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Technical Report 651

Validation of Current and Alternative Armed Services Vocational Aptitude Battery (ASVAB) Area Composites,

Based on Training and Skill Qualification Test (SQT) Information on Fiscal Year 1981 and 1982 Enlisted Accessions

AD-A156 807

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October 1984

U. S. ARMY RESEARCH INSTITUTE

FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency under the Jurisdiction of the

Deputy Chief of Staff for Personnel

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Research accomplished under contract for the Department of the Army

Human Resources Research Organization

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NOTICES

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UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER ARI Technical Report 651	2. GOVT ACCESSION NO. AD-A156807	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) VALIDATION OF CURRENT AND ALTERNATIVE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) AREA COMPOSITES, BASED ON TRAINING AND SKILL QUALIFICATION TEST (SQT) INFORMATION ON FISCAL YEAR 1981 AND 1982 ENLISTED ACCESSIONS		5. TYPE OF REPORT & PERIOD COVERED Interim Report Oct 1982 - May 1984
		6. PERFORMING ORG. REPORT NUMBER --
7. AUTHOR(s) Donald H. McLaughlin (AIR); Paul G. Rossmeissl (ARI); Lauress L. Wise, David A. Brandt, & Ming-mei Wang (AIR)		8. CONTRACT OR GRANT NUMBER(s) MDA 903-82-C-0531
9. PERFORMING ORGANIZATION NAME AND ADDRESS Human Resources Research Organization 1100 South Washington Street Alexandria, VA 22314		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 2Q263731A792 2312 101
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Army Research Institute for the Behavioral and Social Sciences 5001 Eisenhower Avenue, Alexandria, VA 22333-5600		12. REPORT DATE October 1984
		13. NUMBER OF PAGES 238
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) --		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION DOWNGRADING SCHEDULE --

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

--

18. SUPPLEMENTARY NOTES

The Army Research Institute technical point of contact is Dr. Paul G. Rossmeissl.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Validation	SQT
Predictors	Differential validity
Longitudinal data base	Training
ASVAB	Aptitude area composites

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes a large scale research effort to validate and improve the ASVAB aptitude area (AA) composites now used by the Army to select and classify enlisted personnel. Data were collected from existing Army sources on over 60,000 soldiers and over 60 MOS. The research had three major components: First, the composites now being used by the Army were validated. Second, a new set of composites were derived empirically; and finally, both sets were compared on the basis of predictive validity, (Continued)

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 SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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differential validity, and possible prediction bias. Both sets of composites were found to perform well, with the alternative set of four composites doing slightly better than the nine now in operational use.

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Office, Deputy Chief of Staff for Personnel
Department of the Army

October 1984

Army Project Number
2Q263731A792

Manpower and Personnel

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FOREWORD

This document presents the results of the first step in ARI's large scale research effort for improving the selection, classification, and utilization of Army enlisted personnel. The research reported here is unique in that the very large sample sizes that were employed make it one of the largest investigations of test validity conducted to date. Two important findings emerged from the research. First, it is now clear that the current ASVAB composites are good predictors of soldier performance. Second, the predictive power of two of the composites could be substantially improved with little change or cost to the current assignment system. With the operational use of the new composites which started in October 1984, the Army can expect improved performance in the clerical and surveillance/communications MOS, which can be attributed directly to this project.

Edgar M. Johnson

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ACKNOWLEDGMENTS

This report was prepared by staff of the American Institutes for Research and the U.S. Army Research Institute for the Behavioral and Social Sciences, as specified in contract #MDA 903-82-C-0531 between the Army Research Institute and the Human Resources Research Organization, Newell K. Eaton, COR. The analytical work was carried out under the direction of the lead author, in close consultation with the second author. The sections on Historical Background, Purpose and Objectives, and Assessment of Predictive Bias were written by Paul Rossmeissl; the sections on Development of Alternative Composites, Predictive Validity of Alternative Composites, Differential Validity, and the Summary were written by Don McLaughlin. The section on Alternative Composite Scales and Cutoffs was written by Lauress Wise; the section on Predictive Validity of the Current Composites was written by David Brandt; and the Description of Data was written by committee. Valuable inputs were provided by the project's principal investigator, John Campbell; by the project's Scientific Advisory Committee, especially Robert Linn; by the staff of the Army Research Institute, especially Newell K. Eaton, Hilda Wing, Larry Hanser, John Mellinger, and Mike Rumsey; and by reviewers representing the U.S. Air Force.

EXECUTIVE SUMMARY

Requirements:

(1) To compute validity coefficients for the Army's Armed Services Vocational Aptitude Battery (ASVAB) Area Composites for prediction of enlisted personnel performance in the first tour;

(2) To identify and comparatively validate the best alternative set of ASVAB composites based on the nine subtests of ASVAB Forms 8, 9, and 10.

Procedures:

Data Preparation. Records of soldiers with either training outcome data or Skill Qualification Test (SQT) scores as performance criteria were extracted from Army enlisted accessions for FY81 and FY82. The file was limited to enlistees who took ASVAB 8/9/10 and who had not had prior service. These records were extensively edited, then partitioned into analysis "cells" with at least 100 cases each. Criteria were standardized within each cell.

A "training cell" was defined as a set of soldiers who took the same training course in the same MOS; and an "SQT cell" was defined as a set of soldiers who took the same form of an SQT test in the same MOS. The analysis was based on a total of 29,160 soldiers in 92 training cells and 65,193 soldiers' records in 112 SQT cells. A soldier who took two different SQT forms was included in each cell.

Two secondary data sets, consisting of representative samples of 19,027 applicants for enlistment in FY81 and 13,319 in FY82, were extracted for the purpose of estimating the performance of composites with a set of typical enlistees.

Two derived data sets were produced in order to carry out and report analyses at the MOS level: (1) covariance matrices of the ASVAB and criterion scores for each cell aggregated, using sample weights, across cells within each Military Occupational Specialty (MOS); and (2) a file of 64,907 records containing a single criterion score for each individual. These combined criteria analyses were carried out for 98 MOS.

Predictive Validity Estimation. The correlation coefficient between each of the ASVAB Area Composites and the criterion measure was obtained for each training cell, each SQT cell, and each combined cell (MOS). These coefficients were adjusted for range restriction using the multivariate adjustment based on the assumption of homogeneous linear regression (Lawley, 1943). Because the composites are designed for use in selection

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and classification of applicants for enlistment, the target population for the adjustment was taken to be the FY81 and FY82 applicants.

Identification of Alternative Composites. First, the training cells, the SQT cells, and the MOS were partitioned into clusters, based on similarity of ASVAB profiles of successful performance. Then, for each cluster, the unit-weight composite with maximal predictive validity was identified.

The similarity measures were computed separately for training, SQT, and combined cells. The similarity between each pair of cells was defined as the correlation of the predicted criterion performances in the two cells, for the applicant sample. The performance predictions were based on ridge regression, using the ASVAB subtests as predictors.

The cells were clustered by adapting standard "leaf-to-stem" procedures. Upon finding that the results of the clustering were unstable, due to the high intercorrelations of the predicted criterion scores, the clustering procedure was modified to use as a starting point the Army's current groupings of MOS into the nine sets associated with the nine composites. These clusters were combined into four larger clusters when it was found that the overall predictive validity of four unit-weight composites was as high as nine separate unit-weight composites. The four-cluster solution was then further aggregated to three-, two-, and one-cluster solutions for comparative purposes.

Differential Validity Estimation. The validity of the composites for predicting differences in an applicant's expected performance in different MOS was assessed, using a variant of Horst's Classification Efficiency index. Estimates were obtained for the current composites, for each of the alternative solutions, and for an application of the MAGE composites.

Predictive Bias Estimation. Validity coefficients were computed separately for men, women, blacks, and whites; and separate regression functions for each group were compared to identify potential problems of underprediction of performance of one group compared to another.

Norming of Alternative Composites. A table was prepared so that the alternative composites, calculated as simple sums of ASVAB subtest scores, can be transformed into the same distribution as current composites. Although this allows for use of the same cutoff scores as in the past, a table of alternative cutoffs was prepared which would leave invariant the average AFQT score among applicants eligible for the MOS.

Findings:

Predictive Validity of Current Composites. The validities for 98 MOS, based on combinations of training and SQT scores, ranged from .12 to .74, with a mean of .45. Grouping MOS by the current composite clusters, the lowest mean validity was .42, for Surveillance and Communications MOS and for General Maintenance MOS, and the highest was .54, for Skilled Technical MOS. There was almost no tendency for the composite assigned to an MOS to have a higher validity than other current composites for that MOS.

Identification of Alternative Composites. Only unit-weight alternative composites were considered, after it was found that optimal unit-weight composites for four clusters possessed a root mean square (RMS) predictive validity 97% as great as the root mean square validity of ridge regression vectors computed separately for each of 98 MOS. The combination of losses due to using only four composites and limiting them to unit weights was minimal.

The alternative four-composite solution that we identified as maximizing the aggregate predictive validity across 98 MOS was:

Clerical (ACL):	VE + AR + MK
Skilled Technical (AST):	VE + AR + MK + AS
Operations (AOP):	VE + AR + AS + MC
Combat (ACO):	VE + MK + AS + MC.

The operations composite combines the current SC, OF, and MM clusters; and the combat composite combines the current CO, FA, GM, and EL clusters.

Validity of Alternative Composites. The RMS validity of the four-composite set was .486. This compares with an RMS validity of .489 for the best set of nine unit-weight composites. Variations of validity in the third decimal place are neither statistically significant nor of great practical importance, and a variety of alternatives to the four-composite solution were explored.

Of special interest were the three-, two-, and one-composite solutions. The loss in validity which would result from using the new "combat" composite (ACO) for both the "combat" and "operations" MOS is negligible (.001), as is the loss in, further, using the new Clerical composite (ACL) for both Clerical MOS and Skilled Technical MOS. This two-composite solution captures 97% of the predictive power of the ASVAB for the performance criteria used in these analyses. Finally, use of the single (ACO) composite for all MOS resulted in a reduction to 96% of the predictive power of the ASVAB.

Certain of the composites account for a large part of the difference in validity between current and alternative composites. When compared to validities of optimal composites for the same clusters of MOS, the Clerical composite (CL) appeared to be weak, with a validity of .48 versus a potential of .56. One other composite, Surveillance and Communications (SC), was mildly weak, with a validity of .45 versus a potential of .50.

The gain in expected performance if these composites were changed can only be approximated because of the constrained nature of the selection and classification process. If, however, the choice were purely between assignment to an individual MOS and rejection, application of Cronbach's formula yields an expected gain of .05 standard deviations per person in

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the two clusters of MOS from introduction of these two revisions to the current composites.

Differential Validity of Current and Alternative Composites. The ability of current and alternative composites to identify the best MOS for each enlistee was assessed, using a variant of Horst's Classification Efficiency index. The current composites and five alternative sets of composites all possessed between 43% and 68% of the differential validity of the ASVAB as a battery. There was small positive relationship between the number of composites in a set and the measure of differential validity. The nine-composite sets appeared to capture more of the battery's differential predictive value than the one-, two-, three-, or four-composite sets. The performance of the current composite set (68%) was virtually identical to the performance of the alternative which merely replaced the CL and SC composites (66%). In general, the differential validity of the ASVAB as a battery was higher for low-frequency MOS, but this effect was less pronounced for the sets of unit-weight composites.

Predictive Bias of the Current Composites. The validities of the composites are slightly higher overall for whites (.45) than blacks (.38), but there is, if anything, a tendency to underpredict performance of whites more than blacks. The validities of the EL and SC composites are greater for males than for females, but overall the average difference in validity only slightly favors males (.47) over females (.43). Underpredictions of performance were split between males and females, with the most noticeable underprediction being roughly .06 standard deviations for women using the SC composite. In general, the over- and underpredictions were small, especially in the region near the cutoffs.

Predictive Bias of Alternative Composites. In general, the patterns of differential validity and underprediction observed for the current composites also were found for the four alternative composites, ACL, AST, AOP, and ACO. The overall average validity for whites (.47) was somewhat higher than for blacks (.40), but the underpredictions of performance were suffered primarily by whites. An exception to this was the underprediction of blacks' performance by the alternative skilled technical composite (AST). Blacks' criterion scores in the OF cluster were underpredicted by both the current and alternative composites, and the degree of underprediction was slightly greater using the proposed composite.

The alternative composites had a slightly smaller difference in validities between men and women (.48 vs. .42) than the current composites, but again the most noticeable differences were the greater validities for men in the EL and SC clusters. There were also somewhat greater underpredictions of women's performance in the CL, OF, and SC clusters using the alternative composites, although in general the differences were small.

Conclusions:

Selection of a Composite Set. First, the results on predictive validity favor the alternative four-composite solution over the current nine composites in terms of overall absolute predictive validity and differential validity for MOS classification. The results for predictive bias are mixed, but the effects are not large in either direction. The average validity of the alternative composites is .48, vs. .45 for the current composites. The differential validities of the three-, two- and one-composite sets were progressively worse, but the magnitude of the differences were small.

The major source of the relative deficiency of the current composites lay in two of the composites, CL and SC. Because of the costs of implementation of different levels of change in composites, an interim proposal is to replace these two composites with the ACL and AOP composites, respectively, keeping intact the nine-composite structure. The average validity of the revised nine composites would be raised from .45 to .47, while the differential validity as measured by the criterion adapted from Horst (1954) would be virtually unchanged. This solution would also avoid the introduction of AST, with its small increase in underprediction of blacks' performance in skilled technical MOS.

Broadening the Span of Predictors. The current composites, as well as the best alternative composites, account for only about 20 to 25 percent of the variance in the criteria, but they account for over 90% of the variance in the criteria that is predictable from the ASVAB. The ASVAB measures four common factors, but only two eigenvalues are greater than one, and the first principal component accounts for roughly half the variance.

This level of predictability is clearly not sufficient for accurate identification of the optimal assignments of enlisted personnel to MOS. While it was impossible to assess the contributions of limitations of the criteria and of the ASVAB separately in these analyses, the adjusted validities were modest, with only 14 out of 98 greater than .6. There is a need for use of a broader set of predictors in the selection and classification process for enlisted personnel.

Increasing the Sample Size. The present analyses combined the data from two years, FY81 and FY82, with a substantial increase in the possible coverage of MOS over the coverage available from one year's accessions. For many MOS, there are not sufficient numbers in any year to support needed parameter estimation for the purposes of deriving optimal assignment procedures. However, with a proper control for trends across years, the data base can be built up over a few years to the point where the needed two thousand cases in each MOS are available for analysis.

Although the replication of these analyses two years hence was to focus on the FY83 and FY84 cohorts (with the addition of utility information), the data base for those analyses will actually be the four-year cohort, FY81 through FY84 accessions. This will provide the basis for exploring both trends and criterion measures taken later in a soldier's career, as well as an adequate data base for a larger set of MOS.

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Utilization:

The major practical result of this investigation was the identification of suitable replacements for the two relatively weak ASVAB Area Composites currently in operational use by the Army. Introduction of new composites for the Clerical & Administrative and Surveillance & Communications MOS will significantly improve the expected performance of enlisted personnel entering these MOS, without affecting differential validity of the composites or introducing significant predictive bias.

In addition, this effort resulted in the development of systematic procedures for the validation of ASVAB composites, including data editing, range restriction adjustment, ridge regression estimates of optimal composites, differential validity estimation, predictive bias assessment, and setting of cutoff scores. At the same time, the results highlighted needs for additional research and development to build on the foundation of credibility created by this effort. In particular, there are needs for criterion validity and reliability information, performance utility estimates, cumulative additions to sample sizes, further work on range restriction adjustment and differential validity measurement, and a broadening of the coverage of skills required in different MOS. This coverage must be included in both the criterion measures and the predictors.

Throughout the remainder of this project, work will go forward on the development of better predictors and better criteria; and future validations of enlisted personnel selection and classification procedures can be expected to refine and extend the results presented here.

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Historical Background

The Armed Services Vocational Aptitude Battery (ASVAB) is a test battery for assessing cognitive abilities and is used by the military services as their primary instrument for selecting and classifying enlisted personnel. The current operational version of ASVAB (Forms 8/9/10) and all previous versions of military selection and classification tests have been referenced and normalized to the scale of the Army General Classification Test (AGCT), as used during World War II. In the case of the Army, the development and history of ASVAB 8/9/10 as a classification instrument can be more directly traced back through ASVAB 6/7 to the Army Classification Battery.

For many years prior to the operational implementation of ASVAB in 1976, each of the services maintained its own test batteries. Within the Army, the selection and classification decisions were based upon the Army Classification Battery (ACB). The ACB was first used in 1949 when the aptitude area system was introduced operationally by the Army. Under this system, an individual recruit needed to achieve a minimum score in a particular aptitude area before being assigned to an occupation. The original ACB was substantially revised and improved by Maier and Fuchs (1973) based on an empirical validation in seven job areas, to produce ACB-73. The ACB-73 in its final form consisted of twelve subtests and an interest inventory from which four interest scales were derived.

In 1974 the Department of Defense (DoD) recommended the use of a single interservice test battery for military selection and classification, and in January 1976, ASVAB 6/7 became operational as the DoD-wide selection and classification instrument. ASVAB 6/7 contained parallel forms of all of the subtests that had been a part of ACB-73 plus an additional speeded test (numerical operations). For a number of reasons, not yet completely known (Maier & Truss, 1983), the original scale scores of ASVAB forms 6/7 were miscalibrated. The result of this miscalibration was that examinees in the lower range of the ability distribution were given higher scores than they would have received if the battery had been correctly calibrated. DoD supported three research efforts to identify and then correct this calibration error. These efforts resulted in a revised set of norms for the battery. In addition, a panel of experts was formed to review the recalibration research and to insure that calibration efforts for other operational batteries did not result in a similar error (Jaeger, Linn, & Novick, 1980).

ASVAB 8/9/10 replaced ASVAB 6/7 as the operational test battery in October 1980. Forms 8/9/10 differed substantially from the former battery. Some of the old subtests were dropped or combined into single subtests, and two new subtests were added. Finally the complete interest inventory was deleted. These changes resulted in a battery of ten subtests: General Science (GS), Arithmetic Reasoning (AR), Word Knowledge (WK), Paragraph Comprehension (PC), Numerical Operations (NO), Coding Speed (CS), Auto/Shop Information (AS), Mathematics Knowledge (MK), Mechanical Comprehension (MC), and Electronics Information (EI). ASVAB 8/9/10 is the battery currently in use by the armed services.

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Scores from the ten subtests of the current ASVAB are combined into composite scores in several different ways. One combination, the Armed Forces Qualification Test (AFQT) is used by all the services for the initial selection of personnel. The other composites serve as the basis for assignment of personnel to particular jobs or training slots. A minimum qualifying score on one of the aptitude area composites is required for admission to the Army initial level training courses. For example, the combat (CO) composite is used to classify recruits into the infantry and armor specialties.

The nine aptitude area (AA) composites now being used to classify Army personnel have been in place for over ten years (Maier & Fuchs, 1973). The composites were developed empirically, first by clustering Army jobs or Military Occupational Specialties (MOS) based upon their content, and then by using forward stepwise regression, with success in training as the criterion, to select the variables or subtests to be included in the composite score. These subtests were then given unit weights for operational use. When the ACB-73 was replaced by ASVAB 6/7, the Army decided to retain the AA composites that had been used with ACB-73. This decision resulted from the pressures to implement the service-wide test battery as soon as possible, and the decision was considered practical because of the high similarity among the subtests of the two batteries.

When ASVAB 8/9/10 became operational, there were substantial changes in the battery, particularly the deletion of two of the subtests and the interest inventory. The direct transfer of computational formulas for the composites was not possible. The situation had been further complicated by a change in Army training testing procedures. In the mid-1970's, the Army adopted a criterion-referenced model for its training proficiency tests, and also converted many courses to a self-paced mode. While such procedures are appropriate as measures of training success, they do not generally produce data that are well-suited for validation research. Specifically, the criterion-referenced model typically produces test scores that are either pass/fail or have a very limited range of values, all of which denote acceptable performance. Additional information on the time taken to completion, or the number of attempts prior to success, would be far more useful for validation analyses.

For these reasons Maier and Grafton (1981) used Skill Qualification Test (SQT) scores in developing the new composite formulas for ASVAB 8/9/10, based on an empirical validation in 19 MOS. The SQT had been implemented operationally in 1976 to measure job proficiency in a large number of Army jobs. Unlike the criterion-referenced training tests, the SQT yields continuous scores as well as pass/fail information and, therefore, provides a more acceptable criterion measure for validation research. Maier and Grafton found that when SQTs were used as criterion measures, it was possible to compute a set of scoring formulas for the nine AA composites yielding validities that were adequate to justify their operational use for the selection and classification of recruits. The set of AA composites developed by Maier and Grafton are given below:

Table 1

Operational Composites Currently in Use by the Army

Composite		Subtests
Clerical/Administrative	CL	(VE+NO+CS)
Combat	CO	(AR+CS+AS+MC)
Electronics Repair	EL	(GS+AR+MK+EI)
Field Artillery	FA	(AR+CS+MK+MC)
General Maintenance	GM	(GS+AS+MK+EI)
Mechanical Maintenance	MM	(NO+AS+MC+EI)
Operators/Food	OF	(VE+NO+AS+MC)
Surveillance/Communications	SC	(VE+NO+CS+AS)
Skilled Technical	ST	(GS+VE+MK+MC)

VE (verbal ability) is a combination of the word knowledge (WK) and paragraph comprehension (PC) subtests. These composites are now being used by the Army on an operational basis. Maier and Grafton did not investigate alternative groupings or clusters of the MOS to be predicted by these composites. As new MOS have been created, they have been assigned area composites based on rational judgments. Otherwise, the assignment of area composites to MOS have remained the same since the development of ACB-73.

There are two other sets of composites not now used operationally by the Army that are routinely computed from ASVAB. The first of these composite sets is used by the Air Force to select and classify potential enlisted personnel. The Air Force currently uses four ASVAB composites. They are Mechanical (M), Administrative (A), General (G), and Electronic (E). Collectively they are referred to as the MAGE composites.

Another set of ASVAB composites has been developed for use when ASVAB is administered to high school students as a career guidance tool (US Military Enlistment Processing Command, in press). This set includes a composite for Mechanical Trades, for Office and Supply, for Electronics/Electrical, for Skilled Services, and for Academic Ability. Maier and Truss (1983) have recommended that the first four of these high school composites be used by the Marine Corps as the basis for enlisted personnel selection and classification. The composition of both the MAGE and the High School composites is presented in Table 2. Since these composites are already in operational use within DoD, it is important that they be considered by the Army as it considers a change to its personnel allocation system.

Table 2

Other Composite Systems

MAGE Composites		
Mechanical	M	MC + AS + GS
Administrative	A	VE + NO + CS
General	G	AR + VE
Electronic	E	AR + MK + GS + EI

High School Composites		
Mechanical Trades	HSMT	AR + MC + AS EI
Office and Supply	HSOS	VE + CS + MK
Electronics/Electrical	HSEE	AR + EI + MK + GS
Skilled Services	HSSS	AR + VE + MC
Academic Ability	HSAA	AR + VE

A comparison of these three tables reveals the following relationships. The CL composite in operational use by the Army is known within the MAGE system as Administrative (A). Also, the EL composite (Army) is the Electronic composite in MAGE and also the Electronics/Electrical composite in the High School system. In addition, both MAGE and the High School systems use the (AR + VE) combination. In MAGE, it is known as the General composite and it also appears as the Academic Ability composite in the High School set.

Purpose and Objectives

The Army Research Institute (ARI) is currently in the midst of a large-scale research effort to improve the methods the Army uses to select and classify enlisted personnel. This research includes the development of both new predictor variables and new criterion measures. As part of that effort, the research reported here assessed the validity of the present predictor battery as measured by the currently available performance criteria. The validities of the operational ASVAB 8/9/10 composites were computed and compared to alternative sets of empirically developed composites. In addition, the differential validity of the composites was assessed; and finally, the possibility of predictive bias was investigated.

The major steps in this effort are described below.

First, the validities of the current operational AA composites were carefully examined using both training grades and SQT scores as criteria. Next, an alternative set of AA composites was empirically derived. The possibility of a regrouping of the MOS to be predicted by single composites was considered, as well as the selection of different subtests to form that composite. The alternative set of composites was compared to the operational set in terms of overall predictive validity, differential validity, and predictive bias.

This work provides the basis for possible ARI recommendations for changes to the current set of composites, potentially implemented beginning with ASVAB 11/12/13. Finally, on the basis of these validation results, a clearer understanding emerges as to the limitations of ASVAB and the current criterion measures in the development of improved selection and classification procedures for the Army. The areas that show the most promise and need for further research are identified.

In order to accomplish these goals, the following objectives were set:

(1) To collect predictor and criterion data from existing Army and DoD sources, and to edit and check these data;

(2) To adjust the data for range restriction and violations of model assumptions;

(3) To assess the predictive validity of the current operational AA composites, using training grades and SQT scores as criteria;

(4) To construct a set of homogeneous MOS groups on the basis of predictor-criterion relationships;

(5) To derive the best set of ASVAB subtests to predict performance for each MOS group using multiple regression;

(6) To cross-validate the procedures used in steps 4 and 5;

(7) To investigate the effects of moderator variables for both sets of composites in order to determine the appropriateness of using a common composite for all applicant groups;

(8) To estimate the value to the Army of adopting the alternative set of composites in terms of classification efficiency, increased validity, and cost savings; and

(9) To generalize the results obtained from the MOS with sufficient data to be included in these analyses to all MOS.

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Description of Data

Overview

The primary use of ASVAB and the composite measures it provides is in the initial selection and classification of enlisted personnel in the armed forces. As such, the value of ASVAB is based on its ability to predict (1) which recruits will perform well and (2) in which occupational specialties these recruits will perform best relative to other recruits. Therefore, rational validation of current area composites and identification of alternative area composites relies on information about the relations between performance on subtests of the ASVAB and later criterion performance. This, in turn, requires a data base containing both ASVAB scores and valid and reliable criterion measures for a large, representative sample of Army enlisted personnel.

Samples

The present validation is based on 29,160 soldiers with training performance scores and 65,193 SQT records. The sample consisted of all appropriately screened enlisted accessions in the period from 1 October 1980 to 30 September 1982, referred to as the FY81/82 cohort. (Prior service recruits and delayed entry accessions who had not taken ASVAB 8/9/10 were eliminated from consideration.) This represents a sizeable portion of the 274,220 accessions in that time period and covers all major skill areas in the Army. Analyses based on training outcomes drew upon data from 81 Military Occupational Specialties (MOS); analyses based on SQT scores covered 68 MOS. Of these MOS, 46 were in common to the two sets of analyses. Appendix Table A-1 contains a complete list of MOS in the Army.

Information on race and gender was included in the analysis file in order to assess possible predictive bias that would result from using composites based on analyses ignoring these variables. This information was extracted from Applicant Data Files and Enlisted Manpower Files and edited and recoded to ensure accuracy. Analyses investigating the possibility of predictive bias by race were limited to a comparison of the procedures for black and white applicants because other minority groups were not present in sufficient numbers in enough MOS to support analyses. For example, there were only ten MOS in which there were sufficient numbers of Hispanics to support analyses. Such a sample of MOS was deemed insufficient to generalize to all MOS in the Army.

From the file of accessions in the FY81/82 cohort, 77,520 were selected for analysis. These soldiers possessed criterion data, took ASVAB 8/9/10, and had no prior service. Of these, 70,829 were in "criterion cells" with at least 100 soldiers each. A soldier with both training and SQT scores, or SQT scores in different cells, was used for estimation of statistics in each of those cells.

For the training data, a criterion cell was defined as an MOS, school, and course combination. This level of differentiation was used because tests used and scores reported in different courses within an MOS possessed

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significantly different characteristics. For the SQT data, a criterion cell was defined as an MOS, track, and SQT-year combination. Soldiers in different tracks in an MOS performed different tasks, and SQT forms differed by year. The data for the criterion measures are described in greater detail below.

In addition to the primary analysis file, the FY81/82 applicant file was constructed for use in some of the analyses. This file of applicants was extracted for the FY81/82 cohort, which because of delays between application and acceptance, differed slightly from the accessions cohort. A total of 28,981 of the 274,220 accessions (10.6%) during FY81/FY82 had applied and signed a contract prior to October 1980. Virtually all of these recruits took an earlier form of the ASVAB and were therefore excluded from the analysis sample on that basis. Thus, the slight difference in cohort definition was considered inconsequential for purposes of these analyses.

A sample of 19,027 FY81/82 applicants was drawn and used as the basic population to which the validities would be adjusted and as the sample on which alternative composites would be validated for selection. The sample was drawn by first concatenating the FY81 and FY82 applicant files and then systematically sampling within cohort-years. A separate sample of 13,319 applicants was later used for norming the alternative composites and setting tentative cutoffs.

Because separate validations were required for each MOS included in the analyses, a minimum requirement was imposed on the size of sample in each MOS. This minimum sample size would determine the minimum difference between validities which could be reliably assessed. Two types of comparison are critical: comparison between different composites for the same individuals, and comparison of the same composite for different cultural groups. For the former, the estimation of a minimum sample size was further complicated by the expectation of correlations between the composites. Finally, the need to generalize to the entire population of MOS was recognized, and this necessitated setting the minimum sufficiently small to include a representative sample of MOS.

The selection of a minimum sample size of 100 served as a compromise. First, assuming a correlation of .90 between two composites, each with a validity of approximately .50, this allows for reliable identification of differences of .08 between their validities. Second, between two groups for which the validity of a composite is roughly .5, one with a sample size of 100 and the other four times larger, a difference in validities of about .15 can be treated as significant. The estimation of the sample size needed for reliable cluster analysis was deferred until cluster analyses were run, at which time the stability of analyses between half-samples could be examined. The selected sample size permitted the inclusion of 98 MOS in the final combined-criteria validations and 35 and 19 MOS in the investigation of predictive bias for race and gender, respectively.

In the following sections, we briefly describe the ASVAB measures and the two criteria used. Finally, we describe the method by which the two criterion measures were combined.

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ASVAB Data

As described above, the Armed Services Vocational Aptitude Battery has evolved over several decades. The version currently in use, Forms 8, 9, and 10, consists of ten subtests. The subtests, testing time, and reliabilities are given in Table 3. The KR-20 reliabilities for the power subtests are from Ree, Mullins, Mathews, and Massey (1982). They were obtained from a sample of 19,359 applicants who were tested at twenty AFEES. Alternate forms reliabilities for the speeded tests, NO and CS, obtained from Sims and Hyatt (1981), are also presented.

