

Improved Officer Assessment Selection, Placement, and Promotion

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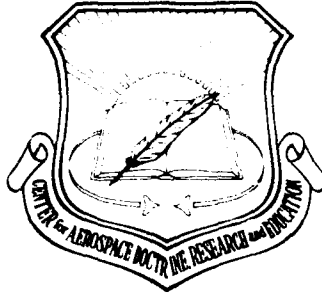
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Improved Officer Assessment, Selection, Placement, and Promotion

by

ROBERT P. SMITH, Lt Col, USAF
Research Fellow
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Contents

Chapter		Page
	DISCLAIMER	iii
	FOREWORD	v
	ABOUT THE AUTHOR	vii
	PREFACE	ix
1	INTRODUCTION	1
	Air Force Needs	1
	Trends and Situations	2
	Overview	3
	Notes	5
2	CURRENT PRACTICES IN OFFICER CLASSIFICATION	7
	United States Air Force Academy	8
	Air Force Reserve Officer Training Corps	10
	Air Force Officer Training School	13
	Availability of Applicants	14
	Coordination among Commissioning Agencies	15
	Initial Classification	16
	Reclassification	17
	Notes	18
3	TESTS	19
	Military Testing	19
	Examples of Successful Assessment Programs	20
	Current Assessment Methods	21
	Individual Intelligence Tests	22
	Group Intelligence Tests	22
	Aptitude Tests	23
	Personality Assessment	26
	Interest Inventories	28
	Honesty Tests	30
	Assessment Center	31
	Other Items Contributing to Assessment	31
	Notes	32

4	AIR FORCE EFFORTS TO IMPROVE PERSONNEL SELECTION, PLACEMENT, AND PROMOTION	35
	Person-Job Matching for Enlisted Personnel	36
	Physical Requirements Matching for Enlisted Personnel	37
	Research Programs	38
	Air Force Pilot Selection and Classification Research Program	38
	Officer Education Profiles	40
	Medical Officer Selection	41
	Officer Person-Job Matching	41
	Officer Performance Measurement and Total Force Person-Job Matching	43
	Notes	47
5	CONSIDERATIONS AND RECOMMENDATIONS FOR INCREASED OFFICER ASSESSMENT	49
	Considerations	49
	Recommendations	51
	Notes	54

ILLUSTRATIONS

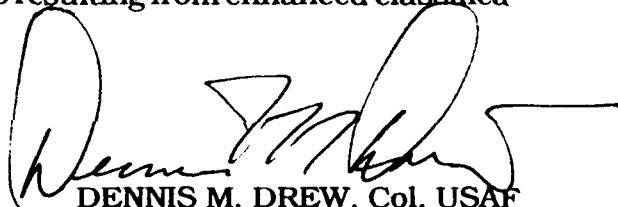
Figure

1	Typical Breakdown of Academy Class High School Achievements	8
2	Average Academic Test Scores from a Recent Academy Class	9
3	Typical Candidate Fitness Test Scores	9
4	AFROTC Production Objectives for Fiscal Year 1987	16

Foreword

This -
~~—Lt Col Robert P. Smith's~~ study reviews Air Force practices in assessing the qualifications and interests of applicants for commissioning as line officers, surveys methods and instruments used for executive recruiting, classification, and placement by other services and civilian firms, and proposes enhanced Air Force classification methods. The premise is that better classification, based on assessments of interests and abilities, will lead to greater efficiency because officers will be more productive earlier in their Air Force careers.

— This study points out several advantages of improved officer classification, especially during periods of difficult recruitment because of declining numbers of eligible applicants for commissioning, and during rapid expansion of the services due to mobilization. The expense of adopting Colonel Smith's recommendations will be the cost of purchasing or developing and administering modern classification instruments for officers. But, if Colonel Smith is correct, the efficiencies resulting from enhanced classification will quickly offset the costs. (KR)



DENNIS M. DREW, Col, USAF
Director
Airpower Research Institute

About the Author

Lt Col Robert P. Smith was born in Birmingham, Alabama. He graduated from S. R. Butler High School in Huntsville, Alabama, in 1961 and received a bachelor of science degree in industrial management from Auburn University in 1967. After attending Air Force Officer Training School, he was commissioned a second lieutenant in March 1968 and began duties in Minuteman missile operations at Whiteman AFB, Missouri. In 1970 he was assigned to the 4315th Combat Crew Training Squadron, Vandenberg AFB, California, as a Minuteman launch control officer instructor. While at Vandenberg AFB, he married Lt Cheryl A. Wall, an Air Force nurse. In 1973, after being assigned to Headquarters Strategic Air Command's Personnel Deputate as a missile subsystems planner, he became a personnel officer with assignments as chief, Awards and Decorations Branch and section chief, Consolidated Base Personnel Office (CBPO). In 1978 he was assigned to Misawa AB, Japan, as chief of CBPO and then director of personnel. In 1982 he was assigned to the Air Force Military Personnel Center's Classification Division at Randolph AFB, Texas, and later became chief of the Airman Retraining Branch, then chief, Personnel Procurement and Accessions Division.

While writing this study, Colonel Smith was the Headquarters AFMPC command-sponsored research fellow at the Airpower Research Institute, Air University Center for Aerospace Doctrine, Research, and Education (AUCADRE) and a student of the Air War College at Maxwell AFB, Alabama. During this time, he also completed a master of science degree in personnel management from Troy State University. He was then assigned as director of personnel and later deputy base commander, Comiso Air Station, Sicily. He subsequently moved to Soesterberg Air Base, the Netherlands, to serve as base commander.

Preface

The Air Force claims to select the "best-qualified" candidates for commissioning, technical training, advanced professional and academic education, and advancement in position and rank, despite the lack of objective, refined selection and classification systems. Considering the attrition rates from training programs and the exit rate of expensively trained officers who get out because they foresee assignment to jobs they do not want (often from duties with which they are very content and very much enjoy), some system analysis is in order. In trying to write this study, I was discouraged at times by the claims, "We don't have a problem," "Why fix it if it ain't broke," and so on. However, I was, and remain, convinced that improvements to what may be good systems will be beneficial in assessing, classifying, and promoting officers.

This study is long overdue. When I presented the final draft to Air Force officer accession officials for review, I got comments such as, "I wasn't really convinced that the Air Force has a problem—can't get too motivated about changing anything now—just agree to follow what the Human Resources Lab is doing and if they come up with something good, use it," and the more sarcastic, "I totally concur with this. In fact, if we could test and classify individuals at birth, we could then put them in training to be president or send them to the electric chair—think of the money we'd save."

These discouraging remarks took their toll: I did not finish the project during my remote assignment. However, with the patience and persistence of my editor, Dianne Parrish, and the director of the Airpower Research Institute, Col Dennis M. Drew, I completed this study, nearly three years later.

I appreciate the sponsorship provided by the Air Force Military Personnel Center, and the advice, encouragement, and perseverance of the staff and fellows of the Air University Center for Aerospace Doctrine, Research, and Education. The program should be continued as an incentive and challenge for a few officers each year to provide detailed studies and recommendations on important Air Force issues.



ROBERT P. SMITH, Lt Col, USAF
Research Fellow
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Chapter 1

Introduction

If everyone hired or promoted could be successful, organizations would prosper and the employees would benefit from personal and organizational rewards. As a large, complex organization, the US Air Force needs a constant supply of line officers who can progress into executive positions as leaders and managers of our modern aerospace forces. Thus, if one believes that better leaders and managers make better decisions, then the cost benefits derived from careful selection, successful training, proper career development, and promotion of the right people will have a noticeable positive impact on the quality of Air Force organizational performance.¹

Selection of qualified people is a fundamental organizational task, critical to the perpetuation of the organization. In fact, selection may be the most important of the personnel tasks since results obtained from training, developing, motivating, and promoting employees into jobs with increased responsibility or complexity may depend directly on the correct selection of competent people to begin with.²

Air Force Needs

To maintain its current structure and strength, the Air Force needs approximately 7,500 line officers each year. The term *line officer* refers to officers who perform the mission and support activities of running the Air Force and not those who are considered professional staff—such as staff judge advocates, chaplains, physicians, and other medical officers.

The people coming into the Air Force as officers must be capable of receiving and completing commissioning and technical training, and they must learn how to handle the responsibilities of higher rank and position. Candidates for Air Force officership, whether they progress to higher positions or not, must have talent and motivation to succeed in the career fields they have chosen. These candidates must also understand the concept of Air Force officership and have knowledge in the disciplines to which they are assigned, based on preference, education, or the needs of the Air Force. Although some authorities believe the Air Force will be able to continue to attract enough well-qualified line officers, even with an improving economy and reduced numbers of college-aged men and women interested in the military profession, there still may be cause for concern.³

The number of talented people with managerial or executive ability to become Air Force leaders may be limited, and they may not be motivated to join the military service, especially in light of budget constraints. In fact, specters like these make it even more important that the Air Force enhance its efforts in matching people to positions, so that candidates can enjoy a better chance of success earlier in their careers and can avoid moves through two or more specialties before identifying the field of interest that is right for them. The cost benefits of improving person-job matching (PJM) can be enormous and quick to accrue. For example, an early indicator of success would be reduced attrition from commissioning training, technical training, and pilot and navigator training.

Trends and Situations

The Air Force has enjoyed relative success in attracting enough well-qualified candidates for commissioning during the past few years; this trend could continue, but it is not likely. If the Air Force continues to require the same number of officers, considering the economy and the diminishing population of college-aged candidates, it may again be faced with the officer recruiting shortfalls similar to those of the mid-1970s, especially in the career areas and academic disciplines requiring technical abilities or aptitudes. Some of our personal experiences of the seventies tend to make us question whether the Air Force will be ready if the supply of officer candidates suddenly varies. If budgetary constraints cause significantly reduced officer accessions and training and the Air Force is faced with more candidates than it can take on active duty (i.e., when the Air Force deferred officers commissioned through the Reserve Officer Training Corps in the late seventies), it must be prepared to select the best candidates available, rather than just accepting the earlier applicants and turning the rest away.

Another situation to be faced is the possibility of a large-scale mobilization, which the military experienced in the 1940s. In this case, the Air Force needs the ability to rapidly assess and classify officer candidates without convening selection boards to identify the best qualified.

In researching this subject I originally considered investigating whether accession and classification policies were adequate to produce the Air Force leaders of tomorrow and if the proposed improvement would increase the pool of leadership from which the Air Force could draw. It seems apparent, however, that if the Air Force continues to access line officers of the same or better quality through current commissioning sources, future leaders of the Air Force will emerge from the cadre of line officers, just as they do now. The recommendations of this study provide some methods for early identification of leaders, thereby improving officer job placement and productivity. Also, if the Air Force continues to want or need officers of varied experience, as well as particular qualifications for senior management and leadership positions, the opportunities to obtain those prerequisite skills

must be made available to more officers to increase the pool of those with the right kinds of qualifications.

Overview

The Air Force is rather thorough in assessing the aptitudes of potential enlisted personnel and matching their abilities and desires to jobs and training, yet the degree of assessment and the objectivity of the methods used to place officer candidates in career fields are less reliable. In fact, officer assessment methods vary somewhat among the commissioning sources: the US Air Force Academy (USAFA), the Air Force Reserve Officer Training Corps (AFROTC), and the Officer Training School (OTS). Lt Col Richard W. Stokes, Jr., presents an excellent discussion of the differences in assessment methods in his 1984 book called *Preserving the Lamberent Flame*.⁴ Stokes's work provides part of the foundation for this study.

It is my intention to go beyond Stokes by developing specific recommendations for improving officer selection and classification procedures that can be implemented by the agencies handling the processes. If the accession, classification, and training agencies of the Air Force will make greater use of proven PJM techniques for placing officers and will develop some Air Force-specific procedures to complement the ones already available, significant positive effects on personnel motivation, retention, and performance will become apparent.

Air Force line officer commissioning and career development programs do a relatively good job of getting officers into satisfying and productive career fields. There are, however, several ways classification and assignment to jobs upon commissioning, or thereafter, can be improved.

Initial classification of officers should take into account their interests, education, and experience for optimum person-job matching. Although the Air Force does this reasonably well, improvements can be made, may even be necessary, and can surely contribute to the cost-effectiveness of the selection, accession, and classification processes.

According to AFR 35-1, *Military Personnel Classification Policy (Officers and Airmen)*, "the purpose of the military personnel classification system is to identify duties and tasks for every position needed to accomplish the Air Force mission [and to identify] qualifications and abilities of each Air Force member in relation to position and skill requirements."⁵ Regarding the classification of newly commissioned officers, the regulation goes on to say that all officers, except pilots and navigators, "are classified based on their qualifications and Air Force requirements . . . based on each officer's education, training, experience, interests and physical qualifications as well as Air Force requirements at the time the officer is ordered to active duty."⁶ Despite this policy statement, actual accession and classification of newly commissioned officers seems more of a catch-as-catch-can operation. Chapter 2 examines these classification procedures in detail.

Many methods and instruments are available for assessing the aptitudes of management candidates. Interest inventories are especially valuable in assessing the desires of candidates to do the kinds of tasks they may encounter in particular jobs. Evaluations of personal integrity—honesty tests—are helpful in identifying candidates with questionable morals or integrity flaws. Personality and psychological assessments are used in indicating one's propensity for success in management. Many of these instruments and processes could be directly adopted or adapted for Air Force use. Chapter 3 discusses several of these successful instruments and procedures and how they might be used by the Air Force.

Chapter 4 describes how some modern candidate evaluation and placement instruments and processes might be combined with existing Air Force practices for the selection and placement of line officers upon accession or when reclassification becomes necessary or desirable. In order to accept some of these proposals, one needs to agree with the following assumptions: (1) people will be more satisfied, will work better, and will stay longer on the job if they like what they do; (2) people can be very proficient at more than one work activity, and some actually thrive on opportunities to display their versatility; (3) people who have had experience in more than one discipline, especially when one or more of those were directly mission related, are more likely to be better managers and leaders in any specialty in which they are promoted; and (4) enhanced job performance and increased retention of line officers is cost-effective for the Air Force, as is increased versatility for assignment in more than one specialty or as leaders and managers of several different functions.

Middle- and senior-level managers and leaders are usually more effective if they have had some experience in other career fields. Officers with varied backgrounds are more likely to understand the interrelationship among the functions they manage, support, or are supported by. Some officers receive opportunities to diversify and to improve their chances for success through career development programs. For others such opportunities come almost by chance or not at all. Some officers become "locked in" with certain weapon systems, career fields, or major commands; these officers may be less competitive for selection to command or key staff positions or for promotion to higher rank if they leave the area in which they have developed their reputations, or if they stay in a given specialty too long. Thus, the system usually views these officers as too narrowly experienced for promotion (applying mostly to promotion beyond the rank of lieutenant colonel).

