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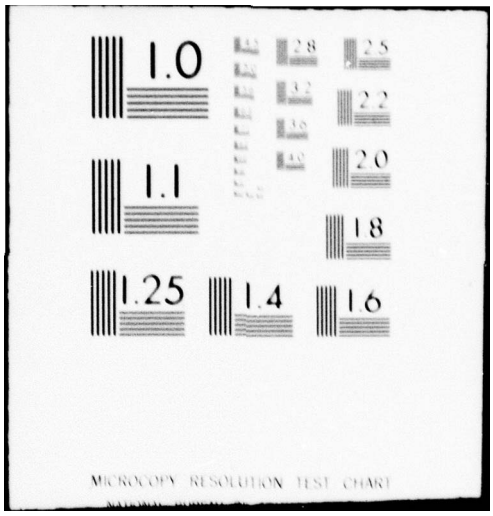
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THE IMPACT OF THE MINUTEMAN EDUCATION PROGRAM ON ACQUISITION AND RETENTION OF MISSILE LAUNCH CONTROL OFFICERS

Michael R. Engel, Captain, USAF
Patrick H. O'Neill, Captain, USAF

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Since the introduction of the Minuteman Missile into the AF arsenal numerous authors have identified problem areas that have to some degree hindered operational effectiveness and morale. Crew member attitudes have been the basis for many of these studies, the latest survey having been taken in 1976. The Minuteman Education Program (MMEP) is one positive aspect of missile crew duty that has been identified in the studies. However, none of the previous works addressed the MMEP as a major consideration in the decision to volunteer for or remain on missile combat crew duty. The purpose of this study was to determine: (1) if job and career field attitudes have changed since 1976; (2) what the attitude was toward a twenty-year career as a crew member; and (3) if the MMEP is in fact an influence on the crew member's decision to volunteer for or remain on a missile combat crew. The authors concluded that (1) attitudes have not significantly improved since 1976, (2) crew members are not interested in a twenty-year career as a crew member, and (3) the MMEP is a significant influence on the crew member's decision to volunteer for and remain on a missile crew.

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Captain Michael R. Engel

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has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

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COMMITTEE CHAIRMAN

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CHAPTER I

INTRODUCTION

Background

Since the early 1960s a small group of officers have been entrusted with the most advanced weapon system known to man: a weapon system with a spectrum of destruction ranging from a single target to entire countries. The weapon system is so complex and so sophisticated that the layman cannot begin to comprehend the computerized inner workings, which not only detect and report system faults, but also corrects many of them without advising the operator. The system is called Minuteman and as the name implies, it is a system capable of almost instantaneous employment. Minuteman is part of the triad, a concept of national defense consisting of intercontinental ballistic missiles, land-based bombers, and submarine launched missiles.

The officers who man the missile launch control centers buried sixty feet under the ground, have what seems to be an awesome responsibility. They alone are the men who may someday be called upon to carry out the President's orders and literally launch this country into nuclear war. There will be no intermediary. But is this responsibility

enough to motivate young officers to volunteer for missile duty? To answer this question the conditions under which the missile combat crew member (MCCM) works must be examined.

The duties performed by these MCCMs are not the typical ones envisioned when the word *combat* is used. Not one crew member in the history of Minuteman has ever launched an operational missile at an enemy target. Not one crew member has ever launched a missile even in practice from an operational launch facility under simulated wartime conditions. Only in the Missile Procedures Trainer (MPT), where crews receive their recurring training, do they practice the procedures to be used in case of an actual attack on this country.

For the most part, crew members perform tasks such as adjusting the clock in the launch control center, running daily maintenance checks on equipment, relaying malfunction indications to maintenance personnel, and playing the part of phone operator. On a daily basis, the crew sits in the launch control center waiting for the word to launch their missiles and hoping it never comes.

The authors of previous studies of the missile combat crew member have commented on the low intrinsic value of this work (4:6-8; 14:28), and all have recommended actions be taken to improve the situation; however, few of these actions have ever been implemented. Many of the

studies, however, have pointed to one program as the biggest incentive for officers to enter the missile career field. That program is the Minuteman Education Program (MMEP) (4:36; 6:130; 14:29-32).

The MMEP was introduced in 1962 with the objectives of motivating officers to enter the missile operations career area; relieving the boredom of the alert tour by offering the crew member an opportunity to partially fulfill his drive for self-actualization; and providing a personnel resource of officers with advanced degrees which the Air Force could use after the crew members' tours in missiles had ended (2).

The MMEP is offered at all six Minuteman bases for missile launch officers, and only recently have participants from other career areas been admitted. There are presently 606 combat crew members enrolled in the MMEP, which is fully funded by the Air Force. There is no cost to the participants except for books. The program's annual budget is approximately two million dollars, which makes it the least expensive of the Air Force fully funded education programs (2).

The MMEP is tailored to meet the needs of crew members and, in fact, is an intricate part of the alert schedule. Crew members attend class two days a week, and by SAC directives, no work can interfere with this class

schedule unless it is mission essential. This means that the alert schedule is built around the MMEP schedule. The course work itself is designed so that the required homework can be accomplished by crew members while on a normal alert shift. The academic offices, classrooms, and library facilities are conveniently located for the students, and restricted to MMEP use only (2).

Currently, the basic degree offered at all six bases is a Master's Degree in Business Administration (MBA). At Malstrom AFB, Montana, a logistics minor is available, and a computer science degree has been introduced at both Whiteman AFB, Missouri, and F. E. Warren AFB, Wyoming. A university in the vicinity of each base administers the academic program for that base. Each university hires professors and administers the degree program as part of its own curriculum. The Air Force Institute of Technology, located at Wright-Patterson AFB, Ohio, supervises the overall MMEP throughout SAC. Thus, the MMEP is a separate program from regular base level education programs (2).

The competition for students between the different university programs at each base has grown more intense as each typically offers a different field of concentration and different curriculums. At Minot AFB, North Dakota, for example, the MMEP is one of three programs on base by which a crew member can work toward a master's degree, and there are other competing programs off base as well. As

noted before, however, only the MMEP is fully funded by the Air Force and made an integral part of the MCCM's duty schedule. Thus, the crew member must weigh these advantages against those of the other available programs and decide which program is best suited for him (2).

Problem Statement

Headquarters, Strategic Air Command is continually evaluating the MMEP with respect to the operating expense involved. The 15th Air Force Director of Personnel (15AF/DP) has also reviewed the program and its objectives and identified possible options regarding the program's future. A previous AFIT/LSG study in a related area reported that 77 percent of the launch officers who had volunteered for the duty indicated that the MMEP had some degree of influence on their decision, although only 55 percent of the Minuteman volunteers were participating in the program (1:110). Thus, it appears that the MMEP has been a major factor in attracting volunteers to missile duty and in keeping them on the crew force.

Before any major decisions are made concerning the future of the MMEP, the current importance of the program to the combat crew members should be assessed. At the same time, information should be gathered and analyzed concerning the crew force's perceptions of, feelings toward, and reactions to various alternative degree options.

Literature Review

The literature review for this study addresses the specific research of previous missile career field studies.

Previous Missile Career Field Studies

Overview. Since the activation of the first operational Minuteman missile squadron in the early 1960s, students at such professional military schools as the National War College (NWC), Air War College (AWC), and Air Command and Staff College (ACSC) have researched the attitudes and motivation of the missile crew force. In addition, this topic has been researched in the private sector by other students, many of whom were former MCCMs. This research effort will highlight the portions of previous studies applicable to MCCMs' attitudes toward their job/career field and specifically toward the Minuteman Education Program. The specific studies of Bickerstaff, Murphy, Brooksher and Scott, Ashbaugh and Godfrey, and Cancellieri and Willoughby are treated separately.

Previous findings. This section will discuss only the most pertinent findings and conclusions of a variety of studies. These findings are grouped into three general classifications: career field, MCCM duty, and MMEP. Synthesis of these conclusions is presented separately. A review of the academic studies of the missile career

field from 1965 to 1973 was done by Rodgers W. Bickerstaff (4:9-10); the interested reader is referred to this work for a more complete and detailed coverage of this specific topic.

Career field findings. The theoretical framework for the studies reviewed focuses on the work of four men: A. H. Maslow, Douglas McGregor, Victor Vroom, and Frederick Herzberg, with Herzberg's dual-factor theory of motivation serving as the primary basis for the majority of the findings. Although not all of the researchers agreed in their evaluations of the missile career field against Herzberg's model, they have in general reached compatible conclusions concerning the existence and impact of the motivation factors in the missile career field. In general, the studies report that the missile career field suffers from a lack of internal advancement visibility (8:15, 49-51; 9:33-34; 14:57), and a lack of career field prestige (7:24; 9:31, 10:16-17; 12:48).

MCCM duty findings. The characteristics of the missile operations career field have been the subject of much study, research, and comment. The authors of previous studies found missile duty to be isolated, monotonous, and rigid (3:27), permitting no creativity, and providing little intrinsic satisfaction (4:38-39; 5:32; 13:58-59).

There are many other descriptions used to characterize the MCCM's job: Murphy referred to MCCM duty as the most

regimented of all existences (14:27); and Bickerstaff characterized the duty as "boring and monotonous" (4:33).

Reporting on the responsibility that is associated with MCCM duty, Bowe and others contended that missile crew members realize the overwhelming responsibility that lays literally at their finger tips, but derive little job satisfaction from that responsibility (5:40; 14:28; 4:46; 13:59; 6:105-106). The technical complexity of the system monitored by the crew members has created an impersonal environment (11:2-3) where there is little or no opportunity for personal judgment or initiative in the routine day-to-day tasks (18:19).

MMEP findings. In his review of the academic studies of the missile career field from 1965 to 1973, Bickerstaff reported no significant references to the MMEP in the literature. Only Murphy has conducted research which related the impact of this education program on the missile career field (14:31). The Murphy study will be treated separately.

Summary of General Studies. The majority of the researchers concluded that missile duty provides little motivation or job satisfaction. Many writers, however, described conditions which exist that give impetus to job dissatisfaction. The dissatisfiers most frequently cited are policy and administration, supervision, working conditions, and status (1:15). Maes and Brooksher both concluded

that MCCMs' perception of policy and administration was the greatest source of job dissatisfaction (6:108; 13:62). Ashbaugh and Godfrey reached a similar conclusion (1:113). Supervision was also reported as a major dissatisfier (4:57; 5:34; 6:112; 13:63-64) as supervisors were viewed as often technically incompetent, and showing little or no interest in the welfare of the crew members. Working conditions, including the physical environment of the launch control center, the geographic locations of the missile bases, and alert tour scheduling also contribute to job dissatisfaction (13:64). Lack of recognition aside from the periodic standardization evaluations, which tend to be a form of negative recognition, contributes further to the MCCM's job dissatisfaction (6:125-128).

The remaining literature review covers specific research that is directly related to this research effort.

Bickerstaff. Rodgers W. Bickerstaff provides a comprehensive review of the missile operations career field studies conducted between 1965 and 1973 (4:9-10). The findings, conclusions, and recommendations that he reviewed, were summarized to generally indicate that a significant number of MCCMs were dissatisfied with their jobs (4:67). Bickerstaff hypothesized that the key to improved morale and retention of officers in the missile field is job satisfaction (4:69). To improve job satisfaction, he

recommended: (1) reduced controls while maintaining accountability for the actions of the crews; (2) reversal of the reward/punishment scheme which makes up management policy; (3) reevaluation of the standardization procedure to determine if it produces an accurate picture of the crews' ability to accomplish their mission; (4) education of all levels of supervisors to the special needs of the crew members; and (5) improvement of the launch control center's environment (4:70-71).

Murphy. The primary purpose of this study was to measure the relationship between an educational program and the missile combat crew member's performance (14:94).

A central point of Murphy's research was the collection and analysis of survey data. Only the combat crew members at Whiteman Air Force Base were selected for analysis in this study, so that any potential problems which could have hampered the investigation of the hypothesis in question would be avoided. Specifically, Murphy used only one base to insure that such factors as differing educational programs, leadership styles, and living and working conditions would not bias the results of the study (14:35).

Based on the analysis of 218 completed surveys (14:49), Murphy's generalized conclusions are that (1) MCCMs perceived their job as being low in intrinsic

satisfaction; (2) participation in the MMEP has no significant impact on performance of the missile combat crew member's task; (3) participation in the MMEP has a significant impact on the job involvement of MCCMs; (4) participation in the MMEP has a significant impact on satisfaction with recognition among all MCCMs; (5) performance is most highly correlated with effectiveness, achievement, and recognition; and (6) performance of the MCCM task is functionally related to recognition, effectiveness, and achievement need satisfaction, but the relationship is very weak (14:93).

In summary, Murphy concluded that participation in the MMEP had a significant positive impact on the higher order need satisfaction of those officers who, because of other factors, had higher levels of lower order need satisfaction (14:94).

Brooksher and Scott. This thesis covered career field selection, career development, and the USAF Officer personnel plan (TOPLINE) (6:12-35).

Central to their research was the collection and analysis of survey data. They conducted three surveys. The first two were unstructured pilot surveys which were distributed to various senior missile commanders, staff officers, and middle level staff officers at the 3901st Strategic Missile Evaluation Squadron (SAC). The third

survey (structured) included 479 current and former MCCMs (6:8-10).

As a result of their analysis, Brooksher and Scott concluded that there was a need to increase the career field motivators, decrease some of the career field dissatisfiers, improve supervision, and to increase the prestige of the MCCM (6:135).

More specifically, they identified the MMEP as the only current incentive program in the missile career field (6:130). For a complete list of all the specific recommendations and conclusions, the reader is encouraged to refer to the original document (6:88-142).

Ashbaugh and Godfrey. The primary purpose of their thesis was to determine whether or not MCCMs' attitudes, job satisfaction, and retention rates had improved since the formation of the Minuteman Working Group (MMWG) at HQ SAC (1:2-3). To collect the needed data, they developed a survey questionnaire primarily based on the questionnaires used by Brooksher and Scott, and McDaniel and Dodd (1:31-32). There were 372 responses received from the 540 selected MCCMs for a response rate of 68.89 percent (1:50).

Using the χ^2 tests and the Mann-Whitney Rank Sum Test to compare their data to the results of previous studies, Ashbaugh and Godfrey concluded that: (1) the

MCCMs did not have favorable attitudes toward either their job or the missile career field; and, (2) MCCMs' attitudes had not changed significantly from the attitudes observed in the prior surveys (1:112-114). Additionally they found that although requests for crew duty extensions had tripled between 1971 and 1975, less than half as many of all MCCMs intended to remain in the missile career field. Ashbaugh and Godfrey postulated that the Minuteman Education Program may have been responsible for the apparent disparity (1:114-115).

Cancellieri and Willoughby. This research effort was based on the data obtained from the Ashbaugh and Godfrey questionnaire, and explored potential MCCM attitude differences among the six Minuteman wings (7:38). It was hypothesized that any differences in the attitudinal variables tested could be explained by demographic variables in the MCCMs tested (7:61).

Cancellieri and Willoughby concluded that MCCMs' attitudes toward the missile career field and their jobs differ from one Minuteman wing to another. However, there was insufficient evidence to conclude that the demographic composition of the missile crew force differs significantly in the missile wings' populations (7:61).

Justification

Previous studies in the missile operations career area have dealt with motivation and attitudes of crew

members with respect to demographic factors and the Missile Management Working Group. Other studies sampled crew member attitudes toward career field selection and what influenced morale and motivation. All of these studies were performed prior to a hardware modification (Rivet Save) which made it possible for one crew member to sleep in the launch control center and, thus, made a 24-hour alert tour possible. HQ SAC, in turn, reduced crew manning by one-third without increasing the monthly crew work load. This program, completed in July 1975, made missile operations a totally volunteer force for the first time since the early 1960s (16). The attitudes of the crew force have not been sampled since this change.

Previous studies have made only passing reference to the MMEP as an incentive in attracting officers to missile operations. The only study dealing specifically with the MMEP tried to establish a correlation between those enrolled and their performance on the job (14:1-99). The MMEP has never been the focus of study as a prime motivator in attracting crew members or as a retention factor.

The 15th Air Force and Strategic Air Command are concerned with the future of the program. Both organizations continually review the program with respect to cost, curriculum, and objectives; however, neither has formally addressed the attitudes or perceptions of the crew members themselves toward the program. Before any further decisions are made

with respect to the MMEP, these perceptions and attitudes should be sampled and analyzed. This information is of significant importance and could directly affect crew member morale.

Objectives

The objectives of this research effort were:

1. To sample current attitudes of Minuteman Missile Combat Crew Members toward:

   a. their career field and their job;

   b. the Minuteman Education Program and alternate graduate education programs; and

   c. a career as a missile combat crew member.

2. To compare the sample of current attitudes of Minuteman Missile Crew Members toward their career and their job with the results of previous studies to determine if attitudes have changed since May 1976.

