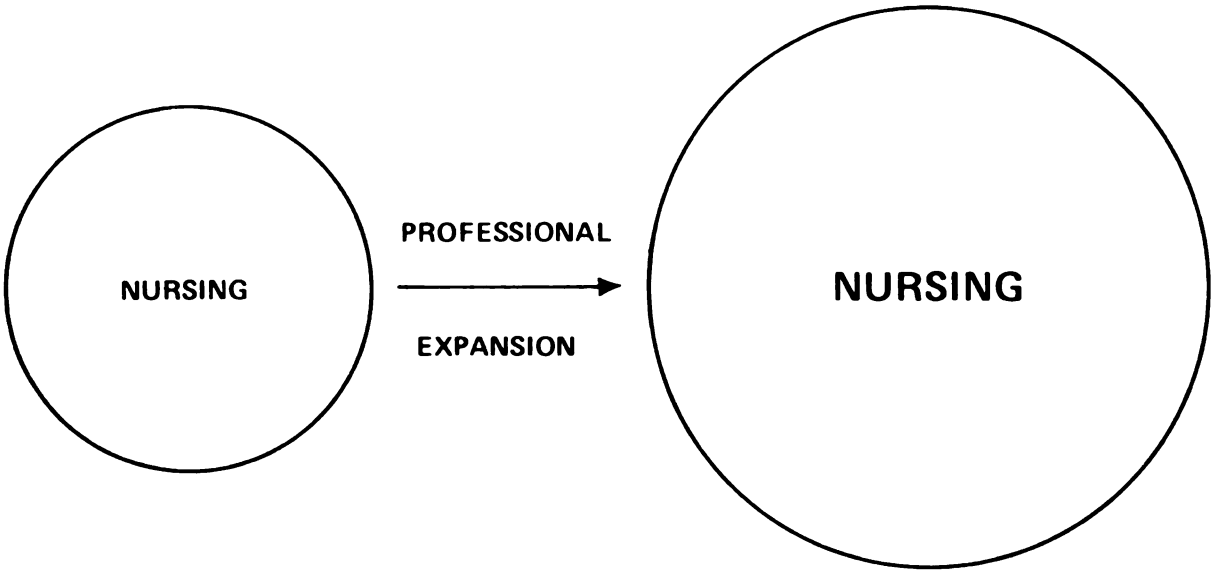
3. Have minimal awareness of role function, training programs, effectiveness in patient care
4. Have moderate awareness of role function, training programs, effectiveness in patient care
5. Have great awareness of role function, training programs, effectiveness in patient care
6. Consider myself authority on this subject

III. Turn the page and read the booklet carefully. **Be sure to answer the questions at the end of the booklet.** Note that with this booklet is a **Resource Information Sheet** which should be retained by you to inform you of the resources which are available to acquaint you with the role of the nurse physician associate.

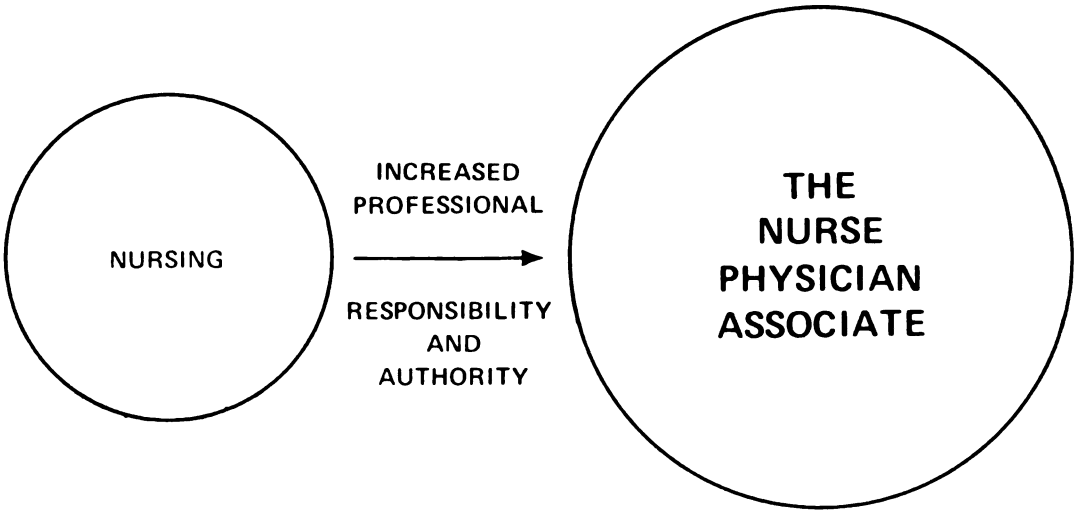
INTRODUCING A DYNAMIC NEW NURSING ROLE:

THE NURSE PHYSICIAN ASSOCIATE

The role of the nurse physician associate represents a major expansion of the role of nursing.