Chapter 5 discusses this specialist-versus-generalist issue and some others on officer selection. It also provides a summary of study findings and recommendations and reemphasizes the need for the Air Force to take a more proactive role in the assessment of officer candidates, resulting in better selection, classification, and placement practices. Also, the chapter includes suggestions for further research in this area.

Notes

1. Col Barbara Darden Francis, *The Assessment Center Process: Its Applicability to the USAF*, AWC Research Report no. 340 (Maxwell AFB, Ala.: Air War College, 1978), 2.
2. Ibid., 1.
3. Air Training Command, "Report of the FY85 ATC Line Officer Procurement Strategy Conference," Randolph AFB, Tex., 4-5 December 1984, C-13.
4. Maj Richard W. Stokes, Jr., *Preserving the Lamberent Flame: Traditional Values and the USAF Officer Accession Program* (Maxwell AFB, Ala.: Air University Press, 1984), 6-8.
5. AFR 35-1, *Military Personnel Classification Policy (Officers and Airmen)*, 1 March 1983, 8.
6. Ibid., 10.

Chapter 2

Current Practices in Officer Classification

Before considering suggestions for enhancing the Air Force officer classification system, it is necessary to examine current procedures, including many recent and ongoing improvements. In his 1984 report, Richard W. Stokes, Jr., discusses the effects of the all-volunteer force concept on officer selection to include a more active officer recruiting effort and a more cooperative approach in recruiting among the three commissioning sources for line officers.¹ Nevertheless, these sources are still significantly different in their recruitment and classification procedures because of the nature and length of the programs. Great strides, however, were made toward achieving a balance between production capabilities and goals. Contributing to these improvements were seven annual line officer procurement strategy conferences, in which representatives of the accession planning and commissioning agencies worked together to develop reasonable production objectives and strategies. This chapter briefly describes the three commissioning sources and their mutually beneficial cooperative efforts.

The three commissioning sources contact and work with potential officer candidates at different points in their development. The United States Air Force Academy (USAFA) deals primarily with high school juniors and seniors. The Air Force Reserve Officer Training Corps (AFROTC) contacts some high school students being considered for four-year AFROTC scholarships but deals mainly with college students during their freshman and sophomore years. The Air Force Officer Training School (OTS), through the Air Force Recruiting Service, deals with college juniors and seniors and graduates. To apply for OTS, an individual must be within five months of graduating; however, recruiters start working with potential applicants well in advance of that.

The Air Force Personnel Plan provides the basis for accession and classification policy. Recommendations from the fiscal year 1982 Line Officer Procurement Strategy Conference were incorporated into the revision of the Air Force Personnel Plan, volume 1, which provides an overview of the nature of Air Force line officer commissioning activities.

The mix of officers procured from the various commissioning sources has an important impact on the maintenance and operation of an effective officer force. Each of the sources has unique capabilities and characteristics. Some of these capabilities and characteristics include: long production lead time, long-range production predict-

ability, relatively short production lead time, flexible and inflexible accessions and varying capabilities to procure personnel with specific skills. These unique capabilities and characteristics should be recognized and exploited in planning and executing officer procurement and accessions.

The Air Force Academy provides high quality personnel who have been educated in a military environment and motivated toward a military career. The stated mission of the Academy since its inception has been to provide a professional cadre of future combat leaders with backgrounds in a variety of academic disciplines and military fundamentals.

The Air Force Reserve Officer Training Corps (AFROTC) is a long lead time commissioning source which provides constant and predictable production available for accession into the active duty force. AFROTC provides a mechanism to motivate officers toward a military career over a relatively long precommissioning program (2-4 years). With a comprehensive scholarship program, AFROTC is an excellent source for meeting predictable and hard-to-fill requirements with high quality accessions. Also, the scholarship program assures a high level of demonstrated academic ability.

To meet short-term and changing requirements, it is also necessary to have a short-lead time commissioning program. The Officer Training School (OTS) program meets this need. To effectively fulfill its short term role, officer production planning programs should maintain OTS at sufficient levels to enable OTS to expand or contract.²

The remainder of this chapter addresses the recruitment, accession, and classification processes of these three commissioning sources.

United States Air Force Academy

Like the other military academies, the USAFA offers prestigious education and varied opportunities for military service that attract many applicants through the various nomination processes. Each year the Academy considers almost 12,000 applicants to fill approximately 2,000 freshman-class openings. Because the screening of candidates is highly competitive, the Academy is able to select superior high school performers (fig. 1).

<i>Achievements</i>	<i>Percentage of Class</i>
Valedictorian	9
Class President	13
Boys/Girls State	21
Scouts	46
National Honor Society	74
Athletic Letter Award	82

Source: *US Air Force Academy Catalog, 1985*, US Air Force Academy, Colorado, 71.

Figure 1. Typical Breakdown of Academy Class High School Achievements.

The USAFA evaluates candidates based on numerous academic and nonacademic criteria that are combined to form a "whole-person" score. The composite consists of academic and leadership components.

The academic component constitutes the major portion of the whole-person score. It includes Scholastic Aptitude Test (SAT) or American College Test (ACT) scores, with math composites weighted more heavily than English or verbal composites, plus high school academic records, including grades, rank in class, and college courses taken (fig. 2). Honors and advanced placement courses usually give the candidates extra credit.

<i>Academic Test</i>	<i>Category</i>	<i>Minimum</i>	<i>Average</i>	<i>Maximum</i>
SAT	Verbal Aptitude	500	551	600
	Math Aptitude	550	619	800
ACT	English	21	27.6	33
	Social Studies	none	26.5	36
	Mathematics	24	29.3	36
	Natural Sciences	none	29.5	35

Source: *US Air Force Academy Catalog, 1985*, US Air Force Academy, Colorado, 72.

Figure 2. Average Academic Test Scores from a Recent Academy Class

The leadership component of the whole-person score consists of athletic activities and nonathletic leadership or initiative indicators. The athletic activities include varsity letters earned, all-league or all-state recognition, or selection as team captain. The nonathletic indicators include participation in student government, scouting, and the Civil Air Patrol; leadership in clubs; and performance in after-school jobs. The leadership component also includes applicant performance on the Candidate Fitness Test (CFT), which consists of physical exercises designed to measure coordination, strength, endurance, speed, and agility. Applicants are scheduled for the CFT after they are nominated and meet all other minimum qualifications for admission. The CFT is usually given at military bases around the country and consists of pull-ups, sit-ups, push-ups, and a 300-yard shuttle run. Failure to receive a satisfactory score (varies according to supply and demand) on the CFT disqualifies applicants from admission; however, minimum scores are not very difficult to obtain (fig. 3).

<i>Exercise</i>	<i>Men</i>		<i>Women</i>	
	<i>Minimum</i>	<i>Average</i>	<i>Minimum</i>	<i>Average</i>
Pull-ups	3	10	1	2
Sit-ups (2 minutes)	39	73	36	70
Push-ups (2 minutes)	11	40	4	25
300-yd shuttle runs (seconds)	64.7	60.2	78.6	68.3

Source: *US Air Force Academy Catalog, 1985*, US Air Force Academy, Colorado, 85.

Figure 3. Typical Candidate Fitness Test Scores.

The Academy is the only commissioning agency to use a physical fitness screening device. AFROTC and OTS cadets undergo some physical activities as part of their training, but no physical fitness test is required as

part of the selection process. Only significant problems manifested during training result in elimination from the programs.

Candidate selection panels, comprised of officers assigned to the Academy staff, review completed applicant files. Candidates are evaluated primarily on academic and leadership potential as well as other indicators of motivation and aptitude. The panels list candidates in order of merit based on whole-person scores, then the Academy Board, chaired by the superintendent, appoints candidates to fill available cadet vacancies in each of the nomination categories.

Academy cadets are admitted to the general course of study and are allowed to select major and minor disciplines as they progress. During the four-year program the rigors of Academy life and the demand for high-quality performance in academic, military, and other activities result in a 40-to-50 percent attrition rate. Of the nearly 2,000 cadets who are appointed to the freshman class, only 900 to 1,000 actually graduate. Some officials consider the high attrition rate as an extensive screening process to assure that only the superior cadets receive commissions from the Academy. Traditionally, over 70 percent of the cadets qualify and are selected for flying duties as pilots or navigators, regardless of their major discipline or degree. The other cadets are guided toward scientific, engineering, and technical fields commensurate with their majors, while a few are allowed to enter nontechnical career fields, generally to fill positions related to combat support. Very few cadets are allowed to enter other, noncombat-related support specialties.

Since Academy graduates begin active duty the day they are commissioned, every effort is made to assign them to flying or technical training classes within 30 days of graduation. This means they are placed in classes in the early summer, with little classification decision making required. Officials at the Air Force Military Personnel Center, Officer Accession Branch (HQ AFMPC/DPMPO), process most of the Academy graduates for flying or technical training classes and coordinate, on a case-by-case basis, classification of the few graduates who request and are recommended for duty in support career fields.

Air Force Reserve Officer Training Corps

AFROTC produces the greater number of new officers during normal peacetime operations. In 1973, when draft/deferment-motivated enrollments ended, AFROTC established active recruitment programs to enroll candidates for commissioning. To make the task even more difficult, AFROTC was directed to concentrate primarily on enrolling students pursuing engineering, technical, or scientific degrees. This challenge was met through AFROTC scholarships, which were awarded based on the needs of the Air Force and cadet qualifications (academic discipline primarily, with emphasis on engineering and technical fields of study). In 1984 ap-

proximately 87 percent of the 7,000 AFROTC scholarships were held by students majoring in scientific, technical, or engineering disciplines.

The number of applicants for pilot or nontechnical categories generally exceeds the number required. This means that AFROTC can be highly selective in those categories. There are times, however, when the need to keep the program functioning causes the staff to increase enrollment, resulting in a lowering of cadet standards. Also, when schools have plenty of applicants, AFROTC accepts more lesser-qualified candidates.³

AFROTC uses a complex comparative analysis system to select qualified entrants into the final two years of the commissioning program.⁴ The system, called the Weighted Professional Officer Course Selection System (WPSS), is a management system which establishes the minimum qualifications of an applicant for entry into the professional officer course (POC)—conducted during the applicant's junior and senior years in college.⁵ The goal of this system is to enable the Air Force to manage and maintain, through controlled selection criteria, a high-quality reserve commissioned officer force. A qualified applicant is one who meets the following minimum standards:

1. Receives a quality index score (QIS) of 65 or higher. The QIS is a measurement of overall quality and is based on the weighted factors of the WPSS. It consists of a unit commander rating which includes the applicant's ranking among cadets in the detachment, grade point average, score on the SAT or ACT, and scores on three composites of the Air Force Officer Qualifying Test (AFOQT): academic aptitude, quantitative, and verbal.

2. Meets or exceeds AFOQT composite scores in required categories. All applicants must have an AFOQT verbal composite score above 15 and a quantitative composite score above 10. Pilot candidates must score above the 25th percentile of the pilot composite and above the 10th percentile on the navigation composite, with the total of the two composites being at the 50th percentile or higher, and meet the verbal and quantitative composite requirements. Navigator candidates have similar requirements, with the pilot and navigation composite minimums being reversed. Applicants for nonflying duties must take the entire test and meet only the requirements on the verbal and quantitative composites.⁶ These are minimum passing scores; actual average composite scores of selectees have been above 60 in recent years.⁷

3. Attains a grade point average (GPA) of 2.0 or higher on a 4.0 scale. Average GPA for selected candidates recently has been above 3.0.

4. Receives approval of required waiver actions (e.g., civil law involvements, age, reenlistment codes, minimum AFOQT scores, and others).

5. Receives medical certification for enrollment category (is desired but not required for selection); receives medical certification before enlistment in the POC.

AFROTC headquarters centrally selects POC applicants from those nominated by detachment commanders during established central selection boards held between November and May each year. Boards convene monthly until recruiting objectives are met.⁸ The board places the selectees into one of the following categories: pilot, navigator, missile, engineer, scientific-technical, and nontechnical. The placement category determines the type of summer field training cadets will receive and narrows their career-field selection upon commissioning.

Officer Accession Branch handles the classification and accession process for cadets to extended active duty (EAD). They classify, train, and assign cadets primarily on the basis of Air Force needs and technical training available at the time they enter EAD, although efforts are made to place individuals in career fields closely related to their academic backgrounds and personal desires.⁹ Officer Accession Branch classifies individuals based on data from the AFROTC Form 53, Academic Information, and cadet desires. This form contains identification data, academic degree, major and minor fields of study, scheduled date of commissioning (DOC), cumulative GPA, AFOQT composite scores, and a breakdown of academic classes completed, with number of hours taken and grades received. The reverse side of the form allows for cadet input to the process; the cadet can list up to three preferences for Air Force specialty code (AFSC), major command assignment, and base assignment. The form also provides space for the cadet to include remarks on what he or she can do best for the Air Force, with rationale to support those preferences. There is also a block for commander's remarks, in which the professor of aerospace studies (PAS) comments as to appropriateness of desired AFSCs and provides observations of cadet performance.

The AFROTC Form 53 is the primary document used to make the classification decision, although transcripts, training records, and other data are available. Detachments send the forms to the Officer Accession Branch six months prior to the individual's commissioning date; the branch reviews documents and makes classification decisions about three months prior to DOC. Career-field classification is considered first, with base, accession timing, and MAJCOM factors weighed later. The AFROTC Form 53 is reviewed to determine the cadet's specialty qualification and career-field preferences and to identify course work that fits Air Force needs for other specialties. After a classification decision is made in the Officer Accession Branch, the cadet selection record is routed to the gaining career-field resource manager who makes an assignment based on technical training requirements, projected vacancies, and cadet base preferences. The branch then decides when the cadet is ordered to EAD, considering such factors as travel time, start date of required technical training or projected assignment, and personal preferences. Most nonrated line officers are ordered to EAD within 160 days after commissioning.¹⁰

Branch personnel use a manual process for classifying AFROTC cadets. The process begins when the decision is made as to cadet category, but the

actual selection of AFSCs takes place as the AFROTC Forms 53 come in, based on projected requirements in each of the Air Force Reserve specialty codes (AFRSC) divided by category. Given this first-come, first-served system, it is very likely that excellent candidates in some AFSCs will not receive certain classifications because the specialties were assigned earlier to lesser-qualified candidates.

