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DETERMINING THE EFFECTS OF THE ALL-VOL-
UNTEER SERVICE UPON THE ENLISTED LOGISTICS
CAREER FIELDS

Edward Berberek, Jr., et al

Air Force Institute of Technology
Wright-Patterson AFB, Ohio

20 September 1972

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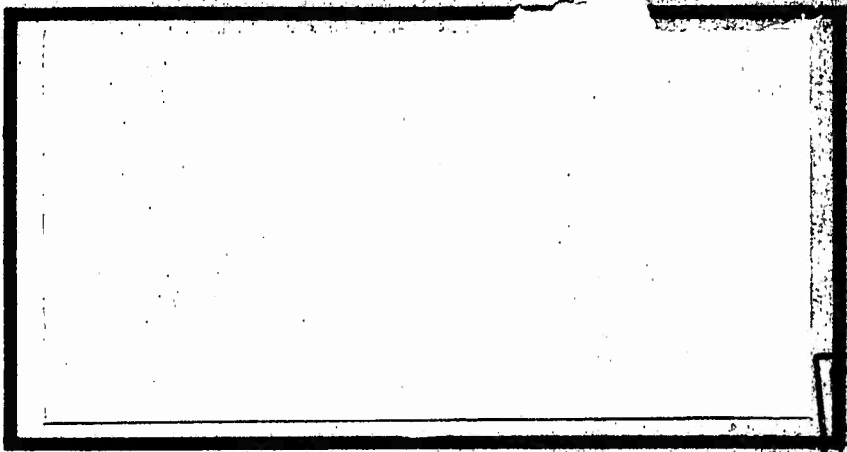
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<p>The proposed end to the draft in June, 1973, may result in the lowering, in terms of Airman Quailfying Examination (AQE) scores, of the quality of the entrants into the Air Force. The decrease in quality has been primarily attributed to the loss of those who have been under draft pressure and who have traditionally scored better on their AQE tests. There have been many studies and much written concerning the type of recruit that could be expected under the all-volunteer armed service. An analysis was made to determine if the quality of recruits in the logistics career fields will go down as some previous studies indicate. Those under no draft pressure will not now "reluctantly volunteer" to enter the Air Force. The mean AQE score for the replacements of those not now "reluctantly volunteering" was calculated.</p> <p>KEY WORDS: Logistics Career Fields All-Volunteer Draft Free</p>			

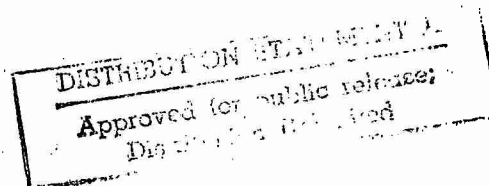
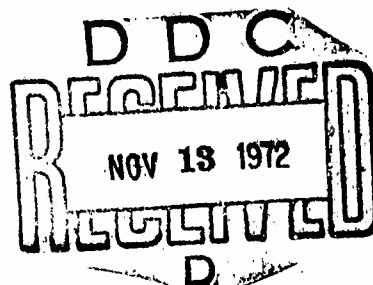
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Edward Berberek Jr., B.S. Captain, USAF
Harvey P. Weber II, B.S. Captain, USAF

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A Thesis

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
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In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Logistics Management

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September 1972

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Alan J. Goldstein

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Chapter 1

Introduction

Problem Statement

With zero draft targeted for mid-1973, and competition for volunteer recruits from other services, it may become a problem for the Air Force to attract the people it needs and desires. Even though the USAF has not had to use the draft, it will nevertheless be affected. A large number of recruits in recent years have been motivated to enlist as a means of avoiding the draft. Without the pressure of the draft, such enlistments will disappear and the profile of new recruits will change. This change will no doubt have an impact on the quality of people entering the logistics career fields. As an aid to future planning this study investigates what changes can be expected in the recruits who will be entering the logistics career fields.

Background

The principle of military service obligation has been passed from generation to generation. Prehistoric men flocked together in common defense and tribes were formed from which all able-bodied men were called upon to fight

an enemy.¹

In the United States the principle of military service obligation goes back to early colonial days. Washington was one of the first advocates of compulsory military service. He proposed something very close to the universal and compulsory, but part-time, military service of the "Swiss System."

. . . It may be laid down as a primary position and a basis of our system, that every citizen who enjoys the protection of a free government, owes not only a proportion of his property, but even of his personal services to the defense of it . . . and that the total strength of this country might be called forth at a short notice on any very interesting emergency.²

Washington's desires were fulfilled by the Militia Act of 1792, which stated in part: "Every free and able-bodied, white, male citizen of the respective states between 18 and 45 should, with certain minor exemptions, be enrolled in the militia by the captain of the company within whose bounds such citizens shall reside." In addition to calling out the

¹William Howells, Back of History (New York: Doubleday, 1954), pp. 6-8.

²Walter Millis, Arms and Men (New York: G. P. Putman's Sons, 1956), p. 44.

state militias, the act also authorized the President to raise six-month, volunteer "levies" directly by national authority.³

With this power officially embedded in the Constitution by the Militia Act of 1792, the next significant development came about with the advent of the Korean War. The Universal Military Training and Service Act of 1951 authorized the non-voluntary procurement of men for military service.

. . . The Congress hereby declares that an adequate armed strength must be achieved and maintained to insure the security of this nation. The Congress further declares that in a free society the obligation and privileges of serving in the armed forces and the reserve components thereof should be shared generally, in accordance with a system of selection which is fair and just, and which is consistent with maintenance of an effective national economy . . .⁴

The Selective Service System, which was altered in 1969 to include the use of a lottery, is based on the aforementioned act. During times of national emergency, conscription has been generally accepted; however, public opinion has never

³ Ibid., pp. 51-52.

⁴ U. S. Selective Service System, Annual Report of the Director of Selective Service for the Fiscal Year 1952 (Washington, D. C.: Government Printing Office, 1953), p. 2.

tolerated peacetime conscription.⁵ The need for additional manpower to support this country's policy in Southeast Asia has provided a great deal of attention to the manpower procurement system. The recurrent controversy over whether men should be drafted to fight and perhaps die in battle has brought to light many critical views about the present system.

All-volunteer armed force. On April 23, 1970, President Nixon sent a message to Congress which will have a severe impact on the military manpower procurement system of this country. The message stated:

The draft has been with us now for many years. It was started as a temporary, emergency measure just before World War II. We have lived with the draft so long and relied on it through such serious crises that too many of us now accept it as a normal part of American life.

It is now time to embrace a new approach to meeting our military manpower requirements. I have two basic approaches:

The first deals with the fundamental way this nation should raise the armed force necessary to defend the lives and rights of the people and to fulfill commitments abroad.

⁵ Samuel H. Hays, "Defense Manpower: The Management of Military Conscription", National Security Management (Washington, D. C.: Government Printing Office, 1952), p. 2.

The second deals with reforming the present recruitment system--part volunteer, part drafted--which in the immediate future will be needed to maintain an armed strength . . .⁶

The President further supported the basic conclusion reached by the Commission on an All-Volunteer Armed Force headed by former Defense Secretary Thomas S. Gates. The President stated, "After careful consideration of the factors involved, I support the basic conclusions of the Commission. I agree that we shall move toward ending the draft now."⁷

The size and quality of manpower is a critical variable in meeting military force level requirements. The maintaining of an efficient force in view of the extensive fluctuation in military strength has and does place a stress on our military manpower procurement system. The Gates Commission Report indicated this wide fluctuation and provided several force level plans for meeting future requirements.⁸

⁶ Richard M. Nixon, "The Nixon Plan for Ending the Draft", U. S. News and World Report, LXVIII (May 4, 1970), p. 25.

⁷ Ibid.

⁸ The Report of the President's Commission on an All-Volunteer Force (Washington, D. C.: Government Printing Office, 1970), p. 33.

The large draft calls of early 1966, which placed students in a vulnerable position, aroused some of the more vocal and outspoken segments of our society and stimulated a public debate over the inequities and problems surrounding the Selective Service System. On July 1, 1966, President Johnson appointed a commission to study the problem of Selective Service.⁹ Recommendations from the commission were formulated into changes with the final result being the adoption of the lottery in 1969. However, the controversy did not end and the more recent result has been the move toward an all-volunteer force.

Today, we find ourselves in a position of preeminent world power during a period of rapid and accelerating technological and social changes. These conditions directly influence the type and size of forces we must maintain. While the basic requirement of the fighting man for endurance, emotional and physical stamina, leadership, courage and practicality are still in demand, they alone are no longer sufficient to cope with the technical weaponry and complicated techniques.¹⁰

⁹Sol Tax, The Draft (Chicago: University of Chicago Press, 1967) p. vii

¹⁰Hays, pp. 1-3

Air Force recruiting system. The United States Air Force's ability to attract sufficient recruits while maintaining the quality necessary to fulfill its assigned missions is of particular interest because draft calls are being sharply reduced and will be eliminated altogether by mid-1973.

The United States Air Force has always had an excess supply of volunteers from which to draw, and has had little difficulty recruiting the airmen it needs in any period.¹¹ It has not participated in the draft in the last two decades, and its recruiting problems and techniques differ from those of the other services. The draft, and the pressure on youths resulting from the specific form of the draft, however, has affected Air Force recruiting techniques, although it has still been relatively easy to obtain the quality and quantity of recruits desired.¹²

In obtaining its recruits in any one year, the Air Force

¹¹A. A. Cook, Jr. & J. P. White, Estimating the Quality of Air Force Volunteers (Santa Monica, Calif: Rand Corp., September, 1970), p. 1. (The Air Force failed to meet its quota in one quarter of fiscal year 1961 and in two quarters of fiscal year 1965.)

¹²Ibid.

uses a quota system. The quotas vary from month to month to better adjust to the available supply, which is correlated with high school graduation, and they also vary geographically to take account of regional variations in population. Although the quotas are generally specified in terms of the total number of recruits desired, a certain number of men with specific capabilities are sought. But, if these capabilities cannot be found explicitly, the next best men are accepted. Near the end of a fiscal year all positions, heretofore unfilled, are filled with whatever volunteers are available.¹³

Lt. General Dixon, Deputy Chief of Staff USAF Personnel, has indicated that it may become a problem for the Air Force to attract the people it needs and desires. He hopes that the Air Force--through pay raises, invigorated recruiting, better housing, and other features designed to make the Air Force more attractive to live and work in--will provide increased incentive for high-quality future enlistments as well as improvement in the first-term reenlistment rate.¹⁴

¹³ Cook, p. 5.

¹⁴ Robert J. Dixon, Lt. Gen. "Air Force Prepares for Zero Draft" Armed Forces Journal (Dec. 21, 1970), p. 28.

The recruiting program received a significant boost in FY 1972. The Department of Defense presentation to the Stennis Committee, February 2, 1971, called for:

A very considerable step-up in recruiting--not only in the number, quality, and pay of recruiting duty personnel, as well as "coverage" throughout the Nation, but in the budget appropriations for media usage, especially for television advertising on a "for pay" rather than a "public service" basis.¹⁵

This step-up in the recruiting effort and more particularly in the monetary backing has had a significant and beneficial effect on the total recruitment effort. This effect will be discussed in detail in latter chapters of this study. Of significant import to mention at this time is that personnel in the Air Force recruiting system now feel that they have a "real product" to sell to prospective enlistees.¹⁶ Thus, we have the situation that Air Force is taking definite steps toward the objective of making the Air Force a more desirable and attractive service,

¹⁵An Analysis of Problems Associated with the Establishment of an All-Volunteer (Zero Draft) Force for the United States (Washington, D. C.: Assistant Chief of Staff, Studies & Analysis, HQ USAF, Dec. 1, 1971) p. 15

¹⁶Flannery, MSgt., NCOIC, Dayton Air Force Recruiting Station, March 10, 1972.

with the ultimate goal of being in an advantageous position when we switch to an all-volunteer atmosphere. However, the basic question arises that if the United States switches to an all-volunteer force, will the Air Force be able to meet its manpower requirements--specifically for our study within the logistics career fields--with recruits of adequate quality?

Quality of enlistees. To be accepted for enlistment, a prospective volunteer must achieve a minimum score both on a service-wide selection test and on at least one of the aptitude indexes derived from the Airmen Qualifying Examination (AQE). Finally, to be assigned to technical training, the enlistees must achieve at least a minimum score on the pertinent aptitude index for that particular technical course, a score which may be even higher than the minimum score required for initial enlistments.¹⁷

For high-skill technical courses, it is ideal for specific entry requirements to be known and men selected on the possession of these requirements. Clearly, if a

¹⁷ Nancy Guinn, Ernest C. Tupes, & William W. Alley, Cultural Subgroup Differences in the Relationships Between Air Force Aptitude Composites and Training Criteria (Lackland AFB, Texas: Air Force Human Resources Lab., Sept., 1970) p. 3.

course requires 12th grade mathematics, it is impractical to put someone into the course who does not have these skills or knowledge. However, it is probable that those individuals possessing low Armed Forces Qualification Test (AFQT) and AQE scores could learn to do the mathematics although they don't possess such skill or knowledge at the time of entry into the service. A key question is whether the Air Force is going to invest the time, effort, and expense to get these men up to an acceptable entry level.¹⁸ This question, of course, hinges on the necessity of accepting lower AFQT/AQE enlistees. The area of quality of future enlistees will be discussed in-depth in latter chapters of this study.

Scope of the Study.

The scope of this paper has been limited to the logistics career field AFSCs. Eight blocks of AFSCs were selected to study the impact of the all-volunteer force on the quality of the enlistees anticipated to be inducted.

¹⁸ Howard H. McFann, Progress Report on HUMRRO Research On Project 100,000 (George Washington University: Human Resources Research Office, July, 1961) p. 17.

in the future. It was felt that an analysis of this range of AFSCs would give a meaningful representation of the overall impact on the logistics fields.

Table 1

Table of AFSCs used for Study

<u>AFSC</u>	<u>Air Force Specialty</u>
30XXX	Communications/Electronics
31XXX	Missile Electronics
32XXX	Avionics Systems
42XXX	Aircraft Accessories
43XXX	Aircraft Maintenance
46XXX	Munitions Maintenance
47XXX	Vehicle Maintenance
64XXX	Supply

Objectives

There are two primary objectives that this study has accomplished:

1. Determined what effect the all-volunteer armed force, in terms of AQE scores, will have on the quality of future enlistees entering into the logistics career fields.

2. Examined what effect the relatively draft-free-pressure period of January through March, 1972, had on the profile of enlistees entering the Air Force during that period.

Hypotheses.

The following hypotheses were tested so as to meet the objectives of this study:

1. The quality of the future enlistees entering into the logistics career fields will be lower than those presently entering these career fields.
2. The quality of enlistees entering the Air Force during the relatively draft-free-pressure period of January through March, 1972, supports the data presented in a 1970 United States Air Force study entitled Saber Volunteer and therefore supports the predictions made by the first hypothesis.

Investigative Procedures.