3. To determine attitudes of Minuteman Missile Combat Crew Members toward a career as a missile combat crew member.

4. To determine if the Minuteman Education Program is a viable incentive to attract and retain officers in the missile operations area.

5. To determine if the Minuteman Missile Combat Crew Members prefer the Minuteman Education Program to alternate graduate education programs offered at their base of assignment.

Research Questions

In order to achieve the third and fifth objectives of this research effort, the following research questions were posed:

1. What is the attitude of missile combat crew members toward a career as a crew member?

2. Which type of graduate level education program do missile combat crew members prefer--the Minuteman Education Program, or base education programs, and why?

Research Propositions and Hypothesis[1]

Research propositions and hypotheses were derived from the second and fourth research objectives. Support or nonsupport of the propositions and hypotheses was determined through the use of statistical and criteria tests. The direction and nature of the results were predicted in each case on the basis of the literature review and personal experience of the authors.

The specific proposition and hypotheses derived from Objective 2 were:

Proposition 1
(Hypotheses 1 through 16)

Attitudes of missile combat crew members toward their job and toward the missile operations career field have improved since May 1976.

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[1]See Figure 1 for an explanation of the relationship between the research objectives, research questions, propositions, and hypotheses.

Hypothesis 1. MCCMs' attitudes toward their job have improved since May 1976.

Hypothesis 2. MCCMs' attitudes toward the manner in which they are supervised by their immediate supervisor have improved since May 1976.

Hypothesis 3. MCCMs' attitudes toward the sense of personal accomplishment they achieve in performing their jobs have improved since May 1976.

Hypothesis 4. MCCMs' attitudes toward the opportunity for individual recognition provided by their job have improved since May 1976.

Hypothesis 5. MCCMs' attitudes toward the actual work involved in accomplishing their jobs have improved since May 1976.

Hypothesis 6. MCCMs' attitudes toward the feeling of individual responsibility allowed by their job have improved since May 1976.

Hypothesis 7. MCCMs' attitudes toward their work schedule have improved since May 1976.

Hypothesis 8. MCCMs' attitudes toward the opportunity provided by their job to develop personal friendships have improved since May 1976.

Hypothesis 9. MCCMs' attitudes toward the physical working environment of the Launch Control Center have improved since May 1976.

Hypothesis 10. MCCMs' attitudes toward the effect that their jobs have on their personal lives have improved since May 1976.

Hypothesis 11. MCCMs' attitudes toward the opportunity for advancement provided by the missile operations career field have improved since May 1976.

Hypothesis 12. MCCMs' attitudes toward the missile operations career field have improved since May 1976.

Hypothesis 13. MCCMs' attitudes toward the adequacy of efforts made to improve missile crew duty and to resolve problems generally encountered by MCCMs have improved since May 1976.

Hypothesis 14. MCCMs' attitudes toward the understanding of missile crew duty displayed by command and staff personnel at higher headquarters have improved since May 1976.

Hypothesis 15. MCCMs' attitudes toward the understanding of missile crew duty displayed by command and staff personnel in their unit have improved since May 1976.

Hypothesis 16. MCCMs' attitudes toward the four-year tour of duty have improved since May 1976.

Specific propositions and hypotheses derived from Objective 4 were:

Proposition 2
(Hypotheses 17 and 18)

The Minuteman Education Program is a viable incentive in attracting officers into the missile career field.

Hypothesis 17. The majority of MCCMs feel that the possibility of attaining a master's degree through the Minuteman Education Program was a major consideration in volunteering for missile crew duty.

Hypothesis 18. The majority of MCCMs feel that the opportunity to earn a master's degree through the Minuteman Education Program influenced their decision to volunteer for missile duty.

Proposition 3
(Hypotheses 19 through 24)

The Minuteman Education Program is a viable incentive in the retention of officers in the missile career field.

Hypothesis 19. The majority of MCCMs who participate in the Minuteman Education Program would have tried to leave missile crew duty earlier if it were not for the Minuteman Education Program.

Hypothesis 20. The majority of MCCMs who participate in the Minuteman Education Program plan to leave the missile crew force as soon as possible after graduating from the program.

Hypothesis 21. The majority of MCCMs who participate in the Minuteman Education Program believe that the program is one of the most positive aspects of the missile crew duty assignment.

Hypothesis 22. The majority of MCCMs believe that the Minuteman Education Program is a significant career benefit of missile crew duty.

Hypothesis 23. The majority of MCCMs who participate in the Minuteman Education Program believe that missile crew duty would be a waste of valuable career time without the Minuteman Education Program.

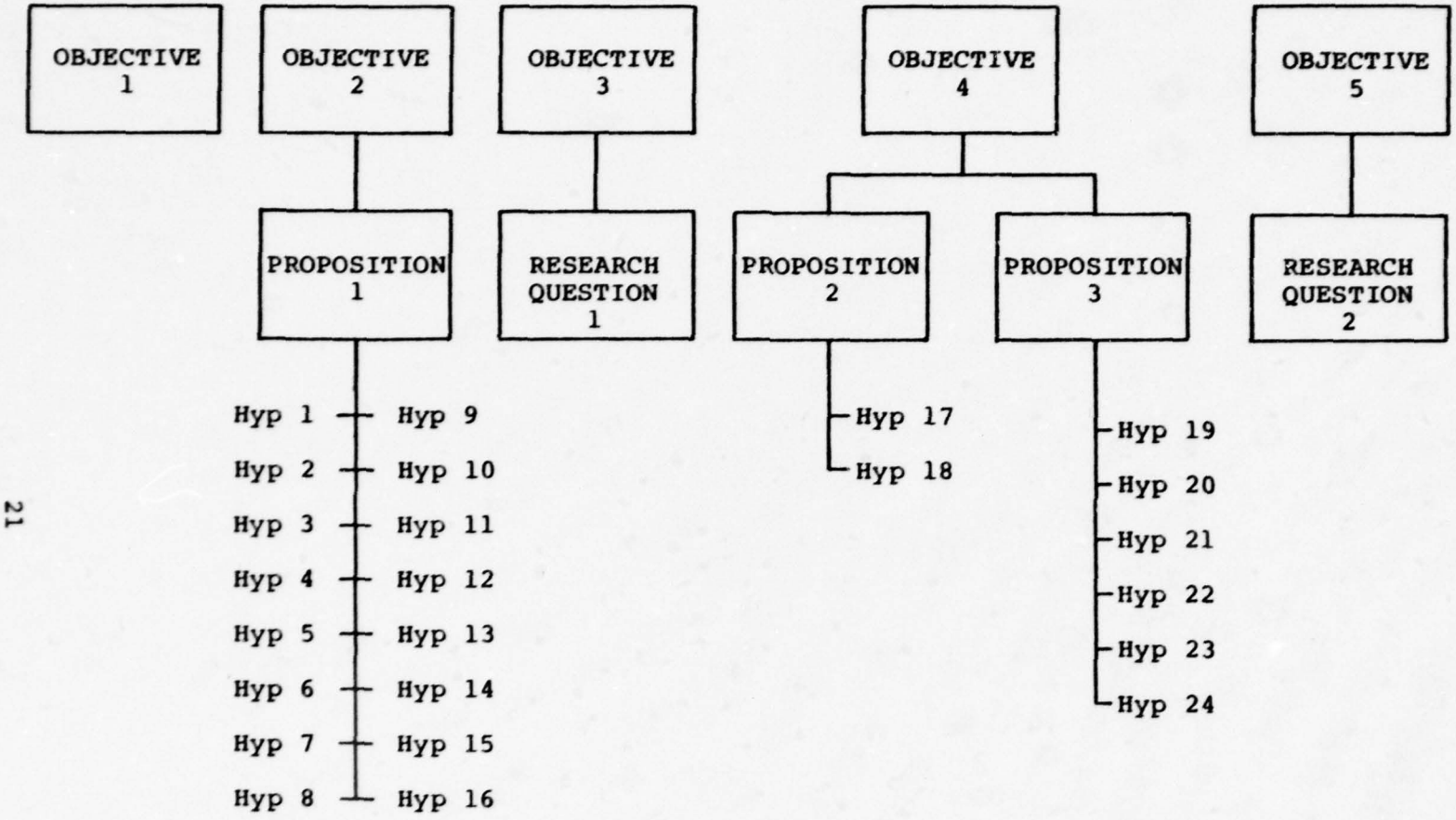

Fig. 1. Relationships of Research Objectives, Research Questions, Propositions, and Hypotheses

CHAPTER II

METHODOLOGY

The Survey Questionnaire

The method used to gather data on attitudes and perceptions of MCCMs was a survey questionnaire (a sample questionnaire is contained in Appendix A). The questionnaire approach was chosen to provide a systematic method of gathering data from a geographically dispersed population. Additionally, it provided logical continuation of the data base provided by the Ashbaugh and Godfrey study which compared MCCMs' attitudes after the formation of the Missile Management Working Group to the results of two prior MCCM attitude studies (1:52).

The survey questionnaire was designed to gather data in six general areas:

1. Demographic.
2. Job/career field attitudes.
3. MCCMs' perceptions of the MMEP and other graduate programs.
4. MCCMs' perceptions of alternate graduate programs.
5. MCCMs' attitudes toward missile launch duty as a lifetime Air Force career.
6. Other items of interest to HQ SAC.

The demographic data was used to identify differences that existed between various categories of respondents (e.g., between MCCMs of different ranks, those enrolled in the MMEP). The job/career field attitude questions were used to acquire information which was compared to data acquired through previous research efforts. The questions pertaining to the MMEP were constructed so as to determine the value of the program as a prime motivator in attracting crew members to missile operations and as a retention enhancing factor.

Questions pertaining to MCCMs' attitudes toward making missile crew duty a twenty-year career program were included to provide insight on this topic for future study. Questions related to other graduate education programs available to the MCCMs were included to identify MCCMs' attitudes toward these programs. Questions concerning MCCMs' perceived educational benefits were included at the request of HQ SAC.

Questions 1 through 61 were grouped into seven parts on the questionnaire. All respondents answered the questions in Part I - III. Non-AFIT respondents completed Part IV. Part V was designed to be answered by participants in, or graduates of a non-AFIT program. Part VI was answered by AFIT participants and AFIT graduates only. Part VII was completed by all respondents who had enrolled in a graduate level education program.

The Survey Subjects

The individual missile combat crew member was the subject of this research. Each individual survey questionnaire, representing the attitudes and opinions of an individual MCCM, was numbered to facilitate the collection and summarization of data.

Variables for Testing

Job Attitude

Job attitude is the attitude of the MCCM toward his particular job and was sampled at the ordinal level based on the responses to ten attitude questions on the survey questionnaire. Each question had five possible responses, so the data was classified as discrete limited. The distribution of responses to each question on the current survey was compared to the distribution of responses on the Ashbaugh and Godfrey survey to determine if a statistically significant difference existed. The aspects of job attitude examined were:

1. General attitude toward job
2. Sense of personal accomplishment
3. Opportunity for recognition
4. Opportunity for social interaction
5. Effect on personal life
6. Adequacy of responsibility

Career Field Attitude

Career field attitude is the attitude of the MCCM toward the missile career field and was sampled by responses to eight attitude questions on the survey questionnaire. Five of the questions sampled at the ordinal level and were classified as discrete limited, while the remaining questions sampled at the nominal level and were classified as discrete dichotomous. Each question dealt with a distinct aspect of career field attitude and was treated separately in the same manner described for job attitude. The aspects of career field attitude examined were:

1. Adequacy of attempts to improve missile crew duty
2. Future offered by missile career field
3. Higher HQ staff understanding of crew duty
4. Unit staff understanding of crew duty
5. Tour length

Perception of the MMEP

The perception of the MMEP is the perception of the MCCM toward the MMEP and was sampled by responses to twenty-one questions on the survey questionnaire. These questions had not been previously asked on the Ashbaugh and Godfrey survey. Fifteen of the questions sampled at the ordinal level and were classified as discrete limited, while the remaining questions sampled at the nominal level and were classified as discrete dichotomous or discrete

limited. Each question dealt with a distinct aspect of the perception of the MMEP and was tested to determine if favorable responses exceed the number of unfavorable responses by a statistically significant amount. The aspects of the MCCMs' attitudes toward the MMEP examined were:

1. General attitude toward MMEP
2. Attitude toward necessity of an advanced degree
3. MMEP as a benefit of missile duty
4. MMEP as a retention factor in missile operations field
5. MMEP as an inducement to volunteer for missile duty
6. Degree of program difficulty
7. Effect on personal life
8. Degree of program visibility
9. MCCMs' perceptions of AFIT Detachment Commander

Attitudes Toward Alternate Graduate Education Programs

These questions were generated to identify attitudes toward other educational programs that compete with the MMEP for the participation of the MCCM. The attitudes of the MCCM toward alternate graduate education programs were sampled by responses to six questions on the survey questionnaire. Four of the questions sampled at the

ordinal level and were classified as discrete limited, while the remaining questions sampled at the nominal level and were classified as discrete dichotomous.

Attitudes Toward Missile Launch Duty as a Twenty-Year Career

Attitudes toward the possibility of making missile launch duty a viable career alternative were sampled by responses to two questions on the survey questionnaire. These questions sampled at the ordinal level and were classified as discrete limited. Responses to these questions were treated in a manner similar to the perceptions of the MMEP.

Other

Three questions were included at the request of HQ SAC. They were open-ended questions constructed to provide feedback on what the MCCMs felt they had gained from their graduate level education.

The Universe

The universe consisted of all commissioned MCCMs assigned to the six operational strategic missile wings of the Minuteman weapon system. The six Minuteman wings are located at:

1. Malstrom Air Force Base
2. Ellsworth Air Force Base

3. Minot Air Force Base

4. Whiteman Air Force Base

5. F. E. Warren Air Force Base

6. Grand Forks Air Force Base

The Population

The population consisted of the attitudes and perceptions of the commissioned officers assigned to the six Minuteman wings as pertaining to their job/career field, the MMEP, other graduate education alternatives, and the opportunity to serve a twenty-year career as a missile launch control officer.

Sampling Plan

As of 4 August 1978, HQ SAC records reflected a total of 1168 crew members in the universe (15). In "A Guide for the Development of the Attitude and Opinion Survey," Headquarters USAF advises that for the survey statistician to be

> . . . 95% confident that the true population statistics lie somewhere within the interval of ±5 percentage points from his achieved sample statistics . . . the following is the general formula for computing maximum sample size. . . .

$$n = \frac{N(Z^2) \times p(1 - p)}{(N - 1)(d^2) + (Z^2) \times p(1 - p)}$$

where:

n = sample size,
N = population size,
p = maximum sample size factor (.50),
d = desired tolerance (.05), and
Z = factor of assurance (1.96) for 95% confidence level [17:117-118].

Computation of this formula for a N = 1168 yields a sample size (n) of 290. A sample size of 480 was used in order to (1) establish a sound basis for statistical inference in generalizing the sample data to the population; and, (2) provide compatibility with the previous data base. Furthermore, a sample size of eighty per Minuteman base was considered appropriate to account for summer leaves, TDY, and PCS moves inherent in the crew force universe.

The possibility of biased data exists due to non-respondents. This bias could have been introduced if the attitudes and opinions of nonrespondents were different than those of the people who chose to respond. However, for the purposes of determining if there was a shift in the distribution of responses between the current survey and the previous survey, it was assumed that there was no difference in the reasons for nonresponse. The response rate reported by Ashbaugh and Godfrey was 68.89 percent (1:50). Accordingly, any bias in the current sample data, due to the nonrespondents, was assumed to be the same as the bias in the previous sample data; therefore, it was assumed that the two data bases could be compared without limitation in terms of the distribution of responses to

individual questions. Furthermore, it was assumed that the responses to the prior survey and the current survey represent the honest opinions of the MCCM respondents.

Data Collection

The sampling plan used for this research was a disproportionate stratified random sample. The 480 individual members were identified by a computerized random selection of eighty MCCMs from each wing. The survey questionnaires were sent to the local AFIT Detachment Commander at each of the Minuteman Missile bases who then distributed a copy of the questionnaire to each individual member of the sample. When completed, the questionnaires were returned for data analysis via the Detachment Commander.

Statistical Tests

The first step in data analysis was to total the individual responses to each question on the survey. This produced the distribution of the sample MCCM responses to specific questions. Statistical inferences were then required to provide explanations for particular responses and justification for generalization to the population (16:41).

Chi Square Test: One Sample

The χ^2 one-sample test was used to test questions that were not taken from the Ashbaugh and Godfrey

questionnaire. The Chi Square test was used to determine whether a significant difference existed between an observed number of responses that fell in each category and an expected number based on the null hypothesis (16:43). In general, the null hypothesis, H_0, was that the responses would be uniformly distributed across alternatives provided on specific questions. The test was conducted at a .05 level of significance. For a one-tailed test for significance in the predicted direction with one degree of freedom, $\chi_c^2 = 3.84$. H_0 was rejected when $\chi^2 > \chi_c^2$. When the results were not in the predicted direction, a two-tailed test was used to test for statistical significance. In these cases, with one degree of freedom, $\chi_c^2 = 5.02$. Again, H_0 was rejected when $\chi^2 > \chi_c^2$.