Air Force Officer Training School

Selection boards at Headquarters United States Air Force Recruiting Service (USAFRS) screen candidates for OTS. Based on application files forwarded from recruiting offices, the boards establish an order of merit ranking list and designate selectees, using accession training quotas as the basis for the number of applicants selected. From approximately 10,000 applications reviewed each year, the boards select between 2,200 and 2,500 OTS candidates. In fact, monthly boards review 800 to 1,000 applications.

Since OTS requires the shortest lead time and production time, it is easier to manipulate than the other commissioning sources. Therefore, the Air Force uses OTS to produce graduates to enter technical training during periods when fewer AFROTC and USAFA graduates are available. For example, during the summer months, when USAFA and AFROTC graduates are entering active duty, OTS graduates fewer cadets (approximately 120 cadets per class, starting every three weeks). However, during the fall and winter months, OTS produces more graduates because of a reduction in USAFA and AFROTC graduates.

Air Training Command establishes specific minimum criteria for OTS selection. Although the board screening process results in selection of candidates with qualities well above the minimums, the boards consider all applicants who meet minimum qualifications. Also, to give recruiters a better idea of the quality of candidates selected, the Air Force summarizes and sends the results of the boards to them in the form of a composite profile of the average selectee's credentials: AFOQT scores, college major, GPA, and other data.¹¹ Recruiters can then use these composites as benchmark for encouraging well-qualified applicants or for counseling and even discouraging applicants with inadequate qualifications.

Boards attempt to select candidates by category (technical, nontechnical, engineer, pilot, and navigator), but they make no attempt to classify applicants into particular career fields. After a board has rank-ordered all applications and a cutoff score has been established, the Officer Accession Branch makes classification decisions based on the needs of the Air Force, availability of technical training slots, applicant qualifications (read transcripts), and applicant preferences. Applicants who volunteer for hard-to-fill AFSCs usually receive those specialties if they meet minimum entry standards and educational requirements. When the classification process is completed, the Air Force notifies the applicants as to their

acceptance and potential career field—unlike AFROTC cadets, OTS applicants may decline the offer. For this reason the OTS selection rate is higher by about 5 to 10 percent to cover the “front door” attrition caused by those who decline.¹²

The USAFRS uses a computer “TILT” model to score applicant files and validate board results based on GPA, AFOQT, age, possession of a pilot’s license, and technical or nontechnical degree. Boards consider the same information plus actual application forms filed by applicants and endorsed by a recruiting officer, justification for any needed waivers, college transcripts, résumés (optional, but highly recommended), and letters of recommendation. Interestingly enough, the Air Force Human Resources Laboratory at Brooks AFB, Texas, has developed a computer-based algorithm to model selection board decisions; but the computer routine is not yet being used in the evaluation and selection of applicants.¹³

Availability of Applicants

Because of the current economic situation, the national mood toward military service, and the relatively high status of the Air Force among the military branches, applicants for commissioning are plentiful and of high quality. But in the recent past this was not the case—in the late seventies and early eighties, some less-qualified applicants were commissioned through AFROTC and OTS. In fact, some demographers predict recruiting problems in the future as the number of commissioning-aged young men diminishes. Since 1982, the number of males between the ages of 18 and 23 has been declining, dropping from over 13 million to about 12 million in 1986, and it is projected to be 11.4 million in 1990 and as low as 10 million in 1994, after which a gradual increase should begin.¹⁴ However, in 1985, an Air Force special study team opined that the 18- to 23-year-old male cohort decline would not be a problem because of the additional numbers of women and aliens entering the work force and because of noted increases in male college enrollments. The team even projected a 3 percent rise in quality recruits.¹⁵

The special study team’s projections were based on a continuing requirement for about 7,500 new Air Force line officers each year. Not addressed in the study was the possibility of full mobilization, perhaps even connected with a return to involuntary conscription, as would be required in case of a large-scale conflict or war. Such a mobilization would require changes in accession and classification standards and rapid processing of candidates for commissioning. From these discussions on how initial classification is handled for line officers commissioned through the USAFA, AFROTC, and OTS, it is apparent that there is a lack of scientific or programmatic systems for assessing candidate qualifications, psychological factors, and preferences, and for matching these indicators to the needs of the Air Force. “None of the officer production agencies conducts psychological testing as

such; they apparently rely on subjective evaluation of performance during training as a psychological aptitude predictor."¹⁶

Coordination among Commissioning Agencies

Because of the independent nature of their projection programs, agency managers have cooperated in varying degrees over the years. To ensure that this coordination continues, the Air Force schedules yearly line officer procurement strategy conferences. The conferences—with participants from the officer procurement and commissioning activities, the Air Staff, Headquarters Air Force Military Personnel Center (AFMPC), Headquarters Air Training Command (ATC), and the Air Force Institute of Technology (AFIT)—provide the Air Force with an opportunity to update and make necessary adjustments to strategies for procuring quality line officers. For instance, the conference objectives for the 1984 meeting were as follows:

- a. Discuss capabilities of the commissioning sources.
- b. Develop the FY 87 AFROTC production objectives by category, race, sex, academic degree, and technical requisite.
- c. Review and adjust as necessary FY 85 and FY 86 AFROTC and OTS production objectives and the production balance between the two sources.
- d. Develop and review accession strategies for the "hard-to-get" kinds: i.e., engineers, mathematicians, missileers, navigators, [and] minorities.
- e. Discuss special areas of concern; e.g., engineer, technical, nontechnical, and minority production and accession numbers.
- f. Review AFROTC scholarship usage and provide guidance for future use.
- g. Review accessions process.
- h. Review precommissioning/commissioning reports.
- i. Provide retention update.¹⁷

During the conferences representatives provide briefings and discuss programs and limitations that have an impact on officer projection such as policy changes, budgetary considerations, production forecasts, production potential, quality comparisons, attrition experience, minority officer recruiting, training facilities, and others. Primary conference results include adjustments to production goals and estimates for the current and next fiscal year, development of production goals for the fiscal year after that, and estimates of production predictions for the following fiscal years. Over the years, the conference program has resulted in more consistent production levels for AFROTC and OTS, thereby reducing the need for short-notice changes in recruiting goals, school schedules, and faculty strength.

Proceedings of the annual conferences also influence future officer classification in that decisions are made on how many technical or nontechnical degree earners are given scholarships, and whether engineers are placed in nonengineering career fields. For example, included in fiscal year 1985 conference recommendations are the following AFROTC production objectives for fiscal year 1987 (fig. 4).

Category	Officer Vacancies
Pilot	1,000
Navigator	475
Missileer	100
Engineer	750
Scientific/Technical	475
Nontechnical	500
Total	3,300

Source: Minutes of the Academy Conference on Officer Production, 1987, p. 10. (The Academy, 1987, p. 10.)

Figure 4. Air Force Officer Production Objectives for Fiscal Year 1987

Also recommended at the conference were goals for minority and female officer production and changes to academic degree guidance to allow pilots, navigators, missileers, and nontechnical support officers to come from any academic discipline on a high-quality, best-qualified basis.

Initial Classification

Other than college entrance examinations, the AFOQT is the only aptitude test used for officer selection. It is a paper-and-pencil aptitude test battery that measures aptitudes used to select candidates for officer commissioning and for pilot and navigator training. In practice, all uses of the AFOQT involve prediction. By measuring aptitudes of candidates prior to selection, the AFOQT provides substantial information for making personnel decisions. It assesses aptitudes required of student pilots and navigators, students in technical training, and officers in general. The AFOQT contains 380 test items, from which 16 subtest scores are obtained; each of the subtests consist of 15 to 45 questions requiring a time limit. The entire AFOQT takes five hours to administer. To control test compromise and to keep terminology current, the Air Force revises the test regularly. Since the test was introduced in 1953, it has been revised 15 times.

The Air Force does not use interest assessment inventories or procedures to make classification decisions; however, applicants may indicate their preferences. In some cases, the classification decision becomes more difficult because of erroneous or insufficient preference information. For example, some applicants apply for hard-to-fill career fields to improve their chances for selection, and others list only their first and second preferences and enter "needs of the Air Force" as their third choice. Also, physical fitness information is not available. Only the Academy requires physical fitness screening, although all officers are expected to maintain their physical condition and weight at the Army levels. Nevertheless, the problem is that certain career fields require officers to have above-average strength.

Reclassification

In addition to initial classification, the Air Force routinely and selectively reclassifies many officers one or more times during their career. Most career-field migration is voluntary and occurs as officers seek complete active duty commitments in their initial specialty. When such time they volunteer to retrain into other specialties they believe are more prestigious, are more in line with their experience or interest, or that offer opportunities for career advancement and assignment potential, approval of officer retraining is subject to career field management (losing and gaining career fields), availability of training, and coordination between the losing and gaining career field resource managers at the Air Force Military Personnel Center. Generally, resource managers try to recruit officers with better records and are reluctant to accept candidates for retraining who have less than "outstanding" records; therefore, many officers who would like to change career fields encounter problems in trying to transfer.

Other than voluntary retraining, the Air Force "selectively cross-flows" several hundred officers each year. Because of imbalances in manning among career fields, especially at the captain and major levels, the Air Force requires more officer retraining than can be accomplished with volunteers. Thus, AFMPC levies career fields with higher than average manning to provide certain numbers of officers for retraining into hard-to-fill career fields such as recruiting, weapons control, missile operations, and officer training. Since 1982 the total officer levy has declined from nearly 600 to less than 400 in 1986 and is projected to approach 300 in the next couple of years.¹⁸ This decline is the result of careful management of career-field allocations, including tighter control of initial classification into the harder-to-fill career fields. Selection of officers to fill the levies is again a negotiation process between resource managers. Levied career field resource managers usually try to recruit volunteers to fill their requirements, but involuntary selection has usually been necessary.

Neither of these retraining procedures involves any additional measurement of candidate aptitude, interest, or psychological affinity for the new career field. Decisions are usually based on candidates' records of performance in their present or previous career field and whether they possess the minimum qualifications for the new career field (such as physical requirements, mandatory courses or degrees, and experience).

Current Air Force procedures for line officer classification are quite good. From all the officers selected, the majority of those who remain in the Air Force beyond their initial period of obligated service progress quite satisfactorily through the rank structure, and superior leaders emerge from all career fields (there are over 30 line officer career fields). However, there are more efficient and better ways to make classification decisions, but they involve changes to current procedures. The next chapter discusses some personnel assessment possibilities.

Notes

1. Maj Richard W. Stokes, Jr., *Preserving the Lamberent Flame: Traditional Values and the USAF Officer Accession Program* (Maxwell AFB, Ala.: Air University Press, 1984), 31.
2. Minutes of the Fiscal Year 1982 Line Officer Procurement Strategy Conference conducted at Headquarters ATC, Randolph AFB, Tex., December 1985, B-2. (Hereafter cited as Procurement Strategy Conference minutes.)
3. Stokes, 35.
4. Ibid., 38.
5. AFROTCR 45-13, *AFROTC Entrance, Selection, Enrollment, and Reporting System* (Senior Units Only), 14 June 1985, 2.
6. AFR 53-27, *Officer Training School USAF (OTS)*, July 1985, table 3.
7. Procurement Strategy Conference minutes, F-25.
8. Ibid., 7.
9. AFROTCR 45-10, *Administration of Senior Air Force ROTC Cadets* (Senior Units Only), 1 August 1985, 248.
10. Col James P. O'Neill, Headquarters AFMPC/DPMA, to Col Howard T. Hanson, vice commandant, AFROTC, Maxwell AFB, Ala., letter, subject: Officer Initial Classification and Accession Process, 26 September 1985.
11. Stokes, 39.
12. Maj Gary Trendle, Headquarters USAFRS/RSOO, interview with author, 19 March 1986.
13. Lynn M. Scott, *Officer Training School Selection Algorithm*, AFHRL Report RS-84-16 (Brooks AFB, Tex.: Headquarters Air Force Human Resources Laboratory, October 1984), 7.
14. Procurement Strategy Conference minutes, C-14.
15. Ibid.
16. Stokes, 36.
17. Procurement Strategy Conference minutes, B-1.
18. Briefing, Headquarters AFMPC/MPCRSS2, Selection Cross-Flow Briefing Slide, 1986.

Chapter 3

Tests

Tests and other assessment instruments and processes are used in business, industry, and government as screening devices in personnel selection. In many cases, state, federal, and local civil service commissions rely heavily on tests in selecting government employees. Tests and screening inventories are also used in business and industry to assist management in decisions about placement and promotion of employees. Since World War I the military services have used tests. In fact, the first group tests of intelligence and personality were developed to meet the needs of the military. The tests were used not only to screen potential recruits and place personnel into training programs and occupational assignments but to identify recruits with the potential to become officers.¹ Some examples of military experiences in test development and its use are discussed next.

Military Testing

During World War I the military services needed a group intelligence test that could be given to a large number of recruits. Robert M. Yerkes headed the team of psychologists tasked with developing the test. The team created a paper-and-pencil test called Army Alpha, which consisted of eight subtests covering such areas as practical judgment, arithmetical reasoning, and analogies. After the war, versions of the group test were developed for nonmilitary use in business and education.²

Also, during World War I, the need for an efficient psychiatric screening device became evident. The research efforts to satisfy that need resulted in publication of the Minnesota Multiphasic Personality Inventory (MMPI), the most widely used personality inventory in the United States.³ A unique feature of the MMPI was that it had several "validity scales" designed to identify individuals attempting to distort the test.

Another area of testing for which the military provided much of the groundwork was in the assessment of aptitudes—measuring an individual's ability to learn certain skills and matching those skills to jobs. Currently, the United States military uses the Armed Services Vocational Aptitude Battery (ASVAB) for enlisted personnel recruitment. It is administered to all applicants for enlistment and to interested high school students each year.

The Air Force uses the AFOQT to assess candidates for officer commissioning programs. It measures aptitudes used to select officer candidates and individuals for pilot and navigator training programs. The AFOQT will be discussed in detail later in this chapter.

