



# **ASVAB Validation Technical Report**

## **Aviation Structural Mechanic (AM) Rating**

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May 17, 2023

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<b>REPORT DOCUMENTATION PAGE</b>			<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
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<b>1. REPORT DATE (DD-MM-YYYY)</b> 17-05-2023	<b>2. REPORT TYPE</b> Technical Report		<b>3. DATES COVERED (From - To)</b> April 2018 – May 2023	
<b>4. TITLE AND SUBTITLE</b> ASVAB Validation Technical Report Aviation Structural Mechanic (AM) Rating			<b>5a. CONTRACT NUMBER</b>	
			<b>5b. GRANT NUMBER</b>	
			<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> Zannette A. Uriell			<b>5d. PROJECT NUMBER</b>	
			<b>5e. TASK NUMBER</b>	
			<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Navy Selection and Classification Office, OPNAV N132, 701 S. Courthouse Road, Arlington, VA 22204			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Director, Navy Selection and Classification Office OPNAV N132 701 S. Courthouse Road Arlington, VA 22204			<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b> OPNAV N132	
			<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b> 23-04	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited				
<b>13. SUPPLEMENTARY NOTES</b>				
<b>14. ABSTRACT</b> The Navy uses scores from the tests in the Armed Services Vocational Aptitude Battery (ASVAB) to classify Sailors into occupations, or ratings. The possible selection composites may be re-evaluated when tasks done by those in the rating change, or when rating training changes, or when there are concerns about the validity of the composites. This report presents a study of the selection criteria for the Aviation Structural Mechanic (AM) rating. The study was undertaken to evaluate the validity of the selection composites as they had not been re-evaluated for several years, but analyses showed that validity remained high for the chosen composites and no change was needed. However, while not changing the composites themselves, the decision was made to reduce the line scores required in order to allow more to qualify for the training, with the knowledge that academic setback rates during training might increase but the percentage who graduate training was not expected to decrease. The data analyzed and the processes used to determine the most valid selection composites are described.				
<b>15. SUBJECT TERMS</b> ASVAB, selection and classification, Navy ASVAB validation/rating entry standards, validity coefficients, cutscores, diversity				
<b>16. SECURITY CLASSIFICATION OF:</b> UNCLASSIFIED			<b>17. LIMITATION OF ABSTRACT</b> UNLIMITED	<b>18. NUMBER OF PAGES</b> 16
<b>a. REPORT</b> UNCLASSIFIED	<b>b. ABSTRACT</b> UNCLASSIFIED	<b>c. THIS PAGE</b> UNCLASSIFIED		
			<b>19b. TELEPHONE NUMBER (include area code)</b> 901-874-4495	
<b>Standard Form 298 (Rev. 8-98)</b> <b>Prescribed by ANSI Std. Z39.18</b>				

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## Introduction

Since at least 1943, the Navy has worked to classify Sailors into specific ratings (or jobs), often using test scores to provide a minimum required for entry into the rating (see, for example, *US Navy Interviewer's Classification Guide*, 2020). The test used has changed over the years, with the Armed Services Vocational Aptitude Battery (ASVAB) being used since 1974 (*History of Military Testing*, n.d.). This battery contains several tests of crystallized intelligence with some additional tests in the battery, or that are conducted along with the battery, that relate to fluid intelligence (see Appendix A for brief descriptions of each test, or visit <https://www.officialasvab.com>). These tests are usually administered at a Military Entrance Processing Station (MEPS) or Military Entrance Testing (MET) site to determine primarily if the person meets the Armed Forces Qualification Test (AFQT) minimums to join the military (*Enlistment, Appointment, and Induction Criteria*, 2016; (Under Secretary of Defense for Personnel and Readiness, 2020) and then secondarily what rating(s) they may be qualified to join.

Selection into a particular rating is dependent upon the rating's ASVAB composite(s) and cutscore(s), as well as needs of the Navy, other rating specific requirements such as minimum vision or security clearance, and Sailor interests (see Appendix B for a list of ratings and their current ASVAB selection composites). Once Sailors complete initial military training ("boot camp"), they attend follow-on training that is particular to a rating ("A" School, and possibly "C" School). After successful completion of training, they are considered part of that rating community.

Prior to the 2010s, ASVAB selection composites were based on final school grade in "A" School; those composites of ASVAB tests that showed the highest correlation with final school grade became the selection composites to begin that rating training (see Held, Hezlett, Johnson, McCloy, Drasgow, and Salas (2014) for more information). In the 2010s, a shift began away from grades to First-Pass Pipeline Success (FPPS), or the ability to successfully complete a school in the first attempt without having any academic setbacks. If a Sailor has FPPS, they are sent to the Fleet the fastest with the lowest cost to train, as compared to those who have an academic setback and require a longer training time, or those who fail a course and have to be reclassified into a different rating and start a different training path (and then need a replacement recruited into the original rating).

Composites may be changed when there are changes in the training as different composites may show higher correlation with the new training, and they may be re-assessed periodically. Suggested composite changes are approved by the ASVAB Validation Review Committee (AVRC), which consists of representatives from many components involved in Navy personnel processes including recruiting, training, and rating health. This report describes the revalidation effort for Aviation Structural Mechanics (AM), a rating that had not been reviewed since prior to 2018.

## Aviation Structural Mechanic Work

Information about the work that is done by a rating can come from a variety of sources. Training courses are based upon the detailed rating information contained in the Navy Enlisted Manpower and Personnel Classifications and Occupational Standards (NEOCS) manuals (available at <https://www.mynavyhr.navy.mil/References/NEOCS-Manual/>), particularly Volume I – Navy Enlisted Occupational Standards. This document contains a paragraph about the scope of the rating, the career pattern, and then any relevant job titles, job description, O\*Net relationships, and tasks that are part of that job.

A condensed version of this information is available on the Navy Credentialing Opportunities On-Line (COOL; <https://www.cool.osd.mil/usn/>). This site provides an overview and rating card for each rating similar to the NEOCS information, and also contains bibliographies for advancement, roadmaps for development, and related civilian credentials and occupations. The COOL rating card provides a starting place for an ASVAB validation. For the AM rating, the October 2022 COOL rating card for AM indicates:

“Aviation Structural Mechanics maintains all aircraft main and auxiliary hydraulic power systems, actuating subsystems and landing gear. They are responsible for maintenance on the aircraft fuselage (mainframe) wings airfoils, and associated fixed and moveable surfaces and flight controls.

### WHAT THEY DO:

- Remove, repair and replace hydraulic system pumps, auxiliary power systems and unit actuating subsystems;
- Maintain aircraft landing gear system, brakes and related pneumatic systems, reservoir pressurization, emergency actuating devices, pumps, valves,
- regulators, cylinders, lines and fittings;
- Service pressure accumulators, emergency air bottles, oleo struts, reservoirs and master brake cylinders;
- Inspect, remove and replace components of hydraulic systems;
- Replace gaskets, packing, and wipers in hydraulic components;
- Remove, repair and replace aircraft fuselage, wings, fixed and movable surfaces, airfoils, regular seats, wheels and tires, controls and mechanisms;
- Remove, install and rig aircraft flight control surfaces;
- Fabricate and assemble metal components and make minor repairs to aircraft skin;
- Install rivets and metal fasteners;
- Fabricate repairs for composite components;
- Perform non-destructive dye penetrant inspections (NDI);
- Perform daily, preflight, post flight and other periodic aircraft inspections.”

Additionally, the COOL card lists other qualifications and interests:

“Aviation Structural Mechanics require an orientation toward tools and equipment, should possess manual dexterity and be physically fit. They must be able to keep records, have a knack for getting along well with other people and work as part of a team. The ability to do repetitive tasks and perform detailed work is also helpful.”

Table 1 has been adapted from the COOL rating card, specifically from the bulletized description of what an AM does, with the first column showing the tasks and the remaining columns showing to which ASVAB tests each task might intuitively link. Seemingly, the Auto and Shop (AS) test would be the most linked to the rating work, although table 1 is not definitive and is simply an initial guide for analyses.

Table 1  
ASVAB Linkages to the AM Rating

AM Tasks	GS	AR	WK	PC	MK	EI	AS	MC	AO	CS	VE
Remove, repair and replace hydraulic system pumps, auxiliary power systems and unit actuating subsystems						X	X	X	X		
Maintain aircraft landing gear system, brakes and related pneumatic systems, reservoir pressurization, emergency actuating devices, pumps, valves, regulators, cylinders, lines and fittings							X	X			
Service pressure accumulators, emergency air bottles, oleo struts, reservoirs and master brake cylinders							X	X			
Inspect, remove and replace components of hydraulic systems							X	X	X		
Replace gaskets, packing, and wipers in hydraulic components							X	X	X		
Remove, repair and replace aircraft fuselage, wings, fixed and movable surfaces, airfoils, regular seats, wheels and tires, controls and mechanisms							X	X	X		
Remove, install and rig aircraft flight control surfaces							X	X	X		
Fabricate and assemble metal components and make minor repairs to aircraft skin							X				
Install rivets and metal fasteners							X				
Fabricate repairs for composite components							X		X		
Perform non-destructive dye penetrant inspections (NDI)							X				
Perform daily, preflight, post flight and other periodic aircraft inspections							X				

## Methods

### Student Data Used

Only AM “A” School data (CDP 2515) was analyzed, as AMs could be assigned to Fleet billets without any additional training after this “A” School. Corporate Enterprise Training Activity Resource Systems (CeTARS) data were downloaded for those with Active Duty Service Dates (ADSD) 1 October 2016 and beyond. Since it was unclear when the AM composite was

last changed (although was known to be prior to 2018), nor when any changes in training occurred that might impact training success (also, prior to 2018), the decision was made to only use the most recent 5 years of data for the CDP (ending 10 April 2023).

