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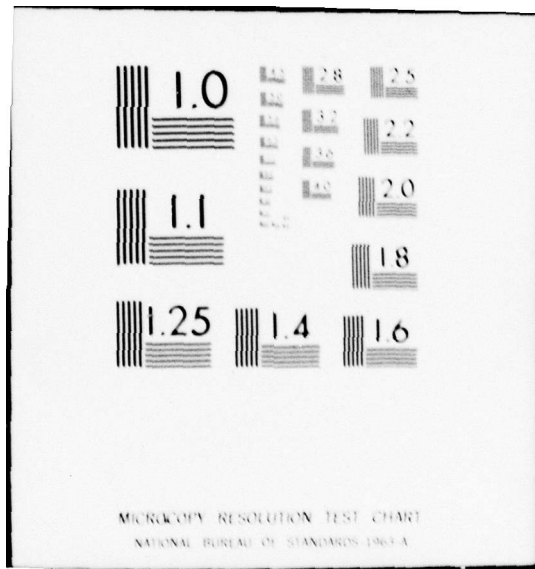
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JUNE 1978

**ARMED SERVICES VOCATIONAL APTITUDE BATTERY
FORMS 0 AND 7: VALIDATION AGAINST SCHOOL
PERFORMANCE-INTERIM REPORT**

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6 ARMED SERVICES VOCATIONAL APTITUDE BATTERY
FORMS 6 AND 7: VALIDATION AGAINST
SCHOOL PERFORMANCE. ~~INTERIM REPORT~~

10 Leonard Swanson

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Two validation studies, one concurrent and one predictive, were conducted to evaluate the effectiveness of the Armed Services Vocational Aptitude Battery, used since January 1976 for acceptance of applicants into the Armed Services and for initial assignment to school after completion of recruit training. ASVAB subtest and current selector composite validities against a final school grade (FSG) or days-in-training (DAYS) criterion were		

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↙ determined for each school sample. Validities of many other two-, three-, and four-test sets of ASVAB composites were also determined to discover more valid composites than those operationally used. In addition, in the predictive study, revised composites developed in a related study on Basic Electricity and Electronics (BE/E) courses were validated in several follow-on "A" schools. ↖

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FOREWORD

This study was conducted in support of a Chief of Naval Personnel requirement to evaluate the recently operational Armed Services Vocational Aptitude Battery (ASVAB), Forms 6 and 7, for assignment of Navy enlisted personnel for school training. It is the second of a series of reports related to validation of ASVAB as an operational instrument. The first concerned the use of ASVAB as a tool for predicting attrition from the Basic Electricity and Electronics School (Dann, Note 1).

Two separate validation studies are reported here, one concurrent and one predictive. In the concurrent study, the ASVAB was administered to students at the beginning of "A" school training. These students had already been selected on the basis of test scores on the Navy Basic Test Battery. In the predictive study, the ASVAB was administered at the time of enlistment and was used for school assignment decisions. The predictive method is preferred because it reflects operational procedures. Also, there may have been a greater problem with motivation during ASVAB test administration in the concurrent study since the students had already been accepted for school training and ASVAB test scores would have no effect on their status. Where there are differences in ASVAB test or composite validities for the same school in the two studies, greater importance should be given to the predictive validities. Some validity differences are largely due to a change in school criterion measure from final school grade to days-in-training.

The study results have been transmitted to cognizant officers of the Bureau of Naval Personnel by informal reports and the recommended changes in EM, GM, and IC selection composites have been implemented, resulting in reduced attrition in BE/E School.

J. J. CLARKIN
Commanding Officer

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SUMMARY

Problem

In January 1976, the Armed Services Vocational Aptitude Battery (ASVAB), Forms 6 and 7, replaced the Navy Basic Test Battery (BTB) for use in selection and initial assignment of recruits to "A" schools. However, the battery had not been validated in Navy schools before its implementation. Such validation is necessary to maintain effective standards for school selection.

Objective

The purposes of this effort were (1) to validate operational composites of ASVAB Forms 6 and 7 for a wide variety of Navy Class "A" schools, and (2) to identify and evaluate alternate ASVAB composites for specific schools.

Approach

Two separate studies are reported here, one concurrent and one predictive. In the concurrent study, ASVAB Form 6 was administered to students in 31 "A" schools at the beginning of training. ASVAB and BTB subtest and composite scores were correlated with end-of-course training performance measures--final school grade (FSG), where available, and days-in-training (DAYS), for self-paced courses.

In the predictive study, ASVAB Form 6 or 7 was administered to Navy applicants at the time of enlistment, and those assigned to 41 "A" schools and 4 ratings requiring attendance at BE/E school were included in the sample. ASVAB subtest and composite scores were correlated with performance measures--FSG or DAYS.

For both studies, zero order and multiple correlational analyses were performed using the general technical, mechanical, electronics, and clerical ASVAB selector composites. Also, various two-, three-, or four-test sets of alternate ASVAB composites were validated in an attempt to discover those that were more valid than those in current use.

Results

In the concurrent study, the median uncorrected (for restriction of range) validity of the ASVAB selector composite against the FSG criterion was .39, and that of the BTB selector composite was .36. The corresponding median uncorrected validity of the ASVAB selector composite in the predictive study was .46. Median uncorrected validities of ASVAB selector composites against the DAYS criterion were -.12 and -.075 in the concurrent and predictive studies respectively.

In both studies, several alternate ASVAB composites yielded very similar validities. Also, revised composites for several ratings requiring attendance at BE/E school, identified by Dann (Note 1), were found to be effective in ratings included in the predictive study.

Conclusions

1. FSG is a more predictable criterion than DAYS.
2. For schools with an FSG criterion, the present Navy ASVAB selector composites are about as valid as were BTB selector composites.
3. Using a single ASVAB selector composite for both "A" schools and BE/E school required for those schools will reduce BE/E attrition and still be effective for "A" schools.
4. The large number of two- and three-test ASVAB composites yielding very similar validities suggests a lack of differential validity among the ASVAB tests.
5. Effective selection for "A" schools may be accomplished by using a fewer number of ASVAB subtests (i.e., by eliminating or combining current ones).
6. Research is needed on school criterion measures, with particular emphasis on self-paced schools.

Recommendations

1. Selector composites for the following schools should be as shown below:

<u>School/Rating</u>	<u>Previous Composite</u>	<u>Recommended Composite</u>
EM and BE/E	MK+MC+SI	2MK+AR+GS
GM and BE/E	MK+MC+SI	AR+MK+GS+EI
IC and BE/E	WK+MC+SI	2MK+AR+GS

The data suggest changes in selector composites for six additional schools (AMH, AMS, BT, PN, PR, and QM); however, no recommendations for changes are made at this time pending results of more extensive analyses of additional data, including determination of appropriate cutting scores.

2. Consideration should be given to (a) improving the reporting of school criterion data for use in validation of classification instruments, (b) including school performance data for individual students on a by-name basis in the Navy's Integrated Training and Reporting System (NITRAS), and (c) identifying and exploring alternative measures of student performance in self-paced courses.

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INTRODUCTION

Background and Problem

In January 1976, the Armed Services Vocational Aptitude Battery (ASVAB), Forms 6 and 7, replaced the Navy Basic Test Battery (BTB) for use in selection and initial assignment of recruits to "A" schools and on-job training. The ASVAB is a selection and classification battery that was first developed in the 1960s for use by the Armed Services in their recruiting efforts. However, the early versions of the ASVAB--Forms 1 through 4--were found to be unsuitable for joint-service classification testing, since they did not include tests for certain aptitudes required by one or another of the military services. This led to the development of the expanded ASVAB--Forms 5, 6, and 7--which includes 12 cognitive subtests, covering all the aptitudes included in the batteries previously used by the various services.

ASVAB Forms 5, 6, and 7 cover the same information and are at the same level of difficulty. However, Form 5 is administered at high schools; and Forms 6 and 7, to potential applicants at Armed Forces Entrance and Examining Stations (AFEES) or by mobile testing teams.

The BTB has been validated in a great many Navy Class "A" schools over a 20-year period (e.g., Alf, Gordon, Rimland, & Swanson, 1962; Thomas & Thomas, 1967; Thomas, 1970; Thomas, Note 2). However, the expanded ASVAB, while containing subtests similar to those in the BTB, has not been validated since it became operational. To maintain effective standards for Class "A" school selection based on the expanded ASVAB, the Bureau of Naval Personnel has requested that continuing studies be made of the relative ability of these tests to predict performance in the various schools.

Purpose

The purposes of this effort were:

1. To validate operational composites in ASVAB Forms 6 and 7 for a wide variety of Navy Class "A" schools.
2. To identify and evaluate alternate ASVAB composites for specific schools.

METHOD

Two separate validation studies of the Armed Services Vocational Aptitude Battery (ASVAB) are reported here. In the first study, ASVAB Form 6 was administered to students in 31 Class "A" schools at the beginning of training. These students had already been selected on the basis of test scores obtained on the Navy Basic Test Battery (BTB). Testing was conducted soon after Form 6 was made available for distribution, but before it had been put into operational use. This was done to provide validity information earlier than it could be obtained if the data collected had to await the normal operational testing cycle. This method, which tests incumbents at the schools, is called "concurrent" validation.

In the second study, ASVAB Form 6 or 7 was administered to Navy applicants at the time of enlistment at Armed Forces Entrance and Examining Stations, mobile examining test sites, or a Naval Training Center. Data obtained were used for school assignment decisions. This method, which uses test scores of personnel from the battery administered prior to selection, is called "predictive" validation. This method is preferred because it is more informative, generally involves a larger sample, and reflects operational procedures. Thus, it will be used in future ASVAB studies.

The concurrent and predictive ASVAB validation studies are described separately in the following sections.

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CONCURRENT VALIDATION STUDY

Approach

Sample

The Armed Services Vocational Aptitude Battery (ASVAB), Form 6, was administered by classification testing personnel to students in 31 Class "A" schools between October 1975 and April 1976. The schools were selected for inclusion in the study because (1) they represented a wide variety of "A" schools, (2) they were, for the most part, large enough to provide adequate samples for analysis, and (3) their locations facilitated administration of the battery.

Variables

Criteria. The most frequently used criterion was final school grade (FSG), which was obtained for 25 schools. For the eight schools using a self-paced instructional mode, a days-in-training (DAYS) criterion was used (two of these schools also used FSG). Finally, for the Hospitalman (HM) School, three other grades in specific phases of the course were obtained: first aid (FA), applications average (AP AV), and patient care (PC). The FA and PC grades were considered by school personnel to be most related to job duties during the first year after graduation.

The schools included in the validation, along with sample sizes (i.e., those having criterion data) are presented in Table 1.

Predictors. The primary predictor variables used in the analyses were the scores of the 12 cognitive subtests of the expanded ASVAB (Form 6), the four Navy ASVAB selector composites,¹ the six subtests of the Navy Basic Test Battery (BTB)--Form 8, the four BTB selector composites, and the Armed Forces Qualification Test (AFQT).² These variables are listed and described briefly in Table 2.

Fifty additional ASVAB test composites were included in the analyses in an attempt to discover alternate composites that might prove to be more valid than existing ones. Of this total, 21 were two-test sets; 24, three-set tests; and 5, four-test sets. These sets, which included 10 used by the Army or Air Force (see Table 2), were considered likely alternate composites in terms of individual test validity for certain schools, based on ASVAB Form 2 validity data and knowledge of course content.

¹Since the current ASVAB became operational before it was possible to validate it, selection composites were established by using the ASVAB composite analogous to the BTB composite that had been found effective at each school.

²The AFQT score is obtained by summing the scores of three ASVAB subtests--the word knowledge, arithmetic reasoning, and space perception tests--see Table 2.