Assessment center methodology actually is rooted in military selection programs. The pre-World War II German military used the multiple-assessment approach, which remains a key concept of current assessment centers, to select officers. The British and American militaries also contributed to the technology during the World War II era; the British developed a better definition of leadership, used group-testing techniques such as leaderless discussion groups, conducted the first validation studies, and provided the first evidence of predictive validity. And the American Office of Strategic Services (OSS) used assessment centers to select candidates for positions ranging from secretaries to cloak-and-dagger specialists.⁴

Examples of Successful Assessment Programs

In a time when management costs are high, organizations can no longer afford the luxury of misplacing candidates in management positions. Thus, in selecting managers it is important to assess the aptitudes and potential of candidates. One argument against better assessment programs for the placement and promotion of personnel is that it is difficult to estimate the value of using the procedures. Two researchers in the field of human resource management estimate that the gross national product of the United States would be increased by \$80 to \$100 billion per year if improved personnel selection procedures were introduced. They based their estimate on a formula devised for figuring the dollar value of improved personnel placement. After evaluating a number of jobs in different organizations, they found that the standard deviation of job performance, as assessed by managers of the positions being studied, was equal to 40 to 70 percent of the average salary for the job. For a more conservative calculation, a figure of 50 percent of the average salary for the job, less the cost of administering the assessment program per employee, provides a reasonable estimate of the value of improved personnel selection and placement.⁵

During a period of expansion and diversification in the early 1950s, Standard Oil of New Jersey recognized the need for early identification of employees with the potential to become successful managers. Top management authorized a study to determine whether there were any techniques or methods not currently being used which could contribute to the identification of management potential. The study, referred to as the Early Identification of Management Potential (EIMP), formed most of the basis for executive selection and development testing.

The EIMP evaluated 443 midlevel managers using standardized tests, experimental instruments, personal history records, and interviews. The evaluation, including the interview, took an average of eight hours to

complete. After reviewing the data and results, program administrators changed the test battery to incorporate two important considerations. One consideration was the contribution of the test to the validity of the battery, eliminating overlap with other instruments. The second was ease of use—the intent being to release the testing instrument to the field for administration, eliminating the need for a trained psychologist on the staff. The revised test was named the Personnel Development Series (PDS) and consisted of the Miller Analogies Test (MAT), a new edition of the Non-Verbal Reasoning Test, the Temperament Survey, and an Individual Background Survey. The new battery of tests required about five hours to administer.⁶

By monitoring the success of candidates who had taken the test battery, it was evident that the PDS scores were closely related to appraisals of potential and to promotions. The PDS scores of the relatively young employees were closely related to the criteria of success when the criteria were based on an adequate number of observations. Consistency among the test scores, estimates of potential, and management ratings increased as candidates progressed in years of service.⁷

Success of management candidates can also be predicted through the use of assessment centers. The best-known assessment center project was established by Douglas Bray and his associates at AT&T. It was studied extensively between 1956 and 1964 and is still in use today. The purpose of the project was to pinpoint the cognitive, motivational, and attitudinal characteristics that have an impact on managerial careers. Bray and his colleagues put management candidates through a three-and-a-half day assessment period. The assessment involved a wide range of techniques including paper-and-pencil tests, an in-basket exercise, projective tests, clinical interviews, and participation in group problem solving and leaderless group discussions. For the next eight years data was collected on the subjects to determine their career progress. When the results were finalized, the assessment center method had correctly predicted success in middle management jobs for 82 percent of college graduates and 75 percent of noncollege graduates and had correctly predicted the lack of success of 94 percent of candidates who were not promoted.⁸

These two studies from industry show the value of comprehensive assessment procedures for the selection, placement, and promotion of management candidates; however, there are many more examples. Since Air Force officers start in or progress to management and leadership positions, it would seem logical that the Air Force could benefit from better assessment procedures in commissioning candidates, in reclassifying personnel, and in selecting personnel for positions or promotions.

Current Assessment Methods

This section provides a brief description of the various tests and procedures used by business, industry, and the military today to identify and

select management-level personnel. It covers intelligence tests, group intelligence tests, aptitude tests, personality assessments, interest inventories, honesty tests, the assessment center, and other items contributing to assessment.

Individual Intelligence Tests

Although the concept of intelligence has been used implicitly for a long time, methods to explicitly measure intelligence have only been developed in this century. These intelligence tests include the Stanford-Binet Intelligence Scale and the Wechsler Intelligence Scale.

Stanford-Binet Intelligence Scale. "The first practical intelligence test was developed in France by Alfred Binet and Théodore Simon between 1905 and 1911. A modern version of this test is still being used today, the Stanford-Binet Intelligence Scale." It has different forms and scales for 20 age levels, including one scale for "average adult" and three scales for "superior adult." Administration, scoring, and interpretation of the Stanford-Binet is performed by a trained examiner on an individual basis. It takes up to 90 minutes to administer and has detailed instructions for proctoring and scoring, including the order in giving each of the component tests. The Stanford-Binet measures current mental functioning and is influenced by the environment and heredity. Although there are several adult scales for the Stanford-Binet, it is mainly used in assessing the IQ of mentally retarded children and adults. It does not appear to be useful for testing all adults, particularly those of superior intelligence.⁹

Wechsler Intelligence Scale. To provide an intelligence test for adults, David Wechsler published the Wechsler-Bellevue Intelligence Scale in 1939 and the Wechsler Adult Intelligence Scale (WAIS) in 1955; a revised edition, the Wechsler Adult Intelligence Scale-Revised (WAIS-R) was published in 1981. The revised edition consists of 11 subtests, with items of each subtest arranged and administered in order of difficulty. Like the Stanford-Binet, the WAIS-R must be administered by a trained examiner using detailed test instructions. It takes from 45 to 60 minutes to administer. The WAIS-R is highly reliable, with split-half reliability coefficients above 90 percent. Research evidence also supports the validity of the Wechsler IQ test.¹⁰

Group Intelligence Tests

Individual intelligence tests—such as the Stanford-Binet and Wechsler Adult Intelligence Scale-Revised—may be the best methods of assessing intellectual function but their use is limited (only one person can be tested at a time) and they must be given by a trained examiner. Also, they are considered costly to administer in terms of time and money, especially when large groups of people need to be tested. For these reasons paper-and-pencil tests of intelligence have been developed for group administration. For

example, the development of the Army Alpha Test is considered by some experts to be the grandfather of group intelligence tests.

Today, several varieties of group tests are used. Scholastic aptitude tests are designed to predict academic success. Screening of candidates for jobs in business and industry is the purpose of several other group tests. In both cases, the goal of management is accurate prediction of academic or job success, rather than a representative sampling of intellectual abilities. Generally, the scores on these group tests have a high correlation with scores on individual intelligence tests.¹¹

Aptitude Tests

Job success depends on workers having the skills and aptitudes needed to perform the duties of the job effectively. Aptitude tests or batteries of tests provide scores that are related to success in various jobs. High schools and colleges use these tests extensively for educational and vocational counseling, the military for screening candidates for enlistment, and business and industry for screening applicants for employment. Some aptitude tests were also developed for evaluating and placing candidates in management positions. Selected examples of aptitude tests are discussed next.

Differential Aptitude Test. The Differential Aptitude Test (DAT) is widely used by college and university counseling centers. Originally published in 1947, the most recent version of the DAT was released in 1982. The battery consists of eight separate tests presented in multiple-choice format. The entire battery of tests takes about four hours to administer. Its primary purpose is for counseling high school students about vocational or educational choices. The DAT is highly reliable and its validity appears to be very good (based on earlier versions).¹²

General Aptitude Test Battery. Developed by the US Employment Service to aid in occupational placement of adults, the General Aptitude Test Battery (GATB) provides useful information in relating aptitudes to performance in several thousand occupations. It consists of 12 tests and takes about two-and-a-half hours to administer. Naturally, state employment offices use this testing instrument.¹³

Air Force Officer Qualifying Test. The Air Force Officer Qualifying Test measures aptitudes used to select candidates for officer commissioning programs such as Officer Training School (OTS) and Air Force Reserve Officer Training Corps (AFROTC). It is also used for selection of candidates into pilot or navigator training. Additionally, other tests have been derived from the AFOQT to meet special military needs. The Air Force developed the first AFOQT in 1951 by combining an aptitude test—the Aviation-Cadet Officer-Candidate Qualifying Test—with a selected group of paper-and-pen-

cil subtests from World War II to new classification batteries. After test validation studies, the Air Force introduced the AFQT in 1953. Normally, the Air Force revises the test about every three years.¹⁴

The current version of the AFQT consists of 380 test items and takes five hours to administer. It is divided into 16 subtests into which items are organized and from which scores can be derived.¹⁵ In 1983 the Air Force required all examinees to complete all portions of the test regardless of the program for which they were being tested. Before that, nonaviation examinees were exempt from the general knowledge and navigator portions of the test.¹⁶ Scores from the subtests are combined into five major composite scores: pilot, navigator, verbal, quantitative, and academic aptitude. Candidates for commissioning programs must obtain minimum scores on the composites to qualify; however, attainment of minimum scores does not necessarily mean an individual is competitive.¹⁷ According to today's Air Force standards, candidates with minimum composite scores would not be competitive for selection. For example, current recommended composite scores for OTS are as follows: academic aptitude—60, verbal—60, quantitative—50.¹⁸ However, most applicants being accepted today have academic aptitude percentile scores in the 1980s and 1990s.

College-Level Aptitude Tests. Probably the most common use of aptitude tests is to screen applicants for college; and most colleges and universities use standardized testing programs, rather than trying to develop their own tests. Two prominent national testing programs associated with admission to undergraduate studies are the American College Testing (ACT) program and the Scholastic Aptitude Test (SAT). The Air Force uses the scores from either or both of these tests to screen applicants for entrance into the United States Air Force Academy and for admission to the Reserve Officer Training Corps. Officer Training School may consider the scores in the evaluation of candidates, but such use is not specified as part of the assessment process.

American College Testing Program. First introduced in 1959, the American College Testing Program is used by many colleges and universities in the Midwest and by relatively few on the East and West coasts. The complete battery of tests consists of three parts: academic tests, consisting of four tests; an interest inventory; and a student profile section. The interest inventory includes 90 items measuring student interest in six different academic and vocational areas. The student profile section gathers 192 items of information about a student's background, plans, and demographic characteristics. When the applicants register for the academic tests, they complete these last two sections.

The academic tests are administered five times each year at about 15,000 locations to about one million students. The four tests are timed, and the battery takes about four hours to administer. The tests measure academic abilities in English, mathematics, social studies, and natural sciences. They evaluate students' reasoning abilities and their knowledge of the

subject matter, making the ACT an achievement test as well as an aptitude test. The ACT has proven to be highly reliable and appears to have predictive and construct validity in that it predicts college grade point average (GPA) and is a measure of academic potential.¹⁹

Scholastic Aptitude Test. Introduced in 1926, the Scholastic Aptitude Test is administered annually to nearly one-and-a-half million high school juniors and seniors who plan to apply for college. The battery of tests consists of six sections of multiple-choice items designed to measure general verbal and mathematical abilities. It takes about three hours to administer. The SAT has proven to be a highly reliable testing instrument. Its content and predictive validity have been established in that it predicts college GPA and scores correlate well with academic achievement in college. However, according to John R. Graham and Roy S. Lilly, experts on psychological testing, "Although the SAT and other aptitude tests can predict college GPA, they are not good predictors of later, nonschool accomplishments."²⁰

Postcollege Aptitude Tests. Since advanced training and education are needed in our technological world, other aptitude tests were developed to screen candidates for graduate programs. Two well-known and widely used entrance tests for graduate school are the Graduate Record Examination (GRE) and the Miller Analogies Test. Additionally, the results of these aptitude tests could be used in the selection and placement of management personnel.

Graduate Record Examination. The GRE has been administered to students since 1937 and was revised in 1981. Nearly 30,000 applicants for graduate school take the GRE each year. All applicants take the three-and-a-half hour aptitude test, and many also take a three-hour specialized achievement test covering their area of undergraduate study. The aptitude test consists of seven sections with multiple-choice test items of four types: antonyms, analogies, sentence completion, and reading comprehension. It reports scores for verbal ability, quantitative ability, and analytical ability. The test is very reliable and content validity is high. As to predictive validity, there is research indicating the GRE is useful in predicting success in graduate school.²¹ For organizational purposes, however, a correlation of scores with career success would be more valuable.

Miller Analogies Test. The MAT is used by many universities as an aptitude test for graduate school admission and by many businesses in screening applicants for management positions. The test, which appears in several forms, consists of 100 sets of analogies and takes 50 minutes to administer. Test items are based on various areas of knowledge such as literature, biology, history, and general information. The items are of varying difficulty so that individuals of high ability are challenged. In fact, the publisher of MAT provides educational and industrial norms. The reliability of the test is quite good and its validity has been supported by

several studies since 1970.²² The MAT measures verbal reasoning and consists of multiple-choice analogies. It may be hand scored by the examiner or machine scored. However, use of the MAT is subject to a licensing arrangement with the publisher, the Psychological Corporation.²³

Personality Assessment

Of the many different definitions of personality, Benjamin Kleinmuntz provides one of the most useful descriptions: "The term personality refers to the unique organization of factors which characterize an individual and determine his pattern of interaction with the environment."²⁴ Factors in this definition include a variety of characteristics such as needs, fears, reactions to stress, self-perceptions, and perceptions of others. Personality tests attempt to measure these characteristics. They are used to learn how a person usually behaves in a situation or class of situations.²⁵

Personality tests can be projective or objective. Projective personality tests use ambiguous stimuli such as inkblots and unstructured, open-ended response formats. They are more difficult to administer and to interpret and usually require one examiner for each subject. Objective personality tests have clear and definite stimuli with limited response choices. They can be administered to groups and by examiners with no psychological training; however, interpretation of the test results usually requires specialized training.²⁶

Projective personality tests are not discussed in this study because they are difficult to administer and interpret. However, there are several objective personality assessment inventories that should be examined because they are successfully employed in management placement batteries and because they might have value as part of an overall assessment battery for officer selection and placement.

Minnesota Multiphasic Personality Inventory. The MMPI is the most widely used self-report personality inventory. First published in 1942, it has been the topic of voluminous research. It is used in many professions "as a diagnostic aid, as a screening device, as a counseling . . . tool, and as a research instrument." Consisting of 550 self-descriptive statements—in which subjects answer yes, no, or cannot say—the inventory takes about an hour to administer. Scores are given for 10 clinical scales and for four validity scales. The scales are based on a general population norm group. The test is computer scored, and a program is available to provide a computerized interpretation of MMPI profiles. For example, when item responses are entered, the computer can score the test, print a copy of the test profile, look up the appropriate descriptive comments, and print an interpretation of the scores.²⁷

Gullford-Zimmerman Temperament Survey. The Guilford-Zimmerman Temperament Survey measures 10 personality traits and temperament characteristics and yields scores for three validity scales. It is used for personnel selection, vocational guidance, and clinical practice. This

paper-and-pencil survey consists of 300 items that examine 10 factor-analytically derived traits which are uniquely measurable—such as general activity, restraint, sociability, emotional stability, objectivity, and others. It is an untimed instrument that normally takes 45 minutes to administer. An examiner is required. Survey responses can be hand scored or machine scored. Materials are inexpensive and may be obtained from the publisher, Sheridan Psychological Services, Inc.²⁸ Reliability of the survey compares favorably with other personality scales.²⁹

California Psychological Inventory. Another instrument designed to assess normal personality, as opposed to the MMPI which was originally designed to measure abnormal personality, is the California Psychological Inventory (CPI), published by Consulting Psychologists Press. "The CPI consists of 480 statements, including some MMPI items, that are presented in a format similar to the MMPI."³⁰ The CPI yields 18 scales, of which three are validity checkers. Hand scoring of the inventory is possible, but sophisticated computer routines are available to provide profile sheets and interpretation assistance. The reliability of the inventory is high and its validity is documented—validity percentages are higher when scores are compared to criterion measures.³¹ Separate norms are provided by sex for high school and college samples.