Nature and Sources of Data. The data used in this study was entirely secondary in nature. It had been collected by other individuals or agencies for use in studies relating to the all-volunteer armed force. Four sources of data were used in this thesis. The first was a study

by Bart M. Vitola from the Air Force Human Resources Laboratory. Mr. Vitola's study concerned itself with the prime enlistment reasons and background data on self-motivated and draft-motivated enlistees. The second source was an extension of Mr. Vitola's study. It was a seven volume study called Saber Volunteer. The study was performed during 1971 and it used data from 1970 accessions. It was monitored by Major General Glenn A. Kent from the Office of the United States Air Force, Assistant Chief of Staff, Studies and Analysis. Saber Volunteer was an in-depth analysis of problems associated with the establishment of an all-volunteer armed force. The data was presented in table form with two tables for each set of data. The first type of table displayed the number and the mean AQE scores of males in the age groups of 17, 18, 19, 20, 21, and 22. (See Table 2 for an example) The second type of table gave the number of "true" and "reluctant" volunteers and the AQE means for the "true" and "reluctant" volunteers in the age groups of 19½, 20, 21, and 22. (See Table 3 for an example) The two types of tables in the Saber Volunteer study were given for males in AFSCs requiring AQE minimums of 40, 50, 60, 70, and 80 in the categories of General,

Administrative, Mechanical, and Electronics. As a result, there were five times four, or 20 sets of data with each set containing the two types of tables just described. The third source of data was approximately 800 pages of computer printouts prepared by Squadron Leader J. Fugill from the Human Resources Laboratory, Lackland Air Force Base, Texas. These printouts consisted of Armed Forces Qualification Test (AFQT) scores and AQE scores for airman accessions in AFSCs 202X0 through 982X0 during the years 1966 through 1970. Table 4 is an example of how the AQE scores were presented in the computer printouts. The fourth data source was the AQE scores of males that took the battery of AQE tests during the months of January, February, and March, 1972, in the state of Ohio. The scores included are only those where the individual obtained at least one score of 40 or greater from among the four AQE categories. Those individuals who score below 40 in all of the AQE categories are not considered at all for entry into the Air Force and therefore were not applicable to this study. The data was available from the Ohio Recruiting Center in Columbus, Ohio.

Table 2 ¹⁹

ITEM	AGE					
	17	18	19	20	21	22
NUMBER OF MALES	43	1798	3583	3040	967	405
MEAN AQE SCORES	56.16	57.17	57.34	59.70	61.79	66.12
REQUIRED AQE SCORE	40.00	40.00	40.00	40.00	40.00	40.00

This table is an example of how the first part of the Saber Volunteer data was presented. This example shows the number and mean AQE scores of male enlistees, by age, in AFSCs requiring an AQE minimum of 40 in the General category (Data is for 1970 only).

¹⁹1970 Lottery Data for the Male Population of Enlisted Accessions of the Air Force (17-22 year olds) Assigned an Air Force Specialty Code (AFSC) Requiring an Airman Qualifying Examination (AQE) Percentile of 40, 50, 60, 70, and 80 to be Achieved in the Aptitude Categories of General, Administrative, Mechanical and Electronics (Saber Volunteer Volume II), Major General Glenn A. Kent, monitor (Washington, D. C. : Government Printing Office, 1 October 1971), p. 8a.

Table 3²⁰

ITEM	AGE				
	17 thru 19	19½	20	21	22
NUMBER OF "TRUE" VOLUNTEERS	No data given	1314	1542	381	102
NUMBER OF "RELUCTANT" VOLUNTEERS	No data given	687	1498	586	303
TOTAL NUMBER	No data given	2028	3040	967	405
MEAN AQE SCORES OF "TRUE" VOLUNTEERS	No data given	54.66	57.56	59.53	57.35
MEAN AQE SCORES OF "RELUCTANT" VOLUNTEERS	No data given	57.26	61.90	63.27	69.00
REQUIRED AQE SCORE	-----	40.00	40.00	40.00	40.00

This table is an example of how the second part of the Saber Volunteer data was presented. This example shows the number and mean AQE scores of male enlistees, by age and volunteer type, in AFSCs requiring an AQE minimum of 40 in the General category (Data is for 1970 only). No data was given for 17-19 year olds since the 1970 lottery, drawn on 1 December 1969, provided no lottery numbers for the 17, 18, and 19 year old males.

²⁰Ibid., p. 27a.

Table 4²¹

233X2 Motion Picture Laboratory Specialist

General

AQE Index	Number	Percent
95	13	4.19
90	5	1.61
85	18	5.81
80	10	3.23
75	14	4.52
70	24	7.74
65	27	8.71
60	28	9.03
55	33	10.65
50	43	13.87
45	46	14.84
40	49	15.81
01	0	0.00
Total	310	100.00

MEAN 58.629
STD DEV 15.698

This table shows how the AQE data on each AFSC in the Fugill preparation was presented. This table shows only one AQE category. In the actual data, all AQE categories (General, Administrative, Mechanical, and Electronics) were shown for each AFSC. The data is from 1966 through 1970.

²¹Squadron Leader J. Fugill, "Airman Qualifications-Aptitude, AFQT, Education-for-Enlistees from 1 January 1966 to 31 December 1970," Work Unit Number - 773402003 (Lackland AFB, Texas, June 22, 1971), p. 31.

Chapter 2

Determining the Quality of Future Enlistees into the Logistics Career Fields

Introduction

This chapter deals with the testing of the first hypothesis. The hypothesis states that the quality of the future enlistees entering into logistics career fields will be lower than those presently enlisting. The major portion of the data analysis for the hypothesis involved the computer printouts prepared by Squadron Leader Fugill (hereafter these printouts will simply be referred to as Fugill) and the Saber Volunteer study. The analysis involved the comparison of the Fugill data, which was from high draft pressure years, with the Saber Volunteer data, which reflected the number of "true" and "reluctant" volunteers. A part of the analysis consisted of manipulating the data so the two sets of data could be compared. The manipulation was required, in spite of the fact that the two sets of data had the same objective of showing mean AQE scores, because the mean AQE scores were displayed using different parameters. In the Saber Volunteer data the means were compared against age groups. The Fugill data had the means computed by AFSC. These parameter differences

can be seen by referring back to and comparing Tables 2, 3, and 4.

Data Analysis

Assumptions. The analysis of the first hypothesis required three assumptions:

1. Even though the Saber Volunteer data and the Fugill data statistically differed in means for the same AQE minimums; AQE means with a difference less than five points were considered to be comparable.

2. The Saber Volunteer data, in terms of "true" and "reluctant" volunteer percentages, was representative of the "true" and "reluctant" volunteer percentages for AFSCs in the Fugill data when the Fugill AFSC had the same AQE minimum as the Saber Volunteer data.

3. The Saber Volunteer data, in terms of age groups, was representative of the age groups for AFSCs in the Fugill data when the Fugill AFSC had the same AQE requirements as the Saber Volunteer data.

Methodology. The comparisons that were made in testing the first hypothesis stated that if the mean AQE scores of the projected inputs, the "true" volunteers from Saber

Volunteer, were lower than the mean AQE scores of the present inputs, the Fugill data, then the quality of the future enlistees would be lower. The Saber Volunteer data provided the "true" volunteer proportions for only the 19½, 20, 21, and 22 year old age groups. This was done since the 17 - 19.49 year olds did not receive lottery numbers and therefore were technically under no draft pressure.²² The mean of this 17 - 19.49 year old group had to be removed from the Fugill AFSC under consideration. This adjustment of the Fugill AFSC mean allowed the authors to say, in conjunction with the assumptions made previously, that the adjusted mean represented the status that would have been expected if there had been a lottery during the years 1966 - 1970 accompanying the draft pressure that was present during those years. The removal of the 17 - 19.49 year group mean from the Fugill data made it comparable with the Saber Volunteer data, since both now contained the same age groups. If the reader desires to further investigate this adjustment process, the detailed formulas, and an explanation of these formulas, can be found in Appendix 1.

²²Saber Volunteer, Vol. II, p. 27A.

As stated previously, the testing of the first hypothesis required that the projected inputs be compared with the present inputs. If the mean AQE score for the "true" volunteers was more than two points below the adjusted Fugill mean, then the hypothesis was accepted. The case where the future projections would be higher in mean AQE score than the present would indicate that the AFSC should have no problems insofar as quality of inputs is concerned. It should be noted that since the two sets of data were statistically different and technically could not be compared, the limit value of two used in the hypothesis testing comparison was arbitrarily chosen by the authors as being a reasonable value.

Results

Fifteen logistics AFSCs were found to be comparable in accordance with the first assumption. These fifteen AFSCs then had the procedural calculations performed on them to remove the mean of the 17 - 19.49 year group so as to make them comparable to the Saber Volunteer data. Table 5 shows the AFSCs, the AQE category and minimum score required for entrance into the AFSC (A. I. requirement),

Table 5

AFSC	Nomenclature	A. I. Rqmt.	Original Means		Adjusted Means		Mean Dif.	Accept Hypoth.
			Saber	Fugill	Tru-Vol	Fugill		
300X0	Communicat/ Elect. Hlpr	E80	89.11	87.87	88.29	87.60	+0.69	No
301X5	Acft Sensor Repairman	E80	89.11	90.17	88.29	90.75	-2.46	Yes
316X0	Missile Sys Analyst	E80	89.11	90.77	88.29	91.57	-3.28	Yes
316X1	Missile Guid & Control	E80	89.11	91.19	88.29	92.14	-3.85	Yes
324X0	Prec. Meas. Equip. Spec.	E80	89.11	91.78	88.29	92.25	-3.96	Yes
325X0	Autopilot	E80	89.11	89.56	88.29	89.92	-1.63	No
325X1	Instrument Specialist	E80	89.11	89.67	88.29	90.07	-1.78	No
422X1	Acft Environ Sys Rpmn	M40	54.40	59.40	56.33	67.05	-10.72	Yes
422X2	Acft Egress Repairman	M50	65.29	67.05	64.00	68.30	-4.30	Yes
424X0	Inflight Refuel Spec	M40	54.40	56.43	56.33	61.77	-5.44	Yes
430X1	Aircraft Maintenance	M40	54.40	58.59	56.33	65.13	-8.80	Yes
432X0	Jet Engine Mechanic	M40	54.40	58.20	56.33	64.53	-8.20	Yes
463X0	Nuclear Wpns Specialist	E80	89.11	91.38	88.29	92.40	-4.11	Yes
471X3	Motor Vehicl Body Rpmn	M40	54.40	50.04	56.33	51.83	+5.50	No
647X0	Material	A60	58.83	55.97	56.44	54.74	+2.70	No

Table 5 shows the results of the testing of the first hypothesis. Indicated are the original Saber Volunteer and Fugill means that were initially compared. Also shown are the "true" volunteer and adjusted Fugill means which were compared to determine if the hypothesis should be accepted. The table includes the difference between the latter two means and the acceptance or non-acceptance of the hypothesis.

KEY: (A. I. Rqmt.)
 E - Electronics
 M - Mechanical
 A - Administrative

the original Saber Volunteer mean and the original Fugill mean of the AFSC that were compared, the "true" volunteer mean from Saber Volunteer, the adjusted mean of the Fugill AFSC, the difference in these latter two means and the acceptance or rejection of the hypothesis. Ten of the fifteen AFSCs accepted the hypothesis. This was a 66.67 per cent acceptance rate. Therefore, it was concluded that, in general, we could expect that the logistics career fields will have lower quality enlistees in the future.

Discussion

The Saber Volunteer data was set up showing the number in the "true" and "reluctant" volunteer categories. The term "true" volunteer refers to those who freely choose to enter military life without regard to the possibility of being drafted. The term "reluctant" volunteer refers to those who perceive a strong likelihood of being drafted and therefore volunteer so as to get the service of their choice. The Saber Volunteer study, by stating the data in the context of the two terms just described, implies that a certain percentage of those who actually enlisted in the Air Force in 1970 would not have entered the military at

all, if there had been no draft pressure. Table 6 illustrates the proportion of "true" and "reluctant" volunteers and their respective means as presented in the Saber Volunteer study. If the "true" volunteer proportions presented in the Saber Volunteer study are representative of what is to come in the future then the following statement can be made. Given that the Air Force manpower levels remain the same, the Saber Volunteer study says that there will be major shortages of personnel in most AFSCs. If this is in fact the case, then two closely related questions are brought forth. How do we adjust for the lowering in quality? From where do we get the "missing" people? An attempt to answer these questions brings forth several considerations.

The first consideration might be called the "rob Peter to pay Paul" approach. This approach says that if you have an AFSC which requires a minimum of 80 in the Electronics category, then in order to bring the AFSC mean and the number required in the AFSC back up to what might be called "pre-all-volunteer" levels, you will have to take people who have at least an 80 in Electronics from other AFSCs. To give the reader an idea of how the "rob Peter to pay Paul" approach would work, the following example is presented.

Table 6

AQE Category Minimum	True Volunteer Prop.	True Volunteer Mean	Reluctant Volunteer Prop.	Reluctant Volunteer Mean
G40	.521	56.64	.479	61.83
G60	.391	73.87	.609	77.77
G80	.342	88.30	.658	89.02
A40	.519	53.70	.481	60.96
A50	.481	53.10	.519	55.16
A60	.525	57.34	.475	66.47
A70	.750	70.00	.250	70.00
A80	.331	87.69	.669	88.57
E40	.526	60.74	.474	68.71
E50	.501	59.25	.499	65.86
E80	.415	88.29	.585	90.00
M40	.482	56.33	.518	60.73
M50	.497	64.00	.503	66.56
M60	.393	67.28	.607	70.83

Table 6 shows the proportions of "true" and "reluctant" volunteers and their respective means for those males which entered AFSCs which required the indicated AQE category/score minimum. Data was taken from Saber Volunteer study conducted during 1970. Note, that with the exception of A70, all "true" volunteer means are lower than the "reluctant" volunteer means.

Table 7 presents a picture of the expected number that would be left in the logistics career fields considered in the testing of the first hypothesis, if the "reluctant" volunteers were removed. For purposes of this discussion the 300X0 AFSC was selected as the AFSC that needed to have the missing people replaced first. As can be seen from Table 7, of the 31,906 that entered the 300X0 AFSC from 1966 through 1970, only 13,341 would have been expected to enlist under an all-volunteer atmosphere. The AFSC required an Electronics AQE category minimum score of 80. Referring back to Table 6, one can see that E80 has a "true" volunteer proportion of .415. Since the "true" volunteer proportion of .415 means that only 13,341 would have voluntarily enlisted, then $31,906 - 13,341 = 18,665$ would be missing as "reluctant" volunteers. Thus, 18,665 individuals would have required replacements from some other AFSC(s) which has people in it with minimum scores of 80 in the Electronics category.

Several AFSCs were selected from the Fugill data. In each AFSC selected only those scoring 80 or above in Electronics were considered. Each AFSC had its own share of "true" volunteers removed. Table 8 shows the AQE

Table 7

28.

AFSC	A. I. Rqmt.	Total In AFSC	Number "true" Volunteer	Number "reluctant" Volunteer
301X5	E80	265	155	110
300X0	E80	31,906	13,341	18,665
316X0	E80	417	244	173
316X1	E80	67	39	28
324X0	E80	700	409	291
325X0	E80	2,579	1,509	1,070
325X1	E80	1,076	629	447
422X1	M40	2,439	1,263	1,176
422X2	M50	1,203	605	598
424X0	M40	1,939	1,004	935
430X1	M40	8,007	4,148	3,852
432X0	M40	8,572	4,440	4,132
463X0	E80	982	574	408
471X3	M40	181	94	87
647X0	A60	9,694	4,643	5,051

Table 7 shows the number that would be expected to remain in the AFSCs that were used to test the first hypothesis. Also indicated are the number of "reluctant" volunteers. A. I. is the Aptitude Index which states the AQE category and the minimum score required in the category to enter the AFSC. Data was taken from the Saber Volunteer and Fugill studies.

category/minimum score criteria of the sample AFSCs and the number in each who scored 80 or above in Electronics. The AFSCs used are not important. Suffice to say, that two AFSCs were selected for each category/minimum score classification and the AFSCs were not from logistics career fields. Also, none of the AFSCs selected required scores in Electronics for eligibility. Table 8 indicates how many individuals would have been available and qualified from the sample AFSCs for entrance into AFSCs that required an 80 or above in Electronics. There were ten sample AFSCs selected. The ten AFSCs had a combined total of 13,017 individuals eligible for entrance into AFSCs requiring 80 or above in an AQE category of Electronics. The 300X0 AFSC that needed the replacements required a total of 18,665 people. Thus, one can see that even considering ten other AFSCs as possible manpower pools to fill AFSC 300X0, the 300X0 AFSC still remained with 5,648 empty positions. One can quickly see the potential problems that would soon start to arise under this "rob Peter to pay Paul" approach. The 300X0 AFSC still needed replacements and the other AFSCs used in testing the first hypothesis still required a combined total of 2,527 replacements

Table 8

Category/ Minimum	Total	Nr. Qual. 80 Elect.	% Qual. 80 Elect.
G40	640	200	31
G60	259	115	44
G80	3,224	3,218	99
A40	1,005	115	11
A50	1,432	202	14
A60	9,062	2,075	23
A80	1,621	1,197	74
M40	2,812	386	14
M50	17,834	2,524	14
M60	7,999	2,984	37
	Total	13,017	

Table 8 shows the number of individuals qualified in selected AFSCs for the AFSC which requires 80 in Electronics. The category/minimum indicates the area from which the AFSCs were selected. All the selected AFSCs were from outside the logistics career fields. Data was obtained from the Fugill computer printouts.

to fill the slots that they had empty as a result of the loss of "reluctant" volunteers. The proverbial merry-go-round starts when one begins to realize that the AFSCs which acted as the manpower pool in this example would eventually need their share of replacements, both to fill the "reluctant" volunteer slots and the slots that were created as a result of stealing people from them to fill other AFSCs. It can be seen that, given the present requirements for each particular AFSC and the projection of the Saber Volunteer study, there exists the distinct possibility that the pool of available personnel for entrance into the Air Force will be badly depleted.

