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Prediction by Career Field
of First Term Airman Performance
from Selection and Basic Training Variables

By

Eli S. Flyer

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PREDICTION BY CAREER FIELD OF FIRST TERM AIRMAN PERFORMANCE
FROM SELECTION AND BASIC TRAINING VARIABLES

By

Eli S. Flyer

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6570TH PERSONNEL RESEARCH LABORATORY
AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
Lockland Air Force Base, Texas

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FOREWORD

Data reduction and computer operations for this project were carried out under Contract AF41(609)1596 with Teledyne Systems Corporation, Hawthorne, California. Dr. Eli S. Flyer monitored the contract for the Personnel Research Laboratory.

ABSTRACT

To gain information that might be useful in improving airman classification,
29 predictor variables were evaluated by multiple regression techniques against
a criterion of satisfactory performance during the first 2 years of enlistment. Vari-
ables included personal data, educational and aptitude data, peer ratings, and an
instructor evaluation collected during basic training. The criterion was high Airman
Performance Rating vs low rating or discharge. Samples were drawn from 15 career
fields. Predictive equations were derived for the full population and for each career-
field sample. In all but 2 career fields prediction was improved by equations based
on the career-field samples, but a full-population equation was judged more imme-
diately useful.

Keywords: airman career field, job proficiency criteria, mathematical predic-
tion, aptitude tests, peer ratings, multiple regression techniques.

This report has been reviewed and is approved.

John V. Patterson, Jr., Col, USAF   A. Carp
Commander   Technical Director

Hq 6570th Personnel Research Laboratory

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1. INTRODUCTION

Results from a recent investigation[1] (Flyer, 1963) have shown that it is now possible to evaluate new airmen with a fair amount of accuracy, in terms of their potential worth to the Air Air Force, during their first month of active duty. Preservice educational level, reference information concerning high school adjustment, and peer evaluations made during basic military training can be combined in a single success-potential index that predicts unsuitability discharge and unsatisfactory performance on the job with a useful degree of precision. This screening device was developed without regard to the specific occupation to which the airman was assigned, and, accordingly, could be viewed as a predictive composite score applicable across the wide variety of Air Force occupations.

The possibility exists that among Air Force occupations different demands are made upon individuals, and that variables predictive of good adjustment in one occupation may be unrelated to adjustment in another. If this is found to be the case, special predictive scores could be obtained for individuals indicating their likelihood for success in occupation A, B, C, and so forth. Improved classification procedures could be developed to maximize the likelihood of successful performance by more appropriate personnel assignments, and would result in a general increase in the level of effective airman performance. The purpose of this investigation is to explore the possibilities for classification purposes of information bearing on preservice educational level and performance during basic military training, as well as the usual aptitude measures.

2. PREDICTOR VARIABLES

Selection and Classification Information

Recruits are selected and classified for Air Force duty primarily on the basis of preservice educational level, Airman Qualifying Examination (AQE) scores, and the Armed Forces Qualification Test (AFQT). The AQE plays the largest single role in classification, and airmen enter the Air Force assigned to any one of four job areas: mechanical, administrative, general, or electronics. Assignment to specific occupational training occurs during basic military training and is based upon the individual's aptitude score in the job area he is assigned to as well as the aptitude score minimums that have been established for specific occupational training.

The selection and classification variables selected for study are listed in Table 1. Educational level, age, and information concerning high school courses taken were based upon enlistment records.

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[1] In many respects the present study is a follow-on of the earlier investigation. A more complete description of the predictor and criterion variables is presented in the earlier report.

Table 1. Correlation of Predictor Variables With
Satisfactory-Unsatisfactory Airman Performance

(Sample: 10,812 airmen enlisting Aug 1959—May 1960 assigned to Strategic Air Command)

