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A STUDY OF FACTORS
AFFECTING THE RETENTION OF
CIVILIAN REGISTERED NURSES
IN THE ARMY MEDICAL DEPARTMENT

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A Graduate Research Project
Submitted to the Faculty of
Baylor University
In Partial Fulfillment of the
Requirements for the Degree
of
Master of Health Administration
by
Captain(P) Frank G. McDonald, III, AMSC
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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS	iii
---------------------------------	-----

Chapter

I. INTRODUCTION	1
Development of the Problem	1
Review of the Literature	3
Research Design	23
II. DISCUSSION	29
The Survey	29
Data Analysis	30
Data Interpretation	50
III. CONCLUSION	53

APPENDIX

A. QUESTIONNAIRE - SURVEY INSTRUMENT	56
B. RETURN RATE CALCULATIONS/SURVEY DISTRIBUTION	61
C. REFINEMENT OF THE VARIABLE LIST	64
D. DISCRIMINANT ANALYSIS - COMPARISON OF METHODS	73
E. DISCRIMINANT ANALYSIS - COMPARISON OF MISSING DATA OPTIONS	75
F. DISCRIMINANT ANALYSIS - PARTIAL F OF 1.5	84
G. DISCRIMINANT ANALYSIS - PARTIAL F OF 2.0	89
H. DISCRIMINANT ANALYSIS - PARTIAL F OF 3.0	93
BIBLIOGRAPHY	97

Dist	Author, or Editor
A-1	

LIST OF ILLUSTRATIONS

1-1	Employee Turnover Causal Chain	4
1-2	Employee Turnover Process	5
1-3	Supply/Demand Balance Geographically.	9
1-4	Excess Supply of CCU Nurses	10
1-5	Indifference Curve - Homogeneous Substitution	10
1-6	Civil Service Hire Process for RNs	17
1-7	Steps in Research Design	24
2-1	Number of Respondents by Groups	31
2-2	Final Variable List for Analysis	32
2-3	Discriminant Analysis Output - Partial F of 1.5	34
2-4	Centroids - Partial F of 1.5	36
2-5	Centroid Plot - Group 1	37
2-6	Centroid Plot - Group 2	38
2-7	Centroid Plot - Group 3	39
2-8	Centroid Plot - Group 4	40
2-9	Centroid Plot of all Groups	41
2-10	Standardized Discriminant Coefficients.	42
2-11	Prediction Results	44
2-12	Discriminant Analysis without Variable 16 - Overall Job Satisfaction	45
2-13	Discriminant Analysis with Tenure and Age Variables	46
2-14	Demographic Data	48
2-15	Demographic Data - Tenure	49

CHAPTER I

INTRODUCTION

Development of the Problem

The problem of the acquisition and retention of the desired number of civilian registered nurses in the Army Medical Department (AMEDD) has recently accelerated to a critical state. Perhaps it is fortunate that the federal sector has been spared, until recently, the severity of the nursing shortage which has caused significant adjustments by those in the private sector. The delayed impact of the registered nurse shortage on the AMEDD has provided the competitors for this scarce resource a head start to plan and implement a strategy to address the problem. Furthermore, it appears that salary and benefit increases, flexibility in work schedules, re-definition of roles and other such adjustments in the civilian sector have been successful in curbing the problem precipitating the crunch now observed in the federal sector.

The severity of the shortage of civilian registered nurses in the AMEDD has been recognized by the Civilian Personnel Office (CPO) at Health Services Command (HSC) through input received by them from the field offices. Most post CPOs supporting HSC Medical Department Activities (MEDDAC) and Medical Centers (MEDCEN) have reported difficulty in filling registered nurse positions. To compete for the limited number of nurses available, supporting CPOs have requested changes in hire policies such as employment at less than full performance level, advanced in-hire rates and direct hire authority. Unfortunately, the laws and regulations

governing Civil Service personnel restrict the latitude of the medical treatment facilities, the supporting CPOs, and HSC to freely adjust to the market.¹

Because of the constraints inherent in management of the civilian registered nurse, it would behoove the managers and policy makers to identify those factors currently affecting retention of civilian registered nurses in the AMEDD and anticipate trends for the future. This would enable the manager to take a proactive stance on the issue.

Information currently available to address the nurse shortage issue is limited. Although numerous studies have been conducted to isolate nurse retention factors, none have addressed the civilian registered nurse in the AMEDD. Direct application of the results from these studies of a different population to the AMEDD is questionable. Considerable data have been gleaned from exit interviews of resigning employees; however, this information is specific to the organization, is subjective, and, therefore, is suspect for use in determining overall policy. An objective data base specifically addressing the civilian registered nurse in the AMEDD is required for managers and policy makers to evaluate and anticipate trends in the total market. This will enable the appropriate individuals to address policy changes in an informed manner.

To this end a survey was conducted to analyze the impact of motivation and hygiene factors on retention. The survey was designed to identify those general motivation/hygiene variables that discriminate between those persons who stay and those who have turned over. The survey population was limited to studying AMEDD civilian registered nurses. Survey questions were designed to ultimately, through a multivariate analysis, generate information for application in a broad context (i.e., HSC-wide)

as opposed to application to specific medical treatment facilities. The respondents were limited to current employees or those that had declined or resigned within the previous six months of the survey (September 1981 to February 1982).

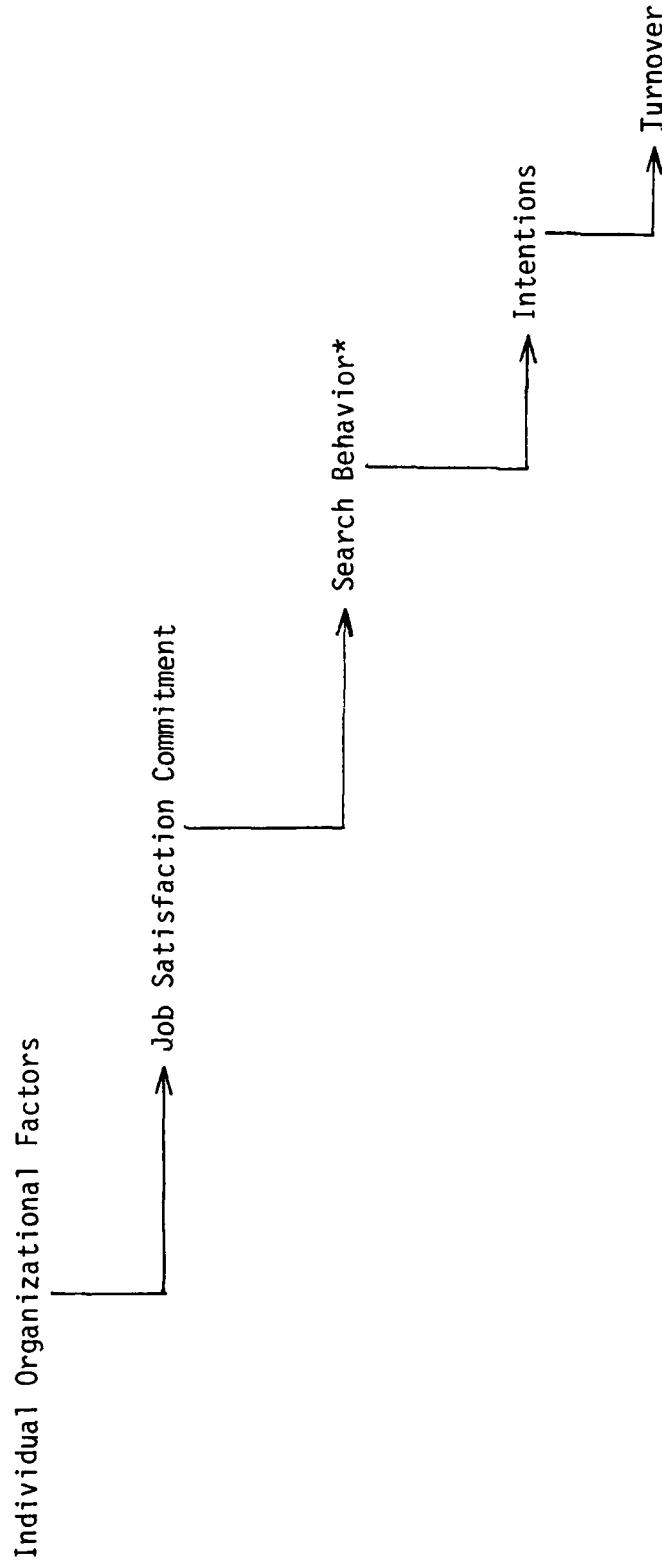
Review of the Literature

The Employee Turnover Process

The literature describes voluntary employee turnover as a process as opposed to a single occurrence.² It is suggested that a causal chain exists beginning with individual and organizational factors which determine job satisfaction and commitment which determines intention ultimately ending in turnover (Figure 1-1). Michaels and Spector acknowledge the fact that their research fails to account for considerable variance in turnover and suggests the insertion of "search behavior" into the causal chain as an opportunity variable to explain this variance.³ Mobley suggests the search behavior to be a precursor to the intent stage.⁴

Although a linear relationship is established by the causal chain models, one must acknowledge the systems context within which the process exists. The suprasystem is composed of at least the subsystems depicted in Mobley's comprehensive schematic of the primary variables affecting turnover (Figure 1-2). It is important to note that it is possible to have a change in any one or a number of these primary variables which have the potential to affect a change in the employee's position in the turnover process. In other words, positive influencing of a variable may result in a regression along the causal chain. A change in marital status may be cause alone to precipitate withdrawal from search behavior and indirectly promote commitment to the organization. Another example would be the realization that the "grass is not greener on the other side of

EMPLOYEE TURNOVER CAUSAL CHAIN

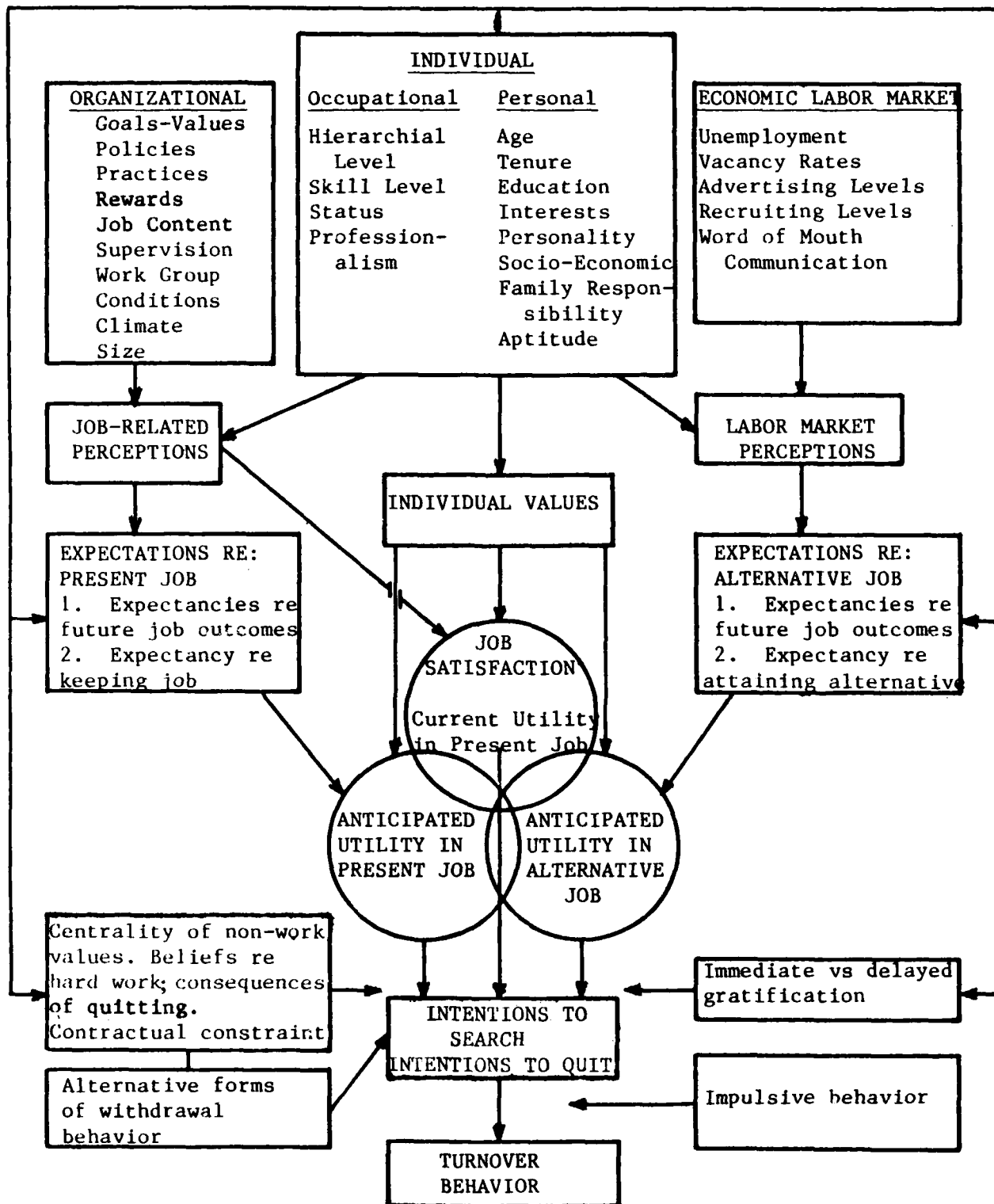


*Possible additional link which may account for large amount of variances in turnover

(Sources: Charles E. Michaels and Paul E. Spector, "Causes of Employee Turnover: A Test of the Mobley, Griffeth, Hand, and Meglino Model," Journal of Applied Psychology, Vol. 67, No. 1, p. 58; and William H. Mobley, "Intermediate Linkages in the Relationship between Job Satisfaction and Employee Turnover," Journal of Applied Psychology, Vol. 63, No. 2, 1977, pp. 237-240.)

Figure 1-1

EMPLOYEE TURNOVER PROCESS



(Source: W. H. Mobley, et al., "Review and Conceptual Analysis of the Employee Turnover Process," *Psychological Bulletin*, 86, [March 1979]: 517.)

Figure 1-2

the fence." A distorted perception crushed by hard realities is oftentimes a deterrent to turnover.⁵

Just as important, one must realize that, as the employee progresses along the causal chain, there can be no course reversal unless significant changes occur in satisfaction or expected utilities. Hellriegel and White demonstrated that, in 60 percent of the turnovers in their study, significant increases in salary (greater than 20 percent) were useless in combating turnover once the worker progressed to the intent stage.⁶

Another essential ingredient to understanding the turnover process is that it is an individually manifested behavior. Although aggregate factors, such as the national unemployment level, are good predictors of turnover on the macro level, such factors are poor predictors in the micro sense.⁷ In fact, the reason causing one employee to stay may be the very reason causing another to turnover.⁸ However, one cannot discount the impact of aggregate factors on individual behavior.⁹

Although employee evaluation of job alternatives in the environment external to his present organization has not been documented, its impact on individual turnover has been included in Mobley's model.¹⁰ Michaels and Spector were unable to confirm this relationship.¹¹

The inverse relationship between job satisfaction and turnover is well documented.¹² Mobley is quick to point out, however, that consistently less than 14 percent of the variance in predicting turnover can be accounted for through overall job satisfaction.¹³ As has been previously suggested, factors other than those directly affecting satisfaction with the immediate present job may account for considerable variance in explaining turnover. Mobley's model (Figure 1-2) suggests the joint contribution of job satisfaction (present utility), anticipated utility from the present job, and the attraction and attainability of alternatives.

The anticipated utility from present job may be considered as "sowing your seeds now for a later harvest" or as "paying your dues." The present immediate job may be a means to a more desirable position - a stepping stone. If it were not for the anticipated utility, a worker may not derive enough job satisfaction to prevent his turnover. Another employee, although not experiencing sufficient job satisfaction to prevent turnover in itself, may stay because of the future gains anticipated which are in some way associated with the present job. The anticipated utility may be either in the present organization or in an alternative organization.

Furthermore, the worker's perception of anticipated utility in an alternative job should contribute to explaining why one employee stays while another leaves. Anticipated utility in an alternative job is the availability and desirability of an alternative job and the worker's perception of the likelihood of acquiring the position and at what cost. This factor may have either a positive or a negative influence in that it can promote retention or turnover. If the employee associates no anticipated utility or disutility to alternative jobs, the employee may stay. If sufficient utility is associated with an alternative job, however, then the employee may become a turnover.

The Nursing Shortage

Whether or not a nursing shortage exists is dependent upon the perspective from which one considers the issue. The concepts presented in this section will be the basis of discussion in later sections. There are at least four generic contexts. First is the macro context or the existing number of registered nurses versus the number "required." Second, there is the number of vacant budgeted positions. Third is the

operational context (i.e., impact of the nurse supply on delivery of health care). Fourth, there is the turnover/fill rate. Each of these can be limitlessly dissected in any number of individual or combined ways. For example, one may wish to consider the number of vacant budgeted cardiac care unit positions on the evening shift in the Baptist hospital system in San Antonio, Texas.

Regardless of the specific context, in order to truly analyze the issue, one must take a systemic perspective. If the aggregate demand exceeds the aggregate supply, a shortage exists. The problem in establishing the aggregate supply is that workers have a propensity to migrate in and out of professions. This is particularly true for female-dominated fields. It has been reported, for example, that today's worker changes fields of employment (not just jobs) an average of three and one-half times during his work history.¹⁵ It is also difficult to establish the demand for registered nurses. The number of vacant budgeted positions may or may not be an indicator of a registered nurse shortage. These positions may be vacant for other reasons. Also, a single hospital, district, state, or even region, may experience a condition which is atypical for the bulk of the industry. As will be addressed subsequently, adjustments oftentimes occur within a given industry or industries to accommodate to scarce resources in an effort to minimize adverse impact on operations. The role of the registered nurse may, in part, be assumed by other personnel such as ward clerks, LPNs, ancillary personnel, and others (homogeneous substitution). Again, the turnover/fill rate may or may not be indicative of the registered nurse supply. Personnel policies and procedures could account for this rate as well as available nurse prospects.

Perhaps a diagram can best demonstrate the wholistic relationship of these contexts. Figure 1-3 depicts an imbalance in the aggregate

registered nurse supply with the demand. The number required versus those available in Region A is equal. The same aggregate imbalance exists in Figure 1-4; however, an excess of cardiac care unit nurses is depicted. Figure 1-5 is an indifference curve demonstrating substitution of other health care workers for registered nurses. A relative decrease in registered nurses (A→B) is absorbed through a homogeneous substitution with an increase in other health care workers (C→D). Despite resistance by the nursing profession, many duties previously considered the registered nurse role are being assumed by more plentiful, less costly resources.¹⁶

As aforementioned, an adequacy of the nursing supply is a relative issue. In a climate of a true nursing shortage, it is possible to have the shortage experienced by all, or an adequate supply experienced by some, precipitating an even greater shortage to be experienced by the remainder of the health care industry.