Mann-Whitney Rank Sum Test

When at least ordinal measurement has been achieved, the Mann-Whitney Rank Sum Test may be used to test whether two independent groups have been drawn from the same population (16:116). This is one of the most powerful of the nonparametric tests.

The Mann-Whitney Rank Sum Test was used to determine if there was a statistically significant difference between the distribution of ordinal level responses obtained from the Ashbaugh and Godfrey questionnaire and those obtained from the present questionnaire. In comparing the responses from the two questionnaires, the null hypothesis,

H_0, was that the two populations had the same distribution; H_1, was that one population was stochastically larger than the other. If "a" is one observation from population A, and "b" is one observation from population B, H_0: $P(a > b) = \frac{1}{2}$ and H_1: $P(a > b) > \frac{1}{2}$. When H_0 is rejected, this implies that the distribution of population A has shifted in the predicted direction. When the shift in the distribution was not in the predicted direction, a two-tailed test was used to test for significance. A two-tailed test is necessary when there is no *apriori* knowledge to serve as a basis for a directional hypothesis. In this case H_1: $P(a > b) \neq \frac{1}{2}$ (16:116).

The Mann-Whitney test assumes that the scores represent a distribution which has underlying continuity (16:123). Thus, the possibility of a tie is considered to be zero. However, with the measures typically employed in research, and used in this research, ties may well occur. These ties were accounted for by giving the responses the average of the ranks they would have had if no ties had occurred. Thus, the correction for ties was applied to the standard deviation of the sampling distribution. In order to simplify the calculations involved in resolving the hypothesis via the Mann-Whitney Rank Sum Test, a computer program was used to process the data.

Chi Square Test: Two Independent Samples

The Chi Square test was used to determine if there was a significant difference between the responses to the current questionnaire and the previous survey on questions providing nominal data. The hypotheses under test were that the two groups differed with respect to the relative frequency with which group members fell in several categories. The nominal data was grouped in accordance with the arrangement shown in the 2 × 2 contingency table (Figure 2).

	Yes	No	
Previous Responses	A	B	A + B
Current Responses	C	D	C + D
TOTAL	A+C	B+D	

Fig. 2. 2 × 2 Contingency Table (16:96)

The computation of χ^2 is as follows (16:107):

$$\chi^2 = \frac{N\left(|AD - BC| - \frac{N}{2}\right)^2}{(A + B)(C + D)(A + C)(B + D)} \quad df = 1$$

The hypotheses were tested at a .05 level of significance. For a one-tailed test for significance in the predicted direction with one degree of freedom, $\chi_c^2 = 3.84$. Therefore, H_o was rejected when $\chi^2 > \chi_c^2$. When the change was not in the predicted direction, a two-tailed test was

used to test for statistical significance. In such cases, with one degree of freedom $\chi_c^2 = 5.02$. Therefore, H_o was rejected when $\chi^2 > \chi_c^2$.

Descriptive Statistics

Descriptive statistics were applied to the data which was obtained from the responses to the questions which dealt with the MMEP, alternate graduate level programs, and attitudes toward a twenty-year career as a MCCM.

Criteria Tests

In addition to the statistical tests applied to the research data, practical decision rules were also required. These decision rules, or criteria tests, were used to determine if the results of the data analysis were of practical importance in meeting the research objectives.

In order to answer Question 1, "what is the attitude of missile combat crew members toward a career as a crew member?," descriptive statistical techniques were employed. Analysis of specific survey questions revealed the preference of the crew members.

Research Question 2, "which type of graduate level education programs do missile combat crew members prefer--the MMEP, or base education programs, and why?," was answered in the same manner as described for Question 1.

In order to confirm Proposition 1, "attitudes of missile combat crew members toward their job and toward the missile operations career field have improved since May 1976," findings of statistically significant differences from the previous study had to be noted. Data from the current questionnaire was compared to data from the previous survey to ascertain support or nonsupport for each of the sixteen hypotheses under Proposition 1. Support of Hypotheses 1, 3, 4, and 5 and support for half of the remaining twelve hypotheses was considered necessary to constitute support for the proposition.

Proposition 2, "the MMEP is a viable incentive in attracting officers into the missile career field," was evaluated by testing the data obtained from the survey. A finding of statistical significance in the number of officers who reported that the MMEP was instrumental in their decision to volunteer for missile duty was considered necessary to validate this proposition.

Proposition 3, "the MMEP is a viable incentive in the retention of officers in the missile career field," was also evaluated by testing the data obtained from the survey. A finding of statistical significance in the predicted direction on at least three of the related hypotheses (19 through 24) was considered necessary to validate this proposition.

CHAPTER III

DATA ANALYSIS

Introduction

This chapter describes the analysis of the data collected for this research and answers the research propositions, hypotheses, and questions developed to satisfy the research objectives listed in Chapter I.

Data Collection

There were 480 questionnaires sent to the AFIT Detachment Commanders at the six Minuteman missile wings during June 1978, 265 completed questionnaires were returned for a response rate of 55.20 percent. The response rate of individual missile wings differed greatly, ranging from a high of 75 percent at F. E. Warren to a low of 40 percent for Grand Forks. A complete summary of the questionnaire responses appears in Appendix A.

To prepare the data for computer analysis, the responses on the individual questionnaires were transferred by the authors to optical-scan answer sheets. This reduced the probability of error due to mismarked answers or multi-marked responses. In those rare cases where a respondent failed to make a response to a question, a "z," No Response, was recorded. In computing the statistics involving each

question, the number of responses were adjusted to reflect the number of "no responses" experienced.

A demographic profile of the current survey respondents compared to the respondents of the Ashbaugh and Godfrey survey is presented in Appendix D. In general, the current survey population was comprised of a greater number of volunteers for missile duty, had more combat ready experience, and included more deputy missile crew commanders than the previous survey population. Additionally, the current survey population was composed of more First Lieutenants, a greater percentage of Air Force Academy graduates and regular officers than previously reported by Ashbaugh and Godfrey. Air Force career intent was 78.1 percent which is almost identical with the 78.3 percent documented by Ashbaugh and Godfrey.

Presentation Format

The presentation of the data analysis will be by research objective as presented in Chapter I. After the restatement of the objective, either a proposition and hypothesis, or a research question will be restated along with the survey question and its possible responses. Research questions will be analyzed in a discussion format, while each hypothesis will be presented in three parts according to the following format:

1. The direction of each hypothesis will be confirmed or contradicted according to the data results.

2. The results of the statistical test will be stated to show if the hypothesis test was statistically significant at the $\alpha = .05$ level.

3. The hypothesis will be related to the proposition to show if the hypothesis, in fact, does support the proposition.

A table will then present the data collected and the test results for the hypothesis. The computed and critical test values, as applicable, will also be shown.

Finally, for each hypothesis, comments will be made concerning various relationships that were found to exist. Several of the hypothesis tests used grouped data. In such cases, "yes" answers are referred to as positive, favorable, or yes responses, and "no" answers are referred to as negative, unfavorable, or no responses. In the tests for Hypotheses 17, 19-21, 23, and 24, responses were grouped into two categories. "Neutral" responses for these questions were included in the "other" category in order to be conservative. This procedure did not distort the intent of the hypothesis test, except as is noted in the case of Hypothesis 24.

Conclusions pertaining to the proposition will follow the statistical tests.

Analysis

Objective 2

To compare the sample of current attitudes of crew members toward their career and their job with the results of previous studies and to determine if attitudes have changed since May 1976.

Proposition 1. (Hypotheses 1 through 16) Attitudes of missile combat crew members toward their job and toward the missile operations career field have improved since May 1976.

Hypothesis 1

MCCMs' attitudes toward their job have improved since May 1976.

1. *Survey Question 18.* Do you like your job?
    a. A definite yes
    b. A qualified yes
    c. Neutral
    d. A qualified no
    e. A definite no
2. *Findings.*
    a. Movement: In predicted direction
    b. Significance: Not statistically significant
    c. Support: Does not offer practical support

TABLE 1

JOB ATTITUDE
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=229)	27	79	36	41	46
All current responses (N=265)	42	98	29	54	42

z_o^*=1.460; z_c (one-tailed test) = 1.645; p=.0721.

*The computed z statistic is represented by z_o, the critical z statistic is represented by z_c.

3. *Comments.* The responses to this question were related to the type of crew; 65 percent of instructors, and 70 percent of standboard crew members indicated that they liked their job while only 45 percent of line crew members expressed a similar view. This compares with 66, 65 and 45 percent for instructor, standboard, and line crew members reported by Ashbaugh and Godfrey.

Missile combat crew members attitude toward their job also appear to be related to experience, i.e., time on the crew force. The relationship is depicted in Figure 3.

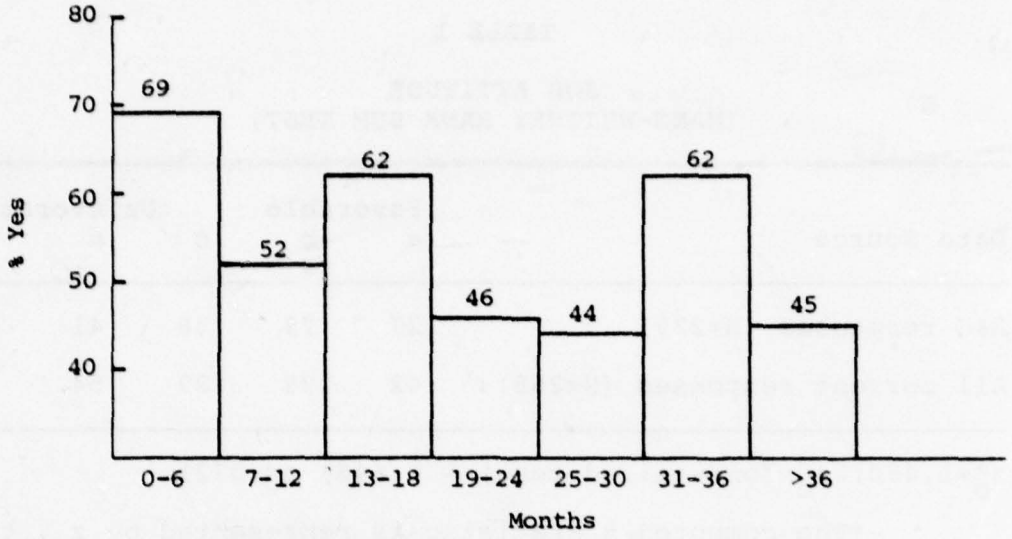

Fig. 3. Job Attitude versus Combat Ready Experience

Hypothesis 2

MCCM's attitudes toward the manner in which they are supervised by their immediate supervisor have improved since May 1976.

1. *Survey Question 12.* Are you supervised by your immediate supervisor in a manner which is satisfactory to you?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

2. *Findings.*

a. Movement: In predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 2

SUPERVISION
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=299)	101	69	24	25	10
All current responses (N=265)	116	98	25	17	9

z_o = 0.763; z_c (one-tailed test) = 1.645; .2206<p<.2236.

3. *Comments.* Over 80 percent of crew members indicated that they were supervised in a satisfactory manner. Deputy Missile Combat Crew Commanders (DMCCCs) are somewhat more satisfied with the manner in which they are supervised than Missile Combat Crew Members (MCCMs); almost 82 percent of the former responded favorably to the question as opposed to 77 percent of the latter. Differences in this area have narrowed since 1976 when Ashbaugh and Godfrey reported that 85 percent of the DMCCCs were satisfied, while only 71 percent of the MCCCs were satisfied.

With respect to grade, 86 percent of the second lieutenants, 80 percent of the first lieutenants, 74 percent

of the captains, and 90 percent of the majors reported favorably. With the exception of first lieutenants, attitudes of all grades have improved since 1976. The largest improvement in satisfaction with supervision was in the grade of major, which went from 57 percent to 90 percent favorable.

Hypothesis 3

MCCMs' attitudes toward the sense of personal accomplishment they achieve in performing their jobs have improved since May 1976.

1. *Survey Question 15.* Do you feel a sense of personal accomplishment when performing your job?

    a. A definite yes
    b. A qualified yes
    c. Neutral
    d. A qualified no
    e. A definite no

2. *Findings.*

    a. Movement: In predicted direction
    b. Signifiance: Statistically significant
    c. Support: Does offer practical support

TABLE 3

PERSONAL ACCOMPLISHMENT
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=229)	29	77	29	48	46
All current responses (N=265)	61	97	29	40	38

z_o=3.412; z_c (one-tailed test) = 1.645; .00023<p<.0003.

3. *Comments.* Responses to this question showed a strong relationship to the type of crew to which an officer was assigned. Eighty-two percent of the standboard crew members and 76 percent of the instructor crew members perceive a sense of personal accomplishment while performing their job, while only 53 percent of the line crew members report experiencing similar feelings. Figure 4 graphically illustrates these differences as well as the improvement in this attitudinal measure since the Ashbaugh and Godfrey study was conducted in 1976.

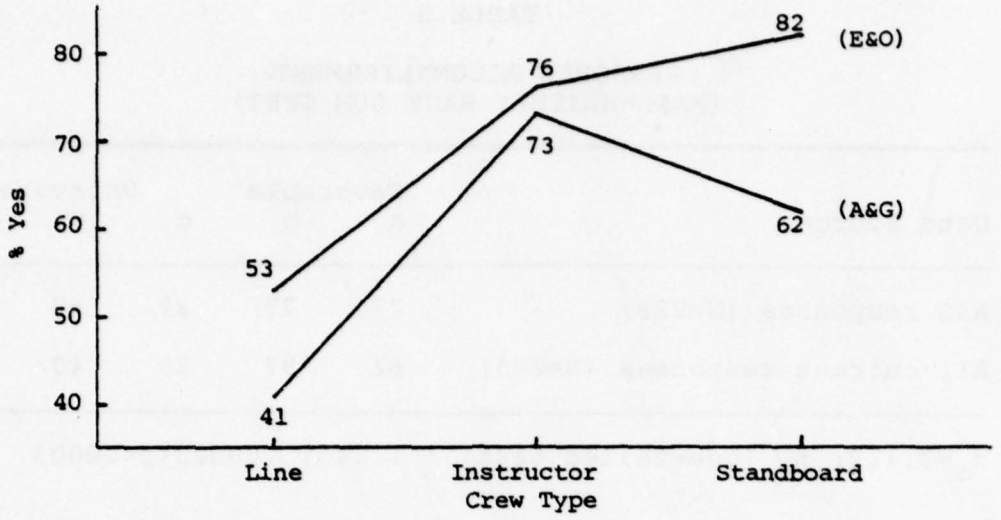

Fig. 4. Personal Accomplishment versus Type of Crew

Favorable responses on this measure also vary significantly by base, ranging from highs of 72 percent at both Grand Forks and Minot to a low of 33 percent at F. E. Warren.

Sixty-one percent of those crew members who volunteered for missile crew duty feel a sense of personal accomplishment which is an increase from 52 percent as reported by Ashbaugh and Godfrey. More significantly, 55 percent of nonvolunteers said they felt the same personal accomplishment as compared to 36 percent of nonvolunteers in the Ashbaugh and Godfrey work.

Hypothesis 4

MCCM's attitudes toward the opportunity for individual recognition provided by their job have improved since May 1976.

1. *Survey Question 21.* Does your job offer you a reasonable opportunity for individual recognition?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

2. *Findings.*

a. Movement: In predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 4

INDIVIDUAL RECOGNITION
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=230)	30	91	23	62	24
All current responses (N=265)	32	115	34	54	30

z_o=0.540; z_c (one-tailed test) = 1.645; p=.2946.

3. *Comments.* Favorable responses on the opportunity to attain individual recognition varied greatly by crew type. Eighty-two percent of those crew members in standboard and 70 percent of the instructors, while only 49 percent of line crew members indicated they had a reasonable opportunity for individual recognition. This is

an improvement from 1976 when Ashbaugh and Godfrey reported rates of 74, 68, and 45 percent for the same three groups respectively.

Favorable responses on this measure also varied significantly by base ranging from a high of 83 percent at Ellsworth to a low of 35 percent at F. E. Warren.

Hypothesis 5

MCCMs' attitudes toward the actual work involved in accomplishing their job have improved since May 1976.

1. *Survey Question 14.* Do you enjoy doing the actual work involved in accomplishing your job?

    a. A definite yes
    b. A qualified yes
    c. Neutral
    d. A qualified no
    e. A definite no

2. *Findings.*

    a. Movement: In predicted direction
    b. Significance: Statistically significant
    c. Support: Does offer practical support

TABLE 5

WORK ATTITUDE
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=229)	39	76	29	40	45
All current responses (N=265)	58	100	38	38	31

z_o=2.584; z_c (one-tailed test) = 1.645; .0197<p<.0202.