Innovative professional leadership in nursing as well as the emergence of a new breed of nurse clinical specialist, who has advanced university training to care for certain types of patients, has effectively laid the foundation for further development of the nurse's role. The history of nursing reveals the gradual evolution of the role of the nurse into areas which have been traditionally thought of as being the unique province of other health care professions. There is a large body of knowledge from research and demonstration projects which has accumulated in the past few years regarding increasing responsibility and authority of nursing roles in order to make available the highest level of patient care possible. The culmination of this expansion of the role of nursing has led to the development of the nurse physician associate.



Examples of such increased authority and responsibility in the role of the nurse physician associate include taking a complete patient history, doing a thorough physical examination, deciding what preliminary laboratory tests should be ordered for a patient, authorizing issuance of certain types of drugs and making judgments as to when medical specialists should be called in as consultants. As part of your educational preparation to meet the challenge of newly developing professional roles in nursing, informational resources are being made available to you on the educational preparation, responsibilities and effectiveness of the nurse physician associate (see resource information sheet). You are encouraged to avail yourself of these opportunities to expand your chosen career in nursing.

I. Please circle the number of the item which best describes **your** present degree of interest in the role of the nurse physician associate.

1. Not interested in obtaining further information
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested in obtaining further information
5. Extremely interested in obtaining further information
6. Extremely interested in obtaining further information, would seriously consider becoming a nurse physician associate

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APPENDIX C

Occupational Information Booklet--

Health Care Role

(Including covariable, measures of early interest, resource information sheet and post card.)

OCCUPATIONAL INFORMATION VALIDATION PROCEDURE

We would appreciate your assistance in helping us determine the effectiveness of occupational information about a new therapeutic role: the nurse physician associate. **Please be assured that your contributions will be kept confidential.**

I. Please write your name here _____

II. Please respond to the following by circling the number of the item which best describes your present degree of awareness of the role of the nurse physician associate.

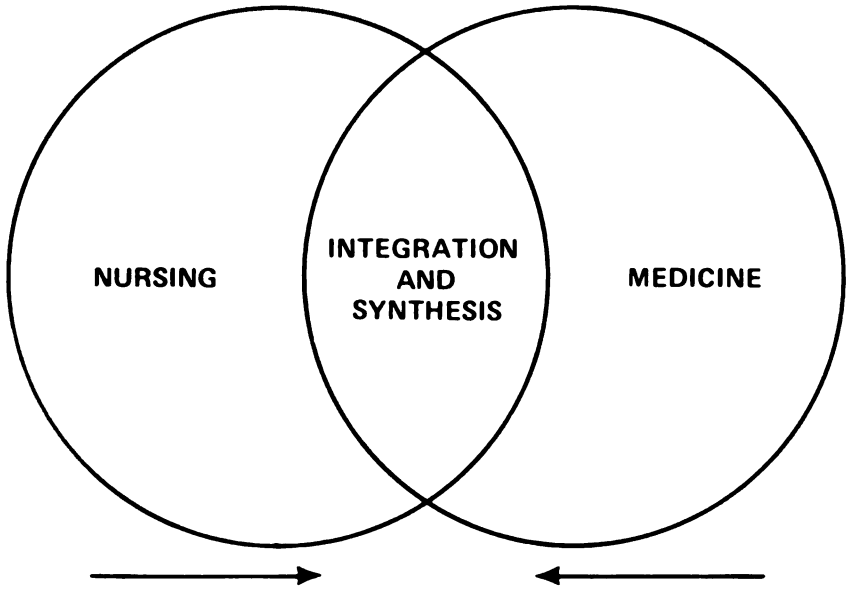
1. Have never heard of nurse physician associate
2. Have heard the role mentioned, but no factual knowledge of training and responsibilities
3. Have minimal awareness of role function, training programs, effectiveness in patient care
4. Have moderate awareness of role function, training programs, effectiveness in patient care
5. Have great awareness of role function, training programs, effectiveness in patient care
6. Consider myself authority on this subject

III. Turn the page and read the booklet carefully. **Be sure to answer the questions at the end of the booklet.** Note that with this booklet is a **Resource Information Sheet** which should be retained by you to inform you of the resources which are available to acquaint you with the role of the nurse physician associate.