Person Event (PEVT) codes were used to determine key milestones during the training (see the CeTARS database for full descriptions). In addition to the enrollment code (2) and the graduation code (288), Table 2 contains those codes that were categorized as a setback or failure due to an academic issue or a non-academic issue; only academic issues, which might be impacted by intelligence measured by the ASVAB, were considered in these results. All those with non-academic failures were removed from the data, and only those who had graduated, academically failed, or who had an academic setback but were still in training were retained.

Table 2  
Person Event Codes Used

Category	Academic Code	Non-Academic Code
Setback	48	73
	51	294
	53	298
	56	300
	324	303
		305
		308
Failure	81	207
	142	230
		311
		320
		969
		970
		971
		973

After these deletions, 3,463 cases remained. Table 3 provides descriptive details for each ASVAB subtest for the remaining sample, and figures 1 and 2 are histograms of the scores on the two relevant composites. All ASVAB scores are standardized so that 50 is the mean and 10 is the standard deviation of the population. Mean scores for AM training data for AR+MK+AS+VE was 213.3 and for AR+MK+MC+VE was 219.2.

Table 3  
ASVAB Test Descriptives for AM Sample

Test	Count	Min	Max	Mean
GS	3458	23	73	53.29
AR	3458	38	72	54.92
WK	3457	21	74	52.37
PC	3458	28	69	53.52
MK	3458	36	73	56.07
EI	3455	20	80	52.13
AS	3458	24	80	49.38
MC	3458	31	79	55.2
VE	3458	25	71	52.96
AO	3145	28	70	58.58
CS	1024	23	72	53.53
AFQT	3458	31	99	65.26

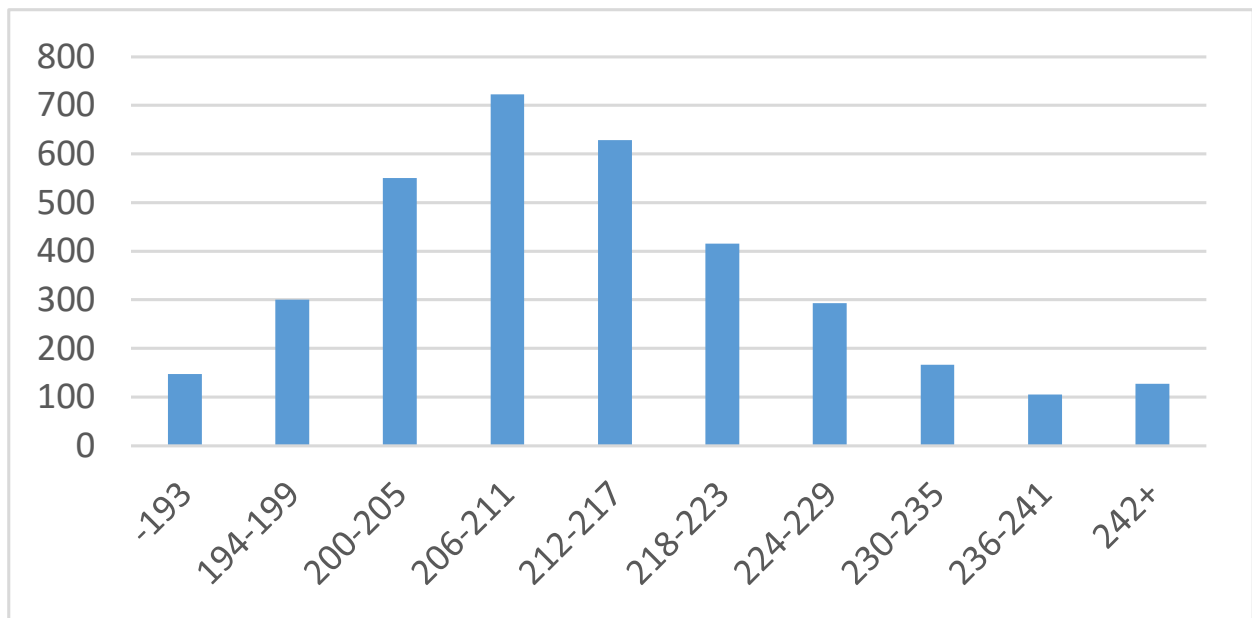


Figure 1. AR+MK+AS+VE Scores of AM Students.

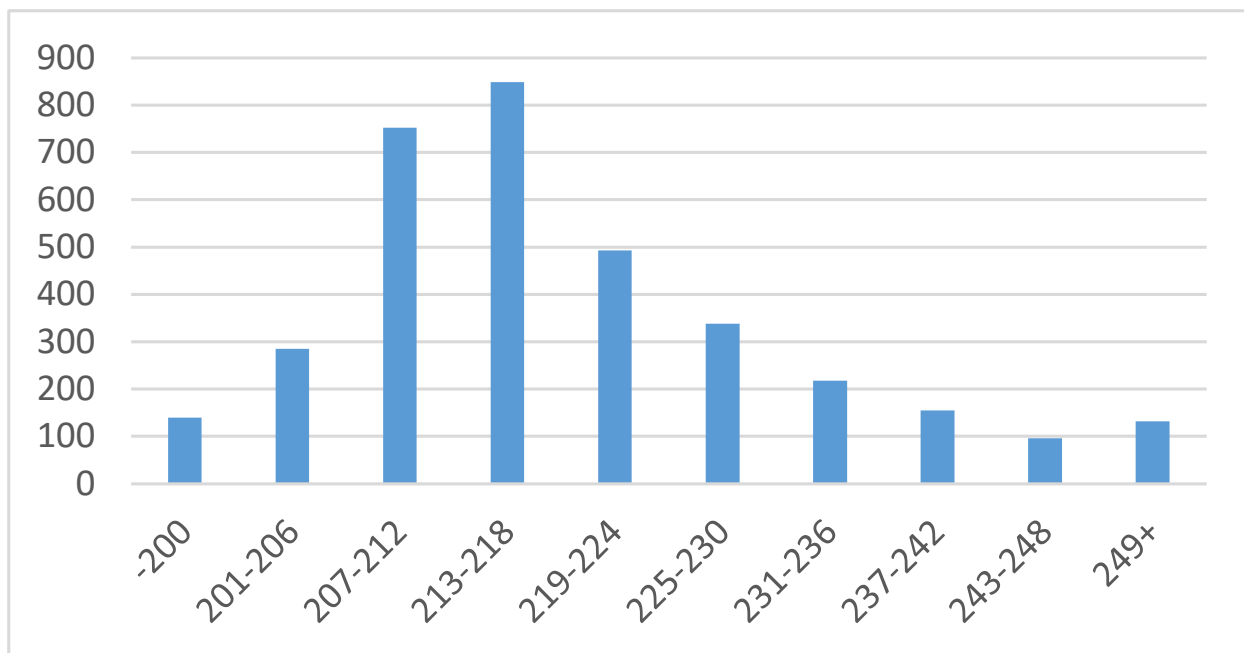


Figure 2. AR+MK+MC+VE Scores of AM Students.

A variable reflecting the method of qualification was computed: a) through  $AR+MK+AS+VE \geq 210$  only, b) through  $AR+MK+MC+VE \geq 210$  only, c) through both equations, or d) not qualified based on the composites. Table 4 provides the decomposition of the data based on this qualification method variable. The rates of academic setback, graduation, and FPPS are also include for each qualification method.

Table 4  
Qualification and FPPS Rates for Each Qualification Method

	Student #	% of Sample	Academic Setback Rate	Academic Setback, Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS%
Total Sample	3463	100.0%	6.4%	7	99.3%	0.4%	93.4%
Qualified Only Through $AR+MK+AS+VE \geq 210$	209	6.0%	8.1%	0	99.5%	0.5%	91.9%
Qualified Only Through $AR+MK+MC+VE \geq 210$	1029	29.7%	8.4%	5	98.9%	0.6%	91.6%
Qualified On Both	1822	52.6%	3.7%	1	99.8%	0.1%	96.2%
Qualified On Either	3060	88.4%	5.6%	6	99.5%	0.3%	94.4%
Waivered	398	11.5%	13.1%	1	99.0%	0.8%	86.9%

As indicated in Table 4, this rating has a very high graduation rate of 99.3% overall, with the lowest graduation rate of 98.9% for those who qualified only through the second composite; 99.0% of those receiving a waiver graduated. The FPPS rate was also high, with those receiving waivers over twice as likely to have an academic setback as those who were qualified, which

lowers the FPPS rate to 86.9% for those receiving waivers compared to 94.4% for those who were qualified.

Waivers are granted per MILPERSMAN 1306-618 to a maximum of 3 points per test on a multi-test composite (*Class "A" School and Rating Entry Requirements, 2016*); Table 3 groups all waivers together, while Figure 3 shows FPPS, graduation, and academic setback (AS) rates based on the number of points per test that were waived. Setback rates are about 20% or below while graduation rates generally are about 95% or above.