Edwards Personal Preference Schedule. The Edwards Personal Preference Schedule (EPPS) is designed to assess the relative strengths of 15 type needs, which are based on Henry Murray's list of manifest needs.³² It is a self-report inventory consisting of 225 items presented in forced-choice pairs. The developer designed the inventory to control the effects of social desirability—the probability that a subject would select the item based on perceived social standard rather than responding to the content of the test item. The inventory incorporates this control factor by pairing equally desirable or undesirable alternatives, each of which measures different traits.³³ The EPPS takes about 45 minutes to administer and can be hand or machine scored. Norms are available for college students and adults. Reliability of the EPPS is high, but studies of its validity are inconclusive. One problem with the instrument is that the scores do not provide information about the strength of individual needs as compared to other persons.³⁴

Sixteen Personality Factor Questionnaire. Raymond B. Cattell developed the Sixteen Personality Factor Questionnaire (16PF) to define and measure the components of human personality.³⁵ The 16PF yields 16 scores on primary personality factors and four scores on secondary factors.³⁶ The questionnaire scales are unidimensional, with high and low scores representing opposite characteristics. Primary personality scales include reserved versus warmhearted, humble versus assertive, trusting versus suspicious, practical versus imaginative, and other characteristics. Secondary personality scales include introversion versus extroversion, low

anxiety versus high anxiety, and many others. To assess test-taking attitudes, scales are developed to detect test fraud. Forms A and B of the inventory, normally used with well-read adults, consist of 187 items and take about 50 minutes to complete. Hand scoring of the questionnaire is possible, but computer scoring and interpretation is preferred. Norms are available for men, women, and combined categories at the high school, college, and adult level. "The 16PF is an instrument that has been researched thoroughly. It is second only to the MMPI in number of research references between 1971 and 1978."³⁷ Some of the 16PF scales produce consistently higher reliability coefficients than others, and validity research is ongoing.

Myers-Briggs Type Indicator. "The Myers-Briggs Type Indicator (MBTI) is a forced-choice, self-report inventory that attempts to classify individuals according to an adaptation of Carl Jung's theory of conscious psychological type."³⁸ It classifies individuals in four areas: extroversion versus introversion, sensation versus intuition, thinking versus feeling, and judgment versus perception. There are 16 possible character types and each is defined by a unique set of behavior traits and tendencies. There are three versions of the MBTI, consisting of 50 to 166 forced-choice items. The test can be administered to groups and takes less than an hour to complete. Hand or computer scoring is possible, and computer routines are available to perform calculations and provide descriptions of the subjects. The inventory is reliable and its results correlate favorably with other personality inventories.

All of these factors—the explosion of research reports, the normality of test items and type descriptions, the positive nature of the instrument, the ease of administration and scoring, the usefulness of the theory, the development of the support organization, the publishing of a dedicated journal—have shared a role in the wide acceptance of the MBTI.³⁹

Interest Inventories

Numerous inventories have been constructed for use primarily with college-educated persons preparing for professional, technical, and managerial careers, for example, the Jackson Vocational Interest Survey and the Strong-Campbell Interest Inventory.⁴⁰ Interest inventories evolved from research started by E. L. Thorndike, J. B. Miner, and C. S. Yoakum in the early 1900s. In 1927 the Strong Vocational Interest Blank (SVIB), a product of Edward K. Strong, provided a comprehensive inventory of interests with scoring keys empirically developed to contrast responses of persons in different occupations with a general reference group. The Strong-Campbell Interest Inventory, the present version, is used for assessing vocational interests.⁴¹

Strong-Campbell Interest Inventory. The Strong inventory is the most widely used and studied psychological inventory. Today's version, the

Strong-Campbell Interest Inventory (SCII) is the most frequently used test at university counselling centres.⁴² It is a self-administered questionnaire.

First, a person will be asked to select five occupations that he or she thinks he or she enjoys. Second, people will be asked to select five occupations that are successful like that. Occupations that are selected in both categories remain fairly permanent from early adulthood to middle adulthood. Third, people who select the same responses as did the majority of people in the same occupation.⁴³

The SCII is criterion-related validity test. It is used on standard groups of successful people in various occupations. Its purpose is to predict the interests of students. The SCII is a self-administered test and is used for assessing an individual's interest in various occupations. It has 162 occupational scales (many developed since the original manual was revised in 1981).⁴⁴ Examples of items on the SCII are "I like" or "dislike" to test items on occupational activities, tasks, or occupations. The computer analyzes the responses to the items and the score profiles on several scales, and provides information on the person's interest. The test takes about 25 to 30 minutes to complete and may be self-administered.⁴⁵

Reliability of the SCII is generally good. It is reliable, even over a three-year period. The SCII has been found to produce correlations of about 70 percent over a three-year period. About 80 percent. Graham and other experts agree that the SCII has good reliability, construct validity, and predictive validity. They also agree that "the SCII is the best vocational interest inventory available."⁴⁶ Although the SCII is considered by many experts to be the best inventory, other well-known inventories are also used.

Kuder Occupational Interest Survey. It is probably the leading alternative interest inventory to the SCII. It is the Kuder Occupational Interest Survey (KOIS), published by the Educational Testing Service. Recently revised, the KOIS also has general, college, and occupational scales.⁴⁶ It is a 100-item paper-and-pencil test. The test consists of a list of three activities or three subject areas. The activities are ranked and most liked. It takes 30 to 40 minutes to administer. The test sheets are computer scored. Subjects are provided a report with their scaled scores indicating their interest in 126 specific occupational groups and 48 college major groups. Interpretative information follows the report.⁴⁷ According to Donald G. Zytowski, the KOIS has good reliability and predictive validity.⁴⁸ It appears best suited for use with high school or beginning college students on field of study or for advising adults on vocational choices.

Jackson Vocational Interest Survey. The Jackson Vocational Interest Survey (JVIS) was constructed to help evaluate career interests of high school and college students and adults. It is generally used for educational and vocational planning and counselling, and for personnel placement. The JVIS is a paper-and-pencil test consisting of 289 paired statements covering 10 occupational themes: expressive, technical, enterprising, communicative,

and others. Test scores are reported as a profile of 34 basic interest scales and 32 occupational clusters. It can be administered to groups and takes 45 to 60 minutes to complete. Hand and computer scoring are possible.⁴⁹

One caution offered by Graham and other experts in interpreting interest inventories is that "persons may be content in an occupation even though their interests are not typical of the majority in the field."⁵⁰ Since individual interests are among the many factors to be considered in exploring career choices, interest inventories should be used with other screening devices for personnel selection.

Honesty Tests

Another area of personnel assessment currently important in business, industry, and the military is honesty. In this section I will discuss lie detector tests and paper-and-pencil honesty tests.

Lie Detector Tests. The efficacy of lie detector tests has long been a subject of debate.

Lie detectors have been a subject of controversy almost since the forerunner of the modern device was invented about 60 years ago. But with the arrest in June [1985] of four Navy men on espionage charges, the issue of using them to uncover spies or ferret out dishonest job seekers has come to the forefront of the debate about what should be done to stem the loss of defense and company secrets and dispel potential thieves in the workplace.⁵¹

There is a growing interest by government officials to require lie detector or polygraph examinations of more federally employed personnel, especially those with access to highly classified information. The controversy surrounding the use of the polygraph relates to its validity. Some people say the polygraph is not a lie detector—it is just a machine that measures physical symptoms. For example, the same physical signs that indicate lying to some observers may simply be manifestations of stress, so a person who is nervous about the experience may give a false positive reading while a person who lies easily may give a false negative reading. The American Polygraph Association maintains that if an operator is well trained and able to reach a conclusion about a person's truthfulness, the test will be accurate more than 90 percent of the time.⁵² Polygraph tests require a trained examiner and operator and must be administered individually, costing in excess of \$50 per examination. Also, they are illegal in 19 states. For these reasons at least 5,000 firms are using other types of honesty tests.⁵³

Paper-and-Pencil Honesty Tests. As an alternative to lie detector tests, firms have begun giving paper-and-pencil honesty tests. They are legal in all states and are much cheaper and easier to administer than polygraph examinations. Currently, there are but 24 paper-and-pencil honesty tests that attempt to assess integrity. Paul R. Sackett, an industrial psychologist, finds their validation evidence lacking but indicates that these tests are better than nothing. He reviewed 10 different tests and located 41 validity studies. Most of these studies reported statistically significant findings

supporting use of the tests. Because this is a new field, specific honesty tests are not detailed in this survey of psychological assessment instruments, but their use should be considered in the personnel assessment process. This discussion leads to the next topic, the assessment center, which incorporates several of the instruments or processes already discussed.

Assessment Center

As mentioned earlier, the first initial large-scale use in this country of situational tests and observer ratings for personnel assessment was conducted by the Office of Strategic Services to screen candidates for several undercover and counterinsurgency tasks in World War II. Today, Robert L. Thorndyke and Elizabeth P. Hagen report that in business and industry these assessment procedures are used largely in recruiting and appraising managers. They also report that more than 100,000 people were assessed by the Bell Telephone system and many others by major corporations.⁵⁴ Some sources estimate that about 2,000 US organizations use assessment centers as compared to 20 in 1970.⁵⁵

Traditional assessment centers administer paper-and-pencil tests and conduct job-related exercises for approximately six to 12 candidates. The candidates are sequestered and evaluated by three or more trained assessors who observe and report the subjects' behavior. Individuals participate in a series of situations that resemble those performed in the job. Assessors observe and rate the participants' behavior in management games, leaderless group discussions, role-playing exercises, and other activities. Then, they consolidate the ratings for each participant on the exercises and attempt to reach a consensus on predicting their management success.

Steve Cohen, executive vice president of Assessment Designs International, a Florida consulting firm, says that "the assessment center is the most effective single tool to evaluate potential, and the most legally valid."⁵⁶ The costs of operating assessment centers can vary from \$25 to \$500 per candidate, excluding staff salaries. However, Dennis Joiner concludes that "well developed and administered assessment centers can greatly improve a selection or promotion process, particularly for jobs requiring a variety of skills in a variety of situational contexts."⁵⁷

Other Items Contributing to Assessment

In the Standard Oil of New Jersey (SONJ) report, some data-collecting devices were mentioned that should be included in this study: the Individual Background Survey and the Non-Verbal Reasoning Test.

Individual Background Survey. The Individual Background Survey consists of items that apply to one's life from birth to graduation from college. It covers home and family background, education, vocational planning and experience, finances, leisure time activities, health history, and social and community relations. It measures such characteristics as

independence, maturity, self-direction, and certain kinds of vocational and avocational interests. This battery was developed for the SONJ early identification of managers project.¹⁰

Non-Verbal Reasoning Test. The Non-Verbal Reasoning Test measures abstract reasoning and is used primarily for job screening and selection of industrial workers and for college admissions.¹¹ References to this test, in *Tests in Practical Mental Measurements Yearbook*, contain little information about the instrument or its uses contained.

This chapter discussed initial, ongoing, successful assessment programs, and current personnel assessment instruments and processes. In fact, some of these instruments may be useful in assessing officer candidates and in selecting, classifying, and promoting officers. Chapter 4 examines some current Air Force efforts to improve evaluation procedures in these areas.

NOTES

1. John R. Graham and Roy W. Lilly, *Psychological Testing* (Englewood Cliffs, N.J.: Prentice-Hall Inc., 1981), 2-3.
2. *Ibid.*, 5-6.
3. W. B. Brown and J. M. McInnis, "Current Psychological Assessment Practices," *Professional Psychology* 7 (1976): 171-8.
4. "Assessment Centers: A Method with Proven Mettle," *Training*, July 1985, 69.
5. F. L. Schmidt and J. E. Hunter, "The Future of Criterion-related Validity," *Personnel Psychology* 33 (1980): 41-60.
6. Harry Laurent, "Early Identification of Managers," *Management Record*, May 1962, 33.
7. *Ibid.*, 36.
8. "Assessment Centers," 69.
9. Graham and Lilly, 77, 87, 89.
10. Frederick G. Brown, *Principles of Educational and Psychological Testing*, 3d ed. (New York: Holt, Rinehart, and Winston, 1983), 66.
11. *Ibid.*, 301, 293.
12. Graham and Lilly, 160-70.
13. *Ibid.*, 171.
14. R. Bruce Gould, *Air Force Officer Qualifying Test Form N*, AFHRL-TR-78-43 (Brooks AFB, Tex.: Air Force Systems Command, August 1978), 5.
15. Air Force Personnel Test 006, *Air Force Officer Qualifying Test*, 1 September 1985.
16. AFR 53-27, *Officer Training and Test* (OTST), 30 September 1981, table 3, rule 3.
17. ATCR 33-2, *Air Force Reserve Officer Training Corps*, 13 July 1984, 9.
18. Captain Higgabothern, post paper, Headquarters AFMPC/MPCAPPZ, 13 August 1985.
19. Graham and Lilly, 181.
20. *Ibid.*, 179.
21. *Ibid.*, 190-94.
22. *Ibid.*, 195-96.
23. Richard C. Sweetland and Daniel C. Keyser, *Tests: A Comprehensive Reference for Assessments in Psychology, Education, and Business* (Kansas City, Mo.: Test Corp. of America, 1984).
24. Quoted in Graham and Lilly, 207.