SUPPLY/DEMAND BALANCE GEOGRAPHICALLY

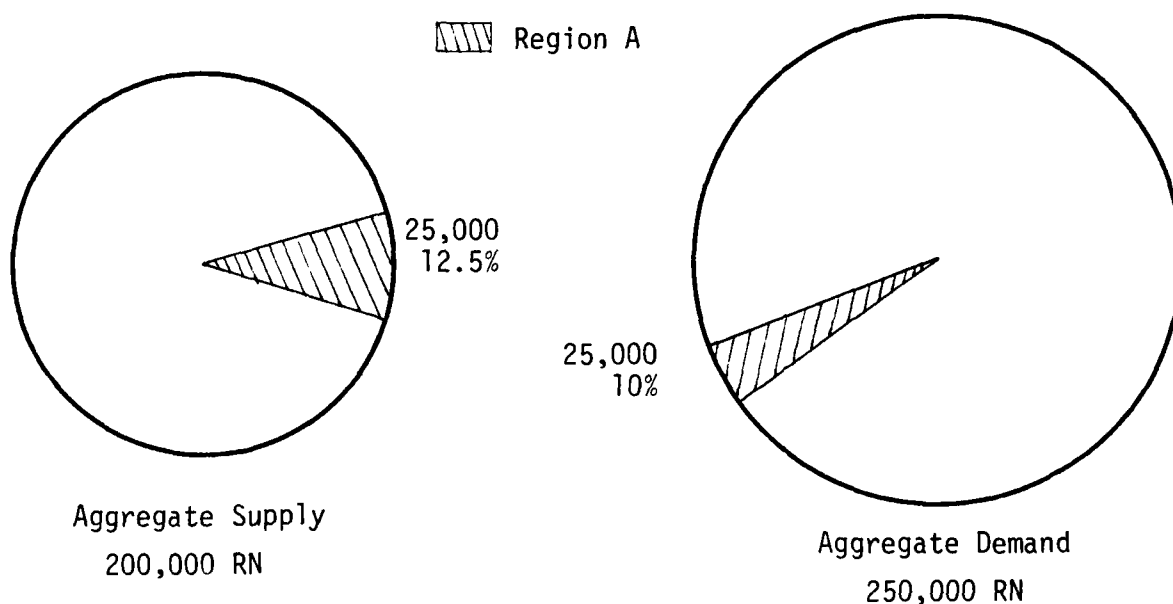


Figure 1-3

EXCESS SUPPLY OF CCU NURSES

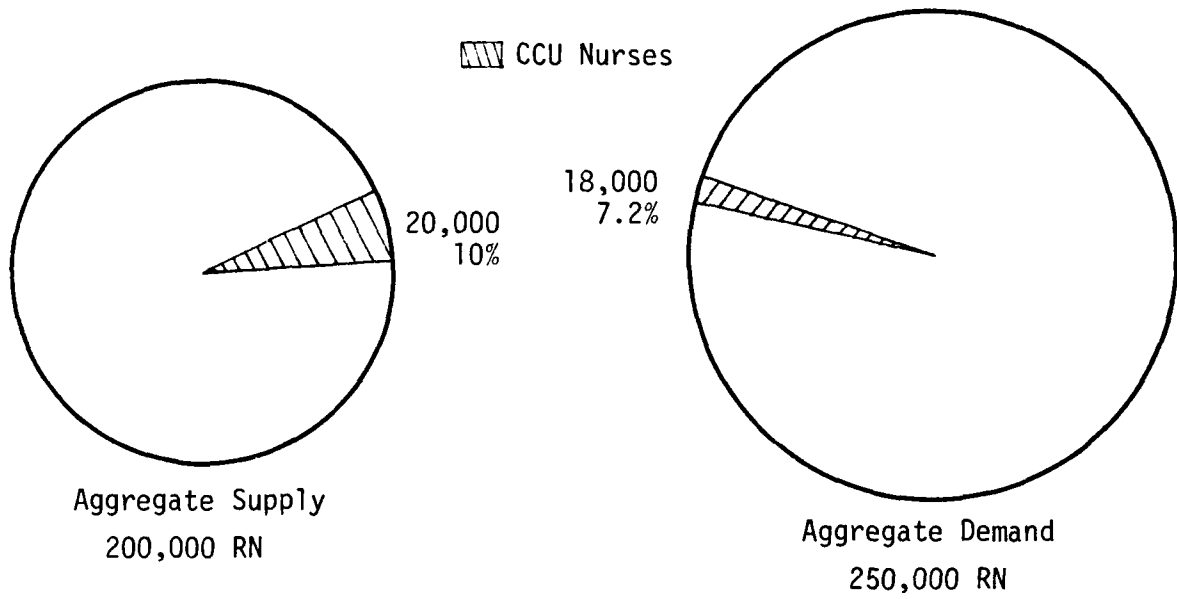


Figure 1-4

INDIFFERENCE CURVE - HOMOGENEOUS SUBSTITUTION

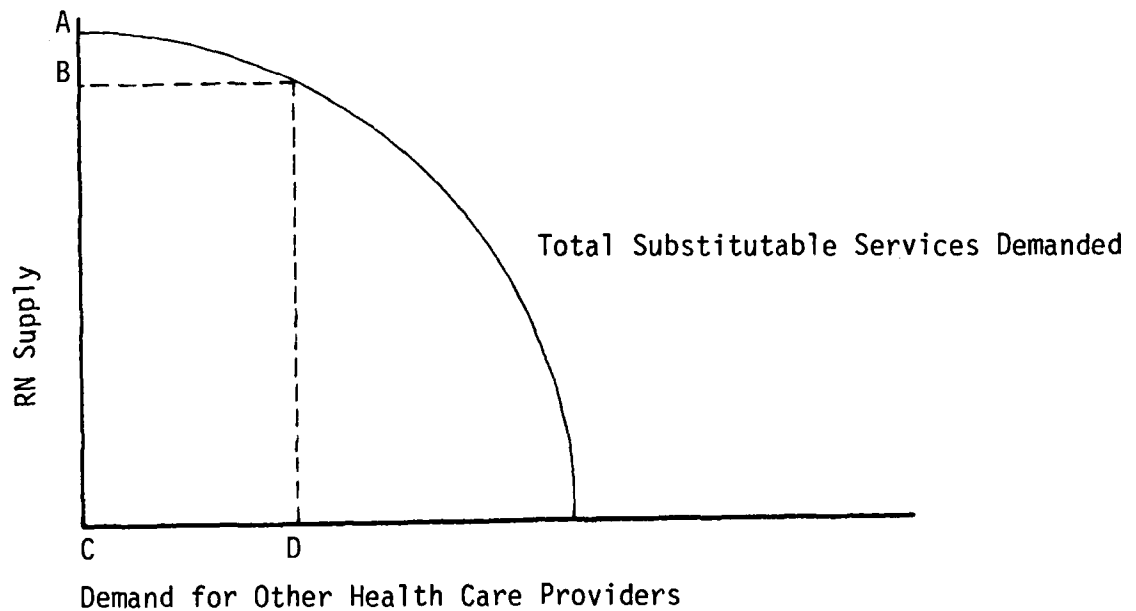


Figure 1-5

The Crisis in Nursing

The health care industry is experiencing increasing difficulty in recruiting and retaining registered nurses. Despite aggressive efforts to overcome the situation, the number of vacant budgeted positions is escalating due to climbing turnover rates coupled with increasing fill time. The situation has become so severe in some areas that the delivery of health care has been restrained. This closure of beds and intensive care units is a manifestation of a classic labor shortage. Goldsmith reports widespread turnover of 32 percent with 96 percent of hospitals surveyed experiencing difficulty filling full-time positions.¹⁷ Texas registered nurse vacancies for January 1981 were 12 percent. Vacancies up to 3 percent are considered normal in commercial/industrial activities.¹⁸ A national survey showed the health care industry was tied for first with the finance field in turnover rates.¹⁹

At the same time this shortage exists in the health care industry, the total number of past graduates from nursing programs exceeds the current demand; however, only 42 percent of the registered nurses in the United States are currently employed in nursing on a full-time basis. The remaining 58 percent work part-time in nursing, work in other areas, or have completely withdrawn from labor force participation.²⁰

The recent literature abounds with articles suggesting reasons for the nursing shortage. These reasons can be classified into four basic categories: perceived utility derived versus the cost, professional issues, factors affecting overall job satisfaction, and external environmental issues.

A report prepared by a division of HHS in context of the economic model describes the indirect cause and effect relationship between wages

paid and the availability of registered nurses at the macro level. Simply stated, a relative increase in wages will increase the number of entrants into nursing programs which will eventually increase the aggregate supply of nurses. Market forces - supply/demand and price theory - account for much of the variance in the number of entrants into the nursing profession. The relationship to economic theory is not always immediately evident. Because of the nonlinear causal linkages and time lags, the relationship becomes obscured.

An adjustment lag, the delay between a relative increase in wages and an increase in number of graduates, information-decision lags, and other factors account for this obscurity. An analysis at one period in time may not reveal a significant relationship, whereas a longitudinal study will show that a relative change in wages will affect the number of future nursing graduates.²¹ Furthermore, the increased demand for registered nurses in response to the greater aggregate demand for health care as stimulated by the introduction of Medicare, Medicaid, and other third-party programs is an example of demand pull. This added demand for registered nurses precipitated an elevation in relative wages. The wage increase affects a change in the market place and creates a larger supply of nurses - not immediately, but at a later date. The competition for this now scarce resource promotes further escalation of wages and further increases the number of entrants to nursing schools. When an adequate supply of nurses is finally produced, the wages are moderated, but there is no significant change in quantity output of nursing schools because of the number of students already in the system. As a nurse surplus develops, wages are suppressed and the number of entrants to registered nurse schools diminishes.²²

The cyclic activity is not unique to nursing. All professions are affected to some degree in a similar fashion. In contrast to profit maximizing firms, non-profit organizations fail to dispatch clear economic signals and goals, dampening the market reactions. The health care industry, because of its traditional non-profit orientation and growing external pressures for voluntary cost containment, attempts to absorb market pressures by holding down increases in nursing wages until the situation becomes severe. The market forces are not allowed to operate properly.²³ Thus, the cyclic response is precipitated.

Additionally, with the change in gender attitudes, there is greater competition for the pool of prospective nurses, women between the ages of eighteen and twenty-five. Individuals in this pool are no longer confined to the professional choice of nursing or teaching. Other job markets are vying for them. The concept of relative wages and the cost to enter the profession (time, money, and expected return) must be expanded to incorporate the whole gamut of available alternatives.

The National Commission on Nursing, a multidisciplinary body established in 1980 by the American Hospital Association, was charged to address current nursing related programs and implications for the future. The Commission reports a lack of agreement about nursing roles and functions. Inherent in this ambiguity is a lack of recognition for the contribution of nurses to patient care. Autonomy is another issue addressed by the Commission. There is an apparent need to define the role of health care workers so that each may carry out his/her duties independently, yet in a collaborative effort.²⁴ In an effort to promote independence, responsibility, and accountability, the primary nursing model and self governance has been adopted.²⁵ The expressed need for registered nurses

to have greater input into patient care and organizational operations reflects the personal and social transformation underway in our culture.²⁶ The scope of self determination has expanded far beyond direct patient care into many aspects of administration, management, and education. In addition to collaboration between medical doctors and registered nurses regarding individual patient care, nursing participation is being encouraged in areas such as fiscal planning, procurement actions, and in representation on all medical committees.²⁷

Encouraging greater participation by nurses has negative as well as positive implications. In the positive vein, there is the potential for better opportunities to influence nurse satisfaction on the whole and to provide personal opportunities for achievement and advancement. On the other hand, the primary nursing model is nursing-intensive and the expansion of the registered nurse role into other than patient care areas will increase the shortage of nurses. Therefore, as Goldsmith suggests, a more acceptable approach would perhaps be abandonment of the pure form of primary nursing for modular nursing.²⁸ Furthermore, minimizing registered nurse involvement in non-patient care related activities and promoting mechanisms to facilitate intervention of factors to create a climate of greater job satisfaction for the nurse may be more desirable than utilizing the nurse in expanded roles.

The link between job satisfaction and nursing turnover has been well established.²⁹ The list of possible factors affecting registered nurses' job satisfaction is endless and, for the most part, mirrors that affecting workers universally. It is important to note, however, that because the majority of nurses are women, some of the more significant factors create a different mix. For example, availability of child care

facilities and personal security have been reported to account significantly to job satisfaction.³⁰ The job satisfaction variables most consistently reported in the literature affecting turnover are salary and rotating shift. Surveys conducted by the Staffing Branch, Civilian Personnel Office Division, Health Services Command, have encountered similar findings.³¹

External environmental factors are those not directly or indirectly inherent to the organization. For example, a nurse may be completely satisfied with her job; the pay, professional experience, and job satisfaction may all be sufficient to retain the worker. Yet, if the spouse relocates, it is likely the nurse will relocate also and terminate employment. This is a frequent occurrence with civilian nurses in the AMEDD who are married to military personnel. Another example is the overall state of the economy. Because of high unemployment conditions, the nurse may be inclined to strive for steady employment even if the nurse would terminate the job during improved economic conditions.

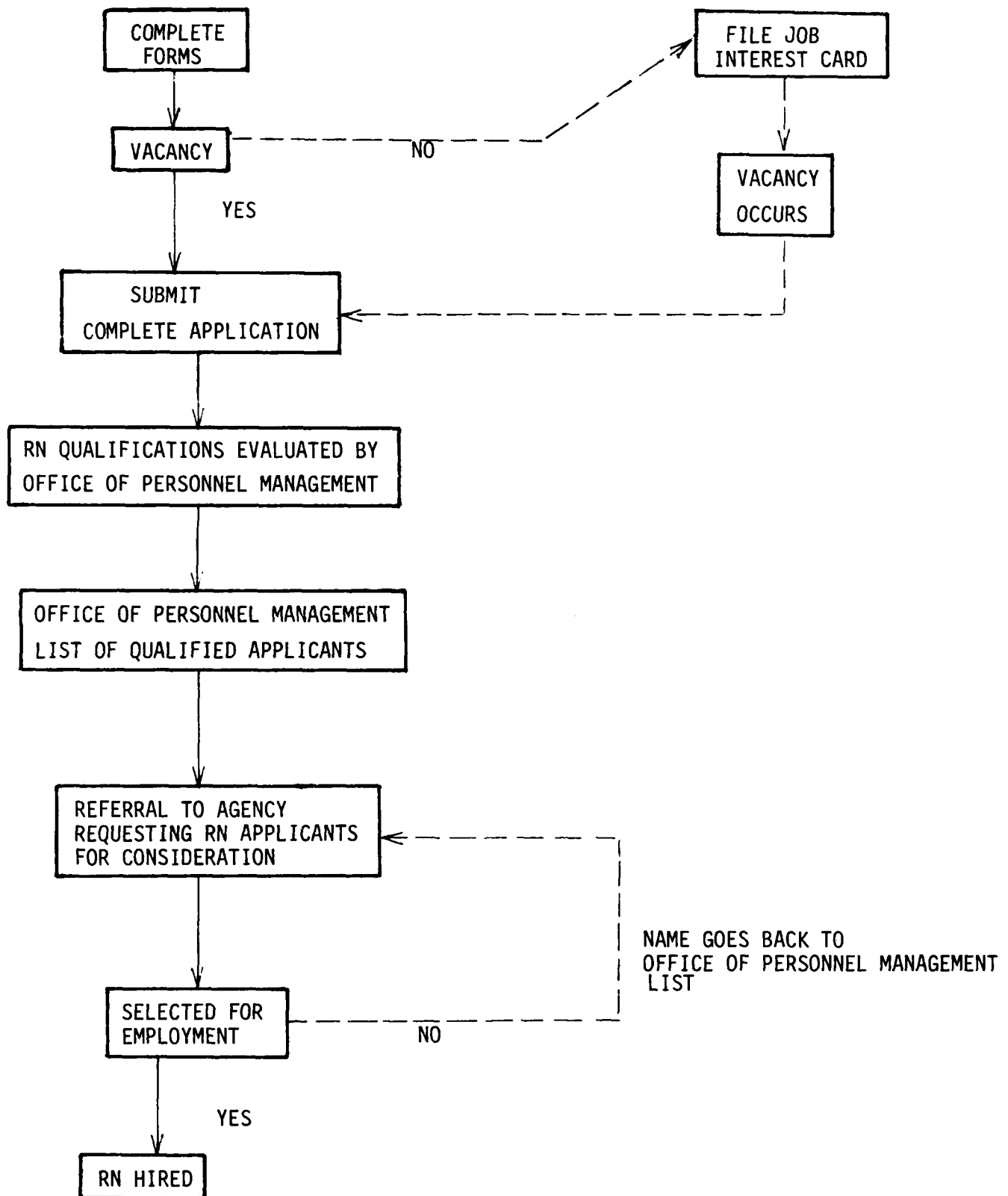
In summary, each of the four factors (perceived utility derived versus the cost, professional issues, factors affecting overall job satisfaction, and external environmental issues) has the potential to affect retention in the job, the organization, and the profession. As was noted during the discussion of the economic model and the turnover process, these factors must be considered not only in perspective of the nursing profession but also other fields of employment. If one recalls Mobley's model, turnover is based not only on present satisfaction but also on the future utility of the present job and utility of alternate positions.

AMEDD Civilian Registered Nurses

The total number of Army Nurse Corps (ANC) slots falls well short of the total registered nurses required to support the AMEDD mission. The Army Nurse Corps is augmented by civilian registered nurses hired through the Civil Service System. In order to gain employment in the Civil Service System, one must undergo a specified process (Figure 1-6). The Civil Service System policies and procedures are universal. With minor variations for specified exceptions, the policies and procedures are also standardized so that all federal civilians are treated equally during hiring and while on the job.³² The hiring process for a registered nurse who is new to the Civil Service System takes about two months.³³ There are many opportunities to stretch out the time involved for hiring. A survey of selected servicing Civilian Personnel Offices (CPO) and Medical Activities (MEDDAC) revealed that the list of registered nurse vacancies was not properly maintained nor was the list of qualified applicants properly maintained.³⁴ Problems with these lists can completely block the hiring process. Even when the process works properly, the two-month hire lag is more than many prospective employees are willing to wait. Instead, they are immediately hired by competing health care organizations.

Several surveys have been conducted recently pertaining to AMEDD civilian registered nurses to determine management's perception of the shortage, what factors are affecting recruitment and retention, and to compare the system to the private sector.³⁵ Not until the spring of 1982 was the perception widespread that a nursing shortage existed in the federal sector. The situation became so severe at Letterman Army Medical Center, Presidio of San Francisco, California, that the ratio of civilian to Army Nurse Corps positions was changed to allow filling vacant positions

CIVIL SERVICE HIRE PROCESS FOR RNs



(Source: US Civil Service Commission, Working for the USA (Washington, DC; US Government Printing Office, 1976), p. 11.)

Figure 1-6

with military nurses. Direct hire authority for registered nurses has been and is being pursued by several servicing Civilian Personnel Offices. Other efforts are being made to further cut the lag time for hire and to make the positions more attractive for recruitment. Many of the areas of worker dissatisfaction reported by the surveys parallel the private sector. Specific to the federal sector is the dichotomy of the military nurse and the civilian nurse. The perception, and oftentimes the reality, is that there is a double standard. In contrast to the Army Nurse Corps, the civilian nurse has no opportunity for advancement and limited growth opportunities.

Any really significant change to the policies and procedures literally requires an act of Congress. Since the system is universally applicable except for minor exceptions, it is inherently difficult to adequately respond to specific needs of individual organizations. The system is relatively conservative and offers stability; however, the required responsiveness to the current nursing situation may be lacking. The private sector has made use of its flexibility and inventiveness to minimize dissatisfaction and maximize satisfaction. Until recently, the Civil Service pay scale and benefits were universally competitive to those offered by civilian facilities. This is no longer the situation.

The Future Environment

Through a review of the literature pertaining to the nursing situation, one develops a perspective of instability. Pressure from numerous forces, internal and external to the profession, are causing change. It is important to anticipate the impact of these forces. Only through this anticipation can the manager be proactive in managing those resources

under his control and accommodate to those he cannot control. These forces will be discussed in context of a supply/demand model.