An additional consideration would be to take only those enlistees who obtained above 80 in Electronics but were assigned to AFSCs which required minimums of less than 80. This is certainly a feasible alternative, but it does have some drawbacks. The obvious result is the lowering of the AFSC means within the AQE category under consideration. In other words, the AFSCs within these respective AQE categories would tend to bottom-out or seek their minimum requirement level. The most drastic change in means would take place in those AFSCs having AQE minimums of 40 or 50.

The percentage of enlistees who are qualified for higher requirement AFSCs but who are assigned to lower AQE requirement AFSCs would drop off significantly. The end result would be that the Air Force would be compelled to accept more recruits that only meet the minimum AQE requirements of 40, or possibly even some below our present standards. As an example, in 1970 there were 9,836 enlistees assigned to AFSCs requiring an AQE minimum score of 40 in the General category. The mean AQE score for these recruits was 58.83 which is significantly above the minimum requirement of 40. In order to sustain the required number in each AFSC with a high AQE score requirement, it would mean that the mean AQE score within the AFSC that requires only 40 would drop very close to its minimum of 40.

The following illustration will perhaps show the results of this consideration. A sample of AFSCs was taken from the General category (Fugill data) and had the Saber Volunteer "true" and "reluctant" volunteer proportions applied to them with the following results: The Saber Volunteer study provided the following data for AFSCs requiring 80 General:

1805 were placed in these AFSCs
887 were "true" volunteers
918 were therefore "reluctant" volunteers

To replace the 918 "reluctant" volunteers, 918 "true" volunteers would be needed from AFSCs requiring only 60 or 40 in the General category. The Saber Volunteer study also indicated that, during 1970, the following applied for AFSCs requiring 60 General:

5676 were placed in these AFSCs
2449 were "reluctant" volunteers
 3227 were therefore "true" volunteers.

A sample of two AFSCs that required 60 General were taken from the Fugill data and each had the following proportion of individuals eligible for entrance into an AFSC requiring 80 General:

AFSC	Number scoring 80, 85, 90, 95	Total in AFSC
221XO	240	508
<u>222XO</u>	<u>96</u>	<u>155</u>
Total	336	663

$336/663 = 0.51$ proportion eligible for entry into AFSCs requiring 80 General

Multiplying the proportion, 0.51, by the number of "true" volunteers that were in AFSCs requiring 60 General (3,227) there was found to be 1,646 individuals who were in AFSCs requiring 60 General but were eligible to enter AFSCs requiring 80 General. If 918 of these 1,646 were placed in the 80 General AFSC, there would only be $3,227 - 918 = 2,309$

individuals left in AFSCs requiring 60 General. The total manning requirement in AFSCs requiring 60 General would be 5,676. This assumes, of course, that the manpower requirement for the AFSCs would remain the same. Therefore, these AFSCs would be short $5,676 - 2,309 = 3,367$ people. These 3,367 individuals would have to be "true" volunteers obtained from AFSCs that require a minimum of 40 in the General category. The Saber Volunteer study provided the following data on AFSCs requiring a minimum of 40 General:

9836 were placed in these AFSCs
3074 were "reluctant" volunteers
 6762 were therefore "true" volunteers

A sample of AFSCs that required 40 General were taken from the Fugill data and the following proportions were found for those in these AFSCs who were eligible to enter an AFSC requiring 60 General:

AFSC	Number scoring 60, 65, 70, 75	Number scoring 80 and above	Total in AFSC
223X0	112	138	303
<u>223X1</u>	<u>416</u>	<u>359</u>	<u>923</u>
Total	528	497	1226

$(528 + 497)/1226 = 0.84$ proportion eligible for entry into AFSCs requiring 60 General

Multiplying the proportion, 0.84, by the number of "true" volunteers, 6,762, that were in AFSCs requiring 40 General

there were found to be 5,680 "true" volunteers who were assigned to AFSCs requiring 40 General that were eligible to enter AFSCs that required 60 General. As noted previously, the 60 General AFSCs were determined to be 3,367 individuals short of their manning requirements. These shortages would be replaced from the 5,680 that were determined to be eligible in the 40 General AFSCs. The 40 General AFSCs would be left with $6,762 - 3,367 = 3,395$ people who could be considered "true" volunteers. The 40 General AFSCs manning requirement was 9,836. Thus, the 40 General AFSCs would be missing a total of $9,836 - 3,395 = 6,441$ people.

Thus, it can be seen from the illustration that it would be possible to replace the missing "reluctant" volunteers with eligible individuals from AFSCs with lower requirements. The end result would be that AFSCs requiring 40 General would have to pick up 6,441 individuals who were not previously accepted into the Air Force for 40 General AFSCs.

The examples that were used to clarify both of the considerations were not intended to be rigorous mathematical or statistical proofs. Both examples were presented for the sole purpose of illustrating the considerations and their

respective applications to the replacement of the "reluctant" volunteers who would be missing under an all-volunteer atmosphere. Both considerations add to a conclusion that was reached in a study by Valentine and Vitola:

. . . under an all-volunteer force, there may be difficulty in recruiting adequate numbers of young men for input into some of the jobs with high aptitude requirements. It may be necessary to revise minimum aptitude requirements for some technical courses, to modify training curricula for instruction of lower aptitude personnel, and to redefine certain jobs.²³

The reader can well appreciate the ramifications that these types of considerations involve. Several questions were brought immediately to mind which would require answers prior to embarking on these types of considerations. Do we want to bring all the highest of those eligible up to the next AFSC level or do we want to bring up some ratio? Do we want to steal from other AFSCs outside the AQE category? Is the manipulation of the personnel worth the disenchantment that it might ultimately create? If we do undertake a plan

²³Lonnie D. Valentine, Jr. and Bart M. Vitola; Comparison of Self Motivated Air Force Enlistees with Draft Motivated Enlistees, July, 1970 (Personnel Research Division, Air Force Human Resources Laboratory, Air Force Systems Command: Lackland Air Force Base, Texas), p. 17

akin to the two considerations, how do we change our present recruiting policy? This last question is probably the first that would require answering. The present recruiting system tries to encourage enlistments by offering the potential applicant his choice of jobs. There are approximately 400 AFSCs within the total Air Force. Of these there are about 96 that the enlistee is guaranteed if he wants the field and is eligible. A large portion of these 96 guaranteed AFSCs are within the logistics career fields.²⁴ This means that in many cases the individuals would either not be available for transfer out of a specific AFSC or would not be available for transfer out of an AQE category. This results in a reduction of the available personnel that could be "shuffled" and adds further substance to the conclusion of Valentine and Vitola.

²⁴ Capt. Randall C. Herr in an interview at the Ohio Regional Recruiting Detachment Headquarters, July 12, 1972.

Chapter 3

Determination of Current Status

Introduction

This chapter concerns itself with the testing of the second hypothesis. The second hypothesis was that the present quality of Air Force enlistees does support the conclusions of the first hypothesis. The conclusion of the first hypothesis was that the all-volunteer atmosphere would result in a lowering in the quality of enlistees entering into the logistics career fields.

All AFSCs have, what might be called, a certain AQE category. For example, entrance into the 325X0, Autopilot, AFSC requires a minimum score of 80 in the Electronics AQE category. An individual entering Aircraft Maintenance would require a minimum of 40 in the Mechanical AQE category. In this manner, AFSCs can be classified into the AQE categories of General, Administrative, Mechanical or Electronics. The analysis of the second hypothesis involved determining the means of the Fugill enlistees who entered AFSCs classified in one particular AQE category and comparing them to the Ohio enlistee scores from January through

March, 1972, who entered AFSCs classified under the same AQE category.²⁵

Data Analysis

Assumptions. The analysis of the second hypothesis required the following assumptions:

1. Due to the absence of draft calls during the months of January, February and March, 1972, these three months were as close to being free of draft pressure as possible. Therefore, for the purposes of this thesis, these three months were, with some qualifications, considered to be the best representation of a "draft free" atmosphere that could be found during the time frame within which this thesis was being written.

2. A study performed in 1966 by Tupes, Valentine and Vitola indicated that the state of Ohio, for the year

²⁵It should be noted that the time that an individual tests and the time he enters the Air Force are usually about three months apart. The data on the Ohio enlistees from January through March 1972, and the references to it, are made with the understanding that even though they probably entered during the April through June cycle, they voluntarily tested during the months of January through March and therefore were subject to assumption 1 in the Data Analysis section.

1965, was close to the national mean in all AQE categories.²⁶ Pages 41, 42, and 43 illustrate the finding of the aforementioned study. Because the prime source of data for the second hypothesis was from Ohio, the assumption was made that, for 1972, the state of Ohio remained close to the national mean in each AQE category.

Methodology. The analytic procedure consisted of performing statistical hypothesis testing to determine if there were significant differences between the Fugill mean of the enlistees entering into AFSCs with a specific AQE classification and the Ohio mean of the enlistees entering into AFSCs with the same AQE classification. The formulas used were the Z statistic formulas used in statistical hypothesis testing when the assumption is made that the population follows a normal distribution. The hypothesis testing was performed using an alpha level of 0.01. If the probability of the calculated Z values, for each

²⁶Ernest C. Tupes, Lonnie D. Valentine, and Bart M. Vitola, Aptitude and Educational Data for Air Force Enlistees, 1962 through 1965 (Lackland Air Force Base, Texas: Personnel Research Laboratory, Aerospace Medical Division, Air Force Systems Command, August 1967), p. 9.

The following two pages illustrate the findings of the 1965 Vitola study. The graphs show the comparison of the region of enlistment, on the horizontal axis, to the AQE category mean, on the vertical axis. The listing below is the key to the identification of the region of enlistment.

<u>REGION</u>	<u>STATES INCLUDED WITHIN THE REGION</u>
0	Alaska, Hawaii, Puerto Rico, Canal Zone.
1	Maine, New Hampshire, Rhode Island, Massachusetts, Connecticut, Vermont.
2	New York, New Jersey.
3	Delaware, Pennsylvania, Maryland, Virginia, West Virginia
4	Alabama, Florida, North Carolina, South Carolina, Tennessee, Georgia, Mississippi.
5	Kentucky, Ohio.
6	Illinois, Indiana, Michigan, Wisconsin.
7	Colorado, Iowa, Kansas, North Dakota, South Dakota, Minnesota, Missouri, Nebraska, Wyoming.
8	Arkansas, New Mexico, Louisiana, Texas, Oklahoma.
9	Arizona, California, Idaho, Utah, Montana, Nevada, Oregon, Washington.

Figure 1

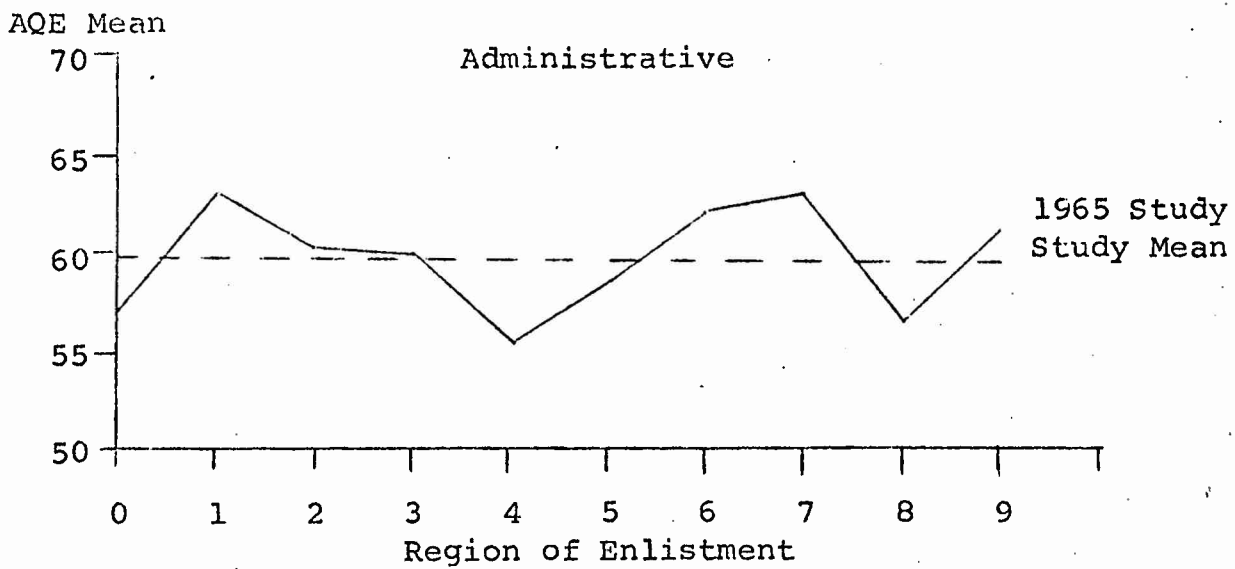


Figure 1 shows the plot of the mean AQE scores, by national region of enlistment, for 1965 and the overall mean for the study for the Administrative AQE category.²⁷

Figure 2

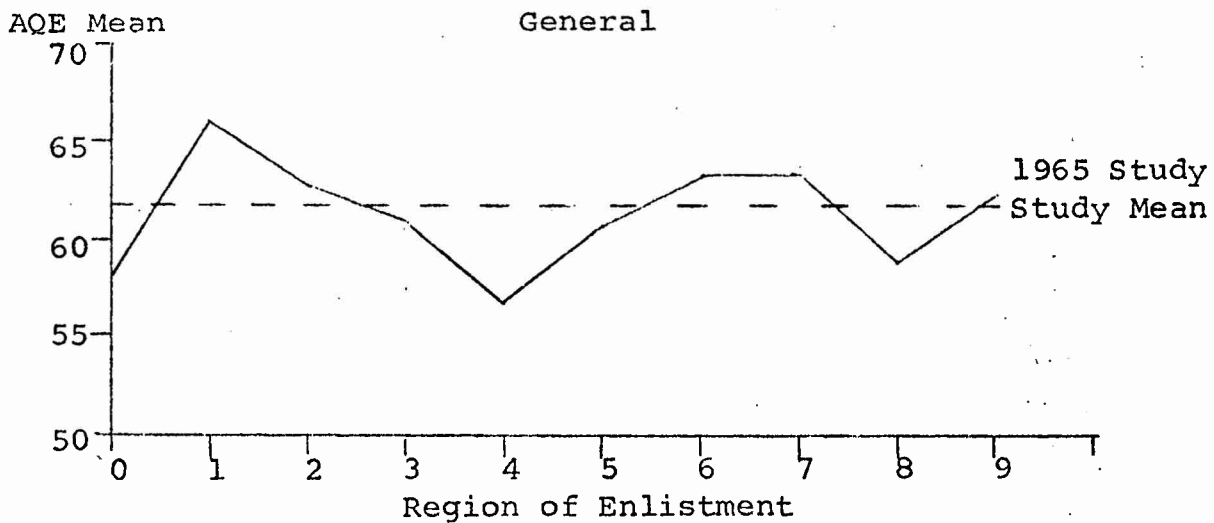


Figure 2 shows the plot of the mean AQE scores, by national region of enlistment, for 1965 and the overall mean for the study for the General AQE category.²⁷

²⁷ Ibid.