25. Ibid.
26. Ibid., 208.
27. Brown, 373-74, 380.
28. Sweetland and Keyser, 139.
29. Graham and Lilly, 270.
30. Brown, 381.
31. Graham and Lilly, 243-44.
32. Robert L. Thorndike and Elizabeth P. Hagen, *Measurement and Evaluation in Psychology and Education*, 4th ed. (New York: Macmillan Pub., Co., Inc., 1977), 666.
33. Brown, 385.
34. Graham and Lilly, 257-62.
35. Ibid., 250.
36. Thorndike and Hagen, 670.
37. Graham and Lilly, 255.
38. Quoted in Carl G. Willis, "Myers-Briggs Type Indicator," in *Test Critiques*, vol. 1, ed. Daniel J. Keyser and Richard C. Sweetland (Kansas City, Mo.: Test Corp. of America, 1985), 482-90.
39. Ibid., 490.
40. Sweetland and Keyser, 670-71, 811.
41. Graham and Lilly, 6-7.
42. Ibid., 298.
43. Ibid., 297-98.
44. Sweetland and Keyser, 811-12.
45. Graham and Lilly, 301-11.
46. Ibid., 311.
47. Sweetland and Keyser, 738.
48. Quoted in Brown, 382.
49. Sweetland and Keyser, 670-71.
50. Graham and Lilly, 311.
51. Abby Brown, "Employment Tests: Issues without Clear Answers," *Personnel Administrator*, September 1965, 50.
52. Ibid., 51.
53. Paul R. Sackett, "Honesty Testing for Personnel Selection," *Personnel Administrator*, September 1985, 67.
54. Thorndike and Hagen, 502.
55. "Assessment Centers," 69-70.
56. Ibid., 70.
57. Dennis A. Joiner, "Assessment Centers in the Public Sector: A Practical Approach," *Public Personnel Management* 13 (Winter 1984): 447.
58. Laurent, 10.
59. Keyser and Sweetland, 801.

Chapter 4

Air Force Efforts to Improve Personnel Selection, Placement, and Promotion

The Air Force is working to improve personnel selection, placement, evaluation, and promotion. Prominent organizations responsible for research in these areas are the Air Force Human Resources Laboratory (AFHRL) at Brooks AFB, Texas, which is part of the Air Force Systems Command; and the Air Force Occupational Measurement Center (AFOMC) at Randolph AFB, Texas, which is an organization of the Air Training Command. AFHRL has developed and applied procedures for creating models of judgment processes for over 26 years.¹ It researches and produces instruments for improving person-job matching and has an extensive data base for validation purposes. The AFOMC analyzes tasks and jobs to establish criterion measures for tests and to validate AFHRL instruments. Other Air Force research efforts include reports by Air Command and Staff College, Air War College, and US Air Force Academy students. Also, AFHRL and Harry G. Armstrong at the Air Force Aerospace Medical Research Laboratory, Human Engineering Division, Wright-Patterson AFB, Ohio, have developed procedures to measure enlisted and officer physical abilities and to relate physical characteristics to Air Force jobs. This chapter reports on some of the past, present, and future research activities for improving person-job matching.

Normally, users of personnel systems request research in a particular area. In the area of officer person-job matching, the primary users are Headquarters USAF, deputy chief of staff, personnel, Personnel Programs Directorate (HQ USAF/DPP), and Personnel Plans Directorate (HQ USAF/DPX); offices of the Air Force Military Personnel Center; Headquarters Air Training Command, assistant chief of staff for commissioning programs (HQ ATC/OC); US Air Force Recruiting Service, director of recruiting operations, Officer Procurement Office (USAFRS/RSOO); Air Force Reserve Officer Training Corps, Selections Division (AFROTC/RRU); and the United States Air Force Academy (USAFA), director of cadet admissions. However, before discussing officer PJM initiatives, I will review some important developments in enlisted PJM.

Person-Job Matching for Enlisted Personnel

In December 1971 the Air Force implemented an assignments system for new enlistees called the Procurement Management Information System (PROMIS). In fact, the Air Force Military Personnel Center (AFMPC), Air Training Command, Air Force Recruiting Service, and Air Force Human Resources Laboratory jointly developed the system. The PJM system, of which PROMIS is a part, matches Air Force applicants for enlistment with specialties in an optimal manner. This matching is accomplished through the use of a computer algorithm which was developed by Dr Joe Ward and others of the AFHRL employing policy-specifying techniques.² In 1976 PROMIS was updated and modified for direct access using remote terminals in the 66 regional armed forces examining and entrance stations. The general concept of the personnel selection and placement system involves establishing a job properties array, consisting of attributes or characteristics associated with jobs, and a person characteristics array, consisting of attributes of individual applicants. The PJM algorithm compares the two sets of data through predicted payoff and allocation techniques and provides a rank-ordered list of available jobs for which each applicant is best suited. The algorithm considers other factors such as applicant aptitude scores from the Armed Services Vocational Aptitude Battery (ASVAB), job difficulty, technical training difficulty, applicant preference data, timing of enlistment, and availability of training.³ Because of recent modifications, the algorithm also considers the applicant's probability of completing a full tour of duty, compared to the relative cost of the training for each specialty and the difficulty of filling the specialty.

In addition to the preenlistment algorithm, the system also includes a postenlistment algorithm, which considers two other variables collected during basic military training (BMT). Since many recruits enlist without a guaranteed job offer through PROMIS, about half of the initial classification takes place during BMT. The two variables incorporated into the postenlistment algorithm, called the processing and classification of enlistees (PACE), are a preference match, based on an individual's stated preference for an enlistment aptitude area (mechanical, administrative, general, or electronic), and a rating of general potential for success given by a classification interviewer. This improved system fills high-priority specialties first and matches about 85 percent of trainee preferences with jobs as compared to 60 percent preference matching for PROMIS. For this reason incorporating an interest matching routine and making other improvements to PROMIS were proposed, and some have been added to the system.⁴

Through the use of PROMIS and PACE, the enlistment processing, classification, and scheduling of technical training for new recruits are significantly more efficient. They are flexible systems which can be adjusted regularly to reflect changed job characteristics and to incorporate new measures of recruit characteristics. For example, recruit interest currently is expressed as a stated preference for work in one or more of the aptitude

areas measured by ASVAB—mechanical, general, administrative, and electronic. However, the Vocational Interest Inventory Examination (VOICE), an AFHRL-developed interest measurement instrument, would provide a more objective method of accounting for enlisted preferences for types of work. It is a good predictor of job satisfaction. In fact, the VOICE score may be included as a replacement for individually stated preferences.⁵

The concepts of PROMIS and the recruitment procedures developed by AFHRL "can be applied to any organization which seeks to match person characteristics with job opportunities. It may have either an ordered list of job opportunities from which an applicant may choose, or an ordered list of applicants from which a job may be made a choice."⁶ For example, in response to my request for personnel research, while managing the AFMPC Airmen Retraining Branch, AFHRL is developing a similar methodology to optimally select personnel for reclassification and to reclassify selected enlisted personnel. It includes variables used in PROMIS; however, additional information on previous forms of duty and performance records is also explored for better utilization.

Physical Requirements and Testing for Enlisted Personnel

Research on enlisted AFSCs and recruits has produced a complete set of physical characteristics that figure into the classification process. Through a complete battery of tests of strength and stamina and job analyses, methods were devised to express physical requirements of jobs and compare them to recruit ability. Basically, all recruits take an upper-body strength test during initial processing at the physical examination stations. The test consists of raising a bar connected to weights on a specially designed weight-lifting machine from chest height to extended-arm height, progressively increasing the weight until the recruit quits or reaches the maximum weight requirement. Recruits are then assigned a physical work capacity indicator—referred to as an *X-factor*—of 1, 2, or 3, with 3 (the ability to lift 40 pounds) being the minimum requirement for entry into the Air Force. Currently, X-factors 2 and 1 indicate the ability to lift 70 and 100 pounds. Eventually, the X-factor is going to be recoded to alphabetic characters representing 10-pound increments.

All jobs are coded with an X-factor indicating the physical ability normally required to do the job. Recruits may be classified into an AFSC for which they are qualified if their X-factor is equal to or better than the X-factor of the job; that is, all recruits with an X-factor of 1 would meet the physical requirements of all jobs, those with an X-factor of 2 would meet the physical requirements of jobs coded X-2 or 1-3. These physical strength requirements are in addition to normal physical profile factors.⁷

P = General Physical Status
U = Upper Extremities
L = Lower Extremities
H = Hearing
E = Eyes (distant visual acuity)
S = Psychiatric (emotional stability)

As mentioned in chapter 2, there is no standardized physical ability screening for officer candidates except the Candidate Fitness Test (CFT) administered to Air Force Academy applicants. However, the Human Engineering Division of the Air Force Aerospace Medical Research Laboratory has conducted testing on strength requirements for aircrew members. Also, AFHRL is conducting continuous research in the area of strength requirements for aircrew members, but such research by either laboratory has yet to be extended to cover officers in nonflying specialties. Naturally, abnormalities in the PULHES categories for enlistment or *commissioning* can result in the applicant's disqualification when the record is screened by medical authorities.

The PROMIS, VOICE, new retraining selection methodology, and X-factor tests are tools used for management of enlisted personnel; however, they could be adapted for management of officer candidates and officers. The procedures are applicable to personnel subsystems for airmen, officers, civilians, and reservists and could be used for optimal assignment of individuals to crews, groups, teams, and units.

The resulting enhancement of personnel utilization and force effectiveness will contribute to reduced attrition, better job performance, and lower personnel and training costs. A major payoff will be the enhanced capability to form groups of personnel uniquely suited for rapid deployment in wartime or other emergency situations.⁸

Research Programs

AFHRL has projects in various stages of development in the following areas: aircrew selection, officer education requirements, medical officer selection, officer PJM, AFROTC and OTS selection, and officer performance measurement. Some of these projects are in response to requirements for personnel research submitted by users and some are outgrowths of other AFHRL research efforts.⁹ A brief description of these research efforts follows.

Air Force Pilot Selection and Classification Research Program

Because of the high costs associated with training military pilots and their importance in modern warfare, the selection of the best pilot candidates and their effective classification into the different types of military aircraft have long been of concern. Recent dramatic increases in fuel and aircraft costs, coupled with the possibility of entering combat with a numerically inferior force, have made the optimal selection of

military pilots as critical today as ever before. At the request of the Air Training Command, AFHRL initiated a multi-year research program designed to capitalize on state-of-the-art technologies to improve the way the Air Force selects and classifies people for pilot training.¹⁰

The primary objective of the research was to improve the pilot selection process by identifying individuals with an excellent chance of completing training and becoming successful operational pilots, thereby lowering training costs and improving Air Force combat capability.

Pretraining testing of candidates involves automated tests of psychomotor ability and computerized assessments of personality and information-processing capabilities. The computerized psychomotor tests include the use of a video screen, joysticks, and rudder pedals to measure two-hand coordination and eye-hand-foot coordination. The other computerized test is the Basic Attributes Test (BAT). It consists of a personality questionnaire developed by the Air Force School of Aerospace Medicine's clinical psychology section. The personality questionnaire is designed specifically for use with aircrews and is based on personality characteristics associated with successful pilot performance. Also, tests to measure decisiveness and risk taking were incorporated. Another major part of the BAT measures candidate information-processing capabilities through a series of experimental tests which assess one's ability to handle large amounts of information, perform many tasks at the same time, and make rapid decisions in a high information content environment. These instruments were administered to pilot training students in 1981, and although they are being validated, preliminary results indicate great success. For example, by using the integrated model (all tests) and a 20th percentile cutoff point (selecting the top 80 percent of candidates), the test would result in rejecting 47 percent of candidates who were later eliminated from pilot training, while rejecting only 10 percent of candidates who graduated. Using a 10th percentile cutoff point, the test would result in rejecting 29 percent of eliminatees and less than 3 percent of graduates.¹¹ Since that preliminary validation, the test battery has undergone some modifications and is being validated. "The battery is designed to measure a variety of information processing abilities and personality characteristics which are considered important in determining the suitability of a candidate for flight training."¹² It assesses such factors as compulsiveness versus decisiveness, effects of uncertainty on decision making, self-assessment ability, self-confidence, survival attitudes, personality factors, and several others which were demonstrated to correlate with success in flight training and duties.

A comprehensive aircrew test station was designed to incorporate the above tests into one portable, computerized unit which can be shipped to testing sites to facilitate candidate assessment and data collection. The device is the Portable Basic Aptitudes Test (PORTA-BAT) System.

The PORTA-BAT is a complete, integrated, portable testing and training laboratory featuring high speed graphics, rugged single and two-axis joysticks, data entry keypad,

fixed and removable hard disk drives. The rugged station enclosure carefully designed to reduce environmental noise during testing and provide a shipping container for transporting the unit.¹³

Officer Education Profiles

Air Force officer jobs are classified into about 20 career areas (operations, logistics, medical, and others) and are further organized into homogeneous groups called utilization fields (pilot, missile operations, civil engineer, and personnel). The utilization fields are further subdivided into Air Force specialties based on the system, process, or function in which the officer will specialize such as pilot, strategic bomber; personnel programs officer, social actions; and missile launch officer, Minuteman modernized. Each Air Force specialty carries certain education, training, and experience requirements.

AFR 36-1, *Officer Classification*, lists the educational prerequisites for specialties. This system of specifying educational qualifications has major limitations: (1) a science degree in one college may be called an arts degree in another; (2) the system permits only dichotomous decisions to be made (the candidate either has the specified qualifications or does not); and (3) the only documentary evidence of educational attainment is the college transcript, which can be confusing because the terminology is not standard.¹⁴

To overcome these limitations, AFHRL scientists conducted research from 1975 to 1982 to develop a more objective approach for deriving standard educational requirement profiles. They developed a profile which describes a college graduate's educational achievements in a simple, standard, quantified format. The profile is a breakdown by semester hours of courses completed. Six academic categories cover 48 academic course titles: (1) business administration and management, (2) mathematics and computer science, (3) social and behavioral sciences, (4) engineering, (5) humanities, and (6) health, biological science, and physical science.¹⁵

Profile reliability was established by field tests, with 50 to 100 profiles provided to officers to evaluate in 12 different utilization fields. Each officer was asked to review the profiles and rate each on the relative suitability of the officer for duty in their utilization field. Interrater agreements of .85 to .95 indicated that officers could perceive differences in educational suitability for training and service in their specialties and that the differences could be reported by rating educational profiles.

This profile research could result in improved officer selection, classification, and job assignment by developing methods for standardized coding of transcripts and by specifying educational requirements for nonrated line officer specialties based on policy-capturing procedures. Because of manpower and financial resource limitations, this research began in fiscal year 1987. To complete the project, researchers will review officer and managerial educational requirements to identify the purpose, problems, and procedures in using educational criteria for officer specialties. They

will also conduct a survey of officers to obtain the following information: organizational characteristics, length of time in the Air Force, job familiarity, nature of work tasks, and work role questions. The subjects will be officers with one to 12 years of service, randomly drawn from approximately 83 nonrated line specialties at the entry level (as opposed to staff officer or director levels). Accompanying the survey will be 50 coded educational profiles with a nine-point suitability scale for each. The analysis will result in reliable and valid mathematical models of educational requirements for each officer specialty.¹⁶ Based on this research, the educational accomplishments of officers can be matched against validated educational requirements for specialties, it could serve as another subroutine of the overall officer PJM process.