Table 1

"A" Schools Included in ASVAB 6 Concurrent Analysis

School Course or Rating	Rating Code	Course Code	Location	Criterion Data	
				FSG (N)	Days (N)
Aviation Electrician's Mate	AE	6515	Memphis	102	-
Aviation Electronics Technician, Navigation	ATN	6503	Memphis	-	190
Aviation Fire Control Technician	AQ	6535	Memphis	-	55
Aviation Machinist's Mate, Jet	ADJ	6501	Memphis	145	-
Aviation Structural Mechanic	AMS	6518	Memphis	126	-
Avionics	AV	6531	Memphis	-	158
Boiler Technician	BT	6069	Great Lakes	225	-
Builder	BU	6081	Pt. Hueneme	61	-
Communications Technician, Administrative	CTA	6020	Pensacola	45	45
Communications Technician, Communications	CTO	6053	Pensacola	135	135
Data Processing Technician	DP	6167	San Diego	127	-
Dental Technician	DT	6086	San Diego	151	-
Electrician's Mate	EM	6071	San Diego	140	-
Electronics Technician	ETA1	6129	Great Lakes	232	-
Electronics Technician	ETA2	6133	Great Lakes	235	-
Electronics Technician	ETA3	6137	Great Lakes	223	-
Engineman	EN	6067	Great Lakes	204	-
Equipment Operator	EO	6097	Pt. Hueneme	64	-
Fire Control Technician	FTA1	6027	Great Lakes	255	-
Fire Control Technician	FTA2	6108	Great Lakes	186	-
Gunner's Mate	GM	6115	Great Lakes	229	-
Gunner's Mate Technician	GMT	6025	San Diego	97	-
Hospitalman ^a	HM	6085	San Diego	239	-
Machinery Repairman	MR	6068	San Diego	110	-
Machinist's Mate	MM	6066	Great Lakes	286	-
Mess Management Specialist	MS	6125	San Diego	167	-
Operations Specialist	OS	6142	Great Lakes	254	-
Personnelman	PN	6102	Meridian	-	121
Radioman	RM	6144	San Diego	-	77
Storekeeper	SK	6059	Meridian	237	-
Yeoman	YN	6057	Meridian	-	123

^aFirst aid (FA), applications average (AP AV) and patient care (PA) grades also obtained for HM students (N = 239).

Table 2

Predictor Variables Used in Concurrent Study

Predictor Variable	Abbreviation	Description
ASVAB Form 6 Cognitive Subtests ^a		
General Information	GI	A 15-item general knowledge test, primarily on sports, outdoor activities, automobile mechanics, and history. Testing time is 7 minutes.
Numerical Operations	NO	A 50-item speeded mathematical test, requiring elementary addition, subtraction, multiplication, and division--3 minutes.
Attention to Detail	AD	A 30-item speeded test in which the examinee counts the number of Cs embedded in lines of Os--5 minutes.
Word Knowledge	WK	A 30-item vocabulary test--10 minutes.
Arithmetic Reasoning	AR	A 20-item arithmetic test requiring examinees to generate a principle to solve a problem--20 minutes.
Space Perception	SP	A 20-item pictorial test. Requires examinee to select the flat pattern that could form three-dimensional stimulus figure--12 minutes.
Mathematics Knowledge	MK	A 20-item test requiring knowledge of algebra, geometry, fractions, decimals, and exponents--20 minutes.
Electronics Information	EI	A 30-item test requiring knowledge of electrical and electronic components, principles and symbols--15 minutes.
Mechanical Comprehension	MC	A 20-item test about drawings illustrating mechanical principles--15 minutes.
General Science	GS	A 20-item test measuring reasoning in the physical (N = 10) and biological sciences (N = 10)--8 minutes.
Shop Information	SI	A 20-item test on examinee's knowledge about the use of a variety of shop tools and practices--8 minutes.
Automotive Information	AI	A 20-item test on automobile parts, operations, or malfunctions--10 minutes.
Navy ASVAB Selector Composites		
WK+AR	GT	General Technical Composite. Also used by the Army and the Air Force
WK+MC+SI	MC	Mechanical Composite.
AR+MK+GS+EI	EL	Electronics Composite.
WK+AD+NO	CL	Clerical Composite. Used as Administrative Composite by Air Force.

^aReported as Navy Standard Scores (NSS) having a mean of about 50 and a standard deviation of 10 for an unrestricted recruit population.

Table 2 (Continued)

Predictor Variable	Abbreviation	Description
Basic Test Battery, Form 8 Subtests		
General Classification Test	GCT	A 35-item sentence completion and verbal analogy test, with five alternatives.
Arithmetic Reasoning Test	ARI	A 20-item arithmetic reasoning test. Similar to the ASVAB AR test.
Mechanical Comprehension Test	MECH	A 25-item pictorial item test, requiring knowledge of mechanical principles. Similar to ASVAB MC test.
Coding Speed Test	CS	A 50-item test of perceptual speed.
Shop Practices Test	SHOP	A 15-item test on shop practices and use of tools. Similar to ASVAB SI test.
Electronics Selection Test	EST	A 35-item test, 14 relating to mathematics (algebra), 6 to science, and 15 to electricity/electronics. A single score is obtained.
Navy BTB Selector Composites		
GCT+ARI	GT	General Technical Composite.
GCT+MECH+SHOP	MC	Mechanical Composite.
ARI+2EST	EL	Electronics Composite.
GCT+CS	CL	Clerical Composite.
ASVAB Form 6 Selector Composites Used by Army or Air Force ^b		
WK+AR+SP		Armed Forces Qualification Test (AFQT).
AR+SP+EI		Electronics Composite--Air Force.
MC+SI+AI		Mechanical Composite--Air Force.
AR+MC+AI+GS		Similar to Army General Maintenance Composite, except that only the 10 biological items in the GS test are used.
AR+EI+MC+SI		Army Electronics Composite, excluding the Classification Inventory (CI) Electronics scale.
AD+WK+AR		Army Clerical Composite, excluding the CI Administration scale.
MK+EI+SI+AI		Army Mechanical Maintenance Composite, excluding the CI Mechanical scale.
WK+AR+SP+MC		Army Surveillance and Communications Composite.
AD+AR+SP+SI		Army Combat Composite, excluding the CI Administration scale.
GI+AI		Army Operators and Food Composite, excluding the CI Administration scale.
AR+MK+GS		Similar to Army Skilled Technician Composite, except that only the 10 biological items in the GS test are used by the Army.

^bFive of the Army Selector Composites listed below used a scale from the Classification Inventory, (CI), which is actually subtest 13 of the expanded ASVAB. Since this test is not administered to Navy "A" students, it was not included in analysis of these composites.

Table 2 (Continued)

Predictor Variable	Abbreviation	Description
Alternate ASVAB Composites (Not Army/Air Force)		
NO+WK	-	-
NO+AR	-	-
NO+SP	-	-
NO+MK	-	-
AD+MK	-	-
AD+AR	-	-
AD+SP	-	-
AD+MK	-	-
WK+SP	-	-
WK+MK	-	-
AR+SP	-	-
AR+MC	-	-
AR+AI	-	-
SP+MK	-	-
SP+EI	-	-
SP+MC	-	-
MK+EI	-	-
MK+MC	-	-
MK+GS	-	-
MK+AI	-	-
NO+AD+AR	-	-
NO+AD+SP	-	-
NO+AD+MK	-	-
WK+AR+SP	-	-
WK+AR+MC	-	-
WK+AR+GS	-	-
WK+AR+SI	-	-
WK+SP+MK	-	-
AR+SP+MC	-	-
AR+SP+GS	-	-
AR+EI+MC	-	-
AR+EI+GS	-	-
AR+MC+SI	-	-
AR+GS+AI	-	-
SP+MK+EI	-	-
SP+MK+MC	-	-
MK+EI+MC	-	-
MK+EI+GS	-	-
MK+MC+SI	-	-
MK+MC+AI	-	-

Analysis

Means, standard deviations and correlations among primary predictors (subtests and selector composites), and criterion variables were computed for each school. Validities of each subtest and each composite were corrected for restriction in range, which occurs when students are selected for technical training.³ Also, validities of the 50 additional ASVAB test composites were compared with existing composite validities.

Multiple correlations (Rs) were computed from uncorrected correlations for the 12 ASVAB tests and the 6 BTB tests for each course, using an accretion method in which an R was computed after the addition of each predictor. At each stage, the R and the increase in R from the previous stage were tested for significance.

Results and Conclusions

Zero order and multiple correlations for the primary predictor scores against school performance using the general technical, mechanical, electronics, and clerical selector composites are presented in Tables 3 through 6, respectively. An examination of the data presented reveals that both the ASVAB and BTB selector composites are moderately effective for predicting the final school grade (FSG) criterion: The median uncorrected validity of the ASVAB selector composite for the 25 schools with a FSG criterion is .39, with a range from .12 to .59; and that of the BTB composite, .36, with a range from .16 to .68. The days-in-training (DAYS) criterion is far less predictable, the median validity for the 8 schools with this criterion being -.12 and -.10 for the ASVAB and BTB selector composites, respectively. It should be remembered that a negative correlation is expected with the DAYS criterion since fewer days required to complete the course should reflect greater ability. However, discussions with school administrative personnel indicated that some students could have completed the course sooner, but they delayed completion until the end of a week to avoid being assigned to general detail duty while awaiting transfer to a new duty station. This and other similar practices may have reduced the validity for predicting the DAYS criterion.

³Since recruits are not selected for "A" school unless they have above average BTB scores, test validities obtained for school samples are lower than those found for a sample with a broader range of ability. The obtained validities, however, can be adjusted or "corrected" to reflect the validities that would be obtained for a sample covering a wide range of ability, and to permit a fairer comparison of test validities for schools with different required scores on classification tests (see Guilford, 1956, pp. 320-321).

Table 3

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance for Nine Schools Using the General Technical Composite