3. *Comments.* MCCMs' attitudes toward the enjoyment of the actual work of a crew member varied relative to type of crew. While only 55 percent of the line crew members answered that they enjoyed their work, 77 percent of the standboard crew members and 70 percent of the instructors gave the same response. This is an improvement from 1976 when only 45 percent of the line crew members and 77 percent of the standboard crew members indicated that they enjoyed their work. However, the percentage of instructors who enjoy their work declined from the 78 percent reported by Ashbaugh and Godfrey.

The percentage of crew members who enjoy their work declined as grade increased. Sixty-two percent of the lieutenants liked their work while 59 percent of the captains, and only 45 percent of the majors indicated enjoyment of the work involved in crew duty.

With respect to volunteers, 62 percent of the volunteers indicated that they enjoyed their work as did 50 percent of the nonvolunteers. This compares to 61 percent of the volunteers, and 34 percent of the nonvolunteers as reported by Ashbaugh and Godfrey.

Hypothesis 6

MCCMs' attitudes toward the feeling of individual responsibility allowed by their jobs have improved since May 1976.

1. *Survey Question 13.* Do you feel that you are given adequate individual responsibility in your job?

    a. A definite yes

    b. A qualified yes

    c. Neutral

    d. A qualified no

    e. A definite no

2. *Findings.*

    a. Movement: In predicted direction

    b. Significance: Statistically significant

    c. Support: Does offer practical support

TABLE 6

INDIVIDUAL RESPONSIBILITY
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=230)	59	67	20	42	42
All current responses (N=265)	84	100	17	38	26

z_o=3.041; z_c (one-tailed test) = 1.645; .0011<p<.0012.

3. *Comments.* Eighty-five percent of standboard, 82 percent of instructors, and 64 percent of line crew members answered affirmatively that they felt a sense of individual responsibility in their job. This is an improvement in all three categories from the findings of Ashbaugh and Godfrey.

Attitude toward responsibility also showed a varied relationship to type of crew assignment as 67 percent of the MCCCs and 72 percent of the DMCCCs felt they were given adequate individual responsibility.

Additionally, volunteer status appeared to have a relationship with attitudes toward responsibility. Sixty-nine percent of the volunteers and only 45 percent of the nonvolunteers answered affirmatively.

Hypothesis 7

MCCMs' attitudes toward their work schedule have improved since May 1976.

1. *Survey Question 20.* Are you satisfied with your work schedule?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

2. *Findings.*

a. Movement: Not in the predicted direction

b. Significance: Statistically significant

c. Support: Is contradictory to proposition

TABLE 7

WORK SCHEDULE
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
All responses (N=230)	23	89	29	58	31
All current responses (N=265)	16	84	47	57	61

z_o=-2.672; z_c (two-tailed test) = -1.960; .0074<p<.0076.

3. *Comments.* Thirty-five percent of the MCCCs responded that they were satisfied with their work schedule while 40 percent of the DMCCCs answered with a positive response.

Attitudes toward the work schedule were also related to the amount of time spent on crew duty. In 1976,

49 percent of the crew members answered with a favorable response. Currently, however, only 39 percent of the crew members who were on crew duty prior to Rivet Save indicated that they are now satisfied with their work schedule. Additionally, only 26 percent of the crew members with seven to twelve months experience were satisfied with their schedules.

Hypothesis 8

MCCMs' attitudes toward the opportunity provided by their job to develop personal friendships have improved since May 1976.

1. *Survey Question 16.* Does your job provide you ample opportunity to develop personal friendships with other officers in your unit?

    a. A definite yes
    b. A qualified yes
    c. Neutral
    d. A qualified no
    e. A definite no

2. *Findings.*

    a. Movement: In predicted direction
    b. Significance: Not statistically significant
    c. Support: Does not offer practical support

TABLE 8

PERSONAL FRIENDSHIPS
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=230)	82	93	24	20	11
All current responses (N=265)	105	97	22	24	17

z_o=0.507; z_c (one-tailed test) = 1.645; .3050<p<.3085.

3. *Comments.* Seventy-six percent of the crew members indicated that the job provided ample opportunity to develop personal friendships. This compares with 72 percent as reported by Ashbaugh and Godfrey.

Hypothesis 9

MCCMs' attitudes toward the physical working environment of the Launch Control Center have improved since May 1976.

1. *Survey Question 17.* Do you consider the physical working environment of the capsule (LCC) to be satisfactory.

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

2. *Findings.*

a. Movement: Not in predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 9

PHYSICAL WORKING ENVIRONMENT
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=230)	14	77	37	52	50
All current responses (N=265)	12	76	35	73	69

z_o=-1.835; z_c (two-tailed test) = -1.960; .0658<p<.0672.

3. *Comments.* The percentage of crew members who consider the working environment of the LCC satisfactory has declined since 1976. Only 33 percent of the crew members currently consider their working environment satisfactory, while Ashbaugh and Godfrey reported a 40 percent favorable response. A relationship between combat ready experience and a favorable attitude toward the working environment is depicted in Figure 5.

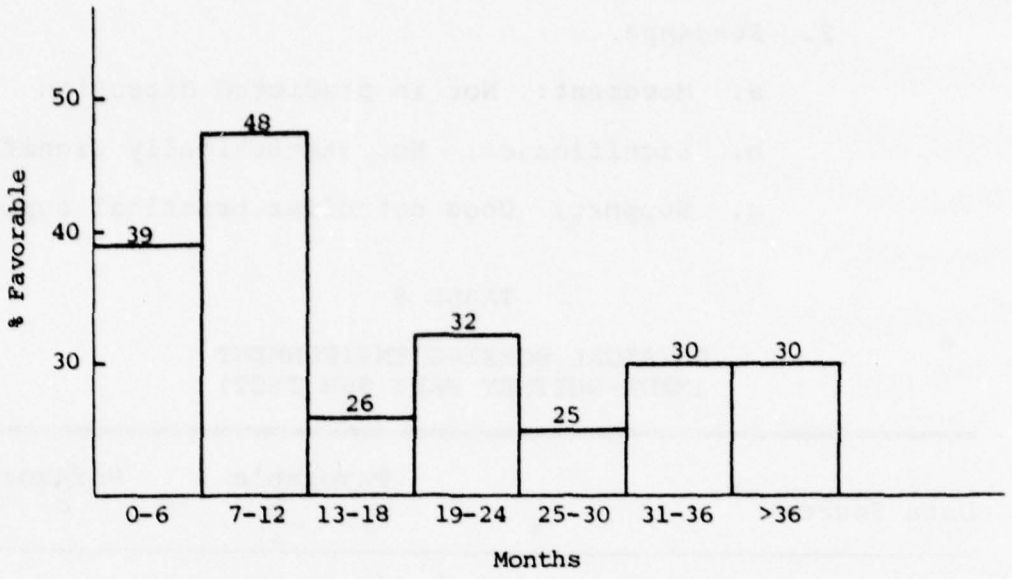

Fig. 5. Physical Working Environment versus Combat Ready Experience

Attitudes toward the physical working environment of the LCC also varied relative to grade. Forty percent of the second lieutenants and 28 percent of the first lieutenants were satisfied with the physical working environment of the LCC. The percentages for captains and majors fell between these two extremes.

Hypothesis 10

MCCMs' attitudes toward their job's effect on their personal life have improved since May 1976.

1. *Survey Question 19.* Does your job have a favorable effect on your personal life?

   a. A definite yes

   b. A qualified yes

   c. Neutral

d. A qualified no

e. A definite no

2. *Findings.*

a. Movement: Not in predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 10

JOB EFFECT ON PERSONAL LIFE
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=229)	8	48	50	71	52
All current responses (N=265)	11	56	62	62	74

z_o=-0.202; z_c (two-tailed test) = -1.960; .8336<p<.8408.

3. *Comments.* Twenty-five percent of the crew members perceive that crew duty has a favorable effect on their personal life. This is a decline from 28 percent in 1976. No meaningful relationships among other variables were found.

Hypothesis 11

MCCMs' attitudes toward the opportunity for advancement provided by the missile operations career field have improved since May 1976.

1. *Survey Question 27.* Do you think the opportunity for advancement in the missile operations career field is *at least* as good as other Air Force career fields?

   a. A definite yes
   b. A qualified yes
   c. Neutral
   d. A qualified no
   e. A definite no

2. *Findings.*

   a. Movement: In predicted direction
   b. Significance: Not statistically significant
   c. Support: Does not offer practical support

TABLE 11

ADVANCEMENT
(MANN-WHITNEY RANK SUM TEST)

Data Source	Favorable a	b	c	Unfavorable d	e
A&G responses (N=229)	34	72	36	46	41
All current responses (N=265)	29	99	50	60	27

z_o=0.776; z_c (one-tailed test) = 1.645; .2077<p<.2206.

3. *Comments.* Forty-eight percent of the crew members answered the question favorably which is an increase of 2 percent over the Ashbaugh and Godfrey figures. Percentages of crew members in each type of crew who answered

the question with a favorable response are as follows: line, 45 percent; instructor, 55 percent; and standboard, 63 percent.

Attitudes toward the opportunity for advancement also varied relative to combat ready experience as depicted by Figure 6.

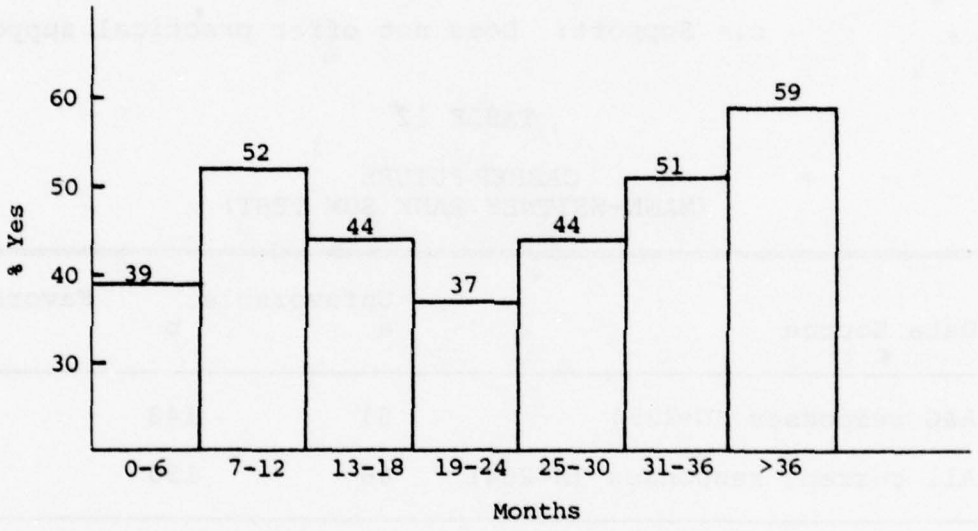

Fig. 6. Advancement versus Combat Ready Experience

Hypothesis 12

MCCMs' attitudes toward the future offered by the missile operations career field have improved since May 1976.

1. *Survey Question 26.* Which of the following best describes your feelings about the missile operations career field?

a. It's a dead end

b. It's a career field with some future

c. It's a career field with a very promising future.

2. *Findings.*

a. Movement: In predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 12

CAREER FUTURE
(MANN-WHITNEY RANK SUM TEST)

Data Source	Unfavorable a	b	Favorable c
A&G responses (N=229)	51	148	30
All current responses (N=264)	66	150	48

$z_o = 0.341$; z_c (one-tailed test) = 1.645; $.3632 < p < .3669$

3. *Comments.* The number of MCCMs who felt that missile operations offers a very promising future improved from 13 percent in 1976 to 18 percent. Also 58 percent felt it was a career field with some future. Attitudes differed based on volunteer status. Twenty-one percent of the nonvolunteers, but only 17 percent of the volunteers felt that missile operations offers a very promising future.

The attitudes also differed with respect to grade as depicted in Figure 7.

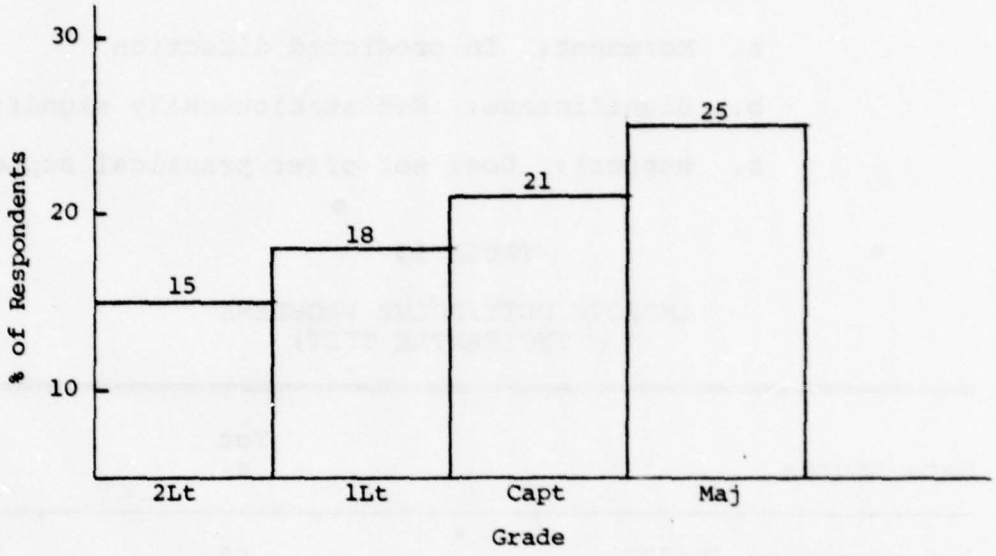

Fig. 7. Career Future versus Grade

Hypothesis 13

MCCMs' attitudes toward the adequacy of efforts made to improve missile crew duty and to resolve problems generally encountered by MCCMs have improved since May 1976.

1. *Survey Question 31.* Do you feel that adequate efforts have been made to improve missile crew duty and to resolve problems generally encountered by missile crew members?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

2. *Findings.*

a. Movement: In predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 13

IMPROVE DUTY/SOLVE PROBLEMS
(χ^2 TWO SAMPLE TEST)

Data Source	Yes a	No b
A&G responses (N=223)	63	160
All current responses (N=265)	75	190

Computed χ^2 statistic* = 0.00783; $.90<p<.95$.

*The critical χ^2 value for a one-tailed test in the predicted direction is 3.84. The critical χ^2 value for a two-tailed test not in the predicted direction is 5.02.

3. *Comments.* Twenty-eight percent of the crew members felt that adequate efforts have been made to improve crew duty and to resolve problems generally encountered by missile crew members. This is the same percentage found by Ashbaugh and Godfrey.

The percentage of crew members by grade answering the question affirmatively is shown in Figure 8.

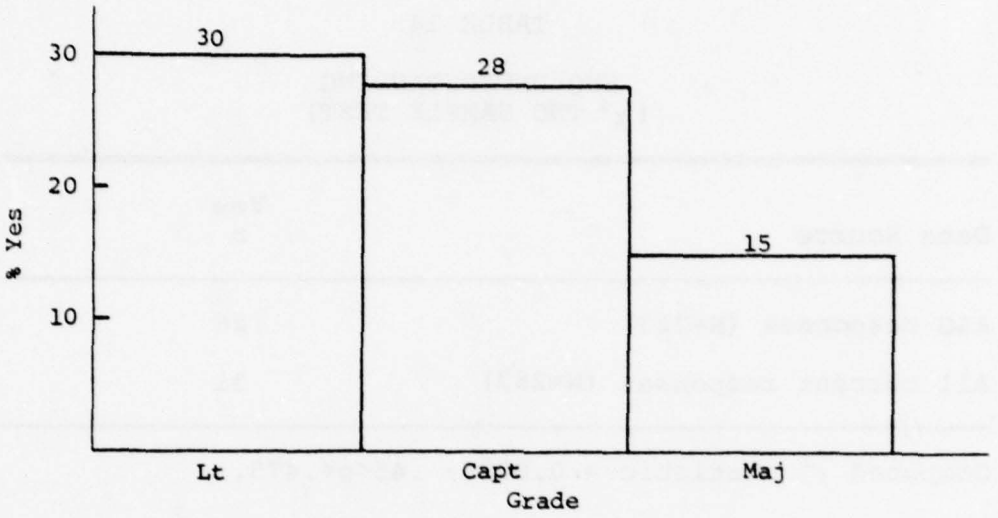

Fig. 8. Improve Duty/Solve Problems versus Grade

Hypothesis 14

MCCMs' attitudes toward the understanding of missile crew duty displayed by command and staff personnel at higher headquarters have improved since May 1976.