Figure 3

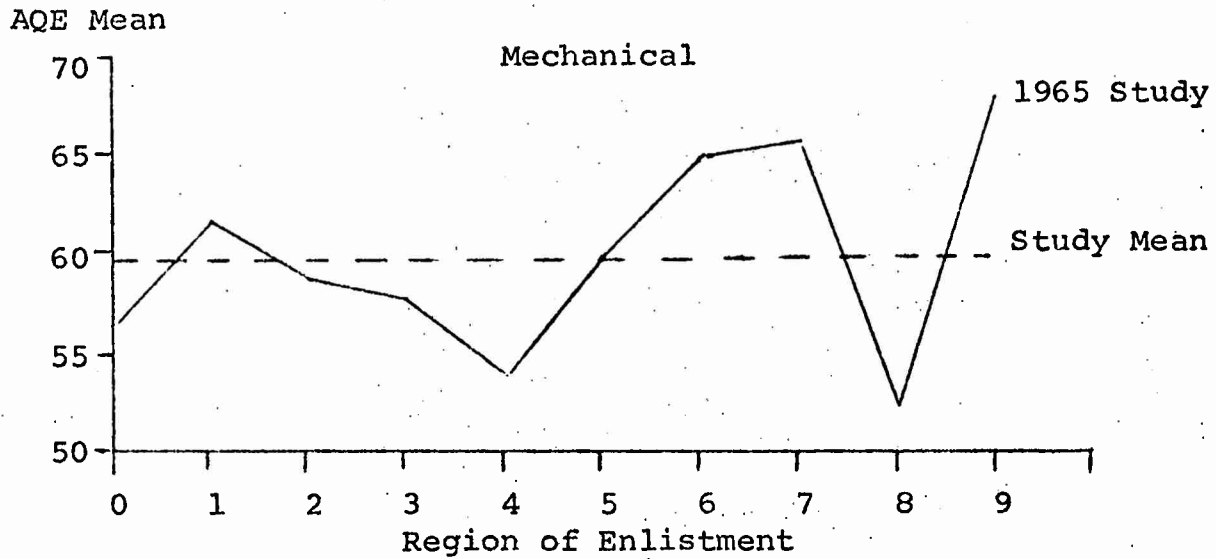


Figure 3 shows the plot of the mean AQE scores, by national region of enlistment, for 1965 and the over-all mean for the study for the Mechanical AQE category.²⁸

Figure 4

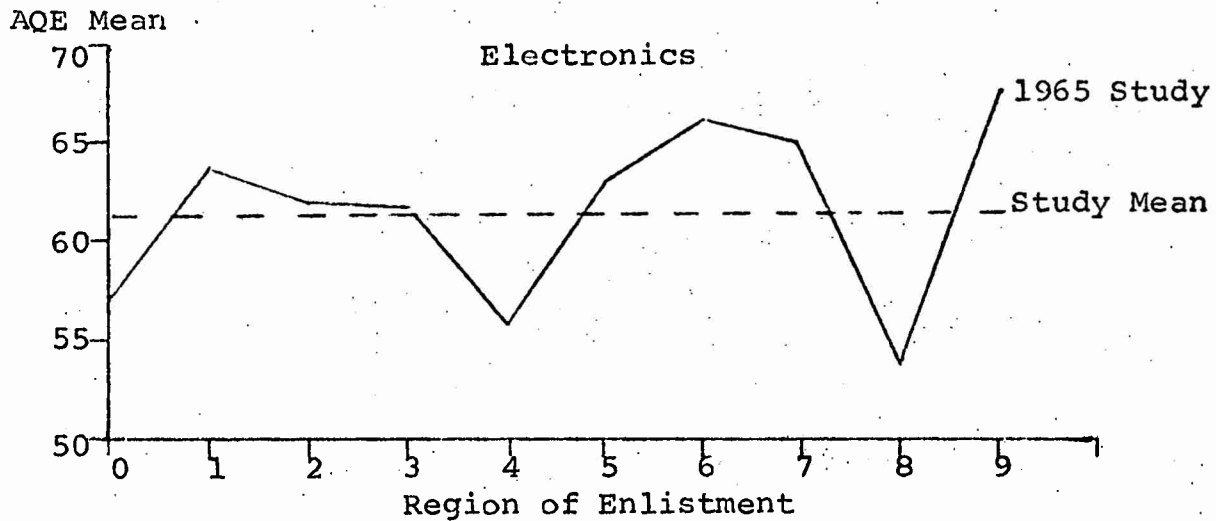


Figure 4 shows the plot of the mean AQE scores, by national region of enlistment, for 1965 and the over-all mean for the study for the Electronics AQE category.²⁸

²⁸ Ibid.

AQE category under consideration, was less than 0.01 then the hypothesis was accepted that the conclusion of the first hypothesis was supported by the quality of the present enlistees. The Z value probabilities were determined through the use of the Normal Probability Function Tables contained in the 19th edition of the Chemical Rubber Company Tables (CRC). The interested reader can find the Z statistic formulas in Appendix 2.

Results

The hypothesis was tested for each of the four AQE categories. The data and results for the Administrative category were:

Fugill Population Mean = 67.86

Fugill Standard Deviation = 13.24

Ohio Sample Mean = 63.93

Ohio Sample Size = 117

Alpha Level = 0.01

The calculated Z value was 3.22. The probability of this value occurring was 0.0006. Since 0.0006 was less than the alpha level of 0.01, there was a significant difference between the Fugill Administrative mean and the Ohio Admini-

strative mean. Therefore, the hypothesis was accepted for the Administrative AQE category.

The data and results for the Electronic category were:

Fugill Population Mean = 85.57

Fugill Standard Deviation = 7.38

Ohio Sample Mean = 83.36

Ohio Sample Size = 149

Alpha Level = 0.01

The calculated Z value was 3.68. The probability of the value occurring was 0.0001. Since 0.0001 was less than the alpha level of 0.01, there was a significant difference between the Fugill Electronic mean and the Ohio Electronic mean. Therefore, the hypothesis was accepted for the Electronics AQE category.

The data and results for the General AQE category were:

Fugill Population Mean = 68.45

Fugill Standard Deviation = 12.66

Ohio Sample Mean = 62.96

Ohio Sample Size = 164

Alpha Level = 0.01

The calculated Z value was 5.55. The probability of this value occurring was 0.0000. Since 0.0000 was less than 0.01, there was a significant difference between the Fugill General mean and the Ohio General mean. Therefore, the hypothesis was accepted for the General category.

The data and results for the Mechanical AQE category were:

Fugill Population Mean = 61.66

Fugill Standard Deviation = 14.57

Ohio Sample Mean = 61.27

Ohio Sample Size = 224

Alpha Level = 0.01

The calculated Z value was 0.40. The probability of this value occurring was 0.3446. Since 0.3446 was greater than the alpha level of 0.01, there was not a significant difference between the Fugill Mechanical mean and the Ohio Mechanical mean. Therefore, the hypothesis was not accepted.

Three out of the four tests accepted the hypothesis. Thus, it was concluded that, with the exception of the Mechanical category, the conclusion of the first hypothesis was supported by the quality of present enlistees.

If the reader desires a detailed breakout of the calculations involved in the performance of the four tests, they can be found in Appendix 2.

Discussion

The graphs on pages 48, 49, 50 and 51 show the cumulative percentage comparisons of the Fugill data and the Ohio data. An analysis of the graphs for the Administrative, Electronics and General categories show that, most of the time, the Ohio percentages were below the Fugill data percentages. The very evident differences between the cumulative percentages seem to confirm that under the all-volunteer atmosphere there will be a significant loss of those individuals who might be called "above average". The area where the Ohio percentages were above the Fugill percentages were predominately in the 40 to 50 score range. This would seem to indicate that what has been predicted is also coming to pass. That is, we can already see a procurement of people from lower quality manpower pools who have not been previously accepted into the Air Force.

The case is somewhat different in the Mechanical category. This graph does not show the same trends as

Figure 5

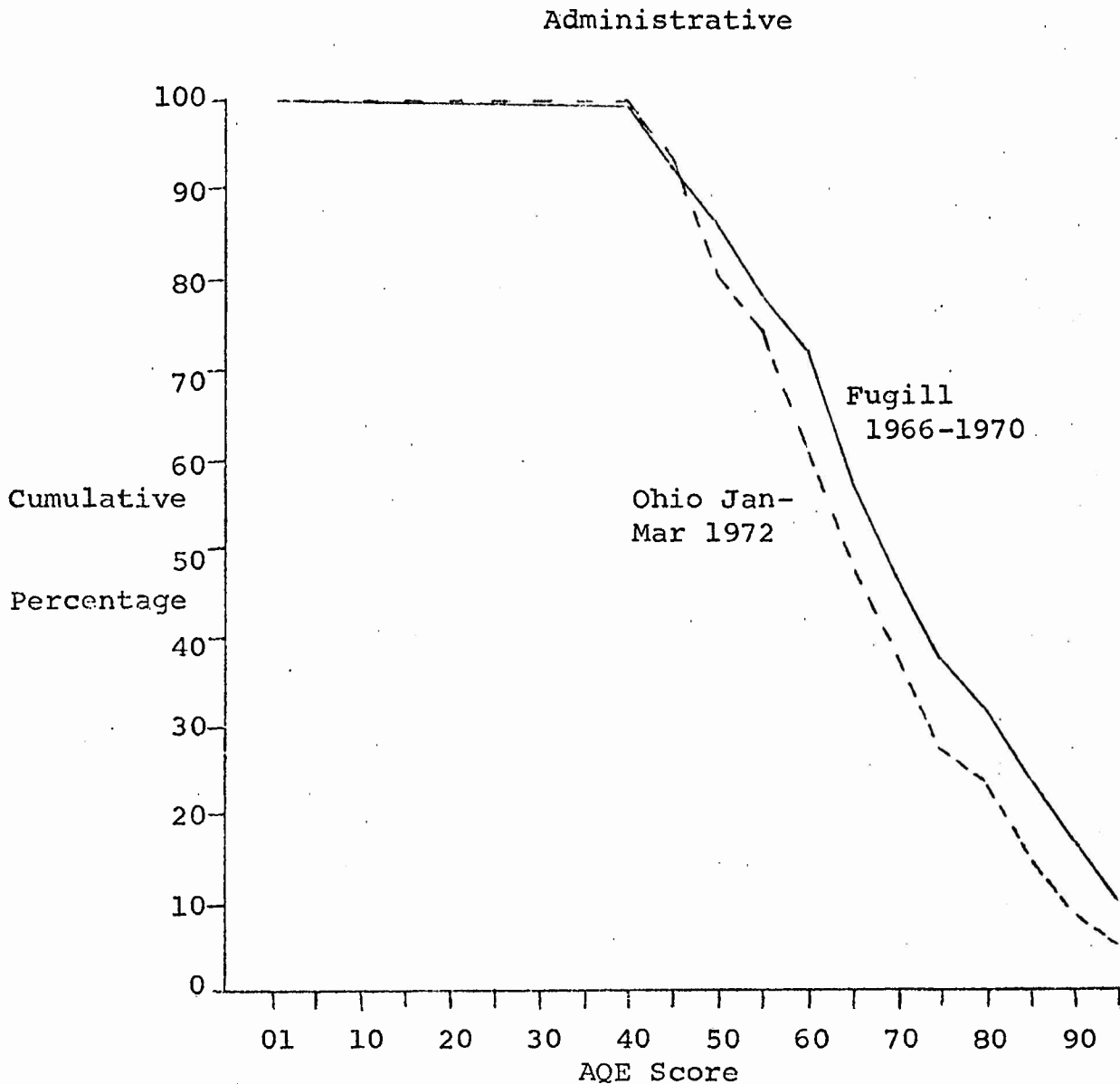


Figure 5 shows the cumulative percentage comparisons for the Fugill data (1966-1970) and the Ohio data (Jan-Mar 1972). The graph reflects the percent of individuals who scored above a specific score on the Administrative AQE test. All individuals entered AFSCs in the Administrative category. For example, 48.72 percent scored 65 and above in Ohio from Jan-Mar 1972.

Figure 6

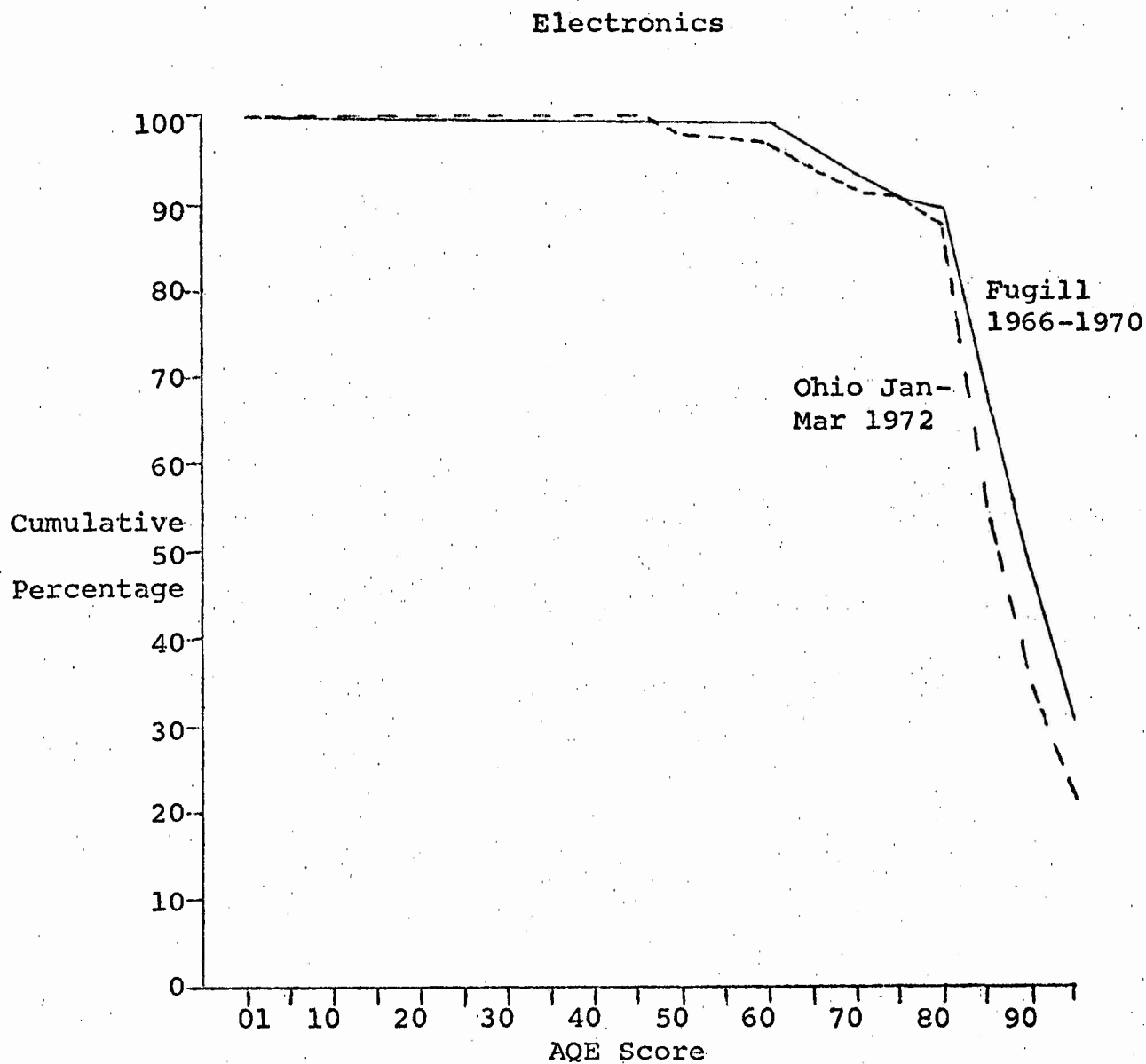


Figure 6 shows the cumulative percentage comparisons for the Fugill data (1966-1970) and the Ohio data (Jan-Mar 1972). The graph reflects the percent of individuals who scored above a specific score on the Electronics AQE test. All individuals entered AFSCs in the Electronics category. For example, 55.03 percent scored 85 and above in Ohio from Jan-Mar 1972.