Table 3

ASVAB 8/9/10 Subtests

	Subtest	Testing Time (min)	Reliability
GS	General Science	11	.86
AR	Arithmetic Reasoning	36	.91
PC	Paragraph Comprehension	13	.81
WK	Word Knowledge	11	.92
NO	Numerical Operations	3	.78
CS	Coding Speed	7	.85
AS	Auto Shop Information	11	.87
MK	Mathematical Knowledge	24	.87
MC	Mechanical Comprehension	19	.85
EI	Electronics Information	9	.82

Two subtests, PC and WK, are ordinarily combined to form VE, a more general verbal ability subtest.

In the fall of 1980, form 8 of the ASVAB was administered to a national sample of American youth that was weighted to be a representative sample of American 18-23 year old males and females. In 1983 the Department of Defense adopted this population as the reference population for constructing the ASVAB score scale and determining the intercorrelations and standard deviations of ASVAB subtests. This population is referred to as the "1980 Reference Population." It is noted, however, that this population has not yet been used to norm the ASVAB. ASVAB 8/9/10 was normed using the AGCT.

The correlations among the subtests for the 1980 Reference Population, for the FY81/82 applicants, and for the accessions on the analysis file used for the validation (pooled within "criterion cell"), are shown in Table 4.

Standard deviations are shown on the diagonal. While the intercorrelations in the 1980 Reference Population and the FY81/82 applicant sample show good agreement, the pooled-within group correlations are substantially lower. This is no doubt due to the restriction of range that results from the the selection and classification process.

The subtests of the ASVAB have relatively high intercorrelations in the Reference Population and in the FY81/82 cohort populations. As a result, composites based on sums of the subtest scores tend to have increased reliability as selection instruments. For the purposes of classification into separate MOS, however, this intercorrelation may be detrimental. If we assume that different skills come into play in achieving proficiency in different MOS, then efficient classification requires that these be measured by the instrument used for assignment to MOS. Although four factors have been identified in the ASVAB by Kass, Mitchell, Grafton, and Wing (1983), (Quantitative [AR and MK], Verbal [VE and GS], Speed [NO and CS], and Technical [AS, MC, and EI]), the first principal component accounts for 60% of the variance, and the second for another 15%. Thus, the number of dimensions effectively measured by ASVAB may not be ideal for predicting soldier effectiveness in a substantial number of MOS.

The use made of the ASVAB for selection and classification is through comparison of composites to cutoffs. Ten composites are currently in use by the Army, the Armed Forces Qualification Test (AFQT) and nine vocational aptitude area composites. The latter nine are the focus of this validation effort: to assess their validity as predictors of performance in the Army and to identify a set of alternative composites.

Applicants must score above the cutoff on the AFQT to be considered for entry into the Army, but they must also score above preset cutoffs on the area composites to be eligible for corresponding MOS. Applicants who desire an MOS and are otherwise qualified for the Army and who score above the cutoff for the MOS are accepted, if there is an opening in the MOS. If there is no current opening, they are frequently accepted for "delayed entry." (It should be noted that there are other reasons for delayed entry.)

Each of the area composites is equated to a mean of 100 and a standard deviation of 20 in the 1944 reference population using an equipercentile procedure. With a few exceptions, each MOS is associated with one of these composites. A few MOS, such as members of the Army band, are evaluated in terms other than ASVAB 8/9/10, and in 22 cases, two composites are recognized as requirements. A single composite was used for the five of these 22 MOS included in the analysis. The relative proportions of FY81/82 accessions entering MOS associated with each of these composites is shown in Table 5.

The cutoffs are normally set at multiples of five, ranging from 80 to 120, and they are subject to revision in response to changing demands of the Army for different occupational specialties.

Table 4

Correlations and Standard Deviations among the Nine ASVAB Subtests

	GS		AR		VE		NO		CS		AS		MK		MC		EI	
GS	10.1[1]																	
	10.0[2]	7.7[3]																
AR	.69[1]		9.5															
	.72[2]	.45[3]	10.0	7.4														
VE	.82		.71		10.2													
	.80	.70	.73	.46	10.0	6.8												
NO	.43		.55		.51		10.2											
	.52	.02	.63	.28	.62	.02	10.0	7.1										
CS	.37		.46		.48		.65		9.4									
	.45	.04	.51	.19	.57	.09	.70	.45	10.0	7.2								
AS	.64		.55		.60		.28		.23		10.0							
	.64	.50	.53	.35	.52	.45	.30	-.06	.22	-.02	10.0	7.9						
MK	.53		.77		.65		.54		.44		.43		9.0					
	.69	.41	.83	.66	.70	.41	.62	.31	.52	.21	.41	.23	10.0	7.5				
MC	.68		.66		.64		.36		.32		.71		.59		9.2			
	.70	.51	.69	.47	.60	.45	.40	.00	.34	.05	.74	.55	.60	.41	10.0	7.3		
EI	.70		.60		.67		.34		.29		.73		.54		.71		9.2	
	.76	.56	.66	.38	.67	.52	.41	-.02	.34	.01	.75	.59	.59	.22	.74	.53	10.0	7.3

1 Correlations and standard deviations for the FY81/82 Applicant Sample.
2 Correlations and standard deviations taken from 1980 reference population.
3 Correlations and standard deviations for the Analysis File used for the Validation (pooled within Criterion Cell).

Table 5

Distribution of FY81/82 Accessions by Cluster

Current Aptitude Area Composite	Percent
CL	14.7
CO	20.2
EL	9.5
FA	5.7
GM	5.2
MM	10.0
OF	9.3
SC	5.1
ST	14.0
Blank	6.0
TOTAL	100.0

Training Data

The Army Research Institute gathered end-of-course test scores on soldiers in 172 MOS at 23 schools during 1981 (Dept. of Army, 1981). The type of test score varied qualitatively between courses, and for the purposes of this validation, they were extensively edited. A memorandum describing the editing of training data for this task has been prepared (Wang, 1983) and is reproduced in Appendix B. In some cases, two scores were available for a single individual, based on different courses; and in some cases, a meaningful criterion score had to be computed as the ratio of two numbers on a record (e.g., number of tries divided by number of tests). For these cases, Wang (1983) also gives the procedures we used in determining a training criterion score for the analyses.

Unfortunately, we were unable to obtain data on the reliability or validity of the end-of-course training scores. These tests were made up at the schools for the purpose of testing whether the students had learned what had been taught, and in most cases they were criterion-referenced. That is, passing students were expected to perform nearly perfectly. Thus, the high frequency of scores close to 100 is not surprising. In a few cases, the scores were the number of times the student had to take and retake a test in order to pass.

In addition to the scores, qualitative information on the outcome of training was available, and this was used in screening the data. For attritions, a reason for attrition was given, and scores for non-academic attritions were highly suspect and therefore deleted. Validations were limited to (1) graduates, including graduates going on to further training, and (2) non-graduates for academic reasons.

For many soldiers, multiple training records were available, based on separate training events. Because of the unknown effects of one training course on another and because of unknown differences in the types of learners who take multiple training courses, a single training event was selected for analysis for each student. This was the earliest one for which (1) a training score was present and (2) the event was eligible for analysis (i.e., not a non-academic failure).

There were a few records for which the score was missing and a few more that were set to missing after identification as outliers. The missing scores were imputed according to the following rules: (1) for graduates, the mean of graduates in that cell was imputed; and (2) for (academic) non-graduates, the value imputed was equal to the first quartile score of the graduates minus one interquartile range $[(Q_3 - Q_1)/2]$ among graduates. The first quartile was used in lieu of the minimum score on the file in order to prevent erroneous data entries from influencing the imputed value. Inspection of the univariate plots by training cell strongly suggested that some of the low scores for graduates may actually be data entry errors. For example, several of the large MOS in the CO cluster contained values of 9 for graduates. It is very likely that the correct scores for these soldiers are in the 90's, since this is where the great mass of the data for these MOS is found.

Only seven scores for graduates were imputed; the great bulk of the imputation was for non-graduates. The rule as stated above was carried out for 1,604 cases. In two Training cells, corresponding to MOS 15D and 15E, only four and five distinct values were used, and were equally spaced in the range 0 - 100. Therefore, the lowest non-zero score was imputed for these two cells. Ten and four scores were imputed in these two cells, respectively.

Our attention was especially focused on the cells with at least 100 observations, because these were cells for which reasonably stable estimates of relations between ASVAB subtests and the criteria could be generated. There were 92 such "training cells," or combinations of MOS, school, and course.

The raw scores ranged from 0 to 100 except for a few cells in which the sign was reversed. Table 6 presents summary descriptive statistics by Training cell. In 33 of the 92 cells, the first quartile score was greater than 85, although the average minimum for these 33 cells was 61. In some other cells, the scale from 0 to 100 was merely a crude standardization of a short test (e.g., scores of 0, 25, 50, 75, and 100 for a four-item test). Finally, the scores were transformed to a mean of 100 and standard deviation of 20 in each training cell.

Table 6

Descriptive Statistics on the Training Criterion by Criterion Cell

TCELL	N	MEAN	MODE	STD	QRANGE	MIN	Q1	MEDIAN	Q3	MAX
05B2A113	519	91.95	100.00	9.25	5.50	56.00	88.00	95.0	99.00	100.00
05C2D113	613	88.19	90.00	5.90	3.50	63.00	85.00	89.0	92.00	100.00
11BIN809	976	94.28	97.00	4.98	3.50	73.00	90.00	93.0	97.00	100.00
11CIN809	578	93.74	97.00	5.56	3.50	70.00	90.00	93.0	97.00	100.00
11HIN809	444	93.89	97.00	5.33	3.50	70.00	90.00	93.0	97.00	100.00
11OIN809	324	94.58	97.00	4.45	3.00	77.00	91.00	97.0	97.00	100.00
12BAB807	143	80.80	85.00	15.24	12.00	35.00	71.00	84.0	95.00	100.00
12FAF807	224	87.73	94.00	10.64	6.50	50.00	81.00	88.0	94.00	100.00
13B3B810	1080	73.64	83.00	20.09	8.00	17.00	67.00	83.0	83.00	100.00
13E3E810	483	96.82	100.00	7.01	0.00	70.00	100.00	100.0	100.00	100.00
13F3F810	679	83.64	83.00	5.28	4.00	69.00	79.00	83.0	87.00	98.00
15D5D810	295	73.97	80.00	22.56	20.00	20.00	60.00	80.0	100.00	100.00
15E5E810	283	82.16	100.00	18.82	12.50	25.00	75.00	75.0	100.00	100.00
16BBA811	165	92.50	92.00	3.41	2.50	75.00	90.00	92.0	95.00	100.00
16BBC811	131	95.71	97.00	3.01	2.50	86.00	93.00	97.0	98.00	100.00
16CCA811	118	93.70	98.00	4.60	2.63	76.00	91.75	95.0	97.00	99.00
16DDB811	112	95.19	96.00	3.24	2.38	85.00	93.00	96.0	97.75	100.00
16EEB811	137	99.81	100.00	1.58	0.00	85.00	100.00	100.0	100.00	100.00
16HHB811	105	86.49	85.00	5.78	3.50	70.00	83.00	86.0	90.00	98.00
16JJA811	119	91.42	93.00	4.01	2.00	78.00	90.00	92.0	94.00	98.00
16PPA811	115	75.15	88.00	19.00	15.00	24.00	58.00	82.0	88.00	97.00
16RRA811	407	90.30	87.00	8.08	4.00	40.00	87.00	92.0	95.00	100.00
16SSA811	596	77.59	85.00	9.21	6.50	43.00	72.00	78.0	85.00	98.00
17C7C061	188	92.23	100.00	10.98	8.50	50.00	83.00	100.0	100.00	100.00
17KGA301	136	77.92	75.00	17.50	9.75	25.00	68.50	75.0	88.00	100.00
19D9D804	215	89.18	100.00	10.14	7.50	54.00	85.00	92.0	100.00	100.00
19E9E804	171	80.85	85.00	10.49	9.00	50.00	72.00	83.0	90.00	100.00
19F9F804	128	85.50	90.00	8.36	5.00	56.00	80.00	85.0	90.00	100.00
27E7E093	184	86.77	80.00	6.85	5.38	60.00	81.25	88.0	92.00	98.00
31M4D113	604	91.50	86.50	5.28	4.75	74.00	86.50	92.0	96.00	100.00
31N4C113	193	97.63	100.00	2.75	2.00	86.00	96.00	99.0	100.00	100.00
31V1V061	457	89.67	100.00	8.80	9.75	60.00	80.50	93.0	100.00	100.00
36CAA113	376	97.32	100.00	3.29	2.00	82.00	96.00	98.0	100.00	100.00
34KAC113	660	94.42	96.00	4.13	2.50	78.00	92.00	95.0	97.00	100.00
41CG7091	105	-1.20	-1.14	0.18	0.09	-2.25	-1.27	-1.1	-1.09	-1.00
44BJ1091	137	-1.55	-1.71	0.17	0.13	-1.93	-1.68	-1.5	-1.43	-1.00
45KK8091	101	-1.43	-1.33	0.25	0.17	-2.33	-1.60	-1.4	-1.25	-1.00
45KK9091	129	-1.68	-1.63	0.32	0.19	-3.00	-1.88	-1.6	-1.50	-1.00
51KBK807	167	91.60	88.50	5.99	3.75	66.00	88.50	92.0	96.00	100.00
54CSS031	183	92.66	96.00	6.25	5.65	67.58	86.20	96.0	97.50	100.00
54ESA031	272	78.09	63.09	12.46	13.37	58.65	63.09	82.0	89.84	98.48
55B5B093	236	85.55	80.00	4.84	4.00	71.00	81.00	85.0	89.00	98.00
57EPE101	126	97.78	99.00	2.00	1.00	91.00	97.00	98.0	99.00	100.00
57HG1551	224	86.65	86.16	3.35	2.08	74.87	84.84	86.9	89.00	94.26
61BG6551	186	79.89	88.00	10.80	8.50	43.00	72.00	82.0	89.00	97.00
61CH1551	138	81.15	87.00	7.67	5.50	59.00	76.00	82.0	87.00	95.00

(cont'd)

Table 6

Descriptive Statistics on the Training Criterion
by Criterion Cell (Continued)

TCELL	N	MEAN	MODE	STD	QRANGE	MIN	Q1	MEDIAN	Q3	MAX
62BCB807	264	90.61	93.00	6.87	5.50	70.00	86.00	91.5	97.00	100.00
62ECE807	133	84.17	77.00	5.74	5.25	74.00	78.50	84.0	89.00	97.00
62FCF807	149	85.14	77.50	7.32	6.75	65.00	77.50	86.0	91.00	98.00
63B3B803	555	87.15	82.00	5.78	4.00	64.00	83.00	88.0	91.00	100.00
63B3B805	381	95.29	98.00	3.45	2.50	82.00	93.00	96.0	98.00	100.00
63DSA171	342	98.93	100.00	2.11	0.00	90.00	100.00	100.0	100.00	100.00
63GM7091	161	-1.14	-1.00	0.13	0.07	-1.57	-1.21	-1.0	-1.07	-1.00
63HH1091	706	-1.07	-1.00	0.06	0.04	-1.31	-1.10	-1.0	-1.02	-1.00
63NTS171	509	99.04	100.00	1.64	1.00	92.00	98.00	100.0	100.00	100.00
63TFI171	572	97.08	100.00	5.05	1.50	78.00	97.00	100.0	100.00	100.00
63WW1091	481	-1.13	-1.00	0.12	0.10	-1.60	-1.20	-1.1	-1.00	-1.00
63YTV171	175	98.03	100.00	2.89	2.00	90.00	96.00	100.0	100.00	100.00
64CEC807	202	81.23	85.00	4.34	2.50	70.00	80.00	83.0	85.00	85.00
64C4C803	561	91.61	94.00	5.90	4.50	74.00	88.00	91.0	97.00	100.00
67N65011	163	90.75	91.00	4.38	3.00	80.00	88.00	91.0	94.00	98.00
67TL6551	124	87.48	92.00	5.50	6.50	72.00	83.00	88.5	92.00	99.00
67UP1551	210	90.89	96.00	7.61	4.00	60.00	88.00	92.0	96.00	100.00
67V18011	194	90.85	94.00	5.08	3.50	75.00	88.00	92.0	95.00	99.00
67YS1551	144	82.74	76.00	6.20	5.50	63.00	77.00	83.0	88.00	96.00
68DT1551	121	84.89	85.00	5.26	4.00	70.00	81.00	85.0	89.00	97.00
68JW6551	120	85.79	86.00	6.32	3.88	66.00	82.25	86.0	90.00	97.00
68MW8551	134	85.52	90.00	8.32	3.75	58.00	82.75	88.0	90.25	98.00
71NL1551	175	83.09	89.00	8.93	5.00	50.00	79.00	84.0	89.00	98.00
72E3G113	143	98.42	100.00	2.31	1.00	88.00	98.00	99.0	100.00	100.00
73C5R121	202	93.44	99.00	6.48	3.50	69.00	91.00	96.0	98.00	100.00
75B5E121	494	85.80	88.00	11.71	7.13	35.00	79.75	88.0	94.00	100.00
75D5D805	233	82.57	71.00	9.40	9.50	70.00	71.00	84.0	90.00	99.00
75E5E805	276	81.12	74.00	7.17	6.50	70.00	74.00	80.0	87.00	97.00
76CEC101	1142	85.99	90.00	6.63	5.00	60.00	81.00	87.0	91.00	99.00
76PSF101	560	86.92	88.00	5.09	4.00	75.00	83.00	87.0	91.00	98.00
76VEV101	401	0.98	1.00	0.03	0.01	0.88	0.97	1.0	1.00	1.00
76WDB101	138	92.26	95.00	5.14	3.50	75.00	89.00	94.0	96.00	100.00
76WPW101	344	92.26	93.00	4.17	2.50	78.00	90.00	93.0	95.00	99.00
76XSX101	158	93.91	94.00	2.94	2.00	82.00	92.00	94.0	96.00	100.00
76YEY101	381	0.92	1.00	0.07	0.06	0.70	0.89	0.9	1.00	1.00
76Y5G101	298	90.04	87.00	4.94	3.50	77.00	87.00	89.0	94.00	100.00
76Y6Y805	470	90.98	100.00	8.55	8.50	69.00	83.00	92.0	100.00	100.00
82C2C810	390	61.76	40.00	17.51	13.63	20.00	47.75	61.5	75.00	98.00
91B01929	783	94.63	100.00	8.69	4.00	34.00	92.00	97.0	100.00	100.00
91C02929	233	89.92	94.00	7.69	4.00	51.00	87.00	92.0	95.00	100.00
91E05929	162	88.62	93.00	6.33	3.63	62.00	85.75	90.0	93.00	100.00
92B25929	133	83.85	84.00	8.12	3.75	52.00	81.50	85.0	89.00	97.00
94BKA101	627	86.37	86.00	1.63	1.00	81.00	85.00	86.0	87.00	91.00
94B4B603	237	86.68	90.00	6.98	5.00	70.00	83.00	87.0	93.00	100.00
94B4B805	416	93.56	94.00	1.32	1.00	89.00	93.00	94.0	95.00	97.00
95BSB813	725	81.33	82.67	5.13	3.08	60.00	78.50	82.0	84.67	95.33

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SQT Data

Since 1977, The Army has administered the Skill Qualification Test (SQT) to enlisted soldiers. The purpose of these tests was to assess individual qualifications for promotion and to evaluate the overall effectiveness of Army training programs. Each year, a separate SQT is constructed for each MOS and skill level (with the exception of a very few exempted MOS). In many cases, alternative forms are constructed for the same MOS and skill level corresponding to different "tracks" within that MOS. An SQT "track" corresponds to a specialized job within an MOS. Most commonly, separate tracks correspond to different types of equipment to which soldiers in the MOS might be assigned. In some other instances, the different test tracks correspond to additional responsibilities for selected individuals within the MOS such as Special Forces. Soldiers in different tracks within the same MOS, in general, take different SQT tests. A list of MOS with multiple SQT tracks in FY82 is contained in Appendix Table A-2.

Each test assesses a soldier's ability to perform tasks specified in the Soldier's Manual for the corresponding MOS and skill level. Anywhere from a dozen to several dozen tasks are selected each year for testing. Announcements are prepared and distributed identifying the specific tasks to be tested, allowing soldiers opportunity for preparation. In the past, both hands-on and written assessment procedures were used in determining a pass-fail score for each soldier on each of the tested tasks. For the period of data covered in this analysis, only written measures were used. A number of multiple choice items were constructed for each task. The number of items varied from as few as 2 or 3 to up to 9 or 10. A passing score was set requiring the soldier to correctly answer all or nearly all of the multiple choice questions in order to pass the task. The soldier's total score is then the percentage of items passed, averaged across tasks.

Major changes in the SQT program were introduced in 1983. At this time, the SQT became one component in the Army Individual Training Evaluation Program (ITEP). The other components include a new Common Task Test (CTT) and the Commander's Evaluation. The SQT was changed to include only MOS-specific tasks, because the common soldier's tasks were to be tested separately in the CTT. In addition, most of the tracking of tests within MOS and skill level was dropped.

The different SQT forms assess different tasks and are not precisely equated with respect to difficulty. Procedures for more precisely equating alternative forms are being studied for 1984. As a consequence, it is essential that each form be standardized separately.

For many soldiers, multiple SQT test results were available, either for different MOS, different tracks, or different SQT-years. Because taking an SQT test was not considered to have a major influence on future skills, multiple SQT scores for an individual appearing in different cells were treated as separate events, each in its own MOS/track/SQT-year "cell." There were 112 cells with at least 100 records, and these covered 68 MOS.

The rationale for including the multiple records for an individual when they were in different cells is as follows. The criteria are regarded as proxies

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for an underlying and unobserved indicator of performance throughout a soldier's career. Under this assumption, multiple records give a more complete sampling of performance over the entire career. It was not within the scope of the present effort, however, to take the further step of combining the measures into a single time-weighted average of performance for each individual. Such a refinement would be appropriate when utility of performance data are available.

Although the SQT forms were professionally developed, reliability and validity information on these forms could not be obtained. Item statistics sufficient for the derivation of internal estimates of consistency were not available.

The SQT scores, like the training scores, were transformed to a mean of 100 and standard deviation of 20 for analyses. Prior to the standardization, the SQT scores ranged theoretically from 0 to 100, and 60 was considered a nominal passing score. However, the majority of the scores were greater than 85, and many were 100. Table 7 presents summary descriptive statistics for the SQT criterion score.

Trimming of Outliers

As noted in the discussion of the training data, several very implausible values remained on the file following the imputation. This was also observed for the SQT data. Therefore, a method of trimming these outliers was employed.

After completing the editing and imputing of the Training and SQT scores, OLS regressions of each criterion on the ASVAB subtests were run within Training and SQT criterion cells to identify outliers. Residuals from the regression lines as well as several so-called "influence diagnostics" were examined. On the basis of this examination it was decided to delete all cases from the file for which the regression residual was greater than four standard deviations. For the training criterion cells, the standard deviation of the graduates was used. For the Training data, 272 data points were deleted; for SQT, 247 values were removed. The major effect of this trimming was to eliminate implausible scores that likely were the result of data entry errors.

Combined Criteria

The main validation analyses were undertaken separately for the two sets of criteria with the understanding that if the results were to differ substantially, a method for combining the results would be needed. Three major alternatives were considered:

(1) Select one of the criteria, if evidence indicates that it is clearly better than the other, either on psychometric grounds, on reasonableness of the results of the validation, or on sample size and coverage of the space of MOS;

(37)

Table 7

Descriptive Statistics on the SQT Criterion by Criterion Cell

PCELL	N	MEAN	MODE	STD	QRANGE	MINIMUM	Q1	MEDIAN	Q3	MAXIMUM
05B1182	613	77.15	84.00	11.20	6.59	31.58	70.83	80.00	84.00	100.00
05C0182	1197	76.05	80.77	9.65	6.37	36.84	70.59	76.92	83.33	96.15
05C0183	1156	73.17	75.00	9.38	6.61	42.56	66.79	73.46	80.00	100.00
05G0183	119	75.96	72.72	9.06	6.56	48.35	69.68	76.41	82.81	92.39
05H1183	110	86.94	91.98	7.68	4.86	55.30	82.27	88.36	91.98	98.75
11B 181	606	88.40	88.00	8.16	6.00	57.00	84.00	89.00	96.00	100.00
11B0183	423	55.48	40.30	11.20	7.04	17.25	48.06	54.44	62.14	94.42
11B1182	3896	86.74	92.86	8.32	5.36	50.00	82.14	89.29	92.86	100.00
11B5182	611	87.11	89.29	7.68	5.36	57.14	82.14	89.29	92.86	100.00
11B6182	419	87.74	92.86	7.58	5.36	57.14	82.14	89.29	92.86	100.00
11B7182	228	86.97	92.86	7.90	5.36	64.29	82.14	89.29	92.86	100.00
11C 181	171	88.04	96.00	8.61	7.00	52.00	82.00	89.00	96.00	100.00
11C0183	112	59.67	57.42	14.56	9.43	10.00	51.10	60.09	69.95	94.44
11C1182	555	89.10	92.59	9.04	5.55	51.85	85.19	92.31	96.30	100.00
11C2182	186	88.49	92.59	8.38	5.55	55.56	85.19	88.89	96.30	100.00
11C4182	246	88.07	88.89	9.41	5.55	52.17	85.19	88.89	96.30	100.00
11C5182	217	89.67	88.89	7.60	5.55	64.71	85.19	88.89	96.30	100.00
11H 181	124	85.25	88.00	8.56	5.88	57.00	80.25	88.00	92.00	100.00
11H1182	442	87.24	92.59	8.88	5.56	52.94	81.40	88.89	92.59	100.00
11H2182	321	89.14	92.59	5.92	3.70	69.57	85.19	88.89	92.59	100.00
12B0183	1978	92.35	95.83	5.79	4.16	68.75	87.50	91.67	95.83	100.00
12B1182	1103	87.04	90.00	7.77	5.00	51.00	83.00	89.00	93.00	100.00
12C0182	175	86.89	88.89	7.48	5.56	59.26	81.48	88.89	92.59	100.00
12C0183	271	91.94	91.67	6.01	4.16	70.83	87.50	91.67	95.83	100.00
13B 181	130	85.13	92.00	9.00	6.00	60.00	80.00	84.50	92.00	100.00
13B0183	3902	72.41	72.62	11.83	8.26	25.24	64.48	72.62	80.99	100.00
13B1182	109	87.83	88.00	9.26	5.91	52.00	84.00	88.00	95.83	100.00
13B2182	263	90.26	92.00	6.78	4.00	68.00	88.00	92.00	96.00	100.00
13B3182	156	89.00	92.00	7.48	6.00	58.33	84.00	90.06	96.00	100.00
13B4182	1184	86.87	92.00	8.85	4.34	50.00	83.33	88.00	92.00	100.00
13B5182	627	86.93	88.00	8.83	4.70	56.00	82.61	88.00	92.00	100.00
13E0182	415	84.48	88.00	11.74	7.77	38.89	76.47	88.00	92.00	100.00
13E0183	194	60.76	63.69	14.45	10.35	7.14	50.94	62.10	71.63	90.28
13F0182	593	94.59	100.00	5.63	3.85	70.83	92.31	96.15	100.00	100.00
15D0182	259	78.86	81.25	13.20	9.38	43.75	68.75	81.25	87.50	100.00
17K2182	110	89.02	92.59	7.50	5.55	61.54	85.19	92.15	96.30	100.00
19D 181	104	83.14	88.00	9.34	5.88	51.00	77.00	85.00	88.75	100.00
19D0183	334	69.00	80.63	12.00	7.82	24.54	61.48	69.53	77.12	100.00
19D1182	742	91.30	93.33	6.24	5.00	66.67	86.67	93.33	96.67	100.00
19E1182	676	90.05	93.33	7.54	5.23	60.00	86.21	90.32	96.67	100.00
19E1183	1010	75.85	80.51	9.43	6.46	39.49	69.54	76.79	82.46	96.92
19E2183	855	74.17	84.36	9.89	6.69	31.72	67.88	74.16	81.26	98.08
19E3182	611	88.90	93.33	6.10	3.33	63.33	86.67	90.00	93.33	100.00
26Q0183	142	72.85	76.92	11.53	6.87	32.56	66.67	75.13	80.41	96.15
27E0182	132	89.94	88.46	7.40	3.77	63.16	88.46	92.00	96.00	100.00
27E0183	225	88.70	89.74	6.43	3.29	57.89	86.05	89.74	92.63	98.68
31J0183	130	85.11	81.76	7.07	4.93	61.75	80.78	85.16	90.64	100.00
31M0183	1449	75.41	69.87	10.56	7.08	36.41	68.72	75.64	82.68	100.00
31M1182	573	87.03	100.00	9.28	6.05	50.00	81.65	88.46	93.75	100.00
31M2182	404	87.45	100.00	9.25	6.36	50.00	82.01	88.89	94.74	100.00
31V0183	151	77.89	81.33	8.76	6.17	48.33	71.67	79.00	84.00	95.67
31V1182	356	85.04	90.00	8.28	5.00	56.00	80.00	86.67	90.00	100.00
35XL	112	81.54	95.56	12.89	8.18	18.83	74.39	85.33	90.75	100.00
36C2182	390	74.49	75.00	8.85	5.69	46.67	65.57	75.00	80.95	95.83
36K0182	939	83.27	90.00	8.53	5.35	47.37	78.95	84.21	89.66	100.00

(cont'd)

Table 7

Descriptive Statistics on the SQT Criterion
by Criterion Cell (Continued)