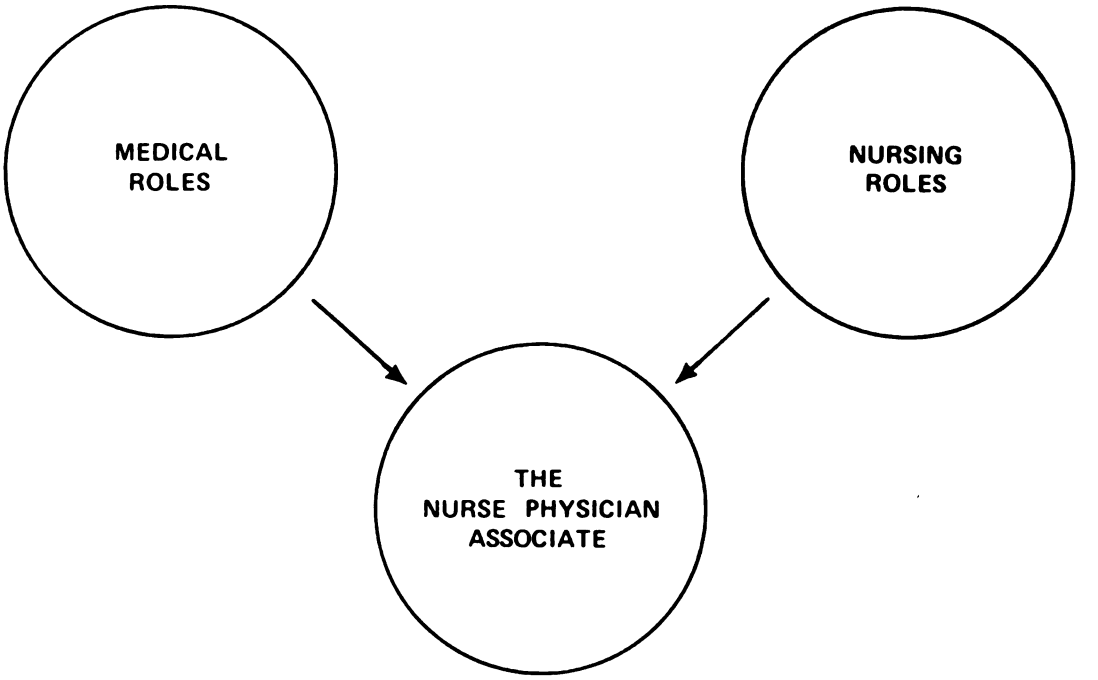
INTRODUCING AN IMPORTANT NEW HEALTH CARE ROLE:

THE NURSE PHYSICIAN ASSOCIATE

The role of the nurse physician associate represents a major development in both the profession of nursing and the profession of medicine. Innovative professional leadership in medicine and nursing has encouraged an integration and synthesis of both professions to accomplish a higher level of patient care.



Nursing and medicine have experienced a dynamic change in the nature and extent of their work in relation to their past, each other and the public. Increasing expectations regarding the availability of health care and a growing array of new specialized diagnostic and therapeutic techniques have caused an increased interdependence of the physician and nurse. These have resulted in procedures and problems of judgment which today cannot be clearly designated as being solely the province of medicine or of nursing. Although generally physician and nurse exercise different means to obtain the goals they share, their collaboration in the process of arriving at a therapeutic program and the activities in which they both engage serve to blur the distinctive features of each role. The amalgamation of medicine and nursing has made possible the role of the nurse physician associate.



Examples of the effective dynamic interaction between nursing and medicine include these roles carried out by nurses trained as nurse physician associates: taking complete patient histories, doing thorough physical examinations, deciding what preliminary laboratory tests should be ordered for patients, authorizing issuance of certain types of drugs and making judgments as to when medical specialists should be called in as consultants.