VARIABLE		MEAN	SD	VALIDITY[a]
	Selection & Classification			
1	Educational level	11.56	1.11	.34
2	Age at enlistment	18.28	1.49	.18
3	AFQT	59.42	22.18	.25
4	AQE Mechanical AI	51.09	22.12	.12
5	AQE General AI	53.80	20.78	.22
6	AQE Administrative AI	52.89	19.55	.22
7	AQE Electronics AI	50.23	22.60	.23
8	Height	69.19	2.53	.05
9	Weight	149.48	21.65	.05
10	Marital status (married) at enlistment	.04	.19	.01
11	HS Algebra	.73	.44	.13
12	HS Geometry	.45	.50	.14
13	HS Trigonometry	.14	.34	.11
14	HS Physics	.26	.44	.10
15	HS Chemistry	.32	.47	.11
16	HS Typing	.42	.49	.10
	Basic Military Training			
17	Tries hard to succeed	.41	10.06	.36
18	Cooperative	.20	8.72	.35
19	Likes to be with people	.18	8.32	.02
20	Calm	.21	7.69	.26
21	Acts bright and alert	-.03	9.66	.27
22	Good natured	.17	8.28	.30
23	Seldom excited and angry	.13	8.18	.26
24	Adventurous	.11	8.81	.05
25	Physically strong	.20	10.84	.15
26	Accepts responsibility	.12	9.85	.34
27	Most likely to succeed	.37	10.62	.32
28	Tactical Instructor evaluation	.72	1.11	.13
	Criterion			
29	Satisfactory vs unsatisfactory	.75	.43	

[a]Biserial coefficients for continuous predictors (1-9, 17-27); phi coefficients for
dichotomous predictors (10-16,28).

Evaluations During Basic Military Trair .g

During the 15th day of basic training, airme.: ir each flight (average flight size is about 60 airmen) are required to rate each other for 11 bipolar characteristics. Each flight member identifies the five airmen he considers to be best d :scrib d by a given characteristic, and five who are best described by its opposi.e. i.e., five "strong," and five "weak." Net scores are obtained for each individual by summing the number of times he is rated as possessing a given characteristic and subtracting from this total the number of times he is rated as possessing the opposite characteristic. Through this procedure an individual obtains 11 peer-rating scores ranging from +59 to -59 (the individual does not rate himself). The peer-rating form used in data collection is shown in Appendix I.

A tactical instructor (TI) evaluation is also obtained at the 15th day of training. In this rating procedure the TI classifies the 60 airmen in his flight into three groups (upper, middle, and lower) in terms of estimated success potential. In the analyses of these data the upper two groups are combined and compared with the low group. The variables are listed in Table 1.

3. AIRMAN PERFORMANCE CRITERIA

Although the full 4-year enlistment will provide more complete airman performance data, information is available at the 2-year mark that is useful as an intermediate criterion. In this investigation airmen were evaluated through operational performance report ratings and unsuitability discharge status. Two criterion groups were formed: (a) "satisfactory airmen" were those rated by their supervisors as "very good" or better in terms of their overall performance, and (b) "unsatisfactory airmen" were those rated less favorably, or discharged for unsuitability.

Table 2. **Distribution of Cases by Performance Category**

PERFORMANCE CATEGORY	NUMBER OF CASES	PERCENT OF TOTAL
Outstanding	815	7.5
Exceptional	2,877	26.6
Very good	4,465	41.3
Good	1,425	13.2
Marginal, unsatisfactory	31	.3
Unsuitability discharge	1,199	i1.1
Total	10,812	100.0

In this treatment, airmen rated by their supervisors as "good" were assigned to the unsatisfactory group. The main reason for this placement was the evidence that "marginal" and "unsatisfactory" airmen had received inflated ratings in the sample studied. The usual expectancy is 5 percent in these lower rating categories when performance report data are collected under confidential and research conditions. For the sample studied, where evaluations were based upon the official performance report in the airman's personnel file, only .3 percent of the airmen were rated as marginal or unsatisfactory. Table 2 provides information concerning the distribution of performance evaluations and unsuitability discharges.

4. POPULATION

The population consisted of 10,812 airmen entering the Air Force August 1959 through May 1960 who were assigned to Strategic Air Command. and for wh m all of the following sets of data were available.

a. Selection and classification variables

b. Basic training peer rati..gs and TI evaluation

c. Unsuitability discharge information or performance reports accomplished at about the 2-year service mark

5. PROCEDURE

The statistical procedures applied to the predictor and criterion data available for the airman population were the following:

a. Computing an intercorrelation matrix for all predictor variables and the criterion.

b. Performing a regression analysis to develop a single composite score predictive of the satisfactory-unsatisfactory performance criterion.

c. Obtaining distributions of the composite score separately for satisfactory and unsatisfacto.y airmen.

d. Sorting the population into a number of occupational groups and computing an intercorrelation matrix for all predictor variables and the criterion separately for each occupational group.

e. Performing a regression analysis for each occupational group separately to develop a single composite score for each occupation predictive of satisfactory-unsatisfactory performance in that occupation.

f. Computing the validity of the population-derived composite score for each occupational group.

g. Computing the validities of the composite score developed for each occupational group for all ccupational groups.