PCELL	N	MEAN	MODE	STD	QRANGE	MINIMUM	Q1	MEDIAN	Q3	MAXIMUM
36K0183	847	67.45	63.73	9.09	6.38	35.88	60.98	67.55	73.73	98.82
43E0183	100	75.62	100.00	20.08	12.86	20.00	64.29	80.00	90.00	100.00
51B0182	196	85.01	87.50	8.48	6.25	54.17	79.17	87.50	91.67	100.00
52D0182	176	77.66	84.62	11.54	6.59	28.57	71.43	78.76	84.62	96.15
55B1182	230	80.84	88.46	8.65	6.73	50.00	75.00	81.29	88.46	96.15
57H0183	194	68.28	66.67	11.40	7.15	26.32	60.71	67.86	75.00	100.00
62B0182	220	80.69	84.00	9.27	6.50	52.38	75.00	82.21	88.00	100.00
62E0182	172	83.62	85.71	8.48	5.76	57.69	77.78	85.45	89.29	100.00
62F0182	117	83.66	89.29	9.58	5.76	55.56	77.78	85.71	89.29	100.00
63B0182	1471	75.98	76.67	7.66	3.34	47.37	73.33	76.67	80.00	93.33
63H0182	335	77.99	77.78	8.24	5.77	50.00	73.08	77.78	84.62	94.74
63N0182	286	75.75	79.31	7.99	5.27	50.00	72.22	75.86	82.76	93.10
63W0182	180	83.44	80.89	8.06	5.55	58.82	77.78	85.19	88.89	100.00
63Y0182	108	88.50	88.89	5.44	3.70	74.07	85.19	88.89	92.59	100.00
64C0182	1573	79.98	79.31	9.43	5.17	38.89	75.86	79.31	86.21	100.00
64C0183	2043	80.85	85.71	8.28	5.35	44.44	75.00	82.14	85.71	100.00
67N 181	123	91.51	92.00	6.61	4.00	72.00	88.00	92.00	96.00	100.00
67N0182	386	90.03	93.75	6.10	3.33	64.52	87.10	90.63	93.75	100.00
67U0182	207	97.77	89.66	7.16	5.17	65.52	82.76	89.66	93.10	100.00
67V0182	232	91.36	92.31	5.76	3.77	69.23	88.46	92.31	96.00	100.00
67Y0182	194	88.13	92.59	6.52	3.99	52.96	84.62	88.89	92.59	100.00
68G0182	121	88.06	92.31	7.42	4.15	61.54	84.00	88.46	92.31	100.00
68J0182	119	92.20	100.00	7.28	3.85	64.71	88.46	92.31	96.15	100.00
71D0182	115	90.37	96.00	9.96	5.15	50.00	85.71	92.00	96.00	100.00
71L1183	2628	55.93	52.77	12.32	8.24	19.90	47.55	55.38	64.04	100.00
71L2183	167	59.32	64.16	14.72	9.92	17.64	50.22	61.34	70.06	89.23
71M0182	182	84.50	89.79	9.24	5.74	50.00	78.57	85.71	90.04	100.00
72E0183	564	74.93	76.28	9.94	6.65	39.49	68.75	75.77	82.05	98.08
73C0182	268	70.02	76.00	15.30	10.00	20.83	60.00	72.00	80.00	100.00
73C0183	415	77.09	82.69	14.38	10.57	21.15	61.54	75.00	82.69	100.00
74D3283	132	78.89	92.00	11.55	8.15	47.40	71.57	78.41	87.88	100.00
75B0182	423	68.94	63.00	17.10	10.00	6.25	60.00	69.57	80.00	100.00
75B0183	631	55.63	41.08	14.88	11.00	0.00	44.91	55.38	66.90	94.10
75C0182	118	66.88	60.00	15.04	10.00	18.75	56.00	68.00	76.00	100.00
75C0183	289	60.79	51.41	11.96	7.02	30.13	53.08	61.15	67.11	100.00
75D0182	370	67.36	68.00	14.69	9.22	12.50	60.00	68.00	78.43	100.00
75D0183	650	51.57	44.23	13.60	9.47	7.69	42.21	50.77	61.15	96.54
75E0182	175	68.26	68.00	15.61	10.00	12.50	60.00	68.00	80.00	100.00
75E0183	279	56.43	54.71	13.08	8.83	15.38	47.22	56.19	64.89	98.46
75F0183	144	64.04	57.69	12.05	8.79	37.37	56.00	62.88	73.59	89.49
76C0183	320	63.71	61.43	10.98	7.50	32.14	56.67	62.92	71.67	90.71
76V0183	216	69.44	67.44	10.46	7.27	40.39	62.45	69.52	76.98	94.00
76W0182	195	70.93	80.00	14.02	8.18	25.00	63.64	72.00	80.00	100.00
76W0183	321	68.94	73.89	11.82	7.22	19.14	62.22	70.00	76.67	97.78
82C1182	209	92.76	100.00	7.14	5.77	68.75	88.46	96.00	100.00	100.00
82C2182	133	92.38	100.00	7.16	4.07	68.00	88.00	93.75	96.15	100.00
91E0182	203	88.61	92.00	6.86	4.00	68.00	84.00	91.30	92.00	100.00
91P0182	159	79.22	83.33	8.84	6.53	53.33	73.91	79.17	86.96	100.00
91R0182	145	89.03	96.00	9.45	6.00	54.17	84.00	91.67	96.00	100.00
92B0182	310	91.85	100.00	7.02	3.92	64.71	88.46	92.59	96.30	100.00
93H0182	114	86.19	85.71	8.45	6.04	61.54	80.77	85.71	92.86	100.00
94B0182	1543	87.91	90.00	9.07	5.00	53.33	83.33	90.00	93.33	100.00
94B0183	2306	75.84	79.33	9.40	6.16	32.89	70.00	76.67	82.33	100.00
95B0182	1853	88.08	88.89	7.90	3.99	55.00	84.62	88.89	92.59	100.00
95B0183	2580	88.29	0.93	5.42	3.52	64.94	85.06	82.76	92.09	100.00
96B0183	172	76.30	84.62	15.51	7.70	30.77	69.23	76.92	84.62	100.00
98C0162	186	66.45	70.00	16.69	12.50	15.00	55.00	70.00	80.00	95.00

(2) Rely primarily on one of the criteria, but where the results using the other criterion would make more sense, use the other; or

(3) Combine the data prior to analysis.

In fact, the results based on the two different types of criteria were not similar, and combination was judged necessary. The lack of convergence is indicated by the correlation between training and SQT criteria, for individuals with both variables. We computed the sample correlation between training outcome and SQT score for soldiers in analysis cells that had 50 or more complete observations. Eighty-one such cells, containing 10,615 records, were found. The correlations ranged from -.12 to .56 in different MOS, with an unweighted mean of .22 (Weighting by the number of soldiers in each analysis cell yielded a correlation of .21). While the low correlations may be due in part to restriction of range, unreliability, and methods-contamination of one or the other of the criteria, they may also indicate valid differences in the aspects of soldier performance covered by the two types of measures.

The third method of criterion combination was used. No overriding cause was uncovered for favoring one criterion over the other, and to ignore one part of the criterion base for an MOS would blind the validation to a possibly very important aspect of a soldier's success in an MOS. The only way to maximize the representativeness of the analyses for entire MOS was to combine the criteria.

For the purpose of identification of clusters and predictive validation of current and alternative composites, the combination was at the MOS level. ASVAB-criterion covariance matrices were computed for each MOS as the weighted average of "cell" covariance matrices, using the sample sizes for weights. Pooled covariance matrices were generated for the 98 MOS. Other analyses in the research required scores at the individual level (e.g., regression residuals). Such a file was generated using either the standardized SQT or Training criterion if only one was available, or the higher of the scores if both existed. This file contained 64,907 observations. The frequencies by MOS and AA cluster are presented in the following section in Table 8 and Appendix Table A-3.

Predictive Validity of Current Composites

Introduction

This section describes our procedures for adjusting for restriction of range and discusses the validities of the current ASVAB composites after adjustment. Our discussion focuses on several interrelated issues:

- The levels of predictive validity, after adjustment;
- Differences among composites in ability to predict performance;
- Differences among MOS clusters of predictability of performance.

The predictive validity coefficients indicate the extent to which the composites cover the skills necessary to obtain proficiency in the corresponding MOS, as measured by training outcomes and SQT scores. Although the primary interest is in the composite associated with each particular MOS, there is also some interest in the entire matrix of composites by MOS, in order to address the question of whether a lower than average validity in a particular MOS is due to the nature of the composite or to the relation of the criterion in that MOS to the ASVAB in general. Differences among MOS in the overall relation of the ASVAB criterion can be interpreted as indicators of either (1) needs for greater criterion reliability or (2) areas in which the skills covered by the ASVAB need to be broadened.

Because the major conclusions of these analyses are based on comparisons of validity coefficients, it is essential that these be adjusted, insofar as possible, for known artifactual sources of variation. In particular, we know that some MOS are much more selective than others in ASVAB skills. It is known that observed validities are reduced as a function of selectivity. Therefore, the observed validities were adjusted for selectivity, or range restriction, prior to comparison.

Adjustment for Restriction of Range

Classical methods of adjustment that have been used in previous ASVAB validations were used here. We chose to adjust to the FY81/82 applicant population rather than the 1980 Reference Population on the assumption that this population was more representative of the applicant pool presently available to the Army.

For the purposes of ASVAB validation, the multivariate adjustment due to Lawley (1943) and described by Lord and Novick (1968, pp. 146ff) was used. We assumed that explicit selection was being made on all ASVAB subtests. In the following sections we will first discuss the validities for the combined criteria and then present results for Training and SQT data separately.

Validities of AA Composites Using the Combined Criterion

Table 8 gives the adjusted validities for the nine current composites for each of the AA clusters and Table 9 gives the intercorrelations among the composites in the FY81/82 applicant population. The validities were obtained by averaging the validities for the individual MOS within each AA cluster and weighting by the number of soldiers in each MOS in the FY81/82 cohort. The main diagonal of Table 8 gives the validities of the composites associated with each cluster of MOS.

Tables of sample correlations and adjusted validities for individual MOS are given in Appendix Tables A-3 and A-4. These tables also contain estimates of the standard errors of the validity coefficients. The SE's paired with each validity estimate were obtained by the so-called "bootstrap" method of generating repeated replications (Efron, 1979; Diaconis & Efron, 1983). A method of obtaining sampling errors by repeated replication was used because it was believed that the classical formula for the standard error of an unadjusted correlation coefficient would not be appropriate for the adjusted validities.

A "bootstrap" replicate is defined as a sample of size N drawn with replacement from a sample of size N. To compute the estimates found in this report, 100 bootstrap samples were drawn from each MOS in the combined criterion file. For each bootstrap sample (N=64,907), a matrix of adjusted validities was computed. These hundred matrices were then merged, and the standard errors were computed from the distributions of

Table 8
Adjusted Validities of the Current Composites:
Combined Criteria

Cluster of MOS	N	CL	CO	EL	FA	GM	MM	OF	SC	ST	Average
CL	10368	48	51	53	54	49	46	50	50	53	50
CO	14266	36	44	43	43	43	42	44	40	44	42
EL	5533	38	47	47	46	47	46	47	44	47	45
FA	5602	39	49	48	48	49	49	49	45	44	47
GM	2571	39	48	46	46	47	48	48	45	47	46
MM	7073	36	48	46	45	48	48	48	43	46	45
OF	8704	38	48	47	45	48	47	48	44	48	46
SC	3729	39	49	48	47	48	47	48	45	49	47
ST	7061	51	56	57	57	55	54	56	54	58	55
Average		40	49	48	48	48	47	49	46	48	47

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Table 9

Intercorrelations among the Current Composites:
Applicant Population

Composite CL	Composite CL	CO	EL	FA	GM	MM	OF	SC	ST
CL	100								
CO	80	100							
EL	73	89	100						
FA	84	94	91	100					
GM	67	90	96	84	100				
MM	75	93	88	84	93	100			
OF	83	94	88	88	91	97	100		
SC	96	91	82	87	82	88	94	100	
ST	76	89	96	90	94	87	92	84	100

the hundred replicates. For comparison purposes, the process was also carried out for the unadjusted validities.

Tables A-3 and A-4 present these validities and bootstrap estimates of standard errors. For comparison, the approximate large-sample standard error of a correlation based on the formula, one divided by the square root of N, is included as the last column. For unadjusted coefficients, the bootstrap and large-sample estimates of standard errors should and do show good agreement. For adjusted validities, the bootstrap estimates are consistently higher.

For tables that present validites at the cluster level, standard errors are not included because the number of observations at this level of aggregation is so large that the standard errors are all .02 or less.

The most striking feature of the data in Table 8 is the uniformity of the validities. All of the entries are between .36 and .58, and the mean of the validities for the set of operational composites is .47. Except for the CL composite, whose validites range from .36 to .51, the composites all perform about the same. In every instance, a given MOS cluster is predicted about as well from its own composite as from several of the others. One MOS cluster, ST, appears to be slightly more predictable than the others; and another cluster, CO, appears to be slightly less predictable. The remaining MOS clusters show very little variance.

Of the current composites, only CL consistently shows validities in the 30's. We will discuss the possible weaknesses of the CL composite and the speeded tests in our more detailed analysis of the validities by individual MOS cells using Training and SQT criteria separately.

Training Data

The sample correlations of the operational composites and the adjusted validities for each of the MOS clusters based on Training outcomes scores is presented in Table 10. These statistics are weighted by the number of FY81/82 accessions in each MOS. For cases in which there is more than one training criterion cell per MOS, the weight was allocated on the basis of the proportion of observations for that MOS in each criterion cell.

Table 10

Sample Correlations and Adjusted Validities: Training Criterion

MOS Cluster	Sample r	Adjusted Validity
CL	19	40
CO	25	36
EL	22	40
FA	25	35
GM	29	52
MM	28	44
OF	20	35
SC	18	34
ST	32	54

Table 10 shows the effects of the restriction of range adjustment on the validity. Due to differences in selection ratios and differences in the distributions of the criterion, the adjustment cannot be expected to have the same effect on all correlations. While the table does show that some clusters are better predicted by their composite than others, it is not at all clear from these data whether certain composites are "better" than others or whether, in general, some MOS clusters are better predicted than others, regardless of composite.

Table 11 presents the average adjusted validities for all the composites in the same form as Table 8. It is apparent from Table 11 that there is no great variation in the average effectiveness of the composites using the training criterion. Except for the clerical composite, which is slightly less predictive than the remaining composites, the average validities across all MOS clusters in the Army are within two points of each other.

Performance in some MOS clusters is appreciably less well predicted than in others. The CO, OF, FA, and SC clusters are well below the overall mean. Each of these MOS clusters is composed of MOS that involve a substantial amount of physical and psychomotor skill. It may be that the reason that the ASVAB does relatively poorly for these MOS is that especially important predictors are absent from the battery. Regrettably, in each instance there is no composite that predicts that cluster relatively well.

Table 11

Average Adjusted Validities: Training Criterion

MOS Cluster	N	CL	CO	EL	FA	GM	MM	OF	SC	ST	Average
		Composite									
CL	5272	40	43	45	46	42	39	42	42	45	43
CO	2879	30	36	33	35	33	34	35	34	34	34
EL	2610	35	42	40	41	39	40	41	39	40	40
FA	1759	27	37	34	35	35	37	36	32	33	34
GM	1944	42	52	51	50	52	52	52	49	50	50
MM	5426	33	44	42	41	44	44	44	40	42	42
OF	4626	28	35	34	33	35	34	35	33	35	34
SC	1463	33	35	35	36	33	32	34	34	35	34
ST	3181	46	52	53	51	52	50	53	51	54	51
Average		35	41	40	43	40	39	40	38	40	40

Validities by Training Cell. The sample and adjusted validities for the ASVAB composites using training outcome as the criterion are presented in the Tables A-5 and A-6 of the Appendix.

On the basis of Table A-6, some general comments can be made about the performance of some of the composites. Clearly, the weakest composite is CL. It was not the best composite for any cell in this sample. In fact, FA was better than CL for all the training cells in which CL is the operational composite. The other weak composite, SC, was not the best composite for any of the cells for which it is operational and was the best composite for only five cells--and three of the five were cells with validities in the .30's.

SQT Data

Table 12 presents the averaged sample and adjusted validities for the nine MOS clusters using the SQT score as the criterion. These data suggest that SQT may be slightly better predicted by the ASVAB than the training criterion. This may, in part, be due to the more favorable distributions of SQT scores and that these SQT scores were generated entirely from paper-and-pencil tests. We examine the SQT validities more closely in the sections below by following the same procedures used for the training criterion.

Table 12

Sample Correlations and Adjusted Validities: SQT Criterion

MOS Cluster	Sample r	Validity
CL	29	49
CO	33	44
EL	28	45
FA	34	45
GM	23	40
MM	28	45
OF	33	50
SC	29	47
ST	32	55

Validities by Clusters of SQT Cells. Table 13 displays the weighted average adjusted validities of the clusters of MOS in the sample using the SQT as the criterion. As was the case with the training data, there is little variability among composites within a cluster. Except for the CL and SC composites, the average validities of the composites are within a couple of points of one another when collapsed across AA clusters. There is greater variability in the predictability of clusters, and the pattern is slightly different than for training data. GM, MM, and CO are most poorly predicted by the ASVAB, while CL and ST are best predicted. As before, the CL composite predicts performance in the CL cluster better than would be expected, but it must be remembered that the CL composite performs worst overall. Generally, composites that include GS, MK, AS, and MC tend to have higher validities than other composites.

Validities by SQT Cell. Tables A-7 and A-8 in the Appendix present the sample and adjusted validities for the SQT Cells included in this analysis. They show that the performance of the two weak composites identified in the analysis of the training data is similar. The CL composite had the highest validity for only one SQT cell--and that was not a cell in which CL was the operational composite. SC had the highest validity for only three cells--again none were for the cells that use SC as their composite. The comparison of the validities of the composites in comparison to the validity of the AFQT shows the same pattern. The AFQT was better than the CL composite for all nineteen cells in the sample that used CL and was better than four of the five SC cells in the sample. By contrast, all other composites were better than AFQT for most of their cells. Because the weak performance of CL and SC replicates across criteria, it appears that there is room for improvement in the absolute prediction of performance in these MOS.

Table 13

Average Adjusted Validities: SQT Criterion

MOS Cluster	N	CL	CO	EL	FA	GM	MM	OF	SC	ST	Average
		Composite									
CL	8006	49	52	55	55	51	48	52	51	55	52
CO	15970	36	44	44	43	43	43	44	40	44	42
EL	5960	35	45	45	43	45	44	45	41	45	43
FA	6964	36	46	46	45	46	46	46	42	46	44
GM	1304	33	41	40	40	40	40	41	38	41	39
MM	4309	32	44	43	41	45	45	44	39	43	42
OF	4724	40	51	51	48	51	49	50	46	51	49
SC	3649	40	52	51	49	52	51	51	47	52	49
ST	6915	48	54	55	55	53	51	54	52	55	53
Average		39	48	48	47	47	46	47	44	48	46

Discussion

From these results a few general trends emerge. Among the composites, CL appears to be the least adequate. Alternative composites that included a quantitative component consistently did better for the MOS in which CL is operational. The FA composite, which includes both AR and MK, was consistently better than the CL composite for the Clerical MOS. Maier (1982) presents data that show that adding more mathematical content to CL does increase its validity. Our data are consistent with his findings.

The relatively weak performance of the CL composite observed here is also consistent with the findings of Sims and Hiatt (1981). Their adjusted validity coefficients for ASVAB 6/7 show the same pattern. Sims and Hiatt recommended groupings of MOS using a combination of empirical evidence and face validity. They recommended that CL be used in nine MOS included in their sample. In every instance, both the FA and the ST composites had the same or higher validities than CL. Thus, it seems clear, on the basis of training data, that some composite that includes a quantitative component will predict training success in a clerical MOS better than CL.

Our findings regarding the pattern of validities for the Clerical cluster are also consistent with the results of the the investigation of CL composite carried out by Weltin and Popelka (1983). They obtained ASVAB and end-of-course grades for 3,984 new trainees entering the Army for clerical training in FY81 in twelve MOS. They evaluated the current CL composite (CL=VE+CS+NO) by comparing its adjusted validity with the adjusted validity of a revised composite suggested by a multiple regression of the ASVAB subtests on the training criterion. Results for the twelve MOS were quite similar in that all suggested that a quantitative subtest (either MK or AR) consistently accounted for the most variance in the criterion. Also, a revised composite consisting of unit weighted AR and VE predicted as well or better than the current composite in all twelve MOS. They reported that this composite correlated significantly higher than the operational composite. Thus, a clear message in both our assessment and the Weltin-Popelka analysis is that substituting a math subtest for the speeded subtests appreciably increases the validity of the CL composite.

Several authors have speculated on the poor performance of the CL composite. The major factors singled out by other workers are:

- The failure to adhere to uniform testing conditions has a greater effect on the speeded tests than the other tests in the ASVAB. When the timing of the test is not rigidly enforced, extra items can be marked by examinees. Weltin and Popelka also reported that examinees tested under military conditions have lower scores than those tested under civilian conditions.

- Scores on the speeded tests can be improved appreciably by practice. McCormick, Dunlap, Kennedy, and Jones (1982) found that when applicants were permitted to take the ASVAB repeatedly, scores of the speeded tests showed the greatest improvement. Thus, if these skills are relevant to job performance in MOS, it may be that they are sufficiently trainable that variance is removed by the time that criterion data are collected.

In general, the results of these analyses indicate that the current ASVAB area composites provide information relevant to the prediction of performance in training and on the job. However, they fall short of the ideal of targeting specific jobs for individuals. There is little evidence that these composites capture skills specific to the MOS with which they are associated.

Development of Alternative Composites

The second major goal of this investigation is to determine whether there are alternatives to the operational composites that would significantly improve the usefulness of the ASVAB as a selection and classification instrument. The data used to validate the operational composites also provides the basis for creating and evaluating alternative combinations of ASVAB subtests.

Theoretically, the ideal composites for the classification of enlistees into MOS would be the combinations of ASVAB subtests that most accurately predict the success of the enlistees in each of the separate MOS. Within the limitations of available criteria, it is possible to identify the best prediction function for each MOS, and each function could be evaluated to determine the differential expectations for success following from alternative assignments. The present investigation, however, aimed at the development of composites that could be used in the context of the current operational selection and classification system. This precludes the evaluation of a large number of complex functions at the time of enlistee selection and classification. The available database also precluded the estimation of stable regression functions in a sizeable number of MOS.

Instead, the goal in this effort was the identification of a small number of "area" composites, each of which would be relevant for a large number of MOS and could be calculated from a simple sum of ASVAB subtest scores. The practical limitation to a small number of composites does not, in fact, greatly limit the predictive validity of the resulting composites. There is little practical difference between using a single composite for a set of MOS and using the empirically determined "optimal" composites for each MOS in the set.

The development of alternative area composites thus involved two steps. The first step was to determine the clusters of MOS for which a common composite would be appropriate. The second step was to find the sum of ASVAB subtest scores for each cluster that "best" predicts the expected performance of all soldiers assigned to MOS in the cluster. The main issue in the first step concerns the choice of a criterion for deciding which MOS to group together for purposes of assigning a common composite. The two main issues in the second step concern (1) the choice of trade-offs between simplicity of use and predictive validity and (2) the choice of trade-offs between overall predictive validity, discriminant validity for MOS classification, and cultural fairness in the evaluation of alternative composites. Finally, an overall issue in the development of composites concerns the combination of results based on different criterion measures.

Identification of MOS Clusters

In the past, the clusters of MOS that use a common composite have been developed primarily on judgmental rather than empirical grounds. MOS which experts judge to require similar cognitive skills in training and subsequent job performance have been grouped together. As new MOS have emerged, they have been assigned to an existing composite function (and hence to the cluster of MOS that use that same function) on the basis of rational judgments, since no empirical data were initially available for these MOS.

In the current investigation, clusters of MOS that require similar combinations of the skills measured by the ASVAB were determined empirically. A prediction function relating ASVAB subtest scores to available criterion measures was identified for each MOS in the analysis sample, and the MOS were clustered on the basis of the similarity of these prediction functions. The stability of the resulting clusters of MOS was cross-validated using half-sample analyses.

Similarity Measure. The similarity between two MOS is based on the similarity between the prediction functions relating ASVAB and criteria in the individual MOS. To the extent that they are similar, the same prediction function can be assigned to both without loss of predictive validity. The prediction functions that were considered in these analyses were limited to linear relations. An examination of scatter plots indicated neither nonmonotonic functions nor step-functions, and the available criterion measures did not support the selection among more complex models.

The "optimal" composite for any MOS was operationally defined as the weighted sum of ASVAB subtest scores most highly correlated with the criterion measure. Any alternative linear composite can be divided into two parts - its "projection" onto the optimal composite and an orthogonal residual. Only the "projection" part contributes to the validity of the alternative composite, and the relative size of that projection is given by the correlation between the two composites. Thus, the correlation between the "optimal" composites for any pair of MOS offers an ideal measure of similarity because it indicates the validity of the composite of one MOS for predicting the criterion in the other MOS. The correlation was estimated in the applicant population, because this best represents the population for which the ASVAB composites would be used for selection and classification.

Focus on correlations among the optimal composites for predicting performance embodied a decision to ignore variation in the overall predictability of criteria in different MOS. Two sums of ASVAB subtest scores with weights in the same relative proportions are perfectly correlated, even if the weights for one of the sums are uniformly smaller due to lower predictability of the criterion. Such lower predictability indicates either lower criterion reliability or greater criterion variance in skills not assessed by the ASVAB. The latter case reminds us that two MOS can be quite similar in terms of ASVAB predictions, even though they are quite different in terms of skills not assessed by the ASVAB.

The validity of the procedure for developing alternative composites is limited by the need to rely on sample estimates of the "optimal" weighted sum for each MOS. Normal practice has been to use ordinary least squares (OLS) regression coefficients as the weights for the optimal composite. OLS estimates provide the maximum correlation between the ASVAB and the criterion in the sample used to estimate these coefficients. There is concern, particularly for MOS with relatively few soldiers, that OLS coefficients capitalize on chance variation so that the resulting multiple correlations are not replicable. Especially with predictors as highly correlated as the ASVAB subtests, OLS regression coefficients based on small samples may not cross-validate. In order to improve the reliability of the results, we decided to use ridge regression to estimate the optimal weighted sums of ASVAB subtest scores (see Draper & Van Nostrand, 1979, formula 3.11). In the language of matrix algebra, the ridge regression estimates for each MOS, $\underline{B}_{R,MOS}$, are computed by the matrix multiplication:

$$\hat{\underline{B}}'_{R,MOS} = cov_{MOS}(y,\underline{X}') * [cov_{MOS}(\underline{X},\underline{X}') + (k_{MOS}\underline{I})]^{-1},$$

where y is the criterion, $\underline{X}$ is a vector of p predictors, $cov_{MOS}(\underline{y},\underline{X})$ is the vector of p covariances of the predictor with the criterion in the MOS, $cov_{MOS}(\underline{X},\underline{X}')$ is the p x p matrix of covariances among the predictors in the paricular MOS, and k_{MOS} is defined by:

$$k_{MOS} = p\ var_{MOS}(y)(1 - \hat{r}^2_{MOS})/[(n_{MOS} - p - 1)(\hat{\underline{B}}'_{MOS}\underline{B}_{MOS})]$$

where the $\underline{B}_{MOS}$ and r_{MOS} are based on OLS regression.

In essence, the ridge regression procedure adds an emprically determined value, k, to the diagonal elements of the matrix of cross-products among the predictors. If k is taken to be zero, ridge regression specializes to OLS regression. The effect of positive values of k is to shrink the estimated values of the regression coefficients toward zero (in comparision to OLS regression coefficients).

Our ridge regression coefficients were somewhat smaller and somewhat more stable than the OLS regression coefficients. Ridge regression vectors were computed for each SQT and training cell with at least 100 observations. The ridge regression vectors for 92 training cells, 112 SQT cells, and 98 combined cells are given in Appendix Tables A-9, A-10, and A-11.

Using the ridge regression coefficients, similarities between MOS cells were computed as the correlations of the predicted performance scores based on our sample of 19,027 FY81/82 applicants. The 98 by 98 similarity matrix for the combined criterion cells is shown in Appendix Table A-12. Similar matrices for the SQT and Training criteria were computed. The analyses for the development of alternative composites were carried out separately on the three criteria.

The correlations among the optimal weighted sums were quite high. Roughly three-fourths were between .90 and 1.00. This reflected both the high intercorrelations among the ASVAB subtests and the fact that the same subtests tended to be the best individual predictors for most MOS. The high correlations created problems for the empirical approach to clustering. Clusters would necessarily be based on relatively small differences in these correlations. Quite different configurations of clusters could yield very similar aggregate composite validities. Nevertheless, we proceeded initially to evaluate the results of purely empirical clustering of MOS.

Initial Cluster Analyses. As the primary clustering method, we used a leaf-to-stem clustering algorithm developed by this project. In this approach, the cells (i.e., MOS) are initially assigned to separate clusters. They are then joined in a series of iterations that reduced the number of clusters by one at each step. At each step, those cells were combined that would minimize the loss in predictive power of the resulting composites. In effect, at each step the combined regression functions were computed for all potential cell combinations, and the combination which caused the smallest decrement in the average validity of the resulting set of composites was selected. Although this did not ensure that the final clustering would be optimal, it was stepwise optimal.

A variation of this algorithm was also developed that forced the clusters to match a pre-specified set of clusters up to a given point. In particular, it was set to match the nine current area composite clusters in the initial series of combinations. A threshold number of clusters was set, and until the number of clusters had been reduced to that threshold, no combinings were allowed to cross the boundaries of the nine current clusters.

In addition to the primary clustering method, cluster algorithms in three standard packages were used. Unlike the primary method, SAS PROC VARCLUS is a stem-to-leaf procedure. That is, it started with a single cluster and broke it successively into smaller clusters. The other two packaged procedures were also stem-to-leaf methods. They were the BIMED BMDP1M variable clustering program and the IMSL subroutine, OCLINK.

The results produced by the different clustering algorithms were compared using a series of programs that examined clusters and identified optimal composites for them. While there was some convergence of results between the cluster algorithms, there was divergence of results across data sources. The clusters identified by the primary clustering algorithm from SQT data and from training data differed from each other. Both solutions differed substantially from the current area composite clusters. These findings demonstrated very little agreement among the clusters from the three sources. The lack of convergence between training and SQT data, in particular, strengthened our focus on the combined criterion data file, with its broader coverage of each MOS.

A critical issue in this phase of the research is the dependability of the MOS clusters formed by these procedures. To evaluate this, the results of the clustering were cross-validated by dividing each cell in the analysis file into half-samples and performing the analysis using each half-sample. The results of the cross-validation did not support the further investigation of purely empirically derived clusters. In particular, the comparisons of the similarity matrices based on the two half-samples were disappointing. These two similarity matrices were compared by correlating each row of one with the corresponding row of the other. Because a row of the similarity matrix represents a profile of the similarities of the corresponding MOS to all the other MOS, the resulting correlations indicated the stability of the profiles of MOS similarity across random replications. As can be seen in Figure 3, there was very little stability in the profile of similarity measures derived from the two half-samples. Overall, the distribution of correlations of the similarity profiles was centered at about .20.