In order to acquaint nursing students with the opportunities for interdisciplinary teamwork which will be available in the future, informational resources are being made available to you on the educational preparation, responsibilities and effectiveness of the nurse physician associate (see resource information sheet). You are encouraged to avail yourself of these opportunities to learn more about the role of the nurse physician associate.

I. Please circle the number of the item which best describes **your** present degree of interest in the role of the nurse physician associate.

1. Not interested in obtaining further information
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested in obtaining further information
5. Extremely interested in obtaining further information
6. Extremely interested in obtaining further information, would seriously consider becoming a nurse physician associate

II. Please circle the number of the item which best describes what **you feel are your classmates'** present degree of interest in the role of the nurse physician associate.

1. Not interested in obtaining further information
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested in obtaining further information
5. Extremely interested in obtaining further information
6. Extremely interested in obtaining further information, would seriously consider becoming a nurse physician associate

III. How do you feel this booklet could be improved?

Content:

Organization:

Illustrations:

RESOURCE INFORMATION SHEET

(Please remove from Booklet and retain)

1. A resource person will be available to you to answer any questions you may have about the role of the nurse physician associate between the hours of 9 a.m. – 12 noon, 1 p.m. – 4 p.m., Monday through Friday in 348 Baker Hall.

2. Reading material on the role of the nurse physician associate will be available to you between the hours of 8 a.m. to 11 p.m., daily, in the MSU Library, in Science Library, assigned reading desk, ground floor – west.

3. You may mail the attached postcard for further information on the role of the nurse physician associate.

POSTCARD

Please send me further information on the role of the nurse physician associate and training programs currently available.

Name _____

Local Address _____

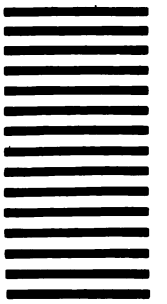
City _____ State _____ Zip _____

FIRST CLASS
Permit No. 941
East Lansing, Mich.

BUSINESS REPLY MAIL
No Postage Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY:

Richard E. Darnell
1407 F. Spartan Village
East Lansing, Michigan 48823



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APPENDIX D

Library Utilization Tally Sheet

Library Utilization Tally Sheet

Student Name	Date of Visit

APPENDIX E

Resource Person Utilization Tally Sheet

Resource Person Utilization Tally Sheet

Student Name	Date of Visit

APPENDIX F

Information Sheet

INFORMATION SHEET REACTION FORM

We would appreciate your opinion of the following information sheet on the role of the nurse physician associate. Your reactions will be used to develop and improve occupational information on this new role. **Please read the following information carefully for content** and make whatever comments you feel are appropriate on the sheet provided. **Be assured that your comments will be kept in strict confidence.**

Please write your name here _____

and turn to the following page.

Information Sheet

During the last ten years in the United States and Europe, there has been a significant increase of interest in the development of the role of the nurse physician associate. The evolution of this new health care role is directly linked to the present severe shortage of physician services. Although several major medical centers are presently establishing training programs, the fullest development of the nurse physician associate has occurred at the University of Colorado under a program established by Henry Silver, M.D. and Loretta Ford, R.N., Ed.D. In this program, there has been an emphasis on the training of professional nurses as pediatric nurse practitioners who provide services to newborns and their mothers far in excess of those ordinarily made available by nursing. After a four-month formal training program, the pediatric nurse practitioners function in the offices of pediatricians in private practice and in field stations in low income urban and rural areas.

The largest constraint operating on the further development of this new professional role appears to be a legal clarification of its functions. Although there has been some concern by the profession of nursing that the full development of this role would cause a greater shortage of professional nurses than now exists, a large number of recent research and demonstration projects have vividly demonstrated the increased efficiency and effectiveness of health care programs which include this new role.

Some of the findings of the training program at the University of Colorado have yielded the following results:

1) Analysis of the functions carried out by the nurse physician associate indicates that they are fully capable of performing them successfully.

2) Nurse physician associates practicing alone in a health care station can care for approximately 75% of the children without the immediate assistance of a physician. Of the remaining 25%, consultations with a physician by telephone were the only form of help necessary for another 11%.

3) A survey of 180 cases seen by nurse physician associates and pediatricians demonstrates that significant differences in assessment occur in only 1% of the cases.