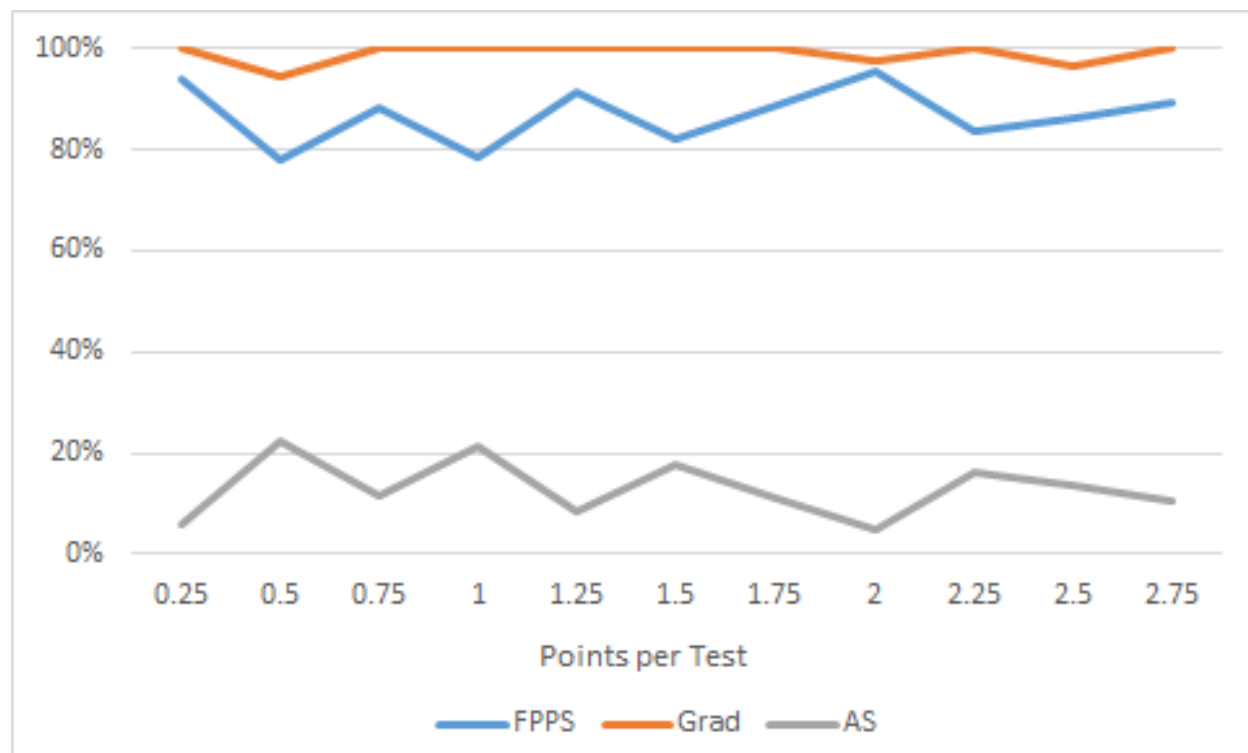


Figure 3. FPPS, graduation, and academic setback rates based on number of points per test waived.

As only about 1/3 of AM students had CS data available, composites with CS were not considered in analyses. Only data for the 3,142 AM students that had all test scores (excluding CS) were used to determine validity coefficients.

### Validity Coefficients

Figures 4 and 5 are the receiver operating characteristic (ROC) curves for AR+MK+AS+VE and AR+MK+MC+VE, respectively. As the diagonal line indicates random classification (i.e., chance), both are classifying for success somewhat better than chance. The area under the curve (AUC) for figure 4 is .6464 and the AUC for figure 5 is .6498, indicating the two equations are nearly identical in their accuracy of classifying success.

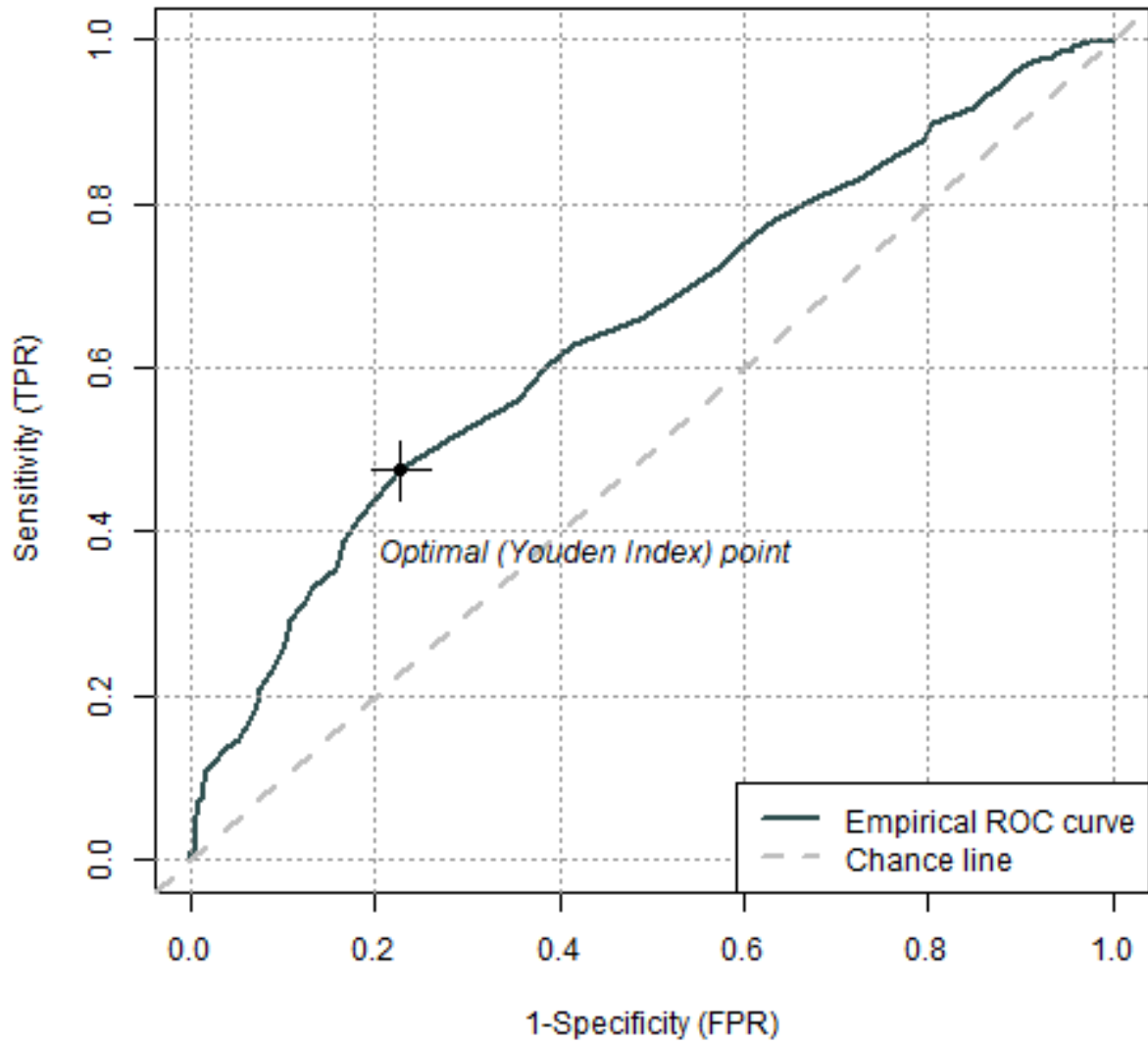


Figure 4. AR+MK+AS+VE ROC.

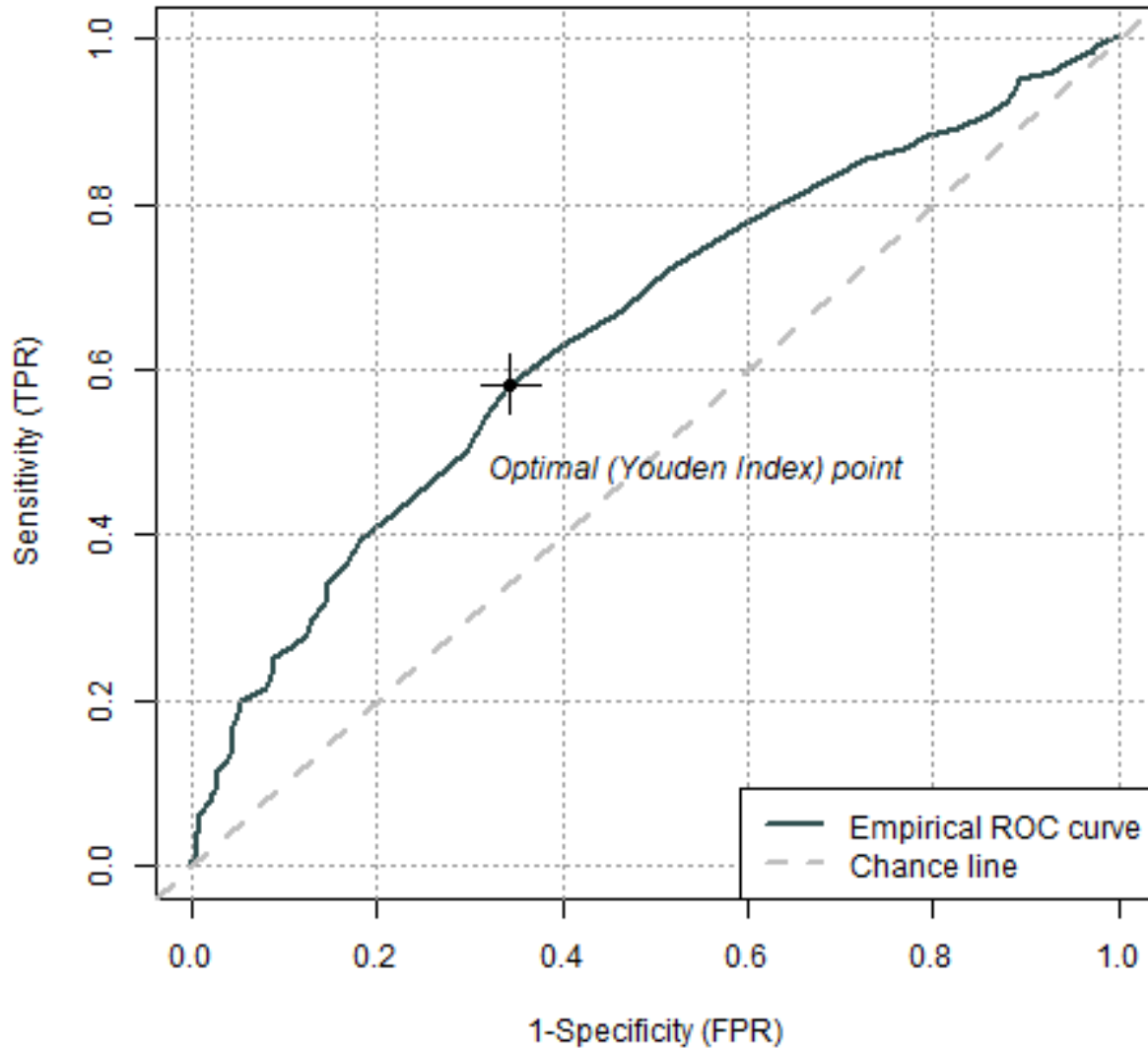


Figure 5. AR+MK+MC+VE ROC.