School	CTO		MS		OS		FN		RM		SK		DP		DT		FSG		First Aid		Avg		Patient Care			
	FSG	F _U	FSG	F _U	FSG	F _U	DAYS	F _U	DAYS	F _U	FSG	F _U	FSG	F _U	FSG	F _U	FSG	F _U	FSG	F _U	FSG	F _U	FSG	F _U		
ASVAB Form 6 Subtests																										
GI	10	35	-13	-24	20	34	08	32	20	26	11	12	18	36	18	43	14	25	24	51	29	52	25	49	34	60
NO	21	30	-18	-23	20	35	21	25	-10	-05	-10	-16	24	35	17	32	18	30	21	43	20	40	16	38	14	41
AD	09	-05	-12	-06	29	27	23	29	-18	-19	-12	-16	20	23	14	18	21	28	15	30	15	29	13	28	15	32
WK	35	60	01	17	29	43	13	42	17	24	-15	-21	21	44	12	44	14	28	33	58	30	53	32	55	39	65
AR	30	59	-21	-33	35	47	30	50	08	18	-08	-16	45	61	34	58	22	34	33	58	32	54	31	54	38	64
SP	17	40	-06	-18	18	32	24	37	-02	08	-42	-43	22	37	17	39	09	16	06	31	12	33	13	34	24	46
MK	40	65	-27	-37	32	45	24	45	-03	09	-21	-25	43	59	38	58	19	32	24	52	20	46	26	50	27	56
MC	27	53	-15	-28	21	35	09	32	06	15	-12	-18	26	36	26	51	20	30	33	55	34	53	37	55	40	61
GS	21	50	03	-15	28	41	20	41	11	20	-26	-29	29	43	24	51	13	26	22	51	26	50	26	51	35	62
EI	35	61	-09	-25	24	39	09	33	14	22	-24	-27	24	43	39	60	15	28	40	62	38	58	38	59	41	60
SI	02	30	-02	-15	14	27	09	26	14	21	-03	-03	14	31	07	32	06	15	21	47	27	48	25	47	29	55
AI	00	22	05	-06	15	28	04	24	16	21	01	-06	19	31	29	51	05	17	21	46	26	47	22	44	33	56
1.2 Tests																										
R =	53		42		48		38		32		54		53		55		34		50		47		47		54	
Navy ASVAB Selector Composites																										
GI	40	65	-11	-27	37	48	26	50	17	24	-14	-20	37	56	27	56	21	33	40	64	37	59	39	61	47	71
MC	29	58	00	-18	31	44	19	44	19	26	-17	-22	27	49	19	51	16	30	33	60	35	58	35	58	44	69
EL	43	67	-24	-35	35	47	26	50	07	18	-22	-25	48	63	44	66	26	37	44	66	42	62	45	64	50	73
CL	33	50	-17	-26	41	50	28	43	-07	02	-17	-22	32	49	22	45	25	36	34	59	32	54	29	53	32	60
BTB, Form 8 Subtests																										
GCT	41	66	03	-20	19	38	20	49	14	22	-19	-22	21	49	26	58	07	26	32	61	29	56	30	57	41	70
ARI	15	55	-23	-34	17	36	22	50	-02	13	09	-07	36	57	45	67	18	32	35	63	29	56	29	56	37	68
MECH	05	31	05	-08	13	28	07	39	13	21	-06	-12	11	30	26	51	04	18	09	40	15	41	16	42	21	51
CS	06	13	-14	-17	23	26	19	27	-08	-01	06	-02	26	40	22	35	22	32	19	41	12	33	16	37	15	40
SHOP	16	39	05	-08	11	26	00	24	08	17	-03	-11	17	36	31	53	12	24	24	48	26	47	22	44	38	59
EST	37	63	-25	-36	29	43	30	52	-13	02	03	-07	35	53	33	58	24	35	30	56	25	50	32	55	29	59
6 Tests																										
R =	48		35		35		37		28		47		45		50		31		45		39		40		53	
Navy BTB Selector Composites																										
GI	36	65	-14	-30	22	39	26	52	09	20	-08	-16	34	56	44	67	16	31	41	66	35	59	36	60	48	73
MC	28	57	04	-16	18	36	11	42	15	23	-11	-18	21	46	35	61	11	27	27	57	30	55	29	55	43	69
EL	35	63	-28	-37	29	43	32	54	-12	05	05	-07	39	58	40	64	26	37	34	61	28	54	35	59	35	65
CL	33	61	-09	-26	30	44	27	51	01	14	-07	-16	31	53	32	59	19	32	32	60	25	53	29	55	34	65
AFQT	24	59	-06	-25	23	40	19	48	02	16	-16	-21	38	57	43	66	25	36	39	64	36	59	41	52	44	70

Notes.

1. Decimal points have been omitted from validities.
2. F_U = Uncorrected validity; F_C = Corrected validity.
3. Validities of selector composites and tests included in them are underlined.

Table 4

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance for Ten Schools Using the Mechanical Composite

School Criterion	AMS FSG (N=126)		BU FSG (N=61)		BT FSG (N=225)		EM FSG (N=104)		EN FSG (N=204)		EO FSG (N=64)		GM FSG (N=229)		GMT FSG (N=97)		MR FSG (N=110)		MH FSG (N=286)	
	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c
ASVAB Form 6 Subtests																				
GI	29	58	29	43	23	47	07	22	19	34	30	35	36	47	22	36	07	19	38	55
NO	11	16	33	33	10	25	18	16	15	20	09	15	05	05	35	35	20	20	34	44
AD	02	11	04	05	09	14	18	15	09	12	20	23	02	03	17	18	19	17	19	23
WK	35	60	47	61	30	56	26	38	31	46	28	36	41	52	13	34	05	19	50	67
AR	47	69	52	62	29	46	36	44	30	41	06	19	33	39	36	46	35	42	50	64
SP	38	64	39	59	20	36	33	42	08	19	10	20	22	34	21	35	34	40	32	48
MK	46	66	55	65	26	43	38	45	30	40	33	40	30	36	44	56	34	39	56	69
MC	46	77	38	60	31	56	43	52	20	38	29	38	32	46	40	54	16	28	51	67
GS	49	75	43	62	37	60	41	50	23	41	28	37	42	53	34	50	26	34	50	67
EI	29	57	30	52	41	62	37	47	32	46	27	35	23	36	22	41	17	26	43	61
SI	39	65	57	73	25	49	17	30	13	32	21	30	25	40	02	22	10	21	26	46
AI	42	70	30	54	25	55	06	20	28	43	25	33	38	50	17	33	14	25	28	51
12 Tests R =	68		84		49		60		46		64		58		59		54		65	
Navy ASVAB Selector Composites																				
GT	50	74	64	75	37	61	34	44	36	50	23	33	44	54	30	46	19	31	57	72
MC	51	78	59	74	39	64	40	51	32	48	36	43	44	56	27	46	12	26	58	74
EL	57	80	64	77	47	67	52	59	39	52	31	39	40	50	51	61	40	47	62	75
CL	24	38	46	53	23	47	28	32	25	37	28	36	23	31	37	41	22	28	47	61
BTB, Form 8 Subtests																				
GT	41	75	57	74	28	59	30	43	29	47	15	28	39	52	23	43	19	32	52	70
ARI	33	61	56	70	28	51	42	50	23	38	12	25	28	40	38	51	39	46	53	68
MECH	41	78	34	61	33	61	25	39	18	39	02	19	14	36	10	36	28	38	36	61
Code. Speed	23	37	43	54	08	18	19	23	20	29	12	18	19	27	24	28	11	15	23	30
SHOP	35	74	37	63	16	53	28	42	14	37	28	37	16	38	05	33	18	31	20	50
EST	37	67	49	62	29	48	52	58	29	43	30	38	27	39	25	38	38	44	62	75
6 Tests R =	62		71		45		59		38		42		42		43		47		65	
Navy BTB Selector Composites																				
GT	45	76	64	77	33	61	40	50	30	47	15	28	39	52	36	51	33	42	58	74
MC	59	85	52	71	37	65	37	49	29	47	21	32	32	48	22	44	25	36	52	71
EL	40	70	56	69	33	54	54	60	31	46	28	37	32	44	32	46	41	47	63	76
CL	39	69	61	75	21	50	30	41	30	46	18	29	36	49	32	47	20	31	46	64
APT	52	82	59	75	41	66	40	50	31	48	30	38	32	48	32	49	30	38	59	75

Notes.

1. Decimal points have been omitted from validities.
2. I_u = Uncorrected r; I_c = Corrected r.
3. Validities of selector composites and tests included in them are underlined.

Table 5

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance for Ten Schools Using the Electronics Composite

School	ADJ		AE		AQ		ATN		AV		ETA1		ETA2		ETA3		FTA1		FTA2		
Criterion	FSG (N=145)		FSG (N=102)		DAYS (N=55)		DAYS (N=190)		DAYS (N=158)		FSG (N=232)		FSG (N=235)		FSG (N=223)		FSG (N=255)		FSG (N=186)		
Predictor	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	
ASVAB Form 6 Subtests																					
GI	12	15	24	52	11	-06	-09	-16	01	-06	20	54	22	51	31	54	15	44	23	49	
NO	06	12	13	15	-22	-38	-11	-19	-07	-13	-02	16	18	28	16	42	-01	15	18	44	
AD	10	11	12	22	-25	-39	-05	-12	-17	-20	12	27	10	17	16	31	05	18	13	22	
WK	34	36	25	50	15	-13	-15	-23	-02	-09	19	50	28	61	17	58	26	50	29	61	
AR	10	19	32	61	-11	-32	-07	-18	-22	-26	24	58	25	59	24	62	27	60	28	64	
SP	03	08	11	37	14	-05	-10	-16	00	-07	27	48	38	60	20	43	36	57	22	55	
MK	27	34	29	62	-16	-35	-11	-21	-08	-16	21	59	26	63	35	72	26	60	24	64	
MC	17	21	22	51	07	-03	-13	-21	-01	-11	32	58	43	70	36	61	41	64	35	65	
GS	29	34	26	54	02	-23	-24	-30	12	00	29	58	39	67	19	52	37	62	30	63	
EI	24	27	13	37	07	-12	-06	-16	07	-03	27	47	38	59	30	53	25	42	37	61	
SI	26	25	20	43	22	10	-05	-13	05	-01	19	27	27	46	23	40	22	39	16	31	
AI	21	17	15	37	12	00	-05	-12	10	04	23	34	30	47	17	33	28	39	29	49	
12 Tests																					
R =	51		42		43		31		33		43		56		50		51		50		
Navy ASVAB Selector Composites																					
GT	31	37	32	61	08	-22	-15	-24	-12	-19	25	59	33	67	23	65	33	61	33	68	
MC	36	38	30	58	20	-06	-14	-23	01	-09	30	58	44	72	37	68	40	63	36	68	
EL	32	39	37	66	-06	-31	-16	-25	-02	-13	38	69	44	74	41	75	43	70	44	77	
CL	24	29	24	41	-17	-36	-16	-24	-12	-18	10	38	26	50	22	55	12	38	28	59	
BTB Form 8 Subtests																					
GCT	30	34	31	57	08	-20	-18	-26	01	-09	33	62	42	71	38	72	34	62	41	74	
ARI	14	24	18	60	-02	-29	-13	-23	-04	-14	28	66	33	71	42	78	36	68	41	78	
MECH	17	19	21	29	17	-02	-08	-16	08	-01	27	51	35	60	31	53	27	50	32	64	
CS	10	14	18	29	-21	-37	-24	-28	-26	-29	-04	13	22	44	22	45	14	32	24	52	
SHOP	19	19	20	31	19	20	-06	-15	13	04	21	33	35	59	30	49	27	50	17	49	
EST	24	33	27	66	-12	-34	-04	-19	-07	-16	31	68	40	75	40	78	32	67	44	81	
6 Tests																					
R =	39		45		30		29		30		45		56		56		49		58		
Navy BTB Selector Composites																					
GT	26	34	30	64	04	-26	-18	-26	-01	-12	37	69	45	76	47	79	42	70	48	80	
MC	32	35	33	52	20	00	-14	-23	10	-02	35	60	49	75	43	71	38	64	38	72	
EL	24	33	32	68	-11	-34	-09	-21	-07	-16	36	70	45	76	48	80	40	70	52	83	
CL	26	32	33	56	-12	-33	-28	-33	-16	-21	18	50	40	69	37	70	32	60	42	75	
AFQT	29	36	31	59	14	-18	-18	-26	05	-09	41	70	44	75	43	76	42	70	45	78	

Notes.

1. Decimal points have been omitted from validities.
2. r_u = Uncorrected r ; r_c = Corrected r .
3. Validities of selector composites and tests included in them are underlined.