4) Physicians in private practice report that those who use nurse physician associates in their practice find that they can see at least 33% more patients.

Because of such findings, a large increase in the number of programs training nurse physician associates can be expected in many medical specialty areas. The evolution of this role may be affected, however, by the large number of physician assistant programs drawing candidates from other professional and non-professional backgrounds. The nurse physician associate training programs presently in operation attempt to attract graduate nurses with considerable experience in patient care. Curriculum development in these programs is complicated by the fact that the exact role and responsibilities of the nurse physician associate are constantly evolving.

Reaction Sheet

1. What is your opinion of the content which was presented?

2. What is your opinion of the organization of the material?

3. How could the information sheet be improved?

Thank you for your help.

APPENDIX G

Test of Recall

(Including measures of late interest)

SURVEY QUESTIONNAIRE INFORMATION RETRIEVAL FORM

Please write your name here _____

I. Please circle the number of the item which best describes **your** present degree of interest in the role of the nurse physician associate as a potential career opportunity for you.

1. Not interested
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested
5. Moderately interested
6. Would seriously consider becoming a nurse physician associate

II. Please circle the number of the item which best describes what **you feel are your classmates'** present degree of interest in the role of the nurse physician associate as a potential career opportunity.

1. Not interested
2. Not interested at present, may be interested in future
3. Unsure of interest at present time
4. Mildly interested
5. Moderately interested
6. Would seriously consider becoming a nurse physician associate

You recently received an information sheet on the role of the nurse physician associate. This survey questionnaire is designed to test the effectiveness of that sheet in transmitting certain factual information. **The results of this survey will not be used in any other way.**

Please write your name on the IBM sheet and fill in the appropriate boxes corresponding to your name. Then answer the following questions by filling in the appropriate space on the IBM sheet with the pencil provided. There is only one correct answer for each question. If you have absolutely no idea of the correct answer, leave the question blank. However, if you are not sure of the correct answer but think you recall it, please feel free to guess.

1. The development of the nurse physician associate has occurred predominantly in the last:

    a. 2 years
    b. 5 years
    c. 10 years
    d. 20 years

2. Interest in the role of the nurse physician associate has occurred mainly in the:

    a. United States
    b. United States and Canada
    c. United States and Europe
    d. United States and South America

3. A great concern by the profession of nursing regarding the role of the nurse physician associate has been:

    a. the erosion of public confidence in nursing
    b. further increases in the shortage of professional nurses
    c. the professional status of the new role
    d. uncertainty regarding the nurse's ability to perform the new role

4. The fullest development of the role of the nurse physician associate has occurred at:

    a. the University of California
    b. Harvard University
    c. Michigan State University
    d. the University of Colorado

5. The persons primarily responsible for the development of the role of the nurse physician associate are:

    a. Silver and Ford
    b. Haney and Smith
    c. Handel and Oliver
    d. Mead and Jones

6. The role of the nurse physician associate has achieved its widest application in the practice of:

    a. surgery
    b. internal medicine
    c. pediatrics
    d. psychiatry

7. The most significant constraint retarding the development of the nurse physician associate appears to be:

    a. ethical
    b. legal
    c. resistance by physicians to their use
    d. resistance by nurses to their use

8. The evolution of the nurse physician associate is most directly linked to:

    a. a severe shortage of physicians
    b. increasing health care demands
    c. expansion of patient care into the home
    d. the rise of specialization in medicine

9. The efficiency and effectiveness of the role of the nurse physician associate has been supported by:

    a. statements by the American Medical Association
    b. statements by the American Nursing Association
    c. the results of various research and demonstration projects
    d. theoretical interrelationships between medicine and nursing

10. The formal training program for the nurse physician associate described in the information sheet is:

    a. 4 months duration
    b. 8 months duration
    c. 12 months duration
    d. 24 months duration

11. After the formal training program, the nurse physician associate functions mainly in:

    a. small general hospitals
    b. large university hospital centers
    c. offices of physicians in private practice and in field stations
    d. visiting nurse associations and labor union clinics

12. Analysis of the functions carried out by the nurse physician associate indicates that they are:

    a. incapable of performing them
    b. moderately capable of performing them
    c. becoming fully capable of performing them
    d. presently fully capable of performing them

13. Nurse physician associates practicing alone can care for approximately what percentage of children without the immediate assistance of a physician?