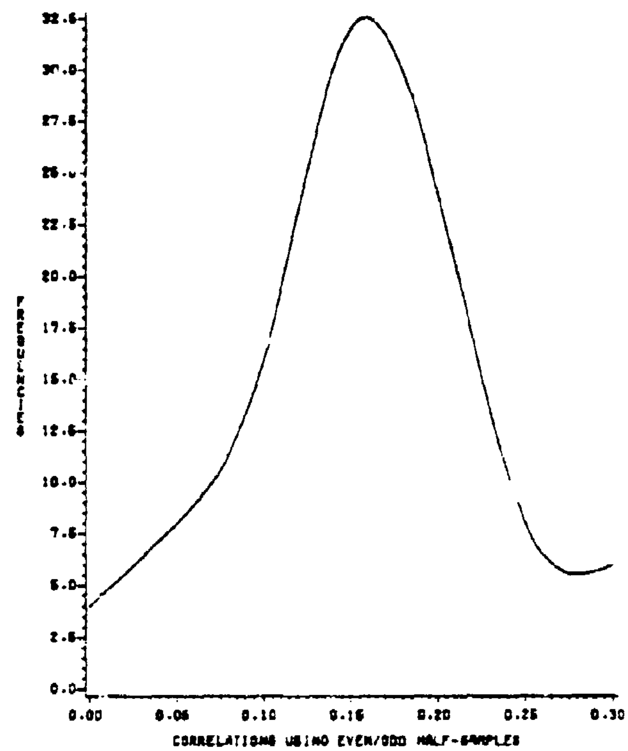

Figure 1. Frequency of Correlations of MOS Similarity Profiles.

One possible explanation for the instability of the similarity matrices would be the presence of a few outliers with high influence. If this is the case, additional trimming of the data would improve stability. As a procedure for both trimming and removing ceiling effects, we transformed the criterion data to normal scores and carried out the same half-sample cross-validation. Regrettably, the results of this new half-sample cross-validation were essentially unchanged: the average correlation of .15 did not indicate sufficient stability to warrant proceeding further on purely empirical clustering. We could not reasonably recommend formation of clusters based purely on empirical data with this level of instability.

Final Cluster Analyses

The results of the cross-validation showed that an empirical approach to clustering was contraindicated. We therefore decided to modify existing clusters based on the data and to identify optimal composites for these alternatives. The leaf-to-stem algorithm was used with the constraint that until the number of clusters was reduced to a threshold of 20, no combinations of MOS across different current composite clusters were permitted. For the final 19 steps, however, the algorithm was freed to form combinations that minimized the loss function. Except for the CL cluster, there was little correspondence between the current clusters and the empirical clustering.

From this work, it was clear that there was no strong natural clustering in the data. Predictive validity would not be highly sensitive to small variations in the structure of the composites. Therefore, we chose to restrict our search to a set of alternatives that would be more practical than other alternatives. In particular, alternative clusters were evaluated directly in terms of the predictive validity of their best unweighted sum of subtest scores involving four or fewer subtests. Sufficient justification for this was provided by the identification (described below) of a set of four unit-weight composites with a root mean square validity of .485, or 97% of the aggregate validity obtainable by use of separate ridge regression vectors for each MOS. The best unit-weight composites for each of the nine current clusters are shown in Table 14. The mean squared validities are shown for composites involving three, four, and five subtests, compared with the maximum possible mean squared validity for the particular set of MOS. Because these estimates are based on ridge regressions, rather than OLS regressions, and because they are based on unit-weight composites, they are not likely to be inflated estimates of true validities.

We restricted our search to clusters that would not break up any of the current composite clusters. An initial four-cluster summary was selected in which all current composite clusters were left intact. From that starting point, the clusters were successively recombined in order to identify a final local maximum aggregate r^2, for unit-weight composites with four or fewer subtests. The results are shown in Table 15.

For the proposed set of composites, the aggregate root mean square absolute validity was .486. These composites are strikingly more similar to each other than to the current composites as well as the MAGE and High School composites. All of the proposed composites use VE and either of the quantitative subtests as a nucleus. The major difference is the weight given to the Technical factor (AS and MC). For the third and fourth composites, the only difference is in the choice of which quantitative test is included. This similarity is a consequence of using predictability as our criterion: the most valid subtests were selected for inclusion in all four composites.

Tables 16, 17, and 18 present comparisons of the validities of the four alternate composites with the current composites using the combined, SQT, and training criteria. These estimates of validities were computed using the ridge regression vectors, and therefore are generally smaller than the corresponding OLS estimates. These tables show appreciable gains in validity for the CL and SC clusters. For CL, the gains appear for both training and SQT criteria; in the case of SC, the effect is confined to the SQT criterion.

From this four-composite solution, the most effective combination to create a three-composite solution was to combine the CO, FA, GM, EL cluster with

(56

Table 14

Optimal Unit-Weight Composites for each Current Cluster

CLUS	Wtd Mn. SQR. Validity Max	3	4	5	Unit Weight Composite 3-subtest			4-subtest				5-subtest				
CL	.305	.288	.287	.288	VE	AR	MK	VE	AR	MK	CS	VE	GS	AR	MK	CS
ST	.328	.299	.305	.312	VE	AR	MC	VE	AR	MK	AS	VE	AR	MK	AS	CS
CO	.200	.187	.191	.193	VE	AR	MC	VE	MK	AS	MC	VE	AR	MK	AS	MC
EL	.240	.217	.222	.226	VE	MK	AS	VE	MK	AS	MC	VE	AR	MK	AS	MC
FA	.259	.242	.249	.252	MK	AS	MC	AR	MK	AS	MC	VE	AR	MK	AS	MC
GM	.214	.184	.194	.196	MK	AS	MC	NO	MK	AS	MC	VE	NO	MK	AS	MC
SC	.235	.218	.223	.226	VE	AR	MC	VE	AR	AS	MC	VE	AR	MK	AS	MC
OF	.232	.221	.223	.223	VE	AR	AS	VE	AR	AS	MC	VE	AR	EI	AS	MC
MM	.238	.215	.217	.220	AR	AS	MC	VE	AR	AS	MC	EI	AR	MK	AS	MC

Table 15

Local Optimal Four-composite Solution

Composite		Subtests
Clerical/Administrative	ACL	(VE + AR + MK)
Skilled Technical	AST	(VE + AR + MK + AS)
Operations	AOP	(VE + AR + MC + AS)
Combat	ACO	(VE + MK + MC + AS)

the SC, MM, OF cluster, using the composite for the former. The resulting aggregate absolute validity was .485. An examination of Appendix Table A-13, in which validities are shown for the four alternative composites as well as the nine current composites for each MOS, corroborates this combination. There are very few MOS for which the composite VE+AR+AS+MC is significantly superior to VE+MK+AS+MC.

Also, all two-cluster solutions were examined, and the optimum was found to be to assign the CL composite to the ST as well as CL cluster. The resulting aggregate absolute validity was .484. Finally, the best single composite, VE+MK+AS+MC, was found to have a weighted average predictive validity of .480, for the entire set of 98 MOS.

The issue of predictive bias was not raised within this process of composite identification but assessed after the choice was narrowed to a single alternative to the current composites. In future evaluations of composites, it should be possible to include predictive bias assessment as a part of the search process, similar to the way in which overall predictive validity was included.

If the search procedure is to include a combination of criteria: predictive validity, differential validity, and predictive bias; a mechanism is needed to evaluate the trade-offs among these different aspects of validity.

TABLE 16

(Weighted) AVERAGE ADJUSTED VALIDITIES: COMBINED CRITERION

MOS CLUSTER	N	VAL. GAIN	ALTERNATE COMPOSITES ACL	AST	AOP	ACO	CURRENT COMPOSITES CL	ST	SC	MM	OF	CO	FA	GM	EL
ALL	64097	--	0.46	0.47	0.47	0.47	0.39	0.47	0.43	0.45	0.46	0.46	0.47	0.46	0.46
CL	10368	.07	0.53*	0.52	0.49	0.49	0.46*	0.51	0.48	0.45	0.48	0.49	0.52	0.48	0.51
ST	7061	.01	0.54	0.55*	0.53	0.54	0.48	0.54*	0.52	0.51	0.53	0.53	0.54	0.52	0.54
CO	[illegible]	.01	0.41	0.43	0.43	0.43*	0.35	0.43	0.40	0.41	0.43	0.43*	0.42	0.42	0.42
EL	[illegible]	.01	0.43	0.45	0.45	0.45*	0.36	0.45	0.41	0.44	0.44	0.45	0.44	0.45	0.45*
FA	[illegible]	.02	0.46	0.49	0.49	0.49*	0.39	0.48	0.45	0.48	0.48	0.49	0.47*	0.48	0.48
GM	[illegible]	.01	0.41	0.43	0.42	0.43*	0.36	0.42	0.40	0.42	0.43	0.42	0.41	0.42*	0.42
SC	[illegible]	.05	0.44	0.46	0.47*	0.47	0.36	0.46	0.42*	0.44	0.45	0.45	0.44	0.46	0.46
OF	[illegible]	.02	0.44	0.46	0.47*	0.46	0.36	0.45	0.42	0.44	0.44*	0.45	0.43	0.45	0.45
MM	[illegible]	.01	0.41	0.44	0.45*	0.45	0.33	0.43	0.40	0.44*	0.44	0.45	0.42	0.44	0.43

TABLE 17

(Weighted) AVERAGE ADJUSTED VALIDITIES: SQT CRITERION

MOS CLUSTER	N	VAL. GAIN	ALTERNATE COMPOSITES ACL	AST	AOP	ACO	CURRENT COMPOSITES CL	ST	SC	MM	OF	CO	FA	GM	EL
ALL	[illegible]	--	0.45	0.48	0.48	0.48	0.38	0.47	0.43	0.45	0.46	0.46	0.45	0.46	0.47
CL	[illegible]	.09	0.35*	0.56	0.53	0.53	0.49*	0.55	0.51	0.49	0.52	0.52	0.55	0.51	0.55
ST	[illegible]	.01	0.52	0.52*	0.51	0.51	0.45	0.51*	0.49	0.48	0.50	0.51	0.51	0.50	0.52
CO	[illegible]	.01	0.42	0.44	0.44	0.44*	0.35	0.44	0.40	0.42	0.43	0.43*	0.42	0.43	0.43
EL	[illegible]	.01	0.44	0.47	0.48	0.48*	0.35	0.47	0.42	0.46	0.46	0.45	0.44	0.47	0.46*
FA	[illegible]	.03	0.43	0.45	0.46	0.46*	0.35	0.45	0.41	0.44	0.45	0.45	0.43*	0.45	0.45
GM	[illegible]	.02	0.34	0.36	0.36	0.36*	0.29	0.35	0.33	0.35	0.35	0.35	0.35	0.34*	0.35
SC	[illegible]	.07	0.47	0.50	0.50*	0.50	0.37	0.49	0.43*	0.48	0.48	0.49	0.46	[illegible]	0.49
OF	[illegible]	.03	0.48	0.51	0.51*	0.51	0.38	0.49	0.45	0.48	0.49*	0.49	0.47	0.50	0.49
MM	[illegible]	.01	0.37	0.40	0.41*	0.41	0.29	0.39	0.35	0.40*	0.39	0.40	0.37	0.40	0.39

TABLE 18

(Weighted) AVERAGE ADJUSTED VALIDITIES: TRAINING CRITERION

MOS CLUSTER	N	VAL. GAIN	ALTERNATE COMPOSITES ACL	AST	AOP	ACO	CURRENT COMPOSITES CL	ST	SC	MM	OF	CO	FA	GM	EL
ALL	[illegible]	--	0.38	0.39	0.39	0.39	0.33	0.35	0.36	0.37	0.38	0.39	0.38	0.38	0.38
CL	[illegible]	.07	0.45*	0.44	0.42	0.42	0.38*	0.43	0.40	0.39	0.40	0.41	0.44	0.41	0.44
ST	[illegible]	.01	0.45	0.46*	0.45	0.45	0.39	0.45*	0.43	0.43	0.44	0.45	0.44	0.44	0.45
CO	[illegible]	.00	0.33	0.34	0.34	0.34*	0.29	0.34	0.33	0.33	0.34	0.34*	0.33	0.33	0.33
EL	[illegible]	.01	0.36	0.38	0.37	0.37*	0.33	0.36	0.36	0.37	0.37	0.38	0.37	0.36	0.36*
FA	[illegible]	.00	0.41	0.43	0.44	0.44*	0.37	0.43	0.41	0.44	0.44	0.46	0.44*	0.43	0.43
GM	[illegible]	.01	0.38	0.40	0.40	0.40*	0.35	0.40	0.39	0.41	0.41	0.41	0.40	0.40*	0.40
SC	[illegible]	.01	0.32	0.31	0.30*	0.30	0.28	0.31	0.29*	0.28	0.30	0.30	0.31	0.29	0.31
OF	[illegible]	.01	0.31	0.33	0.33*	0.33	0.26	0.32	0.30	0.32	0.32*	0.32	0.31	0.33	0.32
MM	[illegible]	.01	0.36	0.39	0.40*	0.40	0.30	0.38	0.36	0.39*	0.39	0.40	0.37	0.39	0.38

59 [illegible]

Predictive Validity of Alternative Composites

The selection of alternative composites was based on comparisons of adjusted validity coefficients. In evaluating a potential composite, the validities of all potential unit-weight composites were generated and the optimum composites identified. The set of alternate composites presented in the previous chapter is built on the VE subtest, two of the technical subtests, and the two subtests measuring quantitative ability. That is, the most predictive subtests appear in all four composites.

The result of focusing on the most valid portion of the ASVAB is that these composites are more highly intercorrelated than other sets. Also, they achieve the primary aim of the effort: they have higher validities. These two facts are apparent in Tables 19 and 20, which present the adjusted validities and the intercorrelations for the four alternative composites. The adjusted validities were obtained by weighting MOS validities by the number of soldiers in the MOS. The correlations were obtained from the sample of FY81/82 applicants. Adjusted validities of the alternative composites based on SQT and Training data separately are shown in Tables 21 and 22.

Table 19

Average Adjusted Validities of the Proposed Composites:
Combined Criterion

MOS Cluster	N	Composite ACL	AST	ACO	AOP	Average
CL/ACL	10368	56	54	52	51	53
CO/ACO	14266	42	44	44	44	43
EL/ACO	5533	46	48	48	48	47
FA/ACO	5602	47	49	50	50	49
GM/ACO	2571	45	48	48	48	47
MM/AOP	7073	44	48	49	49	47
OF/AOP	8704	46	49	49	49	48
SC/AOP	3729	47	49	50	50	49
ST/AST	7061	58	58	57	57	57
Average		48	50	50	50	49

Table 20

Intercorrelations among Proposed Composites in the Applicant Population

Composite	ACL	AST	ACO	AOP
ACL	1.00			
AST	97	1.00		
ACO	91	97	1.00	
AOP	91	97	98	1.00

The corresponding sample and adjusted validities by MOS are contained in the Appendix Tables A-14 and A-15 together with their standard errors.

The aggregate root mean square predictive validity for the alternative composites for their assigned MOS is .486. The root mean square validity for the current composites, by comparison, is .454. There were two major findings: first, there are very few MOS for which the current composite has greater validity than the proposed alternative, even though the number of composites is reduced from nine to four. Second, the current composites for Clerical/Administrative and Surveillance/Communications MOS were significantly weaker than the proposed alternative composites for these MOS. The average validity for MOS in the CL cluster could be increased from .48 to .56, based on the combined criteria, and the average validity for MOS in the SC cluster could be increased from .45 to .50. The difference for CL was apparent using both training and SQT criteria, but the the difference for SC was based almost entirely on SQT results.

Based on the combined criteria, the optimal four-composite solution had at least as high absolute validity as the current composite in every cluster. Moreover, for only one of the 98 MOS on which the combined criteria analyses were based (26Q), was the validity of the current composite as much as .02 greater than the validity of the proposed composite, and that case could be eliminated by reclassification of 26Q to the Skilled Technical cluster. Thus, if savings can be realized by reducing the number of composites from nine to four, there is no indication that this will reduce the absolute predictive validity of the composites for any cluster of MOS. The one negative comparison at the cluster level was for the prediction of training outcomes for the Combat cluster, where the difference of .002 in validity favored the current composite. This difference is not significant.

The four composite solution can be reduced to a three-, and then a two-composite solution with virtually no loss of absolute validity. First, the third composite, VE+AR+AS+MC, can be eliminated and its MOS "reassigned" to the fourth composite, VE+MK+AS+MC. The average loss of validity for the reassigned MOS is merely .002, and the overall mean validity for the three-composite solution is .485, compared to .486 for the four-composite solution.

Table 21

Average Adjusted Validities of the Proposed Composites: SQT Criterion

MOS Cluster	N	ACL	Composite AST	ACO	AOP	Average
CL/ACL	8006	58	56	53	53	55
CO/ACO	15970	43	44	45	44	44
EL/ACO	5960	43	45	46	46	45
FA/ACO	6964	44	47	48	47	46
GM/ACO	1304	39	41	42	41	41
MM/AOP	4309	41	45	46	46	44
OF/AOP	7724	49	52	52	53	52
SC/AOP	3649	50	53	53	53	52
ST/AST	6915	56	56	55	55	56
Average		48	49	49	49	49

Table 22

Average Adjusted Validities of the Proposed Composites: Training Criterion

MOS Cluster	N	ACL	Composite AST	ACO	AOP	Average
CL/ACL	5272	47	46	44	43	45
CO/ACO	2879	33	34	35	35	34
EL/ACO	2610	40	41	41	41	41
FA/ACO	1759	31	34	36	36	34
GM/ACO	1944	48	51	52	52	51
MM/AOP	5426	39	43	44	44	42
OF/AOP	4626	34	36	36	36	36
SC/AOP	1463	37	36	34	35	36
ST/AST	3181	52	54	53	53	53
Average		40	42	42	42	42

The only noticeable difference between the four- and three-composite solutions is that the best three-composite solution is somewhat unbalanced, with 70% of the assignments based on just one of the three composites. Of 205,000 FY81/82 accessions in the 98 MOS used for the combined criteria analyses, 36,000 were assigned to Clerical/Administrative MOS, 24,000 were assigned to Skilled Technical MOS, and 145,000 were assigned to other MOS.

The optimal two-composite solution further eliminates the second (AST) composite, "reassigning" its MOS to the first (ACL) composite. This has the effect of reducing the overall average validity from .485 to .484. However, the average validity loss for the MOS in the ST cluster is .006, which is statistically significant.

In general, these results do not differentiate between the two-, three-, and four-composite solutions, although they do demonstrate improvements in comparison to the current composites in all cases. The differential validity of the composite sets for classification purposes must be examined in order to make a selection among these alternative solutions.

Comparisons to Other Sets of Composites

It is of interest to compare the performance of these composites to the two other sets of currently used composites mentioned in the introduction. Both sets consist of fewer than nine composites, but differ from the set developed here in that there is less overlap among the composites. The statistics for the MAGE composites and the High School composites appear in Tables 23 and 24, respectively. Corresponding tables of sample and adjusted validities for individual MOS appear as Tables A-16, A-17, A-18, and A-19 in the Appendix.

The MAGE composites do not offer a solution to the single greatest weakness of the Army's current operational composites--the low validity of the CL composite. The Administrative composite in MAGE, in fact, is the CL composite. Other than this, however, the MAGE composites perform nearly as well as the proposed set and are comparable to the current set. Differences in the average validity of a composite across all AA clusters are in the range of .02 to .03.

The High School composites perform about as well as the MAGE composites with the exception of their Office and Supply composite. Probably because it does not include both speeded subtests, its validity is appreciably higher than CL.

The comparisons of the current, alternative, MAGE, and High School composites reinforce the claim that there are no great differences in validity among different composites within a given AA cluster. The most valid composites are composed of the most valid subtests.

Table 23

Average Adjusted Validities of the MAGE Composites: Combined Criterion

MOS Cluster	N	Composite M	A	G	E	Average
CL	10368	45	48	54	53	50
CO	14266	42	36	42	43	41
EL	5533	45	38	46	47	44
FA	5602	48	39	46	48	45
GM	2571	46	39	44	46	44
MM	7073	48	36	44	46	43
OF	8704	47	38	47	47	45
SC	3729	47	39	47	48	45
ST	7061	52	51	57	57	54
Average		47	40	47	48	46

Table 24

Average Adjusted Validities for the High School Composites: Combined Criterion

MOS Cluster	N	Composite HSAA	HSMT	HSOS	HSSS	HSEE	Average
CL	10368	54	47	54	53	53	52
CO	14266	42	43	40	44	43	42
EL	5533	46	47	43	47	47	46
FA	5602	46	49	44	49	48	47
GM	2571	44	47	43	47	46	45
MM	7073	44	49	41	47	46	46
OF	8704	47	48	43	48	47	47
SC	3729	47	48	44	49	48	47
ST	7061	57	54	56	58	57	56
Average		47	48	45	49	48	47

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Table 25

Intercorrelations among the MAGE Composites
in the Applicant Population

Composite	M	A	G	E	
M=GS+MC+AS	1.00				Mechanical
A=NO+CS+VE	61	1.00			Administrative
G=AR+VE	81	81	1.00		General
E=AR+MK+GS+EI	88	73	93	1.00	Electronic

Table 26

Intercorrelations among the High School Composites
in the Applicant Population

Composite	HSAA	HSMT	HSOS	HSSS	HSEE	
HSAA=AR+VE	1.00					Academic Aptitude
HSMT=AR+AS+MC+EI	85	1.00				Mechanical Trades
HSOS=VE+CS+MK	89	73	1.00			Office and Supply
HSSS=AR+VE+MC	97	93	87	1.00		Skilled Services
HSEE=AR+EI+MK+GS	93	92	86	94	1.00	Electronics

Differential Validity

The overall performance of the Army depends on how well the skills of recruits can be matched to the requirements of the MOS they enter. Therefore, a set of composites must be evaluated in terms of its differential validity.

In theory, the differential validity of a set of composites is based on the correlation of the best predictor of differences between MOS with the actual differences that one would observe. The practical problem is that, in general, it is infeasible to collect criterion data from the same individual in all jobs. That is, one cannot ordinarily observe the criterion needed for estimating differential validity. Fortunately, Horst (1954) developed a method for measuring the crucial part of the differential validity of a test battery without the necessity of these observations.

Actual use of a set of composites for classification of recruits into MOS is a complex process, however, and an abstract measure of differential validity can only approximate the relative value of one set of composites, compared to another. A more accurate comparison of composites would involve simulation of the assignment process. Work is progressing on the development of the appropriate simulation algorithm. Nevertheless, for the present evaluation, differential validity was estimated using the procedure outlined by Horst (1954).

The results presented here must therefore be interpreted with caution. One set of composites might be measured as possessing greater differential validity than another, even though the other set would lead to a more valuable increase in overall performance of enlisted personnel. Four aspects of the practical application of composites for classification of Army recruits are particularly important to consider in interpreting the results.

(1) The constraints on numbers of recruits needed in each MOS severely restrict the assignment process, so that many recruits must be assigned to MOS for which they are not optimally matched.

(2) Recruits are free to make choices and cannot be summarily assigned to the MOS that the composites identify as optimal.

(3) The appropriate criteria are not expected performance differences but the relative utility of those differences; however, the utility scales are not yet available.

(4) Current practice mixes selection and classification, yet we are addressing the questions of validity for selection and classification separately.

Each of these factors would affect the measurement of overall performance of any set of composites, and to the extent that the effects are the same for all composites, the general results can be meaningfully interpreted. Factors that would affect one set of composites more than another, however, will require further investigation. For example, if the source of differential validity in one set of composites lies primarily in comparisons between "high

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payoff" MOS, the real value of that set of composites would be relatively higher than its measured validity.

As noted above, the starting point for this measurement is the work of Horst (1954). Horst demonstrated that one could compute the ordinary least squares (OLS) linear predictor of the difference between two criteria for an individual without actually having measurements of both criteria for any single individual. Using this result, he proposed a Classification Efficiency index equal to the average (over all pairs) of the variances of the predictors of the differences. In addition, he showed that this index could be elegantly represented in terms of the variances and covariances of the predictions of single criteria.

The formula for Horst's Classification Efficiency index which we used is:

$$(1) \qquad H^2 = \text{Average}(\bar{y}_{ik} - \bar{y}_{jk})^2/2,$$

where the $\bar{y}_{ik}$ and $\bar{y}_{jk}$ are the OLS estimates of standardized criteria i and j for individual k, and the average is over all i, j, and k, such that i does not equal j.

Horst pointed out the problem in using H as a direct measure of differential validity; namely, that the maximum value it can take on, if the predictors are perfectly accurate, is not unity. The maximum value is 1 minus the average intercorrelations among the criteria. Unfortunately, these intercorrelations cannot be measured without observing multiple criteria for single individuals. However, because the intercorrelations of criteria will be the same no matter what the predictors, the values of H for different sets of predictors of the same criteria can be compared.

Brogden (1959) proposed a measure of differential validity similar to the measure derived by Horst. Brogden's measure, which we shall call D, is the product of (a) the average absolute predictive validity of the predictors and (b) the square root of one minus the average of the intercorrelations of the predictors. When these intercorrelations are equal, it is related to Horst's measure by the following equation:

$$(2) \quad H^2 = D^2 + (1 + g/(p-1)) \times \text{Variance(validity coefficients)},$$

where the variance is between criteria,
g is the intercorrelation of the predictors, and
p is the number of predictors.

That is, when all the criteria are equally well predicted by the composites, H is equal to D, and in any other case, H includes a component of differential validity due to the variation in predictability of the criteria.

A corollary of equation (2) is that a battery can possess differential validity, as measured by H, even though the predictors are all perfectly correlated with each other. In that case, D is equal to zero, but H can be greater than zero, if some criteria are more predictable than others. Thus, as pointed out by Maier (1982), examination of the intercorrelations of predictors is insufficient for estimation of the differential validity of a battery.

Although it seems counter-intuitive at first that a set of perfectly correlated composites could possess differential validity, the following example makes clear that they can. Consider the case of a single composite. Suppose that the composite measures a set of skills that account for much of the variation in performance in MOS A but very little of the variation in performance in MOS B. (Perhaps some unmeasured skill accounts for most of the variance in MOS B.) Then it makes sense to assign individuals with higher values of the composite to MOS A and individuals with lower scores to MOS B. Although the skill measured by the composite is related to performance in both MOS, its relation is much stronger in MOS A. Thus, a single composite has differential validity for classification among MOS.

The present problem is somewhat different from that addressed by Horst. His objective was to measure the performance of an entire battery in predicting differences between criteria, while the objective of the present analyses is to compare the performance of different sets of composites based on the same (ASVAB) battery. As noted by Maier (1982), Horst's derivation is based on the assumption that the predictors are based on the full battery; i.e., that they are the multiple regression vectors for predicting the criteria from the ASVAB. Thus, while computation of H for the 98 separate MOS regression vectors provides the maximum achievable differential validity of the ASVAB, the computation of the differential validity of a particular set of composites involves more than merely applying Horst's formula to the covariance matrix of the composites.

Each MOS is associated with a single composite, so the comparison of expected performance between two MOS is associated with a pair of composites (although in many cases, they are the same composite). To assess the differential validity of alternative sets of composites, then, we applied the formula in equation (1), where the predictors for each pair were limited to the one or two composites associated with the pair. Specifically, we obtained the least squares predictor of the difference in criteria between each pair of MOS and then averaged the squares of these over all pairs of MOS.

The measure of composite differential validity we used was:

(3) $$M^2 = \text{Average}(B_{(ij)}C_{ijk})^2/2,$$

where C_{ijk} is the pair of composite values associated with MOS i and j for individual k,
$B_{(ij)}$ is the regression vector for predicting the difference $y_{ik}-y_{jk}$ based on the two composites, and
the average is over all i, j, and k, with i and j not equal.

As Horst had noted, one can estimate the required regression coefficients, even though no individual case has more than a single criterion score. Because the estimation for different pairs is based on different sets of composites, however, the elegant solution which Horst discovered is not available. Nevertheless, the computations were straightforward, though somewhat expensive in computer time.

The computations were carried out for two separate cases: (1) pairs of MOS associated with the same composite, and (2) pairs of MOS whose composites were not perfectly correlated. In each case, the critical assumption, which also underlies Horst's derivation, is that the regression of criterion on composite is the same in both the selected and unselected groups. To simplify the derivation, we assumed that all variables were standardized for the group for which they are available.

Case 1: both MOS i and MOS j use the same composite

The objective is to select b_{ij} to minimize

(4) $\text{Average}(\ y_{ik}-y_{jk} - b_{(ij)}c_k\ )^2,$

where the average is over all accessions, and
c is the common composite for both MOS_i and MOS_j.

The solution can be shown to be

(5) $b_{(ij)} = b_i - b_j.$

That is, the result is simply the difference between the regression coefficients for predicting the criteria in the two MOS separately.

Case 2: MOS i and MOS j use different composites

The objective is to minimize

(6) $\text{Average}(\ y_{ik}-y_{jk} - (b_{(ij)i}c_{ik}+b_{(ij)j}c_{jk})\ )^2,$

where the average is over all accessions,
c_{ik} and c_{jk} are the two composite values associated with MOS i and j, for individual k, and
$b_{(ij)i}$ and $b_{(ij)j}$ are the associated regression coefficients for predicting the difference.

The joint solution for $\underline{B}_{(ij)}' = (b_{(ij)i}, b_{(ij)j})$ turns out to be

(7) $\underline{B}_{(ij)} = \underline{B}_{(i)} - \underline{B}_{(j)},$

where $\underline{B}_{(i)}$ and $\underline{B}_{(j)}$ are the regression vectors for predicting the available criteria in MOS i and j each using the pair of composites. Note that the values of $\underline{B}_{(i)}$ and $\underline{B}_{(j)}$ depend on the particular pairing of i and j.

Thus, in both Case 1 and Case 2 we obtain computable estimates of the regression coefficients; and from these it is straightforward to obtain the measure defined in equation (3). The maximum value for this statistic, for any set of linear composites based on the ASVAB, is the value of H^2 in equation (1).

(70)

The failure of a set of composites to possess differential validity, therefore, can be divided into two parts: (1) failure of the ASVAB as a battery to measure skill components that differ between MOS, and (2) failure of the particular set of composites to capture the potential differential validity of the ASVAB. We can assess the extent to which the composites capture the differential validity possessed by the ASVAB as the ratio of M to H.

The measures H and M weight each of the MOS equally in the estimation of differential validity. Although all of the MOS differences are important for some decisions, it is plausible to assign greater weight to the valid estimation of differences that are involved in the most frequent decisions. Therefore, as a further refinement, we also computed a weighted version of H and M, weighting the entry for each pair by the product of the numbers of the accessions in the two MOS.