This program could be further refined by incorporating the "Patton rating," a submodel developed by AFHRL for rating the quality of colleges and rank-ordering them by degree areas. For example, by assigning weights based on the Patton model, the value of an industrial management degree from college A would be greater than the value for the degree from college B, and similar value differences would occur for specific courses within the academic categories of the profile.

Medical Officer Selection

AFHRL recently completed a selection model for the Air Force Health Professions Scholarship Program (AFHPSP). It was developed in response to a request for personnel research from the AFMPC Office of the Surgeon to improve procedures for selection of Air Force physicians. The research project used working groups comprised of AFHPSP managers to identify appropriate variables and relationships for the model applying policy-specifying techniques. The goal of the research was to identify personal and professional characteristics of AFHPSP applicants that would indicate potential for success as a physician in the Air Force Medical Corps. The selection model that was developed included the Patton rating submodel for comparing colleges. The initial selection system was validated through the use of personal background inventories provided by AFHPSP applicants before the summer of 1985. The new selection model includes a defined tracking system for monitoring the success of physicians selected through use of the model, which allows for continuing validation and refinement.¹⁷

Officer Person-Job Matching

As previously indicated, a number of research projects and computer models have attempted to improve officer PJM, and these methods can be applied to officers, civilians, and reservists. Two notable examples of their use are the Officer Training School selection algorithm and the Air Force Reserve Officer Training Corps selection system.

Officer Training School Selection Algorithm. As discussed in earlier chapters, selection boards (composed of senior officers) evaluate applicants

for Officer Training School. Primarily, selection problems stem from the need to evaluate an overwhelming amount of relevant information, the absence of clear-cut standards, and the subjective nature of the evaluation process. In fact, board members review applicant files that include identifying data, application forms, educational transcripts, letters of recommendation, and other information. Based on experience with the board selection process and with a concern for possible inconsistencies in judgment among members of boards or between different boards, a personnel research request was submitted in 1979 asking for a systematic procedure to overcome these difficulties.

A computer-based algorithm, based on the policy-specifying technique, was developed to model selection board decisions. A group of 14 policy experts was assembled to develop the algorithm. Thirteen relevant variables were operationally defined and combined into three major categories (military performance measures, civilian performance measures, objective cognitive measures). To resolve problems in interpretation of grade point averages (GPAs) from different academic institutions, a supplementary policy algorithm (the Patton rating) was developed to adjust GPAs based on the quality of the institution. . . . A consensus policy was developed on how various levels on the 13 variables could be numerically combined to represent an overall payoff value to the Air Force. The resulting model was checked for general consistency by comparing the applicant group ratings as determined by (a) the algorithm, (b) a mock selection board composed of policy experts, and (c) an actual OTS selection panel. . . . This algorithm was generally consistent with mock and OTS selection procedures but did not represent an exact replication of either.¹⁸

The selection algorithm provided a reliable and clearly specified procedure for rank-ordering OTS applicants, and in 1984 it was recommended for implementation as *part of* the OTS applicant selection system. However, today the algorithm is not being used, even though it could be applied directly to the selection process with only a modest investment in clerical processing, data input resources, and a small microcomputer.¹⁹

Air Force Reserve Officer Training Corps Selection System. As was mentioned in an earlier chapter, AFROTC has a system for selecting cadets to enter the professional officer course (POC). This system, known as the Weighted Professional Officer Course Selection System, was implemented in 1976. In 1980 Air Training Command requested an evaluation of OTS and AFROTC selection procedures to compare processes and to review them against active duty performance measures. AFHRL was asked to identify and develop officer job-performance criteria that would enable validation of the selection systems and to perform comparative analyses of OTS and AFROTC selection procedures. Results would be used to (1) refine and improve the selection systems that relate directly to active duty performance measures and ensure selection and production of quality officers, (2) reduce attrition in technical and flying schools, and (3) enhance officer classification and assignment.

In the portion of the project relating to validation of the AFROTC selection system, AFHRL used the records of AFROTC applicants from 1978, 1980, 1981, and 1982 (records from 1979 were not available) as a data base. The

study compared quality index scores (QIS) computed from the original model to scores computed according to a 1983 modification. Nine criteria of success were used including selection or nonselection of applicants for the POC, award of commission, distinguished graduate status, student performance ratings during the senior year of AFROTC, technical school performance, ratings from various experimental evaluations, and officer effectiveness reports (OER). Study results showed that the current and proposed QIS provided roughly equivalent predictions of applicant selection to the POC, completion of the course, graduation with distinction from AFROTC, job performance, potential for progression, and motivation to perform.²⁰

The research effort to validate both the OTS and AFROTC selection systems was completed in 1986. In fact, AFHRL used similar indicators of success for OTS: completion of OTS, distinguished graduate status, technical school completion and grades, experimental performance evaluations, and OERs.

Officer Performance Measurement and Total Force Person-Job Matching

Recently, AFHRL began a research project to develop cost-effective performance measurement technologies for validation of selection and training procedures. The approach of this project was to (1) define generic performance characteristics of entry-level officers, (2) review the applicability of existing measures and procedures, (3) develop and compare candidate measurement procedures, and (4) use the measures to validate alternate uses of AFOQT scores, educational accomplishments and requirements, and Air Force training. This research should serve to tie together several of the projects discussed above and contribute to the more ambitious project of expanding the existing PJM system to the total force. "The more flexible, multidimensional, and comprehensive optimum match of personnel to jobs that this technology would enable will result in more efficient and effective use of manpower, as well as more effective force manning and [unit] composition."²¹ Other officer classification goals of AFHRL and users of the systems include exploring the differential classification value of the AFOQT, determining the feasibility of a computer-based officer career development system, and developing and validating additional tests and instruments for classification purposes—with emphasis on interest assessment, assessment of leadership and management abilities, and collection and use of biographical information.²²

Differential Classification Value of the Air Force Officer Qualification Test. The AFOQT was validated for use in predicting initial technical training performance of nonrated officers. Recent research by Lt Tom Arth of AFHRL shows that the five composites of the AFOQT can be used to predict technical training success in 37 nonrated specialty courses. The criterion variable was the final school grade earned in each training course.

Performance on the AFOQT was found to be strongly related to success in initial technical training. Also, there was considerable evidence that more than one composite was related to training success. Remember that the five regular composites of the AFOQT consist of variable and sometimes overlapping combinations of subtests. For example, the verbal analogies subtest contributes to the pilot, academic aptitude, and verbal composites; and data interpretation contributes to the navigator-technical, academic aptitude, and quantitative composites. Results from regression analyses revealed that a combination of composites best predicted training success in 20 of the 37 courses analyzed, suggesting that performance in technical training is multidimensional and varies across specialties.²³

[This] conclusion gives a strong indication that future research should focus on differential predictions for each specialty. With the current procedure for obtaining AFOQT subtest scores, it would be possible to compute additional regression analyses using subtest information. New composites could be formed for each course by optimally weighting the appropriate subtests.²⁴

Objectives for further research would be to develop selection composites for a variety of officer specialties, to identify the best combinations of composites or subtests for classification, and to examine the feasibility of using AFOQT subtests instead of the standard composites for classification. This research could be completed within a year to 18 months.²⁵

In fact, AFHRL scientists conducted this type of research for Strategic Air Command (SAC). Headquarters SAC asked AFHRL several years ago to see if the AFOQT could be used to improve the quality of officers entering the missile operations utilization field. The SAC missile combat crew training squadron at Vandenberg AFB, California, provided the criterion measures—scores in operational readiness training. As a result of research and analysis, AFHRL found that a weighted combination of verbal (V) and quantitative (Q) composites could be used as a valid predictor of success in training. The new missile composites, called the M composite, equaled $1V + 4Q$. These research results were presented to SAC, AFMPC, and the Air Staff; however, the new M composite was not adapted for use.²⁶

Since 1981 AFHRL's data-base capability has improved significantly. It has scores of all AFOQTs given from 1981 to present, including percentile scores and individual scores for subtests and composites. If AFHRL was provided criterion measures for the different specialties, they could develop specialty-specific composites.²⁷

As part of its AFOQT development function, AFHRL hires contractors to develop new test items. The current contractor is developing 10 experimental tests composed of experimental items to assess areas not currently covered by the AFOQT. For example, a prenavigator test might indicate a need for remedial mathematics training by identifying a skill or knowledge area which the current navigator-technical composite subtests of the AFOQT do not measure. If these experiments prove beneficial, future

versions of the AFHRL management system and perhaps new composites.²⁸

Optimizing Classification of AFHRL Academy Graduates. In 1985, following a suggestion by a retired colonel, two USAFA first classmen (senior cadets) attempted to solve the problem of classification of new officers entering the Air Force through the commissioning agencies. Faced with many different requirements, programs and philosophies, they quickly narrowed the problem to the need for a process for Air Force Academy cadets. The first classman, Captain (AFM) Steve Connolly, used data on the attributes and qualifications of cadets and compared them to the requirements to provide cadets with ordered lists of specialties for which they were eligible and qualified. Using information available from Academy computer files, they were able to compare certain cadet attributes such as academic major, adjusted academic GPA, and completed courses completed to requirements for specialties. However, the cadets encountered a problem when they attempted to incorporate physiological characteristics into the program—such as color perception, color blindness, etc.—because the physiological descriptions were not available in the accessible data base.

The cadets produced a program that searched the records of each cadet and provide an ordered list of Air Force specialties for which the cadets were qualified based on educational data. But they were unable to solve the physiological qualification issue. Their report included two recommendations: (1) the Academy should capture physiological descriptors for cadets in a data base to be maintained in the medical facility, which could be accessed as necessary for making cadet classification decisions, and (2) AFHRL should construct a standardized biographical/physiological data file of individual characteristics of all Air Force members which would serve as a basis for classification and placement decisions. This second recommendation would be a key element in a standardized classification system useful to all commissioning sources.²⁹

In chapter 2 I discussed the subjective, paper-and-pencil nature of officer selection and classification processes. Likewise, these same limitations are evident in the recording and management of medical records: physical examinations, visual acuity, color vision, physical strength, and other areas. Although the medical community has improved its use of computer records for hospital inpatients and pharmaceutical operations, there has been minimal progress toward establishing a computerized system to record and maintain pertinent data about service members. Discussion of such a system is beyond the scope or purpose of this study, but its development would provide better management of medical records. For our purposes, however, the suggestion that standardized data be recorded and maintained to the extent that it is needed for classification and placement decisions seems appropriate and necessary.

Officer Cross-flow Modeling. The Support Officer Force Management Section, AFMPC (HQ AFMPC/DPMRSS2) and the Force Programs Division, Air Force deputy chief of staff, personnel (HQ USAF/DPPP), use computer modeling in estimating requirements for officer accession and training and for retraining officers among specialties, insofar as numbers and timing are concerned. Their models consider the major requirements of the needed specialties in terms of the number of officers to be accessed and classified into specialties at a certain time of the year and the number to maintain specialty manning at optimum levels for several years into the future. The models perform this function by displaying current demographics of career field manning (year group, grade, sex, rated supplement, and other data) and by "aging" the force, applying retention and promotion rates based on those experienced in the career field in recent years—to indicate what the specialty manning should approximate in future years given current inputs. By using these models, future officer requirements are projected by category (pilot, navigator, engineer, technical, and nontechnical) so that accession agencies can plan accordingly.

Because manning shortages and overages occur each year, cross-flow models were developed to help solve the problem. The successful use of these models by managers has diminished the need to selectively cross-flow officers. For example, the need to selectively cross-flow officers into missile operations declined from 120 in fiscal year 1982 to 41 in fiscal year 1986, and to zero in fiscal year 1987. Similar cross-flow results were attained in the weapons controller specialty, and reductions are occurring in other shortage specialties.³⁰ Notably absent from these successful accession programming and cross-flow models is a method to consider the qualifications and preferences of the officers being cross-flowed—that is, however, still a subjective process (conducted between resource managers by reviewing records or having personal knowledge of the candidates).

Use of Assessment Centers. Most of the literature pertaining to Air Force use of assessment centers (or suggesting such use) is in the form of research reports written by students at the Air Command and Staff College and the Air War College. In a 1978 report Col Barbara Darden Francis recommended the Air Force explore the use of assessment centers for selecting candidates for Air Force commissions, for classifying officer candidates in AFROTC, OTS, and USAFA, and for developing senior officers and others being considered for lateral placement. She also reviewed several other reports that recommended the use of assessment centers to select officers for overseas duty, for Air Command and Staff College faculty positions, for maintenance officer positions, and for fighter, reconnaissance, and bomber-tanker-airlift pilot positions (a topic of consideration in the new dual-track flight training program discussed earlier in this chapter). Colonel Francis concluded that

the assessment center process offers an ideal way to select personnel for sensitive jobs such as military attaché duty, commander or first sergeant positions, instructor duty, and the like [and that] the Air Force has a number of personnel management problems such as selection, evaluation, promotion, development, and retention which might profit from the use of an objective and unbiased technique such as the assessment center process.³¹

In a 1984 Air War College report Lt Col David Rogers explored the use of assessment center selection of organizational commanders, as opposed to continuing to use the impersonal paper descriptions of past performance for commander selection. He pointed out that appraisals of performance, even though they may contain remarks about potential for management or command, were not very reliable for predicting managerial success. And he also identified some shortcomings of command selection boards as they are currently used. Realizing that a wholesale change would be impossible, Colonel Rogers discussed alternative methods such as interviewing, psychometric testing, and résumés. He proposed the Air Force adopt an incremental approach of supplementing existing procedures by setting up trial assessment centers in specific commands to select half of a certain type of organizational commanders (such as recruiting squadron commanders or maintenance squadron commanders) while continuing to use traditional methods to select the others. After two or three years, the results could be compared to determine the more effective system.³²

In this chapter I reviewed a number of Air Force research projects and proposals to improve personnel selection, placement, and promotion. My last chapter emphasizes the need for continuing this research and for implementing the results in a timely manner.