6. RESULTS AND DISCUSSION

The complete intercorrelation matrix for predictor and criterion data is shown in Table 6, Appendix II. The variables included in the analysis and their validities in predicting airman performance are shown in Table 1. The regression analysis procedure applied to the matrix resulted in a two-variable solution using an iterative stop criterion of .006 gain in the squared multiple correlation (R^2). The two variables, in order of their contribution to prediction, were: (a) peer-rating variable "Trie .rd to succeed"; and (b) educational level.

A composite score war .veloped for all cases in the population from statistica' weights assigned to the two variables. Table 3 provides a distribution of the composite score obtained separately for satisfactory and unsatisfactory airmen. Unsatisfactory performance rates varied from 9 percent in the highest composite score interval to 75 percent in the lowest.

COMPOSITE SCORE	SATISFACTORY	UNSATISFACTORY	PERCENT UNSATISFACTORY
96 and higher	460	46	9
90-95	502	59	11
84-89	1466	195	12
78-83	2765	521	16
72-77	976	330	25
66-71	783	381	33
60-65	559	340	38
54-59	304	258	46
48-53	167	214	59
42-47	86	130	60
36-41	49	76	61
30-35	23	53	70
29 and lower	17	52	75
Total	8157	2655	25
Mean	77.88	66.96	

Standard Deviation, 13.85

$r_{pbis} = .34$, $r_{bis} = .47$

[a]Variables weighted in this composite score are peer rating for "Tries hard to succeed" and educational level.

The results at this stage of the investigation were almost identical with the findings obtained in the earlier study. The peer-rating variable "Tries hard to succeed" and educational level provided the best two-variable composite in both analyses.

The sample was sorted into 15 occupational groups (based upon career field identification) each with 200 cases or more. The groups selected, and successful performance rates for each, are shown in Table 4. Means, standard deviations, and validities obtained within occupational group for all predictor variables are shown in Tables 7-9, Appendix II.[2] Results from the regression analysis performed for each occupational group are shown in Table 5, as well as the validity of the population-derived composite score when applied to each of the 15 occupational groups.

The findings presented in Table 5 show that for many occupational groups there is a substantial improvement in performance prediction obtained with the occupation-derived composite score as compared with the population-derived score. Also, as is shown in Table 10, Appendix II, there are occasions when the occupation-derived score is more valid for other occupations than the population-derived score.

[2]Matrices computed for each occupational group are available to qualified requesters from the 6570th Personnel Research Laboratory (PRL), Box 1557, Lackland AFB, Texas.

Table 4. Satisfactory Performance Rates by Occupational Groups

CAREER FIELD	DESCRIPTION	NUMBER OF CASES	PERCENT SATISFACTORY
29	Communication Operations	222	78
30	Communications-Electronic Systems	983	87
31	Missile Electronic Maintenance	252	89
32	Armament Systems Maintenance and Operations	449	86
42	Aircraft Accessory Maintenance	624	78
43	Aircraft Maintenance	1423	77
53	Metal Working	350	70
54	Facilities	325	79
57	Fire Protection	213	57
60	Transportation	228	62
64	Supply	1036	75
70	Administration	914	73
73	Personnel	257	89
77	Air Police	1254	66
90	Medical	323	71

Table 5. Validities of the Group-Derived and Population-Derived Composite Scores for Each Occupational Group

CAREER FIELD	GROUP-DERIVED COMPOSITE			POPULATION-DERIVED COMPOSITE		
	MEAN	SD	VALIDITY[a]	MEAN	SD	VALIDITY[a]
29	77.30	19.58	.74	76.59	13.74	.59
30	87.32	6.28	.32	81.73	10.61	.32
31	88.97	9.86	.59	82.48	10.85	.46
32	85.78	8.04	.40	82.68	9.61	.30
42	78.12	11.85	.43	77.62	12.16	.36
43	76.96	13.98	.45	74.84	12.73	.41
53	69.47	17.30	.51	72.15	14.65	.45
54	78.36	12.84	.47	73.06	12.67	.40
57	56.39	24.99	.65	65.51	16.02	.47
60	61.73	21.34	.57	67.31	16.45	.54
64	74.49	13.95	.45	71.89	13.96	.42
70	72.20	17.32	.54	72.94	14.27	.52
73	87.71	11.74	.74	77.96	11.44	.60
77	65.71	12.91	.36	72.14	14.23	.36
90	70.23	18.84	.57	78.16	12.39	.38

[a]Biserial correlation.