1. *Survey Question 24.* Do you feel that missile crew duty is fully understood and appreciated by command and staff personnel at higher headquarters?

   a. Yes

   b. No

2. *Findings.*

   a. Movement: In predicted direction

   b. Significance: Not statistically significant

   c. Support: Does not offer practical support

TABLE 14

HHQ UNDERSTANDING
(χ^2 TWO SAMPLE TEST)

Data Source	Yes a	No b
A&G responses (N=223)	26	197
All current responses (N=263)	31	232

Computed χ^2 statistic = 0.0096; .45<p<.475.

3. *Comments.* Attitudes of the crew members toward the understanding of missile crew duty by higher headquarters personnel varied with respect to grade as shown in Figure 9.

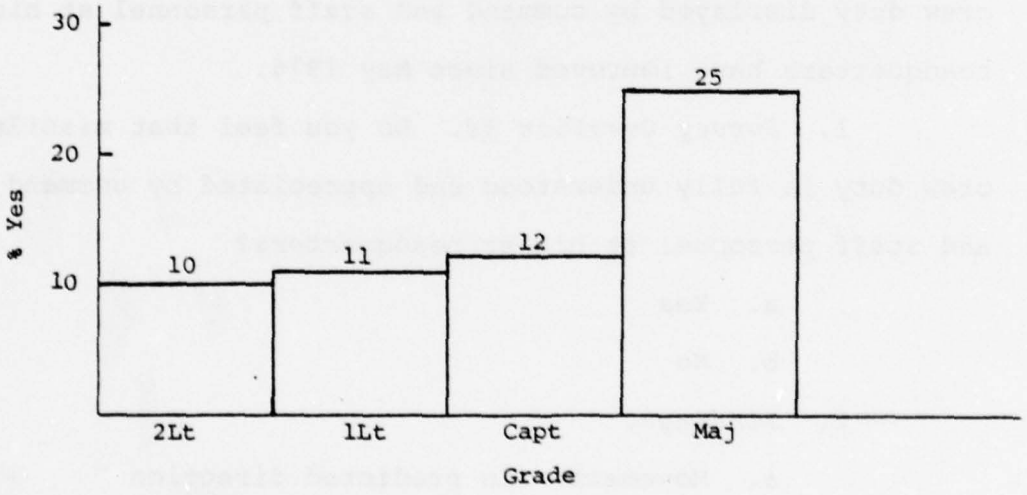

Fig. 9. HHQ Understanding versus Grade

MMCMs' attitudes did not vary greatly with respect to combat ready experience. Thirteen percent of the crew members with six months or less combat ready experience

answered the question favorably as did 13 percent of the MCCMs with over thirty-six months combat ready time.

Hypothesis 15

MCCMs' attitudes toward the understanding of missile crew duty displayed by command and staff personnel in their unit have improved since May 1976.

1. *Survey Question 22.* Do you feel that missile crew duty is fully understood and appreciated by senior command and staff personnel in your unit?

   a. Yes

   b. No

2. *Findings.*

   a. Movement: In predicted direction

   b. Significance: Not statistically significant

   c. Support: Does not offer practical support

TABLE 15

UNIT UNDERSTANDING
(χ^2 TWO SAMPLE TEST)

Data Source	Yes a	No b
A&G responses (N=226)	89	137
All current responses (N=265)	106	159

Computed χ^2 statistic = 0.0022; $.475<p<.49$.

3. *Comments.* MCCMs' attitudes toward the understanding of missile crew duty displayed by command and staff personnel in their unit differed with respect to rank as depicted by Figure 10. Forty percent of the MCCMs believe local command and staff personnel fully understand crew duty as compared to 39 percent reported by Ashbaugh and Godfrey.

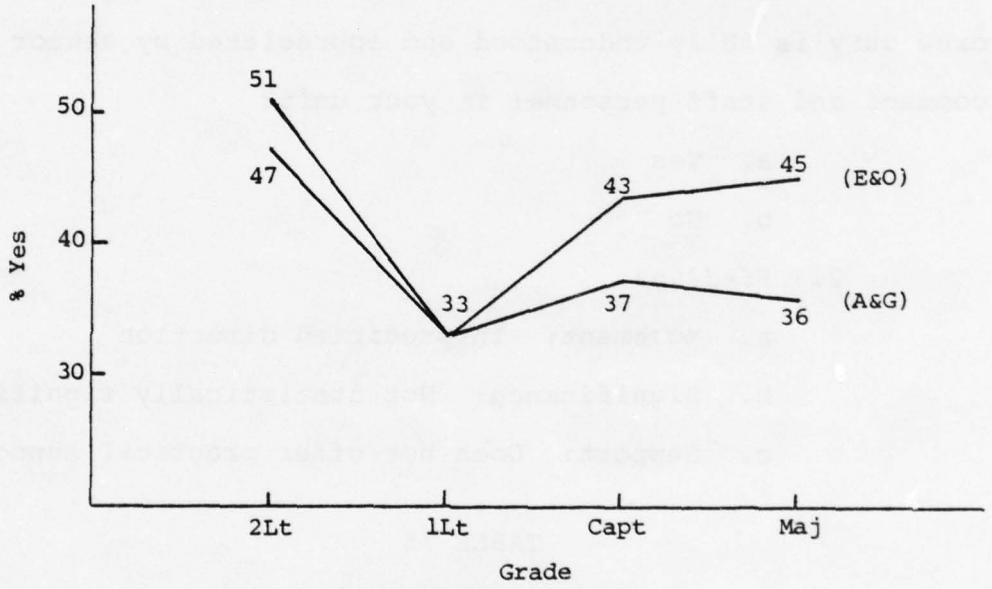

Fig. 10. Unit Understanding versus Grade

Hypothesis 16

MCCMs' attitudes toward the four-year tour have improved since May 1976.

1. *Survey Question 28.* How do you feel about the current four-year tour?

a. It is too short

b. It is about right

c. It is too long

2. *Findings.*

a. Movement: Not in predicted direction

b. Significance: Not statistically significant

c. Support: Does not offer practical support

TABLE 16

TOUR LENGTH
(χ^2 TWO SAMPLE TEST)

Data Source	Too Short a	About Right b	Too Long c
A&G responses (N=228)	3	90	135
All current responses (N=265)	4	95	166

Computed χ^2 statistic = .6996; $.30<p<.50$.
Critical χ^2 statistic (two-tailed test; df=2) = 7.38.

3. *Comments.* Sixty-three percent of the crew members felt that the length of the missile tour (four years) is too long. Attitudes, however, did not show any relationship to volunteer status as 62 percent of both the volunteers and the nonvolunteers felt that the tour length was too long. On the other hand, four MCCMs felt the tour length too short.

Conclusion

The results of testing Hypotheses 1 through 16, which are summarized in Figure 11, do not provide adequate statistical support to conclude that the attitudes of MCCMs toward their job and toward the missile operations career field have improved significantly since May 1976. While movement is in the predicted direction in twelve out of sixteen hypotheses, only three of the sixteen attitudes measured were found to have improved with 95 percent statistical confidence. These were (1) sense of personal accomplishment, (2) attitude toward the actual work itself, and (3) attitude toward the feeling of individual responsibility.

Furthermore, MCCMs' attitudes toward their work schedule was found to be less favorable with 95 percent statistical confidence. This indicates crew members are even more dissatisfied with their work schedule after implementation of the twenty-four-hour alert tour following the Rivet Save program. In addition, three other attitudes showed a shift in a less favorable direction. These were (1) attitude toward the physical working environment, (2) the effect of the job on the MCCMs' personal life, and (3) attitude toward the future offered by the missile operations field.

Hypothesis Number	Question Number	Movement*	Significance**	Supported Proposition
1	18	+	o	No
2	12	+	o	No
3	15	+	+	Yes
4	21	+	o	No
5	14	+	+	Yes
6	13	+	+	Yes
7	20	-	+	No
8	16	+	o	No
9	17	-	o	No
10	19	-	o	No
11	27	+	o	No
12	26	+	o	No
13	31	+	o	No
14	24	+	o	No
15	22	+	o	No
16	28	-	o	No

Fig. 11. Proposition 1: Hypothesis Test Results

*+ means movement in the predicted direction, and - means movement not in the predicted direction.

**+ means statistically significant, and o means not statistically significant.

Objective 3

To determine attitudes of Minuteman Missile Combat Crew Members toward a career as a missile combat crew member.

Research Question 1. What is the attitude of missile combat crew members toward a career as a crew member?

Survey Question 29

Given the opportunity to stay in the immediate area (or at another Minuteman base of your choice), and "do your own thing" during periods when you were not required to be on alert/in training, etc., would you be willing to remain a MCCM for twenty years?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

TABLE 17

ATTITUDE TOWARD CAREER AS A CREW MEMBER
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. A definite yes	4	1.5
b. A qualified yes	22	8.3
c. Neutral	11	4.2
d. A qualified no	27	10.2
e. A definite no	201	75.8

Comments. Attitudes toward remaining a crew member for twenty years varied with volunteer status. Twelve percent of the volunteers, and 3 percent of the nonvolunteers answered favorably.

The attitude varied by type of crew also. Ten percent of the line crew members and 11 percent of the standboard crew members answered favorably, while only 7 percent of the instructors indicated that they would be willing to remain as a crew member for twenty years.

A difference in attitude was related to combat ready experience. Seventeen percent of the crew members with more than thirty-six months crew experience answered favorably, while only 3 percent of the MCCMs with thirty-one to thirty-six months answered affirmatively.

The percentage of favorable responses varied by grade as follows: second lieutenants, 6 percent; first lieutenants, 9 percent; captains, 16 percent; and majors, 10 percent.

Those favorable responses which varied by base are depicted in Figure 12.

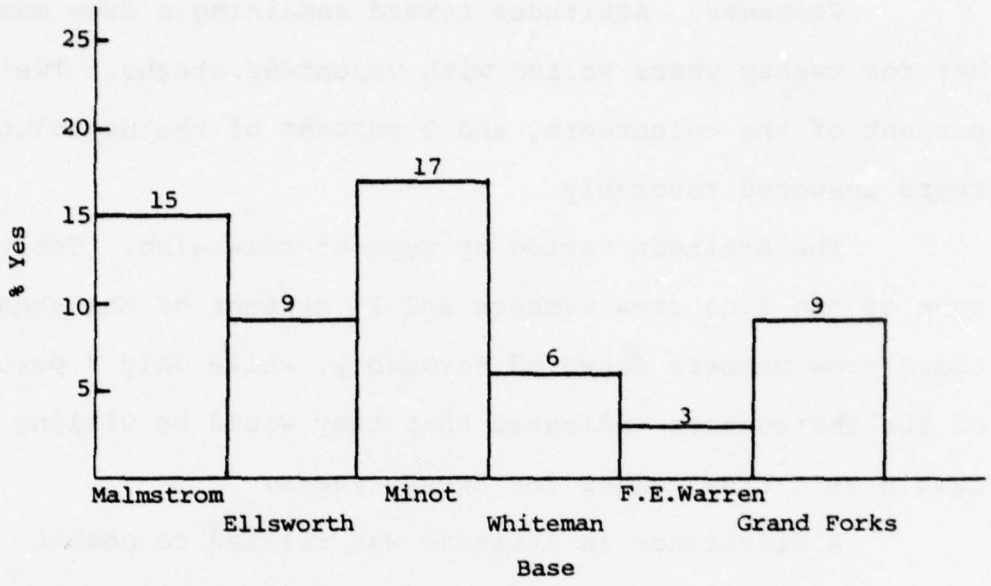

Fig. 12. Attitude Toward Career as a Crew Member versus Base

Survey Question 30

What would your response to the question above be if you knew that promotion opportunity would not exceed the rank of major?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

TABLE 18

CAREER AS A CREW MEMBER/LIMITED PROMOTION
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. A definite yes	3	1.1
b. A qualified yes	14	5.3
c. Neutral	9	3.4
d. A qualified no	20	7.5
e. A definite no	219	82.6

Comments. Six percent of the crew members indicated that they would consider a twenty-year career as a missile launch officer if promotion opportunity would not exceed the rank of major.

Attitude toward a career with limited promotion potential showed some difference with respect to crew type. Eleven percent of the standboard crew members and 7 percent of the line crew members answered favorably, but none of the instructors desired this career option.

Attitudes toward limited promotion also varied with the experience level of the crew member. Twelve percent of the crew members with less than six months experience, 11 percent of those with over thirty-six months experience, and 8 percent of the MCCMs with seven to twelve months experience answered affirmatively. Less than

3 percent of the crew members with thirteen to eighteen months, nineteen to twenty-four months, or thirty-one to thirty-six months experience answered favorably.

A difference in attitude also existed based on rank. Four percent of the second lieutenants and first lieutenants, 12 percent of the captains, and 10 percent of the majors expressed a positive response to the question.

Additionally, attitudes toward the twenty-year option with limited promotion opportunity varied by base. Percentage of respondents answering affirmatively were: 12 percent, Grand Forks; 8 percent, Malmstrom; 7 percent, Minot; 6 percent, Ellsworth, and Whiteman; and 3 percent, F. E. Warren.

Conclusion

The results of questions 29 and 30 show that the majority of crew members are not interested in a career as a combat crew member. Eighty-six percent of the MCCMs indicated that they were not interested in a twenty-year career as a missile launch officer, and 90 percent rejected the twenty-year career option when a limitation was placed on promotion opportunity. Furthermore, these questions elicited a small number of neutral responses, displaying the high degree of polarization caused by this proposal.

Objective 4

To determine if the Minuteman Eduation Program is a viable incentive to attract and retain officers in the missile operations area.

Proposition 2. The Minuteman Education Program is a viable incentive in attracting officers into the missile career field.

Hypothesis 17

The majority of MCCMs feel that the possibility of attaining a master's degree through the Minuteman Education Program was a major consideration in volunteering for crew duty.

1. *Survey Question 38.* The possibility of attaining a master's degree through the Minuteman Education Program was a major consideration in my decision to volunteer for MCCM duty.

    a. Strongly agree
    b. Agree
    c. Neutral
    d. Disagree
    e. Strongly disagree
    f. N/A: Did not volunteer

2. *Findings*

    a. Majority: Affirmative
    b. Significance: Is statistically significant
    c. Support: Does offer practical support

TABLE 19A

DECISION TO VOLUNTEER
(χ^2 ONE SAMPLE TEST)

Data Source	Agree	Other
All current responses (N=225)	151	74

Computed χ^2 statistic = 68.9074; $p < .0005$.

TABLE 19B

DECISION TO VOLUNTEER
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Strongly agree	94
b. Agree	57
c. Neutral	22
d. Disagree	21
e. Strongly disagree	31

Comments. Sixty-nine percent of the volunteers indicated that the Minuteman Education Program was a major consideration in their decision to volunteer for missile crew duty.

Responses varied by base. Seventy-nine percent of the volunteers at Malstrom answered affirmatively, while 57 percent of the volunteers at F. E. Warren indicated

that the MMEP was a major consideration in their decision to volunteer.

Seventy percent of the crew members who indicated that they were career officers agreed that the MMEP was a major consideration in their decision to volunteer, while 63 percent of the noncareer officers answered affirmatively.

The response also varied by source of commission. Seventy-one percent of the AFROTC officers strongly agreed or agreed with the question, but only 50 percent of those officers with OTS or some other program as a source of a commission felt that the MMEP was a major factor in their decision to volunteer.

Attitudes also varied based on rank. Percentages that felt the MMEP was a major consideration in their decision to volunteer are as follows: second lieutenant, 80 percent; first lieutenant, 65 percent; captain, 61 percent; and major, 36 percent.

Hypothesis 18

The majority of MCCMs feel that the opportunity to earn a master's degree through the Minuteman Education Program influenced their decision to volunteer for missile duty.

1. *Survey Question 41.* How much influence did the opportunity to earn a master's degree through the Minuteman Education Program have on your decision to volunteer for missile duty?

a. Large influence

b. Some influence

c. No influence

d. N/A: I did not volunteer for missile duty

2. *Findings.*

a. Majority: Affirmative

b. Significance: Statistically significant

c. Support: Does offer practical support

TABLE 20A

INFLUENCE TO VOLUNTEER
(χ^2 ONE SAMPLE TEST)

Data Source	Influence	No Influence
All current responses (N=222)	172	50

Computed χ^2 statistic = 11.6757; $p<.0005$.

TABLE 20B

INFLUENCE TO VOLUNTEER
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Large influence	104
b. Some influence	68
c. No influence	50

3. *Comments.* MCCMs' attitudes toward the influence that the opportunity to earn a degree through the MMEP had on their decision to volunteer for crew duty varied by base of assignment. Figure 13 compares, by base, the percentage of crew members who agreed that the MMEP was a major consideration in volunteering for crew duty with those who felt that the MMEP influenced their decision to volunteer for missile duty.

Seventy-six percent of the career officers said they were influenced by the Minuteman Education Program, and 79 percent of the noncareer officers also indicated that they were influenced by the MMEP. The perception of the MMEP as an influence varied by grade as follows: second lieutenants, 72 percent; first lieutenants, 77 percent; captains, 71 percent; and majors, 35 percent.