At present, there are 30 Navy classification composites considered. Correlations between FPPS and each test/composite were computed, and two corrections were then applied. The first correction is to adjust for range restriction that occurs from the selection process, and the second correction is for the dichotomous nature of FPPS. For more details on both corrections, see Segall, 2004 for correcting to PAY97 norms, Held, Carretta, Hezlett, Johnson, Mendoza, Abrahams, Drasgow, McCloy, and Wolfe (2015), or appendix C. The initial correlations as well as the correlations after application of each of the two corrections are shown in table 5, grouped by family of the test/composite. The two underlined composites are the two currently in place, and those highlighted are the 10 highest fully corrected validities.

Table 5  
Composite Validities

Composite Family	Composite	Uncorrected Validity	Validity Corrected for Range Restriction to PAY97	Validity Corrected for Range Restriction & Dichotomy (Fully Corrected)
ASVAB test	GS	0.088	0.274	0.525
ASVAB test	AR	0.065	0.289	0.554
ASVAB test	WK	0.045	0.252	0.483
ASVAB test	PC	0.100	0.287	0.549
ASVAB test	MK	0.049	0.274	0.525
ASVAB test	EI	0.121	0.270	0.518
ASVAB test	AS	0.095	0.211	0.404
ASVAB test	MC	0.104	0.276	0.530
ASVAB test	AO	0.064	0.253	0.486
ASVAB test	VE	0.074	0.281	0.539
Administrative	MK+VE	0.092	0.303	0.581
Administrative	PC+MK	0.108	0.306	0.587
Administrative	AR+PC+MK	0.107	0.313	0.599
Mechanical	AR+AS+MC	0.128	0.305	0.584
Mechanical	MK+AS+AO	0.126	0.317	0.607
Mechanical	AR+MK+AS	0.123	0.318	0.609
Mechanical	MK+AS+VE	0.131	0.321	0.616
Operations	AR+MK+AS+VE	0.136	0.324	0.621
Operations	GS+AR+2MK	0.094	0.304	0.582
Operations	AR+MK+AO+VE	0.107	0.316	0.606
Operations	AR+MK+EI+VE	0.137	0.324	0.621
Operations	GS+MK+MC+VE	0.123	0.318	0.610
Operations	MK+EI+VE	0.135	0.322	0.617
Specialized	AR+VE	0.099	0.306	0.587
Specialized	GS+MK+VE	0.105	0.306	0.586
Specialized	AR+WK	0.079	0.296	0.567
Specialized	GS+AR+MK+VE	0.112	0.312	0.597
Specialized	GS+AR+MK	0.103	0.307	0.589
Specialized	GS+MK+2VE	0.100	0.304	0.583
Technical	AR+MK+MC+VE	0.124	0.323	0.618
Technical	GS+AR+MK+EI	0.134	0.320	0.613
Technical	GS+EI+MC	0.128	0.306	0.586
Technical	GS+AR+EI+MC	0.136	0.319	0.611

## Results

To best determine what changes should be made to AM selection composites, 12 months of accessions data was extracted, including those with Active Duty Service Date (ADSD) between 11 April 2022 and 10 April 2023 (31,192 records). Males were 75.0% and females 25.0% of this population; 42.4% were White, 24.0% were Hispanic, and 22.4% were African American, with the remainder being another, unknown, or mixed race. Table 6 lists the ASVAB test descriptives for this population.

Table 6  
ASVAB Test Descriptives for 12 Months of Accessions

<b>Test</b>	<b>Count</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>
GS	31154	21	79	51.8
AR	31156	23	79	52.26
WK	31142	20	77	51.52
PC	31154	24	74	52.39
MK	31154	28	75	54.05
EI	31122	20	80	49.77
AS	31151	20	80	46.08
MC	31149	20	80	51.39
VE	31154	21	77	51.94
AO	28420	26	70	56.17
CS	14045	22	73	61.74
CT	18215	24	79	51.46
AFQT	31171	5	99	57.83

Four composites were selected for consideration in a possible change to the AM selection composites: the two currently used composites (AR+MK+AS+VE and AR+MK+MC+VE), the other composite with highest validity (AR+MK+EI+VE), and a composite in the highest 10 that uses a fluid intelligence test (AO, part of MK+AS+AO). Standardized group mean score differences (Cohen's *d*) were computed for these four equations, comparing female to males as well as African Americans and Hispanics to Whites (see Appendix D for the full briefing of results which contains the Cohen's *d* for the remaining highest-validity composites). Table 7 shows small differences (.20 to .49) for the majority of the composites and groups, although two equations (AR+MK+AS+VE and MK+AS+AO) show medium differences (.50 to .79) for African Americans as compared to Whites.

Table 7  
Standardized Group Mean Score Differences Based on 12 Months of Accessions

	AR+MK+AS+VE	AR+MK+MC+VE	AR+MK+EI+VE	MK+AS+AO
Female-Male	-0.479	-0.262	-0.371	-0.417
African American-White	-0.604	-0.392	-0.360	-0.675
Hispanic-White	-0.382	-0.210	-0.293	-0.221

For the four composites being considered, the predicted FPPS and graduation rates for the accession population were computed, based upon the AM Sailor data. In addition, the qualification rates were computed for various standardized scores (to a 4-test equivalent for MK+AS+AO), as indicated in table 8; a score of 210 is the level currently used for selection, and 198 would be the maximum allowable waiver from that score (see *Class "A" School and Rating Entry Requirements* (2016) for waiver policy). Not surprisingly based on the analysis of the training data, the predicted graduation rate for all composites is about 99% while the FPPS rate for the scores shown varies from about 92% to about 96%. The percentage who would qualify at each score level varies much more substantially than either predicted FPPS or predicted graduation rate; within this score range, only 39.8% of the population would qualify for AR+MK+AS+VE  $\geq$ 210 while 74.5% would qualify with AR+MK+MC+VE  $\geq$ 192.

Table 8  
Predicted FPPS and Qualification Rates based on 12 Months of Accessions

Standardized Score	AR+MK+AS+VE			AR+MK+MC+VE			AR+MK+EI+VE			MK+AS+AO		
	FPPS Rate (%)	Grad Rate (%)	Qual Rate (%)	FPPS Rate (%)	Grad Rate (%)	Qual Rate (%)	FPPS Rate (%)	Grad Rate (%)	Qual Rate (%)	FPPS Rate (%)	Grad Rate (%)	Qual Rate (%)
210	96.4	99.8	39.8	95.8	99.7	47.2	96.3	99.7	45.0	95.0	99.7	43.2
204	95.6	99.7	48.7	94.8	99.6	56.3	95.4	99.6	54.0	94.3	99.6	53.4
198	94.6	99.6	58.3	93.6	99.4	65.3	94.4	99.5	62.9	93.5	99.4	62.9
192	93.4	99.4	68.0	92.3	99.2	74.5	93.3	99.4	72.0	92.9	99.3	69.9

Because no rating selection currently uses just one composite (see appendix B for current composites in use for each rating), various combinations of these four composites were compared, as shown in Table 9. The current goal per the AVRC is to at least maintain graduation rate while increasing qualification, so the cutscores used with the combinations were adjusted to maintain or improve upon graduation and FPPS rates, with the preferred options also maximizing the number who would qualify.

Table 9  
Summary of Qualification Standards Options Considered

	AR+MK+AS+VE $\geq$ 210 or AR+MK+MC+VE $\geq$ 210	AR+MK+AS+VE $\geq$ 210 or AR+MK+EI+VE $\geq$ 210	AR+MK+AS+VE $\geq$ 212 or AR+MK+MC+VE $\geq$ 212 or AR+MK+EI+VE $\geq$ 212	AR+MK+AS+VE $\geq$ 213 or AR+MK+MC+VE $\geq$ 213 or MK+AS+AO $\geq$ 160
	Current Operational Standard	Option 1	Option 2	Option 3
QR	48.9%	47.1%	48.1%	51.5%
Difference from Current Qual #	---	-563	-242	+816
% Qual F::M	0.581	0.542	0.567	0.579
% Qual AA::W	0.344	0.349	0.349	0.352
% Qual H::W	0.620	0.592	0.615	0.666
Predicted Grad	99.7%	99.7%	99.7%	99.8%
Predicted FPPS	96.0%	96.3%	96.3%	96.1%

The third option increases the qualification rate, however in order to compensate for lower expected graduation with these composites, the cutscores required have to increase above the cutscores currently in place. This is also true with option two, however both option two and option one have lower numbers of those qualifying (and are therefore eliminated from consideration based upon AVRC requirements) so do not meet current AVRC requirements.

### Discussion and AVRC Decision

Because of the findings in Table 9, the suggestion was made to the AVRC to maintain the current AM selection composites: AR+MK+AS+VE  $\geq$  210 or AR+MK+MC+VE  $\geq$  210. This combination obviously would maintain graduation and FPPS rates, and shows that there have been no appreciable changes in training or incoming population since these composites were put in place.