If similar results are obtained for new samples, the special equations might offer a substantial improvement over the population-derived equation. The likelihood of this occurring is not too favorable. There is a substantial relationship between the number of cases in the occupational group and the increase in validity. Of the five occupations with gains in validity of .11 and higher, four had sample sizes of 260 cases or less. For the six occupations with gains of less than .05, all but one involved a sample size of 900 or more. This finding suggests "over fitting" for the smaller samples by capitalizing on error variance in regression analysis and the likelihood of lowered validities in a cross validation sample. The results are not definitive, however, and further investigations are necessary.

There are sizable differences in validity among the occupational groups for the population-derived composite score. Some of the differences can be attributed to restrictions in variance resulting from the classification procedure used to assign airmen. For example, the population-derived composite score was least valid for the 30 and 32 career fields, which also have the lowest composite score variances.

There is a possibility that special equations may prove superior to a population-derived equation, and that performance in one career field may be better predicted than performance in another. While additional investigations are called for, the level of predictive accuracy achieved with only educational level and one peer-rating variable is high enough to be operationally useful. Beginning July 1965 airman classification will be accomplished at the 20th day of training by means of computer processing. When this procedures is instituted, the use of peer-rating data for classification becomes feasible. It will be of considerable value to restrict the assignment of potentially unsatisfactory airmen so that they are not assigned to high-risk occupations or those involving expensive technical training.

REFERENCE

Flyer, E. S. *Prediction of unsuitability among first-term airmen from aptitude ind zes, high school reference data, and basic training evaluations.* Lackland Air Force Base, Texas: 6570th Personnel Research Laboratory, Aerospace Medical Division, June 1963. (PRL-TDR-63-17, DDC Document AD-420 530)

Date _____

Name_____ Your Roster No. _____

Last   First   Middle Initial

Serial Number_____Flight No._____

      This is a peer or "Buddy" rating operation, a procedure that is commonly used in the Army, Navy, and the Air Force, including the Air Academy. Attached also is a copy of the roster for your flight. This roster sheet contains the names of all men in your flight during the first week of basic training. You will use this roster in making your ratings. Here is how you proceed.

1. First print your name, serial number, and flight number at the top of this page. Then look at the roster. You will see a roster number printed on the left side of each name. Find your name and print your roster number in the upper right hand corner of this sheet.

2. Now look at the first statement printed below: "Tries hard to succeed in basic training." Underneath this statement there are five boxes. We want you to look at the roster, find the names and numbers of the five men most like this statement, and write their numbers in the boxes. You must put down the numbers of FIVE men—NO MORE OR NO FEWER. Then read statement number 2: "Doesn't try to succeed in basic training." Find the names and numbers of the FIVE men who are most like this statement and write their numbers in the five boxes below the statement. Continue reading the statements and writing in the numbers of the FIVE men who are most like each statement. Finish each one before going on to the next.

3. Note the following special instructions.

    a. Do not include yourself in any of the ratings.

    b. If you feel uncertain about the correctness of some of your ratings, put a check mark underneath the box containing the numbers of the men in question.

    c. The roster has the names of men in your flight during the first week of basic training. Some men named on the roster may have left the flight since that time. You may include these men in your ratings if you want to. However, names of men entering your flight since the first week of training are not included on the roster, and these men will not be rated.

    d. When you have finished both sides of this sheet, go back and make sure that you have written in the numbers of FIVE men for each statement. On items 15 and 16 you must have ten for each statement.

    e. If your name is not on the roster, use "X" as your roster number.

    f. You are to think carefully about each rating as these may be the basis for future assignments. Each space will be completed in full. An incomplete answer will lower your score!

1. Tries hard to succeed in basic training

2. Doesn't try to succeed in basic training

3. Cooperates and helps flight members in GI parties and other details

4. Uncooperative and goofs off on GI parties and other details

5. Likes to be with people, good mixer

6. Likes to be alone

7. Calm, "what's the fuss about?" attitude, does not worry about illness, doesn't become over-tired, sure of himself, doesn't become very upset in an argument, emotionally stable

8. Worries a lot, easily upset, nervous, over-anxious, always tired, complains about not feeling well, fusses over illness, hurts, bodily symptoms a great deal, gets emotional (excited, afraid, mad, sad) or embarrassed (blushes, falls to pieces) easily, unstable

9. Acts bright and alert, catches on quickly

10. Not too bright and alert, catches on slowly

11. Seldom gets excited and angry

12. Frequently gets excited and angry

13. Modest, unassuming. Not likely to tell a secret

14. Loudmouth, "Know it all." Brags too much. Not likely to keep a secret.

15. List 10 in order that you consider MOST LIKELY to succeed in the Air Force (Example: First choice would be box #1, next #2, then #3, etc.)