Table 6

Zero Order and Multiple Correlations for Primary Predictor Scores Against
School Performance for Two Schools Using the Clerical Composite

School Criterion	CTA		Y.N			
	FSG (N=45)	DAYS (N=48)	DAYS (N=123)			
Predictor	r_u	r_c	r_u	r_c		
ASVAB Form 6 Subtests						
GI	-08	-02	20	11	-08	-17
NO	35	70	-40	-69	-25	-41
<u>AD</u>	<u>16</u>	<u>41</u>	<u>-03</u>	<u>-31</u>	<u>-16</u>	<u>-26</u>
<u>WK</u>	<u>55</u>	<u>78</u>	<u>-31</u>	<u>-64</u>	<u>-24</u>	<u>-48</u>
AR	38	69	-24	-59	-25	-46
SP	01	52	15	-39	-14	-17
MK	48	73	-31	-63	-35	-53
MC	15	41	05	-27	-08	-13
GS	30	48	-13	-37	-11	-23
EI	18	49	14	-28	-24	-42
SI	-10	00	10	01	12	16
AI	-08	-08	25	20	03	02
12 Tests R =	77		69		47	
Navy ASVAB Selector Composites						
GT	67	85	-33	-68	-29	-52
MC	42	67	-20	-54	-14	-35
EL	42	73	-14	-57	-30	-49
<u>CL</u>	<u>56</u>	<u>82</u>	<u>-42</u>	<u>-73</u>	<u>-33</u>	<u>-53</u>
BTB Form 8 Subtests						
<u>GCT</u>	<u>71</u>	<u>89</u>	<u>-33</u>	<u>-70</u>	<u>-35</u>	<u>-57</u>
ARI	55	81	-19	-62	-38	-57
MECH	07	32	01	-25	-04	-08
<u>CS</u>	<u>16</u>	<u>70</u>	<u>-38</u>	<u>-74</u>	<u>-31</u>	<u>-54</u>
SHOP	01	63	10	-53	-09	-16
EST	58	74	-26	-56	-22	-40
6 Tests R =	83		59		48	
Navy BTB Selector Composite						
GT	68	88	-28	-69	-40	-60
MC	34	63	-08	-47	-24	-44
EL	62	81	-27	-61	-29	-48
<u>CL</u>	<u>68</u>	<u>90</u>	<u>-54</u>	<u>-82</u>	<u>-45</u>	<u>-64</u>
AFQT	43	75	-05	-54	-32	-53

Notes.

1. Decimal points have been omitted from validities.
2. r_u = Uncorrected r; r_c = Corrected r.
3. Validities of selector composites and tests included in them are underlined.

The uncorrected selector composite validities for both the BTB and ASVAB selector composites and the maximum multiple correlation obtainable from the 12 ASVAB subtests were extracted from Tables 3 through 6 and are presented in Table 7 to facilitate comparisons. Since the validity differences between the ASVAB and BTB composites are generally quite small, go in both directions, and are not significant, it appears that the two composites are about equally effective. However, when the maximum validities obtainable from the 12 ASVAB subtests are compared with the validities of the ASVAB selector composites, the difference is significant at the .01 and .05 levels in nine and five schools, respectively, and approaches the .05 level in several other schools. From this finding, it is clear that it would be possible to increase the validity for predicting both FSG and DAYS by using a larger number of differentially weighted tests as a selector composite. However, since this is impracticable in a field testing situation, the usual practice is to use the simple unweighted sums of two, three, or four tests. Consequently, this study was concerned only with validities obtained from unweighted sums of ASVAB tests.

The validities of the alternate ASVAB selector composites listed in Table 2 were examined, and the most valid of the two- and three-test sets for each school are included in Table 7. No four-test sets are listed because their validities were very similar to those of three-test sets. As shown in Table 7, the validities of the current selector composites for 11 of the 25 schools with the FSG criterion is within .05 of the validity of the most valid alternate composite. Thus, no change in selector composite is considered warranted for these schools. However, for the remaining 14 schools with the FSG criterion, the difference in validities is larger, especially those for the BU, DP, EM, GMT, MR, and SK schools. ASVAB Form 2 validity data are available for three of these schools--BU, EM, and SK--and support the findings of this study for the BU and EM schools. However, for the SK school, the differences between the content of ASVAB Forms 2 and 6 make validity comparisons difficult.

For the eight schools using the DAYS criterion, many of the selector composite validities are very low, often not significantly different from zero. It appears that research should be undertaken to improve the prediction of student performance in schools using this criteria; that is, those using self-paced instruction where no final grade is given.

Table 7

Comparison of Validities for BTB Selector Composites, ASVAB Selector Composites, and ASVAB Subtests and Most Valid Alternate ASVAB Selector Composites Associated with Those Validities

School	Criterion	(1)	(2)	(3)	(4)	(5)	Most Valid Alternate ASVAB Selector Composites	
		BTB 8	ASVAB 6	ASVAB	Diff. (1)-(2)	Diff. (3)-(2)	Two-Test Sets	Three-test Sets
		Selector Composite r_{u}	Selector Composite r_{u}	Subtests (N=12) r_{u}			r_{u}	r_{u}
General Technical Composite (GCT+ARI; WK+AR)								
CTO	FSG (N=135)	36	40	53	-04	13	WK+MK=45 MK+GS=45 MK+EI=41 MK+MC=38	WK+SP+MK=44 MK+EI+GS=43 AR+MK+GS=43 WK+AR+GS=42
CTO	DAYS (N=135)	-14	-11	42	03	31**	NO+MK=-25 MK+EI=-25 MK+GS=-23 AD+AR=-22 NO+AR=-22	NO+AD+MK=-26 AR+MK+GS=-24 NO+AD+AR=-23 MK+EI+GS=-23
DF	FSG (N=127)	44	27	55	17	28**	MK+GS=44 MK+AI=44 MK+EI=40 MK+MC=39	AR+MK+GS=47 AR+GS+AI=42 MK+EI+GS=41 MK+MC+AI=41
DT	FSG (N=151)	16	21	34	-05	13	AD+AR=28 AD+MK=25 MK+EI=24 AD+WK=23	AD+WK+AR=27 AR+EI+GS=26 MK+EI+GS=25 WK+AD+NO=25
HM	FSG (N=239)	41	40	50	01	10	MK+GS=39 MK+EI=37 AD+WK=35 NO+WK=35	WK+AR+GS=44 AR+EI+GS=44 MK+EI+GS=42 AD+WK+AR=41
HM	FA (N=239)	35	37	47	-02	10	AR+AI=36 MK+EI=36 MK+GS=35	AR+EI+GS=44 WK+AR+GS=41 AR+GS+AI=41 MK+EI+GS=41
HM	AP AVG (N=239)	36	39	47	-03	08	MK+EI=41 MK+GS=40 WK+MK=38 SP+EI=33	AR+EI+GS=45 MK+EI+GS=45 WK+AR+GS=42 AR+MK+GS=40
HM	PC (N=239)	48	47	54	01	07	AR+AI=44 MK+EI=44 WK+MK=43	WK+AR+GS=50 AR+EI+GS=50 WK+AR+MC=49 AR+GS+AI=49
MS	FSG (N=167)	22	37	48	-15	11	NO+WK=40 AD+WK=39 AD+AR=39 AR+MC=38	AD+WK+AR=43 WK+AD+NO=41 WK+AR+MC=40
OS	FSG (N=254)	26	26	38	00	12	AR+SP=33 AD+AR=31 SP+MK=31	AR+SP+MC=31 AD+WK+AR=31
PN	DAYS (N=121)	09	17	32	-08	49**	AD+SP=-15 AD+MK=-14 NO+MK=0	NO+AD+MK=-14 NO+AD+SP=-14 NO+AD+AR=-11
RM	DAYS (N=77)	-08	-14	54	06	40**	SP+MC=-41 SP+MK=-37 AD+SP=-33	SP+MK+MC=-40 AR+SP+GS=-34 AR+SP+MC=-34 SP+MK+EI=-33
SK	FSG (N=237)	34	37	53	-03	16*	MK+GS=45 AR+MC=44 MK+MC=44	AR+MK+GS=49

Note. Decimal points have been omitted from validities.

*p < .05

**p < .01

Table 7 (Continued)

School	Criterion	(1)	(2)	(3)	(4)	(5)	Most Valid Alternate ASVAB Selector Composites	
		BTB 8	ASVAB 6	ASVAB	Diff. (1)-(2)	Diff. (3)-(2)	Two-Test Sets	Three-test Sets
		Selector Composite \bar{r}_u	Selector Composite \bar{r}_u	Subtests (N=12) \bar{r}_u			\bar{r}_u	\bar{r}_u
Electronics Composite (AR+2EST or ARI+EST; AR+MK+GS+EI)								
ADJ	FSG (N=145)	24	32	51	-08	19	WK+MK=40 MK+AI=37 MK+GS=35 MK+EI=34 AD+WK=34	MK+EI+GS=37 MK+MC+AI=35 MK+MC+SI=35 WK+AR+SI=35 WK+SP+MK+35
AE	FSG (N=102)	32	37	42	-05	05	MK+GS=36 AR+MC=34 AR+AI=33 MK+AI=33 WK+MK=32	AR+MK+GS=40 AR+GS+AI=37 MK+MC+AI=36 AR+MC+AI=36
AQ	DAYS (N=55)	-11	-06	43	05	37*	AD+AR=-25 AD+MK=-25 NO+AR=-24	NO+AD+AR=-26 NO+AD+MK=-26 NO+AD+SP=-18 WK+AD+NO=-17
ATN	DAYS (N=190)	-09	-16	31	-07	15	MK+GS=-21 WK+SP=-18 WK+MK=-17 NO+WK=-17 MK+MC=-16	WK+AR+GS=-19 WK+SP+MK=-19 AR+SP+GS=-18 AR+MK+GS=-17 WK+AR+SP=-17
AV	DAYS (N=158)	-07	-02	33	05	31**	AD+AR=-25 AD+MK=-17 AD+WK=-13 AR+MC=-13 NO+AR=-12	AD+WK+AR=-19 NO+AD+AR=-16 NO+AD+MK=-13
ETA1	FSG (N=232)	36	38	43	-02	05	AR+MC=35 MK+MC=34 SP+MC=33 SP+EI=33	AR+SP+GS=39 AR+EI+GS=39 AR+GS+AI=37 MK+EI+MC=37 MK+EI+GS=37
ETA2	FSG (N=235)	45	44	56	01	12	SP+EI=46 SP+MC=46 MK+MC=43 AR+MC=42 WK+SP=42	AR+SP+GS=47 SP+MK+EI=47 SP+MK+MC=47 MK+EI+MC=47
ETA3	FSG (N=223)	48	41	50	07	09	MK+MC=43 MK+EI=42 AR+MC=38	MK+MC+SI=46 MK+EI+MC=46 AR+EI+MC=43
FTA1	FSG (N=255)	40	43	51	-03	08	AR+MC=46 SP+MC=44 MK+MC=42 AR+SP=41 SP+EI=40 MK+GS=40	AR+SP+MC=48 AR+SP+GS=48 SP+MK+MC=45 AR+EI+MC=45 AR+SP+EI=45
FTA2	FSG (N=186)	52	44	50	08	06	MK+EI=43 AR+MC=38 AR+AI=36 SP+EI=36 SP+EI=36 MK+MC=36 MK+AI=36	MK+EI+MC=47 AR+EI+MC=46 AR+EI+GS=43 MK+EI+GS=43

Note. Decimal points have been omitted from validities.