Notes

1. Joe H. Ward, "Policy Specifying with Application to Personnel Classification and Assignment" (Paper presented at the 21st annual conference of the Military Testing Association, San Diego, Calif., October 1979), 1.
2. Joe H. Ward, *Creating Mathematical Models of Judgement Processes*, AFHRL-TP-77-47 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, August 1977).
3. Joe H. Ward, *Pre-Enlistment Person-Job Match System*, AFHRL-TP-79-29 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, September 1979).
4. David K. Roberts, *General Purpose Person-Job Match System for Air Force Enlisted Accessions*, AFHRL-RS-82-2 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, December 1982).
5. *Ibid.*, 5.
6. Joe H. Ward, *Assignment Procedures in the Air Force Procurement Management System*, AFHRL-TP-78-30 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, July 1978), 155.
7. AFR 160-43, *Medical Examination and Medical Standards*, 10 November 1983, 10.
8. Manuel Pina, Jr., "Project Forecast II—Candidate Technology," research notes (Brooks AFB, Tex.: Air Force Human Resources Laboratory, 7 February 1986).
9. R. Bruce Gould, briefing charts (manpower), AFRHL Personnel Research Division, Brooks AFB, Tex., May 1986.

10. J. E. Kantor, "The USAF Pilot Selection and Classification Research Program," *Aviation Space and Environmental Medicine*, March 1985, 258.
11. Kantor, 260.
12. J. E. Kantor, "Basic Attributes Tests (BAT)—Version 4. Hardware, System & Individual Test Descriptions," research notes (Brooks AFB, Tex.: Air Force Human Resources Laboratory, June 1985).
13. Ibid.
14. Sharon Garcia, Work Unit Summary Data, AFHRL, Brooks AFB, Tex., 5 December 1984.
15. Ibid.
16. Sharon Garcia, AFHRL, Brooks AFB, Tex., interview with author, 20 March 1986.
17. R. Bruce Gould, briefing notes (manpower), AFHRL, Brooks AFB, Tex., 1986.
18. Lynn M. Scott, *Officer-Training School Selection Algorithm*, AFHRL-RS-84-16 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, October 1984), 1.
19. Ibid., 10.
20. Air Force Human Resources Laboratory, Interim Report of the Validation of the AFROTC Selection System, undated.
21. Pina, 1.
22. Douglas Cowan, AFHRL, Brooks AFB, Tex., interview with author, 20 March 1986.
23. Thomas O. Arth, *Validation of the AFOGT for Non-Rated Officers*, AFHRL-TP-85-50 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, January 1986), 6.
24. Ibid.
25. Cowan interview.
26. Jacobine Skinner, Air Force Human Resources Laboratory, Brooks AFB, Tex., telephone interview with author, 9 June 1986.
27. Ibid.
28. Ibid.
29. Timothy D. Buckley and Steven M. Connolly, Math 457 Final Project Report, US Air Force Academy, Colorado Springs, Colo., 10 May 1985.
30. Briefing charts (manpower), Headquarters AFMPC/DPMRSS2 and Headquarters USAF/DPPP, 1986.
31. Col Barbara Darden Francis, *The Assessment Center Process: Its Applicability to the USAF*, AWC Research Report no. 340 (Maxwell AFB, Ala.: Air War College, 1978), 51-54.
32. Lt Col David P. Rogers, *Using Assessment Center Methodology for Command Selection*, AU-AWC-84-184 (Maxwell AFB, Ala.: Air War College, May 1984), 1-55.

Chapter 5

Considerations and Recommendations for Increased Officer Assessment

Previous chapters described current procedures for assessment; selection, classification, and placement of officer candidates and officers; explained several ways government, business, and industry assess people for management and leadership positions; and discussed Air Force research in this area. The intent of this chapter is to bring together some of the information presented and to recommend ways for increasing the assessment of officer candidates and for improving officer reclassification procedures. In essence, I advocate increased and improved officer assessment and improved procedures for using the additional data that is available.

Considerations

Before proceeding to my recommendations, it is important to address several considerations: the generalist versus specialist issue, use of technology, objective assessment tools, and senior officer acceptance. The first consideration is the generalist versus specialist issue. Some personnel managers maintain that the Air Force is becoming too specialized and that specialization is driving our personnel system to select and produce more officers who are specialists, adversely affecting our ability to develop future leaders. I do not quarrel with this belief—perhaps the Air Force is becoming overspecialized and maybe it needs more generalists to become the leaders of tomorrow—however, it does not present a great dichotomy. Most of the leaders in today's Air Force began as specialists and the quality of our leadership has remained high. The truth is that all new officers need to be specialists—even the second lieutenant squadron section commander has to specialize in the art of running an orderly room and of interacting with people at squadron and base levels. In fact, all Air Force specialties require new officers to be trained and to perform as specialists in the jobs to which they are initially assigned. The officers who learn their jobs thoroughly and perform well are able to expand beyond those jobs and become generalists as they progress in knowledge and rank. Often, the officers who learn their initial responsibilities quickly are able to expand their horizons and talents earlier in their Air Force careers—they are the ones assigned the additional

duties and special projects and who become active on advisory councils, on committees, and in social activities. They are also the ones who want to develop skills and knowledge beyond their specialties by progressing to broader duties or by changing career fields where they will have new opportunities and challenges. That is how generalists are made—the Air Force has few jobs requiring generalists; therefore, to try to access them would be unwise. The Air Force must continue to access and train specialists and “grow our own” generalists through career development, training, professional education, controlled career retraining, and continued rotation of officers between commands and levels of command. Essential to the officer management process is early and more accurate identification of individuals who are good officers, early and accelerated training of officers into specialties for which they are best suited, more accurate recognition of truly superior performers, and purposeful career development for those officers having senior leadership potential. Personnel managers need increased and improved officer assessment methods of intelligence, personality, aptitudes, and interests. They also require improved analysis techniques and use of data through objective, computer-assisted processes to make better management decisions.

Most managers agree that the more one knows about a situation the more one is able to make a decision. Nor, in this enlightened age, do many managers doubt that objectivity is key in making better decisions. Surprisingly though, some managers continue to cling to obsolete manual methods of examining data to make subjective decisions about people who are to be accepted into commissioning programs, provided expensive training, given professional education, and placed in responsible positions. If these people fail to perform successfully, both the individual and the Air Force suffer. The Air Force needs the subjective judgment of experienced senior people in making decisions about officer candidates and officers, but it also needs to provide those decision makers with more information about the people they are considering, using modern technology.

With the exception of the AFROTC Weighted Professional Officer Course Selection System (WPSS), used in the process of selecting cadets to enter the final two years of AFROTC, the Air Force has no scientific or programmatic systems for assessing candidate qualifications, psychological factors, and preferences, or for matching them to the needs of the Air Force. Despite the lack of a refined selection system, the Air Force claims it selects the best-qualified candidates to attend technical training, advanced schooling, professional military education, and academic degree programs, and for advancement in position and grade. Unfortunately, our personnel system spends large sums of money each year sending senior officers to participate in selection boards, where they spend long hours reading through paper records to make subjective decisions about people. Practically speaking, it seems that the process would be more efficient if the board started to review records with an ordered ranking list of candidates based on an objective assessment method. Then the board would have time to examine the

subjective elements—such as letters to the board president, letters of recommendation, and general officer endorsements—and make decisions on borderline cases (records of people just above or below the cutoff score).

The PROMIS and PACE systems for classification of enlisted personnel are effective. The PJM technology is available. The scientists of the AFHRL are ready and eager to modify existing enlisted PJM for officers.¹ The system is there and the additional research and development could be conducted on short notice.² Why, then, has senior management not said, "Let's get on with it?" I believe there are two reasons, both based on subconscious anxieties: an aversion to testing in general and a concern about lives being controlled by computers. It is time, however, to recognize the value of knowing more about the people the Air Force is commissioning and promoting and to use that information in more reasoned ways. Two essential aspects in accomplishing these tasks are improved assessment methods and automated objective procedures for comparing the information about people to Air Force requirements.

Recommendations

In order to improve officer selection, placement, and promotion, the following recommendations are provided.

1. Use psychological tests to improve the Air Force Academy selection process. Stokes said that some people consider the high attrition rate at the USAFA as an extensive screening process to assure only the superior cadets receive commissions from the Academy.³ This high attrition rate means that nearly twice as many cadets will start the Academy than will graduate and be commissioned. Would it not be more cost-effective to improve selection so that more cadets make it all the way through? If applicants were given psychological tests, their motivation for going to the Academy could be examined, their propensity to finish could be estimated, their integrity could be assessed—resulting in fewer losses for honor code violations (and fewer honor code scandals)—and their interests could be considered for better placement in degree programs and in Air Force specialties.

2. Establish an automated officer PJM system. "No one's ever going to buy off on officer classification being done by other than an officer."⁴ That was what an officer responsible for officer classification told me during an interview. The statement may be true, but it is irrelevant—the purpose of an automated officer PJM system is to offer an officer or board of officers the advantages of better assessment with more objective data to assist them in making decisions. Obviously, the computer is unable to determine a candidate's writing ability or consider letters of recommendation—that kind of information should be reviewed by experienced people who can apply their subjective judgment. However, an automated system could provide a

rank-ordered list of candidates with the best potential for success, with the better educational records, with the appropriate physical attributes, and with the preferences for the specialties needed by the Air Force. A PJM system would provide thorough, objective assessment of considerably more data and contribute to more efficient management methods, resulting in fewer staff and clerical people for handling classification and placement actions. The Air Force possesses the capability to produce an officer PJM system, and it could be performed quickly. Despite the low level of activity in the officer management area over the past 15 years, AFHRL is poised and ready to provide new technologies in this area. The potential is there, but the efforts are inhibited by policy.⁵ In other words, the potential users need to say, "I need a better system to do this, and I'll use the system." That is, in effect, what the people at the working level who manage officer selection and placement have said, but the message is not getting through at the right levels.

3. Use the currently available automated OTS selection system. As explained in chapter 2, boards of senior officers select candidates for OTS, although a validated automated OTS selection system is available.⁶ According to an officer directly involved in the selection process, the automated system was not employed primarily because of the computer's inability to weigh the nonquantifiable factors in the applicant's file such as writing ability, recruiter subjective evaluations, and letters of recommendation.⁷ In advocating the use of this system, I am not suggesting that it take the place of the selection board, but rather that it make the board's task easier by providing a refined "starting place." The function of the board members would continue to be to interpret and apply judgment to those subjective factors beyond the capability of the system. What is needed to implement this available system? Simply the opportunity to try it—run the system, give the product to the board, and check the results.

The computer algorithm can be applied directly . . . with only a modest investment in clerical processing, data input resources, and a small microcomputer. . . . Incorporation of the computer-based algorithm . . . would be expected to result in higher overall quality of selectees. . . . Benefit would also accrue by having Air Force selection policy stabilized in the form of the algorithm.⁸

4. Use interest assessments for officer placement. The basic assumption—proven by studies of interest inventories such as the Strong-Campbell, Kuder, and others—is that people are likely to be more satisfied, perform better, and remain longer in an occupation when their preferences and interests match those of other people working in the occupation. I believe the area of interest assessment offers the greatest potential for improving Air Force placement procedures, thus resulting in efficiency and cost-effectiveness. Through interest assessment, the Air Force and applicants for commissioning would know if their preferences are compatible with the job and if they will be satisfied with duty as Air Force officers. Their placement into specialties needed by the Air Force, based on aptitudes and interests, would improve job success. Since AFHRL developed an interest

inventory for placing enlisted personnel, the same technology could be used to develop an interest inventory for officer candidates and for officers facing reclassification. Another alternative could be a commercial inventory.

5. Establish a PJM system for the commissioning sources to standardize selection procedures. I have discussed the variances in selection processes and standards used by the three commissioning sources. The variances need to be resolved so that new officers have similar basic characteristics. For example, the Air Force Academy's minimum physical ability standards should apply to AFROTC and OTS. A comprehensive officer PJM system would become the base for officer selection and classification. It would include physical standards and elements of aptitude, personality, and interests. The new aircrew selection techniques and PORTA-BAT would be adaptable to line officers in several other career fields such as weapons control, missile operations, and space operations.

In fact, the various procedures discussed in chapter 4 need to be implemented as soon as possible. Use of educational profiles, selection algorithms, differential classification based on AFOQT aptitude scores would lead to economies and efficiencies beyond the imagination. The difficulty is to quantify the benefits of developing a PJM system; however, the outcome would surely be worth the cost. According to Manuel Pina, a behavioral analyst for the Air Force Human Resources Laboratory, it has been estimated that a completed PJM system would require between 10 and 15 years to develop and would cost up to \$25 million.⁹

While Air Force specific assessment methods are being developed, personnel managers should start using some validated instruments adopted by business and industry. In fact, the Air Force can obtain these existing instruments at a low cost. Obviously, additional measures of intelligence, interest, personality, and aptitude can only lead to improvements in selection and placement.

6. Establish an officer cross-flow system for commissioning candidates. Personnel managers need the PJM system to select candidates for commissioning and to consider officers for other career fields. The value of better placement in a new career field or specialty would accrue; however, the system could also serve as a check on management decisions. In some cases, officers may be motivated or directed to leave a career field for which they are in fact best suited. In those situations, the officer should not be retrained.

7. Increase the officer classification data base. All pertinent information needed to consider people for classification should be available and accessible in the data base. Physical ability and physical characteristics—such as color vision—are not presently in the records system used for officer classification; therefore, the data base must be expanded and the data captured for the comprehensive PJM system to work.

8. Use assessment centers for officer selection and placement. Assessment centers can be useful for selection and placement purposes. The Air Force could use them for selection of officers for unique positions and

command positions. In fact, AFHRL should study this concept and establish a trial program, perhaps at the Air War College for student placement purposes.

Despite great advances in the areas of personnel assessment, classification, placement, and availability of systems for Air Force use, there has been little progress toward improving current methods. I believe the time is right to implement available systems, to develop new ones, and to work toward a total force PJM system.

Notes

1. R. Bruce Gould, Air Force Human Resources Laboratory, Brooks AFB, Tex., interview with author, 20 March 1986.
2. William Alley, Air Force Human Resources Laboratory, Brooks AFB, Tex., interview with author, 20 March 1986.
3. Maj Richard W. Stokes, Jr., *Preserving the Lumbent Flame: Traditional Values and the USAF Officer Accession Program* (Maxwell AFB, Ala.: Air University Press, 1984), 37.
4. Capt Ray Brinn, Headquarters AFMPC, Officer Accession Division, Randolph AFB, Tex., interview with author, 19 March 1986.
5. Alley interview.
6. Lynn M. Scott, *Officer Training School Selection Algorithm*, AFHRL-SR-84-16 (Brooks AFB, Tex.: Air Force Human Resources Laboratory, October 1984), 1.
7. Maj Gary Trend, Headquarters Air Force Recruiting Service, Randolph AFB, Tex., interview with author, 19 March 1986.
8. Scott, 10.
9. Manuel Pina, Jr., "Project Forecast II—Candidate Technology," research notes (Brooks AFB, Tex.: Air Force Human Resources Laboratory, 7 February 1986), 3.