The results are contained in Tables 27 and 28. For comparison purposes, these tables also include provisional estimates of the differential validity of the MAGE composites. We used G for the CL and OF clusters, E for the EL, SC, and ST clusters, and M for CO, FA, GM, and MM. After dropping the Administrative/CL composite and reordering, we renamed this composite set "GEM."

The loss of one third of the differential validity of the ASVAB through using only 9 unit-weight composites instead of 98 separate OLS regression vectors is to be expected. The 98 OLS regression vectors not only captured true variance between each pair of MOS but also capitalized on any chance variation between pairs of MOS. The 9-composite solution, on the other hand, assigned the same composite to many pairs of MOS; and for these pairs there was no opportunity to capitalize on chance variation.

Generally, the unit-weight composites yield differential validity estimates from 43% to 68% of the potential differential validity in the ASVAB. The solutions with fewer composites, as expected, yielded slightly lower estimates of differential validity, although there was virtually no difference between the proposed 2, 3, and 4 composite or GEM alternatives. Use of a single composite resulted in noticeably lower differential validity. The weighted differential validity estimates were generally lower than the unweighted estimates, reflecting the general phenomenon of smaller differences between the larger MOS. This may be due either to greater uniqueness of skills in small MOS or lower stability of the estimates in those MOS, or both.

The comparison between the operational composites and the alternative set of nine composites, in which the Clerical & Administrative (CL) and Surveillance & Communications (SC) composites were replaced, yielded no noticeable difference. Thus, the significant increase in overall predictive validity achieved by introduction of these two changes is not at the cost of decrease in differential validity.

Table 27

Differential Validity Estimates for Alternative Sets of Composites (Unweighted)

Composites	Average Squared Difference (H^2 or M^2)*	Root Mean Square Difference (H or M)	Relative Efficiency (H or M)/H
Full linear model (98 composites)	.099	.314	(100%)
Current 9 composites	.041	.202	64%
Revised 9 composites (CL and SC changed)	.036	.190	60%
Alternative 4 composites	.026	.160	51%
Alternative 3 composites	.024	.154	49%
Alternative 2 composites	.023	.150	48%
Alternative 1 composite	.019	.136	43%
GEM**	.025	.159	51%

* Note: the measure of differential validity is H for the full 98-composite alternative and M for the other alternatives.

** Three of the four "MAGE" composites. G is used for CL and OF clusters of MOS; E is used for EL, SC, and ST clusters of MOS; and M is used for CO, FA, GM, and MM clusters of MOS.

(72)

Table 28

Differential Validity Estimates for Alternative Sets of Composites (Weighted)

Composites	Average Squared Difference (H^2 or M^2)*	Root Mean Square Difference (H or M)	Relative Efficiency (H or M)/H
Full linear model (98 composites)	.046	.214	(100%)
Current 9 composites	.021	.146	68%
Revised 9 composites (CL and SC changed)	.020	.142	66%
Alternative 4 composites	.016	.125	59%
Alternative 3 composites	.014	.120	56%
Alternative 2 composites	.016	.125	58%
Alternative 1 composite	.011	.106	50%
GEM**	.014	.117	55%

* Note: the measure of differential validity is H for the full 98-composite alternative and M for the other alternatives.

** Three of the four "MAGE" composites. G is used for CL and OF clusters of MOS; E is used for EL, SC, and ST clusters of MOS; and M is used for CC, FA, GM, and MM clusters of MOS.

(75)

Assessment of Predictive Bias

An important scientific and policy issue is the question of predictive bias of the selection and classification procedures. The primary concern here is whether the use of an alternative set of ASVAB composites would lead to bias in the selection and classification of Army enlisted personnel. This question was addressed in three ways: First, the adjusted validities of the subgroups were calculated and compared. The subgroup validities were adjusted to the total applicant population rather than the separate subgroup populations. Second, the differences between the predicted scores for each subgroup were compared in the range of composite score values that contain the operational cutoff points. Third, the common and subgroup regression lines were plotted over this region. The sample regression lines were used as the basis for the latter two sets of comparisons. Unadjusted lines were used because the classical adjustment for restriction of range makes the assumption that the regression line in the selected group is the same as the regression line in the unselected population.

As noted in the earlier description of the data available for this research, we were limited in the analyses of subgroup differences to comparisons between race (blacks and whites) and between gender. We performed subgroup analyses only on those MOS that contained a sample of at least 100 soldiers of each subgroup. For race, this sample included 35 MOS and for gender it included 19 MOS. After the analyses had been obtained for each MOS, the results were aggregated to the cluster level. We will first discuss the analyses based upon comparisons between black and white soldiers and then turn to a discussion of analyses investigating differences as a function of gender.

Analyses of Differences by Race

The sample and adjusted validities of the current operational composites based upon the combined criterion as a function of race are presented in Table 29. (Tables for all subgroup analyses based upon each of the criteria treated separately can be found in the appendices). Similar data based upon the proposed four alternative composites are given in Table 30.

Inspection of these two tables shows that, in general, both sets of composites predict performance in each of the subgroups well. The smallest adjusted validity in either table is a respectable .25, while the average adjusted validities are sizeable at .41 and .43 for the current and alternative composites respectively. While the validities in both tables are high, the validities obtained from the three alternative composites were consistently higher for both subgroups across all of the clusters.

Both tables show small differences between the validities obtained by whites in comparison to blacks. These differences are quite stable across the two different sets of composites. The average difference in adjusted validities between blacks and whites among the current composites was .08, while in the case of the alternative composites this value is slightly smaller at .07. The only sizeable changes in the black-white validity differences were found in GM and MM clusters, where the subgroup differences were .04 and .03 smaller for the alternative composites. The stability of these differences,

Table 29

Sample and Adjusted Validities for Blacks ("B") and Whites ("W"):
Current Operational Composites
SQT and Training Criteria Combined

Cluster/ Composite	Sample Size "W"	"B"	Sample Validities "W"	"B"	Adjusted Validities "W"	"B"	Difference (Adjusted)
CL	4780	6985	.30	.13	.51	.42	.09
CO	14523	3570	.30	.19	.44	.41	.03
EL	4527	3111	.26	.10	.43	.29	.14
FA	4936	3234	.36	.19	.56	.42	.14
GM	474	624	.20	.11	.41	.55	-.14
MM	2729	1039	.25	.12	.40	.34	.06
OF	6941	3316	.29	.14	.47	.39	.08
SC	3207	1708	.25	.11	.44	.30	.14
ST	6682	956	.27	.14	.41	.25	.16

Table 30

Sample and Adjusted Validities for Blacks ("B") and Whites ("W"):
Four Alternative Composites
SQT and Training Criteria Combined

Cluster/ Composite	Sample Size "W"	"B"	Sample Validities "W"	"B"	Adjusted Validities "W"	"B"	Difference (Adjusted)
CL/ACL	4780	6985	.41	.26	.57	.49	.08
CO/ACO	14523	3570	.31	.22	.45	.43	.02
EL/ACO	4527	3111	.27	.12	.44	.29	.15
FA/ACO	4936	3234	.37	.19	.57	.42	.15
GM/ACO	474	624	.29	.08	.46	.56	-.10
MM/AOP	2729	1939	.26	.18	.40	.37	.03
OF/AOP	6941	3316	.31	.22	.49	.42	.07
SC/AOP	3207	1708	.34	.22	.47	.33	.14
ST/AST	6682	956	.27	.18	.42	.26	.16

despite the radical changes in the makeup of the composites between the operational and the alternative sets, suggests that the small differences observed in ASVAB composite validities as a function of race are most likely attributable to the ASVAB subtests themselves or to the criterion measures, rather than to the way they are combined into composites.

Differences between subgroup validities such as those observed in Tables 29 and 30 above do not necessarily mean that either set of composites is culturally biased. Cronbach (1976) makes the distinction between equality of test validities and fairness in selection policies. The relationship of the subgroup regression lines to each other is the key issue in the analysis of predictive bias.

Clearly, predictive bias would not be an issue if both groups shared the same regression line. If this were true, each recruit would have the same predicted value on the criterion regardless of subgroup membership. Therefore, a natural way of investigating predictive bias is to identify values of the AA composite for which a significant difference in predicted criterion scores exists.

To compare the black and white regression lines, we calculated the predicted criterion scores for the two subgroups for composite scores ranging from 80 to 110 points. This range of values was selected because it contains all of the cutoff scores now in operational use by the Army. The two sets of predicted scores were then subtracted to obtain the difference score, and standard error of the difference was estimated using the formula for the variance of the difference given in Rogosa (1980). The differences between the two regression lines are given in Table 31 for the current operational composites and Table 32 for the proposed four alternative composites.

Inspection of these two tables shows that, in general, for both sets of composites the two subgroup regression lines tend to be close over this range of composite scores. The average differences between the two lines for the current composites are: 3.80 for the CL cluster, 2.76 for the CO cluster, 2.38 for the EL cluster, 4.88 for the FA cluster, 4.23 for the GM cluster, 3.40 for the MM cluster, .88 for the OF cluster, 5.93 for the SC cluster, and 2.56 for the ST cluster. The average differences for the proposed alternative composites were 1.57 (CL), 2.10 (CO), .89 (EL), 2.77 (FA), 4.70 (GM), 1.10 (MM), -.90 (OF), .90 (SC) and .87 (ST). While some of these differences and those given in the tables are statistically significant, they tend to be relatively small in comparison to the standard deviation of the combined SQT and training criterion, which had been standardized to a value of 20 for accessions into each MOS. Only for fairly high values of the composite scores (around 110) did the differences in predicted scores for the two subgroups become large. These findings are typical of the comparisons of black and white regression lines found in other educational, employment, and military research (i.e., Hanser & Grafton, 1983).

Tables 31 and 32 show that the relationships between the black and white regression lines are similar for both sets of composites. In both tables the differences most often have positive values, indicating that the white regression lines lie above the black regression lines. In other words, the black criterion scores are overpredicted by the regression line based upon the white subgroup. This relationship of average overprediction of the black

Table 31

Predicted Criterion Scores for Blacks ("B") and Whites ("W"): Current Operational Composites

Composite Score	Predicted Criterion Score (Combined	B	W)	Subgroup Difference (W - B)	Standard Error of the Difference
CL Cluster					
80	88.44	90.03	90.14	.10	2.54
85	91.07	91.69	93.03	1.34	2.17
90	93.70	93.34	95.92	2.58	1.84
95	96.33	95.00	98.81	3.80*	1.57
100	98.95	96.66	101.70	5.04*	1.39
105	101.58	98.32	104.59	6.27*	1.35
110	104.21	99.97	107.48	7.50*	1.44
CO Cluster					
80	90.66	89.37	91.59	2.22	1.19
85	93.14	91.54	93.94	2.40*	1.14
90	95.61	93.71	96.29	2.58*	1.11
95	98.09	95.88	98.64	2.76*	1.11
100	100.57	98.05	100.99	2.94*	1.14
105	103.04	100.22	103.34	3.12*	1.19
110	105.52	102.39	105.69	3.30*	1.26
EL Cluster					
80	90.18	91.50	90.86	-.63	2.23
85	93.24	93.60	93.97	.37	1.88
90	96.31	95.70	97.07	1.37	1.60
95	99.37	97.80	100.18	2.38	1.43
100	102.44	99.90	103.28	3.38*	1.42
105	105.50	102.00	106.39	4.39*	1.56
110	108.57	104.10	109.49	5.39*	1.81
FA Cluster					
80	90.07	90.33	92.54	2.21	1.14
85	93.12	92.30	95.38	3.08*	1.01
90	96.18	94.26	98.22	3.95*	.91
95	99.23	96.23	101.06	4.82*	.83
100	102.29	98.20	103.90	5.69*	.80
105	105.34	100.17	106.74	6.56*	.81
110	108.40	102.14	109.58	7.44*	.87

(cont'd)

Table 31

Predicted Criterion Scores for Blacks ("B") and Whites ("W"): Current Operational Composites (Continued)

Composite Score	Predicted Criterion Score (Combined	B	W)	Subgroup Difference (W - B)	Standard Error of the Difference
GM Cluster					
80	95.09	97.24	95.84	-1.40	2.50
85	98.53	98.78	99.26	.48	2.27
90	101.97	100.32	102.68	2.36	2.35
95	105.41	101.86	106.09	4.23	2.69
100	108.85	103.40	109.51	6.12	3.22
105	112.29	104.93	112.93	8.00*	3.86
110	115.73	106.47	116.35	9.88*	4.56
MM Cluster					
80	91.50	89.84	93.74	3.90*	1.60
85	94.12	92.29	96.02	3.73*	1.48
90	96.74	94.75	98.31	3.56*	1.42
95	99.36	97.20	100.60	3.40*	1.41
100	101.98	99.65	102.88	3.23*	1.45
105	104.60	102.10	105.17	3.06.	1.56
110	107.22	104.56	107.46	2.90	1.70
OF Cluster					
80	93.14	90.73	94.87	4.14*	1.17
85	96.03	94.38	97.43	3.05*	1.11
90	98.91	98.03	100.00	1.97	1.10
95	101.80	101.68	102.56	.88	1.45
100	104.68	105.32	105.12	-.20	1.25
105	107.57	108.97	107.69	-1.29	1.39
110	110.45	112.62	110.25	-2.37	1.56
SC Cluster					
80	89.64	86.83	93.82	6.99*	2.09
85	92.25	89.32	95.96	6.64*	1.82
90	94.87	91.81	98.09	6.28*	1.59
95	97.48	94.30	100.22	5.92*	1.41
100	100.09	96.79	102.36	5.57*	1.29
105	102.71	99.28	104.49	5.22*	1.27
110	105.32	101.76	106.62	4.86*	1.34
ST Cluster					
80	85.52	85.78	86.02	.24	1.30
85	88.54	87.98	89.00	1.02	1.26
90	91.56	90.19	91.98	1.79	1.24
95	94.58	92.40	94.96	2.56*	1.25
100	97.60	94.61	97.95	3.34*	1.29
105	100.62	96.82	100.93	4.12*	1.35
110	103.64	92.02	103.91	4.89*	1.44

*$p < .05$

Table 32

Predicted Criterion Scores for Blacks ("B") and Whites ("W"): Four Alternative Composite Solutions

Composite Score	Predicted (Combined	Criterion B	Score W)	Subgroup Difference (W - B)	Standard Error of the Difference
CL Cluster					
80	93.10	92.90	92.36	-.54	2.43
85	96.08	95.47	95.63	.16	2.08
90	99.06	98.04	98.91	.87	1.76
95	102.04	100.61	102.18	1.57	1.50
100	105.02	103.18	105.45	2.27	1.33
105	107.99	105.75	108.72	2.98*	1.29
110	110.97	108.32	112.00	3.68*	1.37
CO Cluster					
80	92.17	91.22	92.35	1.13	1.18
85	94.46	93.17	94.62	1.45	1.13
90	96.74	95.11	96.89	1.78	1.11
95	99.03	97.06	99.16	2.10	1.11
100	101.32	99.00	101.43	2.42*	1.13
105	103.60	100.95	103.69	2.74*	1.18
110	105.89	102.90	105.96	3.07*	1.25
EL Cluster					
80	95.35	95.58	94.87	-.71	2.23
85	97.71	97.52	97.34	-.17	1.88
90	100.06	99.46	99.82	.36	1.60
95	102.42	101.39	102.29	.90	1.43
100	104.77	103.33	104.76	1.43	1.42
105	107.12	105.27	107.23	1.96	1.56
110	109.48	107.21	109.70	2.50	1.81
FA Cluster					
80	95.02	94.92	95.08	.16	1.14
85	97.42	96.50	97.53	1.03	1.01
90	99.81	98.08	99.99	1.90*	.90
95	102.20	99.67	102.44	2.77*	.83
100	104.59	101.25	104.89	3.64*	.80
105	106.99	102.83	107.35	4.52*	.81
110	109.38	104.41	109.80	5.39*	.87

(cont'd)

Table 32

Predicted Criterion Scores for Blacks ("B") and Whites ("W"): Four Alternative Composite Solution (Continued)

Composite Score	Predicted Criterion Score (Combined	B	W)	Subgroup Difference (W - B)	Standard Error of the Difference
GM Cluster					
80	97.92	98.69	97.73	-.95	2.49
85	100.62	99.78	100.71	.93	2.27
90	103.32	100.86	103.68	2.82	2.34
95	106.02	101.96	106.66	4.70	2.68
100	108.72	103.05	109.64	6.59*	3.21
105	111.41	104.14	112.61	8.48*	3.85
110	114.11	105.23	115.59	10.36*	4.55
MM Cluster					
80	93.55	91.71	94.80	3.09	1.59
85	95.88	94.49	96.92	2.43	1.48
90	98.22	97.28	99.04	1.76	1.41
95	100.55	100.06	101.16	1.10	1.40
100	102.88	102.84	103.27	.44	1.45
105	105.21	105.62	105.39	-.23	1.55
110	107.54	108.40	107.51	-.89	1.70
OF Cluster					
80	92.84	91.40	93.82	2.42*	1.16
85	95.76	95.19	96.50	1.31	1.09
90	98.68	98.98	99.19	.21	1.08
95	101.60	102.78	101.88	-.90	1.13
100	104.52	106.57	104.56	-2.00	1.23
105	107.44	110.36	107.25	-3.11*	1.37
110	110.35	114.15	109.94	-4.21*	1.54
SC Cluster					
80	92.59	91.30	93.45	2.16	2.00
85	95.17	94.13	95.87	1.74	1.75
90	97.74	96.96	98.28	1.32	1.52
95	100.31	99.79	100.69	.90	1.35
100	102.89	102.62	103.10	.49	1.24
105	105.46	105.44	105.51	.07	1.22
110	108.03	108.28	107.93	-.35	1.28
ST Cluster					
80	85.20	88.38	85.19	-3.19*	1.29
85	88.37	90.22	88.38	-1.84	1.25
90	91.54	92.06	91.58	-.48	1.23
95	94.70	93.90	94.77	.87	1.24
100	97.87	95.74	97.96	2.22	1.28
105	101.04	97.58	101.16	3.58*	1.34
110	104.21	99.42	104.35	4.93*	1.43

* $p < .05$

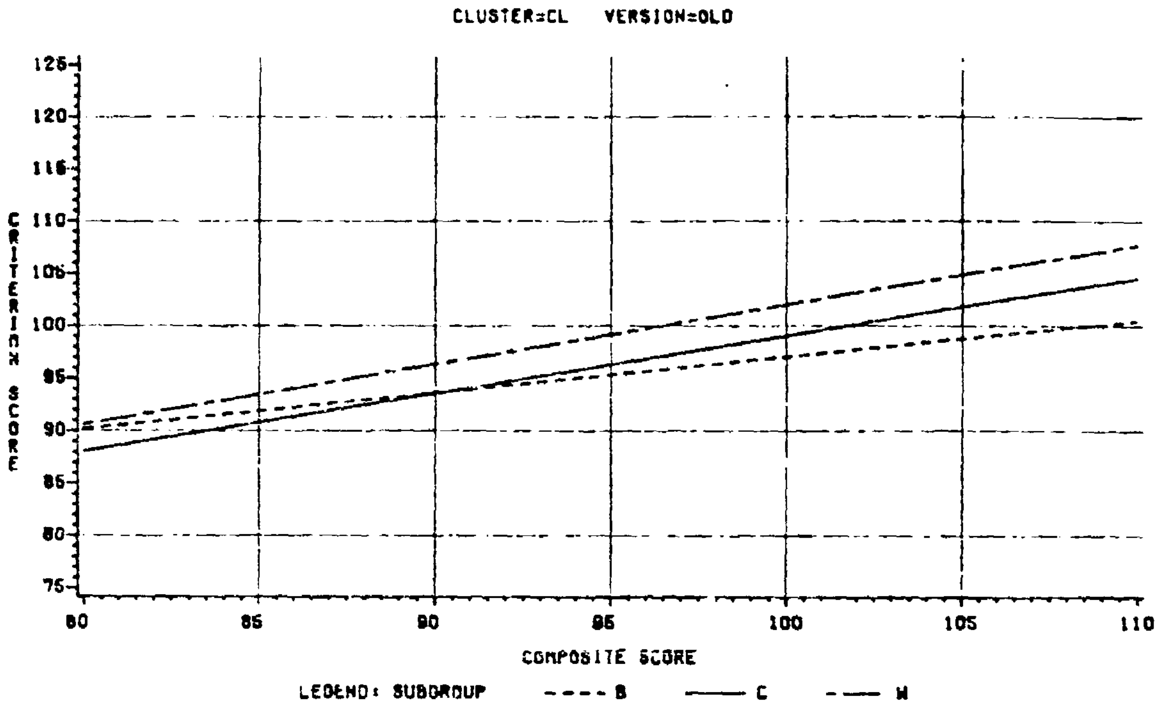
regression line by the white regression line across this range of composite scores was true for all of the current composites and all but one (OF) of the proposed alternative composites.

The alternative composites differ from the current operational set in two ways. Overall, the differences in predicted criterion scores observed in the alternative composites are smaller than the differences found with the operational composites. The average of the absolute values of differences from the current composites is 3.42, while the proposed alternative composites show an average absolute value of the differences of 1.76. Again, both of these values are fairly small when compared to a criterion standard deviation of 20. The other noticeable aspect in which the two sets of composites differ has already been noted above. When the alternative OF (AOP) composite is used to predict performance for the OF cluster of MOS, the white regression line tends to slightly underpredict rather than overpredict the black regression line. Tables 31 and 32 show that the basic pattern of general overprediction of the black regression line by the white regression with some underprediction for low composite scores is the case for both the operational and the alternative composites.

Given that the Army does not use separate black and white regression lines to select and classify enlisted personnel, the relationship of each subgroup line to the common regression line becomes important when significant differences between the subgroup lines exist. If the criterion scores for a subgroup are substantially underpredicted by the common regression line (e.g., the subgroup line falls above the common line), use of the common line to select and classify potential personnel would be unfair to that subgroup since its "true" predicted criterion would be higher than the value predicted by the common selection/classification instrument.

Underprediction of any subgroup is a serious problem only when the underprediction is for values of the composite near the cutoff point for that MOS. This is true because an individual is able to enlist in his or her MOS of choice as long as his or her composite score is above the appropriate cutoff. Composite scores well above the cutoff do not have any real meaning to the system. For example, if two individuals with composite scores of 95 and 105, respectively, wished to enter an MOS with a cutoff score of 90, both would be allowed to enlist in the MOS. The ten-point difference in their composite scores would not affect either person's selection or classification.

To investigate the relationships between the subgroup regressions and the common regression lines, we plotted the black, white, and common lines in the region that contains the cutoff scores for the Army MOS. These plots are presented in Figures 2 through 10. These plots show that the predicted values of all three lines tend to have higher slopes for the alternative composites than for the current composites. This finding is in agreement with the earlier validity data which showed somewhat higher criterion predictability with the use of the alternative composites. In each of the figures, the plots based upon the alternative composites tend to show the three lines being closer together than they are in the plots obtained from the current composites. This is consistent with Table 32, which showed that the alternative composites have the smaller differences among the predicted criterion scores from the two subgroups.



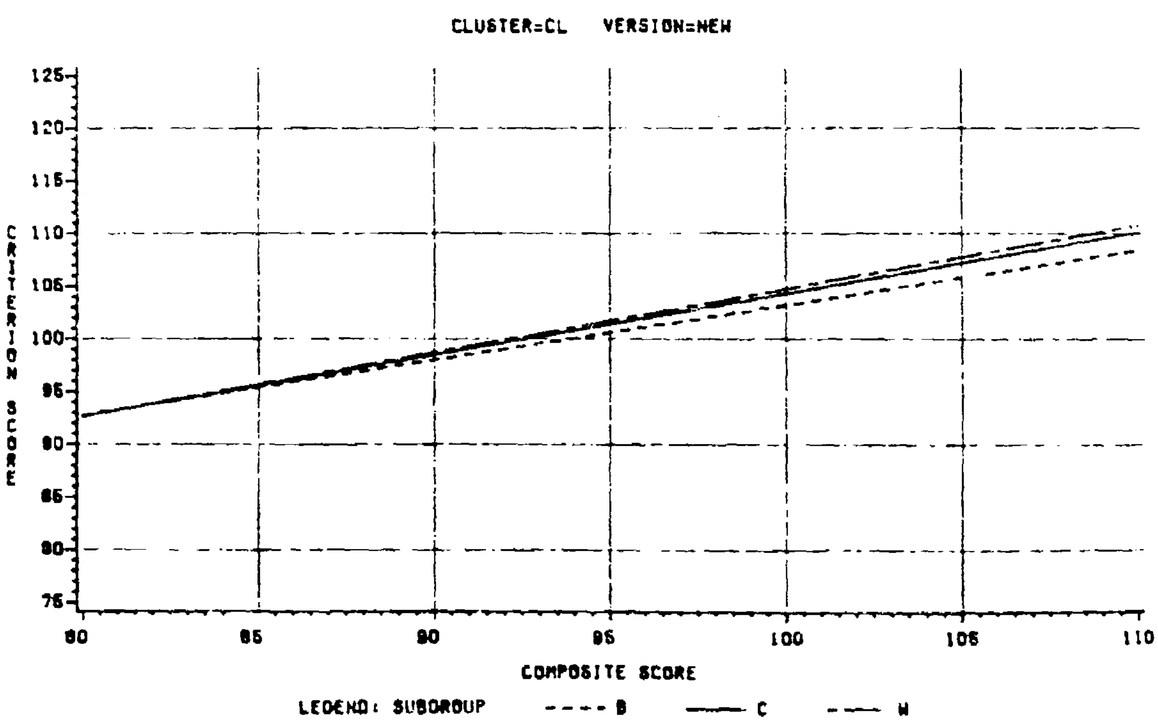
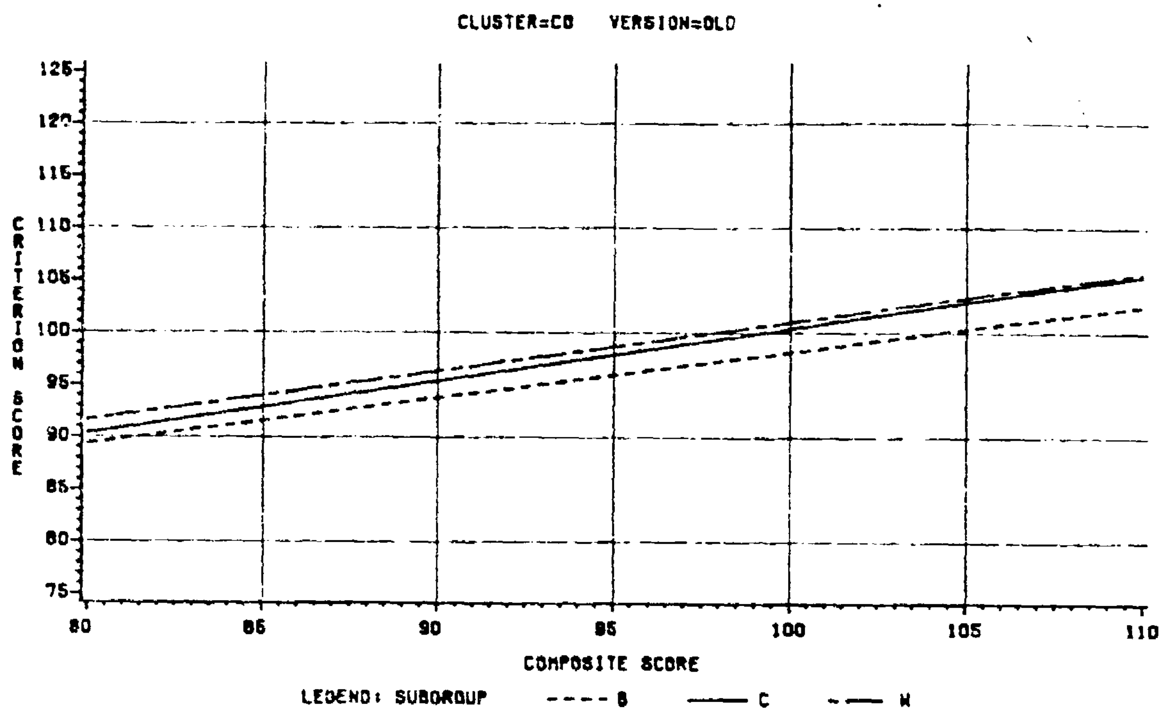


Figure 2. Regression lines for Current and Alternative (old and new) Composites for CL MOS, by Race