*p < .05

**p < .01

Table 7 (Continued)

School	Criterion	(1)	(2)	(3)	(4)	(5)	Most Valid Alternate ASVAB Selector Composites	
		BTB 8	ASVAB 6	ASVAB	Diff. (1)-(2)	Diff. (3)-(2)	Two-Test Sets	Three-test Sets
		Selector Composite \bar{r}_U	Selector Composite \bar{r}_U	Subtests (N=12) \bar{r}_U			\bar{r}_U	\bar{r}_U
Mechanical Composite (GCT+MECH+SHOP; WK+MC+SI)								
AMS	FSG (N=126)	59	51	68	08	17*	MK+GS=57 MK+AI=56 AR+MC=55 AR+AI=55 MK+MC=55	AR+GS+AI=61 MK+MC+AI=61 AR+MC+AI=60 AR+SP+GS=60
BU	FSG (N=61)	52	59	84	-07	25**	WK+AR=64 WK+MK=62 MK+GS=61 WK+SP=59 AR+AI=58 SP+MK=58	WK+AR+SI=71 WK+AR+SP=69 WK+SP+MK=67
BT	FSG (N=225)	37	39	49	-02	10	MK+EI=42 SP+EI=41 MK+GS=38 MK+AI=36	AR+EI+GS=48 AR+EI+MC=47 MK+EI+GS=46 MK+EI+MC=45
EM	FSG (N=140)	37	40	60	-03	20*	MK+GS=49 MK+EI=48 MK+MC=47 AR+MC=46	MK+EI+GS=52 MK+EI+MC=51 AR+EI+GS=50 AR+EI+MC=50
EN	FSG (N=204)	29	32	46	-03	14	AR+AI=40 MK+AI=39 MK+EI=38 WK+MK=36	AR+GS+AI=40 AR+EI+GS=38 MK+EI+GS=38 MK+MC+AI=38
EO	FSG (N=64)	21	36	64	-15	28**	MK+MC=38 AD+WK=37 AD+MK=37 WK+MK=37 MK+EI=37 MK+GS=37 MK+AI=37	MK+EI+MC=41 MK+EI+GS=39 MK+MC+SI=39 MK+MC+AI=39
GM	FSG (N=229)	32	44	58	-12	14*	MK+AI=48 AR+AI=48 GI+AI=45 WK+AR=44 WK+MK=43	AR+GS+AI=53 MK+MC+AI=48 AR+MC+AI=48 WK+AR+GS=48
GMT	FSG (N=97)	22	27	59	-05	32**	MK+MC=49 MK+GS=49 AR+MC=47 NO+MK=44	AR+MK+GS=51 MK+EI+GS=47 SP+MK+MC=46 MK+EI+MC=46 AR+EI+MC=46 AR+EI+GS=46
MR	FSG (N=110)	25	12	54	13	42**	SP+MK=43 AR+SP=42 MK+GS=41	AR+SP+GS=45 AR+MK+GS=42 SP+MK+EI=42 AR+SP+EI=41
MM	FSG (N=286)	52	58	65	-06	07	MK+MC=61 MK+GS=61 MK+EI=59 MK+AI=57 AR+MC=58	MK+EI+MC=62 MK+EI+GS=61 AR+MK+GS=61 WK+AR+MC=61 MK+MC+SI=60

Note. Decimal points have been omitted from validities.

*p < .05

**p < .01

Table 7 (Continued)

School	Criterion	(1)	(2)	(3)	(4)	(5)	Most Valid Alternate ASVAB Selector Composites	
		BTB 8	ASVAB 6	ASVAB	Diff. (1)-(2)	Diff. (3)-(2)	Two-Test Sets	Three-test Sets
		Selector Composite \bar{r}_u	Selector Composite \bar{r}_u	Subtests (N=12) \bar{r}_u			\bar{r}_u	\bar{r}_u
Clerical Composite (GCT+CS; WK+AD+NO)								
CTA	FSG (N=45)	68	56	77	12	21	WK+AR=67 WK+MK=63 NO+WK=58 AD+WK=58	AD+WK+AR=58 WK+SP+MK=57 WK+AR+MK=55 WK+AR+GS=52
CTA	DAYS (N=48)	-54	-42	69	12	27	NO+WK=-49 NO+MK=-43 NO+AR=-40 WK+MK=-38	NO+AD+MK=-36 NO+AD+AR=-34 AD+WK+AR=-30
YN	DAYS (N=123)	-45	-33	47	12	14	NO+MK=-35 WK+MK=-35 MK+GS=-35 AD+MK=-34	NO+AD+MK=-36 WK+SP+MK=-35 AR+MK+GS=-34 AD+WK+AR=-32

Note. Decimal points have been omitted from validities.

PREDICTIVE VALIDATION STUDY

Approach

Sample

The "A" schools included in this study with sample sizes are presented in Table 8. Although students in most of the included schools completed training by December 1976, those in a few schools completed training as late as April 1977. In most cases, the samples in Table 8 do not include all or even a majority of students who completed school during 1976 for various reasons, including the following: (1) students beginning training before April 1976 had been classified by the Basic Test Battery (BTB) rather than the Armed Services Vocational Aptitude Battery (ASVAB), and (2) criterion data for some schools were not available by the cut-off date for inclusion in the sample sets.

Lack of complete criterion data was a major factor in limiting the sample sizes of most of the 41 schools included in the analysis and in excluding many additional schools. It was estimated that the percentage of criterion data received from the schools varied from 10 to 100 percent, with a median of 30 percent. For 10 schools other than those listed in Table 8, sample sizes were too small for meaningful analysis; for another 18, no final school grades were received. In 18 of the 41 schools included, there were no criterion data for academic drops although other data sources indicated their presence during the period of this study.

Table 8 also includes three electromechanical ratings in the Basic Electricity and Electronics (BE/E) school. Navy recruits destined for approximately 20 different ratings must pass through BE/E school before they can attend their respective "A" schools, and the attrition rates of students destined for certain schools are unacceptably high. In an attempt to reduce this attrition rate, Dann (Note 1) investigated use of the expanded ASVAB in screening out applicants who are not likely to succeed in "A" schools. This study was an effort to extend her suggested changes in selector composites for certain BE/E students and to evaluate the use of a single composite for any one person.

Variables

Criteria. For 19 of the 41 "A" schools, final school grades (FSG) were obtained. For the other 22 schools, which used a self-paced mode of instruction, the days-in-training (DAYS) criterion was used, as computed from the course starting and completion dates reported for the students. For the BE/E ratings, a pass/fail criterion was used, data for which were obtained from the Chief of Naval Education and Training.

Predictors. The primary predictors were the scores of the 12 cognitive subtests of the expanded ASVAB, the four ASVAB test selector composites (general technical, mechanical, electronics, and clerical), and the Armed Forces Qualification Test (AFQT). These variables are listed in Table 2.

Table 8

Schools Included in ASVAB 6/7 Predictive Analysis

School/ Course or Rating	Rating Code	Course Code	Location	N With Criteria		
				Total	Graduate	Academic Drop
Air Controlman	AC	6278	Memphis	52	52	0
Aviation Machinist's Mate, Jet	ADJ	6501	Memphis	385	365	20
Aviation Structural Mechanic, Hydraulics	AMH	6517	Memphis	78	78	0
Aviation Structural Mechanic, Structures	AMS	6518	Memphis	89	89	0
Aviation Ordnanceman	AO	6506	Memphis	136	136	0
Avionics Technician, Aviation Electronics Technician	AT	6239	Memphis	265	233	32
Aviation Antisubmarine Warfare Operator	AW	6537	Memphis	92	92	0
Avionics Technician, Aviation Antisub Warfare Technician	AX	6241	Memphis	60	56	4
Aviation Maintenance Administration	AZ	6528	Meridian	66	66	0
Boiler Technician	BT	6260	Great Lakes	753	701	52
Communications Technician, Administrative	CTA	6020	Corry Station	57	48	9
Communications Technician, Communications	CTO	6053	Corry Station	73	60	13
Communications Technician, Collection	CTR	6301	Corry Station	55	39	16
Communications Technician, Technical	CTT	6302	Corry Station	118	89	29
Communications Technician, Field Operations Special Non-Morse	CTT	6320	Corry Station	35	35	0
Dental Technician	DT	6086	San Diego	166	159	7
Electrician's Mate	EM	6070	Great Lakes	169	169	0
Engineman	EN	6261	Great Lakes	389	382	7
Electronics Technician, Communications	ET	6263	Great Lakes	254	254	0
Electronics Technician, Radar	ETR	6265	Great Lakes	202	202	0
Electronics Technician, Communications	ETN	6266	Great Lakes	64	64	0
Fire Control Technician, Missile	FT	6027	Great Lakes	91	91	0
Gunner's Mate, Guns	GM	6115	Great Lakes	109	109	0
Hospitalman	HM	6084	Great Lakes	1214	1126	88
Hospitalman	HM	6085	San Diego	1079	1021	58
Hull Maintenance Technician	HT	6119	San Francisco	160	158	2
Hull Maintenance Technician	HT	6120	Philadelphia	289	287	2

Table 8 (Continued)

School/ Course or Rating	Rating Code	Course Code	Location	N With Criteria		
				Total	Graduate	Academic Drop
Machinist's Mate	MM	6262	Great Lakes	1444	1411	33
Mess Management Specialist	MS	6125	San Diego	103	103	0
Operations Specialist	OS	6142	Great Lakes	220	220	0
Postal Clerk	PC	6300	Ft. B. Harrison	36	36	0
Polaris/Poseidon Electronics	PE	6146	Dam Neck	91	91	0
Photographer's Mate	PH	6523	Corry Station	43	43	0
Personnelman	PN	6102	Meridian	135	124	11
Aircrew Survival Equip- mentman	PR	6519	Lakehurst	76	75	1
Quartermaster	QM	6001	Orlando	65	65	0
Radioman	RM	6144	San Diego	681	643	38
Radioman Sea Duty	RM	6380	San Diego	225	225	0
Radioman Shore Duty	RM	6381	San Diego	221	221	0
Signalman	SM	6005	Orlando	42	42	0
Yeoman	YN	6057	Meridian	212	174	38
<hr/>						
<u>BE/E Samples</u>						
Electrician's Mate	EM	6070	All locations	230	223	7
Gunner's Mate	GM	6115	All locations	238	176	62
Interior Communications Electrician	IC	6076	All locations	87	70	17

In addition, 61 other ASVAB test composites were included in the analyses in an attempt to discover alternate composites that might prove to be more valid than existing ones. This total included 26 two-test sets, 27 three-test sets, 7 four-test sets and 1 five-test set. These sets included the composites used by the other services (see Table 2) and special composites for five individual Navy schools (AR+MC for Torpedoman's Mate, WK+MC for Aviation Structural Mechanic, AR+SI for Quartermaster, WK+AR+NO+AD for Communications Technician, Interpreter, and WK+MC+MK+EI+GS for Ocean Systems Technician).

Analysis

"A" Schools. Means, standard deviations, and product-moment correlations among primary predictors and criterion variables were computed for each school. As in the concurrent validation study, the validities of each predictor were corrected for restriction in range, which occurs when students are selected for technical training (see Footnote 3).

Multiple correlations (Rs) were computed from uncorrected correlations for various numbers of ASVAB tests (12, 5, and 3) for each course, using an accretion method in which a multiple correlation was computed after the addition of each test.

BE/E Ratings. ASVAB test and composite validities, expressed as biserial correlations with the pass/fail criterion, were computed for (1) all BE/E students, (2) those selected based on the current mechanical composite (WK+MC+SI), and (3) those selected based on the current electronics composite (AR+MK+GS+EI). Regression equations were then developed for the three groups.

New composites were developed on one sample using a stepwise regression procedure and cross validated on a holdout sample. In this procedure, the best two to four predictors were selected and given related integer weights to simplify operational use of the composites. The validities of the composites were determined on each cross validation sample to ensure that no marked loss in predictive accuracy occurred. Details of these procedures are provided in Dann (Note 1).

Finally, product-moment correlations of BE/E derived composites against final school grades were determined for the "A" schools included in the sample.

Results and Discussion

"A" Schools

Zero order and multiple correlations for the primary predictor scores against school performance using the general technical composite are presented in Tables 9 and 10; those using the mechanical, electronics, and clerical/special composites are presented in Tables 11 through 13, respectively. An examination of the data presented in these tables indicates that ASVAB validity depends substantially on the criterion of school performance used. For the 19 schools that have a final school grade (FSG) criterion (8, 2, 6, and 3 in Tables 9, 11, 12, and 13 respectively), the median uncorrected validity of the current selector composite is .46, with a range from .16 to .69. The median corrected validity for these schools is .64, indicating substantial predictiveness--about equal to that previously reported for the Navy BTB (Thomas, 1970).