One can expect a decrease in the relative input of individuals into the nursing profession. The Texas State Board of Nurse Examiners reported a 16.9 percent drop in nurse enrollment from 1977 to 1979. The Board continues to report that this trend is representative nationwide.³⁶ The decline in the entry into nursing is related to numerous factors previously addressed in the discussion on utility. At the 1982 American College of Hospital Administrators Congress, representatives of the National Commission on Nursing firmly announced their support of the baccalaureate degree as the minimum entry into the profession of nursing.³⁷ This, of course, would eliminate entry via two other current modes: diploma and associate programs. The impact of the Commission's recommendation may be voided in that the American Hospital Association's General Council, after receiving the Commission's initial report, continues to support maintenance of all three entries. If the recommendation is enacted, however, the cost to enter nursing would greatly increase in terms of money and time. The economic model suggests this would require a substantial increase in wages and benefits to offset the increased "initial investment" cost.

Further understanding of the future may be achieved by projecting the impact of future United States economic policy and its impact on the health care arena, particularly the allocation of resources. There will be a concerted effort to redirect resources from consumption into investment. In this context, health care expenditures are considered a form of consumption. This effort will deter the aggregate growth of health care incomes. This implies that most segments of health care industry

workers will not have significant wage increases. The change in income per physician will reflect the change across the health care industry; however, with the anticipated growth in the number of physicians over the next two decades, there will be an increase in their portion of the industry total of resources consumed.³⁸ Furthermore, continued government support in other areas such as the Nurse Training Act is not likely. This government support has previously been a strong inducement to attract potential nurses.³⁹

Other reasons for the decline in entrants to nursing are the closure of nurse training programs associated with hospitals, the decrease in the pool of persons from which to draw, an increase in competition for these persons by other occupations, and increasing pressure to restrain increased costs in the health care industry. Although baccalaureate programs continue to grow in numbers, the hospital-based diploma programs diminish because of increasing cost containment pressures.⁴⁰ The pool of potential entrants, aged eighteen to twenty-five years, has begun to stabilize and will decline since the United States birth rate peaked in 1960.⁴¹ Though the nurse profession has been, and may continue to be, enticing to many, women now have greater occupational choice than ever. Other occupations now available will draw significantly from this manpower pool in the future.

The negative impact of a decrease in the number of entrants to nursing will be reinforced through a decrease in the retention of those already in the profession. Every occupation experiences a trickle of individuals leaving for another occupation, limiting their work to part time, or leaving the work force entirely. Because many of the same factors aforementioned are projected to curb future initial entry, this trickle may evolve into a steady stream. Dissatisfaction with inflexible schedules and rotating shifts, weekend duty, low salary, professional

unfulfillment, conflicts with personal goals and family roles, and the attractiveness of alternatives are but a few of the variables with the potential to accelerate turnover.

The nurse manpower shortage has brought back into the profession many former nurses. The current registered nurse work force has a greater number who are married and who have children. Commitment to the organization and the profession may not be as high as it once was. One must recognize that some nurses work because of the motivation of a strong commitment to the profession; however, there are others who are motivated to work to support their strongest commitments which are elsewhere. This is not intended to imply that primary commitment denotes one who will contribute the most. On the contrary, because of the commitment elsewhere, that worker could be motivated to perform to maximum potential. The point is that this type of worker could become a turnover to the organization or profession more easily. Flowers and Hughes discuss this issue in depth.⁴²

The previously mentioned inherent working conditions in the nurse profession are not conducive to satisfying the needs of those with a commitment to family. Unless there is a major effort to accommodate to the needs of this segment of the registered nurse population, there will be an exodus to more accommodating occupations.

Associated with the projected increase in the number of physicians, there may be a shrinkage in the nurse's role. During the recent period of a physician shortage, nurses and other health care professionals expanded their roles to fill the void in the demand for health care. Through this expansion evolved the nurse clinician and the nurse practitioner along with physician assistants and others. In specialty care

units (e.g., intensive care and cardiac care units) nurses have assimilated which were once considered non-traditional roles. Accepting the limitations on expansion of resources devoted to the health care industry and coupled with the growing number of physicians, one must expect many of these former physician functions to be usurped by physicians along with the monetary and non-monetary benefits. Undoubtedly, this will result in great dissatisfaction by many registered nurses currently in these positions and for those who would aspire to such. Rather than becoming a part of the general nurse pool, there is the chance that many of these individuals will leave nursing altogether. With the projected increased demand for home health care, outpatient care, and hospital care in the 1980s, it is apparent that there will be competition for registered nurses within the health care industry. Those positions meeting the nurses' needs will be filled drawing from the registered nurse pool to the regret of the remainder of the health care industry.

The supply of nurses, currently and for the future, is bleak. The discussion will now address the future demand for registered nurses. The Commission on Nursing predicts an increase in the demand for nursing care. This will be precipitated from increasing numbers of elderly persons, an increase in incidence of chronic diseases, further expansion in technology and information, an increase in specialized health care, and new types of family units.⁴³ Again, the impact of greater numbers of physicians can be anticipated. Greater numbers of physicians in itself will generate added demand for nursing and ancillary support services.⁴⁴ In summary, ceteris paribus, the supply of registered nurses appears to be, and will continue to be in the foreseeable future, significantly short of demand.

Research Design

As noted in the review of the literature, numerous recent studies have been conducted to explain the variance in employee behavior with regard to turnover in the nursing profession. Although the similarities between the factors affecting turnover of AMEDD civilian registered nurses and other registered nurses are great, there are significant differences in work situations. There have been no multivariate studies of the AMEDD civilian registered nurses from the perspective of the nurse. The survey subsequently described is such a study. Figure 1-7 shows the steps in the research design. After reviewing the literature on the turnover process, the model which seemed to be the most appropriate was selected on which to base the survey instrument. To verify the general relationship and any grossly obvious differences between factors affecting turnover in the general registered nurse population and this target population segment, personal interviews were conducted with nurses and health care managers. Based on these interviews and the literature review, a questionnaire was developed. Distribution of the survey encompassed nearly all Health Services Command activities. The multivariate analysis was accomplished through discriminant analysis.

STEPS IN RESEARCH DESIGN

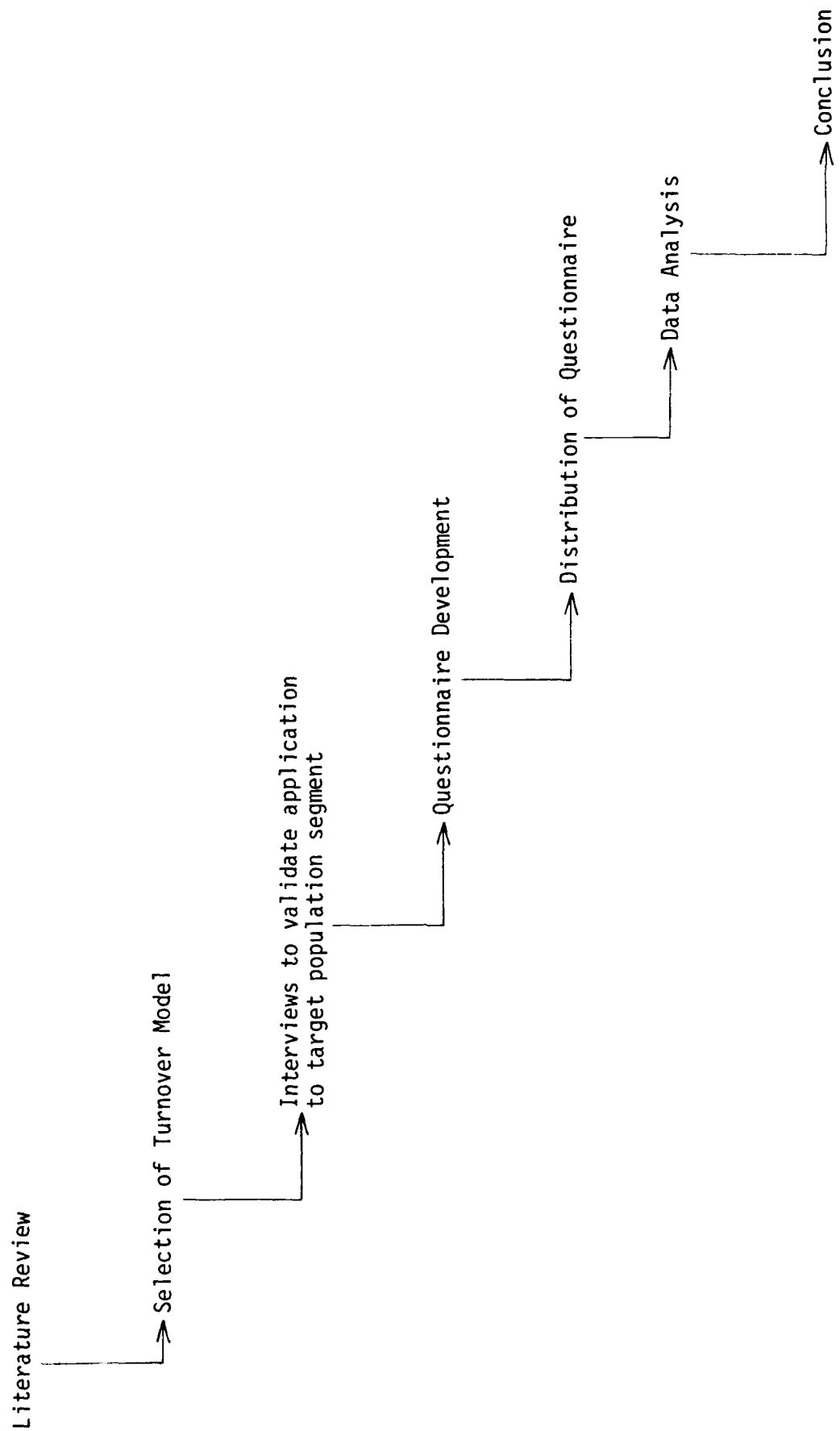


Figure 1-7

Footnotes

¹See Harold K. Cress, "Shortage of Civilian Registered Nurses (RN)," Fort Sam Houston, TX, Oct 1981; Harold K. Cress, "Competitive Status in Recruiting for Specialized Civilian Nursing Positions; i.e., ICU, CCU, Neonatal, OR, and Nurse Anesthetists," Fort Sam Houston, TX, Oct 1981; Harold K. Cress, "Shortage of Civilian Registered Nurses (RN) in Army Medical Treatment Facilities," Fort Sam Houston, TX, Sep 1981; Health Services Command Civilian Personnel Office, "The Shortage of Civilian Registered Nurses (RN) because of Lack of Competitive Pay Scale in Real Life Conditions," Fort Sam Houston, TX, Oct 1981; and an interview with Harold K. Cress, Chief, Staffing Branch, CPO Division, Office of the Deputy Chief of Staff, Personnel, HQ, HSC, Fort Sam Houston, TX, 30 Oct 81.

²See W. H. Mobley et al., "Review and Conceptual Analysis of the Employee Turnover Process," Psychological Bulletin 86 (March 1979): 493-522; and C. E. Michaels and P. E. Spector, "Causes of Employee Turnover: A Test of the Mobley, Griffeth, Hand, and Meglino Model," Journal of Applied Psychology 67 (January 1982): 53-59.

³Michaels and Spector, p. 58.

⁴See Mobley et al., pp. 516-518; W. H. Mobley, "Intermediate Linkages in the Relationship Between Job Satisfaction and Employee Turnover," Journal of Applied Psychology 62 (February 1977): 237-239.

⁵D. Hellriegel and G. E. White, "Turnover of Professionals in Public Accounting: A Comparative Analysis," Personnel Psychology 26 (1973): 239 -249.

⁶Ibid., p. 248.

⁷W. S. Robinson, "Ecological Correlations and the Behavior of Individuals," American Sociological Review 15 (1950): 351-357.

⁸V. S. Flowers and C. L. Hughes, "Why Employees Stay," Harvard Business Review 51 (July-Aug 1973): 40.

⁹Mobley et al., "Employee Turnover Process," p. 495.

¹⁰Ibid., p. 519.

¹¹Michaels and Sector, p. 57.

¹²See Mobley et al., "Employee Turnover Process," p. 495; Flowers and Hughes, p. 40; Michaels and Spector, p. 57; and L. W. Porter, R. M. Steers, and R. T. Mowday, "Organizational Commitment, Job Satisfaction, and Turnover Among Psychiatric Technicians," Journal of Applied Psychology 59 (1974): 603-609.

¹³Mobley et al., "Employee Turnover Process," p. 497.

¹⁴A. C. Bluedorn, "A Unified Model of Turnover from Organizations," Human Relations 35 (February 1982): 135-153; Mobley et al., "Employee Turnover Process," p. 495; and Michaels and Spector, p. 57.

¹⁵Nancy Dixon, Ph.D., "Managing the Changing Workforce," a workshop presented by the University of Texas, Department of Curriculum and Instruction, at Galveston, TX, 29 Jan 82.

¹⁶S. LaViolette, "Technicians Do Some Nursing Chores," Modern Health Care 12 (June 1982): 58.

¹⁷J. C. Goldsmith, Can Hospitals Survive? (Homewood, IL: Dow-Jones Irwin, 1981), pp. 184-85.

¹⁸Texas Hospital Association, Survey of Nursing Staff Requirements (Austin: Texas Hospital Association, 1981), p. 3.

¹⁹"Survey of Industries Finds Hospitals 1st in Turnover, 3rd in Absenteeism," Hospitals 56 (May 1982): 39.

²⁰Goldsmith, p. 186.

²¹U.S., Dept of Health and Human Services, The Recurrent Shortage of Registered Nurses, A New Look at the Issues (Washington, DC: Government Printing Office, 1981), p. 19.

²²Ibid.

²³Ibid., p. 18-21.

²⁴National Commission on Nursing, Initial Report and Preliminary Recommendations (Chicago: The Hospital Research and Educational Trust, (1981)), pp. 9-12.

²⁵See "National Leadership Conference Highlights Programs That Work," Hospitals 56 (May 1982): 47-48; "Nurses Must Seek More Authority in Their Role in the Hospital, Nursing Expert Says," Hospitals 56 (April 1982): 65; S. G. Kernaghan, "The Nurse Shortage: How Can We Turn the Exodus Around?" Hospitals 56 (Feb 1982): 53-56; M. R. Traska, "Nurses as Managers: Acceptance Problems May Lie with Nurses Themselves," Hospitals 56 (Feb 1982) 57-59.

²⁶A. C. Bennett, "Changing Values, Agressiveness, Bureacracy Lead to RN Discontent," Modern Health Care 11 (Dec 1981): 94-96.

²⁷See LaViolette, p. 58 and "Engineering Department Uses 'Quick Slip' to Handle Minor Repairs in Hospital," Hospitals 56 (Jan 1982): 67.

²⁸Goldsmith, p. 189.

²⁹J. McCloskey, "Influence of Rewards and Incentives on Staff Nurse Turnover Rates," Nursing Research 23 (March 1974): 239-247.

³⁰See J. McCloskey, p. 245; and C. Lewis and E. A. Sloane, "Hospital-Based Child Care," Hospital Forum, March/April 1982, pp. 47-49.

³¹Interview with Harold K. Cress, 30 Oct 81.

³²U. S. Civil Service Commission, Working for the USA (Washington, DC: US Government Printing Office, 1976), p

³³Interview with Ms Pat Strahan, Recruitment and Placement Branch, Civilian Personnel Office, Fort Sam Houston, TX, 9 June 1982.

³⁴Interviews with Recruitment and Placement Specialists, Civilian Personnel Offices, Fort Sill, Fort Hood, and Fort Polk, 17, 18, and 23 November 1981.

³⁵Force Development Division, Brooke Army Medical Center, Fort Sam Houston, TX, "BAMC Recruitment/Retention Impact Areas," a report dated February 1982; Civilian Personnel Office, Fort Sam Houston, TX, "Legend of Sources Surveyed," an information paper dated February 1982; and Civilian Personnel Office, Fort Sam Houston, TX., "Responses from HSC-CPO Survey I," an information paper dated January 1982.

³⁶J. Haddad, "Nurse Shortages: The Growing Crisis," Texas Hospitals, February 1980, p. 25.

³⁷American College of Hospital Administrators, Progress Report - Initial Report and Preliminary Recommendations (Chicago, Ill., February 1982).

³⁸ V. E. Reinhardt, On the Future of the American Economy and Its Impact on the Health Care Sector, 1980 Michael M. Davis Lecture, Chicago: University of Chicago, Ill., 28 May 1980.

³⁹ U.S., Dept of Health and Human Services, The Recurrent Shortage of Registered Nurses, p.1.

⁴⁰ Goldsmith, p. 187.

⁴¹ U.S., Dept of Health and Human Services, The Recurrent Shortage of Registered Nurses, pp. 19-22.

⁴² Flowers and Hughes, p.40.

⁴³ National Commission on Nursing, Initial Report and Preliminary Recommendations, p. 10.

⁴⁴ P. J. Feldstein, Health Care Economics (New York: Wiley and Sons, 1979), pp. 87-89.

CHAPTER II

DISCUSSION

The Survey

The conceptual framework of Mobley's employee turnover model (Figure 1-2) was adopted for this survey. Personal interviews of nursing and management personnel in federal nursing programs identified the need to incorporate into the study variables directly addressing the civilian/military dual system and the influence of significant others (i.e., spouse).

A three-part, 143-question survey was developed (Appendix A). Part 1 composed the bulk of the questions through which personal perceptions of specific variables were surveyed in three contexts: degree of satisfaction in present job (current utility), degree of satisfaction anticipated in present job, and degree of satisfaction anticipated in an alternative job (anticipated utility in alternative job). A Likert-type measurement scale was used to record the responses on a five-point scale using a mark-sense form. The response scale was "Highly Satisfied," "Satisfied," "Neutral," "Dissatisfied," and "Highly Dissatisfied." The second part of the survey, composed of thirteen multiple-choice questions, addressed the basic demographics. Part 3 was composed of four open-ended questions to allow the gathering of information on potentially significant variables not included in Part 1. Quantities of the survey were mailed to thirty-seven Civilian Personnel Offices servicing Health Services Command activities for distribution to the respondents. In addition to a cover

letter explaining the survey and instructing the Civilian Personnel Office in the distribution of the surveys, letters endorsing the project from the Chief, Nursing Division, and the Chief, Civilian Personnel Division, at Health Services Command were also inclosed in an effort to generate support for the project. The Civilian Personnel Offices were requested to distribute the surveys to the three categories of respondents: (a) Currently employed in AMEDD civilian nurse positions; (b) Formerly employed in AMEDD civilian nurse positions resigning between 1 September 1981 and 28 February 1982; and (c) Declining an AMEDD civilian nurse position between 1 September 1981 and 28 February 1982. The three groups of respondents were instructed to complete the survey as follows: (a) Currently employed AMEDD civilian registered nurses in context of present job; (b) Turnover AMEDD civilian registered nurses in context of AMEDD civilian job prior to turnover; and (c) Registered nurses who declined AMEDD civilian registered nurse positions in context of expectations about the declined position.

Data Analysis

The total number of surveys incorporated in the data analysis was 470, representing a final adjusted response rate of approximately 40 percent.¹ Figure 2-1 provides a breakdown of respondents by group. Refer to Appendix B for a description of the calculation of the response rate.

Questions from Parts 1 and 2 were analyzed using programs from a version of Statistical Package for the Social Sciences (SPSS). Part 3, the open-ended questions, was screened manually. Only responses addressing current utility of present job and anticipated utility of alternative jobs from Part 1 were included in the analysis. Because of limitations

NUMBER OF RESPONDENTS BY GROUP

Group 1	163	(35)
Group 2	174	(37)
Group 3	85	(18)
Group 4	39	(08)
Unclassified	9	(02)
Total	470	

NOTE: The parentheses denotes percent of total number.

Figure 2-1

inherent in the version of SPSS available, which established a maximum number of variables for the analysis, all of the variables in the instrument could not be incorporated into the discriminant analysis. Refer to Appendix C for discussion on limitations of variables. Figure 2-2 is the final variable list for analysis.