1	2	3	4	5

6	7	8	9	10

16. List 10 in order that you consider LEAST LIKELY to succeed in the Air Force (Example, first choice would be #1, next #2, then #3, etc.)

1	2	3	4	5

6	7	8	9	10

Table 6. Intercorrelation Matrix for Predictor and Criterion Variables

VAR[a] NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1		35	31	09	36	33	32	16	15	01	35	37	27	29	34	26	31	27	06	24	29	24	20	08	15	31	31	17	25
2			08	09	05	08	09	04	11	12	07	09	09	10	10	08	23	22	-04	18	15	21	18	01	10	24	20	07	13
3				55	42	71	75	11	11	01	30	35	27	27	26	06	19	18	02	15	27	12	09	06	07	22	23	17	18
4					-17	46	53	07	06	03	05	10	10	12	06	-04	10	10	-01	08	15	06	05	01	04	12	13	08	09
5						57	44	11	08	00	36	38	29	25	29	17	18	14	07	13	23	12	09	08	07	18	20	13	16
6							73	10	11	00	31	39	30	30	31	06	17	15	02	12	24	11	09	04	03	20	20	15	16
7								10	10	01	10	40	34	34	31	05	18	16	-02	13	24	12	11	02	04	21	22	15	17
8									49	03	08	07	04	05	07	03	05	03	03	04	05	00	-03	07	11	09	08	05	04
9										03	01	08	05	07	09	04	07	06	03	09	06	02	04	07	31	11	11	06	04
10											01	-01	00	-01	00	02	09	08	10	06	08	05	08	03	06	08	09	04	01
11												52	24	27	32	13	15	13	07	13	19	11	08	05	09	16	17	11	13
12													42	40	45	06	17	14	05	14	21	11	07	05	08	18	19	13	14
13														45	38	00	12	10	01	11	16	08	03	02	05	14	15	08	11
14															42	-01	12	11	01	10	14	09	05	05	05	14	14	09	10
15																04	15	13	03	12	18	10	07	07	07	16	17	08	11
16																	10	08	01	05	08	07	07	00	02	09	09	09	10
17																		83	32	64	74	66	50	38	50	88	88	31	27
18																			29	59	65	68	54	33	46	79	77	26	26
19																				46	53	20	07	82	58	29	44	13	01
20																					69	63	56	53	61	62	72	23	19
21																						48	33	63	62	76	85	30	20
22																							84	15	26	62	62	17	22
23																								00	12	44	45	11	19
24																									74	40	54	17	04
25																										51	62	19	11
26																											89	31	25
27																												32	23
28																													13
29																													

[a] See Table 1 for names of variables.   *Note.*—Decimal points omitted.

Table 7. Correlation of Predictor Variables with Satisfactory-Unsatisfactory Airman Performance by Occupational Group