In the 22 schools for which a DAYS criterion was used, the course is customarily divided into instructional modules and the student must pass a test on each module before proceeding to the next. For those schools (11, 6, 3, and 2 in Tables 10 through 13 respectively), the median uncorrected validity of the ASVAB selector composite against the DAYS criterion is only -.075, with a range of .18 to -.29. However, for the 9 schools using the mechanical or electronics composites (Tables 11 and 12), the picture is considerably better: For these schools, the median uncorrected validity of the current selector composite is -.21; and the median corrected validity, -.39.

There is no adequate explanation for the low validities obtained for self-paced courses. A negative validity is expected, since fewer days required to complete a course should reflect greater ability. Also, as in the concurrent study, school administration personnel reported that some students postponed finishing a course to avoid general detail duty, which may have contributed to the problem. In any event, it is a serious problem, particularly since more and more schools have gone from the lock-step mode of instruction to a self-paced mode over the past few years and the trend is continuing. It has been recently addressed by Christal (1976), who provided suggestions for research.

In Tables 9 through 13, the maximum validity of the ASVAB for each school is shown by the multiple correlation (R) using all 12 ASVAB tests. The median R across the 19 schools with the FSG criterion is .60, which is somewhat higher than the .46 reported above for the median uncorrected validity of the current selector composite. Validities using 5 and 3 tests were also listed, because no current ASVAB composite has more than 5 tests and most have 3. However, as shown, there is very little difference between the validities for 5 tests and all 12 tests and, for some schools, between the validities for 3 and all 12 tests.

Table 9
Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance
(Final Grade Score Criterion) for Eight Schools Using the General Technical Composite

School	AC (N=52)		AM (N=92)		AZ (N=66)		HM CL (N=1214)		HM SD (N=1079)		MS (N=103)		OS (N=220)		SM (N=42)	
	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c
ASVAB 6/7 Subtests																
GI	17	49	21	25	16	48	26	48	24	53	20	51	24	42	12	41
MO	22	38	29	32	37	64	32	49	31	49	28	47	31	47	-13	10
AD	-20	-32	21	19	20	21	15	23	14	20	03	06	09	16	32	41
MK	27	62	17	25	43	75	46	67	37	66	50	76	16	49	-04	40
AR	35	65	34	39	48	77	41	65	36	66	34	70	39	61	48	65
SP	13	-02	17	20	22	28	07	15	13	27	-15	-17	09	20	10	19
MK	25	51	46	49	60	80	49	66	43	66	42	68	37	56	43	62
MC	44	66	34	38	47	69	30	52	27	55	26	56	45	59	22	48
GS	38	66	39	42	34	65	47	65	41	66	42	70	26	50	07	41
EI	32	56	27	31	47	71	31	52	23	51	39	63	20	35	11	40
SI	50	69	34	37	28	55	15	39	16	46	37	62	26	47	19	40
AI	51	68	23	25	41	53	19	38	18	45	25	47	22	38	14	33
12 tests R =	67		60		75		60		60		67		62		69	
5 tests R =	64		58		72		59		58		65		62		64	
3 tests R =	59		56		70		58		57		62		59		60	
ASVAB 6/7 Selector Composites																
GI	39	67	23	30	54	80	49	73	44	70	53	79	32	58	31	57
MC	54	73	27	33	52	77	36	61	33	63	50	76	37	60	18	49
EL	41	67	34	38	63	83	51	70	47	71	56	79	38	61	36	59
CL	08	38	31	36	46	71	40	62	37	62	43	67	27	53	11	46
AFQT	19	51	32	35	44	71	35	57	34	63	41	72	31	54	23	53

Notes.

1. Decimal points have been omitted from validities.
2. I_u = Uncorrected validity; I_c = Corrected validity.
3. Validities of selector composites and tests included in them are underlined.

Table 10

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance (Days in Training Criterion) for 11 Schools Using the General Technical Composite

School	CTO (N=73)		CTR (N=55)		CTT (N=118)		CTT (Field) (N=166)		PH (N=43)		PC (N=36)		PN (N=135)		RM (N=681)		RM (Sea) (N=225)		RM (Shore) (N=221)		
	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	
GI	-08	-11	11	17	02	-01	05	-06	09	07	04	01	11	01	10	14	09	21	-01	01	
MO	33	27	20	24	02	-01	-03	-17	-07	-06	-07	-08	-18	-23	08	12	07	17	09	09	
AD	01	02	34	35	-10	-11	08	-07	-06	-06	22	19	-13	-17	01	03	01	07	03	04	
MK	-01	-08	-08	07	-23	-19	-13	-25	07	05	13	04	-17	-23	09	14	20	33	-02	01	
AR	-05	-10	27	29	15	05	-11	-23	-06	-02	-17	-12	-02	-13	05	12	11	27	06	06	
SP	06	02	25	29	11	10	04	00	-04	-04	13	13	04	05	04	04	-03	-06	05	06	
MK	00	-07	41	43	07	01	01	-14	06	05	06	14	-05	-14	05	11	09	23	04	05	
MC	-06	-10	-05	08	00	-04	-05	-16	-07	-05	20	19	00	-08	04	09	06	20	02	03	
GS	-09	-13	06	14	-06	-08	-27	-34	04	04	05	03	-04	-13	07	12	18	29	04	05	
EI	-10	-14	-17	-02	06	04	-23	-29	03	03	-06	-06	-04	-11	11	15	-02	10	00	02	
SI	05	01	12	19	05	01	-06	-12	-06	-04	36	39	-02	-09	12	15	05	16	00	02	
AI	05	-01	26	30	13	12	-22	-15	-14	-10	-18	-19	09	03	07	11	16	23	06	06	
12 tests R =	50		70		40		50		29		73		32		18		31		15		
5 tests R =	45		65		37		45		27		64		31		17		30		14		
3 tests R =	40		58		34		40		25		51		30		16		29		11		
ASVAB 6/7 Subtests																					
ASVAB 6/7 Selector Composites																					
GI	-04	-09	10	18	-03	-06	-15	-26	01	02	10	19	-11	-18	08	14	18	31	02	04	
MC	-01	-08	01	12	-06	-08	-11	-24	-04	-01	38	36	-08	-15	10	15	12	28	00	02	
EL	-08	-12	20	24	09	01	-02	-18	03	02	18	24	-05	-15	08	14	11	27	04	05	
CL	19	08	26	29	-13	-13	-09	-22	-03	-02	07	15	-21	-26	08	13	12	26	05	06	
AFQT	01	-05	04	13	05	00	-06	-20	02	02	08	17	-09	-16	01	08	14	27	03	05	

Notes.

1. Decimal points have been omitted from validities.
2. r_u = Uncorrected validity; r_c = Corrected validity.
3. Validities of selector composites and tests included in them are underlined.
4. A negative validity is expected for the DAYS criterion.

Table 11

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance for Eight Schools Using the Mechanical Composite

School Criterion	EM (N=169)		GM FSG (N=109)		BT DAYS (N=753)		EN DAYS (N=389)		HT SanFran DAYS (N=160)		HT Phil DAYS (N=289)		MM DAYS (N=1444)		PR DAYS (N=76)	
	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C	\bar{X}_U	\bar{X}_C
ASVAB 6/7 Subtests																
GI	51	67	32	59	-11	-22	-20	-34	-17	-36	-07	-17	-29	-45	-15	-13
NO	29	38	13	33	-17	-24	-10	-21	-21	-30	-10	-16	-27	-39	-16	-16
AD	08	08	05	26	-04	-06	-13	-17	-14	-24	06	03	-13	-18	-01	-01
WK	46	73	41	70	-08	-25	-14	-33	-07	-31	-08	-19	-31	-49	27	19
AR	56	76	25	60	-19	-31	-20	-35	-18	-35	-15	-23	-39	-54	-09	-09
SP	29	53	23	52	-01	00	-02	-03	-15	-27	06	08	-15	-28	-11	-11
MK	57	74	12	44	-19	-30	-19	-33	-20	-35	-13	-21	-35	-50	-18	-16
MC	58	79	32	66	-12	-27	-21	-37	-10	-32	-14	-24	-26	-47	-10	-08
GS	65	81	42	69	-11	-26	-13	-31	-22	-39	-09	-20	-30	-48	-15	-14
EI	43	68	36	64	-15	-27	-20	-36	-15	-33	-18	-26	-27	-46	-05	-05
SI	46	74	28	64	-09	-26	-09	-30	-21	-39	-03	-17	-23	-44	-17	-13
AI	30	55	46	69	-18	-29	-17	-33	-16	-33	-11	-20	-15	-34	-15	-13
12 Tests R =	78		58		29		33		35		29		44		57	
5 Tests R =	76		57		29		32		32		27		44		55	
3 Tests R =	74		56		24		28		31		24		43		53	
ASVAB 6/7 Selector Composites																
GI	60	80	40	71	-17	-31	-21	-37	-16	-36	-14	-24	-40	-56	07	03
MC	67	84	46	73	-14	-29	-21	-37	-19	-39	-11	-21	-35	-53	-02	-04
EL	72	86	41	71	-23	-34	-25	-40	-25	-41	-19	-27	-40	-55	-17	-13
CL	37	57	23	57	-14	-26	-18	-33	-20	-37	-04	-15	-32	-48	02	00
AFQT	59	79	38	69	-16	-30	-15	-32	-12	-34	-05	-16	-36	-52	03	00

Notes.

1. Decimal points have been omitted from validities.
2. \bar{X}_U = Uncorrected validity; \bar{X}_C = Corrected validity.
3. Validities of selector composites and tests included in them are underlined.
4. A negative validity is expected for the DAYS criterion.

Table 12

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance for Nine Schools Using the Electronics Composite

School Criterion	AD (N=136)		ET (N=254)		ETR FSG (N=202)		ETN FSG (N=64)		FT FSG (N=91)		PE FSG (N=91)		ADJ DAYS (N=365)		AT DAYS (N=265)		AX DAYS (N=60)	
	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c	I_u	I_c
ASVAB 6/7 Subtests																		
GI	27	66	10	48	13	53	05	16	21	54	-03	43	-22	-46	-05	-31	-24	-53
NO	15	20	11	35	13	47	11	18	02	28	-06	06	-11	-33	-15	-23	-01	-20
AD	-05	-10	02	07	13	26	-05	-04	02	13	-10	-03	-14	-18	-02	05	-07	-05
AK	28	69	24	58	19	65	11	23	32	65	08	56	-26	-50	-11	-40	-30	-57
AR	37	76	28	66	27	70	06	21	19	69	02	58	-25	-53	-22	-48	-24	-53
SP	25	16	30	56	27	58	17	26	28	58	16	55	15	20	-12	-28	-02	-34
MX	15	67	32	68	38	77	15	27	17	65	40	73	-29	-55	-20	-47	-15	-49
MC	45	77	36	67	45	67	16	27	30	72	25	69	-16	-44	-21	-47	-13	-47
GS	22	71	28	67	36	76	19	29	39	77	29	70	-20	-47	-15	-49	-05	-44
EI	20	67	36	69	38	77	-03	15	35	75	29	71	-14	-44	-10	-43	-22	-53
SI	30	70	23	57	28	63	12	23	24	62	33	59	-24	-49	-08	00	-21	-52
AI	28	61	25	55	24	56	09	20	30	63	-02	49	-25	-48	-08	-35	-18	-49
12 Tests R =	57		50		56		41		55		60		45		37		51	
5 Tests R =	55		49		55		37		52		59		43		35		49	
3 Tests R =	52		47		54		31		47		59		40		32		47	
ASVAB 6/7 Selector Composites																		
GT	41	78	33	68	29	73	11	24	35	75	06	02	-32	-57	-20	-48	-42	-62
MC	48	80	39	71	42	79	17	28	39	76	23	69	-29	-55	-17	-47	-30	-57
EL	41	79	46	75	52	82	14	26	47	80	39	76	-36	-60	-26	-52	-25	-55
CL	15	47	14	43	21	60	04	14	16	49	-07	28	-26	-48	-14	-32	-20	-45
AFQT	42	76	35	68	38	74	20	29	37	74	14	65	-20	-48	-21	-49	-21	-50

Notes.