Discriminant-analysis techniques are useful in predicting group membership based on the combination of discriminating variables. It is a multivariate technique which accounts for the intercorrelations of a variable mix.

The final variable list was entered into a series of discriminant function analyses which were used to classify respondents into one of four groups:

- Group 1 - Stay in present job until retirement
- Group 2 - Have no reason to leave at this time
- Group 3 - Plan to leave in the near future
- Group 4 - Have informed supervisor of intent to resign,
initiated resignation, already left, or declined.

FINAL VARIABLE LIST FOR ANALYSIS

VARIABLE SUBJECT	VARIABLE CONTEXT		
	Present Position	Future Position	Alternate Position
Current Salary	001*	043	085*
Responsibility	002*	044	086*
Working Conditions	003*	045	087
Education Opportunities	004	046	088
Recognition	005	047	089
Co-Workers Relations	006*	048	090
Growth Opportunities	007*	049	091
Policies/Procedures	008	050	092
Supervisor Relations	009*	051	093*
Work Performed	010*	052	094*
Advancement Opportunities	011*	053	095
Achievement	012*	054	096
Job Security	013	055	097
Status	014	056	098*
Role Clarity	015	057	099
Job Satisfaction - Overall	016*	058	100*
Significant Other Perception of Job	017*	059	101*
Goal Congruance	018*	060	102*
Benefits	019*	061	103*
Training Opportunities	020*	062	104*
Continuity of Patient Care	021	063	105*
Personnel System	022	064	106
Organizational Communication	023*	065	107
Collaboration - MD/RN	024	066	108*
Collaboration - Nonphysician/RN	025	067	109
Workload	026	068	110
Sense of Accomplishment	027	069	111
Supervisor	028	070	112
Co-Workers	029	071	113*
Support re Personal Goals	030*	072	114
Performance Evaluations	031*	073	115
Nursing Profession	032	074	116
Equipment/Facilities	033*	075	117
Starting Salary	034	076	118*
Retirement Program	035	077	119*
Personal Security	036	078	120*
Administrative Work Requirements	037*	079	121
Uniform Policies	038	080	122*
Control of Personal Destiny	039	081	123
Time Off	040*	082	124
Flexibility of Job	041	083	125
Future Salary	042	084	126
Sex			127
Marital Status			128
Tenure - Position			129
Tenure - Facility			130
Tenure - Civil Service			131
Pay Grade			132
Age			133
Position (Specialty)			134
Career Intentions			135
Work Hours			136*
Anticipated Satisfaction in Other Job			137*
Job Status			138
*Final Variable			

Figure 2-2

Question Number 134 of the survey, "Which of the following best describe your job intention," was used to assign group membership. The method of discriminant analysis used was MAXMINF, a method using stepwise selection criteria which maximizes the smallest F ratio between pairs of groups. Missing data were handled by ignoring all missing value declarations. For a discussion of the comparison of methods of analysis and comparison of missing data options, refer to Appendixes D and E, respectively. A series of discriminant analyses was made, each analysis incorporating all of the variables in Figure 2-2, changing the partial F criteria for entry into and exit from the stepwise analysis. The partial F is a test of the statistical significance of the amount of centroid separation added with the inclusion of the variable in excess to that provided by variables already in the analysis.² Refer to Appendixes F through H for review of complete data output as generated by this series of analyses.

Figure 2-3 displays the information derived from the discriminant analysis using a partial F of 1.5 to enter and exit the analysis. Wilks' lambda is an inverse measure of the discriminating information remaining which has not been accounted for by previous functions. The smaller Wilks' lambda is the greater the amount of information remaining to be derived. The chi-square statistic is based on the value of Wilks' lambda.³

The eigenvalues and the canonical correlations demonstrate relative power in isolating the groups. The eigenvalues is a measure of the relative importance of the function, the sum of which denotes the total variance within the discriminating variables. The canonical correlations can be viewed as the square root of the variance in the discriminant function as explained by the groups. When more than one discriminant

AMEDD CIVILIAN NURSE RETENTION

05/17/82 PAGE 6

	VAR118	3.61816	29	0.24601	0.000	944.44452	27.47914	0.000
45	VAR118	3.61816	29	0.24601	0.000	944.44452	27.47914	0.000
46	VAR108	1.19922	30	0.24396	0.000	953.67328	9.22876	0.026
47	VAR108	1.67871	31	0.24111	0.000	967.01064	13.33736	0.004
48	VAR10C	1.48096	32	0.23862	0.000	974.51243	7.50179	0.058

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	1.54836	72.50	0.779	0	0.2385	633.326	96	0.000
2	0.45050	21.13	0.557	1	0.6083	219.910	62	0.000
3	0.13886	6.28	0.344	2	0.8819	55.527	30	0.003

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

DISCRIMINANT ANALYSIS OUTPUT -PARTIAL F OF 1.5

Figure 2-3

function has been derived, it is important to note the relative percentage of the total sum of eigenvalues attributed to each function.⁴

It is important to note, also, that Function 1 is always the most powerful and that the subsequent functions occur with progressively decreasing power. Oftentimes, not all of the functions will be used in the interpretation of the data partially because of their minimal contribution.

Analysis of the information presented in Appendixes F through H indicates all three discriminant functions are statistically significant and that considerable discriminating power is present.

The centroids of groups in reduced space (Figure 2-4) are the mean discriminate scores. When plotting the groups in space, the centroid value for each function is a dimension in space.⁵ A four-group discriminant analysis can produce three functions ($g - 1$) resulting in a three-dimensional model composed of the centroids (i.e., mean discriminant scores) for each group. The greater the difference in the centroids, the greater the distance between the groups. Figure 2-5 through Figure 2-8 are two-dimensional plots of each group. All four-group centroids are plotted in Figure 2-9.

Analysis of the group centroids in space reveals that in Function 1 the greatest separation is between Group 1 and Groups 3 and 4, a simple measure of the difference in the values. Function 2 separates Groups 3 and 4. Groups 2 and 3 are furthestest apart in Function 3. This pattern is repeated in all of the discriminant analyses of this survey.

The standardized discriminant function coefficients (Figure 2-10) denote the relative contribution of that variable to the relevant function. In Function 1, Variable 16 (0.38097) makes the greatest contribution to

CENTROIDS - PARTIAL F OF 1.5

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.30260	0.61398	-0.23298
GROUP 2	-0.20103	-0.13208	0.42405
GROUP 3	-0.18081	-0.95742	-0.40781
GROUP 4	2.55571	0.10985	-0.02936

Figure 2-4

CENTROID PLOT - GROUP 1

PLOT OF DISCRIMINANT SCORE 1 (HORIZONTAL) VS. DISCRIMINANT SCORE 2 (VERTICAL). * INDICATES A GROUP CENTROID.
 THE SYMBOL * DENOTES A CASE FROM GROUP 1

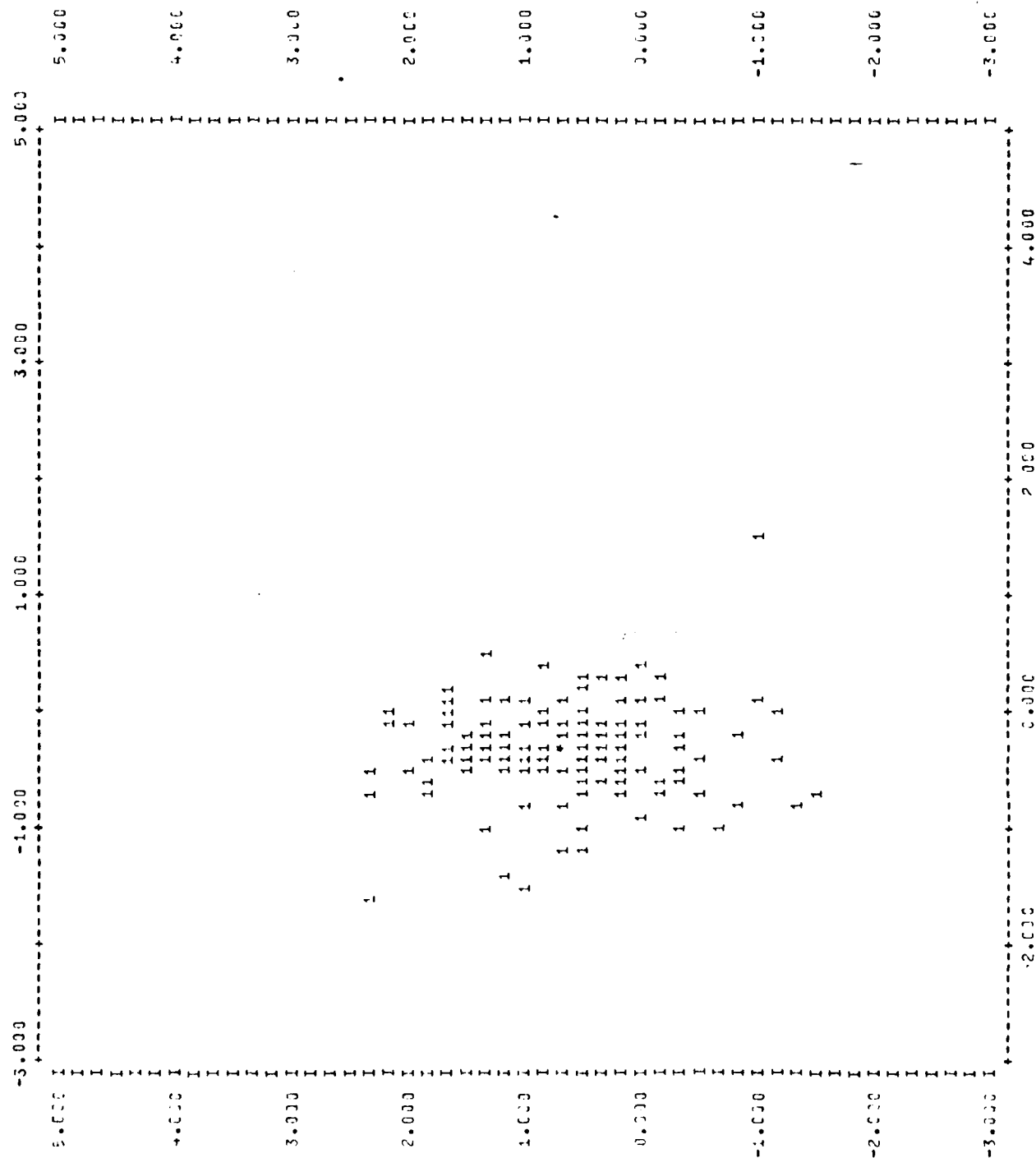


Figure 2-5

PLOT OF DISCRIMINANT SCORE 1 (HORIZONTAL) VS. DISCRIMINANT SCORE 2 (VERTICAL). * INDICATES A GROUP CENTROID.
 THE SYMBOL 2 DENOTES A CASE FROM GROUP 2

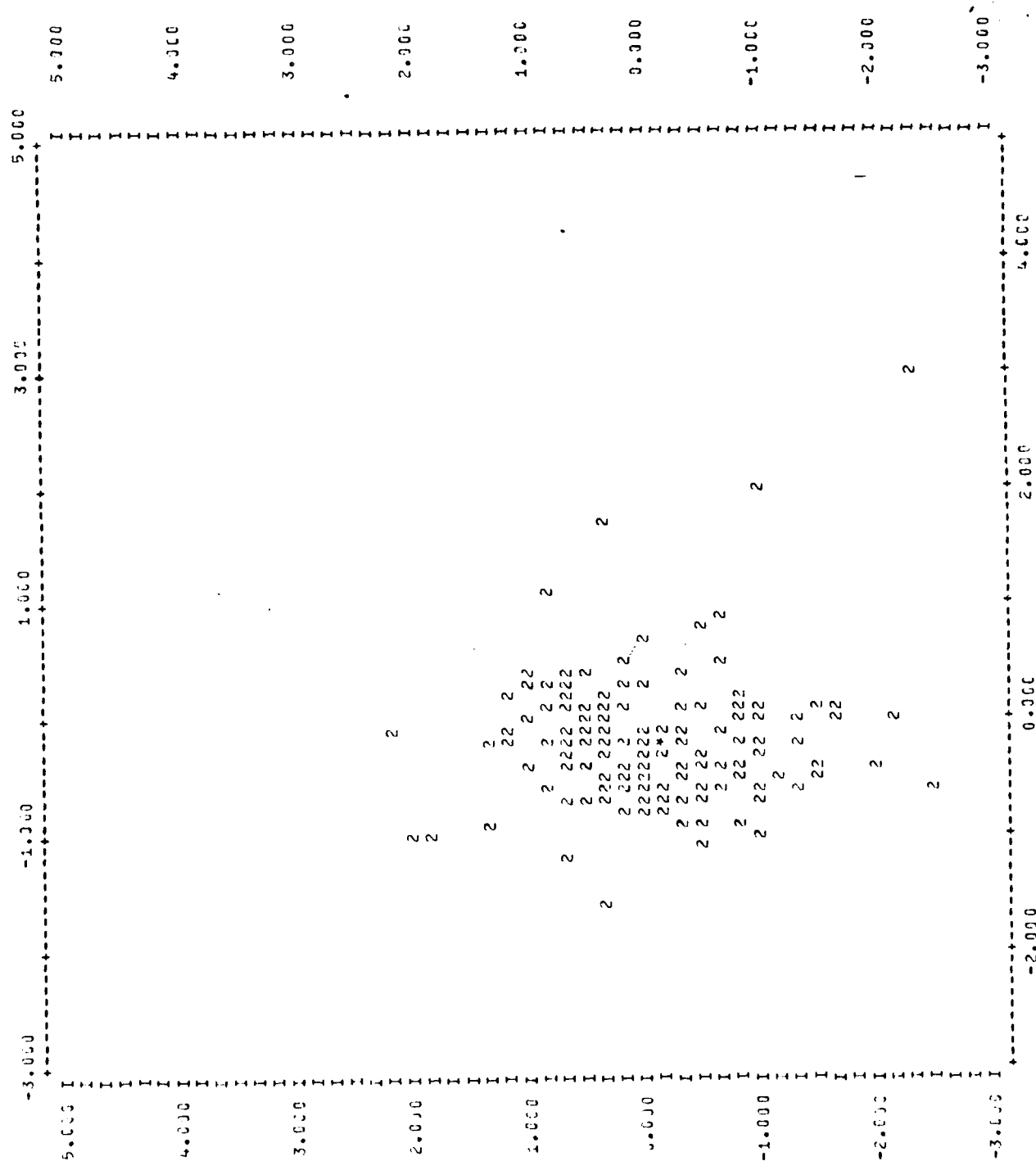


Figure 2-6

CENTROID PLOT - GROUP 3

PAGE 10

05/17/92

AMEDD CIVILIAN NURSE RETENTION

PLOT OF DISCRIMINANT SCORE 1 (HORIZONTAL) VS. DISCRIMINANT SCORE 2 (VERTICAL). * INDICATES A GROUP CENTROID.
 THE SYMBOL 3 DENOTES A CASE FROM GROUP 3

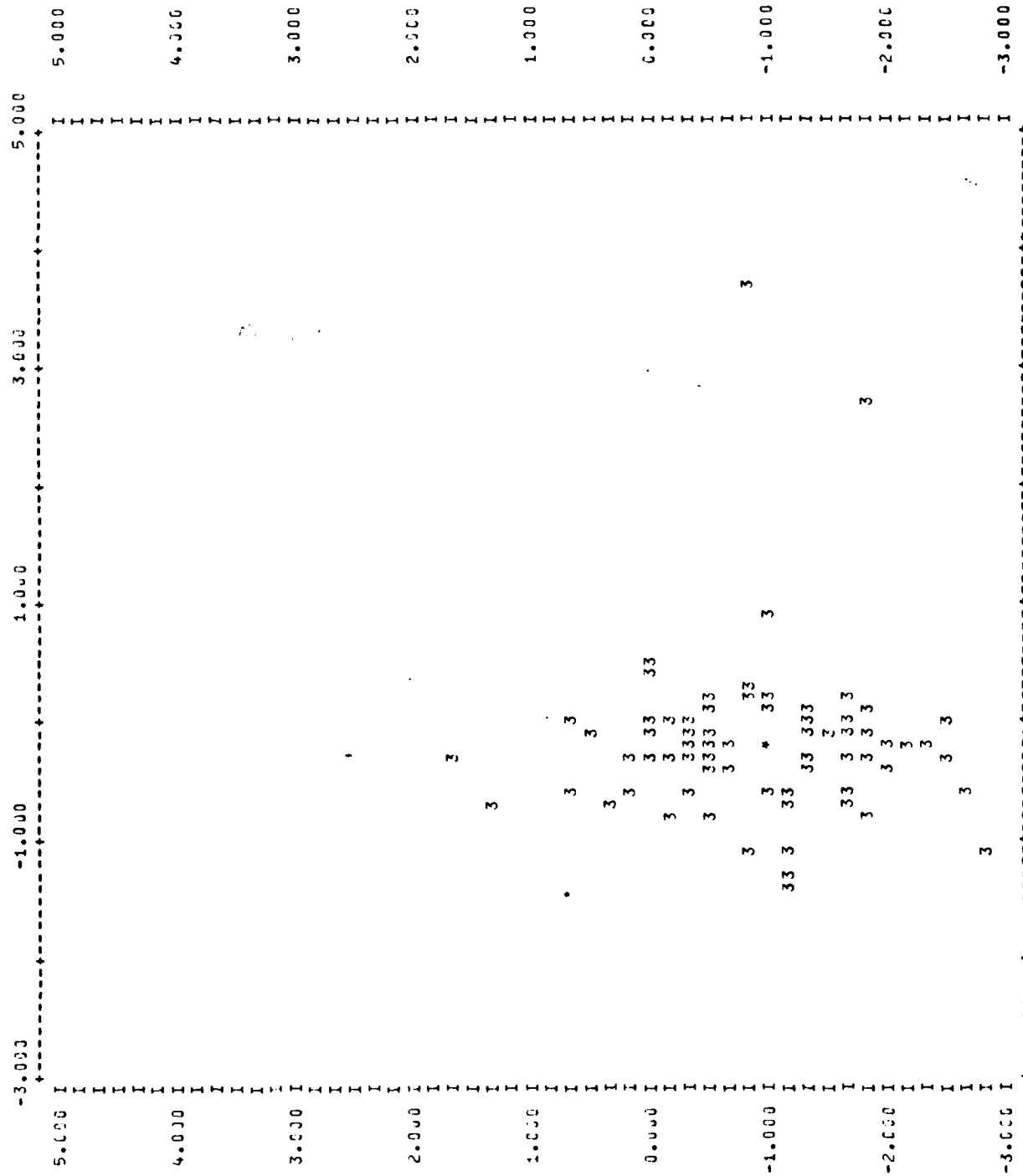


Figure 2-7

CENTROID PLOT - GROUP 4

PAGE 11

05/17/82

AMEDD CIVILIAN NURSE RETENTION

PLOT OF DISCRIMINANT SCORE 1 (HORIZONTAL) VS. DISCRIMINANT SCORE 2 (VERTICAL). * INDICATES A GROUP CENTROID.
 THE SYMBOL " " DENOTES A CASE FROM GROUP 4