	CAREER FIELD[a]														
PREDICTOR	29	30	31	32	42	43	53	54	57	60	64	70	73	77	9?
Selection and Classification															
1 Educational level	45	22	18	05	25	32	34	32	43	40	27	35	52	33	21
2 Age at enlistment	15	21	17	13	18	21	14	08	21	20	15	16	12	09	09
3 AFQT	08	08	02	11	14	21	14	21	34	14	07	26	25	12	28
4 AQE Mechanical AI	11	03	12	16	06	10	03	24	10	05	-01	11	13	01	23
5 AQE General AI	24	16	-03	-03	10	18	20	13	28	11	14	24	27	14	09
6 AQE Administrative AI	18	-03	-02	05	18	18	20	14	20	10	04	20	38	15	20
7 AQE Electronics AI	08	00	02	06	11	17	20	14	30	08	08	26	17	01	21
8 Height	11	-03	07	-05	07	01	-01	07	16	01	-04	04	00	06	16
9 Weight	06	-02	-10	02	11	03	03	11	15	04	-05	00	08	01	09
10 Marital status	-11	02	08	05	07	-03	01	05	03	09	05	02	06	-07	07
11 HS Algebra	10	00	09	-04	06	10	11	20	10	13	08	03	11	13	01
12 HS Geometry	14	00	16	-02	11	12	19	11	20	16	06	09	07	10	06
13 HS Trigonometry	14	07	05	-02	10	03	04	05	10	14	06	11	12	08	08
14 HS Physics	10	01	03	01	11	02	15	01	08	-01	09	05	05	06	04
15 HS Chemistry	24	03	03	-06	16	08	09	13	14	17	07	05	02	07	00
16 HS Typing	08	08	02	-04	07	08	02	15	09	08	16	12	14	11	03
Basic Military Training															
17 Tries hard to succeed	50	25	45	37	31	32	40	24	34	40	33	39	40	27	36
18 Cooperative	56	27	40	30	34	32	37	13	29	40	37	38	40	27	24
19 Likes to be with people	17	02	33	02	-01	-06	04	-04	00	05	03	-07	13	09	09
20 Calm	36	11	48	37	25	18	34	07	26	22	23	16	30	18	41
21 Acts bright and alert	38	17	40	27	22	25	34	14	30	22	25	26	25	17	30
22 Good natured	48	19	30	22	25	26	30	10	45	41	30	27	23	22	34
23 Seldom excited & angry	35	16	25	22	20	24	22	10	38	37	29	24	20	16	34
24 Adventurous	24	05	30	13	06	00	11	-01	01	05	05	-07	18	08	11
25 Physically strong	29	08	28	25	15	11	18	15	25	13	08	07	27	16	24
26 Accepts responsibility	52	24	37	32	28	32	36	25	38	31	30	28	35	23	34
27 Most likely to succeed	45	17	43	29	25	29	34	23	33	32	30	34	35	25	33
28 Tactical Instructor Evaluation	26	03	02	07	10	13	21	06	04	16	10	12	16	10	21

[a]See Table 4 for names of career fields.

Note.—Biserial coefficients for continuous predictors, phi coefficients for dichotomous predictors; decimal points omitted.

Table 8. Means of Predictor Variables by Occupational Group

Predictor	CAREER YIELD[a]														
	29	30	31	32	U	45	55	54	57	60	64	76	73	77	50
Selection & Classification															
1 Educational level	11.66	12.03	12.15	12.11	11.66	11.61	11.15	11.18	10.05	11.04	11.39	11.59	11.90	11.36	11.81