Figure 7

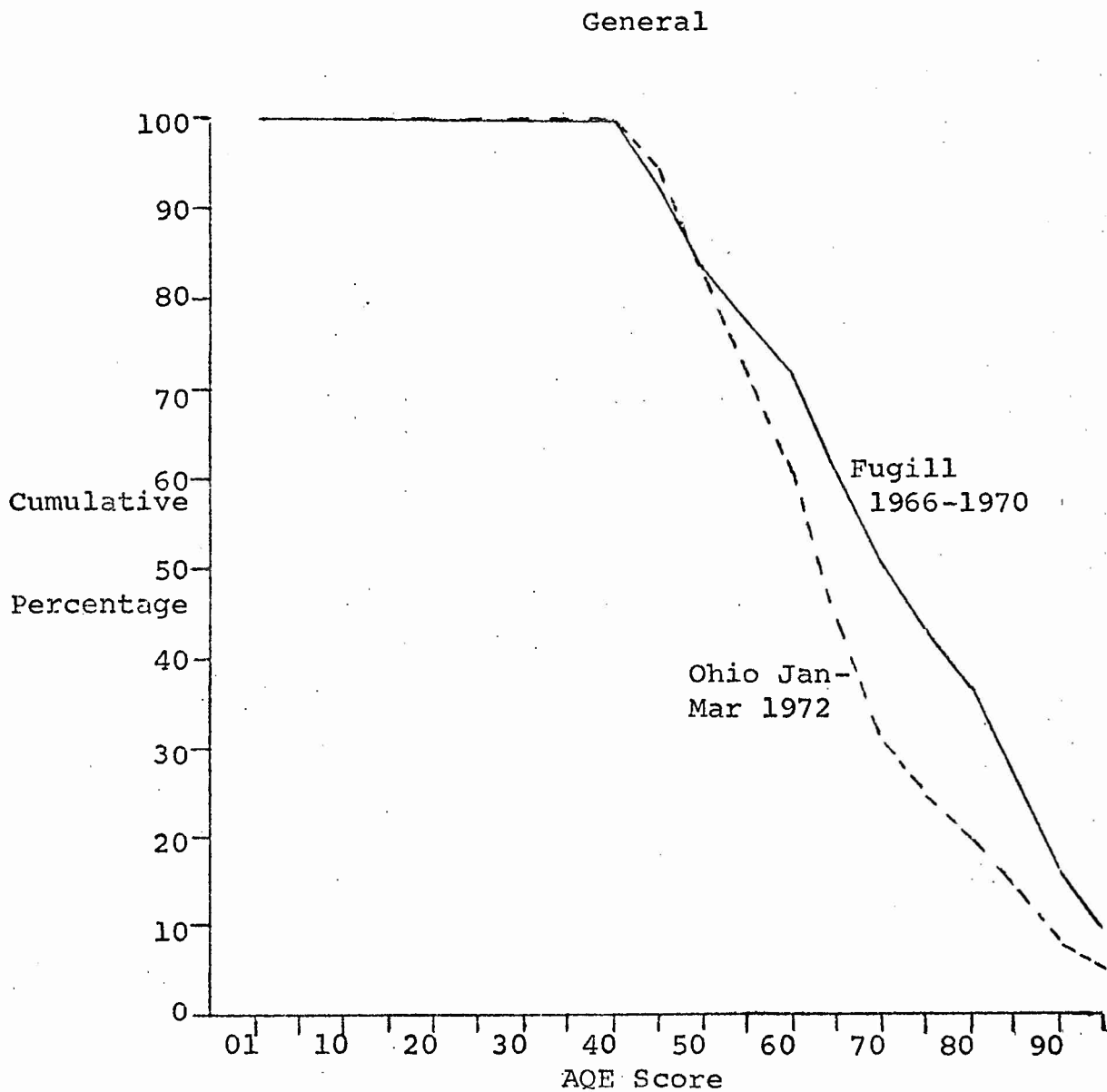


Figure 7 shows the cumulative percentage comparisons for the Fugill data (1966-1970) and the Ohio data (Jan-Mar 1972). The graph reflects the percent of individuals who scored above a specific score on the General AQE test. All individuals entered AFSCs in the General category. For example, 25.01 percent scored 75 and above in Ohio from Jan-Mar 1972.

Figure 8

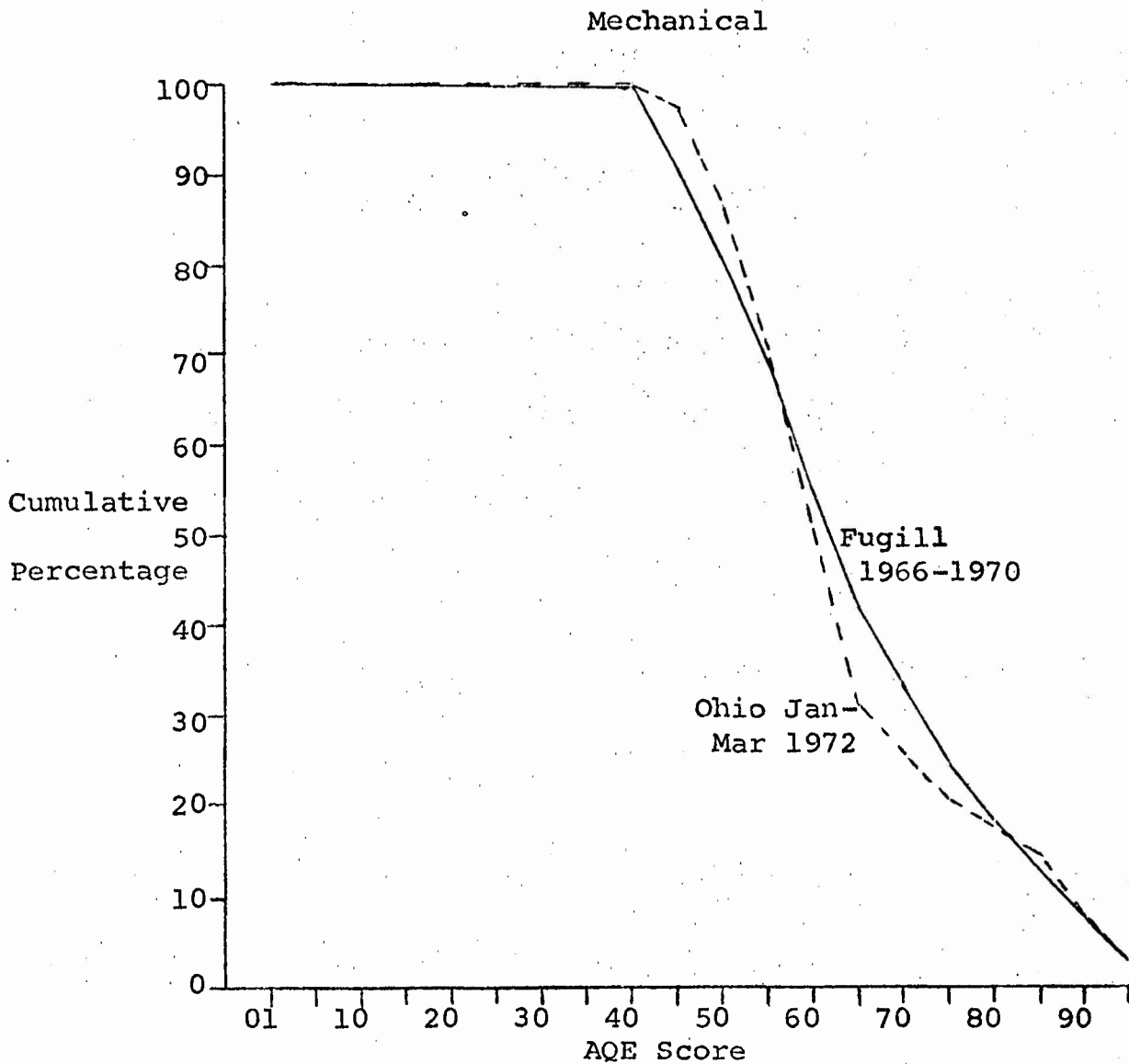


Figure 8 shows the cumulative percentage comparisons for the Fugill data (1966-1970) and the Ohio data (Jan-Mar 1972). The graph reflects the percent of individuals who scored above a specific score on the Mechanical AQE test. All individuals entered AFSCs in the Mechanical category. For example, 50.89 percent scored 60 and above in Ohio from Jan-Mar 1972.

the other three categories. That is, the Ohio percentages do not run below the Fugill percentages with any consistency. Instead, the two sets of data cross at about the 55 score and then again at about the 80 score. The reasons as to why the deviation in the percentage trend in the Mechanical category would for the most part be speculation and beyond the scope of this thesis. One might question the validity of the Mechanical sample in that it was not representative of the Ohio enlistees entering into Mechanical oriented AFSCs. This is entirely possible; however, it should be noted that the sampling procedure for the Mechanical category was the same as that used for the other AQE categories. Also, one must keep in mind that the total number of individuals from the four Ohio AQE categories was 654, while 806 were enlisted from Ohio during the months of April through June, 1972. This accounts for 77.4 percent of the total enlistments for Ohio during the April to June cycle. Thus, it was possible to say that the sample from Ohio was very close to approaching the population of the Ohio enlistees during the period.

It was stated back in Chapter 2 that the Saber Vol-

unteer study, by dividing the data into "true" and "reluctant" volunteers, implied that, under a completely draft free atmosphere, there would be a substantial reduction in the number of individuals who applied for entry into the Air Force. Is this implication still valid? The answer to that question can be found by looking at the recruitment data for Ohio. If one accepts the earlier assumption that January through March, 1972, was as close to being draft free as possible, it can be generally said that we are doing satisfactorily. Even though Ohio might be considered a sample of one and therefore might not be very conclusive, the following can be offered as tentative proof. For the cycle of April through June, 1972, the Ohio recruiters had quotas totaling 559 people. For the same period, the recruiters enlisted 806 individuals. A sample taken at Peoria, Illinois also tends to bear out the conclusion that we are, at present, having no problems in recruiting the required number of men in an atmosphere that is becoming more and more draft free. While specific numbers were not obtained from the recruiter in Peoria, he stated that he had met all his quotas. However, he did anticipate some problems in recruiting enough personnel

as June, 1973, approached.²⁹ The tentative evidence, that the implication made by Saber Volunteer might not be valid, raises yet another question. What is the reason for the influx of people to replace the "reluctant" volunteers?

There are many factors that must be considered when answering this question. The unemployment situation and the recruiters were considered, by the authors, as being two of the more important factors and worthy of some brief discussion. It is the feeling, of not only the authors but also of the recruiters that were interviewed, that the unemployment situation has a great effect upon the number of applicants that come to the Air Force. If the employment situation is poor then, there will be more applicants to the armed services. These applicants would be those who do not have definite feelings against the military services and would join not out of a sense of duty to their country, but rather out of a sense of duty to insure that there was food on the table for the family. It is specu-

²⁹An interview with TSgt Robert Lehr, Peoria, Illinois Air Force Recruiting Office, June 22, 1972.

lated that those with strong anti-military feelings would probably not join the military for any reason. Looking at Ohio, with respect to the unemployment rate, it is generally acknowledged that Ohio is a relatively industrial state. Also, it is acknowledged that Ohio has its problems with unemployment as do many other parts of the country. Therefore, there is the distinct possibility that the unemployment rate within Ohio has a direct effect upon the fact that Ohio recruited 247 more people than was required. Once the economic situation takes a turn for the better, there can be expected to be fewer applicants to the Air Force. The big problem that faces the Air Force, as well as the other military services, is how to sustain the inflow of applicants even in a state of low unemployment.

It is acknowledged by the authors that the preceding discussion of the unemployment factor was extremely simplified in view of the complexity of the subject. An in-depth discussion was not the purpose of this thesis but will be suggested in the conclusion chapter as a possible subject for further research. The second factor to be discussed concerning the apparent satisfactory filling of recruitment

quotas is that of the recruiters and the recruiting policies. The recruiter's ability to do his job is a direct outcome of the information and policies with which he has to work. If given the proper tools, the recruiter can possibly counteract the low inflow of applicants during times of high employment. In the last year or so there have been some policy changes that give the recruiters some added power in the performance of their jobs. The new policy of stressing that the applicant will be guaranteed a job in certain areas, if he is qualified, is intended to counteract the idea that, once having signed on the dotted line, the enlistee is at the mercy of the Air Force as far as his placement into a job is concerned. The selection of a job by an enlistee, and the ability of the recruiter to inform the enlistee about jobs, takes on four different aspects. First, there is the enlistee who, after talking to friends in the Air Force who have been in or have knowledge about a job, knows what job he wants and is very unwilling to settle for anything else. If he is thoroughly convinced that being a cook is the best job in the Air Force, the inability of the recruiter to place him in this job or convince him that other jobs are as good or better will

probably result in the individual being lost as a potential enlistee. The second type of recruit is the individual who also knows what job he wants but can be persuaded to take another choice. The third type is the individual who does not know what he wants and can be convinced that any particular job is good. Finally, there is the individual who does not know what he wants and cannot be convinced that a particular job is good. This final individual also represents a potential loss of an enlistee if he cannot be convinced. All four areas cause the recruiter problems. The problems are caused by lack of information. The recruiting offices have a form entitled "Comparison Chart - Relating Air Force Career Fields to Civilian Jobs by Aptitude". This form lists, by AQE category, and within each category, by AQE score, the military name of a job and its related civilian job. The form deals with job titles only. There is no description of the jobs. If the applicant chooses a job from the list, and in choosing tries to relate the job to somewhat limited knowledge that he has about the related civilian job, then he runs the potential risk of being dissatisfied later on. The recruiter has

the difficult task of trying to explain to the individual what each job consists of. In many cases, the recruiter has a hard time in describing the job. This is not to say that the recruiter is at fault. This means that the recruiters must be given current and relevant information on each one of the AFSCs that the Air Force possesses. The recruiter has the responsibility of "selling" the applicant on an AFSC that needs people. The "selling" must not be of the type that puts individuals in a job just to fill quotas. It must be of the type that shows the applicant the advantages of the job. The job must be "sold" in light of satisfying the enlistee to the point that he either reenlists or passes favorable information along to friends who are potential applicants. This means that if we want recruiters to "sell" the hard to fill AFSCs, then we must re-evaluate and expand the job descriptions for recruiter use and re-evaluate the job itself so as to gain maximum job satisfaction on the part of the enlistee.

It is felt the new policy of guaranteeing jobs in certain areas has had a favorable impact upon the ability to meet, and exceed, quotas within the state of Ohio. In addition, there is the possibility that the current

economic situation within the state of Ohio might have had some effect upon the large influx of personnel. Neither factor was discussed in great detail and probably raised more questions than were answered. The purposes of presenting the discussions on recruiting policies and the unemployment rate were to make the reader more aware of some of the items that work for and against the ability of the Air Force to maintain its current manpower levels.