Any changes to the operational composites would require maintaining the composites for a period of time before conducting a re-evaluation to determine if other composites might perform better. A benefit of not making changes at this time is that another option is currently available that could be used to increase qualification rates to help recruiters in during difficult recruiting times (see, for example, Anderson, 2022). Several ratings have recently had their cutscores reduced based on analysis of the success of those receiving waivers; if there is no

appreciable decrease in graduation rates and a minimal increase in setback rates, reducing the cutscores allows for more to qualify to start the training. At present, these adjustments are temporary and can be rescinded when recruiting improves. Figure 1 shows that those who received waivers are not substantially lower in graduation rates nor substantially higher in setback rates than those who qualified. This is also shown in Table 8, with 99% being predicted to graduate even if the cutscore is reduced from 210 to 192, and graduation from training is what is required to fully become part of the rating.

As this is a medium-complexity rating (per Appendix B of Crookenden and Blanco, 2016), a two point per test reduction in the cutscore can be considered using the process currently in place. When applying such a reduction to the 2019-2021 applicant population, this would have led to an increase of over 20,000 (10%) qualified to attend AM training, as indicated in table 10.

Table 10  
Comparison of Impact of Cutscore Change to 2019-2021 Applicant Population

Cutscore	Qual Rate Overall	2019-2021 Applicant Population (N=187,368)							
		Qualification Rates by AFQT Band							
		I	II	IIIA	IIIB	IVA	IVB	IVC	V
		93-99	65-92	50-64	31-49	21-30	16-20	10-15	1-9
210	43.76%	100.0%	97.2%	36.2%	3.8%	0.1%	0.0%	0.0%	0.0%
202	54.72%	100.0%	99.8%	65.5%	17.8%	0.8%	0.1%	0.0%	0.0%

This cutscore change was suggested to the AVRC as a temporary change only, to be re-evaluated in future and rescinded or extended as needed. When the AVRC met on 3 May 2023 to discuss, they voted to make this temporary reduction, to be effective until 30 September 2024.

Table 11  
Composites for Selection

Selection Composites prior to 31 May 2023	Selection Composites as of 31 May 2023
AR+MK+AS+VE $\geq$ 210 or AR+MK+MC+VE $\geq$ 210	AR+MK+AS+VE $\geq$ 202 or AR+MK+MC+VE $\geq$ 202

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**Appendix A**  
**Description of the ASVAB and Additional Selection Tests**

<b>Test Type</b>	<b>Test Name and Abbreviation</b>	<b>Test Description</b>
Standard ASVAB	General Science (GS)	Knowledge of physical and biological sciences
	Arithmetic Reasoning (AR)	Ability to solve arithmetic word problems
	Word Knowledge (WK) <sup>a</sup>	Ability to select the correct meaning of words presented in context and correct synonyms
	Paragraph Comprehension (PC) <sup>a</sup>	Ability to obtain information from written passages
	Mathematics Knowledge (MK)	Knowledge of high school mathematics principles
	Electronics Information (EI)	Knowledge of electricity and electronics
	Auto and Shop Information (AS)	Knowledge of automobile and shop technologies, tools, and practices
	Mechanical Comprehension (MC)	Knowledge of mechanical and physical principles
	Assembling Objects (AO)	Ability to determine correct spatial forms from their separate parts and connection points (not administered in all versions)
Special Tests (May be Given in Conjunction with ASVAB)	Coding Speed (CS)	Ability to quickly identify correct word/number pairings from a key with many options
	MCt	Ability to maintain value of 3 counters that increment and decrement simultaneously
	Cyber Test (CT)	Information and communications technology literacy
	Navy Advanced Placement Test (NAPT)	Knowledge of advanced physics, mathematics, and chemistry
	Defense Language Aptitude Battery (DLAB)	Aptitude to learn a foreign language

<sup>a</sup> WK and PC are combined to form the Verbal (VE) composite that is a component of the AFQT and several Navy ASVAB classification composites.

**Appendix B**  
**Current Composites in Use Across All Ratings**

<b>Composite Name</b>	<b>Composite Calculation</b>	<b>Rating/Program Entry Standards</b>
Administration 1	VE+MK	CTI, LN, PS, QM, RP, YN
Administration 2	MK+CS+VE	OS, PS, RP, YN
Administration 3	PC+MK	CTR
Administration 4	AR+PC+MK	AC, CTR, HM
Cyber 1	MK+VE+CT	CTN, IT/ATF, IT/SG, ITS
Cyber 2	AR+MK+CT	CTT/AEF, CTT/SG
Mechanical 1	AR+AS+MC	BU, CM, EO, SW
Mechanical 2	MK+AS+AO	AO, AS, BM, MR, PR
Mechanical 3	AR+MK+AS	UT
Mechanical 4	MK+AS+VE	AD
Operations 1	AR+MK+AS+VE	ABE, ABF, ABH, AIRC, AIRR, AM, AME, AN (APACT), AO, BM, DC, EN, FN (E/PACT), GSM, HT, MM, MR, PR
Operations 2	GS+AR+2MK	AECF, CTN, CTT/SG, EA, ET, FC, FCA, GM, ITS, OS, SB
Operations 3	AR+MK+AO+VE	AE, AME, AT, AV, BU, EN, GSM, IC, IC/ATF, MM, MN, MT, SO, STG, STG/AEF
Operations 4	MK+MC+CS+VE	SO
Operations 5	AR+MK+EI+VE	AS, CTM, IT/SG, MMA, MMS, TM
Operations 6	GS+MK+MC+VE	QM
Operations 7	MK+EI+VE	AD
Specialized 1	AR+VE	AZ, CS, EOD, LN, LS, MC, ND, RS, SB, SN (S/PACT), SO
Specialized 2	GS+MK+VE	AG, CTI, HM/ATF, IT/ATF, IT/SG, NC
Specialized 3	AR+WK	HM/ATF
Specialized 4	GS+AR+MK+VE	HM, HM/ATF, IS, IT/ATF, ITS
Specialized 5	GS+AR+MK	AG
Specialized 6	GS+MK+2VE	HM
Specialized 7	AR+MK+MC+VE+NAPT	EM(NUC), ET(NUC), MM(NUC), NUC
Specialized 8	GS+AR+MK+EI+NAPT	EM(NUC), ET(NUC), MM(NUC), NUC
Technical 1	AR+MK+MC+VE	AC, AE, AIRC, AIRR, AM, AS, AT, AV, CSS, CTN, DC, EM, EM(NUC), ET(NUC), ETV, FT, FN (E/PACT), GSE, HT, LSS, MA, MM(NUC), MN, MR, MT, NUC, SECF, STS, YNS
Technical 2	GS+AR+MK+EI	AECF, CE, CSS, CTT/AEF, EM, EM(NUC), ET, ET(NUC), ETV, FC, FCA, FT, GM, GSE, IC, IC/ATF, LSS, MM(NUC), NUC, SECF, STS, STG, STG/AEF, UT, YNS
Technical 3	GS+EI+MC	EOD, SO
Technical 4	GS+AR+EI+MC	MMA, MMS, TM

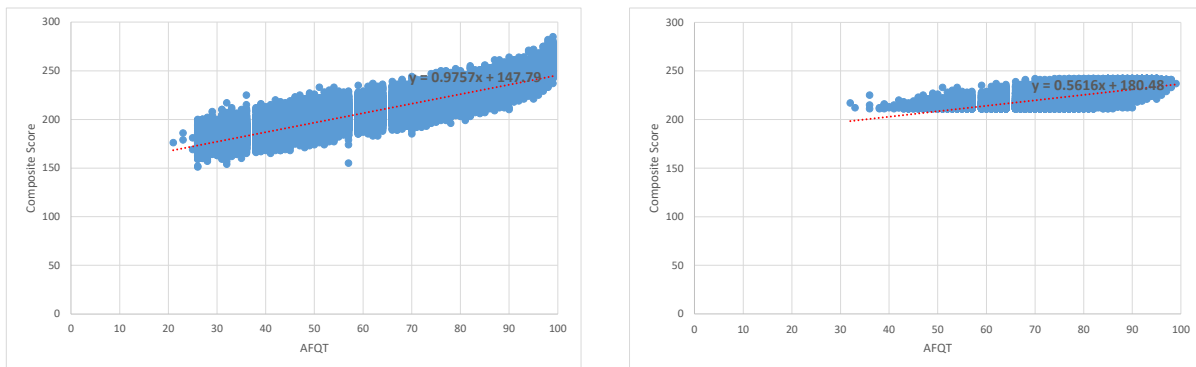
As of 4/11/2023.

## Appendix C

### Corrections of Validity Coefficients

Two corrections are executed before determining the fully corrected validity coefficients used to determine the best-fitting composites. The first correction is for range restriction, and the second is for dichotomy. A simplistic explanation of both is included below, with more detailed information provided in Held, Carretta, Hezlett, Johnson, Mendoza, Abrahams, Drasgow, McCloy, & Wolfe (2015).

Because a selection for the rating has already occurred prior to analyzing the training data, the validity coefficients initially computed do not cover the entire spectrum of possible ASVAB scores, as can be seen in the two graphs below with the left graph showing the complete spectrum of AFQT scores vs a composite AFQT score, and the right graph showing all AFQT but only the composite scores above a selected cutscore of 210. The correlation line equation is different between the two graphs because of the restriction in range of the graph on the right.



Matrix algebra is used to correct for this range restriction by adjusting the variance/covariance matrix of the test scores and FPPS to the PAY97 variance/covariance matrix created by Segall (2004) in the PAY97 norming process. Once each individual ASVAB score is corrected, each composite of ASVAB scores can also be corrected as laid out in Held, et al (2015).