2 Age at enlistment	18.29	18.56	18.55	13.43	18.35	18.24	1?.11	18.39	18.42	17.86	18.16	18.23	18.19	18.04	18.39
3 AFQT	53.74	81.87	84.09	85.66	67.11	5?.08	50.56	50.78	42.72	49.52	47.17	47.55	56.58	51.47	65.83
4 ACE Mechanical AI	38.62	67.69	71.27	70.63	61.49	64.35	53.33	53.35	45.63	49.90	34.43	31.45	33.33	42.04	51.72
5 ACE General AI	64.55	65.64	65.83	68.94	52.69	41.66	38.15	39.13	36.23	39.68	53.93	57.46	75.31	50.96	63.50
6 ACE Administrative AI	47.45	71.64	74.31	76.97	52.42	48.52	42.14	42.42	37.09	38.36	46.1	42.05	56.09	50.03	67.72
7 ACE Electronics AI	42.66	79.87	81.77	84.38	58.88	46.99	37.53	39.71	32.86	35.55	35.81	37.06	46.25	49.97	55.03
8 Height	68.87	69.42	69.42	69.68	69.12	69.09	68.92	68.94	68.77	68.71	69.35	69.08	69.13	59.24	69.18
9 Weight	148.83	151.11	153.44	152.89	149.37	147.90	146.77	147.06	145.96	146.64	132.58	147.98	151.17	149.25	149.03
10 Marital status	.04	.04	.04	.04	.04	.03	.04	.05	.03	.01	.04	.04	.03	.03	.03
11 HS Algebra	.60	.91	.95	.95	.78	.63	.57	.57	.48	.60	.68	.70	.86	.66	.82
12 HS Geometry	.42	.74	.81	.83	.49	.33	.27	.22	.23	.22	.34	.38	.56	.34	.57
13 HS Trigonometry	.10	.31	.47	.38	.17	.07	.04	.05	.01	.03	.06	.09	.16	.05	.16
14 HS Physics	.22	.49	.63	.60	.31	.18	.13	.14	.12	.17	.17	.19	.28	.17	.28
15 HS Chemistry	.27	.51	.64	.61	.35	.23	.16	.20	.13	.19	.26	.26	.42	.25	.41
16 HS Typing	.49	.44	.39	.45	.41	.39	.31	.34	.33	.36	.44	.52	.63	.39	.45
Basic Military Training															
17 Tries hard to succeed	1.86	3.02	3.39	3.09	1.73	.34	-.16	.87	-3.97	-2.91	-.80	-.35	1.07	-.81	1.13
18 Cooperative	1.55	2.23	2.02	1.96	1.43	.46	-.26	.83	-3.60	-2.52	-1.05	-.82	.60	-.55	.91
19 Likes to be with people	1.95	-.21	.65	.04	.40	.13	-.16	-.63	.82	-.51	.61	-.19	.77	.07	.07
20 Calm	1.20	1.89	1.81	1.24	1.14	.06	-.15	.90	-2.03	-1.80	-.48	-.27	.61	-.51	-.10
21 Acts bright and alert	1.33	3.45	4.40	3.58	1.29	-.44	-1.24	-.69	-3.83	-3.28	-1.89	-1.09	.34	-1.36	.44
22 Good natured	.77	1.83	1.64	1.80	.54	.25	-.37	.76	-3.53	-1.59	-.52	-.39	.90	-.61	.28
23 Seldom excited and angry	.47	1.44	1.07	1.08	.38	.46	-.44	1.02	-2.76	-.89	-.64	-.55	.74	-.62	.31
24 Adventurous	1.82	.35	1.06	.16	.80	-.15	-.26	-.42	.22	-.82	.17	-.05	.26	.10	-.06
25 Physically strong	2.17	1.14	.65	-.79	1.19	.00	.28	.34	-.86	-1.50	.68	-.67	.08	.09	-.?2
26 Accepts responsibility	1.22	2.98	3.83	3.18	1.40	-.23	-.89	.14	-3.99	-2.75	-1.27	-.94	.66	-.94	.78
27 Most likely to succeed	1.86	3.80	4.35	3.59	1.99	.13	-.71	.23	-4.44	-3.19	-1.21	-.91	1.09	-.87	.97
28 Tactical instructor Evaluation	.77	.95	.95	1.02	.72	.72	.70	.55	.33	.67	.67	.51	.80	.58	.72