1. Decimal points have been omitted from validities.
2. I_u = Uncorrected validity; I_c = Corrected validity.
3. Validities of selector composites and tests included in them are underlined.
4. A negative validity is expected for the DAYS criterion.

Table 13

Zero Order and Multiple Correlations for Primary Predictor Scores Against School Performance for Five Schools Using Clerical or Special Composites

School Criterion ----- Predictor	Clerical				WK+MC				AR+SI	
	CTA		YN		AMH		AMS		QM	
	DAYS (N=57)		DAYS (N=212)		FSG (N=78)		FSG (N=89)		FSG (N=65)	
	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c	r_u	r_c
ASVAB 6/7 Subtests										
GI	26	28	09	07	41	61	27	54	58	73
NO	-08	-14	-13	-15	04	20	31	42	33	45
AD	<u>02</u>	<u>-07</u>	<u>-07</u>	<u>-10</u>	07	25	-16	-11	27	32
WK	<u>-08</u>	<u>-13</u>	<u>04</u>	<u>01</u>	<u>31</u>	<u>61</u>	<u>22</u>	<u>58</u>	<u>66</u>	<u>78</u>
AR	07	01	10	07	38	62	49	70	76	88
SP	-16	-18	-07	-08	06	-16	-03	-03	10	21
MK	07	00	06	03	29	51	46	65	60	73
MC	-08	-07	04	02	<u>47</u>	<u>70</u>	<u>36</u>	<u>66</u>	46	70
GS	07	06	09	07	29	53	31	61	54	72
EL	11	13	02	00	47	59	24	54	51	71
SI	08	07	04	03	43	59	44	67	<u>38</u>	<u>70</u>
AI	28	30	08	07	44	60	38	61	<u>43</u>	<u>66</u>
12 Tests R =	48		23		69		67		84	
5 Tests R =	45		22		67		65		83	
3 Tests R =	41		21		63		61		82	
ASVAB 6/7 Selector Composites										
GT	02	-05	09	04	43	68	45	70	79	89
MC	-02	-05	07	03	63	79	47	71	68	84
EL	10	06	11	06	51	70	54	74	71	85
CL	<u>-07</u>	<u>-13</u>	<u>-07</u>	<u>-11</u>	18	50	16	45	59	72
Special	--	--	--	--	<u>53</u>	<u>74</u>	<u>40</u>	<u>68</u>	<u>67</u>	<u>84</u>
AFQT	05	-02	06	03	45	66	36	64	66	82

Notes.

1. Decimal points have been omitted from validities.
2. r_u = Uncorrected validity; r_c = Corrected validity.
3. Validities of selector composites and tests included in them are underlined.
4. A negative validity is expected for the DAYS criterion.

An examination of the validities of ASVAB subtests and selector composites shows that the operational composites do not have the highest validities for many schools. Thus, zero order validities of the alternate ASVAB selector composites included in this study were compared with those of the current selector composites. The most valid two- and three-test sets for each school are presented in Table 14, along with the validities of its school's operational selector composites. No four-test sets are listed because their validities were no higher than those of the two- or three-test sets.

Table 14 shows that, for most schools, several, or sometimes many, sets of tests yield almost the same validities, a finding which reflects the high relationships among many of the ASVAB tests. These data were examined, along with that obtained in the concurrent validity study described in the previous section and in earlier studies of BTB validity (Thomas, 1971, Note 2) on the same schools, in order to arrive at recommended changes in selector composites. Results showed that, in 12 to 14 schools, the validities of alternate selector composites were sufficiently higher than those of the present composites to be considered for operational use. In some of these schools, however, the sample sizes were too small on which to base recommendations. The six schools not requiring BE/E as a requisite in which selector changes are suggested are AMH, AMS, BT, PN, PR, and QM. No recommendations for selector changes are made at this time pending results of more extensive analyses of additional data, including determination of appropriate cutting scores.

BE/E Ratings

The validities of the current selector composites (mechanical and electronics) and the most promising new selector composite (with integer weights for each test rather than the more precise regression weights) for the three BE/E ratings included in this study and the Class "A" school samples for two of these ratings--EM and GM--are provided in Table 15. The validities of the recommended selector composites are enclosed by dotted lines. As shown, for GM students, the recommended electronics composite yields an increase in validity from .44 to .69 in the BE/E school, where substantial attrition has occurred, and a decrease in validity from .46 to .41 in the "A" school. The overall effect is expected to be a larger throughput of trained students into the GM rating.

For EM students, the newly recommended BE/E composite (2MK+AR+GS) increases BE/E school validity from .44 to .73, which should reduce BE/E school attrition without reducing the .67 validity obtained by the present "A" school composite. Although this study did not include a Class "A" sample of IC students, a change to the new BE/E selector composite for both IC Class "A" and BE/E students seems warranted, since IC and EM ratings are similar with regard to course content, job knowledge required, and test validities.

Table 14

Validities of ASVAB 6/7 Selector Composites and the
Most Valid Alternate ASVAB Composites for 41 Schools

School	Code	N	Criterion	Validity of ASVAB 6/7 Selector Composites		Valid Alternate ASVAB Composites					
				r_u	r_c	Two-test Sets		Three-test Sets		r_u	r_c
General Technical Composite (WK+AR)											
AC	6278	52	FSG	39	67	AR+AI	54	73	MC+S1+AI	55	73
						SI+AI	54	72	WK+MC+S1	54	73
						MK+AI	51	70	AR+MC+AI	54	73
						AR+S1	50	71	AR+GS+AI	54	73
AW	7537	92	FSG	23	30	NO+MK	41	44	MK+E1+GS	36	40
						MK+GS	37	40	NO+AD+MK	35	39
						MK+E1	36	40	AR+MK+GS	34	38
						NO+WK	33	38	MK+E1+MC	33	38
									MK+MC+S1	33	38
AZ	6528	66	FSG	54	80	MK+E1	68	85	MK+E1+MC	65	83
						WK+MK	66	84	MK+E1+GS	62	82
						MK+MC	62	81	MK+MC+AI	61	81
						AR+MK	61	82	AR+MK+GS	60	82
						NO+MK	61	81			
HM	6084	1214	FSG	49	73	WK+MK	55	72	WK+AR+GS	52	71
						MK+GS	53	71	AR+MK+GS	52	71
						NO+WK	50	69	MK+E1+GS	50	70
HM	6085	1079	FSG	44	70	WK+MK	49	72	AR+MK+GS	49	72
						MK+GS	47	70	WK+AR+GS	48	71
						NO+WK	45	69	MK+E1+GS	44	69
						NO+WK	45	67	WK+AR+MC	43	69
						AR+MK	44	69			
MS	6125	103	FSG	53	79	NO+WK	58	79	MK+E1+GS	56	78
						WK+MK	55	79	WK+AR+GS	55	80
						MK+E1	53	76	WK+AR+S1	52	78
						MK+GS	51	76	AR+E1+GS	52	78
									AR+MK+GS	52	78
OS	6142	220	FSG	32	58	MK+MC	45	64	MK+MC+S1	43	63
						AR+MC	44	64	WK+AR+MC	41	62
						NO+AR	41	62	AR+E1+MC	41	62
						AR+MK	40	62	AR+MC+S1	41	62
						NO+MK	39	59	MK+E1+MC	41	61
									MK+MC+AI	41	61
SM	6005	42	FSG	31	57	AR+MK	51	67	AD+WK+AR	44	63
						AR+S1	47	65	AR+MC+S1	42	62
						AD+AR	47	64	AR+MK+GS	41	62
						AD+MK	47	63	MK+MC+S1	37	59
						AR+MC	43	63			

Notes.

1. Decimal points have been omitted from validities.
2. A negative validity is expected for the DAYS criterion.

Table 14 (Continued)

School	Code	N	Criterion	Validity of ASVAB 6/7 Selector Composites		Valid Alternate ASVAB Composites						
				r_u	r_c	Two-test Sets		Three-test Sets		r_u	r_c	
General Technical Composite (WK+AR) (Continued)												
CTO	6053	73	DAYS	-04	-09	MK+EI	-06	-11	AR+EI+MC	-09	-13	
						AR+MC	-06	-11	MK+EI+GS	-08	-12	
						SP+EI	-05	-09	MK+EI+MC	-07	-11	
						MK+GS	-05	-11				
CTR	8301	55	DAYS	10	18	None valid.		None valid.				
CTT	6302	118	DAYS	-03	-06	AD+WK	-20	-18	WK+AD+NO	-13	-13	
						NO+WK	-13	-13				
						WK+MC	-12	-12				
CTT	6320	35	DAYS	-15	-26	AR+AI	-23	-23	AR+GS+AI	-30	-36	
						SI+AI	-18	-19	AR+EI+GS	-29	-35	
						MK+GS	-14	-26	WK+AR+GS	-21	-30	
						MK+EI	-14	-24	MK+EI+GS	-21	-30	
						MK+AI	-14	-23				
DT	6086	166	DAYS	01	02	AR+AI	-13	-07	NO+AD+SP	-11	-11	
						AD+SP	-11	-11	AR+SP+MC	-11	-07	
						SP+MC	-11	-09	AR+MC+AI	-11	-07	
						AR+SP	-11	-08	MC+SI+AI	-11	-07	
						SI+AI	-11	-08				
PH	6523	43	DAYS	10	19	None valid.		None valid.				
PC	6300	36	DAYS	-02	-04	AR+AI	-22	-20	AR+GS+AI	-18	-15	
						MK+AI	-16	-16	AR+MC+AI	-10	-10	
						NO+AR	-13	-12	AR+EI+GS	-09	-09	
						GI+AI	-12	-12				
						AR+MK	-10	-09				
PN	6102	135	DAYS	-11	-18	NO+WK	-22	-26	WK+AD+NO	-21	-26	
						AD+WK	-19	-24	AD+WK+AR	-16	-22	
						NO+AD	-17	-22	NO+AD+MK	-16	-21	
									NO+AD+AR	-15	-21	
RM	6144	681	DAYS	08	14	None valid.		None valid.				
RM	6380	225	DAYS	18	31	None valid.		None valid.				
RM	6381	221	DAYS	02	04	None valid.		None valid.				
Mechanical Composite (WK+MC+SI)												
EM	6070	169	FSG	67	84	MK+MC	69	85	MK+MC+SI	72	87	
						MK+GS	69	84	AR+MK+GS	71	85	
						AR+MC	67	84	AR+EI+GS	70	85	
						WK+MC	65	84	AR+GS+AI	70	85	
									MK+EI+GS	70	85	
									MK+EI+MC	69	85	
									2MK+AR+GS	68	83	

Notes.