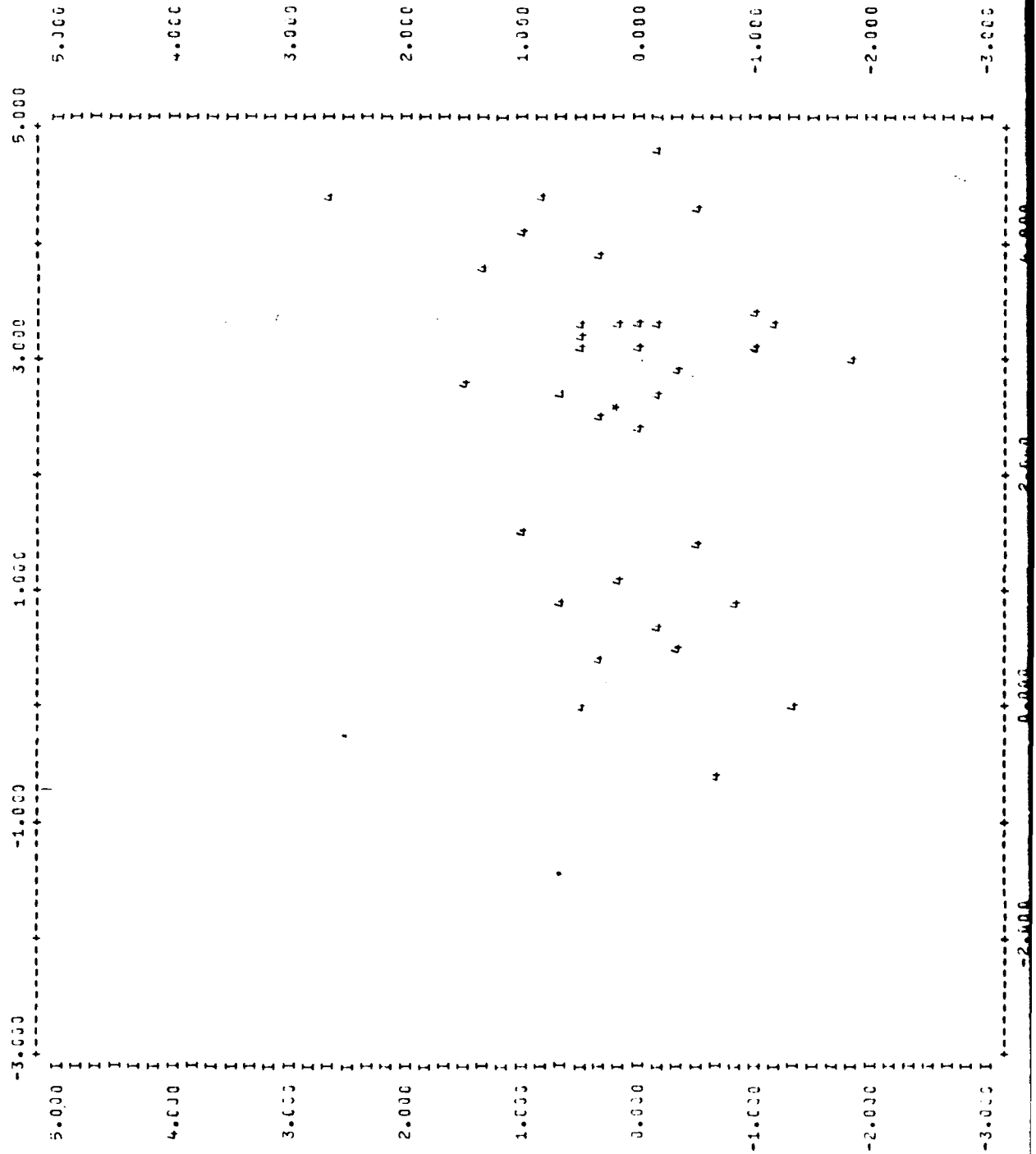


Figure 2-8

CENTROID PLOT OF ALL GROUPS

PAGE 12

05/17/82

AMEDO CIVILIAN NURSE RETENTION

PLOT OF DISCRIMINANT SCORE 1 (HORIZONTAL) VS. DISCRIMINANT SCORE 2 (VERTICAL). * INDICATES A GROUP CENTROID.

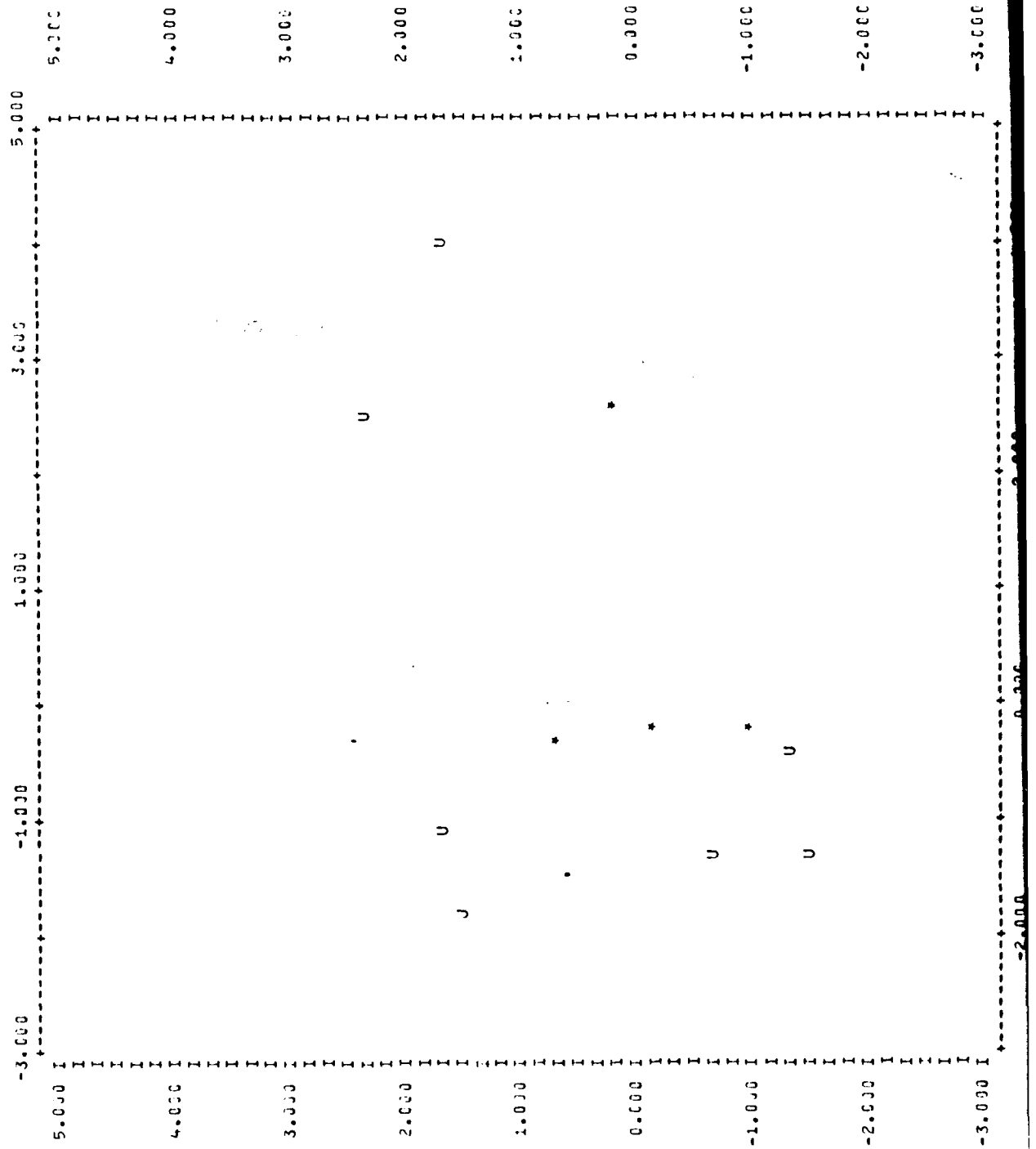


Figure 2-9

FUNC 1 FUNC 2 FUNC 3

VAR001	0.16692	0.08212	-0.33778	Current Salary
VAR002	0.07838	0.23278	0.15591	Responsibility
VAR003	-0.21936	-0.39235	-0.29184	Working Conditions
VAR016	0.38097	-0.05698	-0.28009	Job Satisfaction - Overall
VAR017	0.03686	-0.29006	0.32735	Significant Other Perception of Job
VAR018	0.21067	0.15202	-0.29238	Goal Congruance
VAR019	0.00718	0.27952	0.26715	Benefits
VAR020	-0.11256	0.31026	0.10741	Training Opportunities
VAR030	0.22174	-0.30413	0.04777	Support re: Personal Goals
VAR031	-0.15481	0.37650	-0.38992	Performance Evaluations
VAR033	0.24443	0.04948	0.32302	Equipment/Facilities
VAR037	-0.31831	-0.08670	0.37439	Administrative Work Requirements
VAR040	0.30498	-0.09301	-0.14687	Time Off
VAR085	0.36863	-0.42365	0.09984	Current Salary
VAR086	-0.18433	0.51894	-0.01788	Responsibility
VAR093	0.08771	-0.65742	0.41365	Supervisor Relations
VAR094	0.18516	0.25477	-0.27567	Work Performed
VAR104	0.20992	-0.08543	0.42993	Training Opportunities
VAR105	-0.02904	0.41134	-0.09050	Continuity of Patient Care
VAR108	0.08942	-0.45859	-0.02713	Collaboration - MD/RN
VAR113	0.16763	0.13471	0.34812	Co-Workers
VAR118	-0.31470	0.75194	0.32924	Starting Salary
VAR120	-0.09147	-0.24431	0.80259	Personal Security
VAR122	-0.23395	-0.13203	-0.15057	Uniform Policies
VAR137	-0.29607	-0.07045	-0.15211	Anticipated Satisfaction

Present Job

42

Alternate Job

STANDARDIZED DISCRIMINANT COEFFICIENTS

Figure 2-10

discriminating among the groups. Although Variable 120 (-0.80259) in Function 3 is relatively large, its overall contribution is not great because the high score occurs in Function 3. In this study, the standardized discriminant functions, within context of the function order and disregarding the sign, can be said to represent the relative contribution to turnover.

The final piece of information derived in this discriminant analysis is the prediction results (Figure 2-11). The percent of respondents predicted to belong to their action groups is calculated and is an overall measure of the predictability of the equation. One should base the interpretation on the improvement over the a priori probability of group membership. In this study of four groups, the a priori probability was .25 for each group. A prediction rate of .25 is no prediction and 100 percent is perfect prediction.⁵ To the functional manager, prediction results are the most important measure of significance of that generated through the discriminant analysis.

In addition to the series of analyses incorporating the same variable set in which the partial F was increased to isolate the minimum number of variables while minimizing the loss in discriminating power, two other sets of variables were analyzed. Overall job satisfaction, Variable 16, was removed in one analysis with minimal change (Figure 2-12). The results are interesting because there is an actual minimal improvement in the data despite the fact that this variable contributed strongly in previous analyses. The other variable set included variables 129, 130, 131, and 133; three addressing tenure and one addressing age, respectively (Figure 2-13).

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		GP. 1	GP. 2	GP. 3	GP. 4
GROUP 1	163.	110. 67.5%	26. 16.0%	16. 9.8%	11. 6.7%
GROUP 2	174.	44. 25.3%	61. 35.1%	40. 23.0%	29. 16.7%
GROUP 3	85.	5. 5.9%	17. 20.0%	51. 60.0%	12. 14.1%
GROUP 4	39.	4. 10.3%	0. 0.0%	5. 12.8%	30. 76.9%
UNGROUPED CASES	9.	6. 66.7%	0. 0.0%	2. 22.2%	1. 11.1%

PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED 54.66%

PREDICTION RESULTS

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION
		GP. 1	GP. 2	GP. 3				
GROUP 1	163.	103. 63.2%	29. 17.8%	19. 11.7%	1 2 3	3.36335 0.12211 0.04534	62.35 29.46 8.19	0.505 0.373 0.204

GROUP	NO. OF CASES	GP. 1	GP. 2	GP. 3	FUNC. 4	FUNC. 5	CHI-SQUARE	OF	SIGNIFICANCE
GROUP 2	174.	52. 29.9%	46. 26.4%	39. 22.4%	37. 21.3%				
GROUP 3	85.	9. 10.6%	14. 16.5%	52. 61.2%	10. 11.8%				
GROUP 4	39.	5. 12.8%	2. 5.1%	5. 12.8%	27. 69.2%				

PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED 40.4%

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3	
VAR003	-0.06391	-0.34048	0.58469	Working Conditions
VAR017	0.15343	-0.39987	-0.26343	Significant Other Perception of Job
VAR018	0.24659	0.25677	0.42379	Goal Congruence
VAR019	0.09656	0.43931	-0.25572	Benefits
VAR030	0.31633	-0.15017	0.08512	Support re: Personal Goals
VAR031	-0.22634	0.47545	0.43640	Performance Evaluations
VAR032	0.27221	0.10756	-0.53137	Equipment/Facilities
VAR037	-0.36235	-0.19535	-0.42184	Administrative Work Requirements
VAR040	0.40319	0.04598	0.15955	Time Off
VAR045	-0.45686	-0.34690	-0.13668	Current Salary
VAR055	-0.15988	0.60173	0.05499	Responsibility
VAR073	0.28858	-0.73528	-0.27971	Supervisor Relations
VAR114	-0.32344	0.63918	-0.14653	Starting Salary
VAR137	-0.35433	-0.14249	0.15347	Anticipated Satisfaction

Present Job

Alternate Job

CENTROIDS OF GROUPS IN REDUCED SPACE

GROUP	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.57223	-0.05818	0.14942
GROUP 2	0.02472	0.04819	-0.26477
GROUP 3	0.65546	0.49246	0.23146
GROUP 4	0.82206	-1.04311	0.11766

DISCRIMINANT ANALYSIS WITHOUT VARIABLE 16 - OVERALL JOB SATISFACTION

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP				DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION
		GP. 1	GP. 2	GP. 3	GP. 4				
GROUP 1	163.	127. 77.9%	25. 15.3%	8. 4.9%	3. 1.8%	1 2 3	0.57212 0.10248 0.004876	79.09 14.17 6.74	0.603 0.305 0.216
GROUP 2	174.	54. 31.0%	54. 31.0%	35. 20.1%	31. 17.8%				
GROUP 3	85.	13. 15.3%	12. 14.1%	41. 50.6%	17. 20.0%				
GROUP 4	39.	6. 15.4%	5. 12.8%	7. 17.9%	21. 53.8%				

PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED 53.15%

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3	
VAP001	0.12741	-0.15134	0.58992	Present Job
VAP002	0.24043	-0.23666	-0.07054	
VAP017	0.03755	0.53518	-0.15326	
VAP018	0.15810	-0.08688	0.53134	
VAP013	-0.02162	-0.48600	-0.43122	
VAP020	0.20699	0.03566	0.27659	Alternate Job
VAP023	0.10010	0.63638	-0.14246	
VAP118	-0.05386	-0.76931	-0.34268	
VAP129	-0.33471	0.07390	0.53336	
VAP133	-0.61325	-0.20080	-0.00492	

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.73283	0.03397	0.12501
GROUP 2	0.12548	-0.04349	-0.27123
GROUP 3	0.75533	-0.37883	0.24607
GROUP 4	0.85680	0.97771	0.15130

DISCRIMINANT ANALYSIS WITH TENURE AND AGE VARIABLES

Figure 2-13

Demographic characteristics are presented in Figures 2-14 and 2-15. Career intent, age, pay grade, marital status, and tenure were significantly different ($p < .005$) by group. Sex distribution by group was almost identical ($p > .995$). Little variance was demonstrated in position. As one would anticipate, those persons turning over or inclined to do so in the near future (Groups 3 and 4) tended to have less tenure in all three areas (position, facility, and civil service).

A t-test was performed for each group comparing the respondents' perceptions of present job satisfaction with anticipated utility in an alternate job. For example, the average response on Question 7 (i.e., growth opportunities in present job) was compared with the average response on Question 91 (i.e., growth opportunities anticipated in alternate position) by group. There was little difference in perceived utility of present versus alternative job in Group 1 reference future salary, workload, continuity of patient care, or goal congruence. Groups 1 and 2 perceived the same strong difference between present retirement program and that associated with an alternative job, in favor of the former. All groups significantly perceived the same differences in growth and advancement opportunities, favoring of the alternative job. A two-group (those that have resigned/declined and those that have not) cross tabulation of variables reveals virtually no difference in the groups' perception of the nursing profession in general or their work hours as demonstrated through the chi-square analysis.

As one would anticipate, the open-ended questions in Part 3 of the survey precipitated a multitude of different reasons for turnover, plus likes and dislikes about the job. Only one specific item was consistently

DEMOGRAPHIC DATA

	TOTAL	GROUP 1	GROUP 2	GROUP 3	GROUP 4
<u>Work Hours</u>					
Three Rotating Shifts	252(54)	85(54)	102(60)	42(51)	23(61)
Two Rotating Shifts	141(30)	44(28)	53(31)	31(38)	12(31)
Day Shift	54(11)	27(17)	15(09)	9(11)	3(08)
Other	23(05)				
	No chi-square calculation			Missing observations 23	
<u>Career Intent</u>					
Full time nursing	334(73)	141(87)	132(76)	42(51)	19(49)
Part time nursing	60(13)	5(03)	25(15)	16(19)	14(36)
Discontinue working	17(04)	7(04)	4(02)	4(05)	2(03)
Change careers	46(10)	9(06)	12(06)	21(25)	5(13)
	Chi-square - Significance = 0.0000 Missing observations 14				
<u>Position</u>					
ICU	122(27)	31(29)	50(29)	30(35)	11(28)
OR/Anesthesia	18(4)	8(02)	4(05)	4(05)	2(05)
Other	318(69)	122(68)	118(60)	51(60)	26(67)
	Chi-square - Significance = 0.6004 Missing observations 1				
<u>Age</u>					
25	5(01)	0(00)	2(01)	1(01)	2(05)
25-30	49(11)	3(02)	19(11)	15(18)	12(31)
31-35	79(17)	7(04)	39(22)	24(28)	9(23)
36-40	68(15)	11(07)	29(17)	22(26)	6(15)
40	261(56)	142(87)	85(49)	23(27)	11(30)
	Chi-square - Significance = 0.0000 Missing observations 8				
<u>Pay Grade</u>					
GS8	11(02)	3(02)	5(03)	2(02)	1(03)
GS 9-10	417(91)	142(88)	161(93)	78(92)	36(92)
GS11	29(06)	16(10)	7(04)	4(05)	2(05)
	Chi-square - Significance = 0.0000 Missing observations 14				
<u>Marital Status</u>					
Married	322(70)	104(64)	129(74)	57(67)	32(84)
Single	70(15)	21(13)	26(15)	18(21)	5(13)
Other	68(15)	37(23)	19(11)	10(12)	2(06)
	Chi-square - Significance = 0.0023 Missing observation 10				
<u>Sex</u>					
Male	22(05)	7(04)	9(05)	4(05)	2(05)
Female	438(95)	155(96)	165(95)	81(95)	36(95)
	Chi-square - Significance = .9951 Missing observations 10				

NOTE: Figures in parenthesis denote percent of total for column (group).

Figure 2-14

DEMOGRAPHIC DATA - TENURE

	TOTAL	GROUP 1	GROUP 2	GROUP 3	GROUP 4
Position Tenure					
<6 mos	48(10)				
6-12 mos	55(12)	8(05)	19(11)	12(14)	9(23)
1-5 yrs	131(28)	12(07)	25(15)	14(17)	4(10)
>5 yrs	220(48)	16(10)	70(40)	33(39)	12(31)
Never employed in AMEDD position	7(02)	126(77)	58(35)	24(28)	11(28)
Chi-square- Significance = 0.0000 Missing observations 17					
Facility Tenure					
<6 mos	44(10)	6(04)	21(12)	11(13)	6(15)
6-12 mos	52(11)	11(07)	22(13)	13(15)	6(15)
1-5 yrs	140(30)	17(10)	72(41)	35(41)	16(41)
>5 yrs	220(48)	128(79)	58(33)	25(29)	8(21)
Chi-square - Significance = 0.000 Missing observations 15					
Civil Service Tenure					
<6 mos	22(05)	1(01)	12(07)	7(08)	2(05)
6-12 mos	39(09)	7(04)	18(10)	11(13)	3(08)
1-5 yrs	110(24)	9(07)	58(33)	26(31)	17(44)
>5 yrs	285(62)	145(90)	85(49)	40(47)	14(36)
Chi-square - Significance = 0.0000 Missing observations 1					

NOTE: Figures in parentheses denote percent of total for column (group).