[a] See Table 4 for names of career fields.

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Table 2. Means and Standard Deviations of Predictor Variables by Occupational Group.

	CAREER FIELD														
Predictor	29	30	31	32	42	45	53	54	57	60	64	70	73	77	90
Selection & Classification															
1 Educational level	.97	.84	.91	.73	1.04	1.06	1.26	1.30	1.36	1.30	1.10	1.06	.90	1.13	.98
2 Age at enlistment	1.22	1.48	1.35	1.26	1.41	1.42	1.84	1.35	1.11	2.00	1.41	1.57	1.99	1.57	1.28
3 AFQT	18.36	13.81	13.54	12.57	20.38	19.67	19.00	19.37	17.04	16.22	17.85	19.22	18.98	18.12	18.69
4 ACE Mechanical AI	19.12	17.97	15.43	17.33	16.84	13.36	12.03	14.48	9.75	12.22	19.08	16.20	18.39	19.26	21.99
5 ACE General AI	13.83	16.18	17.71	15.02	19.63	18.90	19.42	19.30	18.88	20.07	14.85	15.73	9.03	18.84	17.20
6 ACE Administrative AI	17.49	13.97	15.06	11.88	17.52	16.39	16.45	17.09	16.12	16.09	16.00	17.19	15.01	11.70	11.50
7 ACE Electronics AI	19.27	7.67	12.11	5.11	19.45	17.77	16.82	17.52	16.84	16.07	16.07	15.92	16.64	16.14	16.91
8 Height	2.80	2.47	2.51	2.63	2.59	2.47	2.62	2.40	2.28	2.68	2.51	2.54	2.66	2.46	2.44
9 Weight	22.37	21.07	20.60	21.89	21.95	20.81	19.34	20.95	19.12	21.34	22.79	21.82	20.65	21.87	22.02
10 Marital status	.20	.21	.23	.19	.20	.18	.20	.22	.17	.11	.22	.20	.17	.17	.16
11 HS Algebra	.40	.28	.22	.23	.42	.48	.50	.50	.50	.49	.47	.46	.35	.47	.38
12 HS Geometry	.50	.44	.39	.38	.50	.47	.44	.42	.42	.42	.47	.49	.50	.47	.50
13 HS Trigonometry	.30	.46	.46	.49	.37	.26	.20	.22	.12	.17	.28	.28	.37	.28	.37
14 HS Physics	.41	.55	.48	.49	.46	.38	.36	.34	.32	.37	.37	.40	.45	.37	.45
15 HS Chemistry	.44	.50	.48	.49	.48	.42	.37	.40	.34	.39	.45	.44	.50	.45	.49
16 HS Typing	.50	.50	.49	.50	.49	.49	.46	.47	.47	.48	.50	.50	.49	.49	.50
Basic Military Training															
17 Tries hard to succeed	10.24	9.68	9.84	8.74	9.25	9.08	10.48	7.95	11.31	12.04	10.30	10.77	8.99	10.21	9.51
18 Cooperative	9.49	8.10	8.52	7.63	8.34	7.99	8.73	7.17	10.46	10.25	9.30	9.28	7.87	8.75	8.11
19 Likes to be with people	7.85	8.27	9.35	7.60	8.19	7.73	8.39	7.75	7.35	8.16	8.39	9.25	8.48	8.45	8.53
20 Calm	7.54	7.44	9.63	7.77	7.20	7.06	7.87	6.43	7.65	8.04	7.80	8.15	7.88	7.66	7.63
21 Acts bright and alert	10.03	9.42	11.32	8.13	8.91	8.78	9.56	8.25	9.98	9.80	9.42	10.01	9.59	9.42	10.58
22 Good natured	8.77	7.72	7.93	7.87	7.87	7.51	8.47	7.07	9.71	9.45	8.86	9.28	7.75	8.01	7.62
23 Seldom excited and angry	8.50	7.77	7.87	8.14	8.29	7.26	8.39	6.90	9.21	9.05	8.75	9.04	7.66	6.21	7.68
24 Adventurous	8.62	9.02	10.20	8.36	8.31	8.44	8.62	7.60	7.35	8.42	8.88	9.66	8.78	9.17	9.16
25 Physically strong	11.18	10.82	11.95	10.54	10.11	10.41	10.37	9.09	9.27	11.00	11.50	11.65	9.74	11.27	11.59
26 Accepts responsibility	10.21	10.29	11.44	9.66	9.28	8.91	9.85	7.78	10.02	10.50	9.86	10.51	8.62	9.41	9.54
27 Most likely to succeed	11.11	10.73	12.25	9.45	9.86	9.49	10.96	8.36	10.50	12.06	10.56	11.41	9.88	10.38	10.38
28 Tactical Instructor Evaluation	1.11	1.07	1.07	1.00	1.09	1.09	1.01	1.17	1.24	1.10	1.09	1.13	1.10	1.10	1.19

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Table 10. Validities [a] of the Composite Scores for All Occupational Groups

GROUP	POPULATION COMPOSITE	CAREER-FIELD-DERIVED COMPOSITE SCORE														
		29	30	31	32	42	43	53	54	57	60	64	70	73	77	90
Total Population	.47	43	44	37	37	43	46	42	41	42	44	46	46	43	44	40
29 [a]	59	74	66	44	51	67	65	61	51	49	57	63	53	60	60	39
30	32	26	32	21	26	28	30	23	25	25	26	33	33	26	31	18
31	46	26	41	59	51	29	35	39	41	22	33	44	38	32	43	46
32	30	17	26	33	40	19	30	22	30	10	20	27	27	24	28	33
42	36	38	39	29	31	43	38	35	30	35	34	39	36	36	35	29
43	41	43	41	32	33	41	45	37	39	36	37	41	42	42	40	35
53	45	46	46	37	38	44	47	51	39	35	41	44	43	44	45	41
54	40	30	31	32	30	31	34	32	47	38	34	33	41	36	38	25
57	47	42	43	43	35	43	46	44	45	65	54	41	47	47	48	44
60	54	49	50	36	40	48	47	45	47	50	57	55	54	49	49	36
64	42	38	41	27	30	39	39	37	31	29	42	45	42	36	38	30
70	52	43	45	32	39	43	48	40	43	41	46	51	54	48	46	40
73	60	49	57	48	42	43	60	51	51	46	49	58	56	74	57	47
77	36	34	35	27	26	31	34	33	31	28	33	35	35	37	36	37
90	38	38	37	43	40	31	45	39	37	41	37	39	36	42	37	57

[a] This table should be read in the following manner: For the 29 career field the validity of the population-derived score was .59, for the equation developed on the 29 career field, the validity was .74, for the equation developed on the 30 career field, the validity was .66, and so on.

Note.—Biserial correlation coefficients with decimal points omitted.