Thus far, this chapter has looked at the results of the hypothesis testing, the status of recruiting in terms of the number of enlistees, and two factors which might have had some possible influence upon the high number of enlistees in Ohio during April through June, 1972. Two questions remain unanswered. The first is "How did the quality of the Ohio enlistees compare to the "predicted" quality of the "true" volunteers from the Saber Volunteer study?" The second is "Can we project what type of replacements we are getting for the "reluctant" volunteers we are losing?"

A comparison of the Ohio enlistee means and the means of the "true" volunteers from the Saber Volunteer study can be found in Table 9 on the following page.

Table 9

AQE Category	Ohio Mean	"True Vol. Mean
General	62.96	63.87
Mechanical	61.27	62.01
Administrative	63.93	57.73
Electronic	83.36	74.31

Table 9 shows comparisons of the Ohio enlistee mean and the "true" volunteer mean from the Saber Volunteer study.

The table indicates some very interesting trends. One can see that in the General and Mechanical AQE categories the Ohio enlistee means are very close to being the same as the "true" volunteer mean from Saber Volunteer. In the Administrative and Electronic AQE categories the Ohio means are far above those of the "true" volunteers. The closeness of the General and Mechanical means to the "true" volunteer mean might say that the enlistee of today is not much different than the "true" volunteer enlistee of 1970. The wide differences between the Ohio and Saber Volunteer AQE means in the Administrative and Electronic categories

says that the enlistees in these areas today are of much higher quality than the "true" volunteers of 1970. Accounting for the large differences in the Administrative and Electronics means presented a difficult task. In the end, three hypotheses were put forth as possible reasons for the wide variances in the two AQE categories. First, there was the possibility that the quality of recruits pictured will not be as bad as Saber Volunteer, or many other studies, portray. This says that the absence of draft pressure will not make that much difference as to who will, or will not, voluntarily enlist. Second, there was the possibility that Ohio, in 1972, did not represent the national average in AQE mean scores. This suggests that the means during the same time period of April through June, 1972, were, for other parts of the country, close to being what was presented in the Saber Volunteer study. Finally, there was the distinct possibility that the guaranteed job at enlistment program was working as designed.

The answer to the second question of projecting the quality of the replacements for the "reluctant" volunteers was possible by the use of one assumption. That assumption was that the proportion of "true" volunteers that existed

in the Saber Volunteer time period also was present in the Ohio enlistees and they existed in the Ohio enlistees with the same mean as Saber Volunteer. Using this assumption, the calculation involved the removal from the Ohio mean a proportionate number of individuals as "true" volunteers and their respective mean. The value that remained was the mean of the "reluctant" volunteer replacements. The formula used in this calculation can be found in Appendix 3.

The General category contained the data:

"true" Volunteer Proportion = 0.458

"reluctant" Volunteer Proportion = 0.542

Number in Ohio Sample = 164

"true" Volunteer Mean = 63.87

Ohio Sample Mean = 62.96

Inserting these values into the equation in Appendix 3, the value of 62.19 was calculated. This means that the replacements for the "reluctant" volunteers in the General AQE category have a mean AQE score of 62.19. The replacement mean AQE score is 9.58 below that of the "reluctant" volunteers of Saber Volunteer.

The data for the Mechanical category was:

"true" Volunteer Proportion = 0.465

"reluctant" Volunteer Proportion = 0.535

Number in Ohio Sample = 224

"true" Volunteer Mean = 62.01

Ohio Sample Mean = 61.27

Using these values led to a mean AQE score of 60.63 for the replacements for the "reluctant" volunteers. The replacement mean is 5.41 below that of the "reluctant" volunteers of Saber Volunteer.

The data for the Administrative AQE category was:

"true" Volunteer Proportion = 0.487

"reluctant" Volunteer Proportion = 0.513

Number in Ohio Sample = 117

"true" Volunteer Mean = 57.73

Ohio Sample Mean = 63.93

These values gave a mean AQE score of 69.98 for the replacements for the "reluctant" volunteers. The replacement mean is 6.16 above the mean of the "reluctant" volunteers from Saber Volunteer.

The data for the Electronics AQE category was:

"true" Volunteer Proportion = 0.460

"reluctant" Volunteer Proportion = 0.540

Number in Ohio Sample = 149

"true" Volunteer Mean = 74.31

Ohio Sample Mean = 83.26

This data resulted in a value of 91.16 as the mean AQE score for the "reluctant" volunteer replacements. The replacement mean is 10.27 above that of the Saber Volunteer "reluctant" volunteers.

The comparison of these replacement means to the Saber Volunteer "reluctant" volunteer means can be seen in Table 10. The comparisons only further confirm the hypotheses that were presented for describing the differences between the Ohio enlistees and the Saber Volunteer "true" volunteer means.

Table 10

AQE Category	"Reluctant" Mean	Replacement Mean
General	71.17	62.19
Mechanical	63.82	69.98
Administrative	66.04	60.63
Electronic	80.89	91.16

Table 10 shows comparison of the "reluctant" volunteer means from Saber Volunteer and the calculated mean of the replacements for the "reluctant" volunteers.

In addition, the comparisons say that in the General and Mechanical categories that the replacements are of lower quality than those who were "reluctant" volunteers in 1970. Also, it can be seen that the replacements in the Administrative and Electronic categories are significantly above the Saber Volunteer "reluctant" volunteers from 1970. The graphs shown on pages 66, 67, 68, and 69 show a comparison of the means for the Fugill data, the Saber Volunteer "reluctant" volunteers, the Saber Volunteer "true" volunteers, the Ohio enlistees and the calculated means for the "reluctant" volunteer replacements.

Figure 9

General

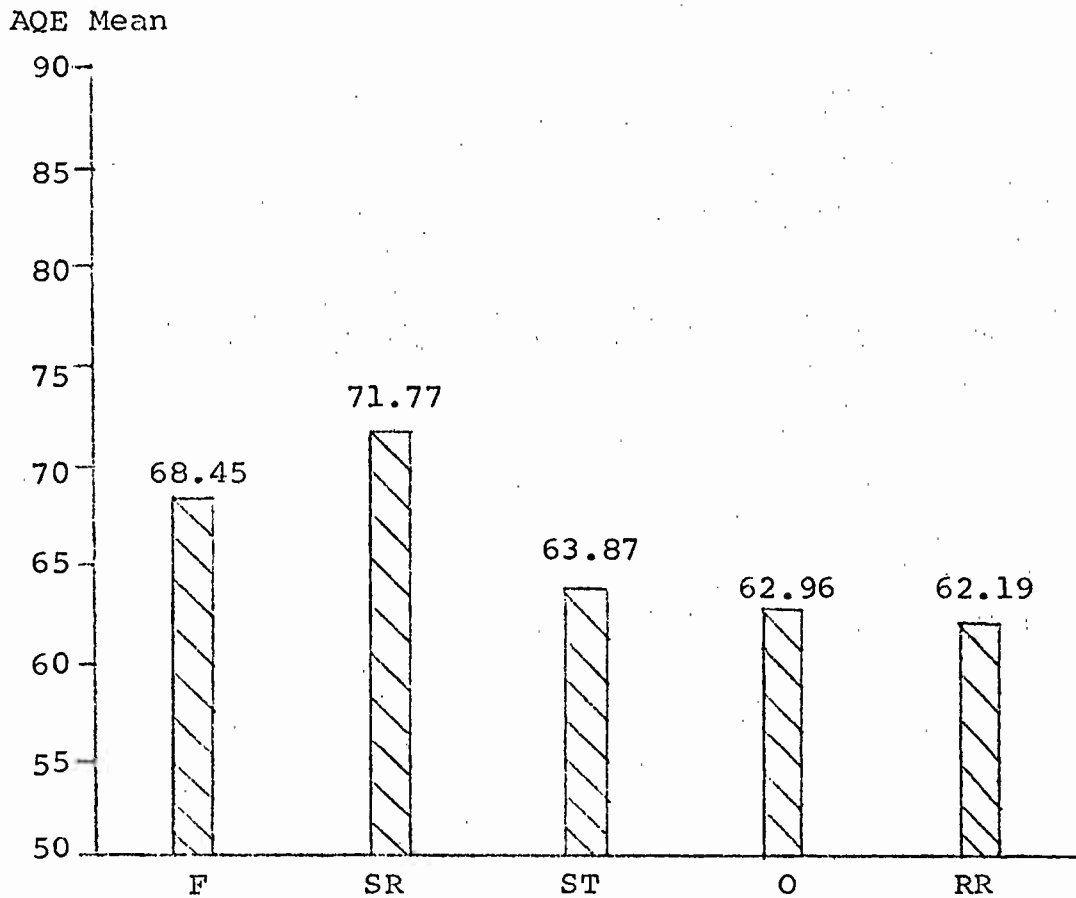


Figure 9 shows the comparison of Fugill (F), Saber Volunteer "reluctant" volunteers (SR), Saber Volunteer "true" volunteers (ST), Ohio enlistees (O), and the calculated "reluctant" volunteers replacements (RR) AQE means for the General AQE category.

Figure 10

Mechanical

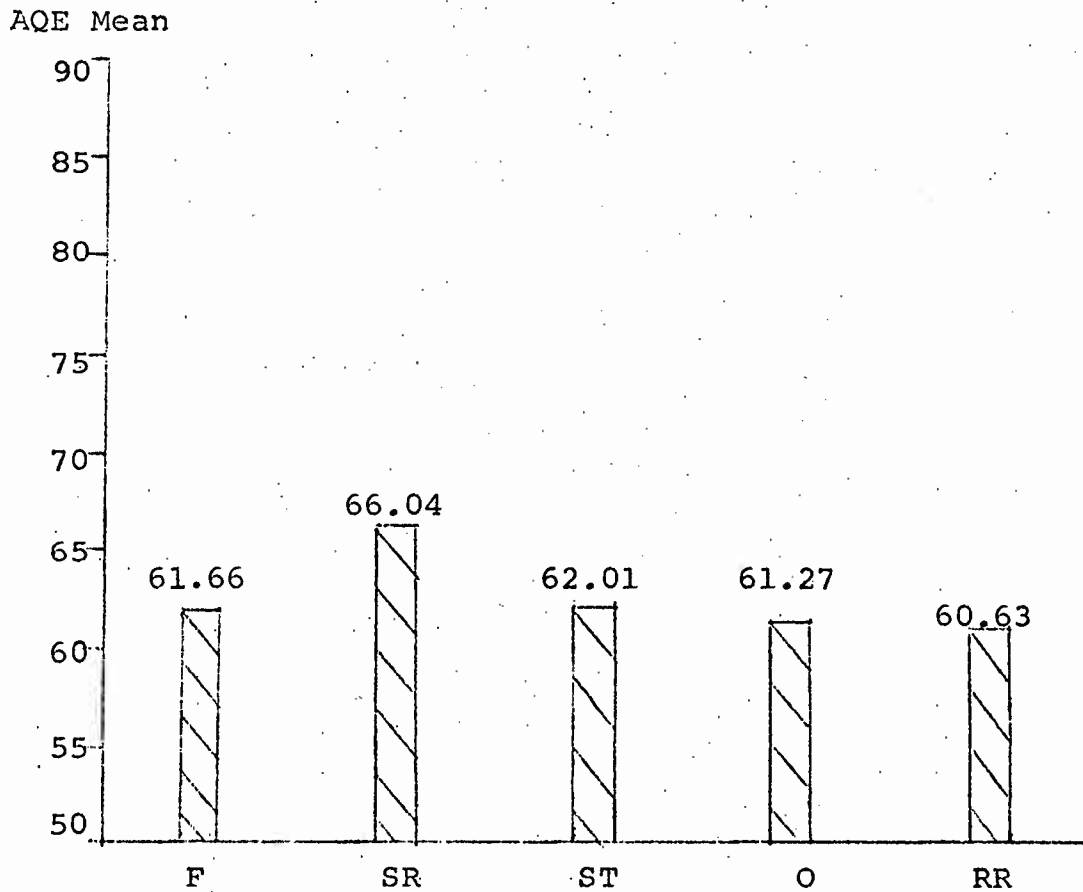


Figure 10 shows the comparison of Fugill (F), Saber Volunteer "reluctant" volunteers (SR), Saber Volunteer "true" volunteers (ST), Ohio enlistees (O), and the calculated "reluctant" volunteer replacements (RR) AQE means for the Mechanical category.

Figure 11

Administrative

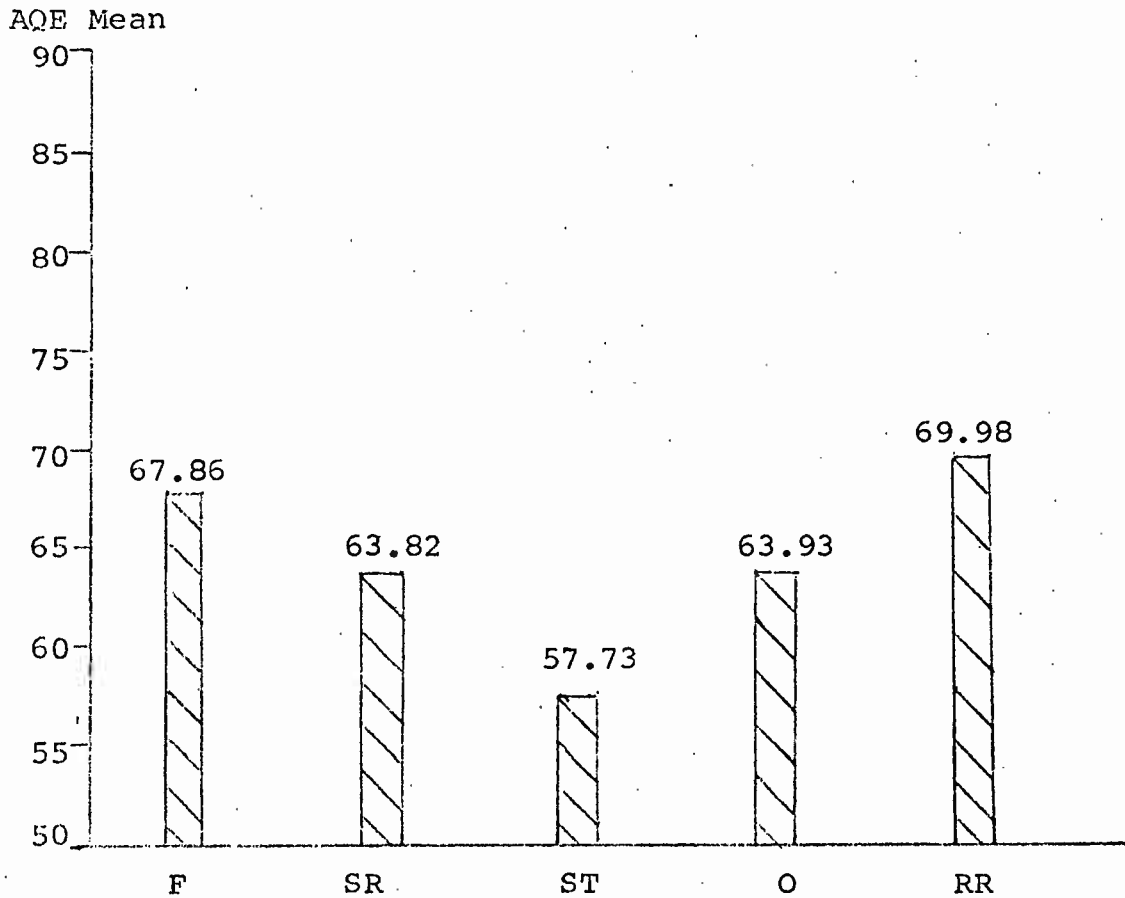


Figure 11 shows the comparison of Fugill (F), Saber Volunteer "reluctant" volunteers (SR), Saber Volunteer "true" volunteers (ST), Ohio enlistees (O), and the calculated "reluctant" volunteers replacements (RR) AQE means for the Administrative AQE category.