Figure 2-15

negatively mentioned, rotating shifts. Workload, unequal consideration (favoring the military nurse), pay, benefits, and advancement opportunities were often specifically mentioned as dissatisfiers. The type of work performed (i.e., nursing) was overwhelmingly viewed positively. The bulk of the remaining items appeared to be associated either directly or indirectly to management skill and techniques.

Data Interpretation

The results of the discriminant analyses have identified several variables that, as a set of intercorrelated variables, can predict group membership to a significant degree. The analyses consistently separate Groups 3 and 4 from Group 1 in the first function; Group 3 from Group 4 in the second function; and Group 3 from Group 2 in the third and least significant function.

Generally speaking, no single powerful discriminating variable was identified. Furthermore, there was no clearly identified related variable groups. Instead, for the most part, the discriminating variables demonstrated comparatively mild differences in their discriminating ability. This result indicates there are no major single variables or variable groups, of those included in the survey, that can discriminate between the nurses that currently plan to stay and those who plan to leave. As an interrelated mix of variables, however, significant discriminant power exists. It is the aggregate combination of the variables into a whole that creates the power of prediction demonstrated.

The variables in the equation are a mix of variables addressing satisfaction in the present job and anticipated utility in an alternative job, thus supporting the impact of factors external to the organizational

environment. The influence of the significant other is also demonstrated as a variable to turnover. Salary was the strongest and most consistent discriminator. The addition of the set of tenure variables and the age variable did isolate age as a powerful discriminator; however, that variable mix did not have as high an accurate prediction rate for the turnover group as previous analyses.

It is interesting to note that the rotating shifts variable was not a discriminator in the discriminant analysis, despite the frequency with which it was mentioned in response to questions in Part 3 of the survey. One reason explaining why rotating shifts was not a discriminator is the fact that there are limited alternatives available, though the private sector is evolving toward established shifts and away from rotating shifts. Another reason rotating shifts is not a discriminator is because it is a universal dissatisfier. All four groups were nearly equally dissatisfied with rotating shifts as demonstrated by the chi-square analysis. Unless there is a difference perceived by one or more of the groups, the variable cannot be a discriminator. The inverse applies to the variable, nursing profession. The chi-square analysis shows the groups were nearly equally satisfied with nursing.

The adjusted response rate of approximately 40 percent must be addressed. Babbie is of the opinion that a response rate of 50 percent is adequate for analysis and reporting, 60 percent is good, and 70 percent is very good. One reason a high response is desirable is that the response bias can usually be controlled. Babbie further states that high response rates are not as important as demonstrated lack of response bias.⁷ Because of problems encountered in distributing and accounting for the surveys, it is not possible to objectively address response bias.

Footnotes

¹F. J. Kviz, "Toward a Standard Definition of Response Rate," Public Opinion Quarterly, 41 (1977): 265-267.

²N. H. Nie et al., Statistical Package for the Social Sciences 2nd ed. (New York: Mc-Graw-Hill, 1975), p. 453.

³Ibid., pp. 440-443.

⁴Ibid.

⁵Ibid., p. 440

⁶J. P. Allegrante et al., "A Discriminant Analysis of Student Utilization Behavior at a University Health Service," Journal of the American College Health Association 26, No. 3 (1977): 147.

⁷E. R. Babbie, The Practice of Social Research, 2nd ed. (Belmont, California: Wadsworth Publishing Company, 1979), p. 335.

CHAPTER III

CONCLUSION

As demonstrated by Mobley's model of employee turnover (Figure 1-2), the turnover process is complex and wholistic in nature. It is not surprising then that this survey did not identify any extraordinarily powerful single or group discriminator. In fact, one could say that the survey tends to support the idea of wholism in regard to the turnover process, at least among civilian nurses employed by the AMEDD. The study also supports the idea fostered by Flowers and Hughes that people stay for reasons other than satisfaction associated with the present job.

The results of this study must be viewed as what they are - a snapshot in time of the perceptions of the worker. The supraenvironment is constantly in a flux as are the many subenvironments. A seemingly unrelated future event may indirectly affect the retention of civilian registered nurses in the AMEDD. Directly, an adjustment in salary or alternation in rotating shift policy will effect retention.

The implications for management in an environment defined in context of Mobley's model are realized. Elementary managerial theory addresses the issues prescribed in the model. Why then is there a current retention problem? First, comments received in response to questions in Part 3 of the survey indicate the first-line supervisors bear little understanding of the Civil Service System and are not full aware of the impact of their management activities, especially scheduling. Adequate training of the first-line supervisor in these two areas could

be a deterrent to turnover. Second, there are inherent barriers to the Civil Service System that create a climate in which only certain registered nurses will stay. Whether the climate was designed to selectively retain this segment of the nurse pool or whether it was accidental is, in one sense, of little consequence. One must be aware of the impact of such a system and manage accordingly. In another sense, unless the system was intentionally created, not necessarily exclusively for, but inclusively of, nurses, then change should be actively sought to tailor a system to fit the needs of the organization. The point must be emphasized here that it is imperative to have the needs of the organization incorporate the common needs of the worker. Third, the private sector has become more competitive, especially in pay and through perquisites. The Civil Service System must remain competitive to maintain sufficient nurse personnel.

Some specific recommendations can be made to address these fundamental areas. The work environment can be made more appealing through attention to basic dissatisfiers, promoting communication and a means of allowing grievances to be addressed, and eliminate the requirement to rotate three shifts. Consideration should be given to external factors which affect the workers, such as the need for day care service twenty-four hours a day. Changes can be made in the work role. Transferring non-nursing duties (i.e., answering telephone, drawing blood, escorting patients, etc.) to others can promote increased efficiency in personnel utilization and free the registered nurse to perform more nursing duties. Instituting undergraduate and graduate scholarship programs similar to that recently implemented by the Veterans Administration could fulfill the motivational needs of some nurses and, at the same time, obligate them for a period of service.

One must recognize that turnover is not always undesirable. A system cannot exist to meet the needs of all potential registered nurses. The system must be designed to promote retention of that segment most useful to meeting the organization's objectives while promoting voluntary or involuntary turnover of workers outside that segment.

In summary, a nursing shortage exists currently and will most likely worsen. Retention and turnover of civilian registered nurses in the AMEDD appear to be governed by variables also observed elsewhere in the nursing profession. Training of first-line supervisors to develop management skills may deter turnover. Salary and rotating shifts appear to be potentially significant discriminators with the anticipated upcoming changes in the private sector. Some factors are within the purview of the manager. Others require intervention to alter policies and procedures in the Civil Service System. The effective manager will be proactive - monitoring for change, managing that which is within his control, and accommodating to that which is not.

APPENDIX A
QUESTIONNAIRE - SURVEY INSTRUMENT

Hello, I am CPT Frank McDonald assigned to Brooke Army Medical Center, Fort Sam Houston, Texas. The attached survey has been forwarded to you in hopes that you will assist me in a project concerned with the retention of civilian nurses in Army Medical Treatment Facilities (MTF). This survey has been sent to Civilian Personnel Offices servicing Army MTF for forwarding to currently employed civilian nurses and those, within the last six months, who have either voluntarily resigned or declined a position at the MTF. This project is being conducted for two reasons:

(1) Partial fulfillment of the requirements for a masters of arts degree in Health Care Administration.

(2) It is hoped that relevant factors may be identified which may be used to enhance the retention of the civilian nurse.

Your participation will be greatly appreciated and is, of course, strictly voluntary. I personally assure you that the information will be safe guarded and handled so that individual responses will be indiscernible.

The survey is composed of three types of questions which are segregated into three sections. If you VOLUNTARILY RESIGNED try to complete the survey in context of the job at the time of your resignation. If you DECLINED a position try to complete the survey in context of your expectations of the job at the time you declined. If you receive multiple surveys, complete only one.

Your response must be received NLT 29 March to be included in the project!

Section A - Use the red answer sheet - the side with spaces 1 thru 210. Read directions on answer sheet (there will be no true-or-false questions). Each of the forty-two questions require THREE SEPARATE ANSWERS:

FIRST ANSWER should reflect your view in perspective of your present position in the Army MTF. Answer is always marked in column #1 headed by space #1.

SECOND ANSWER should reflect your view in perspective of future positions in the Army MTF. Answer is always marked in column #2 headed by space #43.

THIRD ANSWER should reflect your view in perspective of an alternative position in another hospital. Answer his always marked in column #3 headed by space #85. Example, question #2 -- FIRST ANSWER in space #2; SECOND ANSWER in space #44; THIRD ANSWER in space #86.

Response Scale for Section A items:

- A. Highly satisfied
- B. Satisfied
- C. Neutral
- D. Dissatisfied
- E. Highly dissatisfied

Mark Answers on Red Answer Sheet

	COLUMN #1 Present Position	COLUMN #2 Future Position	COLUMN #3 Alternative Position
1. Current Salary	1	43	85

	COLUMN #1 Present Position	COLUMN #2 Future Position	COLUMN #3 Alternative Position
2. Responsibility	2	44	86
3. Working Conditions	3	45	87
4. Education Opportunity	4	46	88
5. Recognition Received	5	47	89
6. Relations with other Workers	6	48	90
7. Opportunities for Growth	7	49	91
8. Policies & Procedures	8	50	92
9. Relations with Supervisors	9	51	93
10. Work Performed	10	52	94
11. Advancement Opportunities	11	53	95
12. Achievement	12	54	96
13. Job Security	13	55	97
14. Status	14	56	98
15. Role Clarity	15	57	99
16. Overall Job Satisfaction	16	58	100
17. Perception of Significant other re: job	17	59	101
18. Congruance of your goals/objectives with those of the organization	18	60	102
19. Benefits	19	61	103
20. Training Opportunities	20	62	104
21. Continuity of Patient Care	21	63	105
22. Personnel System	22	64	106
23. Organizational Communication	23	65	107
24. Collaboration by nurses & physicians	24	66	108
25. Collaboration by nurses & other non-physician	25	67	109
26. Workload	26	68	110
27. Sense of Accomplishment	27	69	111
28. Supervisor	28	70	112
29. Co-Workers	29	71	113
30. Support re: your Personal goals	30	72	114
31. Performance Evaluations	31	73	115
32. Nursing Profession	32	74	116
33. Equipment & Facilities	33	75	117
34. Starting Salary	34	76	118
35. Retirement Program	35	77	119
36. Personal Security	36	78	120
37. Administrative Work Requirements	37	79	121
38. Uniform Policies	38	80	122
39. Control of Personal Destiny	39	81	123
40. Time Off	40	82	124
41. Flexibility of Job	41	83	125
42. Future Salary	42	84	126

Section B - Single answer multiple choice questions to be answered on red answer sheet in column headed by space #127.

Mark answers on red answer sheet.

127. Sex:

- (A) Male (B) Female

128. Martial Status:

- (A) Married (B) Single (C) Other

129. Length of time employed in this position?

- (A) Less than 6 months (D) More than 5 years
(B) 6 - 12 Months (E) Never
(C) 1 - 5 Years

130. Length of time employed in this facility?

- (A) Less than 6 months (D) More than 5 years
(B) 6 - 12 Months (E) Never - position declined
(C) 1 - 5 Years

131. How long have you been in the Civil Service?

- (A) Less than 6 months (D) More than 5 years
(B) 6 - 12 months (E) Never
(C) 1 - 5 years

132. Civilian pay grade:

- (A) 8 or longer (C) 11 or higher
(B) 9 - 10

133. Age:

- (A) Less than 25 (D) 36 - 40
(B) 25 - 30 (E) More than 40
(C) 31 - 35

134. Which of the following best describes your job intentions?

- (A) Stay in present job until retirement
(B) Have no reason to leave at this time
(C) Plan to leave in near future
(D) Have informed supervisor or initiated resignation or already left or declined

135. Your position:

- (A) ICU Specialty (B) OR/Anesthesia (C) All other

136. Which of the following best describes your career intentions?

- (A) Stay in nursing as full time career
- (B) Work in nursing part time
- (C) Discontinue working
- (D) Discontinue nursing - change to another career

137. Work hours:

- (A) Three rotating shifts
- (B) Two rotating shifts - day & evening
- (C) Two rotating shifts - day & night
- (D) Two rotating shifts - evening & night
- (E) Worked day shift

138. How successful do you expect you would be in finding greater satisfaction in a different nursing job or profession?

- (A) Highly successful
- (B) Successful
- (C) Unsuccessful
- (D) Highly unsuccessful

139. When did you decline/resign?

- (A) Currently employed
- (B) Declined prior to 1 December
- (C) Declined after 1 December
- (D) Resigned prior to 1 December
- (E) Resigned after 1 December

Section C - Questions are open ended. Space is provided for the answer following the question.

1. If you are currently employed at an Army MTF briefly list the likes, dislikes and you plans re: the job.

2. If you have declined or resigned a position at an Army MTF briefly list reasons.

3. What would make the job more attractive to you?

4. What single most important factor could cause/has caused you to resign/decline?

Return red answer sheet and the answers to Section C questions via the self-addressed envelope - no postage is necessary. Thank you for your participation in this survey. Your assistance is greatly appreciated.

APPENDIX B

RETURN RATE CALCULATIONS/SURVEY DISTRIBUTION PROCESS

RETURN RATE CALCULATIONS/SURVEY DISTRIBUTION PROCESS

The response rate was calculated using the following formula:

$$RR = \frac{n}{A_r - (B_r + C_r + D_r + E_r) + A_c - (C_c + D_c + E_c)}$$

Where:

RR = Response Rate

A_c = Surveys distributed by CPO 1224

A_r = Surveys distributed by investigator 60

B_r = Returned to sender 15

C_c = Ungrouped cases - current RNs 11

C_r = Ungrouped cases - turnover RNs 4

D_c = Unreadable cases - current RNs 80

D_r = Unreadable cases - turnover RNs 4

E_c = Returned after deadline - current RNs 12

E_r = Returned after deadline - turnover RNs 2

n = Surveys in analysis 470

The aggregate RR is:

$$RR = \frac{470}{60 - (15 + 4 + 4 + 2) + 1224 - (11 + 80 + 12)}$$

$$RR = \frac{470}{1156}$$

$$RR = .406$$

The distribution of the surveys was designed as a three-step process:

(a) Mail packet to Civilian Personnel Office (CPO) servicing the medical treatment facility (MTF). Each packet contained, in addition to

the letters of instruction and endorsement, the surveys for registered nurses who had resigned or declined. Surveys for the latter group were enclosed in a franked envelope along with a return addressed and stamped envelope and answer sheet.

(b) Since only the local CPO maintains adequate records of names and addresses of those who have declined or resigned, the CPO was tasked to address the envelopes of this group and mail the surveys. At the same time, the CPO was to locally distribute the survey with a return envelope to nurses currently employed. All surveys were identical - only the method of dispersement differed.

(c) The respondent was instructed in the process for completion of the survey and to return the survey via the enclosed envelope.

Unfortunately, erroneous advice was received when designing this study. The majority of the surveys addressed and mailed using franked envelopes were not delivered to the addressee but returned to the investigator. These surveys had to be re-addressed and mailed again in unfranked envelopes.

It is impossible to accurately determine the number of surveys distributed to those who declined or resigned since an undetermined number were delivered via franked envelopes.

APPENDIX C
REFINEMENT OF THE VARIABLE LIST

REFINEMENT OF THE VARIABLE LIST

The SPSS user manual does not limit the number of variables for discriminant analysis. Unfortunately, the computer support available to analyze the data of this project utilizes a version of SPSS which has an inherent limitation on the number of variables to be analyzed at any one time. An a priori decision was made to completely eliminate all the variables addressing the anticipated utility in present job.

The analysis of the remaining data was accomplished in two basic steps with refinements in subsequent analyses. Two sets of variables were analyzed separately (Tabs 1 and 2 respectively). The significant variables identified through the separate discriminant analyses were combined into a final variable list for final analysis (Figure 2-2).

The initial two variables in Step 1 were composed of:

- (a) All variables addressing utility of present job (Questions 1-42) plus selected demographics (Questions 137-138)
- (b) All variables addressing anticipated utility of alternative job (Questions 85-126) plus selected demographics (Questions 137-138)

A discriminant analysis was performed utilizing method MAXMINF with a partial F for entry and exit of 1.0. The variables from the two groups identified by the separate discriminant analysis for inclusion in the analysis were combined to form the final variable list (Figure 2-2).

TAB 1 REFINEMENT OF THE VARIABLE LIST

VARIABLES - 001-042 plus 128-131, 133, 136, and 137

METHOD - Discriminant Analysis/MAXMINF

ARMED CIVILIAN HURSE RETENTION

05/13/82

PAGE 162

FILE NAME (CREATION DATE = 05/13/82)

DISCRIMINANT ANALYSIS

SUMMARY TABLE

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	RAO'S V	CHANGE IN RAO'S V	SIG. OF CHANGE
1	VAR133		43.78125	1	0.77674	0.050	131.35291	131.35291	0.000
2	VAR119		5.80459	2	0.74816	0.000	150.30294	18.94993	0.000
3	VAR131		3.29102	3	0.73227	0.000	160.56373	10.26090	0.016
4	VAR128		4.19345	4	0.71255	0.000	175.45487	14.89113	0.002
5	VAR120		4.55074	5	0.69170	0.000	192.20401	16.74914	0.001
6	VAR130		5.94727	6	0.66542	0.000	214.74049	22.53648	0.000
7	VAR137		2.30459	7	0.65536	0.000	222.71035	7.97047	0.047
8	VAR117		2.55273	8	0.64439	0.000	231.91734	9.20639	0.027
9	VAR111		4.55453	9	0.62535	0.000	248.43631	16.51897	0.001
10	VAR112		1.62500	10	0.61862	0.000	253.93847	5.50216	0.139
11	VAR116		2.10156	11	0.61001	0.000	262.32070	8.38223	0.039
12	VAR115		0.64500	12	0.61266	0.000	260.09745	-2.22325	1.000
13	VAR110	VAR029	2.16932	13	0.60396	0.000	267.80093	7.70339	0.053
14	VAR107		1.54492	14	0.59765	0.000	273.51447	5.71365	0.126
15	VAR103		2.62949	15	0.58724	0.000	282.14691	8.63234	0.035
16	VAR137		4.89344	16	0.56942	0.000	303.32230	21.17549	0.000
17	VAR128		1.72007	17	0.56195	0.000	310.02427	6.70197	0.082
18	VAR102		3.33436	18	0.54941	0.000	324.97488	14.95061	0.002
19	VAR034		1.64355	19	0.53334	0.000	331.48989	6.51500	0.089
20	VAR133		3.91504	20	0.52921	0.000	348.50414	17.01426	0.001
21	VAR111		1.15367	21	0.52505	0.000	352.49581	3.99167	0.262
22	VAR131		3.14053	22	0.49731	0.000	367.92004	35.42423	0.000
23	VAR129		3.46397	23	0.48576	0.000	405.16437	17.24434	0.001
24	VAR116		3.24323	24	0.47516	0.000	419.32203	14.15765	0.003
25	VAR022		1.21729	25	0.47120	0.000	425.53191	6.20978	0.112
26	VAR118		2.72656	26	0.46249	0.000	438.32049	12.78868	0.005
27	VAR123	VAR022	0.89599	27	0.46532	0.000	433.92369	-4.39681	1.000
28	VAR123		2.25781	28	0.45817	0.000	442.35174	8.42805	0.039
29	VAR124	VAR123	1.94915	29	0.46118	0.000	478.62190	-3.72994	1.000
30	VAR130		1.27783	30	0.45714	0.000	444.73206	6.11026	0.106
31	VAR040		3.13773	31	0.44742	0.000	460.04893	15.31697	0.002
32	VAR109		2.06152	32	0.44111	0.000	471.34644	11.29751	0.010
33	VAR134	VAR034	1.94454	33	0.44400	0.000	467.88431	-3.46213	1.000
34	VAR134		1.35596	34	0.43936	0.000	474.12153	6.23722	0.101