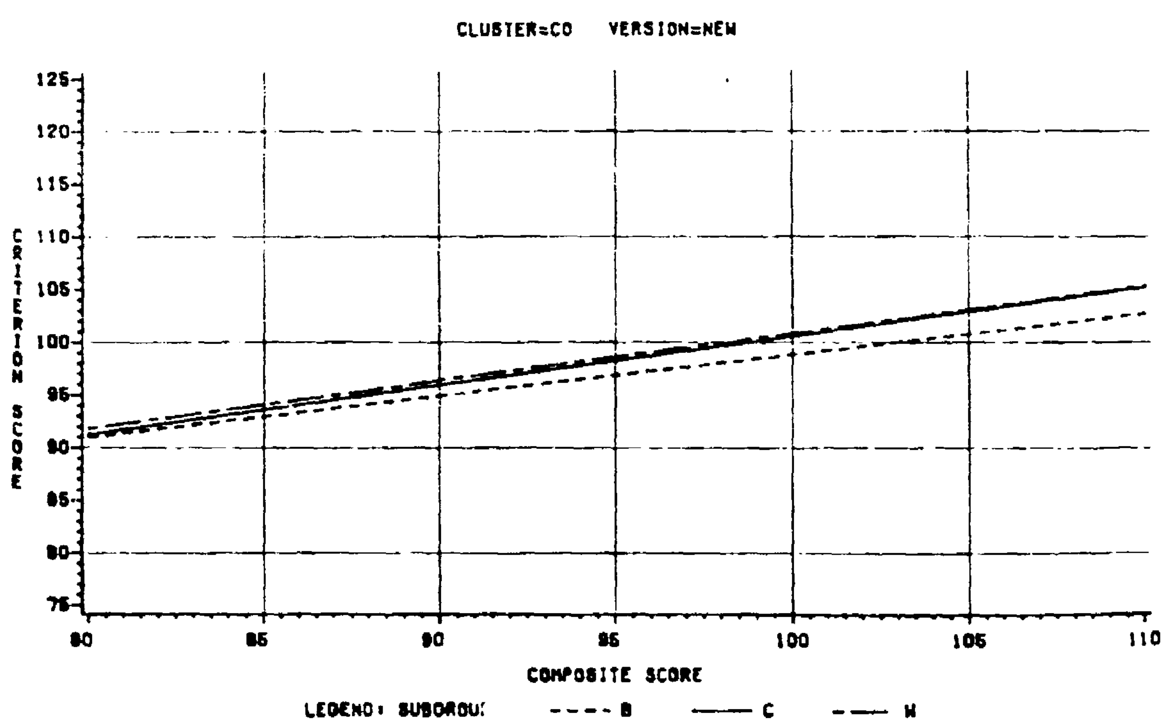
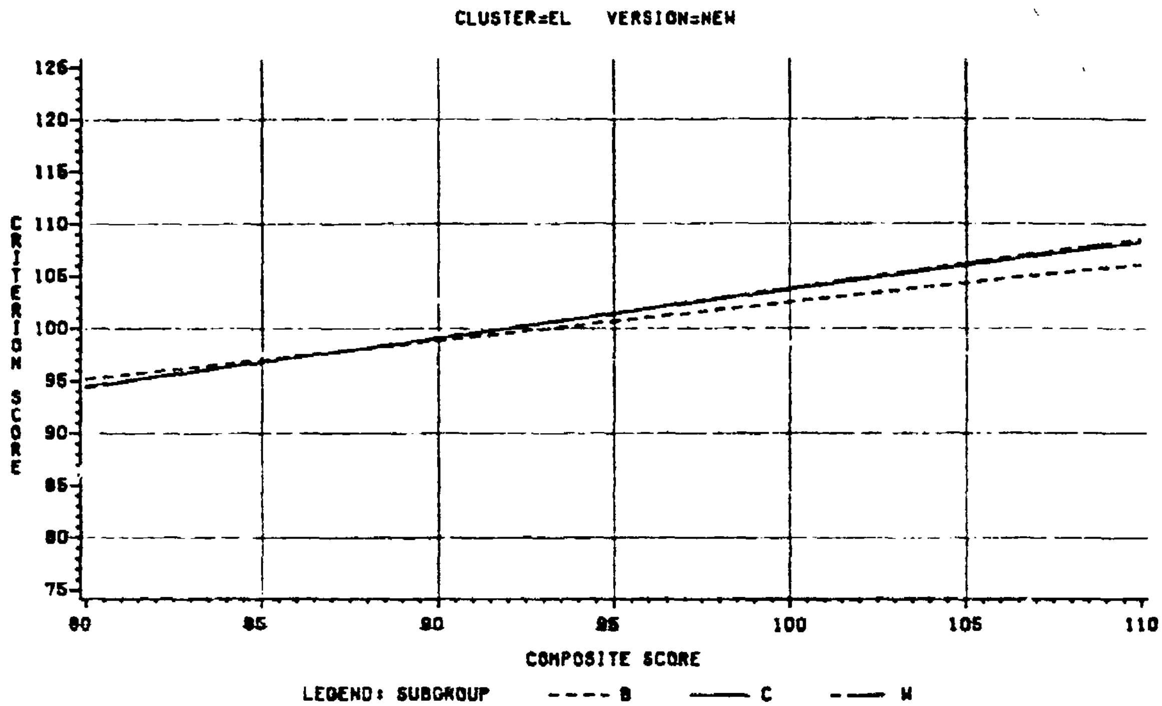


Figure 3. Regression lines for Current and Alternative (old and new) Composites for CO MOS, by Race



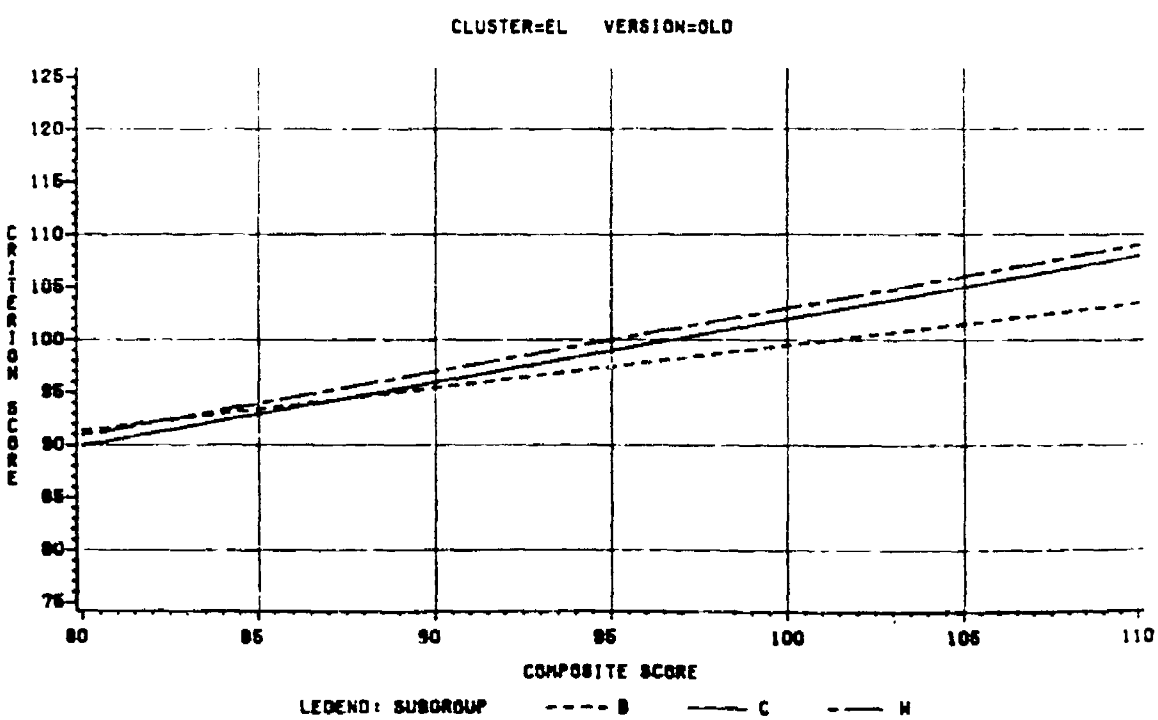


Figure 4. Regression lines for Current and Alternative (old and new) Composites for EL MOS, by Race

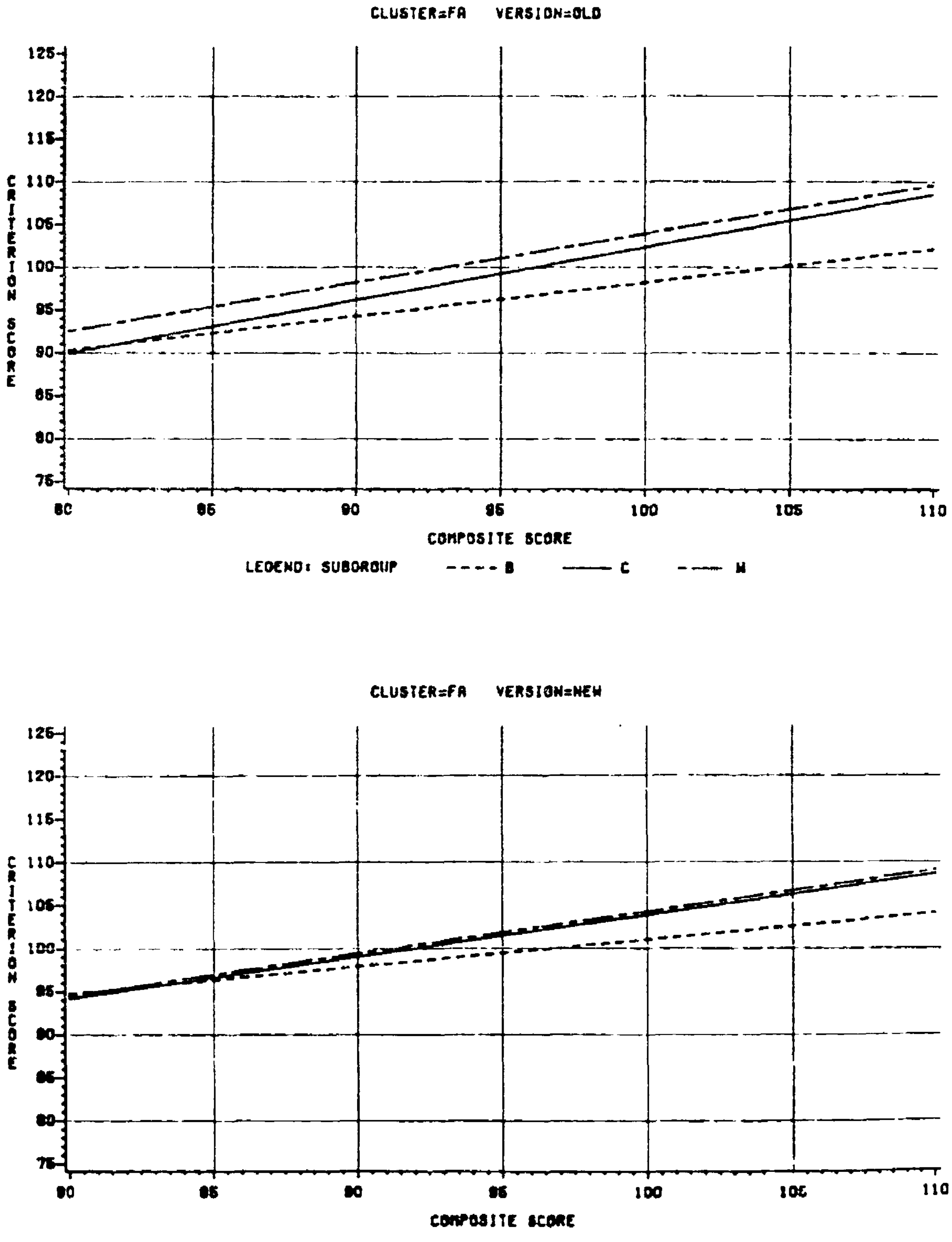


Figure 5. Regression lines for Current and Alternative (old and new) Composites for FA MOS, by Race

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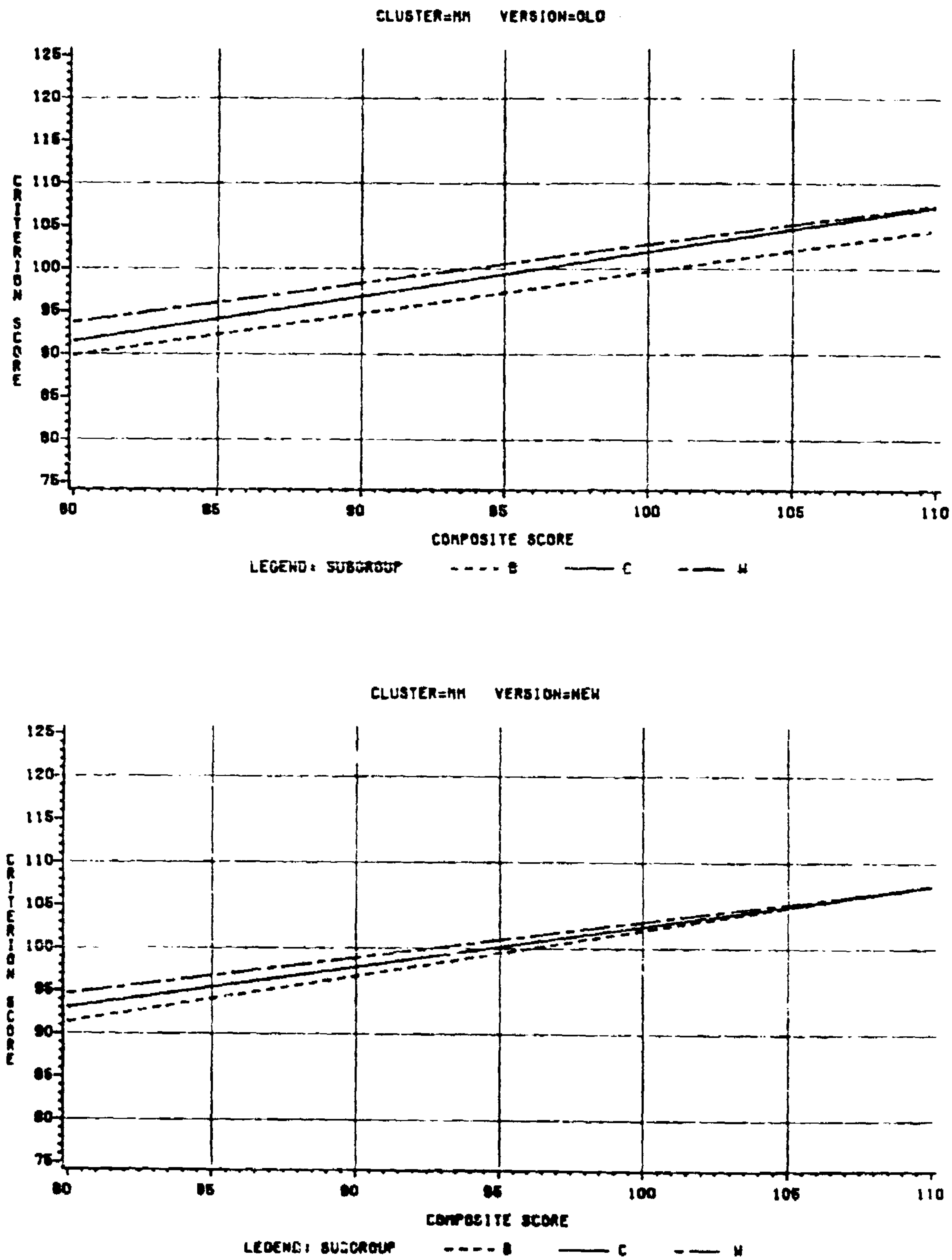
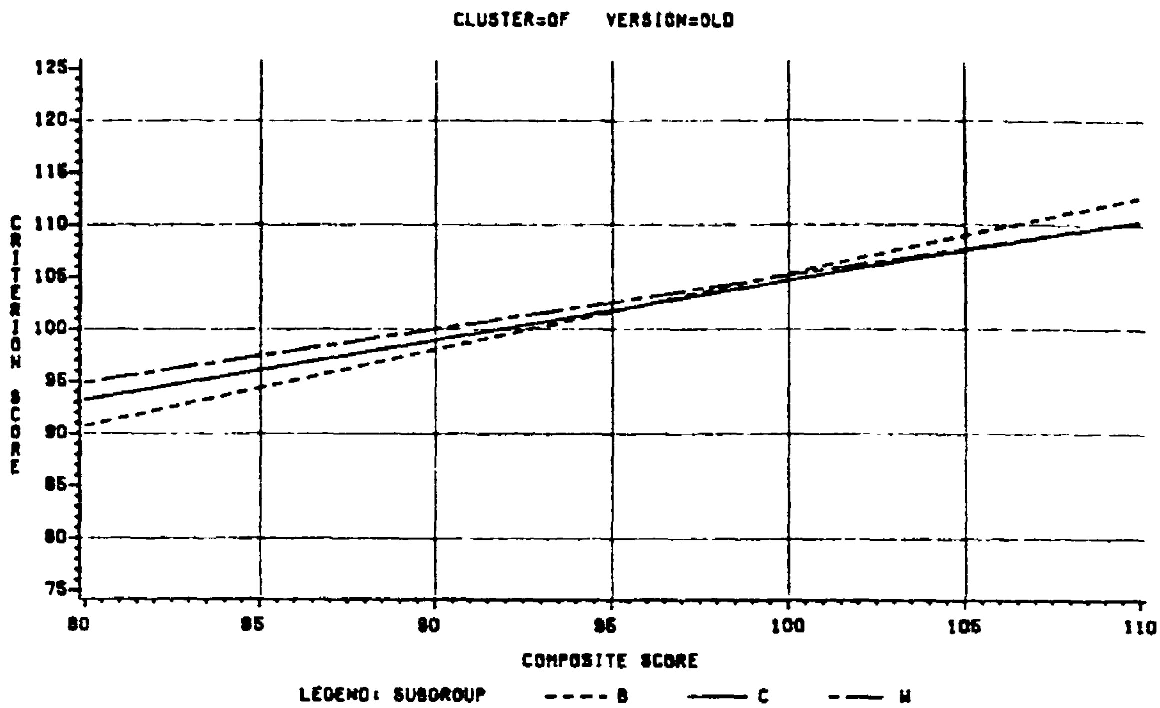


Figure 6. Regression lines for Current and Alternative (old and new) Composites for MM MOS, by Race



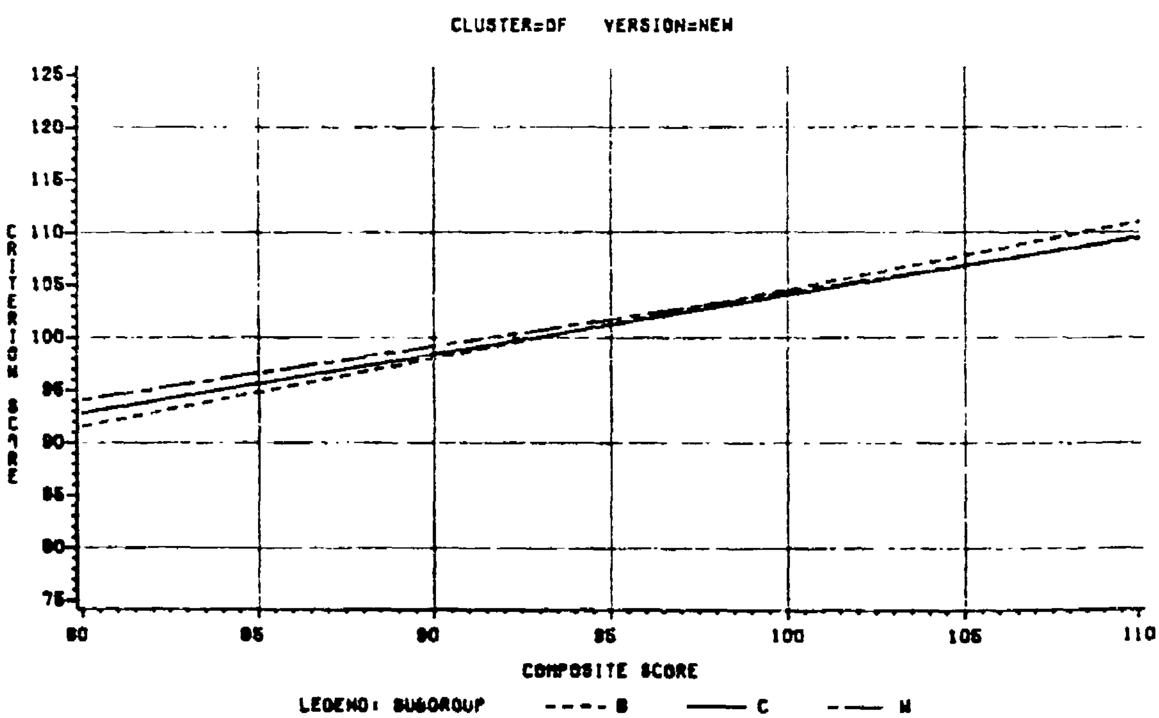


Figure 7. Regression lines for Current and Alternative (old and new) Composites for OF MOS, by Race

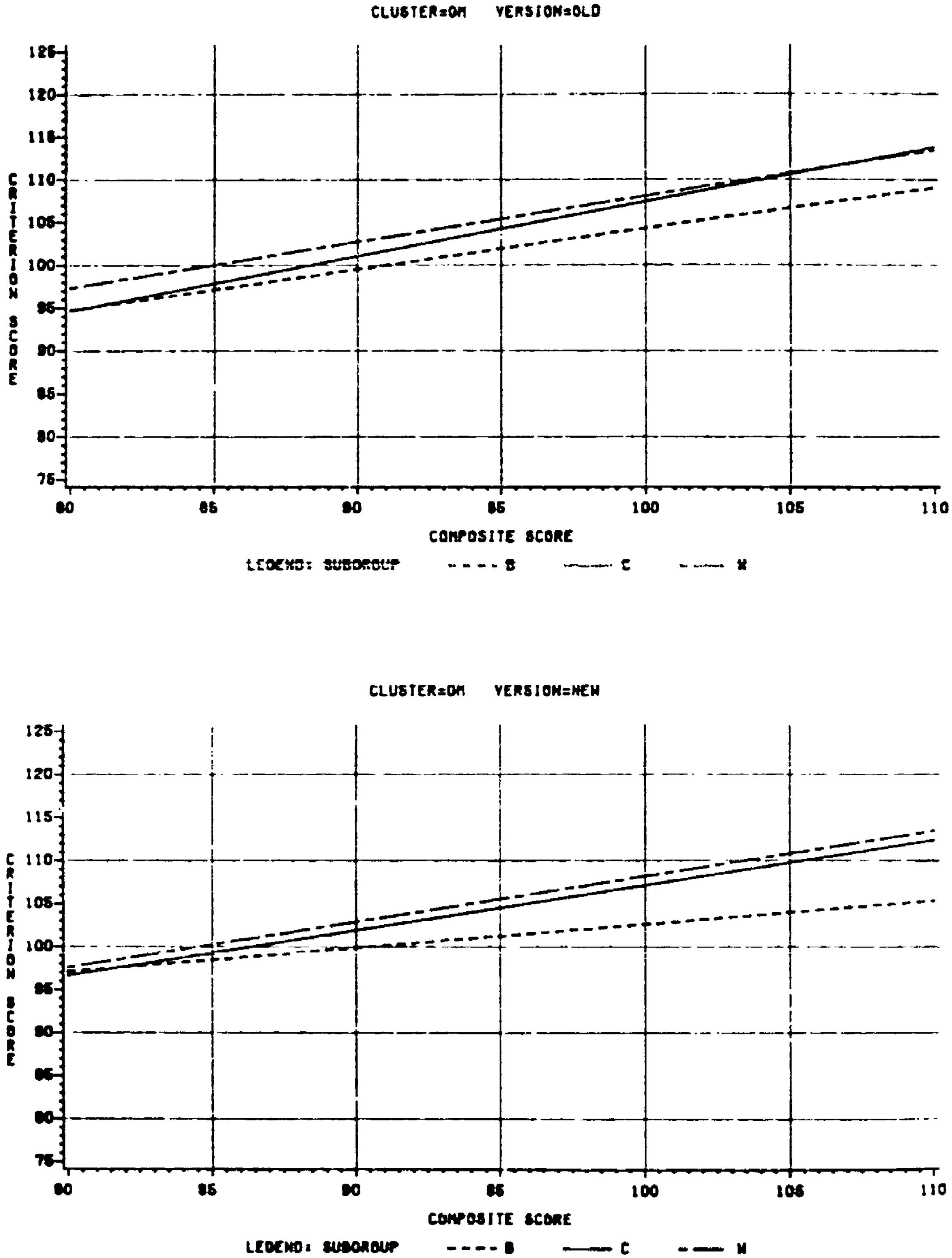
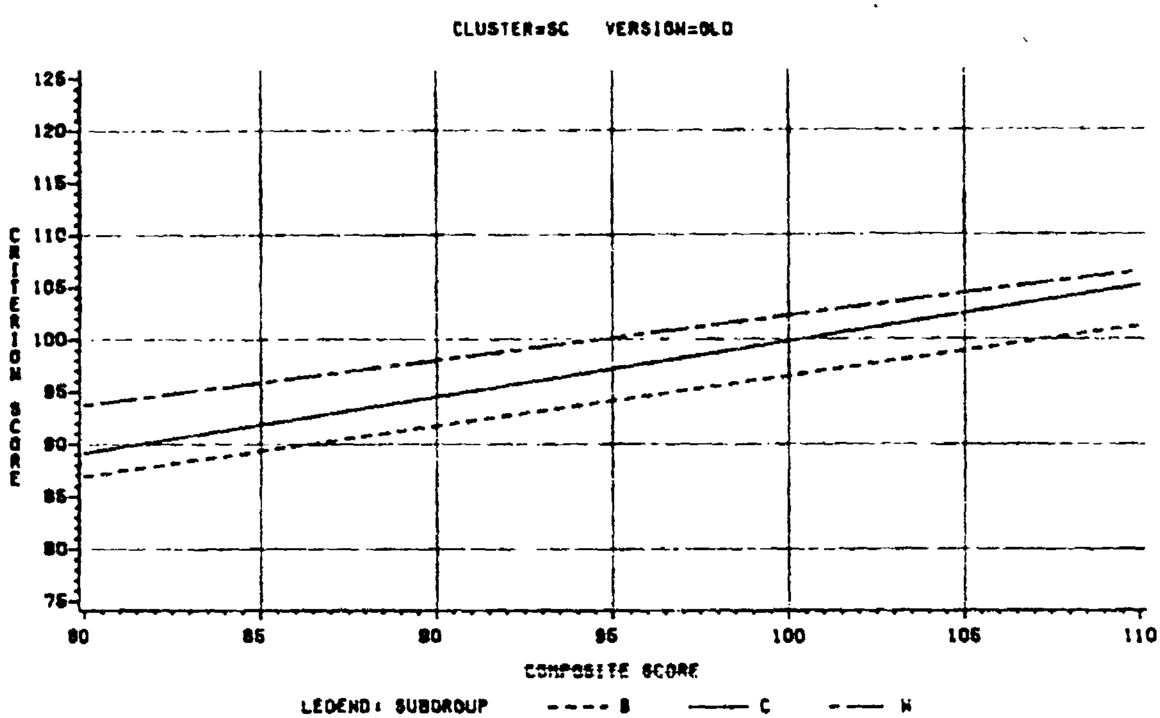


Figure 8. Regression lines for Current and Alternative (old and new) Composites for GM MOS, by Race



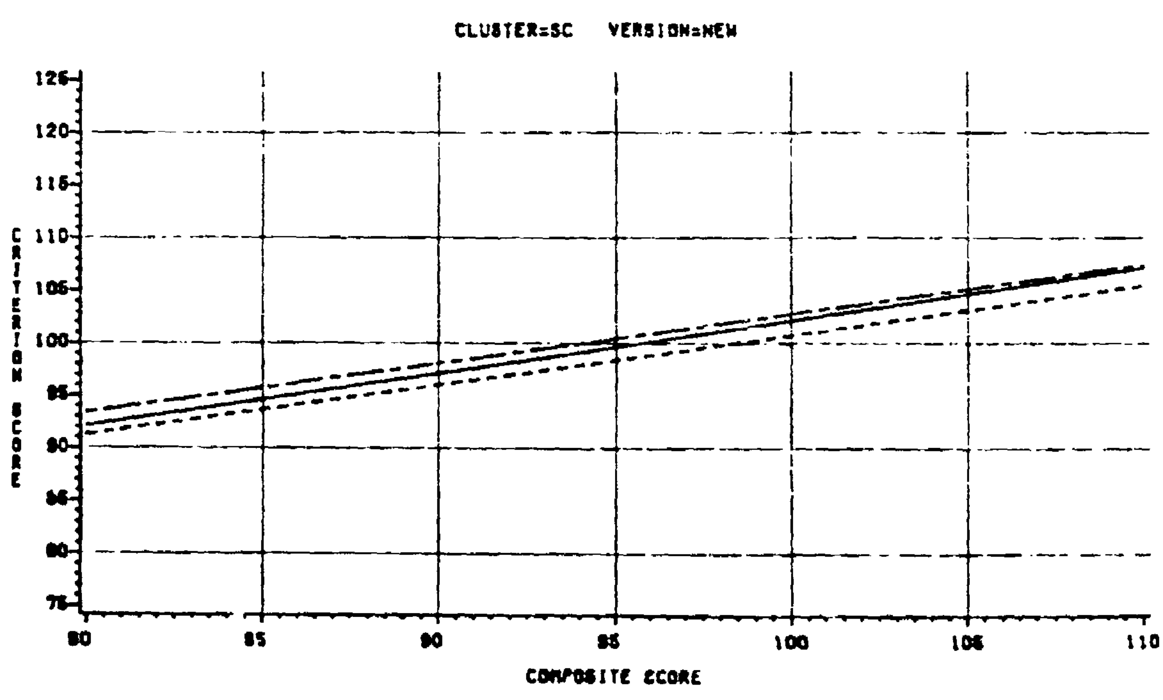
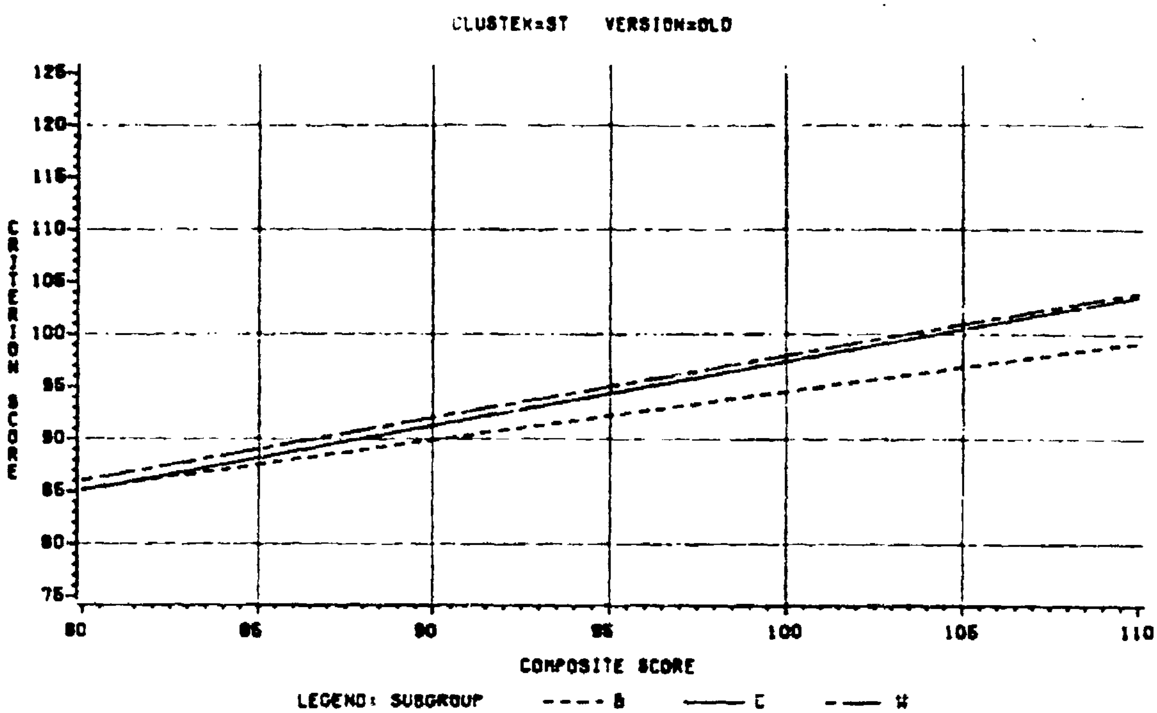


Figure 9. Regression lines for Current and Alternative (old and new) Composites for SC MOS, by Race



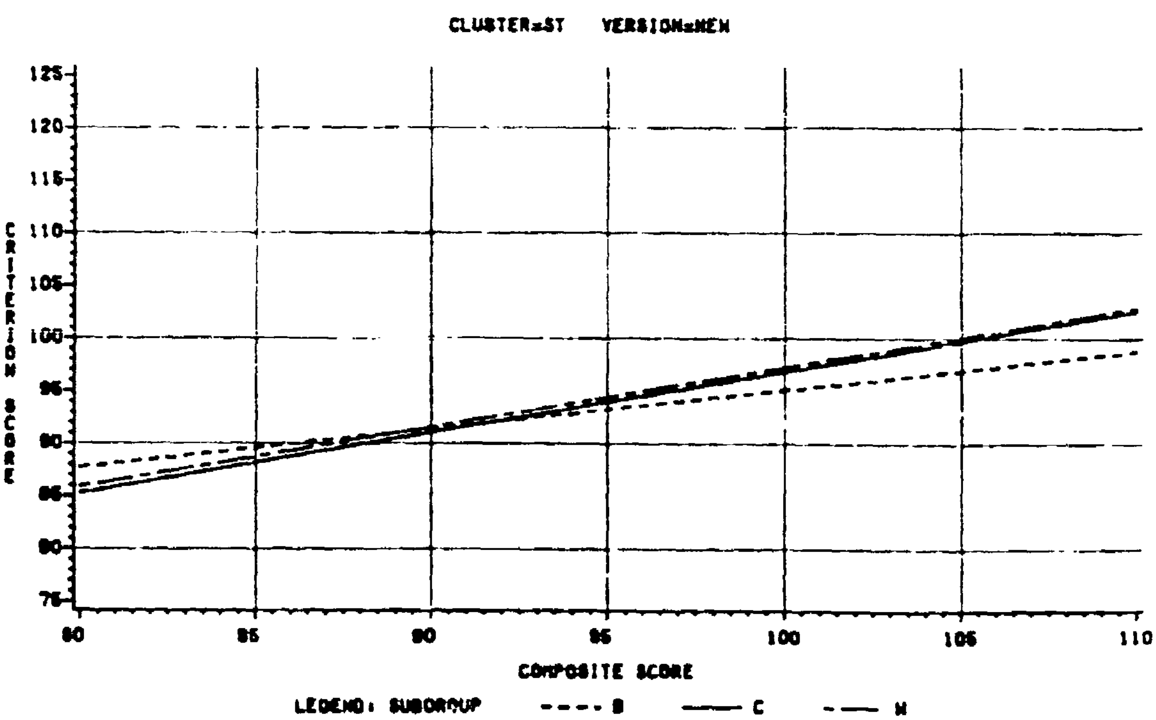


Figure 10. Regression lines for Current and Alternative (old and new) Composites for ST MOS, by Race

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Figures 2 through 10 also show that the pattern of the relationships between the three regression lines near the possible cutoff values is quite similar for the two sets of composites for most of the nine clusters. Eight of the nine composites show overprediction of performance by blacks rather than the more serious underprediction of performance. The one exception was the OF cluster, which revealed overprediction for the lower composite scores and underprediction for the higher values. This pattern among the regression lines of the OF cluster was observed for both the operational and the proposed alternative composites.