    a. 25%
    b. 50%
    c. 75%
    d. 100%

14. A survey of cases seen by nurse physician associates and medical specialists demonstrate that significant differences in assessment occurs in what percentage of cases?

    a. 1%
    b. 5%
    c. 10%
    d. 20%

15. Physicians report that those who use nurse physician associates in their practice find that they can see at least what percentage more patients?

    a. 10%
    b. 33%
    c. 50%
    d. 100%

16. The acceptance of the nurse physician associate role by patients has been shown to be:

    a. uneffected by socio-economic class
    b. limited in the very rich
    c. limited in the very poor
    d. insufficient information in information sheet to respond

17. In the future, the role of the nurse physician associate can be expected to:

    a. increase in many medical specialty areas
    b. remain relatively stable
    c. increase only in psychiatry
    d. decrease generally

18. The evolution of the role of the nurse physician associate may be most affected by:

    a. lack of patient acceptance
    b. lack of physician acceptance
    c. resistance by health care insurance programs
    d. physician assistant programs other than those drawing from the profession of nursing

19. The nurse physician associate training programs presently in operation attempt to attract:

    a. qualified practical nurses
    b. qualified undergraduate nursing students
    c. registered nurses immediately after graduation
    d. registered nurses with considerable experience in patient care

20. Curriculum development in nurse physician associate training programs is complicated by:

    a. financial limitations
    b. lack of acceptance by physician
    c. the evolution of the role of the nurse physician associate
    d. a lack of qualified faculty

APPENDIX H

Interview Format

INTERVIEW FORMAT

Level	Treatment

Student Name_____

Date Interviewed_____

Interviewer_____

1. What was your general impression of the total program made available to you to provide an orientation to the role of the nurse physician associate?

   Positive_____; Negative_____; Non-commital_____

   Comments:

2. What other opportunities to learn about the role of the nurse physician associate would have appealed to you?

   1_____

   2_____

   3_____

   4_____

3. Did you try to obtain information about the nurse physician associate through any other means? If so, what?

   1_____

   2_____

   3_____

4. a. Were you aware that different students received different occupational information booklets?

   Yes_____; No_____

   b. If answer is 'Yes', what were they?

   c. Did you discuss the differences with other nursing students?

   Yes_____; No_____

5. Do you feel that the nurse physician associate is

   _____practicing nursing,

   _____becoming a physician,

   _____obliterating the distinction between nursing and medicine,

   _____a new professional identity?

   _____Non-commital

6. Do you have any other comments?

APPENDIX I

Standardized Statement for Introduction of Experimental Treatments to Subjects and for the Collection of Dependent Variables

All experimental treatments were introduced by reading directly from the instruction page accompanying each treatment. The dependent variables were collected in a similar fashion. The classroom instructor did not assume the responsibility for the task of exposing the subjects to the experimental treatments and for the collection of the dependent variables. When questions arose which could not be directly answered from the instruction sheets accompanying the independent and dependent variables, the subject was asked to use her own judgment or draw her own conclusions.

APPENDIX J

Notice to Freshmen to Promote Second Group Contact

Enclosed you will find one dollar for your time and effort to pick up this envelope. We would like you to read the Information Sheet Reaction Form and respond to the questions on the last page. You need not do so if you do not desire to. The dollar is yours for your efforts to come here.

In order to earn an additional two dollars for ten minutes of your time, you can come to 348 Baker Hall on Thursday or Friday, October 29 or 30, between the hours of 9 a.m. - 12 noon, or between 1 p.m. - 4 p.m. Please bring the Information Sheet Reaction Form with you.

Thank you for your cooperation.

APPENDIX K

Notice to Freshmen to Promote Third Group Contact

Thank you for responding to the occupational information validation procedure.

We would appreciate your further assistance. If you will come to room 348 Baker Hall between the hours of 9 a.m. - 12 noon, or between 1 p.m. - 4 p.m. on Monday or Tuesday, October 26 or 27, you will be given an envelope with your name on it which will contain one dollar to partially compensate you for your trouble and additional materials which will require five minutes of your reading time. You may choose to read the materials or not to read the materials at your option.

Also included in that envelope will be further instructions on how you can earn an additional two dollars on Thursday or Friday, October 29 or 30, for ten minutes of your time.

Thank you for your cooperation.