Figure 12

Electronic

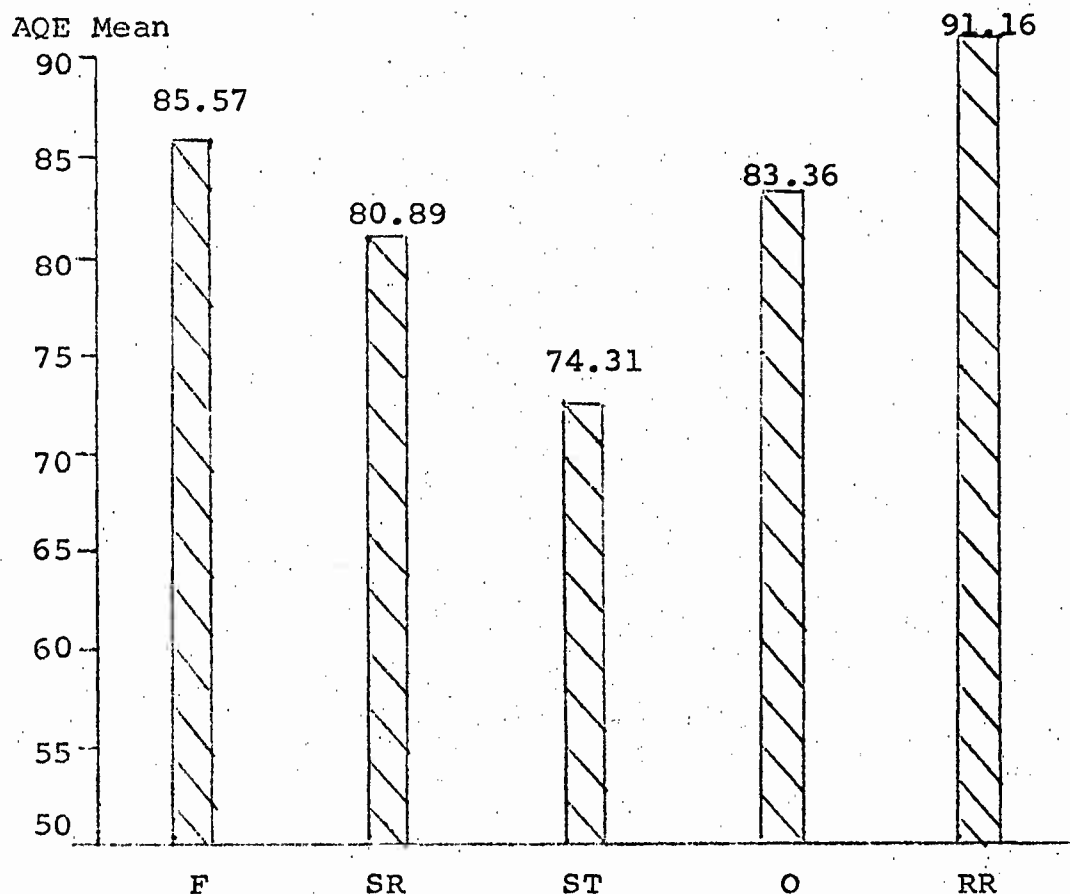


Figure 12 shows the comparison of Fugill (F), Saber Volunteer "reluctant" volunteers (SR), Saber Volunteer "true" volunteers (ST), Ohio enlistees (O), and the calculated "reluctant" volunteer replacements (RR) AQE means for the Electronics AQE category.

Chapter 4

Conclusions and Recommendations

At 3:40 P.M. on September 28, 1971, President Nixon signed into law the 1971 draft extension and reform bill. The President said after the signing that the new draft law introduces important reforms to the draft, "making it as fair and equitable as possible as we progress toward the volunteer force." He said he was hopeful "that this is the last time the President must sign an extension of the draft induction authority."³⁰

July 1, 1973, is the target-date set by the Department of Defense for establishing an all-volunteer armed force with a standby draft. In moving toward this date the Air Force is faced with a serious question. Will it (the Air Force) be able to attract young men in sufficient quantity and quality to meet its present high standards of enlistment? In analyzing this question there are many sources available which present the pros and cons of moving toward an all-volunteer force. The Assistant Secretary of Defense for Manpower and Reserve Affairs, Roger T. Kelly, narrowed in on one of the key problems facing

³⁰Selective Service News, "President Signs Draft Bill into Law," (Washington D. C.: Government Printing Office, October, 1971), p. 1.

this nation as it moves toward a zero draft:

The All-Volunteer Force means that the Armed Forces must trade effectively in the same market from which private business draws its employees. The right people will be attracted to the Armed Forces only if the expectations of service life are adequate. And the right people will be retained only if these expectations are realized.³¹

The logistics career area is a crucial segment of the Air Force and will face similar problems to those faced by the military services as a whole. The intent of this study has been to investigate the specific Air Force Specialty Codes within the logistics career field to determine the impact of the move toward an all-volunteer force on the logistics career area as a whole.

The investigation involved a critical examination and analysis of the available studies, surveys, reports, literature, and statistical data. In moving toward the objectives of this study, two hypotheses were brought forth and tested:

1. The quality of the future enlistees entering into

³¹"Secretary Kelly Discusses People: All-Volunteer Force," Commander's Digest, Vol. 9, No. 7 (November 28, 1970), p. 7.

the logistics career fields will be lower than those presently entering these career fields.

2. The quality of enlistees entering the Air Force during the relatively draft-free-pressure period of January through March, 1972, supports the data presented in a 1970 United States Air Force study entitled Saber Volunteer and therefore supports the predictions made by the first hypothesis.

The study attempted a solution to these two hypotheses through, first, making a statistical comparison of selected AFSCs from the logistics career field with "true" volunteer aptitude index scores from the Saber Volunteer study; next, by making a statistical comparison of Ohio enlistees for the period January through March, 1972, with AFSC enlistment data for the period 1966 through 1970; and, finally, by making a comparison of the Ohio enlistee data with the Saber Volunteer data.

Conclusions

1. A comparison of mean AQE scores from fifteen selected logistics career field AFSCs with the mean AQE aptitude index scores of "true" volunteers from the Saber

Volunteer study resulted in acceptance of the hypothesis in ten out of fifteen cases that the quality of future enlistees entering into logistics career fields will be lower than those previously entering these career fields. Based on this acceptance rate of approximately 67 percent it was thus concluded that the quality of future enlistees would be lower.

2. A statistical comparison of Ohio enlistment aptitude index scores (the AQE score obtained in the aptitude category under which the enlistee was inducted) for the period January through March, 1972, with AFSC enlistment data for the period 1966 through 1970, resulted in acceptance of the hypothesis in three out of four AQE categories that the quality of enlistees entering the Air Force during the relatively draft-free period (January through March, 1972) was lower than the quality of enlistees previously entering these fields (1966 through 1970). Thus, the second hypothesis was accepted that the quality of enlistees entering the Air Force during this relatively draft-free-pressure period is representative of the data presented in the Saber Volunteer study and therefore supports the conclusion made by the first hypothesis.

3. As additional support of the second hypothesis, a comparison was made of the Ohio enlistee data with the Saber Volunteer data. The intent of this comparison was to determine the quality of enlistees that were being inducted as a replacement to the "reluctant" volunteer enlistments which should disappear under a draft-free environment. This was done to see if the quality of the replacements was higher than, equal to, or lower than the quality of "true" volunteers from the Saber Volunteer study. This comparison resulted in the interesting findings that the quality of enlistees entering AFSCs in the respective AQE aptitude index categories ranged across the spectrum from significantly higher to slightly lower. For the Electronics and Administrative categories the "reluctant" volunteer replacement mean was significantly higher; while it was only slightly lower for the General and Mechanical categories. There are a number of possible explanations for these results.

a. The Ohio data was not representative of the population presented in the Saber Volunteer study;

b. The Saber Volunteer study was inaccurate in its "predictions";

c. The changes in the Recruiting Service Program, which includes offering of guaranteed enlistment AFSCs to certain qualified individuals, has caused the environment to change from the environment that was present during the Saber Volunteer study. This is particularly true for the Electronics and Administrative categories; or

d. The period of January through March, 1972, was only partially representative of a truly draft-free environment, and therefore, cannot be expected to be completely representative.

The authors of this study tend to lend more credence to the last two possible explanations. It is felt that a combination or interaction of these two factors explains the difference between recent observations and the findings of the Saber Volunteer study. The basis for this position stems primarily from discussions and interviews with Recruiting Service personnel.

The Air Force Recruiting Service has adopted a program of offering prospective enlistees the opportunity to enlist in certain specific AFSCs which are of a critical nature to the Air Force. A large number of Electronics

category AFSCs are included in this program, which would tend to explain the result that, in the Electronics aptitude index category, the replacements for "reluctant" volunteers from the Ohio sample were significantly higher than the "true" volunteer predictions from Saber Volunteer.³²

An explanation of what this new recruitment program means to a prospective enlistee can best be demonstrated through a hypothetical example. Assume that a prospective enlistee obtains scores of 80 or above in all four aptitude index categories. This would qualify him to enter any AFSC offered by the Air Force. The prospective enlistee now has a decision to make. He can enlist under one of the critical AFSCs offered by the new recruiting program, and thereby guarantee himself of the career field that he chooses; or he can apply for another AFSC with the hope that he will be placed into that career field upon completing basic training.

Thus, it can be seen that with this change in recruitment policy, it is quite possible that the implication made

³² Interview with Capt. Randall C. Herr, Ohio Regional Air Force Recruiting Detachment, Columbus, Ohio, July 12, 1972.

by the Saber Volunteer study could be significantly affected, especially in an area such as Electronics where there is a large number of critical AFSCs that fall under this new guaranteed AFSC program.

The fourth possible explanation, which inferred that the period of January through March, 1972, was only partially representative of a truly draft-free environment, and therefore, not completely representative of the Saber Volunteer "true" volunteer predictions, would also tend to affect the results of the comparison. Although the period could be categorized as almost draft-free, it should not be forgotten that the draft is still in effect, and some young men undoubtedly still perceive it as a relevant factor.³³ This leads to the combined probability that the possibility of draft pressure plus the changes in the recruitment program may very well account for the

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Semiannual Report of the Director of Selective Service, (Washington, D. C. : U. S. Government Printing Office, August 15, 1971), p. 59. The total calls for the years 1966 through 1971 were as follows: 1966 - 336,530; 1967 - 288,900; 1968 - 343,300; 1969 - 266,900; 1970 - 209,300; and 1971 - 157,969. There were no calls during the period January through March, 1972, and there were only 5,000 per month for the period April through June, 1972.

differences in what Saber Volunteer implied and what was found.

Thus, the reader will have to decide for himself the applicability of the conclusions and the validity of the predictions. However, the authors do feel that the conclusions drawn about the lowering of the quality of future enlistees are valid and significant, and that the Air Force will have to make some adjustments in its recruitment and placement policies to account for this change. The next section of this chapter will present the recommendations of the authors regarding these possible changes.

Recommendations

It appears that the Air Force has already taken significant and important steps toward improving the desirability of an Air Force career. The recent pay raises have done much to put the Air Force in a competitive position in the open market. Also, the definite steps being taken to reduce career irritants has improved the image of the Air Force in the eyes of prospective enlistees. The changes to the Air Force Recruitment program have also been significant, both from the aspect of presenting the Air Force

in a more desirable light and improving the basic recruitment policies of the service.

From the logistics career field standpoint, the area of recruitment appears to be one of the most fruitful in which to place additional emphasis and further investigation. A number of logistics AFSCs fall into the category of critical replacement AFSCs. These are AFSCs which have been placed under the guaranteed enlistment program. One thing that should be insured from the logistics standpoint is that prospective qualified enlistees are fully aware of the AFSCs that fall into this category, and that they have a reasonable understanding of the career enrichment opportunities offered by the different AFSCs. Since the prospective recruit is being given some degree of latitude in choosing the AFSC or career area he wishes to enter, it becomes increasingly important that these AFSCs have job descriptions which are meaningful. This might best be accomplished by relating the AFSCs to civilian jobs or opportunities, thereby giving the prospective enlistee something to which he can specifically relate. The intent of this action should be obvious in that it will give the enlistee some idea of what he will be doing in the Air

Force; while at the same time outlining the career area in relation to future civilian opportunities.

With the possibility that the Air Force will be faced with accepting recruits of lower quality under the all-volunteer environment, it appears that further investigation and consideration should be given to the utilization of personnel with lower mental abilities. One example of a program directed toward this end is Project 100,000. This program calls for the utilization of Category IV personnel, a group defined as those applicants scoring between the 10th and 30th percentile on the Armed Forces Qualifying Test.³⁴ An important factor in the success of such programs is the identification of the kinds of jobs available for personnel with lower levels of aptitude and abilities. The authors feel that this is an area that requires further investigation and study. It may very well become necessary for the Air Force to lower its minimum entrance requirements in some career fields and revise its technical training programs in order to utilize

³⁴Mayo, Clyde C., A Method for Determining Job T for Low Aptitude Airmen, (Lackland Air Force Base, Texas: Human Resources Laboratory, November, 1969), p. 1.

low aptitude airmen. Therefore, this area should be fully investigated in order to insure that we are prepared to transition to this possibility under the all-volunteer program.

In considering the effects of an all-volunteer force one must also consider what effect this will have on the Air Force retention program. A study prepared for the United States Air Force Project Rand in 1971, found that "true" volunteer recruits have significantly higher reenlistment intentions than draft-induced recruits. The study also found that "true" volunteer recruits not only intend to, but actually do, reenlist at a statistically significant higher proportion than do draft-induced recruits.³⁵

Thus, any conclusions drawn about the effects of an all-volunteer force should also take into consideration the very likely condition that under an all-volunteer force the demand for recruits should drop off due to higher reenlistment rates. Therefore the Air Force may be able to retain its present high-quality enlistment standards, and

³⁵ Brunner, G. L. The Importance of Volunteer Status: An Analysis and Reliability Test of Survey Data, (Santa Monica, California: Rand Corporation, December, 1971), p. 29.

not be faced with as much of a lowering of quality of future recruits as anticipated.

In total retrospect, the findings of this study should be carefully evaluated in light of the limitations, conclusions, and recommendations discussed. It can easily be seen that this is an area with numerous possibilities for future study and investigation.

Recommendations for Future Study

With the draft still in effect, one of the primary limitations of this study was the shortage of data that represented a truly draft-free environment. Although the authors were able to gather data which represented "relatively" little pressure from the draft, it still was not a truly draft-free environment. Thus, first and foremost of recommendations to be made would be for a future study to be initiated as soon as sufficient data becomes available which represents a "true" draft-free environment. It is presently planned for the Government to initiate a trial period, January through June, 1973, during which time no draft calls will be issued. The intent of this action is to prepare the services for the

environment they will be operating under effective July 1, 1973, when the all-volunteer force plan is put into effect. Therefore, this period of January through June should provide ideal research data to continue or follow on to the objectives of this study.

Another area which requires further study is the availability of future enlistees. This study would have to take into account such factors as unemployment, the push for college education, and the relative monetary aspects of the military versus the civilian economy. There have been a number of studies in these areas under the past and present environments; however, when we transition into the all-volunteer force environment, it will become necessary to reevaluate the effect of these factors on the enlistee manpower pool.

It is also felt that it will become lucrative for the Air Force to promulgate future studies into the area of how to better relate the descriptions of Air Force Specialty Codes to civilian jobs and positions. The rationale behind this action was discussed under the Recommendations section. As the Air Force Recruiting Service continues to transition into the program of offering

guaranteed enlistment AFSCs to prospective recruits, it will become more and more important for a prospective enlistee to understand just what the Air Force is offering him.