To summarize the findings of the investigation of black versus white predictive bias, it appears that there are small differences in the predictive validities and the regression lines for the two groups for all composites in both their operational and alternative versions. The subgroup regression lines are also not perfectly approximated by a single common regression line, although for both sets this difference results in overprediction rather than underprediction of blacks in the region of the lines where selection and classification takes place. However, since the validity and regression line differences were not very large and the use of the common regression line does not, in general, result in underprediction of performance by blacks, either set of composites could be used without unfairly impacting the enlistment of black soldiers.

Analyses of Differences by Gender

The sample and adjusted validities for gender subgroups of the current AA operational composites based upon the combined SQT and training criterion are presented in Table 33. Similar data but based upon the four proposed alternative composites are found in Table 34. The CO, FA, and GM clusters are not included in either of these tables because no MOS in these clusters met the criterion of at least 100 female soldiers (CO and FA do not contain MOS that are currently open to enlistment for women).

As was the case in the analysis of racial subgroups, both sets of composites tend to be accurate predictors of performance in each subgroup. Here the mean overall validities were .42 and .45 respectively for the current and alternative composites. The tables also show that the adjusted validities for the alternative composites tended to be higher than the values obtained by the current composites for both subgroups and across all clusters. The one exception to this rule was the validity of the ACO composite when used to predict the performance of men in the EL cluster. In this case the adjusted validities were equal for the current and alternative composite.

Another similarity between the data presented in Tables 33 and 34 and the validity differences discussed earlier for the black and white subgroups is that there was little change in the adjusted validity differences between the groups as a function of the two composite sets. The mean difference between male and female adjusted validities was .06 for the operational composites and .05 for the alternative composites. The change in validity differences between the two tables is only .01 and for two of the clusters (CL and SC) the difference in subgroup validities was consistent across composite sets. This finding further suggests that differences in the predictive

Table 33

Sample and Adjusted Validities for Males ("M") and Females ("F")
Current Operational Composites
SQT and Training Criteria Combined

Cluster/ Composite	Sample Size "M"	Sample Size "F"	Sample Validities "M"	Sample Validities "F"	Adjusted Validities "M"	Adjusted Validities "F"	Difference (Adjusted)
CL	9035	4352	.30	.19	.48	.45	.03
EL	3110	852	.25	.10	.41	.16	.25
MM	2238	195	.30	.33	.43	.51	-.08
OF	8142	1536	.31	.23	.47	.43	.03
SC	4113	1097	.29	.13	.47	.28	.19
ST	5912	1195	.27	.31	.46	.50	-.04

Table 34

Sample and Adjusted Validities for Males ("M") and Females ("F")
Four Alternative Composites
SQT and Training Criteria Combined

Cluster/ Composite	Sample Size "M"	Sample Size "F"	Sample Validities "M"	Sample Validities "F"	Adjusted Validities "M"	Adjusted Validities "F"	Difference (Adjusted)
CL / ACL	9035	4352	.42	.32	.56	.53	.03
EL / ACO	3110	852	.26	.14	.41	.19	.22
MM / AOP	2238	195	.31	.34	.43	.52	-.09
OF / AOP	8142	1536	.35	.27	.50	.46	.04
SC / AOP	4113	1097	.37	.25	.51	.32	.19
ST / AST	5912	1195	.27	.35	.46	.52	-.06

validity of ASVAB composites between gender or racial subgroups is primarily a function of the the ASVAB subtests and not the manner those subtests are combined into composites.

Both Tables 33 and 34 show that in two clusters (EL and SC), there were fairly large differences in predictive validity between males and females. For the EL cluster this difference was .25 for the current composite and .22 for the alternative composite. The difference for the SC cluster was consistent at .19 for both composites. Whether these validity differences impact upon the selection and classification of women into these MOS clusters will be further discussed in the analysis of the differences between the regression lines and the discussion of the plots of the common and subgroup regression lines.

Table 35 presents the comparisons between the female and male regression lines for the current operational composites, while similar data are given for the four alternative composites in Table 36. The data in these tables were obtained in the manner that has been previously described in the analyses of racial subgroups.

Tables 35 and 36 show that, despite the higher predictive validity of the alternative AA composites for both subgroups, the subgroup regression lines based upon the operational composites tend to be closer together than the female - male regression lines based upon the alternative composites. The mean absolute value of the differences in predicted criterion scores between the two groups was 1.69 for the operational composites in comparison to 2.79 for the alternative composites. Four clusters (CL, MM, OF, and SC) showed sizeable increases in the absolute value of the differences, but of these the change for MM should not present an issue for the assignment of personnel to MOS. It represents an increase in overprediction of the female regression line by the male regression rather than underprediction. A more serious concern is the apparent underprediction of female performance by the proposed alternative AA composites in the CL, OF, and SC clusters. It should be noted, however, that an observed average of about two and a half units of underprediction for these clusters is fairly small in comparison to the combined criterion standard deviation of 20. The seriousness of these differences in regression lines also depends on where along the common regression line they are found, and this issue can be best addressed by examining the plots of the three regression lines for each cluster.

Figures 11 through 17 present the plots of the female, male, and common regression lines across for the range of composite scores that contain the cutoff values, for both the current operational and the proposed alternative composites. A comparison of the figures for these two sets of composites shows that for one cluster (ST) the pattern among the plotted regression lines is quite similar for the two sets of AA composites. For two other clusters (EL and MM) the alternative composites show more overprediction of female soldier performance than do the current operational composites. Since in both of these cases the female line is overpredicted by the common line, a switch to the alternative should not hinder the enlistment of women into the MOS that comprise the MM and ST clusters. The plots for the remaining three clusters (CL, OF, and SC) all showed an increase in underprediction of female performance with the alternative composites. For the CL and SC clusters, the current composites also showed underprediction of the female criterion scores, and the new composites produced a small increase in that underprediction, particularly for high composite scores. In the case of the

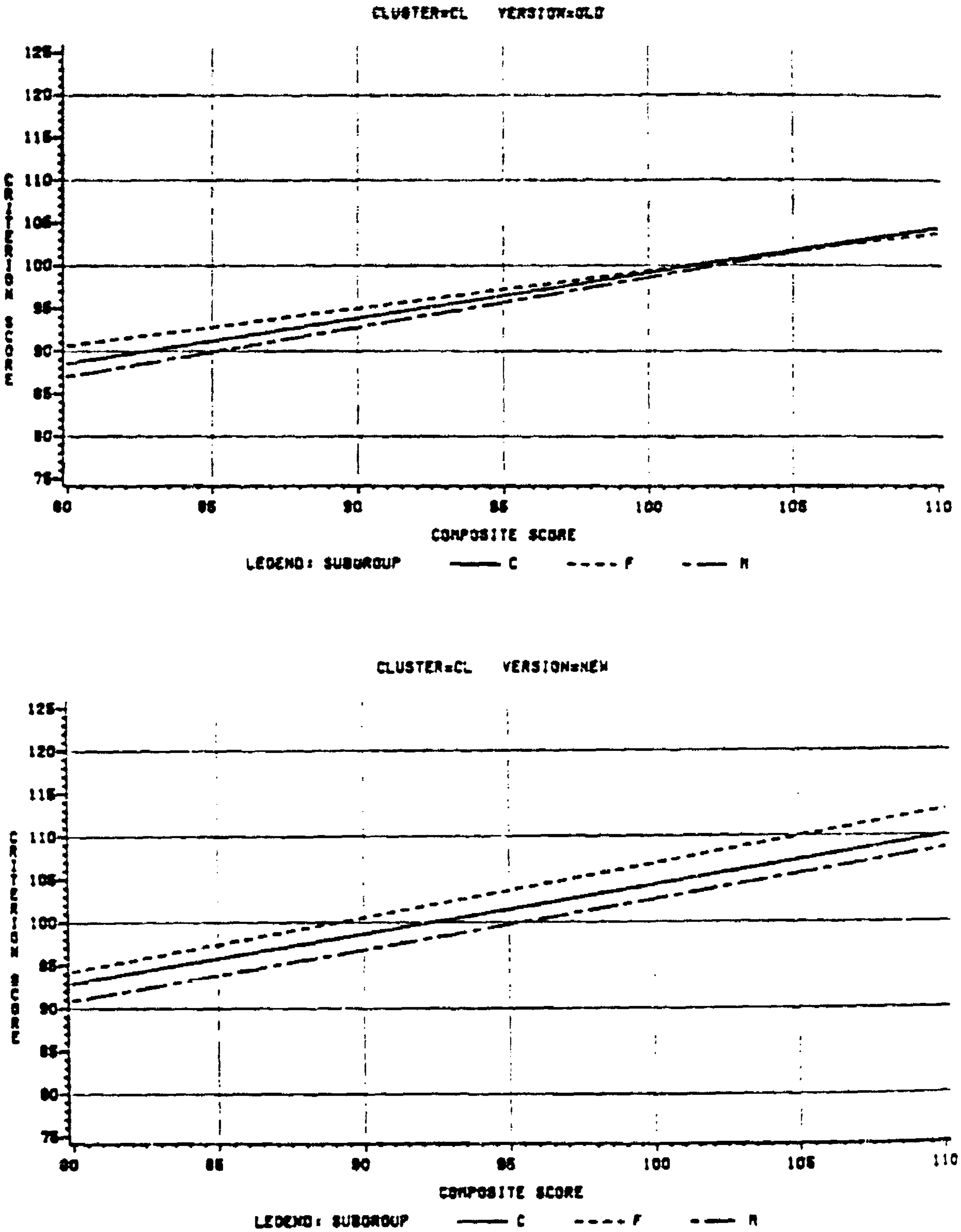
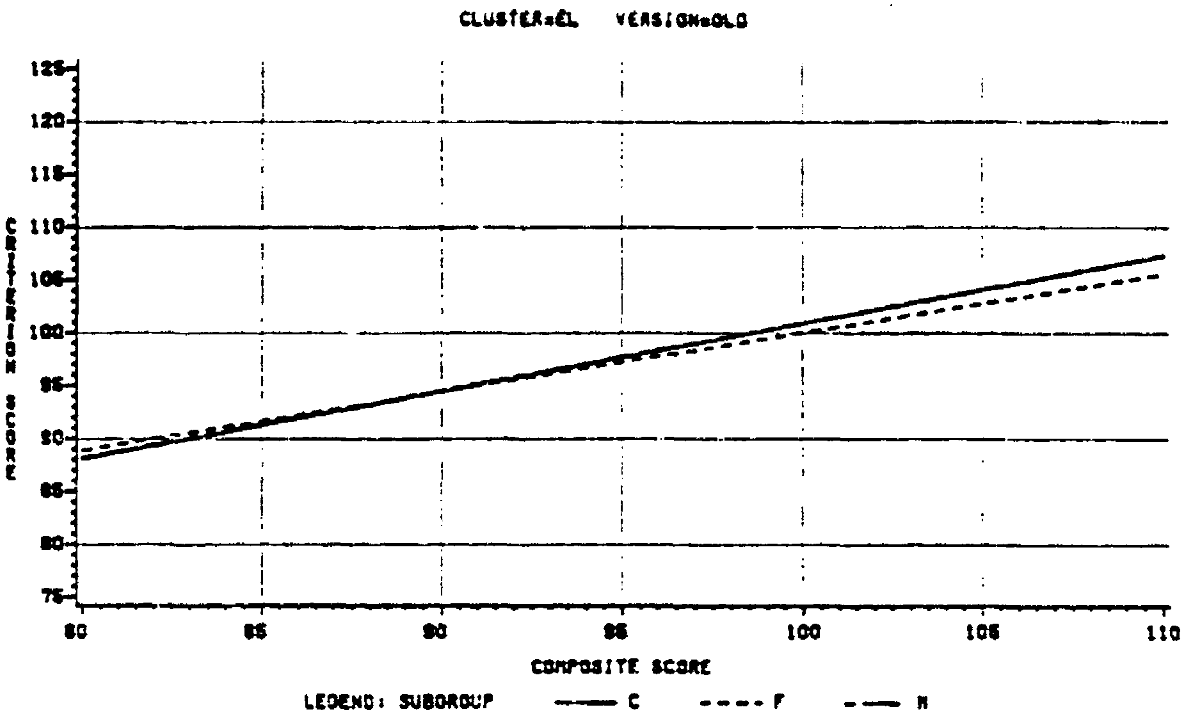


Figure 11. Regression lines for Current and Alternative (old and new) Composites for CL MOS, by Gender.



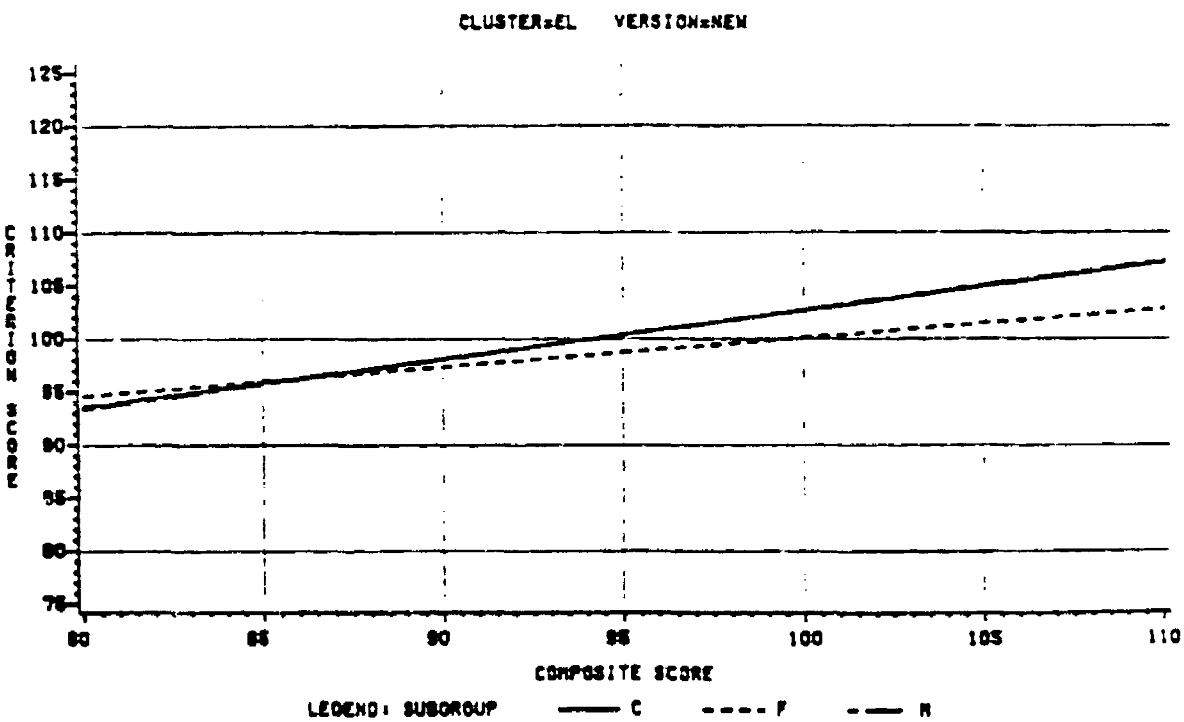


Figure 12. Regression lines for Current and Alternative (old and new) Composites for EL MOS, by Gender.

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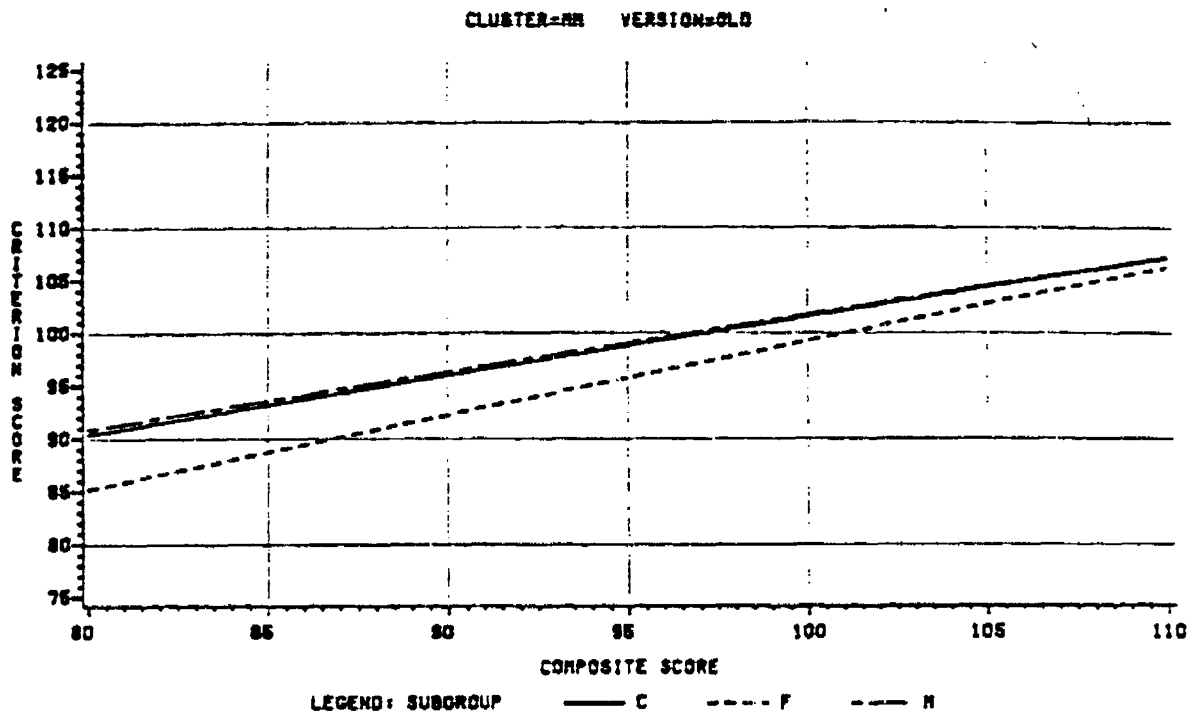


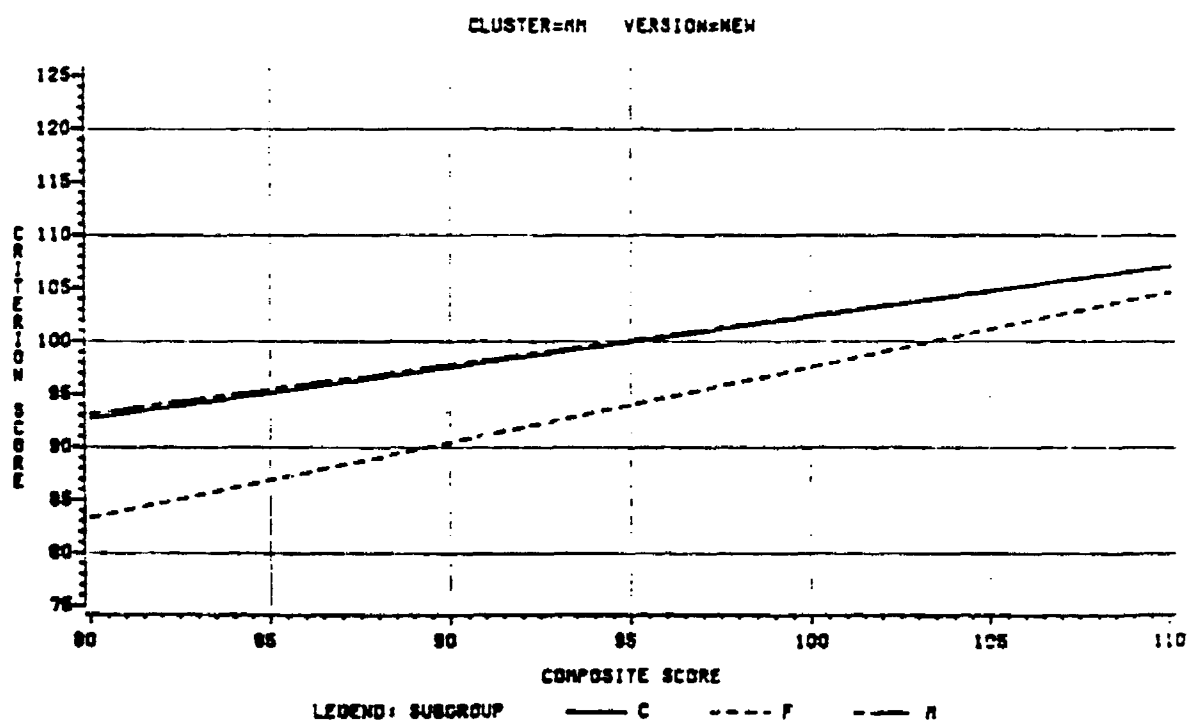
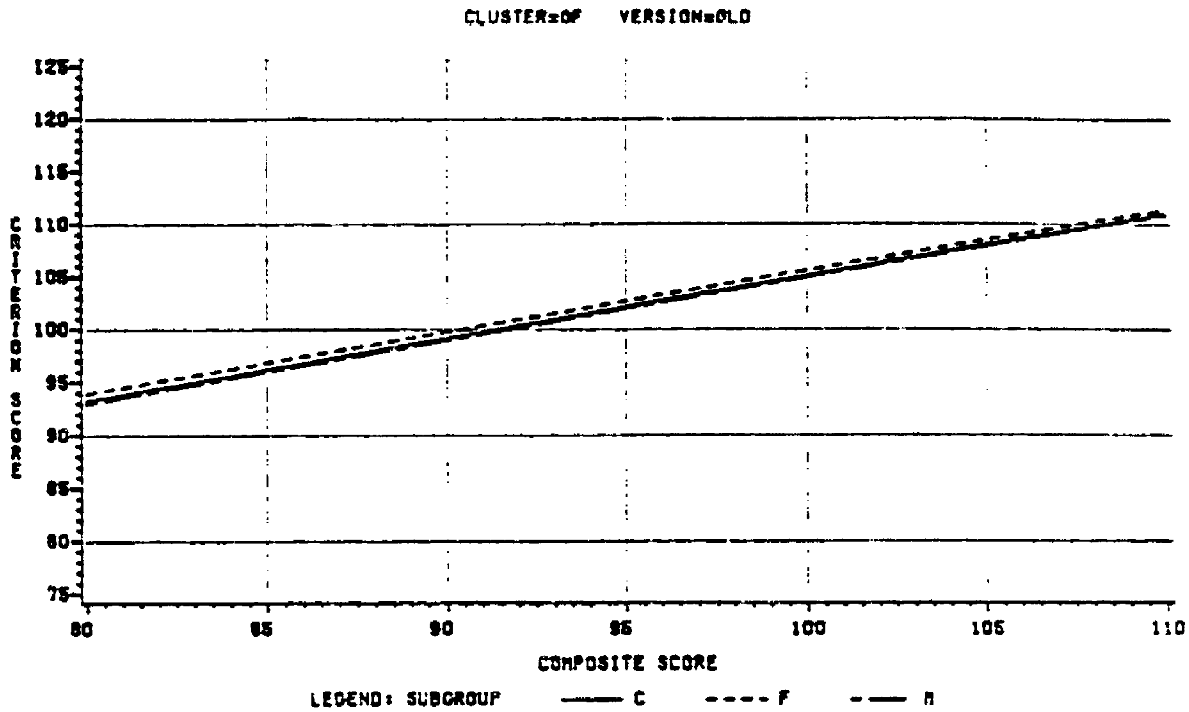


Figure 13 Regression lines for Current and Alternative (old and new) Composites for MM MOS, by Gender.



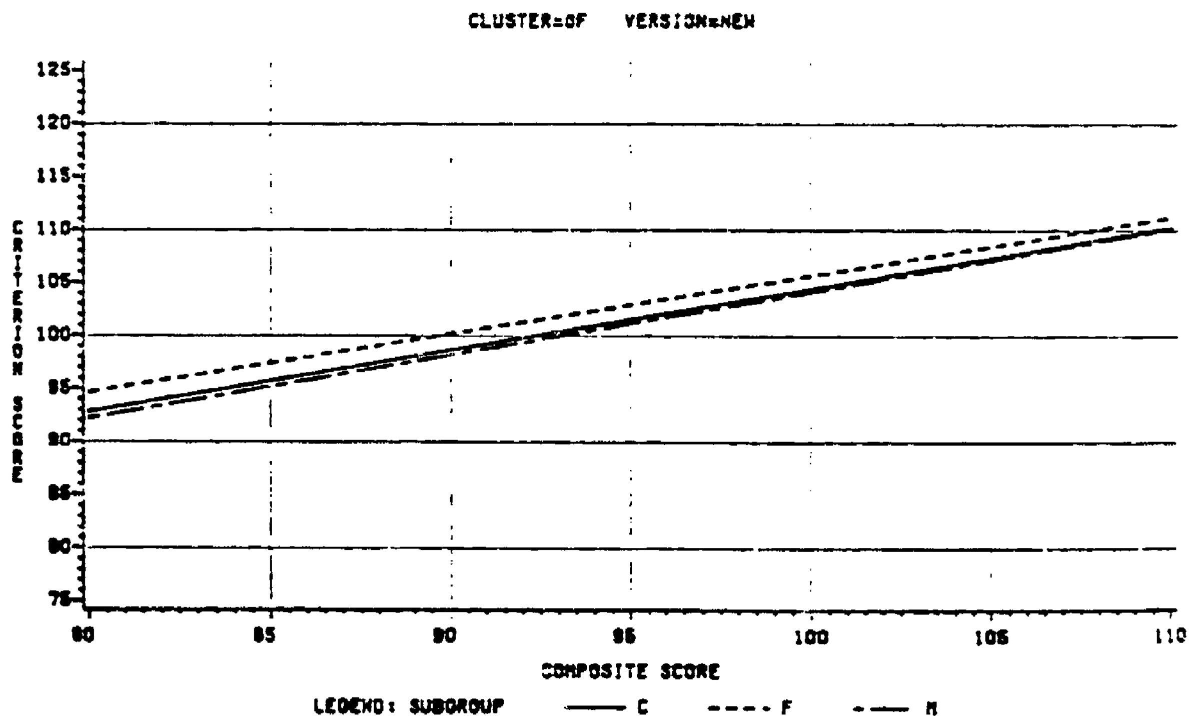


Figure 14 Regression lines for Current and Alternative (old and new) Composites for OF MOS, by Gender.