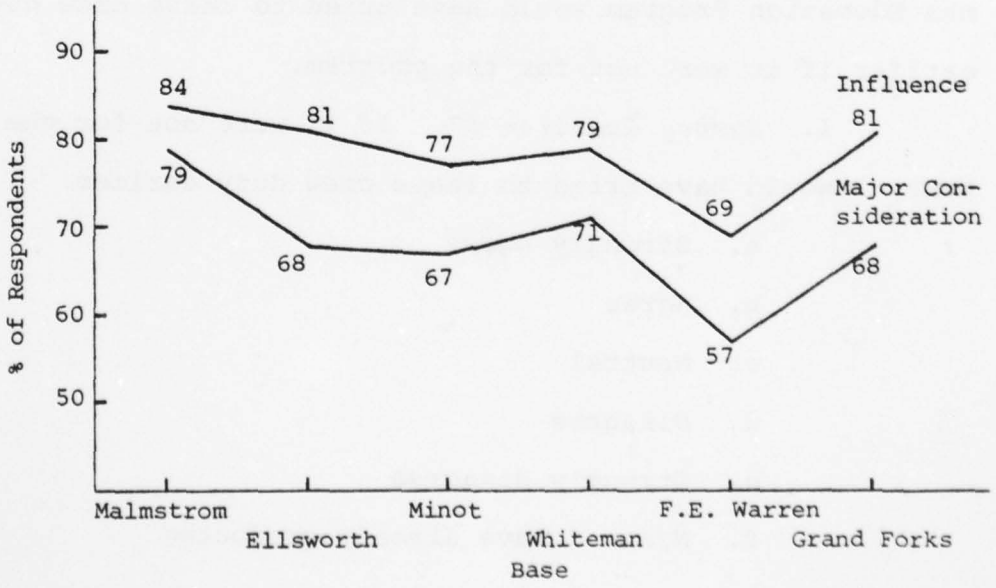

Fig. 13. MMEP Major Consideration/Influence versus Base

Conclusion.

Hypotheses 17 and 18 both lend statistical support to Proposition 2 as summarized in Figure 14. The majority of MCCMs who volunteered for missile duty felt that (1) the possibility of attaining a master's degree through the Minuteman Education Program was a major consideration in volunteering for crew duty, and (2) the opportunity to earn a master's degree through the Minuteman Education Program had an influence on their decision to volunteer for missile duty.

Proposition 3. The Minuteman Education Program is a viable incentive in the retention of officers in the missile career field.

Hypothesis 19

The majority of MCCMs who participate in the Minuteman Education Program would have tried to leave crew duty earlier if it were not for the program.

1. *Survey Question 57.* If it were not for the MMEP, I would have tried to leave crew duty earlier.

a. Strongly agree

b. Agree

c. Neutral

d. Disagree

e. Strongly disagree

f. N/A: I have already graduated

AD-A061 302 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHO--ETC F/G 5/9
THE IMPACT OF THE MINUTEMAN EDUCATION PROGRAM ON ACQUISITION AN--ETC(U)
SEP 78 M R ENGEL, P H O'NEILL

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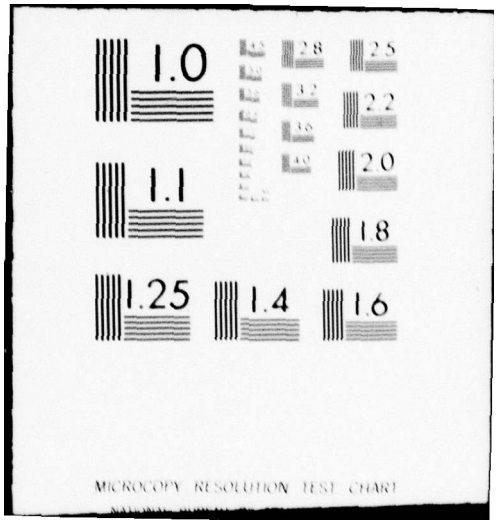
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MICROCOPY RESOLUTION TEST CHART

Hypothesis Number	Question Number	Majority Favorable	Significance*	Supported Proposition
17	38	Yes	+	Yes
18	41	Yes	+	Yes

Fig. 14. Proposition 2: Hypothesis Test Results

*+ means statistically significant.

2. *Findings.*

a. Majority: Affirmative

b. Significance: Statistically significant

c. Support: Does offer practical support

TABLE 21A

EARLY RELEASE FROM CREW DUTY
(χ^2 ONE SAMPLE TEST)

Data Source	Agree	Other
All current responses (N=107)	64	43

Computed χ^2 statistic = 17.5016; $p < .0005$.

TABLE 21B

EARLY RELEASE FROM CREW DUTY
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Strongly agree	35
b. Agree	29
c. Neutral	26
d. Disagree	14
e. Strongly disagree	3

3. *Comments.* Volunteer status appears to be related to attitudes toward the MMEP as a retention factor. Only 52 percent of the volunteers indicated that

they would have tried to leave crew duty earlier if it were not for the MMEP while 62 percent of the nonvolunteers expressed similar views.

Attitudes toward the MMEP as a retention factor also varied by base. Seventy percent of the crew members at Whiteman, but only 36 percent at Malmstrom answered that they would have left crew duty earlier if not for the MMEP.

Hypothesis 20

The majority of MCCMs who participate in the Minuteman Education Program plan to leave the missile crew force as soon as possible after graduating.

1. *Survey Question 53.* Do you plan to leave the missile crew force as soon as possible after graduating from the MMEP?

    a. A definite yes
    b. A qualified yes
    c. Neutral
    d. A qualified no
    e. A definite no
    f. N/A: I have already graduated

2. *Findings.*

    a. Majority: Affirmative
    b. Significance: Statistically significant
    c. Support: Does offer practical support

TABLE 22A

DEPARTURE FROM CREW DUTY AFTER GRADUATION
(χ^2 ONE SAMPLE TEST)

Data Source	Yes	Other
All current responses (N=106)	67	39

Computed χ^2 statistic = 23.7877; $p < .0005$.

TABLE 22B

DEPARTURE FROM CREW DUTY AFTER GRADUATION
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Definite yes	45
b. Qualified yes	22
c. Neutral	18
d. Qualified no	13
e. Definite no	8

3. *Comments.* Fifty-six percent of the volunteers enrolled in the MMEP indicated that they plan to leave crew duty as soon as they graduate, while 62 percent of the non-volunteers enrolled in the MMEP answered affirmatively.

The decision to leave missile duty was also related to combat ready experience. Ninety-two percent of the MCCMs with thirteen to eighteen months combat ready experience plan to leave missile duty upon completing the MMEP,

while 29 percent of those MCCMs with less than six months plan to leave missile duty.

Hypothesis 21

The majority of MCCMs who participate in the Minuteman Education Program believe that the program is one of the most positive aspects of the missile crew duty assignment.

1. *Survey Question 50.* The MMEP is one of the most positive aspects of my missile duty assignment.

    a. Strongly agree

    b. Agree

    d. Neutral

    d. Disagree

    e. Strongly disagree

2. *Findings.*

    a. Majority: Affirmative

    b. Significance: Is statistically significant

    c. Support: Does offer practical support

TABLE 23A

MMEP AS POSITIVE ASPECT
(χ^2 ONE SAMPLE TEST)

Data Source	Agree	Other
All current responses (N=117)	97	20

Computed χ^2 statistic = 89.7450; $p<.0005$.

TABLE 23B

MMEP AS POSITIVE ASPECT
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Strongly agree	63
b. Agree	34
c. Neutral	11
d. Disagree	8
e. Strongly disagree	1

3. *Comments.* Eighty-three percent of the students participating in the MMEP felt that it is one of the most positive aspects of misisle crew duty. Eight percent disagreed, and 9 percent remained neutral.

Hypothesis 22

The majority of MCCMs believe that the Minuteman Education Program is a significant career benefit of missile duty.

1. *Survey Question 40.* Do you consider the Minuteman Education Program to be a significant career benefit of missile duty?

a. Yes, large benefit

b. Yes, some benefit

c. No benefit

2. *Findings.*

a. Majority: Affirmative

b. Significance: Is statistically significant

c. Support: Does offer practical support

TABLE 24A

CAREER BENEFIT
(χ^2 ONE SAMPLE TEST)

Data Source	Large Benefit	Some Benefit	No Benefit
All current responses (N=264)	142	96	26

Computed χ^2 statistic = 77.5455; $p<.0005$.

TABLE 24B

CAREER BENEFIT
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Yes, Large benefit	142
b. Yes, some benefit	96
c. No benefit	26

3. *Comments.* Fifty-four percent of the crew members surveyed indicated that the MMEP was a large benefit of missile duty, and another 36 percent said it was of some benefit.

With respect to grade, the percentages of officers considering the MMEP as a large benefit of crew duty were: second lieutenant, 66 percent; first lieutenant, 46 percent; captain, 54 percent; and major, 50 percent. Ninety-two percent of the second lieutenants indicated that the Minuteman Education Program was of some benefit as did 87 percent of the first lieutenants, 93 percent of the captains and 90 percent of the majors.

One hundred percent of those crew members with thirteen to eighteen months experience thought the MMEP was a benefit of crew duty, while 83 percent of the crew members with twenty-five to thirty months combat ready experience indicated that the MMEP was a career benefit.

Hypothesis 23

The majority of MCCMs who participate in the Minuteman Education Program believe the program provides a means to relieve the monotony of the alert tour.

1. *Survey Question 55.* The MMEP provides a means to relieve the monotony of the alert tour.

a. Strongly agree

b. Agree

c. Neutral

d. Disagree

e. Strongly disagree

2. *Findings.*

a. Majority: Affirmative

b. Significance: Is statistically significant

c. Support: Does offer practical support

TABLE 25A

MMEP RELIEVES MONOTONY
(χ^2 ONE SAMPLE TEST)

Data Source	Agree	Other
All current responses (N=118)	83	35

Computed χ^2 statistic = 45.2556; $p<.0005$.

TABLE 25B

MMEP RELIEVES MONOTONY
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Strongly agree	36
b. Agree	47
c. Neutral	16
d. Disagree	15
e. Strongly disagree	4

3. *Comments.* Seventy percent of the crew members enrolled in the MMEP responded that the program was a means to relieve the monotony of the alert tour, while 16 percent

said it was not. Forty-nine percent of the non-MMEP students felt that their education programs relieved the monotony of crew duty while 33 percent did not. Further breakout by variables did not show significant differences by categories.

Hypothesis 24

The majority of MCCMs who participate in the Minuteman Education Program believe missile duty would be a waste of valuable career time without it.

1. *Survey Question 56.* Without the MMEP, missile duty would be a waste of valuable career time.

    a. Strongly agree

    b. Agree

    c. Neutral

    d. Disagree

    e. Strongly disagree

2. *Findings.*

    a. Majority: Disagree

    b. Significance: Not statistically significant

    c. Support: Does not offer practical support

TABLE 26A

WASTED CAREER TIME
(χ^2 ONE SAMPLE TEST)

Data Source	Agree	Other
All current responses (N=118)	57	61

Computed χ^2 statistic = 3.3912; $.05<p<.10$.

TABLE 26B

WASTED CAREER TIME
(QUESTIONNAIRE DATA)

Response	Number of Respondents
a. Strongly agree	31
b. Agree	26
c. Neutral	28
d. Disagree	30
e. Strongly disagree	3

3. *Comments.* Although no statistical significance for support of the proposition was found when the favorable answers were grouped, forty-eight percent of the crew members participating in the MMEP felt crew duty would be a waste of time without the MMEP, while 28 percent of the crew members diagreed. When the "neutral" responses are removed and "agree" answers tested against the disagree answers, there is statistical significance.

The responses varied with the experience level of the crew members. Sixty percent of the MCCMs with seven to twelve months combat ready experience agreed with the proposition, while only 36 percent of those with thirty-one to thirty-six months experience agreed that without the MMEP, missile duty could be a waste of valuable career time.

Conclusion.

The results of Hypotheses 19 through 24 which related to Proposition 3, are presented in Figure 15. Hypotheses 19 through 23 are statistically significant at the 95 percent confidence level and support Proposition 3. Hypothesis 24 was not significant as tested; however, when "neutral" responses were removed, the hypothesis did support the proposition at 95 percent confidence level.

Objective 5

To determine if the Minuteman Missile Combat Crew Members prefer the Minuteman Education Program to alternate graduate education programs offered at their base of assignment.

Research Question 2. Which type of graduate level education program do missile combat crew members prefer--the Minuteman Education Program, or base education programs, and why?

Survey Question 34

Did your supervisors encourage you to participate in a graduate education program other than the Minuteman Education Program?

a. A definite yes

b. A qualified yes

c. Neutral

Hypothesis Number	Question Number	Majority Favorable	Significance*	Supported Proposition
19	57	Yes	+	Yes
20	53	Yes	+	Yes
21	50	Yes	+	Yes
22	40	Yes	+	Yes
23	55	Yes	+	Yes
24	56	No	o	No

Fig. 15. Proposition 3: Hypothesis Test Results

*+ means statistically significant, and o means not statistically significant.

d. A qualified no

e. A definite no

TABLE 27

SUPERVISOR ENCOUNRAGEMENT (NON-MMEP)
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. A definite yes	15	5.7
b. A qualified yes	47	17.8
c. Neutral	80	30.3
d. A qualified no	57	21.6
e. A definite no	65	24.6

Comments. Comments pertaining to Survey Question 34 are combined with those for Question 35.

Survey Question 35

Did your supervisors encourage you to participate in the MMEP?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

TABLE 28

SUPERVISOR ENCOURAGEMENT (MMEP)
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. A definite yes	67	25.3
b. A qualified yes	86	32.5
c. Neutral	71	26.8
d. A qualified no	24	9.1
e. A definite no	17	6.4

Comments. Supervisor encouragement to participate in graduate education varied according to type of program. Fifty-eight percent of the respondents indicated that their supervisors encouraged them to participate in the MMEP, while only 24 percent of the MCCMs were encouraged to participate in other graduate progrsm.

Survey Question 36

From an OER viewpoint, it is better to be enrolled in the MMEP than one of the locally available off-duty graduate education programs.

a. Strongly agree

b. Agree

c. Nuetral

d. Disagree

e. Strongly disagree

TABLE 29

OER CONSIDERATIONS
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. Strongly agree	16	6.0
b. Agree	43	16.2
c. Neutral	114	43.2
d. Disagree	73	27.5
e. Strongly disagree	19	7.2

Comments. From an OER standpoint, the MCCMs perceived no advantage to being enrolled in the MMEP versus alternate graduate education programs. Twenty-two percent of the crew members felt that enrollment in the MMEP was advantageous, while 35 percent indicated that MMEP enrollment was not advantageous. Forty-three percent of the crew members were neutral on this point.

Survey Question 39

Compared to the locally available off-duty graduate education programs, the AFIT/MMEP is academically:

a. Much more difficult

b. Somewhat more difficult

c. No different

d. Somewhat less difficult

e. Much less difficult

TABLE 30

MMEP ACADEMIC DIFFICULTY
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. Much more difficult	67	27.4
b. Somewhat more difficult	91	37.1
c. No different	73	29.8
d. Somewhat less difficult	13	5.3
e. Much less difficult	1	0.4
MISSING RESPONSES	20	

Comments. Comments pertaining to Survey Question 39 are combined with those for Question 44.

Survey Qustion 43

Would you have been more interested in the MMEP if the degree options had been different?

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

TABLE 31

DIFFERENT DEGREE OPTIONS
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. A definite yes	78	53.1
b. A qualified yes	29	19.7
c. Neutral	25	17.0
d. A qualified no	6	4.1
e. A definite no	9	6.1

Comments. Comments pertaining to Survey Question 43 are combined with those for Question 44.

Survey Question 44

What *primarily* influenced you *not* to enroll in the Minuteman Education Program or to drop out after enrollment?

a. Conflict with duty

b. Not interested in the degree offered

c. Had established a date of separation

d. Already had a master's degree

e. Didn't qualify academically

f. Too much time required for needed prerequisites

f. The new OER system

h. Other: specify_____

TABLE 32

PRIMARY INFLUENCE NOT TO ENROLL IN MMEP
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. Conflict with duty	12	8.2
b. Not interested in degree offered	55	37.2
c. Had established DOS	...	...
d. Already had master's degree	18	12.3
e. Didn't qualify academically	3	2.0
f. Too much time for prerequisites	29	19.7
g. The new OER system	1	0.7
h. Other: specify_____	29	19.7
1. Poor academic rating of university	5	
2. Pressure from unit staff	2	
3. Do not need advanced degree	3	
4. Conflicting outside interests	1	
5. Academic terms too long	1	
6. Planing to enroll	8	
NONRESPONSE	3	

Comments. Sixty-five percent of the MCCMs surveyed indicated that they perceive the MMEP to be academically more difficult than other available graduate programs. Furthermore, 73 percent of those not enrolled in the MMEP indicated that they would have been more interested in the MMEP if a degree other than a MBA was offered. The factors influencing MCCMs not to enroll were also surveyed. When asked directly for their reasons for not enrolling in the MMEP, 37 percent of those not enrolled said that they had not enrolled primarily because they were not interested in the degree offered. Twelve percent of the respondents already had earned a master's degree. Twenty percent felt that the MMEP was too time consuming and 2 percent were not academically qualified. Eight percent of those not enrolled felt that the MMEP presented a conflict with their duties, 1 percent perceived enrollment as detrimental to their performance and subsequent OER. Twenty percent of those not enrolled specified "other," and responded as indicated in Table 32.