Correcting for dichotomization accounts for the dependent variable (FPPS in this report) being a 0 or 1, which is actually a measure of an underlying continuous variable Final School Grade. The Table of Normal Deviates and Ordinates is consulted to determine the y ordinate that corresponds to the FPPS rate (“B Area in the larger portion” within the table). Each range restricted correlation is then multiplied by the calculated dichotomy correction factor

$$\frac{\sqrt{FPPS*(1-FPPS)}}{y\text{-ordinate}}$$

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# Aviation Structural Mechanic (AM)



**ECM Brief**

**Zannette A. Uriell**  
**Navy S&C**



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# Background

- **Navy S&C develops and monitors ASVAB standards for all Navy ratings**
  - Goal is to balance rating qualification rate and training performance
  - Ideally a revalidation occurs every 3-5 years
  - About 18 months after any change in selection standards, a retrospective is conducted to determine if change is functioning as expected
  
- **AM composites have not changed for many years**
  - AR+MK+AS+VE  $\geq$  210 OR AR+MK+MC+VE  $\geq$  210
  
- **AVRC decision to revalidate AM based on time since last validated**



# Study Goals

- **In ideal Navy, improve First Pass Pipeline Success (FPPS) to save money in training time and lessen aggravation due to training/reclassification of Sailors**
- **In recruiting-challenged Navy, maintain or improve graduation rate while increasing number who would qualify for training**
  - Use FPPS predictions to determine most valid composites (FPPS and graduation are generally related)
  - Test most valid composites and linescores to determine graduation and qualification rates
  - Consider adjustment of linescore further to account for unique recruiting environment, similar to temporary adjustments to other ratings based on rating complexity (medium) and findings of waiver analyses



# About AM and Linkage to ASVAB

- Aviation Structural Mechanics maintains all aircraft main and auxiliary hydraulic power systems, actuating subsystems and landing gear. They are responsible for maintenance on the aircraft fuselage (mainframe) wings airfoils, and associated fixed and moveable surfaces and flight controls.
  - Navy COOL, Oct 2022

	GS	AR	WK	PC	MK	EI	AS	MC	AO	CS	VE
Remove/repair/replace hydraulic sys pumps, aux power sys and unit actuating subsys						X	X	X	X		
Maintain aircraft landing gear system, brakes and related pneumatic sys, reservoir pressurization, emergency actuating devices, pumps, valves, regulators, cylinders, lines and fittings							X	X			
Service pressure accumulators, emergency air bottles, oleo struts, reservoirs and master brake cylinders							X	X			
Inspect/remove/replace components of hydraulic sys							X	X	X		
Replace gaskets, packing, and wipers in hydraulic components							X	X	X		
Remove/repair/replace aircraft fuselage, wings, fixed and movable surfaces, airfoils, regular seats, wheels and tires, controls and mechanisms							X	X	X		
Remove/install/rig aircraft flight control surfaces							X	X	X		
Fabricate/assemble metal components and make minor repairs to aircraft skin							X				
Install rivets and metal fasteners							X				
Fabricate repairs for composite components							X		X		
Perform non-destructive dye penetrant inspections (NDI)							X				
Perform daily/preflight/post-flight/other periodic aircraft inspections							X				



# Findings – CDP 2515

- **FPPS overall 93.4%; lowest at 86.9% for those with waivers due to 13% having academic setbacks (although 99% graduate)**
- **Graduation rate nearly 100% regardless of qualification method**

CDP 2515	Student #	% of Sample	Academic Setback Rate	Academic Setback Still in Training	Grad Rate	Academic Failure Rate	Observed FPPS
Total Sample	3463	100.0%	0.0641	7	0.9931	0.0035	0.9339
Qualified Only Through AR+MK+AS+VE>=210	209	6.0%	0.0813	0	0.9952	0.0048	0.9187
Qualified Only Through AR+MK+MC+VE>=210	1029	29.7%	0.0836	5	0.9893	0.0058	0.9164
Qualified On Both	1822	52.6%	0.0368	1	0.9984	0.0011	0.9621
Qualified On Either	3060	88.4%	0.0556	6	0.9951	0.0029	0.9438
Waivered	398	11.5%	0.1307	1	0.9899	0.0075	0.8693

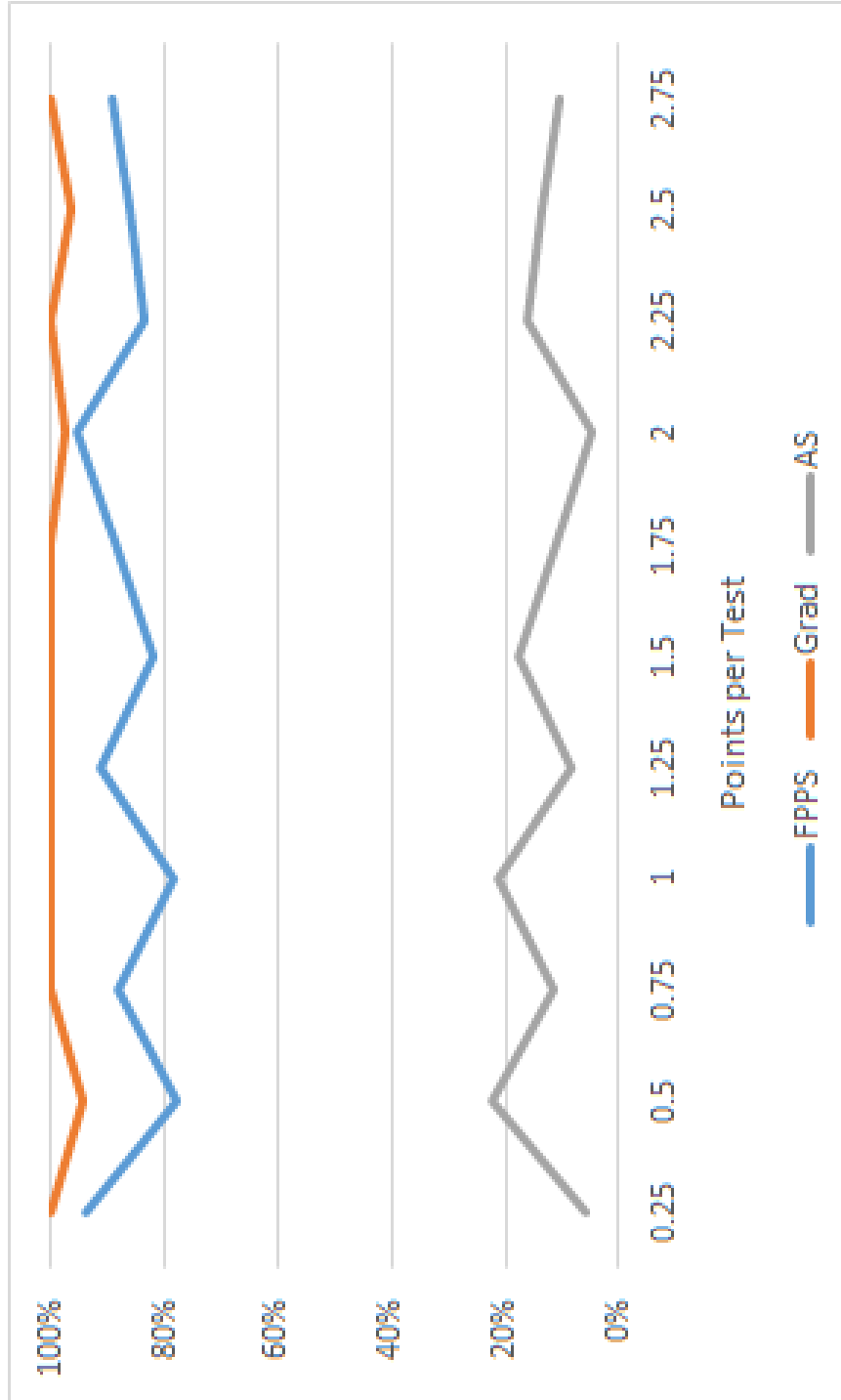
Most recent 5 years of CDP 2515 data.

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# Waiver

- For the 11.5% who received waivers, graduation rate is close to 100% regardless of how many points per test were waived; academic setback rate is 22% or less



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# Fully Corrected Validity Coefficients and Diversity

- Composites with highest validity coefficients (after corrections) listed below for comparison

Composites	Composite (Family)	Fully Corrected Validity Coefficients n=3,142 with AO	Standardized Group Mean Score Differences: 12month Accession Population (n=31,192)		
			F-M	AA-W	H-W
AR+MK+AS+VE	OPS1	0.621	-0.479	-0.604	-0.382
AR+MK+MC+VE	TECH1	0.618	-0.262	-0.392	-0.210
AR+MK+EI+VE	OPS5	0.621	-0.371	-0.360	-0.293
MK+EI+VE	OPS7	0.617	-0.385	-0.398	-0.397
MK+AS+VE	MECH4	0.616	-0.508	-0.698	-0.511
GS+AR+MK+EI	TECH2	0.613	-0.471	-0.467	-0.323
GS+AR+EI+MC	TECH4	0.611	-0.695	-0.737	-0.473
GS+MK+MC+VE	OPS6	0.610	-0.343	-0.565	-0.416
AR+MK+AS	MECH3	0.609	-0.533	-0.581	-0.265
MK+AS+AO	MECH2	0.607	-0.417	-0.675	-0.221

\* Effect Size, or “Cohen’s d”, are terms used for measurement of group test score differences with .20 considered small, .50 moderate, and .80 large, with zero indicating no difference.