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	0.77171	74.38	0.660	0	0.4399	355.481	78	0.000
2	0.14725	14.19	0.358	1	0.7793	110.964	50	0.000
3	0.11850	11.42	0.325	2	0.8941	49.934	24	0.001

AMEDO CIVILIAN NURSE RETENTION

05/13/82

PAGE 163

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VAR001	-0.09535	-0.19022	-0.41448
VAR002	-0.17895	-0.12893	0.12431
VAR003	0.16011	0.36594	-0.40720
VAR006	-0.11896	0.33996	0.12240
VAR007	0.02330	-0.40431	-0.19011
VAR009	0.18339	0.02322	-0.02164
VAR010	-0.09911	-0.27977	0.27520
VAR011	-0.06535	0.14279	0.38374
VAR012	0.13917	-0.23012	-0.15875
VAR016	-0.19275	-0.13910	-0.32388
VAR017	0.01130	0.40883	0.05584
VAR018	-0.17535	-0.12963	-0.34679
VAR019	0.04148	-0.27046	0.31842
VAR020	0.03734	-0.23341	0.25911
VAR023	-0.08752	0.12655	0.46076
VAR030	-0.16187	0.33893	-0.23659
VAR031	0.11121	-0.38498	-0.17805
VAR033	-0.14525	-0.13775	0.22534
VAR037	0.16533	0.21515	0.31321
VAR040	-0.21546	0.06570	-0.23728
VAR129	0.14642	-0.12438	-0.06136
VAR130	0.15239	-0.15464	-0.19023
VAR131	0.03732	0.32729	-0.23048
VAR133	0.51301	-0.31319	0.05469
VAR136	-0.08854	-0.02391	-0.21240
VAR137	0.17921	0.11926	-0.10111

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	0.81232	-0.00981	-0.19031
GROUP 2	-0.15930	0.01899	0.45975
GROUP 3	-0.84714	-0.46075	-0.31973
GROUP 4	-0.33751	1.00408	-0.37561

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		GP. 1	GP. 2	GP. 3	GP. 4
GROUP 1	163.	131. 80.4%	19. 11.7%	4. 4.9%	5. 3.1%
GROUP 2	174.	42. 24.1%	74. 42.5%	32. 18.4%	26. 14.9%
GROUP 3	85.	3. 10.6%	13. 15.3%	47. 55.3%	16. 18.8%
GROUP 4	33.	2. 5.1%	6. 15.4%	5. 12.8%	26. 66.7%

PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED 60.30%

TAB 2 REFINEMENT OF THE VARIABLE LIST

VARIABLES - 085-126 plus 128-131, 133, 136, and 137

METHOD - Discriminant Analysis/MAXMINF

AMEL CIVILIAN NURSE PETITION

FILE NAME (CREATION DATE = 05/14/92)

05/14/92 PAGE 39

DISCRIMINANT ANALYSIS

SUMMARY TABLE

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	FAO'S V	CHANGE IN FAO'S V	SIG. OF CHANGE
1	VAR133		43.79125	1	0.77674	0.000	131.35291	131.35291	0.000
2	VAR114		3.92773	2	0.75714	0.000	143.50313	12.15011	0.007
3	VAR121		3.56518	3	0.73975	0.000	154.64404	11.14101	0.011
4	VAR124		1.95566	4	0.73225	0.000	159.43567	4.79156	0.189
5	VAR137		7.41632	5	0.69797	0.000	187.75236	28.31676	0.000
6	VAR106		3.3391	6	0.69226	0.000	199.05229	11.29992	0.010
7	VAR145		3.03125	7	0.68074	0.000	219.00624	19.95395	0.000
8	VAR119		1.97705	8	0.65215	0.000	225.76951	6.76327	0.090
9	VAR194		1.44322	9	0.64519	0.000	231.72511	5.95560	0.114
10	VAR149		1.46324	10	0.63950	0.000	236.64617	4.92106	0.178
11	VAR101		1.10547	11	0.63449	0.000	240.27099	3.62482	0.305
12	VAR128		2.21934	12	0.62558	0.000	248.56184	8.29085	0.040
13	VAR143	VAR124	0.99027	11	0.62979	0.000	245.18472	-3.37713	1.000
14	VAR104	VAR103	3.75195	12	0.61428	0.000	258.54761	13.36290	0.004
15	VAR104	VAR103	1.95752	11	0.61824	0.000	255.44132	-3.10629	1.000
16	VAR102		1.57311	12	0.60975	0.000	262.79041	7.34908	0.062
17	VAR122		1.93195	13	0.60233	0.000	269.22774	6.43733	0.092
18	VAR124		1.83015	14	0.59457	0.000	276.71496	7.48723	0.053
19	VAR124		0.55459	15	0.58209	0.000	313.95374	37.23878	0.000
20	VAR113		1.27539	16	0.55726	0.000	319.27683	5.32309	0.150
21	VAR131		1.71633	17	0.55083	0.000	325.20965	5.93283	0.115
22	VAR107		1.46592	14	0.54538	0.000	330.65431	5.44435	0.142
23	VAR108		1.91804	19	0.53817	0.000	337.69030	7.03629	0.071
24	VAR105		1.48632	20	0.53210	0.000	342.00459	5.31429	0.150
25	VAR130		1.07655	21	0.52839	0.000	348.19863	5.19405	0.158

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	0.55339	72.71	0.597	0	0.5290	284.959	63	0.000
2	0.15167	19.61	0.363	1	0.8220	87.693	40	0.000
3	0.06628	7.33	0.231	2	0.9467	24.501	19	0.178

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

05/14/82

ARMED CIVILIAN SUSPECT RETENTION

STEP 1: LINEAR DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VAR 10	0.31122	0.24443	-0.20917
VAR 100	-0.12375	-0.54333	-0.11056
VAR 101	0.17400	0.62143	0.51305
VAR 104	0.07910	-0.29119	-0.50722
VAR 111	-0.11436	0.44759	-0.33411
VAR 112	0.02157	0.23224	0.44701
VAR 113	0.01744	-0.56936	-0.11911
VAR 114	0.16776	-0.14080	0.54375
VAR 115	-0.01424	-0.45239	-0.05153
VAR 116	0.09279	0.44254	-0.16388
VAR 117	0.13540	-0.11533	0.47716
VAR 118	-0.24504	-0.90533	0.07155
VAR 119	0.12745	0.14339	0.61342
VAR 120	-0.13493	0.32153	-0.03499
VAR 122	-0.19329	0.13542	0.01257
VAR 124	-0.03234	-0.17041	-0.31852
VAR 125	-0.19310	-0.03559	0.07308
VAR 130	-0.19545	0.01311	-0.06191
VAR 131	0.03330	0.31311	-0.26313
VAR 133	-0.60030	-0.12740	0.29064
VAR 137	-0.30456	0.07430	0.28479

DETERMINING OF GROUPS IN REDUCED SPACE

GROUP	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.75343	0.11743	-0.07338
GROUP 2	0.22260	-0.19150	0.25590
GROUP 3	0.59033	-0.31753	-0.37953
GROUP 4	0.91508	1.05440	-1.00746

APPENDIX D

DISCRIMINANT ANALYSIS - COMPARISON OF METHODS

DISCRIMINANT ANALYSIS - COMPARISON OF METHODS

The SPSS version available offered the same methods of discriminant analysis as described in the SPSS user manual: direct, Wilks, MAHAL, MAXMINF, MINRESID, and RAO (the latter five incorporating stepwise selection criteria). For an explanation of each method, the reader is referred to the SPSS user manual, pages 446 - 448. A comparison of the different methods was made using data from this survey. There was essentially no difference in the results obtained by the different stepwise methods.

APPENDIX E
DISCRIMINANT ANALYSIS -
COMPARISON OF MISSING DATA OPTIONS

DISCRIMINANT ANALYSIS - COMPARISON OF MISSING DATA OPTIONS

The SPSS version available offered the same two options as described in the SPSS user manual for handling missing data during the analysis:

Option 1 - Include missing data

Option 2 - Include cases with missing values during classification.

For an explanation of the options the reader is referred to the SPSS user manual, page 456. A comparison of the two options for handling missing data was made using data from this survey (Tabs 1 and 2). Option 1 produced the better results. There did not appear to be any contraindication for using Option 1; therefore, it was incorporated into the series of analyses of the final variables list.

TABLE 1 - OPTIONS COMPARISON

Option 1 - Include missing data

"With this option all missing-value declarations are ignored. In this instance, all cases are included during the stepwise and analysis phases provided that they satisfy the GROUPS specification. During the classification phase, all cases are included regardless of their group assignment."

SPSS Manual, page 456

AMERICAN CIVILIAN WARREN RETENTION

05/13/82 PAGE 162

FILE NAME (CREATION DATE = 05/13/82)

DISCRIMINANT ANALYSIS

COVARIANCE

STEP	VARIABLE	ENTERED	REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	RAO'S V	CHANGE IN RAO'S V	SIG. OF CHANGE
1	VAR133			43.78125	1	0.77674	0.050	131.35291	131.35291	0.000
2	VAR119			5.80463	2	0.74816	0.000	150.30244	18.94993	0.000
3	VAR131			3.29132	3	0.73227	0.030	160.56373	10.26090	0.016
4	VAR124			4.19145	4	0.71255	0.000	175.45487	14.89113	0.002
5	VAR120			4.55274	5	0.69170	0.000	192.20401	16.74914	0.001
6	VAR131			5.94727	6	0.65542	0.000	214.74043	22.53648	0.000
7	VAR137			2.30859	7	0.65536	0.000	222.71095	7.97047	0.047
8	VAR117			2.55273	8	0.64439	0.000	231.91734	9.20639	0.027
9	VAR101			4.55453	9	0.62535	0.000	248.43631	16.51897	0.001
10	VAR112			1.62500	10	0.61862	0.000	253.93847	5.50216	0.139
11				2.10156	11	0.61031	0.000	262.32070	8.38223	0.039
12				0.64500	12	0.61266	0.000	260.09745	-2.22325	1.000
13	VAR106			2.16932	13	0.60386	0.000	267.80383	7.70338	0.053
14	VAR110			1.54492	14	0.59765	0.000	273.51447	5.71365	0.126
15	VAR103			2.62948	15	0.58724	0.000	282.14691	8.63234	0.035
16	VAR137			1.89344	16	0.56842	0.000	303.32230	21.17549	0.000
17	VAR128			1.72617	17	0.56195	0.000	310.02427	6.70197	0.042
18	VAR104			3.83496	18	0.54941	0.000	324.97488	14.95061	0.002
19	VAR133			1.64355	19	0.54334	0.000	331.48988	6.51500	0.049
20	VAR111			3.91504	20	0.52921	0.000	348.50414	17.01426	0.001
21	VAR131			1.15367	21	0.52505	0.000	352.49541	3.99167	0.262
22	VAR129			8.14253	22	0.49731	0.000	367.92004	35.42423	0.000
23	VAR116			3.46337	23	0.48576	0.000	405.16437	17.24434	0.001
24	VAR122			3.24323	24	0.47516	0.000	419.32213	14.15765	0.003
25	VAR118			1.21729	25	0.47120	0.000	425.53191	6.20979	0.102
26	VAR123			2.72656	26	0.46249	0.000	438.32049	12.78868	0.005
27	VAR123			2.88594	27	0.46512	0.000	433.92369	-4.39691	1.000
28	VAR123			2.25741	28	0.45917	0.000	442.35174	8.42805	0.038
29	VAR130			3.34915	29	0.46114	0.000	478.62190	-3.72994	1.000
30	VAR130			1.27783	30	0.45714	0.000	444.73206	6.11026	0.106
31	VAR130			3.13373	31	0.44742	0.000	460.04893	15.31637	0.002
32	VAR130			2.06152	32	0.44111	0.000	471.34644	11.29751	0.010
33	VAR134			3.94458	33	0.44400	0.000	467.88431	-3.46213	1.000
34	VAR134			1.35596	34	0.43936	0.000	474.12153	6.23722	0.101

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DEPICTED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	0.77171	74.38	0.660	0	0.4393	365.481	78	0.000
2	0.14725	14.19	0.358	1	0.7793	110.964	50	0.000
3	0.11850	11.42	0.325	2	0.8941	49.834	24	0.001

ANERO CIVILIAN HOUSE RETENTION

05/13/92

PAGE 163

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VAR001	-0.09535	-0.19322	-0.41448
VAR002	-0.17995	-0.12893	0.12431
VAR003	0.16011	0.36594	-0.40720
VAR006	-0.11996	0.33996	0.12240
VAR007	0.02330	-0.40431	-0.19011
VAR009	0.18339	0.02322	-0.02164
VAR010	-0.09911	-0.27477	0.27520
VAR011	-0.08535	0.14279	0.38374
VAR012	0.13917	-0.23012	-0.15875
VAR016	-0.19275	-0.15910	-0.32398
VAR017	0.01130	0.40883	0.05594
VAR018	-0.17533	-0.12953	-0.34679
VAR019	0.04148	-0.27046	0.31842
VAR020	0.03724	-0.23441	0.25931
VAR023	-0.08752	0.12655	0.46076
VAR030	-0.15197	0.33993	-0.29639
VAR031	0.11121	-0.38438	-0.17805
VAR033	-0.14525	-0.13775	0.22534
VAR037	0.15553	0.21515	0.31321
VAR040	-0.21545	0.06570	-0.29728
VAR129	0.14642	-0.12434	-0.06136
VAR130	0.15299	-0.15964	-0.19023
VAR131	0.03732	0.32729	-0.23048
VAR133	0.51021	-0.31319	0.05469
VAR135	-0.03954	-0.02391	-0.21246
VAR137	0.17921	0.11926	-0.10111

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	0.81232	-0.00981	-0.18031
GROUP 2	-0.15930	0.01899	0.43975
GROUP 3	-0.84734	-0.40075	-0.31973
GROUP 4	-0.83761	1.00438	-0.37561

AMERICAN CIVILIAN NURSE RETENTION

05/13/82

PAGE 164

ASSIGNMENT RESULTS -

TOTAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		GP. 1	GP. 2	GP. 3	GP. 4
GROUP 1	163.	131. 80.4%	19. 11.7%	9. 4.9%	5. 3.1%
GROUP 2	174.	42. 24.1%	74. 42.5%	32. 18.4%	26. 14.9%
GROUP 3	83.	3. 10.6%	13. 15.3%	47. 55.3%	16. 18.8%
GROUP 4	33.	2. 5.1%	6. 15.4%	5. 12.8%	26. 56.7%

PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED 60.30%

TAB 2 - OPTIONS COMPARISON

Option 2 - Include cases with missing values during classification

"During the classification phase, all cases with missing data are processed. If the group code is missing, the case is treated as unclassified. If data are missing from the discriminating variable, the total mean for the respective variable is submitted."

SPSS Manual, page 456

NAMES CIVILIAN NURSE RETENTION

05/13/82

PAGE 155

FILE NAME (CREATION DATE = 05/13/82)

DISCRIMINANT ANALYSIS

SUMMARY TABLE

STEP FUNCTION	VARIABLE ENTERED	REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	RAO'S V	CHANGE IN RAO'S V	SIG. OF CHANGE
1	VAR010		13.55853	1	0.90352	0.000	40.68304	40.68304	0.000
2	VAR019		4.19322	2	0.84859	0.000	66.74654	26.06350	0.000
3	VAR133		31.05459	3	0.64113	0.000	169.27995	102.53342	0.000
4	VAR042		3.78320	4	0.66127	0.000	183.01430	13.73435	0.003
5	VAR017		2.23320	5	0.62047	0.000	191.40585	8.39155	0.039
6	VAR112		1.66113	6	0.64037	0.000	196.87341	5.46756	0.141
7	VAR013		2.00596	7	0.63045	0.000	204.64719	7.77378	0.051
8	VAR035		1.20410	8	0.62492	0.000	208.97548	4.32829	0.228
9	VAR031		3.04432	9	0.60988	0.000	220.26459	11.28911	0.010
10	VAR033		2.57310	10	0.59745	0.000	230.25107	9.98648	0.019
11	VAR007		1.31434	11	0.59116	0.000	234.94297	4.69190	0.196
12	VAR037		1.29346	12	0.53503	0.000	240.13597	5.19299	0.158
13	VAR020		1.50732	13	0.57795	0.000	245.40735	5.27138	0.153
14		VAR007	0.32104	12	0.59190	0.000	242.39153	-3.01582	1.000
15	VAR041		1.30371	13	0.57570	0.000	248.10389	5.71237	0.126
16	VAR033		1.46324	14	0.56686	0.000	253.22601	5.12271	0.163
17	VAR035		1.13135	15	0.56357	0.000	258.25850	5.03190	0.169
18	VAR033		3.41602	16	0.54831	0.000	271.82597	13.56747	0.004
19		VAR035	0.97754	15	0.55271	0.000	267.47320	-4.35277	1.000
20	VAR009		1.82031	16	0.54458	0.000	275.94842	8.47522	0.037
21	VAR035		1.23036	17	0.53913	0.000	281.56196	5.61354	0.132
22	VAR129		7.79698	13	0.50657	0.000	316.67618	35.11423	0.000
23		VAR013	0.83338	17	0.51005	0.000	313.03340	-3.64279	1.000
24	VAR130		1.36816	18	0.50436	0.000	318.94357	5.91017	0.116
25		VAR041	1.95142	17	0.50832	0.000	314.43949	-4.50408	1.000
26	VAR137		4.68164	18	0.48943	0.000	337.74665	23.30717	0.000
27		VAR001	0.94312	17	0.49323	0.000	333.30563	-4.44102	1.000
28	VAR002		1.93936	18	0.48547	0.000	343.33077	10.02513	0.018
29		VAR035	0.85964	17	0.48891	0.000	339.49137	-3.83940	1.000
30	VAR040		2.84473	18	0.47771	0.000	353.33103	13.88967	0.003
31	VAR016		1.15527	19	0.47319	0.000	359.37103	5.99090	0.112
32	VAR023		1.10010	20	0.46891	0.000	363.33867	3.96764	0.265

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	0.74506	77.18	0.651	0	0.4689	281.729	60	0.000
2	0.14592	15.41	0.358	1	0.8135	76.742	38	0.000
3	0.07167	7.52	0.259	2	0.9331	25.749	18	0.106

REMARKS: COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION

STANARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VARJ02	0.16636	0.05335	0.08187
VARJ03	-0.19705	-0.30119	-0.47413
VARJ04	0.13102	-0.29443	0.06118
VARJ05	-0.07114	0.41713	0.00338
VARJ06	0.15704	-0.05721	-0.13512
VARJ07	0.07439	-0.26252	0.09888
VARJ08	0.12174	0.14357	-0.34576
VARJ09	0.00956	0.45030	0.26935
VARJ10	0.33251	0.37476	0.14768
VARJ11	0.04742	-0.01716	0.41722
VARJ12	0.06627	-0.36789	-0.33919
VARJ13	-0.15500	0.29551	-0.23311
VARJ14	0.17323	0.23106	0.23571
VARJ15	-0.11714	-0.04172	0.34066
VARJ16	0.16541	-0.02366	-0.29266
VARJ17	0.11043	0.26641	-0.27684
VARJ18	-0.19700	0.22461	-0.04873
VARJ19	-0.16367	-0.13761	-0.33651
VARJ20	-0.51325	0.24236	0.01646
VARJ21	-0.21058	-0.05340	-0.15024

CENTRIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.82099	-0.01232	-0.13586
GROUP 2	0.17743	0.03227	0.32013
GROUP 3	0.80396	0.46397	-0.30337
GROUP 4	0.81337	-0.97176	-0.22751

APPENDIX F
DISCRIMINANT ANALYSIS - PARTIAL F OF 1.5

DISCRIMINANT ANALYSIS

SUMMARY TABLE

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	RAO'S V	CHANGE IN RAO'S V	SIG. OF CHANGE
1	VARJ17		3.37391	1	0.94785	0.000	25.14618	25.14606	0.000
2	VARJ20		7.82031	2	0.90146	0.000	48.80992	23.66384	0.000
3	VARJ16		13.14453	3	0.82955	0.000	91.04589	42.23597	0.000
4	VARJ03		3.70312	4	0.80973	0.000	103.11391	12.06603	0.007
5	VARJ03		2.66895	5	0.79566	0.000	111.58879	8.47788	0.037
6	VARJ13		2.49219	6	0.78271	0.000	119.72275	8.13596	0.043
7	VARJ19		2.94629	7	0.76766	0.000	129.38167	9.65892	0.022
8	VARJ31		3.14355	8	0.75190	0.000	139.44181	10.06014	0.018
9	VARJ40		5.90339	9	0.72338	0.000	160.65553	21.21373	0.000
10	VARJ23		1.19727	10	0.71763	0.000	164.43311	3.77758	0.287
11	VARJ33		1.93457	11	0.70843	0.000	171.10311	6.57000	0.083
12	VARJ20		2.37312	12	0.69731	0.000	176.69464	7.58152	0.056
13	VARJ66		3.34082	13	0.68195	0.000	190.00170	11.31706	0.010
14		VARJ33	0.87842	14	0.68599	0.000	186.80580	-3.19590	1.000
15	VARJ19		1.78809	15	0.67782	0.000	192.66876	5.86296	0.118
16	VARJ36		1.16162	16	0.67254	0.000	196.50420	3.83544	0.260
17	VARJ18		2.88379	17	0.65965	0.000	207.05185	10.54765	0.014
18	VARJ02		2.53961	18	0.64822	0.000	216.07161	9.01976	0.029
19	VARJ37		6.24932	19	0.62159	0.000	245.33538	24.26347	0.000
20	VARJ05		1.34131	20	0.61596	0.000	245.12615	4.79107	0.188
21	VARJ37		5.42573	21	0.59393	0.000	266.25565	21.12950	0.000
22	VARJ06		1.67578	22	0.58719	0.000	272.23357	5.97792	0.113
23	VARJ01		1.73975	23	0.58026	0.000	278.90196	6.66839	0.083
24	VARJ05		2.98828	24	0.56856	0.000	291.07030	12.16834	0.007
25	VARJ38		149.87500	25	0.27955	0.000	847.90033	556.83002	0.000
26		VARJ17	0.92798	26	0.28134	0.000	843.54149	-4.35883	1.000
27		VARJ33	0.95874	27	0.28319	0.000	836.95684	-4.58485	1.000
28	VARJ22		1.79541	28	0.27974	0.000	846.65813	7.70149	0.053
29	VARJ09		1.56494	29	0.27675	0.000	854.91524	8.25710	0.041
30	VARJ04		1.53320	30	0.27385	0.000	860.79114	5.87590	0.118
31	VARJ03		1.30957	31	0.27138	0.000	866.62854	5.83741	0.129
32	VARJ01		1.18408	32	0.26917	0.000	872.99132	6.36277	0.095
33		VARJ02	3.65845	33	0.27040	0.000	869.20035	-3.79095	1.000
34	VARJ02		1.01025	34	0.26852	0.000	873.53669	4.33633	0.227
35	VARJ01		3.23437	35	0.26260	0.000	888.95691	15.42022	0.001
36		VARJ33	1.96338	36	0.26436	0.000	894.82444	-4.13247	1.000
37	VARJ33		3.45215	37	0.25816	0.000	901.51066	16.68622	0.001
38	VARJ04		2.66797	38	0.25344	0.000	913.45413	11.94347	0.008
39		VARJ02	0.77295	39	0.25481	0.000	907.81403	-5.64010	1.000
40	VARJ07		1.11377	40	0.25284	0.000	914.17574	6.36171	0.095
41	VARJ02		1.12491	41	0.25104	0.000	918.76224	4.58651	0.205
42		VARJ07	0.98022	42	0.25276	0.000	912.95348	-5.80677	1.000
43	VARJ33		1.25732	43	0.25056	0.000	921.17116	8.21768	0.042
44		VARJ02	0.95459	44	0.25223	0.000	916.96538	-4.20578	1.000

AMEDC CIVILIAN NURSE RETENTION

05/17/82 PAGE 6

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
45 VAR118		3.61916	29	0.24631	0.000	944.44452	27.47914	0.000
46 VAR120		1.19922	30	0.24336	0.000	953.67328	9.22876	0.024
47 VAR106		1.67371	31	0.24111	0.000	967.01064	13.33736	0.004
48 VAR100		1.48396	32	0.23862	0.000	974.51243	7.50179	0.058
1	1.54806	72.60	0.779	0	0.2385	633.326	96	0.000
2	0.45050	21.13	0.557	1	0.5080	219.910	62	0.009
3	0.13386	6.28	0.344	2	0.6819	55.527	30	0.003

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

AMEDE CIVILIAN NURSE REGISTRATION

05/17/82

PAGE

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VAR001	-0.06235	-0.19002	-0.31650
VAR003	0.10347	0.30737	-0.25520
VAR009	-0.06831	0.13664	-0.05729
VAR010	-0.10452	-0.14971	0.26774
VAR015	0.09429	-0.36194	-0.22857
VAR016	-0.02562	-0.26355	-0.31718
VAR019	-0.05300	-0.11906	0.30512
VAR020	-0.10145	0.01543	0.08396
VAR023*	-0.01163	0.03545	0.37255
VAR030	0.12142	-0.13346	-0.05733
VAR031	-0.13637	0.00159	-0.32222
VAR033	0.05913	-0.21929	0.21242
VAR037	-0.00911	0.34672	0.26281
VAR040	0.15140	-0.28377	-0.17931
VAR055	-0.19089	-0.23483	0.09354
VAR059	-0.21437	-0.05937	0.00639
VAR073	0.21252	-0.00198	0.39184
VAR079*	0.02923	-0.19513	-0.39439
VAR100	0.07448	0.23150	-0.28132
VAR101	-0.10846	0.04356	0.29731
VAR103	0.10839	0.22552	-0.32092
VAR104	-0.06654	-0.30359	0.45426
VAR105	-0.15090	-0.17839	-0.09718
VAR109	0.13930	0.52874	-0.02212
VAR113*	0.00326	-0.18541	0.31890
VAR118	-0.22964	0.05314	0.13444
VAR119*	-0.03052	-0.14033	0.52520
VAR120	0.03028	0.11475	-0.70973
VAR122	0.00059	0.30152	-0.12753
VAR135*	0.06055	-0.02655	-0.20467
VAR137	-0.04923	0.28633	-0.12726
VAR139	0.87976	0.16457	0.03089

* VAR not sig until FUN 3

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.30260	0.61398	-0.23298
GROUP 2	-0.20133	-0.13208	0.42435
GROUP 3	-0.18081	-0.95742	-0.40731
GROUP 4	2.55571	0.10385	-0.02936

Salary - P
Working Cond - P
Relations w/ Supervisor - P
Work Performed - P
Overall Job Satisfaction - P
Goal Connuance - P
Benefits - P
Training Opp - P
Organization Communication - P
Snt of Personal Goals - P
Performance Evals - P
Equip/Facilities - P
Admin Work Reqd - P
Time Off - P
Salary - A
Responsibility - A
Relations w/ Supervisor - A
Work Performed - A
Overall Job Satisfaction - A
Perceptions of Significant Other - A
Benefits - A
Training Opportunities - A
Continuity of Rx - A
Collaboration (MD/Nurse) - A
Co-Workers - A
Starting Salary - A
Retirement Program - A
Personal Security - A
Uniform Policy - A
Rotating Shifts
Success in Locating Other Job

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		GP. 1	GP. 2	GP. 3	GP. 4
GROUP 1	153.	115. 77.6%	34. 20.9%	13. 8.3%	1. 0.6%
GROUP 2	174.	44. 25.3%	84. 48.3%	43. 24.7%	3. 1.7%
GROUP 3	85.	9. 10.6%	15. 17.6%	59. 69.4%	2. 2.4%
GROUP 4	33.	3. 7.7%	5. 12.8%	1. 2.6%	33. 76.9%
UNGROUPED CASES	3.	4. 44.4%	1. 11.1%	2. 22.2%	2. 22.2%

PERCENT OF GROUPED CASES CORRECTLY CLASSIFIED 62.47%

APPENDIX G
DISCRIMINANT ANALYSIS - PARTIAL F OF 2.0

DISCRIMINANT ANALYSIS

SUMMARY TABLE

STEP NUMBER	VARIABLE ENTERED	REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	RAC'S V	CHANGE IN RAC'S V	SIG. OF CHANGE
1	VAR017		8.77861	1	0.07785	0.000	25.14608	25.14608	0.000
2	VAR020		7.82031	2	0.92146	0.000	48.80992	23.66394	0.000
3	VAR016		13.14453	3	0.92955	0.000	91.04589	42.23597	0.000
4	VAR067		3.70312	4	0.90973	0.000	103.11391	12.06803	0.007
5	VAR003		2.66805	5	0.79566	0.000	111.58879	8.47485	0.037
6	VAR113		2.49219	6	0.78271	0.000	119.72275	8.13396	0.043
7	VAR019		2.04820	7	0.76766	0.000	129.38167	9.65892	0.022
8	VAR071		3.14355	8	0.75190	0.000	139.44181	10.06014	0.018
9	VAR040		5.00030	9	0.72378	0.000	160.65553	21.21373	0.000
10	VAR002		2.47559	10	0.71158	0.000	169.77409	9.11855	0.028
11	VAR086		3.75586	11	0.69438	0.000	182.34065	12.56676	0.006
12	VAR014		5.02148	12	0.67140	0.000	201.55029	19.21945	0.000
13	VAR037		1.41406	13	0.67778	0.000	196.05174	-5.49555	1.000
14	VAR120		3.13194	14	0.66390	0.000	206.37286	10.32312	0.016
15	VAR119		1.86133	15	0.65557	0.000	212.50542	6.13256	0.105
16	VAR085		3.18869	16	0.64177	0.000	224.53529	12.42987	0.006
17	VAR037		3.78320	17	0.62573	0.000	239.19856	14.26327	0.003
18	VAR119		1.38867	18	0.63162	0.000	234.63003	-4.56854	1.000
19	VAR115		9.97656	19	0.59183	0.000	269.92871	35.29869	0.000
20	VAR018		7.07227	20	0.57955	0.000	282.15412	12.22540	0.007
21	VAR037		3.40030	21	0.56844	0.000	295.45140	13.25728	0.004
22	VAR094		2.49121	22	0.55658	0.000	305.20823	9.75663	0.021
23	VAR119		1.95947	23	0.54962	0.000	312.44771	7.23348	0.065
24	VAR122		1.77246	24	0.54302	0.000	319.97473	7.52702	0.057
25	VAR001		2.60840	25	0.53347	0.000	330.23636	10.26163	0.016
26	VAR104		1.74902	26	0.52712	0.000	337.08835	6.85199	0.077
27	VAR020		1.38477	27	0.52215	0.000	331.97429	-5.11406	1.000
28	VAR108		2.03320	28	0.52480	0.000	339.55404	7.57975	0.056
29	VAR030		1.89258	29	0.51804	0.000	347.64604	8.09203	0.044
30	VAR119		1.44141	30	0.52319	0.000	342.29627	-5.34977	1.000
31	VAR002		1.86377	31	0.51555	0.000	349.44803	7.15175	0.067
32	VAR105		1.89014	32	0.50989	0.000	356.58001	7.23199	0.065
33	VAR020		2.40918	33	0.50151	0.000	366.26625	9.60624	0.022

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	0.45913	57.16	0.361	0	0.5015	307.451	75	0.000
2	0.26493	30.56	0.444	1	0.7313	135.426	46	0.000
3	0.09944	12.28	0.299	2	0.9104	41.827	23	0.010

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

AMERICAN CIVILIAN NURSE RETENTION

12/23/82

PAGE

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VAR311	0.16602	0.08212	-0.33776
VAR312	0.07839	0.23278	0.15591
VAR313	-0.21935	-0.39235	-0.29134
VAR316	0.39037	-0.05609	-0.28009
VAR317	0.03696	-0.20006	0.32735
VAR318	0.21057	0.15202	-0.29239
VAR319	0.05719	0.27952	0.26715
VAR320	-0.11256	0.31026	0.10741
VAR321	0.22174	-0.36413	0.04777
VAR322	-0.15481	0.37650	-0.38992
VAR323	0.24443	0.04948	0.32302
VAR324	-0.31831	-0.09670	0.37439
VAR325	0.30494	-0.09301	-0.14687
VAR326	0.36863	-0.42365	0.05934
VAR327	-0.18473	0.51894	-0.01798
VAR328	0.06771	-0.65742	0.41355
VAR329	0.19516	0.25477	-0.27567
VAR330	0.20990	-0.09543	0.42993
VAR331	-0.02904	0.41134	-0.09050
VAR332	0.08462	-0.45959	-0.02713
VAR333	0.16753	0.13471	0.34812
VAR334	-0.31470	0.75194	0.32924
VAR335	-0.03147	-1.24431	-0.80259
VAR336	-0.23335	-0.13203	-0.15057
VAR337	-0.29607	-0.07045	-0.15211

Current Salary
Responsibility
Working Conditions
Job Satisfaction - Overall
Significant Other Perception of Job
Goal Congruance
Benefits
Training Opportunities
Support re: Personal Goals
Performance Evaluations
Equipment/Facilities
Administrative Work Requirements
Time Off
Current Salary
Responsibility
Supervisor Relations
Work Performed
Training Opportunities
Continuity of Patient Care
Collaboration - MD/RN
Co-Workers
Starting Salary
Personal Security
Uniform Policies
Anticipated Satisfaction

Present Job

Alternative Job

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.63473	-0.04680	-0.21475
GROUP 2	0.03481	0.12011	0.37434
GROUP 3	0.82284	0.45778	-0.32709
GROUP 4	0.72398	-1.33893	-0.06235

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		GP. 1	GP. 2	GP. 3	GP. 4
GROUP 1	163.	110. 67.5%	26. 16.0%	15. 9.2%	12. 7.3%
GROUP 2	174.	44. 25.3%	61. 35.1%	40. 23.0%	29. 16.7%
GROUP 3	85.	5. 5.9%	17. 20.0%	51. 60.0%	12. 14.1%
GROUP 4	39.	4. 10.3%	0. 0.0%	5. 12.8%	30. 76.9%
UNGROUPED CASES	9.	6. 66.7%	0. 0.0%	2. 22.2%	1. 11.1%

PREDICTION OF 'GROUPED' CASES CORRECTLY CLASSIFIED 54.66%

APPENDIX H
DISCRIMINANT ANALYSIS - PARTIAL F OF 3.0

AMEDD CIVILIAN NURSE RETENTION

06/04/82

PAGE 15

FILE NONAME (CREATION DATE = 06/04/82)

DISCRIMINANT ANALYSIS

SUMMARY TABLE

STEP NUMBER	VARIABLE ENTERED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS' LAMBDA	SIG.	RAO'S V	CHANGE IN RAO'S V	SIG. OF CHANGE
1	VAR017	8.37891	1	0.94785	0.000	25.14608	25.14608	0.000
2	VAR020	7.82031	2	0.90146	0.000	48.80992	23.66384	0.000
3	VAR016	13.14453	3	0.82955	0.000	91.04589	42.23597	0.000
4	VAR093	3.70312	4	0.80973	0.000	103.11391	12.06803	0.007
5	VAR019	3.06836	5	0.79360	0.000	112.80645	9.69254	0.021
6	VAR020	2.46387	4	0.80656	0.000	104.98578	-7.82067	1.000
7	VAR105	3.80762	5	0.78672	0.000	116.98640	12.00062	0.007
8	VAR137	6.18359	6	0.75569	0.000	138.98457	21.99817	0.000
9	VAR031	4.12891	7	0.73549	0.000	152.22795	13.24338	0.004
10	VAR040	4.78906	8	0.71273	0.000	169.91418	17.68624	0.001
11	VAR037	4.61914	9	0.69138	0.000	186.88032	16.96613	0.001
12	VAR001	3.15820	10	0.67706	0.000	198.13342	11.25311	0.010
13	VAR018	3.33496	11	0.66224	0.000	211.12121	12.98779	0.005
14	VAR001	2.95996	10	0.67540	0.000	200.36300	-16.75821	1.000
15	VAR118	4.83398	11	0.65417	0.000	216.58819	16.22519	0.001
16	VAR105	2.60352	10	0.66560	0.000	207.47760	-9.18060	1.000
17	VAR086	3.10840	11	0.65200	0.000	218.19837	10.72077	0.013

DISCRIMINANT FUNCTION	EIGENVALUE	RELATIVE PERCENTAGE	CANONICAL CORRELATION	FUNCTIONS DERIVED	WILKS' LAMBDA	CHI-SQUARE	DF	SIGNIFICANCE
1	0.31555	66.09	0.490	0	0.6520	193.540	33	0.000
2	0.13199	27.64	0.341	1	0.8577	69.441	20	0.000
3	0.02992	6.27	0.170	2	0.9709	13.341	9	0.148

REMAINING COMPUTATIONS WILL BE BASED ON 3 DISCRIMINANT FUNCTION(S)

STANDARDIZED DISCRIMINANT FUNCTION COEFFICIENTS

	FUNC 1	FUNC 2	FUNC 3
VAR16	0.46978	0.04596	-0.28013
VAR17	0.02886	0.53151	0.22300
VAR18	0.32590	-0.04626	-0.40111
VAR19	0.09245	-0.41300	0.50398
VAR21	-0.10167	-0.48564	-0.45058
VAR23	-0.35893	0.21339	0.36238
VAR24	0.37527	0.04043	-0.07304
VAR26	0.09706	-0.48526	0.04908
VAR28	0.18179	0.64926	0.25728
VAR18	-0.08402	-0.59993	0.42482
VAR137	-0.33728	0.01802	-0.22984

Job Satisfaction - Overall
Significant Other Perception of Job
Goal Congruance
Benefits
Performance Evaluations
Administrative Work Requirements
Time Off
Responsibility
Supervisor Relations
Starting Salary
Anticipated Satisfaction

Present Job
Alternate Job

CENTROIDS OF GROUPS IN REDUCED SPACE

	FUNC 1	FUNC 2	FUNC 3
GROUP 1	-0.52362	-0.03221	-0.13975
GROUP 2	-0.02374	-0.00506	0.21850
GROUP 3	0.78165	-0.39406	-0.12466
GROUP 4	0.59080	1.01607	-0.11903

ANEDO CIVILIAN NURSE RETENTION

06/04/82

PAGE 21

PREDICTION RESULTS -

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		GP. 1	GP. 2	GP. 3	GP. 4
GROUP 1	163.	95. 58.3%	30. 18.4%	18. 11.0%	20. 12.3%
GROUP 2	174.	56. 32.2%	50. 28.7%	40. 23.0%	28. 16.1%
GROUP 3	85.	9. 10.6%	12. 14.1%	56. 65.9%	8. 9.4%
GROUP 4	39.	8. 20.5%	4. 10.3%	5. 12.8%	22. 56.4%

PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED 48.37%

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