Survey Question 49

If it was not for the cost involved, I would have preferred to be enrolled in one of the locally available off-duty graduate education programs rather than in the MMEP.

a. A definite yes

b. A qualified yes

c. Neutral

d. A qualified no

e. A definite no

TABLE 33

COST
(QUESTIONNAIRE DATA)

Response	Number of Respondents	Percentage of Respondents
a. A definite yes	2	1.7
b. A qualified yes	15	12.7
c. Neutral	14	11.9
d. A qualified no	31	26.3
e. A definite no	56	47.4

Comments. Education program preference as related to the costs involved for the indiviudal were surveyd. Seventy-four percent of the respondents indicated that the monetary cost of a program had no bearing on their choice of the MMEP over other educational options.

Conclusion

The responses to Survey Questions 34, 35, 36, 39, 43, 44 and 49 answer the question of education program MCCMs preferred, and why. While only 45 percent of the

survey respondents are enrolled in the MMEP, 65 percent of the respondents perceive the MMEP to be the most academically valuable program. The academic value of the MMEP was further substantiated by 73 percent of the MMEP participants who said they would still prefer the MMEP, other things, such as cost, being equal.

CHAPTER IV

DISCUSSION AND CONCLUSIONS

Introduction

This chapter presents the significant findings of this research effort as they are related to the five research objectives. We conclude by offering some general recommendations for further research concerning the missile operations career field and the Minuteman Education Program.

Objectives and Findings

Objective 1

Objective 1 was to sample current attitudes of missile combat crew members (MCCMs) toward (a) their career field and their job, (b) the Minuteman Education Program and alternate base level graduate education programs, and (c) a career as a missile combat crew member.

This objective was satisfied by routing a survey questionnaire to 480 MCCMs. The response rate of 55.2 percent would indicate that the attitudes expressed by the survey respondents may not necessarily reflect the attitudes of the entire Minuteman crew force due to nonrespondent bias. However, this lack of response is more likely attributable to several other factors. The survey was

sent to the field during the peak of the summer PCS rotations, leaves, and TDYs. Hence, a number of the potential respondents were unavailable to complete the survey. Also, the manner in which the survey was administered by the AFIT Detachment Commanders at the individual missile bases could have influenced the number of respondents and nonrespondents rather than a difference in attitudes between the two groups. For instance, at one base, the Detachment Commander changed mid-way through the survey period. At another base, the local CBPO was experiencing computer outages and the random sample listing of respondents was delayed which compressed the survey period at this base.

In general, we found that MCCMs do not have a favorable attitude toward their job or the missile operations career field. Thus, Ashbaugh and Godfrey's conclusions (1:112) are reinforced by the results of the current survey. However, MCCMs do perceive the Minuteman Education Program as being a positive and influencing aspect of an otherwise unsatisfactory career assignment.

Objective 2

Objective 2 was to compare the sample of current attitudes with the results of the Ashbaugh and Godfrey survey to determine if attitudes have changed since May 1976.

The testing of the numerous hypotheses that comprise much of Chapter III satisfies this objective.

In general, we found that the attitudes of MCCMs have changed or improved slightly, but not significantly, since May 1976. This is not to say that isolated attempts to improve missile duty have been ineffective in all cases, but it does indicate that the basic underlying causes of job/career dissatisfaction among MCCMs have still not been identified and/or resolved. For example, MCCMs' attitude toward the crew schedule were found to be less favorable since the implementation of Rivet Save. Furthermore, we speculate that the negative attitudes will continue as long as the operational requirements of the Minuteman weapon system are met and the human factors of crew duty largely neglected.

Objective 3

Objective 3 was to determine attitudes of Minuteman Missile Combat Crew Members toward a career as a missile combat crew member. In order to achieve this objective, research Question 2 was posed and Survey Questions 29 and 30 were used as a basis for evaluation of the MCCMs' attitudes.

The research found that the vast majority of crew members do not believe that a career as a combat crew member is an attractive idea; only 4 of the 265 crew members surveyed indicated that they would be definitely interested.

Furthermore, while 10 percent of the MCCMs indicated that the idea had merit with unlimited promotion potential, only 6 percent answered affirmatively under the limited promotion concept. However, since the crew force experiences a total personnel turnover every three to four years, it could be speculated that this small group (10 percent) of crew members would grow through time and provide a permanent base of missile launch control officers. This situation would then offer certain advantages such as improved continuity, weapon system knowledge and experience in the operational squadrons, as well as various advantages in civilian-military relationships.

Objective 4

Objective 5 was to determine if the Minuteman Education Program is a viable incentive to attract and retain officers in the missile operations area. In order to accomplish the objective, two propositions were developed. The first, Proposition 2, dealt with the MMEP as an incentive in attracting officers to missile operations; and the second, Proposition 3, dealt with the MMEP as a retention factor.

Proposition 2 was supported by Hypotheses 17 and 18. It was found that the majority of crew members who volunteered for crew duty said the opportunity to earn a master's degree through the MMEP was a major consideration. Furthermore, 78 percent of those crew members said

the MMEP influenced their decision to volunteer. Junior officers, especially second lieutenants, felt very strongly that it was a major consideration and influenced their decision to volunteer for crew duty. This is significant since the vast majority of crew members are junior officers.

Proposition 3 was supported by Hypotheses 19 through 24. The results for all except Hypothesis 24 were significant and, even number 24 lent practical support when the "neutral" responses were removed.

In the case of Hypothesis 22, the majority of all crew members believed that the MMEP was significant career benefit of missile duty. Interestingly enough, the percentage of affirmative responses did not differ significantly between junior and field grade officers.

In Hypotheses 19 through 21, and 23, the majority of those crew members enrolled in the MMEP agreed (1) that without the MMEP, they would have tried to leave crew duty earlier, (2) that they will try to leave crew duty as soon as possible after graduation, (3) that the MMEP is one of the most positive aspects of crew duty, and (4) that the MMEP provides a means to relieve the monotony of crew duty. Furthermore, 48 percent went so far as to say that without the MMEP, missile crew duty would be a waste of valuable career time.

Thus, we must conclude that the MMEP is still perceived by crew members as a significant benefit of

crew duty and not only provides an incentive in the attraction of officers to the missile operations career area, but is also a definite retention factor.

Objective 5

Objective 5 was to determine if the MCCMs preferred the MMEP to alternate graduate education programs offered by their base of assignment.

This objective was satisfied by asking them which program they preferred and the reasons for their choice. We found that although only 45 percent of the respondents were actively enrolled in the MMEP, 65 percent perceived the MMEP to be the program that offered the greatest academic challenge. The fact that the MMEP is cost-free to the participants was not seen as an influencing factor in their preference as 74 percent of those enrolled indicated that they would have desired the MMEP, all things being equal. Our survey also revealed that MCCMs were encouraged by their supervisors to participate in the MMEP to a much greater extent than were they encouraged to participate in the other base graduate education options.

In relationship to the effect that participation in the MMEP versus the other available programs have on their OERs, MCCMs perceived no difference. In effect, the MCCMs see participation in any graduate level program as career enhancing. However, our survey did not provide sufficient data to determine the extent of this perception.

The survey data also suggests that MCCMs favor the MMEP because of its academic strength. However, as the data suggests, other things, such as supervisor recommendation, tailored crew schedule for MMEP participants, peer participation, and type of degree offered, also influence MCCMs' attitudes toward the MMEP.

Recommendations for Future Research

Since the attitudes or missile combat crew members show little change since May 1976, it is obvious that the underlying causes of dissatisfaction have not been isolated or treated. Therefore, one area of future research that is recommended is to identify the causes of this dissatisfaction and also solutions to solve such problems. The data base used in this study along with that used by Ashbaugh and Godfrey are available for future use by contacting AFIT/LSGR, Wright-Patterson AFB, Ohio.

Another area of possible research is the advancement problem within the missile career area itself. There are simply not enough positions for all crew members to advance within missile operations. Discussions with persons at SAC HQ, indicated a need for a study in this area.

In dealing with the MMEP, it was found that several reasons for not enrolling were given and can be found in Table 32. A more detailed examination of these reasons for

nonenrollment and suggestions for improving the program might be undertaken.

APPENDIXES

APPENDIX A

MISSILE COMBAT CREW MEMBER SURVEY

USAF SCN 78-129 (Expires 31 August 1978)

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY XXXXX(ATC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO ATTN OF: LSGR (LSSR 28-78B/Capt Engel/Capt O'Neill/AUTOVON 785-4698)

SUBJECT: Missile Combat Crew Member Survey

2 June 1978

TO:

1. The attached survey was prepared by a research team at the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio. The purpose of the survey is to measure the current attitudes of missile combat crew members toward missile combat crew duty, the missile operations career field and the Minuteman Education Program.

2. You are requested to provide an answer or comment for each applicable question. Headquarters USAF Survey Control Number 78-129 has been assigned to this survey. Your participation in this research is voluntary.

3. Your responses to the questions will be confidential since the completed surveys are not identified to individuals. Please remove this cover sheet before returning the completed survey to your wing project officer. Your cooperation in providing this data will be appreciated and will be beneficial in evaluating the impact of the Minuteman Education Program on missile combat crew member attitudes.

Henry W. Parlett

HENRY W. PARLETT, Colonel, USAF
Associate Dean for Graduate Education
School of Systems and Logistics

2 Atch
1. Privacy Act Statement
2. Questionnaire

Missile Combat Crew Member Survey

This survey is designed to obtain your perception of your job, the missile operations career field and the Minuteman Education Program. There are no *trick* questions and there are no *right* answers. Please answer each question as honestly and frankly as possible from the choices available. Select only one answer for each question.

Thank you for your cooperation and willingness to contribute your time and effort to this study.

Privacy Statement

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority

(1) 5 U.S.C. 301, Departmental Regulations, and/or

(2) 10 U.S.C., 80-12, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or

(3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or

(4) AFR 30-23, 22 Sep 76, Air Force Military Survey Program.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

Part I

Please circle the appropriate response for each of the following questions.

1. What is your base of assignment?

   a. Malstrom (40)
   b. Ellsworth (53)
   c. Minot (46)
   d. Whiteman (34)
   e. F. E. Warren (60)
   f. Grand Forks (32)

2. To what type of crew are you assigned?

   a. Line (192)
   b. Instructor (46)
   c. Standboard (27)

3. What is your crew position?

   a. MCCC (139)
   b. DMCCC (126)

4. How many months of missile combat ready experience do you have?

   a. 0 - 6 months (26)
   b. 7 - 12 months (50)
   c. 13 - 18 months (27)
   d. 19 - 24 months (35)
   e. 25 - 30 months (36)
   f. 31 - 36 months (37)
   g. More than 36 months (54)

5. What is your grade?

   a. Second Lieutenant (73)
   b. First Lieutenant (104)
   c. Captain (68)
   d. Major (20)
   e. Lieutenant Colonel (0)

6. What is your source of commission?

   a. Air Force Academy (20)
   b. ROTC (175)
   c. OTS (SMSO) (48)
   d. AECP (17)
   e. Other (5)

7. Are you a regular officer?

   a. Yes (76)
   b. No (189)

8. What is your aeronautical rating?

   a. Pilot (7)
   b. Navigator (6)
   c. Not rated (252)

9. Do you intend to make the Air Force a career?

   a. A definite yes (124)
   b. A qualified yes (83)
   c. Neutral (38)
   d. A qualified no (10)
   e. A definite no (10)

10. Were you a volunteer for missile crew duty?

   a. Yes, first choice (162)
   b. Yes, second choice (31)
   c. Yes, third choice (10)
   d. No (36)
   e. Had to volunteer for missiles to come on active duty (26)

11. Are you participating in the Minuteman Education Program?

   a. Yes (111)
   b. No (154)

Part II

Please circle the response which is most representative of your opinion about each item.

12. Are you supervised by your immediate supervisor in a manner which is satisfactory to you?

    a. A definite yes (116)
    b. A qualified yes (98)
    c. Neutral (25)
    d. A qualified no (17)
    e. A definite no (9)

13. Do you feel that you are given adequate individual responsibility in your job?

    a. A definite yes (84)
    b. A qualified yes (100)
    c. Neutral (17)
    d. A qualified no (38)
    e. A definite no (26)

14. Do you enjoy doing the actual work involved in accomplishing your job?

    a. A definite yes (58)
    b. A qualified yes (100)
    c. Neutral (38)
    d. A qualified no (38)
    e. A definite no (31)

15. Do you feel a sense of personal accomplishment when performing your job?

    a. A definite yes (61)
    b. A qualified yes (97)
    c. Neutral (29)
    d. A qualified no (40)
    e. A definite no (38)

16. Does your job provide you ample opportunity to develop personal friendships with other officers in your unit?

a. A definite yes (105)
b. A qualified yes (97)
c. Neutral (22)
d. A qualified no (24)
e. A definite no (17)

17. Do you consider the physical working environment of the capsule (LCC) to be satisfactory?

a. A definite yes (12)
b. A qualified yes (76)
c. Neutral (35)
d. A qualified no (73)
e. A definite no (69)

18. Do you like your job?

a. A definite yes (42)
b. A qualified yes (98)
c. Neutral (29)
d. A qualified no (54)
e. A definite no (42)

19. Does your job have a favorable effect on your personal life?

a. A definite yes (11)
b. A qualified yes (56)
c. Neutral (62)
d. A qualified no (62)
e. A definite no (74)

20. Are you satisfied with your work schedule?

a. A definite yes (16)
b. A qualified yes (84)
c. Neutral (47)
d. A qualified no (57)
e. A definite no (61)

21. Does your job offer you a reasonable opportunity for individual recognition?

a. A definite yes (32)

b. A qualified yes (115)

c. Neutral (34)

d. A qualified no (54)

e. A definite no (30)

22. Do you feel that missile crew duty is fully understood and appreciated by senior command and staff personnel in your unit?

a. Yes (106)

b. No (159)

23. Do you desire to remain in the missile career field?

a. Yes (71)

b. No (190)

Missing (4)

24. Do you feel that missile crew duty is fully understood and appreciated by command and staff personnel at higher headquarters?

a. Yes (31)

b. No (232)

Missing (2)

25. If your missile duty is a career braodening assignment, do you believe it enhances your career opportunities?

a. A definite yes (15)

b. A qualified yes (40)

c. Neutral (9)

d. A qualified no (8)

e. A definite no (12)

f. N/A: was not career broadening assignment (181)

26. Which of the following best describes your feelings about the missile operations career field?

a. It's a dead end. (66)

b. It's a career field with some future. (150)

c. It's a career field with a very promising future. (48)

Missing (1)

27. Do you think the opportunity for advancement in the missile operations career field is <u>at least</u> as good as other Air Force career fields?

a. A definite yes (29)

b. A qualified yes (99)

c. Neutral (50)

d. A qualified no (60)

e. A definite no (27)

28. How do you feel about the current four year tour?

a. It is too short. (4)

b. It is about right. (95)

c. It is too long. (166)

29. Given the opportunity to stay in the immediate area (or at another Minuteman base of your choice), and "do your own thing" during periods when you were not required to be on alert/in training, etc., would you be willing to remain a MCCM for 20 years?

a. A definite yes (4)

b. A qualified yes (22)

c. Neutral (11)

d. A qualified no (27)

e. A definite no (201)

30. What would your response to the question above be if you know that promotion opportunity would not exceed the rank of major?

a. A definite yes (3)

b. A qualified yes (14)

c. Neutral (9)

d. A qualified no (20)

e. A definite no (219)

31. Do you feel that adequate efforts have been made to improve missile crew duty and to resolve problems generally encountered by missile crew members?

a. A definite yes (8)

b. A qualified yes (67)

c. Neutral (30)

d. A qualified no (81)

e. A definite no (79)

32. When was the first official information on the Minuteman Education Program (MMEP) presented to you?

a. AFROTC/ACADEMY/OTS/AECP (160)

b. Vandenberg (ORT/IQT) (35)

c. At your missile wing (43)

d. Other: Specify _____ (27)

33. The first official information I received about the MMEP was:

a. Inadequate (35)

b. A brief overview of the MMEP (202)

c. A well organized presentation (23)

d. A comprehensive treatment of all aspects of the MMEP (5)

Part III

Please circle the response which is most representative of your opinion about each item.