## Options Under Consideration

➔ **Same or better graduation rate, with more qualifying** ➔

1. **No change at present**
2. **Keep AR+MK+AS+VE and change 2nd to AR+MK+EI+VE**
  - Small change, slightly higher diversity
3. **Keep current composites and add AR+MK+EI+VE as 3<sup>rd</sup> alternative**
  - Small change, potentially increasing pool with another high-validity composite
4. **Keep current composites and add MK+AS+AO as alternative**
  - Small change, alternative includes AO



# Predicted FPPS with Individual Composites

- Possible scores and predicted impact on FPPS, Grad Rate, and Qualification Rate (QR) listed below, with the bold scores being the current linescore and the waiver limit of the current linescore
- Predicted graduation rates 99% across all scores shown, although QR varies greatly

Linescore Analysis for Predicted FPPS/Graduation at or above Key Scores Applied to 12-month Navy Accessions N=31,192												
Transformed Score	AR+MK+AS+VE (Current - Composite 1)			AR+MK+MC+VE (Current - Composite 2)			MK+AS+AO (Possible Composite)					
	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR	Score	Pred. FPPS	Pred. Grad	QR
213	213	96.7%	99.8%	35.2%	213	96.2%	99.7%	42.8%	160	95.3%	99.7%	39.2%
<b>210</b>	<b>210</b>	<b>96.4%</b>	<b>99.8%</b>	<b>39.8%</b>	<b>210</b>	<b>95.8%</b>	<b>99.7%</b>	<b>47.2%</b>	<b>158</b>	<b>95.0%</b>	<b>99.7%</b>	<b>43.2%</b>
207	207	96.0%	99.7%	44.2%	207	95.3%	99.6%	51.7%	155	94.6%	99.6%	49.3%
204	204	95.6%	99.7%	48.7%	204	94.8%	99.6%	56.3%	153	94.3%	99.6%	53.4%
201	201	95.1%	99.6%	53.5%	201	94.2%	99.5%	60.6%	151	94.0%	99.5%	57.5%
<b>198</b>	<b>198</b>	<b>94.6%</b>	<b>99.6%</b>	<b>58.3%</b>	<b>198</b>	<b>93.6%</b>	<b>99.4%</b>	<b>65.3%</b>	<b>148</b>	<b>93.5%</b>	<b>99.4%</b>	<b>62.9%</b>
195	195	94.0%	99.5%	63.2%	195	93.0%	99.3%	79.8%	146	93.2%	99.4%	66.5%
192	192	93.4%	99.4%	68.0%	192	92.3%	99.2%	74.5%	144	92.9%	99.3%	69.9%
189	189	92.8%	99.3%	72.5%	189	91.6%	99.1%	78.9%	142	92.5%	99.3%	73.1%
186	186	92.1%	99.2%	77.3%	186	91.0%	99.0%	82.6%	140	92.2%	99.2%	76.0%

Notes.

1. Tests transformed to be equivalent to a 4-test score.
2. 12-month Navy accessions 4/1/2022 – 4/10/2023.

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# Summary of Full Permanent Options

- Changing second composite leads to a decrease in the qualification rate
- Adding a third alternative requires increasing linescore to maintain graduation rate, and may yield only minor improvement in qualification rate

	Qualification Standard			
	AR+MK+AS+VE ≥ 210 or AR+MK+MC+VE ≥ 210 [Current]	AR+MK+AS+VE ≥ 210 or AR+MK+EI+VE ≥ 210 [Option 1]	AR+MK+AS+VE ≥ 212 or AR+MK+MC+VE ≥ 212 or AR+MK+EI+VE ≥ 212 [Option 2]	AR+MK+AS+VE ≥ 213 or AR+MK+MC+VE ≥ 213 or MK+AS+AO ≥ 160 [Option 3]
QR	48.9%	47.1%	48.1%	51.5%
Diff from Current #	---	-563	-242	+816
%Qualified F::M	0.581	0.542	0.567	0.579
%Qualified AA::W	0.344	0.349	0.349	0.352
%Qualified H::W	0.620	0.592	0.615	0.666
Predicted Grad	99.7%	99.7%	99.7%	99.8%
Predicted FPPS	96.0%	96.3%	96.3%	96.1%

\*12-month Navy accessions 4/1/2022 – 4/10/2023.

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# Recommendation 1

- Continue with AM selection composites currently in place:

**AR+MK+AS+VE ≥ 210**

**or**

**AR+MK+MC+VE ≥ 210**

- Conduct full revalidation in 3-5 years



## Temporary Modification

- Because AM graduation rates for qualified vs non-qualified are similar (99.4% vs 98.2%), implementing a 2-point per test temporary reduction of the line score (similar to other medium-complexity ratings) would increase the qualification rate of applicants from 44% to 55%

		2019-2021 Applicant Population (N=187,368)							
		Qualification Rates by AFQT Band							
Standard	Qualification Rate	I	II	IIIA	IIIB	IVA	IVB	IVC	V
210	43.76%	93-99	65-92	50-64	31-49	21-30	16-20	10-15	1-9
202	54.72%	100.0%	97.2%	36.2%	3.8%	0.1%	0.0%	0.0%	0.0%
		100.0%	99.8%	65.5%	17.8%	0.8%	0.1%	0.0%	0.0%



## Recommendation 2

- Issue memo for temporary modification to linescore, similar to other medium-complexity ratings recently changed
  - Adjust 2 points per test

$$AR+MK+AS+VE \geq 202$$

or

$$AR+MK+MC+VE \geq 202$$

- Evaluate impact of waiver in summer 2024 to determine if temporary modification should be extended

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Backup



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# ASVAB and Special Classification Tests

Test	Content
General Science (GS)	Biological and physical sciences
Arithmetic Reasoning (AR)	Arithmetic word problems
Word Knowledge (WK)*	Synonyms/meaning of words in context
Paragraph Comprehension (PC)*	Written passages
Mathematics Knowledge (MK)	Algebra, geometry, fractions, decimals, exponents
Electronic Information (EI)	Electrical principles and electronics
Auto and Shop Information (AS)	Automotive, tool, shop, practices
Mechanical Comprehension (MC)	Mechanical and physical principles
Assembling Objects (AO)	Patterns and connection point recognition

\*VE, Verbal, is a combination of 1/3 PC and 2/3 WK

## Special Classification Tests:

- Coding Speed (CS) is a perceptual speed and accuracy test.
- DLAB is the Defense Language Aptitude Battery administered to CTI candidates.
- NAPT is the Navy Advanced Placement Test administered to about 1/2 of NF candidates.
- Cyber Test (CT) is operational for some computer intensive ratings.
- Mental Counters (MCt), a working memory test, may be operational in FY23.

AFQT is a combination of PC, WK, AR, and MK; 2VE+AR+MK.



# More Common PEVT Codes

## Non-Academic Setback

73	STBK NACAD W/O REMEDIAL ADMINISTRATIVE LEAVE
294	STBK NACAD MEDICAL W/O REMEDIAL TRNG
295	STBK NACAD PHYSICAL W/O REMEDIAL TRNG
296	STBK NACAD MILITARY W/O REMEDIAL TRNG
298	STBK NACAD ADMIN W/O REMEDIAL TRNG
300	STBK NACAD MEDICAL W/REMEDIAL TRNG
301	STBK NACAD PHYSICAL W/REMEDIAL TRNG
302	STBK NACAD MILITARY W/REMEDIAL TRNG
305	STBK NACAD ADMINISTRATIVE W/REMEDIAL TRNG
308	STBK NACAD OTHER W/O REMEDIAL TRNG

## Academic Setback

48	STBK ACAD W/O REMEDIAL TRAINING ADMINISTRATIVE
51	STBK ACAD W/REMEDIAL REVIEW BOARD
53	STBK ACAD W/REMEDIAL CLSRM LACK OF COMPREHENSION
56	STBK ACAD W/REMEDIAL TRNG MOTIVATION LACK OF PERF
324	STBK ACAD W/REMEDIAL TRAINING LAB INABILITY
855	STBK ACAD W/REMEDIAL TRAINING

## Non-Academic Failure

148	NON-GRAD NACAD ADMIN UNSUITABILITY
149	NON-GRAD NACAD ADMIN HARDSHIP
207	NON-GRAD NACADDEATHNON-TRAININGRELATED
211	NON-GRAD NACAD PHYSICAL NOT AQUATICALLY ADAPTABLE
212	NON-GRAD NACAD PHYSICAL PRTFailure
214	NON-GRAD NACAD PHYSICAL PERFORMANCEFAILURE
227	NON-GRAD DSNRL CLASS/COURSECANCEL
228	NON-GRADDSNRL ADMINRATING/PROGCONV
229	NON-GRAD DSNRLADMIN RECALLEDBY PARENTACTIVITY
230	NON-GRAD DSNRLADMIN NONPREREQ MED/PHY
231	NON-GRAD DSNRL ADMIN NONPREREQACADEMIC
232	NON-GRAD DSNRL ADMIN NONPREREQ SECURITY
311	NON-GRAD NACAD OTHER
320	NON-GRAD NACAD MOTIV NEGATIVE MILITARY ATTITUDE
970	NON-GRAD NACAD MEDICAL
971	NON-GRAD NACAD LEGAL - UCMJ ACTION
972	NON-GRAD NACAD LEGAL - CIVIL ACTION
973	NON-GRAD NACAD LEGAL - ADMIN ACTION
986	NON-GRAD NACAD MEDICAL 986
987	NON-GRAD NACAD LEGAL 987
994	NON-GRAD NACAD MEDICAL 994

## Academic Failure

81	NON-GRAD ACAD CLSRM LACK OF CMPRH/RETENTION
103	NON-GRAD ACAD LABORATORY LACK OF MANUAL SKILLS
106	NON-GRAD ACAD LABORATORY LACK OF KNOWLEDGE APPL
135	NON-GRAD NACAD MOTIV EXPRESSED DOR
138	NON-GRAD NACAD MOTIV LACK OF PERF SCOL N/O CHOICE
141	NON-GRAD NACAD MOTIV LACK OF PERF SCOL N/W EXPCTD
142	NON-GRAD NACAD MOTIV LACK OF PERF NEG TRNG ATT
309	NON-GRAD ACAD OTHER

(NOTE: Historically PEVT 135, 138, and 141, categorized as motivational attrition, are considered academic failures for ASVAB validation analyses as these students are judged to be unable keep up in the course.)