One final area which may require further study is the utilization of men with lower mental aptitudes. If the Air Force is forced into a position of accepting personnel with low mental abilities, changes may have to be made in recruitment policies, technical training courses, and skill upgrade programs. Therefore, depending on what occurs under the all-volunteer program, this area may very well become one of the more important to future researchers.

With the many efforts already undertaken, and the countless more that will undoubtedly occur, it is entirely reasonable that the Air Force, and the military as a whole, will greatly benefit from the all-volunteer force. Rather than considering the detrimental effects, we may find ourselves in a position enviable to many other professions in that we will be blessed with a highly motivated, skillful, and energetic body of men capable of fulfilling or surpassing all goals.

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Appendix 1

This appendix gives the detailed formulas used in the data adjustment for the first hypothesis. Seven formulas were used in the calculations.

Determining the proportion of 17 to 19.49 year olds in a Saber Volunteer table with a specific AQE minimum.

$$(1) \quad A = \frac{\sum_{i=17}^{19} (x_i) - x_{19\frac{1}{2}}}{\sum_{i=17}^{19} (x_i)}$$

where x_i = the number in each age group in Saber Volunteer data similar to Table 2 in Chapter 1.

$x_{19\frac{1}{2}}$ = the number in the 19½ year age group in Saber Volunteer data similar to Table 2.

The proportion found in equation (1) was removed from the selected Fugill AFSC to give the number in the AFSC who were 19½ years and older.

$$(2) \quad B = n(1 - A)$$

where n = the number in the selected Fugill AFSC (same as the total in the example illustrated by Table 4 in Chapter 1).

A = the value found using equation (1).

Determining the mean AQE score of the 19½ year old group from the Saber Volunteer study. The year group included both

"true" and "reluctant" volunteers. The data was taken from the appropriate table in the Saber Volunteer study similar to Table 3 in Chapter 1.

$$(3) \quad C = \frac{(n_t)(u_t) + (n_r)(u_r)}{n_t + n_r}$$

where n_t = the number of 19½ year old "true" volunteers in the Saber Volunteer study.

u_t = the mean AQE score of the 19½ year old "true" volunteers in the Saber Volunteer study.

n_r = the number of 19½ year old "reluctant" volunteers in the Saber Volunteer study.

u_r = the mean AQE score of the 19½ year old "reluctant" volunteers in Saber Volunteer.

Determining the mean AQE score of the 19-19.49 year old group in the Saber Volunteer study. The data was taken from Saber Volunteer tables similar to the examples shown in Tables 2 and 3 in Chapter 1.

$$(4) \quad D = \frac{(n_{19})(u_{19}) - (n_{19\frac{1}{2}})(C)}{n_{19} - n_{19\frac{1}{2}}}$$

where n_{19} = the number of all 19 to 19.99 year olds in a particular AQE category/minimum score in the Saber Volunteer study.

u_{19} = the mean AQE score of the 19 to 19.99 year old group.

$n_{19\frac{1}{2}}$ = the number of all 19½ to 19.99 year olds.

C = the mean AQE score of all 19½ to 19.99 year olds found in equation (3).

Determining the mean for the 17-19.49 year old group.

Data was taken from tables in the Saber Volunteer study similar to the example shown by Table 2 in Chapter 1.

$$(5) \quad E = \frac{(n_{17})(u_{17}) + (n_{18})(u_{18}) + (n_{19-19.49})(D)}{n_{17} + n_{18} + n_{19-19.49}}$$

where n_{17} = the number of 17 year olds from the Saber Volunteer study.

u_{17} = the mean AQE score for 17 year olds from the Saber Volunteer study.

n_{18} = the number of 18 year olds from the Saber Volunteer study.

u_{18} = the mean AQE score for 18 year olds from the Saber Volunteer study.

$n_{19-19.49}$ = the number of 19 to 19.49 year olds from the Saber Volunteer study.

D = the mean AQE score of the 19 to 19.49 year olds as calculated in equation (4).

Remove the mean AQE score for the 17 to 19.49 year group from the mean of the Fugill AFSC under consideration.

$$(6) \quad F = \frac{(n_f)(u_f) - A(n_f)E}{B}$$

where n_f = the total number in the Fugill AFSC under consideration.

u_f = the mean AQE score of the Fugill AFSC.

A = the proportion of 17 to 19.49 year olds calculated in equation (1).

E = the mean AQE score for the 17 to 19.49 year olds as calculated in equation (5).

B = the number in the Fugill AFSC 19½ years and older. Calculated in equation (2).

Determining the mean AQE score for the "true" volunteers from the Saber Volunteer study. These "true" volunteers contained only the age groups of 19½, 20, 21, and 22. Data was taken from a table similar to the example shown in Table 3 in Chapter 1.

$$(7) \quad G = \frac{\sum_{i=19\frac{1}{2}}^{22} ((n_i) (u_i))}{\sum_{i=19\frac{1}{2}}^{22} (n_i)}$$

where n_i = the number in the i^{th} age group.

u_i = the mean AQE score of the i^{th} age group.

All data used in the seven equations came from tables in the Saber Volunteer study and AFSCs in the Fugill data that had the same parameters. For example, if a Fugill AFSC under consideration required a General 40 score for eligibility, then the Saber Volunteer data was obtained from tables which also required General 40 scores.

To test the hypothesis, the results of equations (6) and (7) were compared to each other. If the value found in equation (7) was more than two below the value calculated in equation (6), then the hypothesis was accepted. If the value found in equation (7) was less than two below, or was greater than, the value found in equation (6), then the hypothesis was not accepted.

Appendix 2

This appendix shows the statistical formulas and the detailed calculations that were used in the testing of the second hypothesis. The formulas are those used in hypothesis testing whenever the population is assumed to be normally distributed.

$$Z = (u - \bar{x}) / \sigma_{\bar{x}}$$

where u = the population mean

\bar{x} = the sample mean

$\sigma_{\bar{x}}$ = the standard error of the mean

The standard error of the mean was calculated using the formula:

$$\sigma_{\bar{x}} = s / \sqrt{n}$$

where s = the population standard deviation

n = the sample size

The data and calculations for the Administrative category were:

$$u = 67.86$$

$$s = 13.24$$

$$\bar{x} = 63.93$$

$$n = 117$$

$$\alpha = 0.01$$

$$\sigma_{\bar{x}} = s / \sqrt{n} = 13.24 / \sqrt{117} = 1.22$$

$$P(Z > (u - \bar{x})/\sigma_{\bar{x}}) = P(Z > (67.86 - 63.93)/1.22)$$

$$P(Z > 3.93/1.22) = P(Z > 3.22) = 0.0006$$

0.0006 < 0.01 therefore there is a significant difference.

The significant difference is between the Fugill mean in the Administrative category and the Ohio mean in the Administrative category.

The data and calculations for the Electronics category were:

$$u = 85.57$$

$$s = 7.38$$

$$\bar{x} = 83.36$$

$$n = 149$$

$$\alpha = 0.01$$

$$\sigma_{\bar{x}} = s/\sqrt{n} = 7.38/\sqrt{149} = 0.60$$

$$P(Z > (u - \bar{x})/\sigma_{\bar{x}}) = P(Z > (85.57 - 83.36)/0.60)$$

$$P(Z > 2.21/0.60) = P(Z > 3.68) = 0.0001$$

0.0001 < 0.01 therefore there is a significant difference.

The significant difference is between the Fugill mean in the Electronics category and the Ohio mean in the Electronics category.

The data and calculations for the General category were:

$$u = 68.45$$

$$s = 12.66$$

$$\bar{x} = 62.96$$

$$n = 164$$

$$\alpha = 0.01$$

$$\sigma_{\bar{x}} = s/\sqrt{n} = 12.66/\sqrt{164} = 0.99$$

$$P(Z > (u - \bar{x})/\sigma_{\bar{x}}) = P(Z > (68.45 - 62.96)/0.99)$$

$$P(Z > 5.49/0.99) = P(Z > 5.55) = 0.0000$$

0.0000 < 0.01 therefore there is a significant difference.

The significant difference is between the Fugill mean in the General category and the Ohio mean in the General category.

The data and calculations for the Mechanical category

were:

$$u = 61.66$$

$$s = 14.57$$

$$\bar{x} = 61.27$$

$$n = 224$$

$$\alpha = 0.01$$

$$\sigma_{\bar{x}} = s/\sqrt{n} = 14.57/\sqrt{224} = 0.97$$

$$P(Z > (u - \bar{x})/\sigma_{\bar{x}}) = P(Z > (61.66 - 61.27)/0.97)$$

$$P(Z > 0.39/0.97) = P(Z > 0.40) = 0.3446$$

0.3446 > 0.01 therefore there is not a significant difference.

There is no significant difference between the Fugill mean in the Mechanical category and the Ohio mean in the Mechanical category.

Appendix 3

This appendix gives the equation that was used to calculate the "reluctant" volunteer replacement mean. The equation was:

$$\begin{array}{l} \text{"reluctant"} \\ \text{Volunteer} \\ \text{Replacement} \\ \text{Mean} \end{array} = \frac{(u_o)(n_o) - (u_t)(n_o)(p_t)}{(n_o)(p_r)}$$

- where u_o = the mean of the Ohio enlistees
- n_o = the number of Ohio enlistees
- u_t = the mean of the "true" volunteers
- p_t = the proportion of "true" volunteers
- p_r = the proportion of "reluctant" volunteers

Appendix 4

Definitions

Accession(s)

A general term referring to young males officially received into one of the four U. S. Military Services. Applies indifferently to draftees, "reluctant" or draft-induced volunteers, or "true" volunteers.

AFQT (Armed Forces Qualification Test)

A test administered to prospective Military accessions. Originally normalized on the basis of all men and women in the Armed Forces in December, 1944 and January, 1945, the test is up-dated periodically. Its purpose is to screen candidates for the Armed Forces and to classify them in terms of mental ability into five categories (1-5). By law, those scoring in Category 5 are ineligible for Military Service.

AFSC (Air Force Specialty Code)

A 5-digit classification system used by the Air Force to identify specific skills (e.g., general, administrative, mechanical, and electronic). Aptitudes, in turn, are--for airmen--based on the AQE. The AFSC is employed in the assignment of Air Force personnel.

AQE (Airman Qualifying Examination)

A test administered by the Air Force to non-prior Service enlistees, and used by the Air Force Recruiting Service as a basis for Air Force skill code (AFSC) awards, and career counselling. The test requires about two hours to administer. It is revised every two years to take account of increases to the normative population, research results, and other data.

Career Fields (Air Force Usage)

denotes clusters of closely-related aptitudes and jobs which taken together, and giving effect to experience, constitute a specific career.

Draftee

An individual officially and legally inducted into Military Service; not a "true" or "reluctant" volunteer.

Draft-Induced Volunteer

An individual who, perceiving that he is likely to be drafted, volunteers for Military Service. He is considered to be responsive to "draft pressure."

Enlistee/Enlisted Personnel

Refers to non-officer personnel and new personnel acquisitions. Contrary to much DOD practice, the term "enlistee" does not designate a volunteer.

Lottery

Refers to the process by which the sequence of induction calls are issued to prospective draftees. Calls are determined by a random drawing of birth dates (days of the year). A number is associated with a specific date (e.g., number 15 with October 1st). The order of calls follows the sequence of numbers (called Random Sequence Numbers--RSN).

Qualified

Refers to those young men who meet the statutory and administrative criteria for admission into the Armed Forces. There are three broad categories of criteria; mental, moral, and medical.

"Reluctant" Volunteer

Refers to accessions who, perceiving the strong likelihood of being drafted, choose to volunteer for the Service and enlistment period of their choice.

Returnees

Refers to ex-Service personnel who, after having left the Military to go back to civilian life--elect to return to the Military.

Supply

Refers to the male population, ages 17-22, from which an adequate number of young men who are qualified for Military Service can be recruited for an all-volunteer force.

"True" Volunteer

Refers to young men who freely choose to enter military life without regard to the probability of their being drafted.

Volunteer

See "True" Volunteer, "Reluctant" Volunteer.

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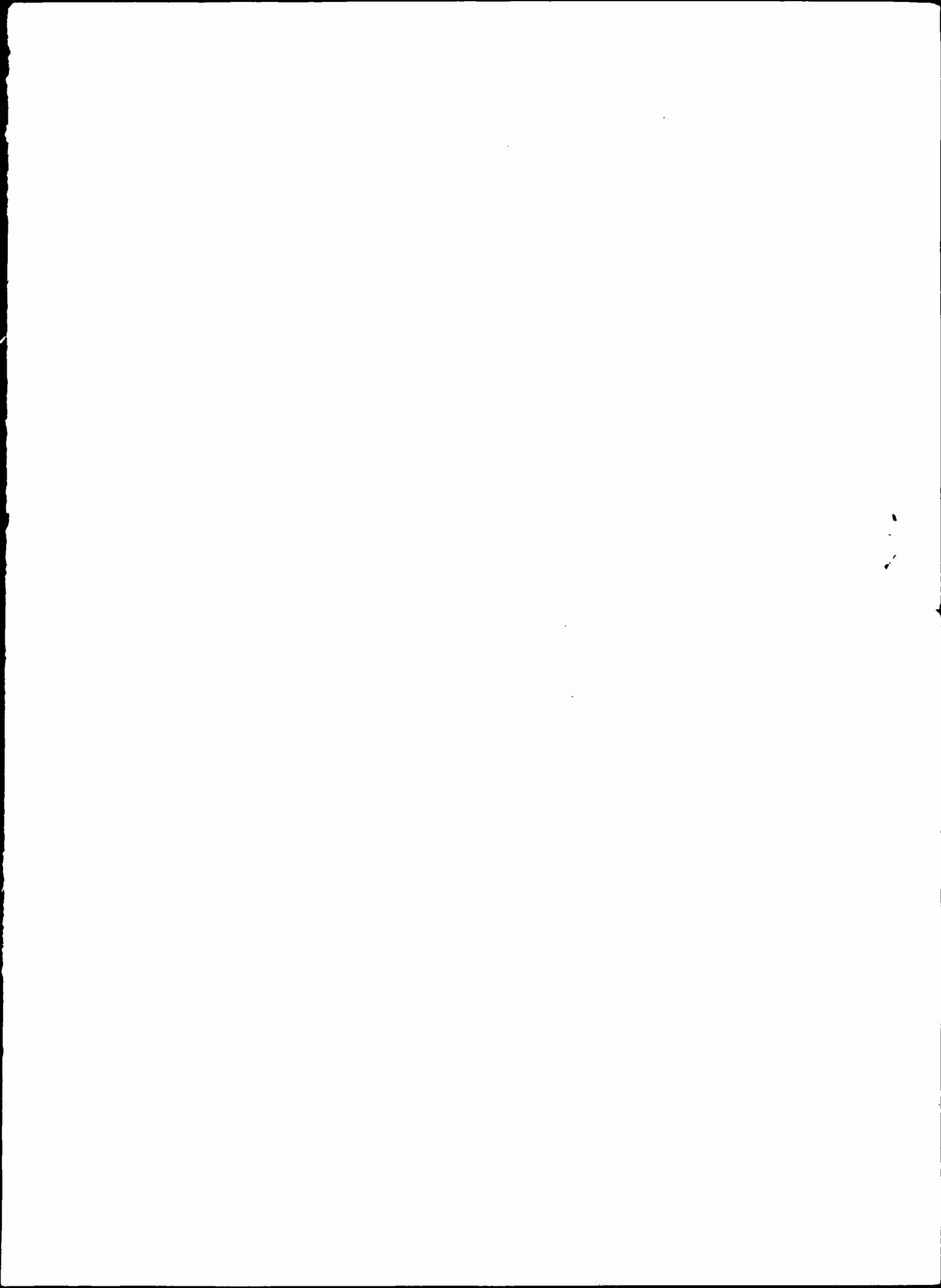
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