34. Did your supervisors encourage you to participate in a graduate education program other than the Minuteman Education Program?

a. A definite yes (15)

b. A qualified yes (47)

c. Neutral (80)

d. A qualified no (57)

e. A definite no (65)

Missing (1)

35. Did your supervisors encourage you to participate in the MMEP?

a. A definite yes (67)

b. A qualified yes (86)

c. Neutral (71)

d. A qualified no (24)

e. A definite no (17)

36. From an OER viewpoint, it is better to be enrolled in the MMEP than in one of the locally available off-duty graduate education programs.

a. Strongly agree (16)

b. Agree (43)

c. Neutral (114)

d. Disagree (73)

e. Strongly disagree (19)

37. Does the local AFIT/MMEP Detachment Commander actively promote enrollment in the MMEP?

a. A definite yes (77)

b. A qualified yes (75)

c. Neutral (82)

d. A qualified no (23)

e. A definite no (8)

38. The possibility of attaining a master's degree through the MMEP was a major consideration in my decision to volunteer for MCCM duty.

a. Strongly agree (94)

b. Agree (57)

c. Neutral (22)

d. Disagree (21)

e. Strongly disagree (31)

f. N/A: did not volunteer (40)

39. Compared to the locally available off-duty graduate education programs, the AFIT/MMEP is academically . . .

a. Much more difficult (67)

b. Somewhat more difficult (91)

c. No different (73)

d. Somewhat less difficult (13)

e. Much less difficult (1)

Missing (20)

40. Do you consider the Minuteman Education Program to be a significant career benefit of missile duty?

a. Yes, large benefit (142)

b. Yes, some benefit (96)

c. No benefit (26)

Missing (1)

41. How much influence did the opportunity to earn a master's degree through the Minuteman Education Program have on your decision to volunteer for missile duty?

a. Large influence (104)

b. Some influence (68)

c. No influence (50)

d. N/A: I did not volunteer for missile duty. (42)

Missing (1)

42. Are you enrolled in a non-AFIT graduate level education program?

a. Yes (77)

b. No (188)

AFIT graduates and participants go to question 49.

All others continue with question 43.

Part IV

(Non-AFIT ONLY) Please circle the response which is most representative of your opinion about each item.

43. Would you have been more interested in the MMEP if the degree options had been different?

a. A definite yes (78)

b. A qualified yes (29)

c. Neutral (25)

d. A qualified no (6)

e. A definite no (9)

N/A (118)

44. What primarily influenced you not to enroll in the Minuteman Education Program or to drop out after enrollment?

a. Conflict with duty (12)

b. Not interested in the degree offered (55)

c. Had established a date of separation (0)

d. Already had a master's degree (18)

e. Didn't qualify academically (3)

f. Too much time required for need prerequisites (29)

g. The new OER system (1)

h. Other: specify_____ (29)

N/A (118)

If you participated in, or graduated from a non-AFIT graduate level education program, continue, otherwise STOP.

Part V

(PARTICIPANTS IN, OR GRADUATES OF NON-AFIT GRADUATE PROGRAMS ONLY) Please circle the response which is most representative of your opinion about each item.

45. Without a graduate level education program, missile duty would be a waste of valuable career time.

a. Strongly agree (14)
b. Agree (24)
c. Neutral (17)
d. Disagree (16)
e. Strongly disagree (11)

N/A (183)

46. Are you participating or did you participate in a graduate level education program because you feel an advanced degree is necessary for career progression?

a. Yes (78)
b. No (4)

N/A (183)

47. Your graduate level education program provides, or provided (for graduates) a means to relieve the monotony of the alert tour.

a. Strongly agree (17)
b. Agree (23)
c. Neutral (15)
d. Disagree (18)
e. Strongly disagree (9)

N/A (183)

48. If it were not for my graduate level education program, I would have tried to leave crew duty earlier.

a. Strongly agree (12)
b. Agree (9)
c. Neutral (24)
d. Disagree (15)
e. Strongly disagree (9)
f. N/A: I have already graduated. (13)

N/A (183)

Proceed to question 59.

Part VI

(AFIT PARTICIPANTS AND AFIT GRADUATES ONLY) Please circle the response which is most representative of your opinion about each item.

49. If it was not for the cost involved, I would have preferred to be enrolled in one of the locally available off-duty graduate education programs rather than in the MMEP.

a. A definite yes (2)
b. A qualified yes (15)
c. Neutral (14)
d. A qualified no (31)
e. A definite no (56)
N/A (147)

50. The MMEP is one of the most positive aspects of my missile crew duty assignment.

a. Strongly agree (63)
b. Agree (34)
c. Neutral (11)
d. Disagree (8)
e. Strongly disagree (1)
N/A (147)
Missing (1)

51. If the MMEP was not available to you, would you have enrolled in some other graduate level program offered in the local area?

a. Yes (94)
b. No (22)
N/A (149)

52. Do you feel that participation in the MMEP improves your duty performance as a MCCM?

a. A definite yes (25)
b. A qualified yes (35)
c. Neutral (20)
d. A qualified no (23)
e. A definite no (15)
N/A (147)

53. Do you plan to leave the missile crew force as soon as possible after graduating from the MMEP?

a. A definite yes (45)
b. A qualified yes (22)
c. Neutral (18)
d. A qualified no (13)
e. A definite no (8)
f. N/A: I have already graduated. (11)
N/A (147)
Missing (1)

54. Are you participating, or did you participate in the MMEP, because you feel an advanced degree is necessary for career progression?

a. Yes (102)
b. No (16)
N/A (147)

55. The MMEP provides a means to relieve monotony of the alert tour.

a. Strongly agree (36)
b. Agree (47)
c. Neutral (16)
d. Disagree (15)
e. Strongly disagree (4)
N/A (147)

56. Without the MMEP, missile duty would be a waste of valuable career time.

a. Strongly agree (31)
b. Agree (26)
c. Neutral (28)
d. Disagree (30)
e. Strongly disagree (3)
N/A (147)

57. If it were not for the MMEP, I would have tried to leave crew duty earlier.

a. Strongly agree (35)
b. Agree (29)
c. Neutral (26)
d. Disagree (14)
e. Strongly disagree (3)
f. N/A: I have already graduated. (11)
N/A (147)

58. Is your AFIT Detachment Commander available to help solve problems you encounter in the MMEP?

a. A definite yes (58)
b. A qualified yes (33)
c. Neutral (21)
d. A qualified no (4)
e. A definite no (2)
N/A (147)

Part VII

(PARTICIPANTS IN, OR GRADUATES OF AFIT, OR NON-AFIT GRADUATE PROGRAMS) Briefly answer the following questions.

59. What, if anything, have you received in the way of information or training from your graduate level education program which has helped, or will help you to become a better officer?

60. What skills (technical, conceptual, or human) have you acquired from your graduate level education program which have helped you, or will help you to become a better manager in the military environment?

61. In what way has your graduate level education program improved your duty performance?

APPENDIX B

QUESTIONNAIRE SYNOPSIS

Question	Source		Question Category
1.	A&G*	Base Identification	Demographic
2.	"	Type of Crew	"
3.	"	Crew Position	"
4.	"	Combat Ready Experience	"
5.	"	Grade	"
6.	"	Source of Commission	"
7.	"	Type of Commission	"
8.	"	Aeronautical Rating	"
9.	"	Career Intentions	"
10.		Volunteer Status	"
11.		Participation in MMEP	"
42.		Participation in Other Graduate Program	"
12.	A&G	Satisfaction with Supervision	Job/Career Field
13.	"	Adequacy of Responsibility	Attitude
14.	"	Enjoyment from Actual Work	"
15.	"	Sense of Personal Accomplishment	"
16.	"	Development of Friendships	"
17.	"	Physical Working Environment	"
18.	"	General Attitude Toward Job	"
19.	"	Effect on Personal Life	"
20.	"	Satisfaction with Work Schedule	"
21.	"	Opportunity for Recogniition	"
22.	"	Unit Staff Understanding of Crew Dity	"
23.	"	Desire to Remain in Career Field	"
24.	"	HHQ Staff Understanding of Crew Duty	"
25.	"	Enhancement of Career Opportunity	"
26.	"	Attitude toward Career Field	"
27.	"	Opportunity for Advancement	"
28.	"	Tour Length	"
31.	"	Efforts to Improve Duty/Solve Problems	"

*Denotes Ashbaugh and Godfrey survey is source for questions.

Question	Source		Question Category
29.		Attitude toward MCC Career	Special Interest
30.		Attitude toward MCC Career/Limited Promotion	"
32.		MMEP Information Distribution	"
33.		Adequacy of MMEP Information	"
37.		Activeness of MMEP Det CC in Promoting Enrollment	"
58.		Availability of MMEP Det CC for Problem Solving	"
34.		Supervisor Encouragement toward Program Other than MMEP	Education
35.		Supervisor Encouragement toward MMEP	"
36.		Education Programs' Effect on OER	"
38.		MMEP as Major Consideration when Volunteering	"
39.		Academic Quality of Graduate Program	"
40.	A&G	Attitude toward MMEP as a Career Benefit	"
41.	"	Influence of MMEP on Volunteer Decision	"
43.		Attitude toward MMEP Degree Offered	"
44.		Factors Causing Nonenrollment in MMEP	"
45.		Without Graduate Program Career Time Wasted	"
46.		Graduate Program's Contribution to Career Progression	"
47.		Graduate Program Relieves Monotony of Crew Duty	"
48.		Graduate Program's Effect on Early Release from Crew Duty	"
49.		Graduate Program Preference Due to Cost	"
50.		MMEP as a Positive Aspect of Crew Duty	"
51.		Attitude toward Graduate Programs if not AFIT	"
52.		Improvement of Duty Performance by AFIT	"
53.		MMEP Effect on Departure after Graduation	"
54.		MMEP Contribution to Career Progression	"
55.		MMEP Relieves Montony of Crew Duty	"
56.		Without MMEP Career Time Wasted	"
57.		MMEP Effect on Early Release from Crew Duty	"

APPENDIX C

TABLE OF QUESTIONS AND STATISTICAL TESTS

TABLE 34

TABLE OF QUESTIONS AND STATISTICAL TESTS

Hypothesis Number	Q Survey Question	Category	Level of Data	Classification of Data for Testing	Test
1	18	Job/Career Field Attitude	Ordinal	Discrete Limited	Mann-Whitney
2	12	"	"	"	"
3	15	"	"	"	"
4	21	"	"	"	"
5	14	"	"	"	"
6	13	"	"	"	"
7	20	"	"	"	"
8	16	"	"	"	"
9	17	"	"	"	"
10	19	"	"	"	"
11	27	"	"	"	"
12	26	"	"	"	"
13	31	"	"	"	Two Sample
14	24	"	Nominal	Discrete Dichotomos	"

TABLE 34--Continued

Hypothesis Number	Q Survey Question	Category	Level of Data	Classification of Data for Testing	Test
15	22	Job/Career Field Attitude	Nominal	Discrete Dichotomos	Two Sample
16	28	"	Ordinal	Discrete Limited	"
17	38	MMEP	"	"	One Sample
18	41	"	Nominal	Discrete Dichotomos	"
19	57	"	Ordinal	Discrete Limited	"
20	53	"	"	"	"
21	50	"	"	"	"
22	40	"	Nominal	Discrete Dichotomos	"
23	55	"	Ordinal	Discrete Limited	"
24	56	"	"	"	

APPENDIX D

DEMOGRAPHIC COMPARISONS

Demongraphic Variable Category	Survey*	
	A&G	CS
Crew Position		
MCCC	58.3%	52.5%
	41.7	57.5
Volunteer Status		
First Choice	54.3	61.1
Second Choice	7.0	11.7
Third Choice	7.4	3.8
Nonvolunteer	31.3	23.4
Combat Ready Experience		
0 - 6 months	8.3	9.8
7 - 12 months	20.4	18.9
13 - 18 months	13.5	10.2
19 - 24 months	14.3	13.2
25 - 30 months	12.2	13.6
31 - 36 months	10.9	14.0
More than 36 months	20.4	20.4
A. F. Career Intent		
Definite Yes	52.2	46.8
Qualified Yes	26.1	31.3
Undecided	11.3	14.3
Qualified No	5.7	3.8
Definite No	5.3	3.8
Type of Crew		
Standboard	9.6	10.2
Instructor	13.0	17.4
Line	77.4	72.5
Source of Commission		
A. F. Academy	5.2	7.5
ROTC	54.4	66.0
OTS	31.3	18.1
AECP	6.5	6.4
Other	2.6	11.9

*A&G is the Ashbaugh and Godfrey survey, and CS is the current research.

Demographic Variable Category	Survey A&G	 CS
Regular Commission		
Yes	25.2%	28.7%
No	74.4	71.3
No Response	.4	.....
Grade		
Second Lieutenant	27.4	27.5
First Lieutenant	24.3	39.2
Captain	43.5	25.7
Major	4.8	7.5
Base		
Grand Forks	13.9	12.1
Ellsworth	20.4	20.0
F. E. Warren	14.8	22.6
Minot	16.5	17.4
Whiteman	19.6	12.8
Malmstrom	14.8	15.1

NOTE: Reference 1:123-124, 126.

APPENDIX E

MANN-WHITNEY RANK SUM TEST COMPUTER PROGRAM

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010C MANN-WHITNEY RANK SUM TEST PROGRAM WITH
020C CORRECTION FOR TIES
030 DIMENSION OLD(5),NEW(5),RANGE(5),W(5),RANK(5),
040&ARANK(5),PRANK(5),TI(5)
050 PRINT,"ENTER THE OLD SAMPLE SIZE"
060 READ,N2
070 PRINT,"ENTER THE NEW SAMPLE SIZE"
080 READ,N1
090 EW=(.5*N2)*(N1+N2+1)
110 N=N1+N2
120 CVR=1.645
130 CVT=-1.96
140 50 PRINT,"ENTER THE OLD VALUES"
150 READ,OLD(1),OLD(2),OLD(3),OLD(4),OLD(5)
160 IF(OLD(1).GE.999)GO TO 200
170 PRINT,"ENTER THE NEW VALUES"
180 READ,NEW(1),NEW(2),NEW(3),NEW(4),NEW(5)
190 ST=0
200 DO 2 I=1,5
210 TI(I)=((OLD(I)+NEW(I))**3-(OLD(I)+NEW(I)))*(1.0/12)
220 ST=ST+TI(I)
230 2 CONTINUE
240 V=N1*N2
250 Q=N*(N-1)
260 X=V/Q
270 YY=(((N**3)-N)/12)
280 Y=YY-ST
290 Z=X*Y
300 SD=SQRT(Z)
310 RANGE(0)=0
320 PRANK(0)=0
330 RANK(0)=0
340 DO 10 I=1,5
350 RANGE(I)=OLD(I)+NEW(I)+RANGE(I-1)
360 PRANK(I)=(RANGE(I)*(RANGE(I)+1))/2
370 RANK(I)=PRANK(I)-PRANK(I-1)
380 ARANK(I)=RANK(I)/(OLD(I)+NEW(I))
390 10 CONTINUE
400 SW=0
410 DO 20 I=1,5
420 W(I)=ARANK(I)*OLD(I)
430 SW=SW+W(I)
440 20 CONTINUE
450 ZW=(SW-EW)/SD
460 IF(ZW.GE.0)GO TO 98
470 PRINT," "
480 PRINT,"MOVEMENT IS NOT"
490 PRINT,"IN THE PREDICTED DIRECTION"
```

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500 PRINT,"WITH A TWO TAILED TEST"
510 PRINT,"AT THE .05 ALPHA LEVEL"
520 IF(ZW.LT.CVT)GO TO 96
530 PRINT,"THE MOVEMENT IS NOT"
540 PRINT,"STATISTICALLY SIGNIFICANT"
550 GO TO 55
560 96 PRINT,"THE MOVEMENT IS"
570 PRINT,"STATISTICALLY SIGNIFICANT"
580 GO TO 55
590 98 PRINT," "
600 PRINT,"MOVEMENT IS IN THE PREDICTED DIRECTION"
610 IF(ZW.GT.CVR)GO TO 99
620 PRINT,"MOVEMENT IS NOT STATISTICALLY SIGNIFICANT"
630 PRINT,"AT THE .05 ALPHA LEVEL"
640 GO TO 55
650 99 PRINT,"MOVEMENT IS STATISTICALLY SIGNIFICANT"
660 PRINT,"AT THE .05 ALPHA LEVEL"
670 55 IF(ZW.GE.0)GO TO 105
680 PRINT 101,CVT
690 GO TO 110
700 105 PRINT 101,CVR
710 110 PRINT 100,ZW
720 GO TO 50
730 200 STOP
740 100 FORMAT (1X,"THE COMPUTED Z VALUE IS      ",
750&F7.3,////)
760 101 FORMAT (/,1X,"THE CRITICAL Z VALUE IS      ",
770&F7.3,/)
780 END
```

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