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# Findings Table – Key Points

- Findings, or decomposition, table will show how many qualified through each possible qualification method and various success rates for each
- Non-academic failures are removed from all analyses; non-academic setbacks are not considered since a change of ASVAB would not impact these (see separate list for what is considered non-academic failure)
- Those with an academic setback but not yet done with training included in FPPS analyses, so graduation rate + academic failure rate may not total to 100%

	Student #	% of Sample	Academic Setback Rate / 100	Academic Setback Still in Training	Grad closer to 1 is better - rate = % / 100	Academic Failure Rate	Observed FPPS%
Total Sample	218	100%	.1835	5	.9343	.0657	80.73%
Qualified Only Through VE+AR+MK+AS≥210	4	1.8%	0	0	1.000	0	100.00%
Qualified Only Through MK+AS+AO≥152	135	61.9%	.2370	3	.9394	.0606	75.56%
Qualified On Both	54	24.8%	.0556	1	.9623	.0377	92.59%
Qualified On Either	193	88.5%	.1813	4	.9471	.0529	80.83%
Waivered	25	11.5%	.2000	1	.8333	.1667	80.00%

These can show if one composite is driving the data

More data is better for basing decisions, recommend never less than 100 total

Setback closer to 0 is better - rate = % / 100

Grad closer to 1 is better - rate = % / 100

First Pass Pipeline Success - 100% is better

Top line is all data being considered

Next set of lines is per individual composite as well as combination

Last set of lines is qualified (sum of the previous set) vs waived



## Validity Chart Overview

- Chart shows multiple things – most valid composites (29 currently in use), what “family” composite is in (6 possible), what the corrected validation coefficient of the data is, and demographic comparisons of the mean scores/dispersion for each composite

Composites	Composite (Family)	Fully Corrected Validity Coefficients n=214 with AO	Standardized Group Mean Score Differences: 12month Accession Population (n=38,308)		
			F-M	AA-W	H-W
<u>VE+AR+MK+AS</u>	OPS1	.667	-0.652	-1.096	-0.644
<u>MK+AS+AO</u>	MECH2	.598	-0.549	-1.079	-0.514
VE+AR+MK+EI	OPS5	.662	-0.594	-0.961	-0.592
VE+AR+MK+MC	TECH1	.656	-0.556	-1.006	-0.585
GS+AR+MK+EI	TECH2	.655	-0.637	-1.018	-0.612
AR+MK+AS	MECH3	.654	-0.649	-1.058	-0.577
PC+AR+MK	ADMIN4	.651	-0.338	-0.753	-0.436
MK+AS+VE	MECH4	.649	-0.680	-1.130	-0.700
GS+AR+MK+VE	SPEC4	.647	-0.489	-0.934	-0.576
VE+AR	SPEC1	.645	-0.495	-0.894	-0.548
MK+EI+VE	OPS7	.644	-0.602	-0.947	-0.627

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# Validity Chart - Composites

- Usually top 10 with highest validity are shown in descending order, with those currently in use underlined and at the top
- Coefficients closer to 1 are better; there is a greater level of prediction as the two things (in this case, composite score and FPPS) are closely related (.7 or higher is considered a very strong relationship)

Composites	Composite (Family)	Fully Corrected Validity Coefficients n=214 with AO
<u>VE+AR+MK+AS</u>	OPS1	.667
<u>MK+AS+AO</u>	MECH2	.598
VE+AR+MK+EI	OPS5	.662
VE+AR+MK+MC	TECH1	.656
GS+AR+MK+EI	TECH2	.655
AR+MK+AS	MECH3	.654
PC+AR+MK	ADMIN4	.651
MK+AS+VE	MECH4	.649
GS+AR+MK+VE	SPEC4	.647
VE+AR	SPEC1	.645
MK+EI+VE	OPS7	.644

- 6 families, roughly based on ratings that utilize the composite (Administration, Cyber, Mechanical, Operations, Specialized, Technical)
- Composites currently in use (listed at top) may not be highly correlated, but may still provide usefulness in qualification decision (e.g., AO is a test of fluid intelligence and minority groups may score higher than they would on crystallized intelligence tests)
- Very little difference (meaningless) between a validity of .645 and .644; .598 and .644 nearly similar



# Validity Chart – Group Differences

3 right columns compare minority and majority (females compared to males, African Americans compared to Whites, Hispanics compared to Whites) using Cohen’s d, which looks at the size of the difference between the means and how dispersed the data is around the means

Composites	Standardized Group Mean Score Differences: 12month Accession Population (n=38,308)		
	F-M	AA-W	H-W
<u>VE+AR+MK+AS</u>	-0.652	-1.096	-0.644
<u>MK+AS+AO</u>	-0.549	-1.079	-0.514
VE+AR+MK+EI	-0.594	-0.961	-0.592
VE+AR+MK+MC	-0.556	-1.006	-0.585
GS+AR+MK+EI	-0.637	-1.018	-0.612
AR+MK+AS	-0.649	-1.058	-0.577
PC+AR+MK	-0.338	-0.753	-0.436
MK+AS+VE	-0.680	-1.130	-0.700
GS+AR+MK+VE	-0.489	-0.934	-0.576
VE+AR	-0.495	-0.894	-0.548
MK+EI+VE	-0.602	-0.947	-0.627

- Negative numbers show that the first listed (minority group for this chart) is lower than the majority group
- Absolute value closer to 0 would be very little difference between the 2 groups
  - .2 or less is considered small effect size
  - .5 is considered medium effect size
  - .8 is considered large effect size
- If correlations are similar, select composite with lower effect size (may not be lower for all 3 comparisons)

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# Options Chart Overview

- Chart shows current composite combination compared to several others deemed the best of those considered during analyses
- Many issues considered when determining combinations to consider, including correlation with FPPS, graduation and FPPS rate, qualification rate, current composite (incremental changes), and demographic subgroup comparisons

		Qualification Standard		
	VE+AR+MK+AS ≥ 210 or MK+AS+AO ≥ 152	VE+AR+MK+AS ≥ 199 or VE+AR+MK+EI ≥ 199 or VE+AR+MK+MC ≥ 199	VE+AR+MK+AS ≥ 187 or VE+AR+MK+EI ≥ 187 or VE+AR+MK+MC ≥ 187	VE+AR+MK+AS ≥ 204 or VE+AR+MK+EI ≥ 204 or VE+AR+MK+MC ≥ 204
	[Current]	[Option 5 – Waiver match current FPPS]	[Option 6 – Match current FPPS]	[Option 7 – Match current QR]
QR	66.4%	75.3%	92.4%	67.3%
Diff from Current #	---	+3,443	+9,990	+357
%Qualified F::M	.699	.745	.903	.683
%Qualified AA::W	.504	.606	.836	.520
%Qualified H::W	.632	.803	.943	.752
Predicted Grad Rate	95.3%	95.6%	94.6%	96.0%
Predicted FPPS	85.9%	90.9%	86.2%	92.6%

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# Options Chart - Interpretation

- Chart applies findings from those who went through A-school (data in use) to a larger group, either recent Navy accessions or applicants (i.e., what would last year have looked like if these standards had been in place at the start)

Qualification Standard			
VE+AR+MK+AS ≥ 210 or MK+AS+AO ≥ 152 [Current]	VE+AR+MK+AS ≥ 199 or VE+AR+MK+EI ≥ 199 or VE+AR+MK+MC ≥ 199 [Option 1]	VE+AR+MK+AS ≥ 187 or VE+AR+MK+EI ≥ 187 or VE+AR+MK+MC ≥ 187 [Option 2]	VE+AR+MK+AS ≥ 204 or VE+AR+MK+EI ≥ 204 or VE+AR+MK+MC ≥ 204 [Option 3]
66.4%	75.3%	92.4%	67.3%
Diff from Current #	+3,443	+9,990	+357
%Qualified F::M	.699	.903	.683
%Qualified AA::W	.504	.836	.520
%Qualified H::W	.632	.943	.752
Predicted Grad Rate	95.3%	94.6%	96.0%
Predicted FPPS	85.9%	86.2%	92.6%

If H and W were same size groups, roughly 6 H qualify for every 10 W

Options may have different cutscores from current, as several cutscores may have been evaluated to meet desired criteria

Predictions, assuming next year consistent with previous year; may not actually be observed in future

Change in number qualified compared to current

Ratio of qualification rates for various demographic subgroups; a ratio closer to 1 shows the qualification rates to be similar

Predicted graduation rates lower than predicted FPPS due to setbacks; if setbacks less of a concern, can base comparison between options solely on graduation rate



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1230  
OPNAV S&C/080  
16 May 2023

MEMORANDUM FOR THE RECORD

SUBJ: RATING ENTRY STANDARDS FOR THE AVIATION STRUCTURAL MECHANIC (AM) RATING

Ref: (a) MILPERSMAN 1306-618  
(b) COMNAVCRUITCOMINST 1130.8 (CRUITMAN-ENL)  
(c) Catalog of Navy Training Courses (CANTRAC)

1. The Navy Selection and Classification Office (OPNAV N132G) ASVAB Validation Review Committee analyzed observed training outcomes for Initial Skills Training for the AM rating and simulated the effects of possible alternative entry standards.

2. Based on the analysis and coordination with all stakeholders, the composite test score criteria for the AM rating through Fiscal Year 2024 will be:

$AR+MK+AS+VE \geq 202$

or

$AR+MK+MC+VE \geq 202$

3. Organizations responsible for references (a) through (c) and other publications, manuals, articles, and instructions referencing minimum rating entry requirements should update their materials and classification systems to reflect this standard. Navy Selection and Classification Office will ensure the appropriate RIDE WEB Service Qualification Policy Tables reflect this standard.

4. The new standard is temporary, and will become effective 31 May 2023 and remain in effect until 30 September 2024 when it will automatically revert to the previously approved composite test score criteria unless extended by additional memoranda for the record.

JACOBS-  
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J. JACOBS-LENTZ  
Acting

Copy to:  
OPNAV N132  
BUPERS 3 (Codes BUPERS-32, BUPERS-33)  
PERS 4  
CNRC (Codes N3, N35, N6)  
NETC N3