1. Decimal points have been omitted from validities.
2. A negative validity is expected for the DAYS criterion.

Table 14 (Continued)

School	Code	N	Criterion	Validity of ASVAB 6/7 Selector Composites		Valid Alternate ASVAB Composites					
				\bar{r}_U	\bar{r}_C	Two-test Sets		Three-test Sets			
						\bar{r}_U	\bar{r}_C		\bar{r}_U	\bar{r}_C	
Mechanical Composite (WK+MC+SI) (Continued)											
GM	6115	109	FSG	46	73	AR+AI	49	74	AR+GS+AI	51	75
						AI+AI	48	73	AR+MC+AI	49	75
						GI+AI	47	73	MC+SI+AI	49	74
						WK+MC	45	73	WK+AR+GS	48	74
									WK+AR+GS	48	74
								2MK+AR+GS	29	62	
BT	6260	253	DAYS	-14	-29	MK+AI	-25	-35	MK+MC+AI	-21	-33
						AR+AI	-24	-35	AR+MK+GS	-21	-33
						NO+AR	-22	-34	AR+MC+AI	-20	-33
						NO+MK	-22	-33	AR+GS+AI	-20	-32
						MK+EI	-22	-33	MK+EI+MC	-20	-32
						AR+MK	-21	-33	2MK+AR+GS	-21	-33
						MK+MC	-20	-32			
EN	6261	389	DAYS	-21	-37	AR+AI	-25	-40	AR+EI+MC	-24	-39
						GI+AI	-25	-40	AR+MC+AI	-24	-39
						AR+MC	-25	-40	AR+MK+GS	-23	-38
						MK+AI	-24	-39	MK+MC+AI	-23	-38
						MK+MC	-23	-39	AD+WK+AR	-23	-38
						MK+EI	-23	-38	2MK+AR+GS	-23	-38
						AR+MK	-23	-38			
HT	6119	160	DAYS	-19	-39	MK+GS	-25	-41	AR+GS+AI	-26	-42
						MK+AI	-24	-40	MK+EI+GS	-25	-41
						AR+SI	-24	-41	AR+MK+GS	-25	-41
						AR+AI	-23	-40	AR+EI+GS	-24	-41
						NO+MK	-23	-37	AR+SP+GS	-23	-40
									MK+MC+AI	-23	-40
									NO+AD+AR	-23	-37
									NO+AD+MK	-23	-37
									2MK+AR+GS	-24	-40
HT	6120	289	DAYS	-11	-21	AR+MC	-17	-26	AR+EI+MC	-21	-28
						AR+AI	-17	-25	MK+EI+MC	-21	-28
						MK+AI	-17	-25	AR+EI+GS	-19	-27
						MK+MC	-16	-25	AR+MC+AI	-18	-26
									MK+EI+GS	-18	-26
			MK+MC+AI	-18	-26						
MM	6262	1444	DAYS	-35	-53	AR+MC	-39	-55	WK+AR+MC	-41	-56
						AR+MK	-39	-54	WK+AR+SI	-40	-56
						NO+AR	-39	-53	WK+AR+GS	-40	-55
						WK+MK	-38	-54	AR+MK+GS	-40	-55
						MK+EI	-37	-53	AR+EI+MC	-39	-55
						AR+SI	-37	-54	AR+EI+GS	-39	-55
						NO+WK	-37	-52	2MK+AR+GS	-39	-54
						MK+MC	-36	-53	AR+MC+SI	-38	-54
						MK+GS	-36	-53	AR+GS+AI	-38	-54
						NO+MK	-36	-51			
						AR+AI	-36	-53			
						MK+AI	-34	-51			

Notes.

1. Decimal points have been omitted from validities.
2. A negative validity is expected for the DAYS criterion.

Table 14 (Continued)

School	Code	N	Criterion	Validity of ASVAB 6/7 Selector Composites		Valid Alternate ASVAB Composites					
				r_u	r_c	Two-test Sets		Three-test Sets		r_u	r_c
Mechanical Composite (WK+MC+SI) (Continued)											
PR	6519	76	DAYS	-02	-04	MK+GS	-21	-17	MK+MC+SI	-19	-19
						MK+AI	-19	-16	AR+MK+GS	-18	-15
						NO+WK	-19	-17	AR+GS+AI	-18	-14
						SI+AI	-18	-14	MK+EI+GS	-18	-14
						GI+AI	-18	-15	MK+MC+AI	-18	-13
						NO+SP	-17	-17	SP+MK+MC	-17	-13
						SP+MK	-17	-15			
Electronics Composite (AR+MK+GS+EI)											
AO	6506	136	FSG	41	79	AR+MC	49	81	WK+AR+MC	50	81
						WK+MC	47	80	AR+EI+MC	48	81
						AR+AI	42	79	WK+MC+SI	48	80
						MK+MC	41	79	AR+MC+AI	46	80
									AR+MC+AI	46	80
									MK+MC+SI	46	80
									2MK+AR+GS	32	77
ET	6263	254	FSG	46	75	MK+EI	44	74	MK+EI+MC	47	75
						MK+MC	42	73	AR+EI+MC	45	74
						WK+MC	41	72	AR+EI+GS	44	74
						AR+MC	39	71	MK+EI+GS	44	74
									SP+MK+EI	43	73
									2MK+AR+GS	40	73
ET	6265	202	FSG	52	82	MK+EI	51	82	MK+EI+MC	54	83
						MK+MC	50	81	MK+EI+GS	52	82
									AR+EI+MC	52	82
									AR+EI+GS	51	82
									2MK+AR+GS	43	80
EI	6266	64	FSG	14	26	SP+MK	21	30	AR+SP+GS	22	31
						MK+GS	21	30	SP+MK+MC	22	31
						SP+MC	20	29	WK+SP+MK	21	31
						MK+MC	20	29	MK+MC+SI	19	29
						WK+SP	19	28	2MK+AR+GS	18	28
						NO+SP	19	27			
FT	6027	91	FSG	47	80	MK+EI	43	79	MK+EI+GS	48	81
						MK+GS	40	79	AR+EI+GS	45	80
									AR+GS+AI	45	80
									AR+SP+GS	45	80
									WK+AR+GS	44	80
									2MK+AR+GS	36	77
PE	6146	99	FSG	39	76	MK+GS	46	78	MK+EI+GS	45	77
						MK+EI	45	77	MK+EI+MC	44	77
						MK+MC	43	76	2MK+AR+GS	40	76
						SP+MK	33	71	SP+MK+EI	39	75
						WK+MK	32	72	MK+MC+SI	37	74
									AR+MK+GS	36	75
ADJ	6501	365	DAYS	-36	-60	WK+MK	-36	-59	AR+MK+GS	-36	-60
						MK+MC	-34	-58	2MK+AR+GS	-36	-59
						MK+GS	-33	-58	AR+GS+AI	-33	-58
									AD+WK+AR	-33	-56

Notes.

1. Decimal points have been omitted from validities.
2. A negative validity is expected for the DAYS criterion.

Table 14 (Continued)

School	Code	N	Criterion	Validity of ASVAB 6/7 Selector Composites		Valid Alternate ASVAB Composites					
				r_u	r_c	Two-test Sets		Three-test Sets		r_u	r_c
Electronics Composite (AR+MK+GS+EI) (Continued)											
AT	6239	265	DAYS	-26	-52	MK+MC	-26	-51	AR+MK+GS	-29	-53
						MK+GS	-26	-52	2MK+AR+GS	-28	-53
						AR+MK	-25	-51	AR+SP+GS	-25	-51
						AR+MK	-25	-51	WK+AR+MC	-24	-51
						NO+AR	-24	-46	AR+EI+MC	-24	-51
								AR+EI+GS	-24	-51	
AX	6241	60	DAYS	-25	-55	WK+AR	-42	-62	AD+WK+AR	-31	-56
						WK+MK	-33	-58	WK+MC+SI	-30	-57
						WK+MC	-29	-56	WK+AR+SI	-24	-55
						WK+SP	-27	-56	2MK+AR+GS	-20	-53
Clerical Composite (WK+AD+NO)											
CTA	6020	57	DAYS	-07	-13	NO+SP	-13	-17	WK+SP+MK	-08	-13
						WK+SP	-13	-16	SP+MK+MC	-08	-11
						SP+MC	-12	-14			
						NO+WK	-11	-15			
YN	6057	212	DAYS	-07	-11	NO+SP	-13	-16	NO+AD+SP	-12	-15
						AD+SP	-09	-12			
Composite WK+MC											
AMH	6517	78	FSG	53	74	AR+MC	51	72	WK+MC+SI	63	79
						AR+AI	51	70	AR+EI+MC	59	76
						MK+AI	49	67	AR+MC+SI	57	75
						MK+EI	48	65	AR+MC+AI	57	75
						SI+AI	48	64	MK+EI+MC	57	75
						MK+MC	47	69	MK+MC+SI	57	75
						MK+MC+AI	56	75			
AMS	6518	89	FSG	40	68	MK+AI	58	76	AR+MK+GS	56	75
						AR+MK	55	74	2MK+AR+GS	55	74
						AR+AI	54	74	MK+MC+SI	52	73
						MK+MC	53	73	MK+MC+AI	50	72
									AR+MC+SI	49	72
									AR+MC+AI	49	72
									AR+GS+AI	49	72
									WK+MC+SI	47	71
Composite AR+SI											
QM	6001	65	FSG	67	84	WK+AR	79	89	WK+AR+MC	76	88
						AR+MK	72	85	WK+AR+SI	76	88
						WK+MK	69	82	WK+AR+GI	73	86
						WK+MC	68	83	AD+WK+AR	73	85
						AR+MC	67	84	AR+EI+GS	70	85
						AR+AI	67	85	WK+MC+SI	68	84
						NO+AR	65	80	2MK+AR+GS	68	83
									AR+MK+GS	71	85
									AR+EI+MC	68	84

Notes.

1. Decimal points are omitted from correlations.
2. A negative validity is expected for the DAYS criterion.

Table 15

Validities of Operational and Selected Alternate Composites
in Three Electromechanical Ratings Presently Using
the Mechanical Selector Composite

Composite	Sample Source	School Course					
		GM		EM		IC	
		<u>r</u>	<u>N</u>	<u>r</u>	<u>N</u>	<u>r</u>	<u>N</u>
WK+MC+SI (Mechanical Composite)	BE/E	.44	591	.44	591	.44	591
	"A" School	.46	109	.67	169		
2MK+AR+GS (New BE/E Composite)	BE/E	.73	297	.73	297	.73	297
	"A" School	.29	109	.68	169		
AR+MK+GS+EI (Current Electronics Composite)	BE/E	.69	591	.69	591	.69	591
	"A" School	.41	109	.72	169		

Notes.

- Validities for BE/E school are biserial correlations against a pass/fail criterion based on all BE/E students for whom the WK+MC+SI selector composite was used since the BE/E curriculum is virtually identical and individual rating samples were, in some cases, too small for separate analysis. Validities for "A" schools are product moment correlations against a Final School Grade criterion.
- The BE/E Ns for the new BE/E composite are based on a cross validation sample and are about half the size of the total sample.
- The validities enclosed in dotted lines are for the composites recommended in each rating.

Conclusions

The following conclusions appear warranted from the results of this study:

1. FSG is a more predictable criterion than DAYS.
2. For schools with an FSG criterion, the present Navy ASVAB composites are about as valid as were Navy BTB composites.
3. Using a single ASVAB selector composite for both BE/E school and "A" schools requiring attendance at BE/E school will reduce BE/E attrition and be effective for "A" schools.
4. The large number of two- and three-test sets of ASVAB composites that yield similar validities suggests a lack of differential validity among the ASVAB tests.
5. Recruits may be effectively selected for "A" schools using a fewer number of ASVAB subtests (i.e., by eliminating or combining current ones).
6. Research is needed on criterion measures used by schools, especially those that are self-paced.

RECOMMENDATIONS

1. Selector composites for the following schools (and prerequisite BE/E school) should be as shown below:

<u>School/Rating</u>	<u>Previous Composite</u>	<u>Recommended Composite</u>
EM and BE/E	WK+MC+SI	2MK+AR+GS
GM and BE/E	MK+MC+SI	AR+MK+GS+EI
IC and BE/E	WK+MC+SI	2MK+AR+GS

2. The data suggest changes in selector composites for six additional schools (AMH, AMS, BT, PN, PR, and QM); however, no recommendations for changes are made at this time pending results of more extensive analyses of additional data, including determination of appropriate cutting scores.

3. Consideration should be given to (a) improving the reporting of school criterion data for use in validation of classification instruments, (b) including school performance data for individual students on a by-name basis in the Navy's Integrated Training and Reporting System (NITRAS), and (c) identifying and exploring alternative measures of student performance in self-paced courses.

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