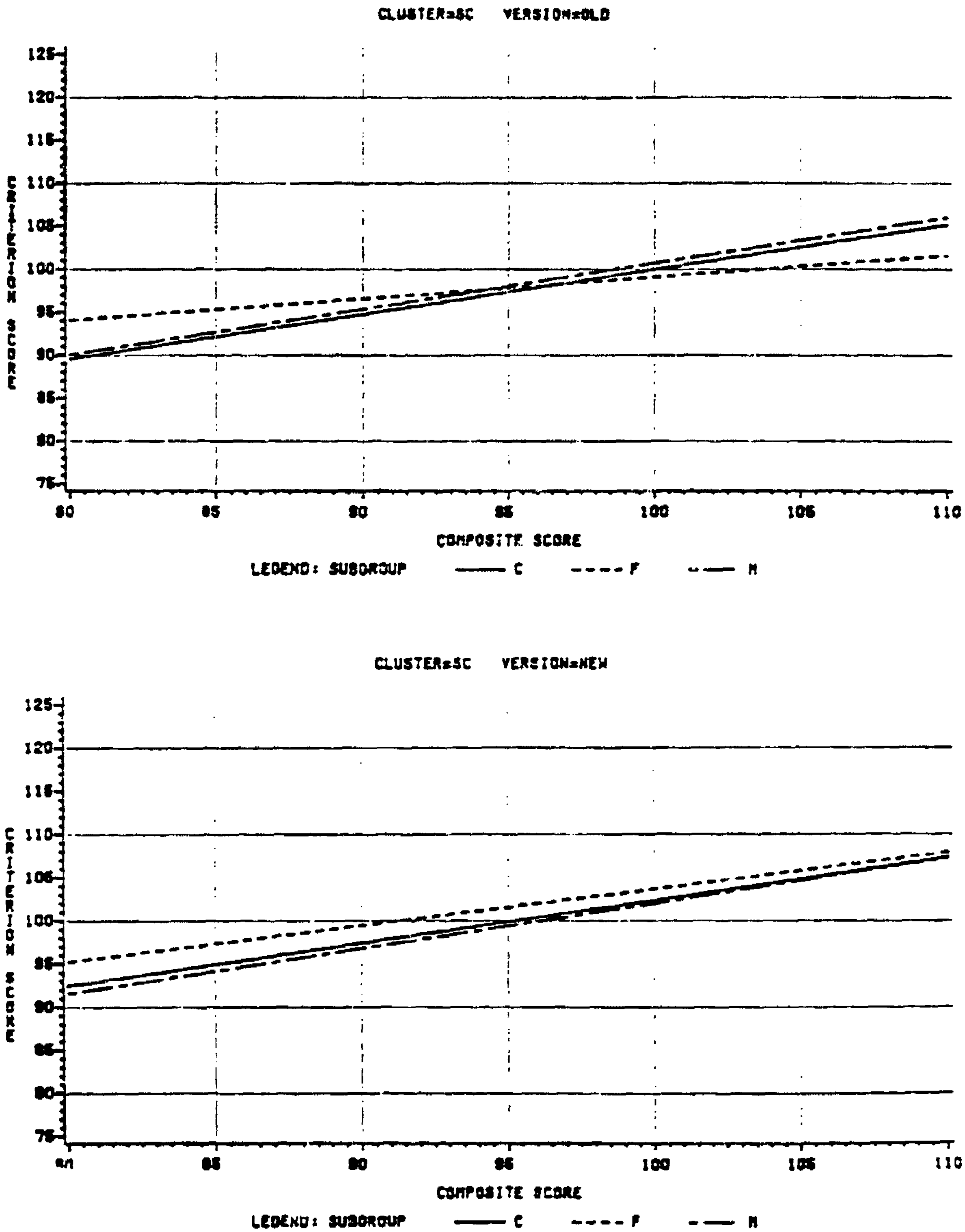
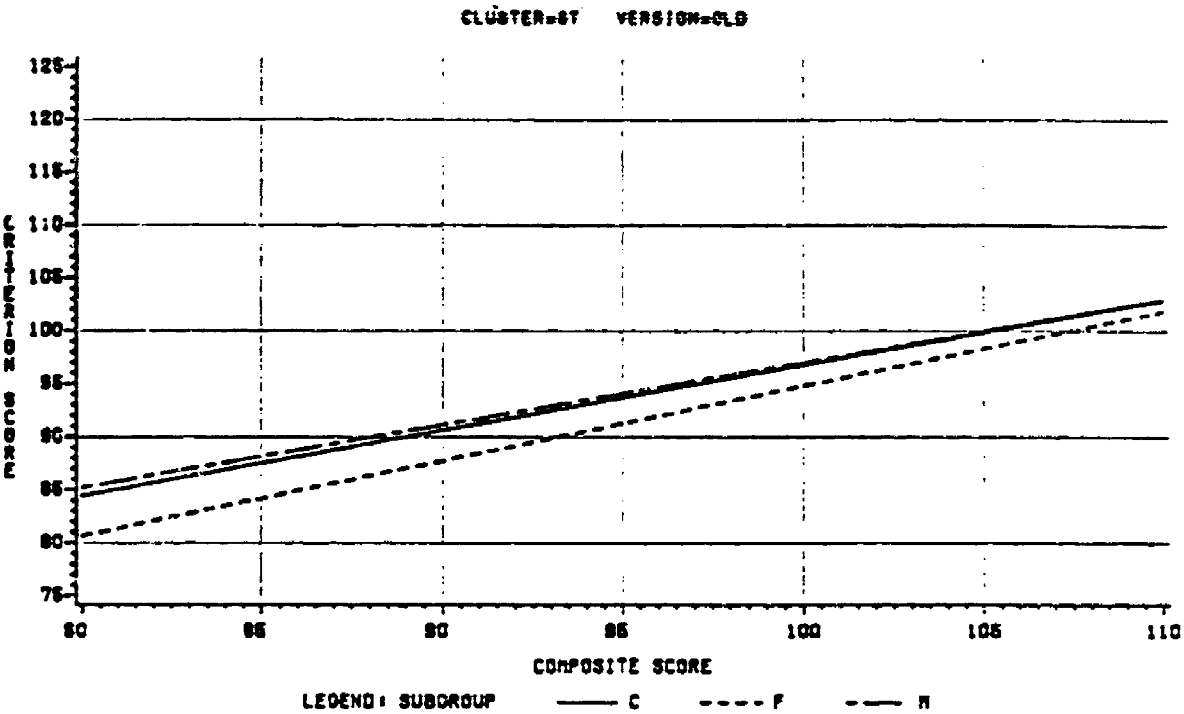


Figure 15 Regression lines for Current and Alternative (old and new) Composites for SC MOS, by Gender.



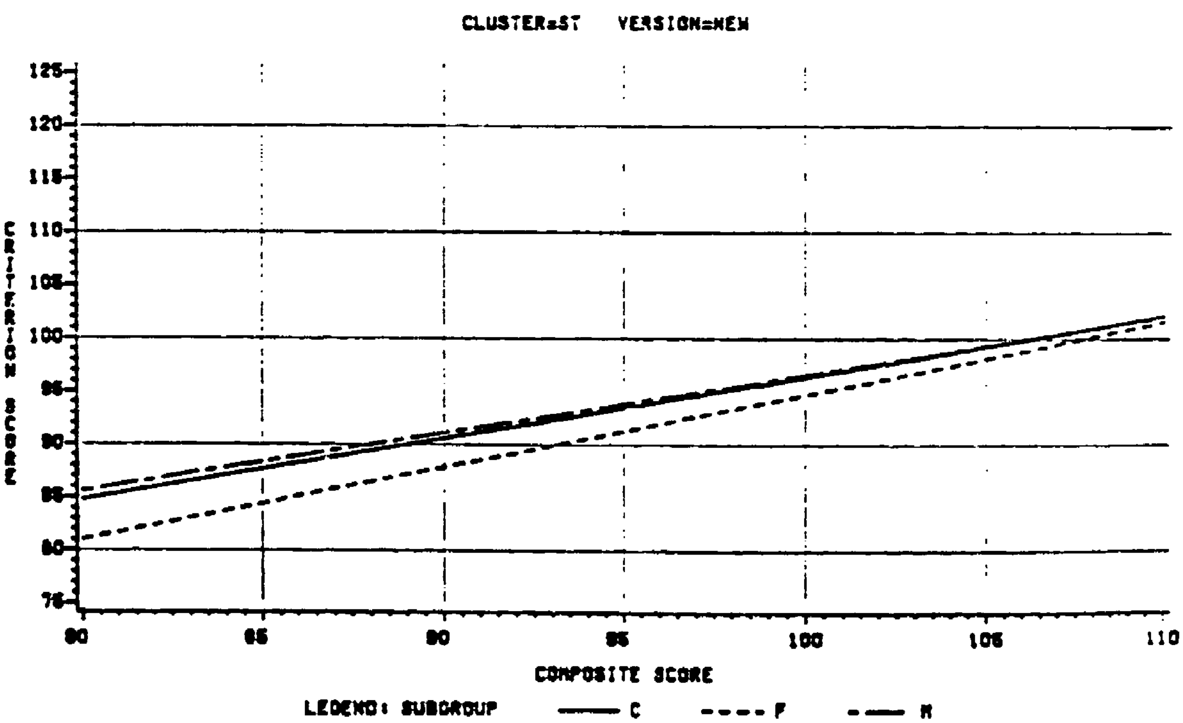


Figure 16 Regression lines for Current and Alternative (old and new) Composites for ST MOS, by Gender.

Table 35

Predicted Criterion Scores for Males ("M") and Females ("F"): Current Composites

Composite Score	Predicted (Combined	Criterion F	Score M)	Subgroup Difference (M - F)	Standard Error of the Difference
CL Cluster					
80	88.39	91.26	86.77	-4.49	3.02
85	91.03	93.36	89.68	-3.68	2.50
90	93.66	95.46	92.59	-2.87	2.03
95	96.30	97.56	95.50	-2.06	1.65
100	98.93	99.66	98.41	-1.25	1.42
105	101.56	101.77	101.33	-.44	1.38
110	104.20	103.87	104.24	.37	1.58
EL Cluster					
80	84.23	86.20	83.98	-2.22	2.97
85	88.28	89.74	88.09	-1.65	2.39
90	92.32	93.28	92.20	-1.08	1.83
95	96.37	96.83	96.31	-.51	1.35
100	100.42	100.37	100.42	.05	1.03
105	104.46	103.91	104.54	.62	1.04
110	108.51	107.46	108.65	1.19	1.39
MM Cluster					
80	90.37	85.24	90.88	5.63	2.98
85	93.16	88.74	93.59	4.85*	2.38
90	95.95	92.25	96.31	4.06*	1.92
95	98.74	95.75	99.02	3.27	1.71
100	101.53	99.25	101.74	2.49	1.86
105	104.32	102.75	104.46	1.70	2.29
110	107.11	106.25	107.17	.92	2.87
OF Cluster					
80	93.26	93.93	93.00	-.93	1.65
85	96.22	96.84	95.99	-.85	1.27
90	99.18	99.75	98.97	-.78	1.01
95	102.13	102.66	101.95	-.70	.97
100	105.09	105.57	104.94	-.63	1.17
105	108.05	108.47	107.92	-.55	1.52
110	111.00	111.38	110.90	-.48	1.95

(cont'd)

Predicted Criterion Scores for Males ("M") and Females ("F"):
Current Composites (Continued)

Composite Score	Predicted (Combined	Criterion F	Score M)	Subgroup Difference (M - F)	Standard Error of the Difference
SC Cluster					
80	89.64	94.26	90.44	-3.82	4.05
85	92.25	95.45	93.08	-2.37	3.29
90	94.87	96.63	95.72	-.92	2.57
95	97.48	97.82	98.36	.54	1.94
100	100.09	99.01	101.00	1.99	1.50
105	102.71	100.20	103.64	3.44*	1.46
110	105.32	101.38	106.28	4.90*	1.84
ST Cluster					
80	85.21	81.52	86.03	4.51	3.19
85	88.22	84.89	88.92	4.03	2.67
90	91.22	88.26	91.82	3.55	2.18
95	94.23	91.64	94.71	3.07	1.72
100	97.23	95.01	97.60	2.59	1.33
105	100.24	98.39	100.50	2.11	1.10
110	103.24	101.76	103.39	1.63	1.13

* $p < .05$

OF cluster, the three regression lines of the current composite are essentially equal, while a switch to the alternative composite would result in some underprediction along the entire regression line. In general, the degree of underprediction of female scores shown in these three clusters is relatively small. The CL cluster is perhaps the most extreme case and here the common regression line falls only about two points below the female line.

Considering all of the data discussed above, it appears that the alternative AA composites could replace the composites now being used operationally without increasing predictive bias on the basis of gender. The differences in predictive validity of the two sets of composites are quite similar, and the degree of underprediction of female performance by a common regression line is much the same for both composite sets.

Other Analyses of Subgroup Differences

One possible explanation of the lower predictive validities for blacks in Tables 29 and 30 and for females in some clusters of Tables 33 and 34 is that these subgroups showed less variability in their criterion scores than the other two subgroups. The data relevant to this hypothesis can be found

Table 36

Predicted Criterion Scores for Females ("F") and Males ("M"): Four Alternative Composites

Composite Score	Predicted Criterion Score (Combined	F	M)	Subgroup Difference (M - F)	Standard Error of the Difference
CL Cluster					
80	93.10	94.36	90.98	-3.38	2.86
85	96.08	97.63	94.06	-3.57	2.37
90	99.06	100.91	97.14	-3.77*	1.93
95	102.03	104.18	100.21	-3.97*	1.56
100	105.01	107.45	103.29	-4.16*	1.34
105	107.99	110.73	106.36	-4.36*	1.31
110	110.97	114.00	109.44	-4.56*	1.49
EL Cluster					
80	91.37	92.47	91.02	-1.45	2.95
85	94.49	95.38	94.20	-1.18	2.37
90	97.61	98.30	97.38	-.92	1.82
95	100.74	101.21	100.55	-.66	1.34
100	103.86	104.12	103.73	-.40	1.02
105	106.98	107.04	106.90	-.14	1.04
110	110.11	109.95	110.08	.13	1.38
MM Cluster					
80	92.70	84.42	93.28	8.86	2.97
85	95.13	87.82	95.66	7.83	2.36
90	97.57	91.23	98.03	6.80	1.90
95	100.00	94.63	100.40	5.77	1.70
100	102.43	98.04	102.77	4.74	1.85
105	104.86	101.44	105.14	3.70	2.27
110	107.29	104.84	107.52	2.67	2.86
OF Cluster					
80	92.75	94.06	92.21	-1.85	1.62
85	95.81	97.24	95.32	-1.91	1.25
90	98.88	100.42	98.44	-1.98*	.99
95	101.94	103.59	101.55	-2.04*	.95
100	105.01	106.77	104.67	-2.10	1.15
105	108.07	109.95	107.78	-2.17	1.49
110	111.14	113.13	110.90	-2.23	1.91

(cont'd)

Predicted Criterion Scores for Females ("F") and Males ("M"):
Four Alternative Composites Solution (Continued)

Composite Score	Predicted (Combined	Criterion F	Score M)	Subgroup Difference (M - F)	Standard Error of the Difference
SC Cluster					
80	92.59	95.16	92.26	-2.90	3.88
85	95.17	97.41	94.89	-2.53	3.16
90	97.74	99.66	97.51	-2.15	2.47
95	100.31	101.91	100.14	-1.78	1.86
100	102.89	104.16	102.76	-1.40	1.44
105	105.46	106.41	105.39	-1.02	1.40
110	108.03	108.66	108.02	-.65	1.76
ST Cluster					
80	85.38	81.69	86.14	4.46	3.18
85	88.46	85.27	89.10	3.83	2.67
90	91.54	88.86	92.07	3.21	2.17
95	94.63	92.44	95.03	2.59	1.71
100	97.71	96.03	97.99	1.96	1.33
105	100.79	99.61	100.95	1.34	1.10
110	103.87	103.20	103.91	.71	1.13

$p < .05$

in Table 32 for the comparison of racial subgroups and Table 33 for comparisons based upon gender. It should be noted that all of the standard deviations in these tables are similar, because the criterion measures had been standardized to have a standard deviation of twenty in each MOS.

Examination of Table 37 shows that the small differences observed between black and white composite validities are not due to any major restriction in the variability of the criterion for black soldiers, relative to white soldiers. For seven of the nine clusters the black subgroup showed greater criterion variability than did the white subgroup. The differences in predictive validity between these groups, therefore, cannot be attributed to differences in criterion variability.

The data in Table 37 do suggest an explanation for the observed overprediction of black soldier performance by the use of a common regression line. For all nine clusters in this table, the mean criterion score for blacks is slightly smaller than the value for whites. Such a relationship normally leads to common line overprediction of the subgroup with the lower mean criterion score.

Table 37

Means and Standard Deviations Of the Combined Criterion Scores for Black (B) and White (W) Subgroups

Cluster	Means		Standard Deviations	
	B	W	B	W
CL	97.63	105.68	19.18	19.63
CO	94.46	103.71	20.05	19.08
EL	99.60	105.75	19.72	18.74
FA	97.23	107.55	19.24	18.25
GM	99.74	104.72	19.28	20.77
MM	95.13	103.99	20.63	18.97
OF	97.51	104.34	20.43	19.00
SC	97.00	105.78	19.93	18.62
ST	96.34	104.27	19.85	18.68

Table 38 shows that lower criterion variances cannot explain the differences in validities between females and males in Tables 33 and 34. For the clusters that had shown somewhat lower validities for females than males (CL, EL, OF, and ST), only in the CL cluster did the criterion scores from female soldiers have less observed variance than the male criterion scores.

Table 38

Means and Standard Deviations Of the Combined Criterion Scores for Female (F) and Male (M) Subgroups

Cluster	Means		Standard Deviations	
	F	M	F	M
CL	103.63	101.00	18.12	19.89
EL	102.09	105.05	19.16	18.92
MM	96.09	101.36	20.76	19.92
OF	99.34	101.78	20.23	19.77
SC	98.40	104.23	20.10	19.03
ST	99.86	103.76	20.37	18.74

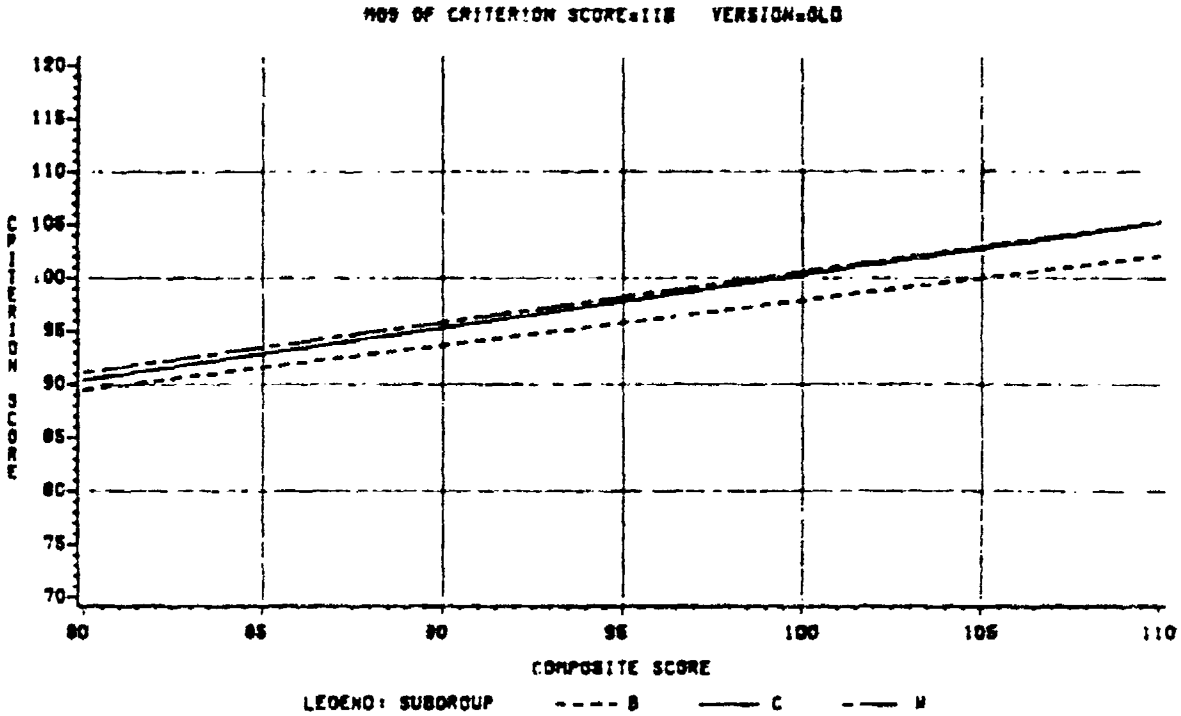
For all of the comparisons among subgroup predictive validities and regression lines discussed above, the reporting of analyses has been at the cluster rather than the MOS level. In order to aggregate the information to this level, the statistics were first calculated for each MOS. The resulting data were then pooled (weighted by sample size) across the appropriate MOS to obtain the analyses for each cluster or composite. While this approach is the most reasonable way to aggregate MOS-level data to the cluster level, it does not inform about MOS-level relationships. This question is particularly relevant for MOS with different proportions of subgroup populations.

We addressed this question by comparing regression lines for sets of two MOS within each cluster. The particular MOS for these analyses were selected according to the following criteria: First, there had to be at least two MOS within a cluster for which we had data for at least 100 soldiers in each subgroup. Second the two MOS within each cluster were selected by taking the two that showed the greatest difference in the ratio of subgroup sample sizes. For example, in the the analyses of racial differences within the CL cluster, the two MOS examined were 71L and 75D. In the case of 71L the ratio of whites to blacks was 1.07, while in 75D the same ratio was .43. This procedure was followed in order to maximize the probability of uncovering differences in the regression lines as a function of the distribution of subgroups within the MOS. The procedure had the side effect of allowing for the reporting of analyses of MOS with relatively small sample sizes in comparison to the other analyses of this report, but the minimum sample of at least 100 soldiers per subgroup was still large in comparison to past research.

For the MOS meeting these criteria the differences between subgroup regression lines for both racial and gender comparisons are given in Tables 39 and 40 for the current composites and in Tables 41 and 42 for the alternative composites. The comparison of the subgroup regressions to the common regression line are presented in Figures 17 through 30.

Three important findings emerge from these tables and figures. First, these data indicate that a switch to the alternative composites would not result in an increase in predictive bias for either blacks or women. Most (nine out of fourteen) of the MOS show quite similar patterns among the subgroup regression lines drawn from the current and alternative composites. For the comparisons based upon race, only MOS 11H and 13F showed substantial change with the new composites. For MOS 11H, the switch to the new composites would tend to result in overprediction of black soldier performance while the current system produces some underprediction. For MOS 13F, the new composites produce a subgroup regression line that is closer and no longer nearly parallel to the common regression line. Neither of these changes would negatively impact the enlistment of blacks into these MOS.

Likewise, a change to the alternative composites does not present problems for the enlistment of female soldiers even when the pattern among the regression lines appears to change with the composites. In the case of MOS 05C this change results only in the regression lines being closer together, and therefore showing less underprediction of female performance by the common regression line. For MOS 75C the relative degree of underprediction versus overprediction is fairly constant for the two sets of composites, but where each occurs along the common regression line changes as the composition of the composites changes. In this MOS, underprediction tends to occur for



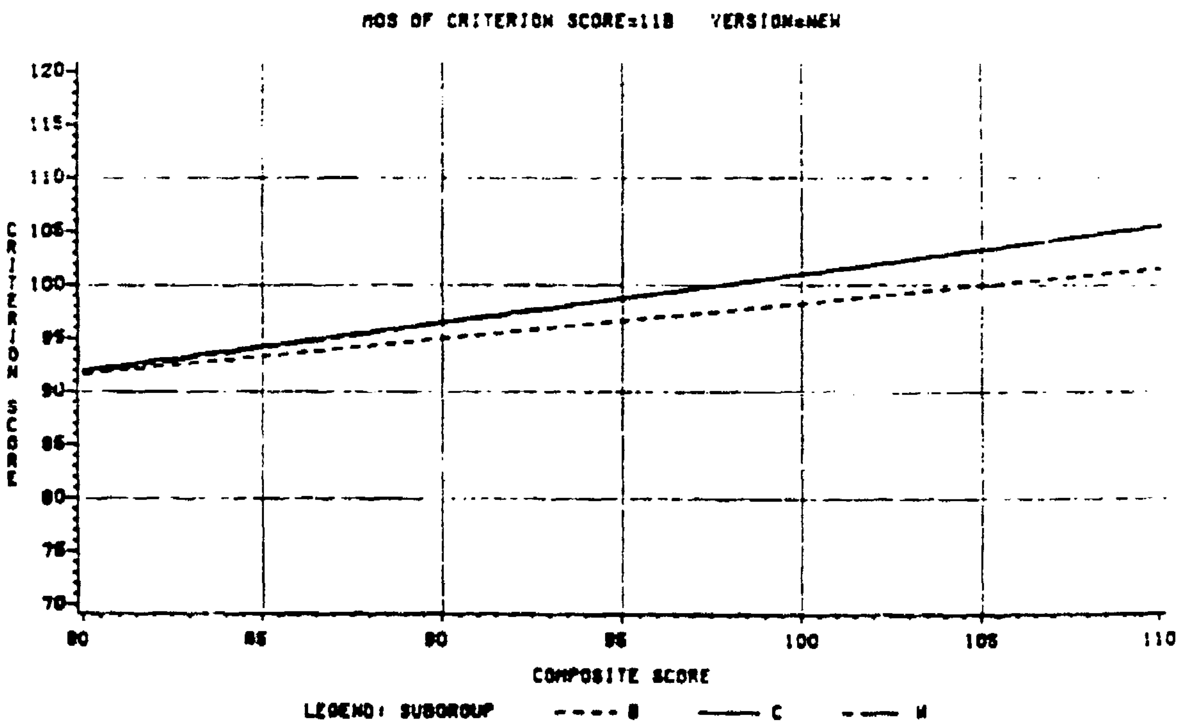
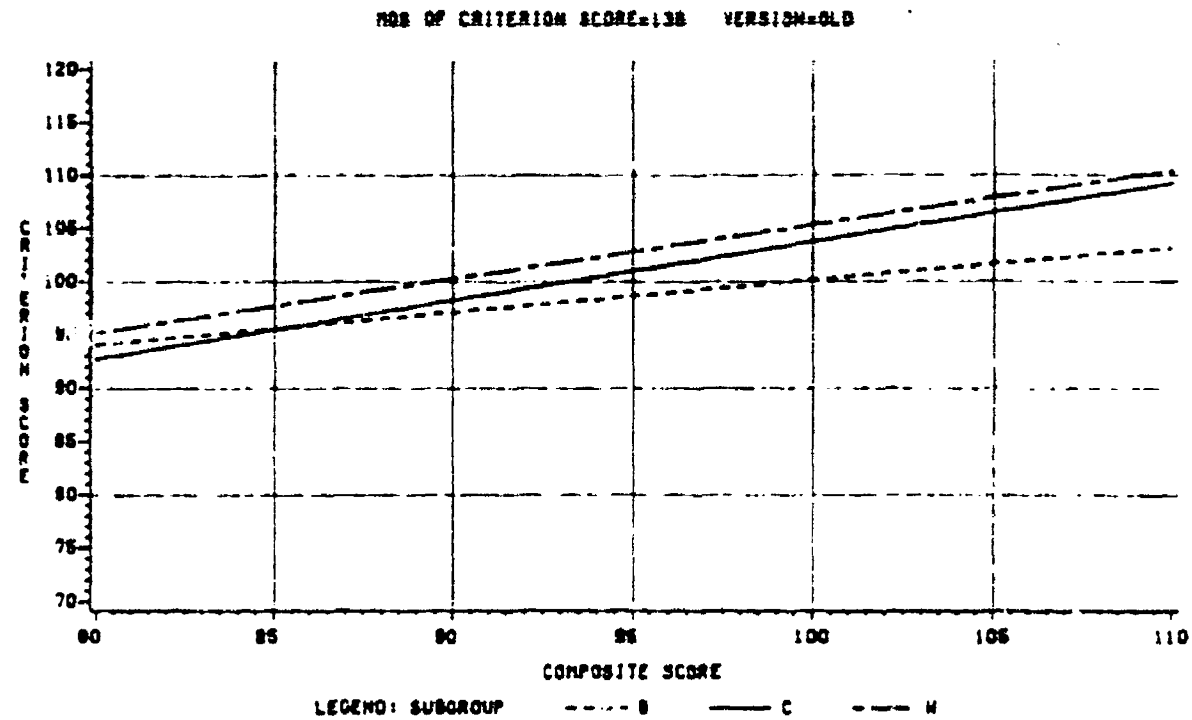


Figure 17 Regression lines for Current and Alternative (old and new) Composites for MOS 11B, by Race



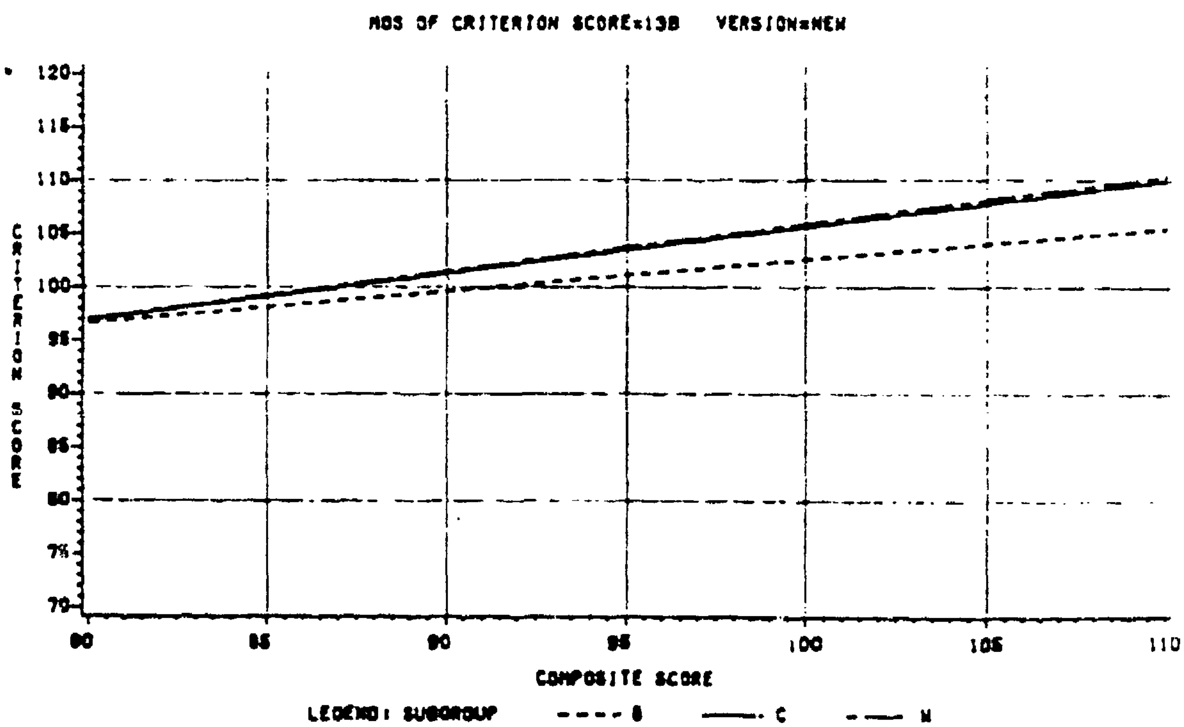


Figure 18 Regression lines for Current and Alternative (old and new) Composites for MOS 13B, by Race

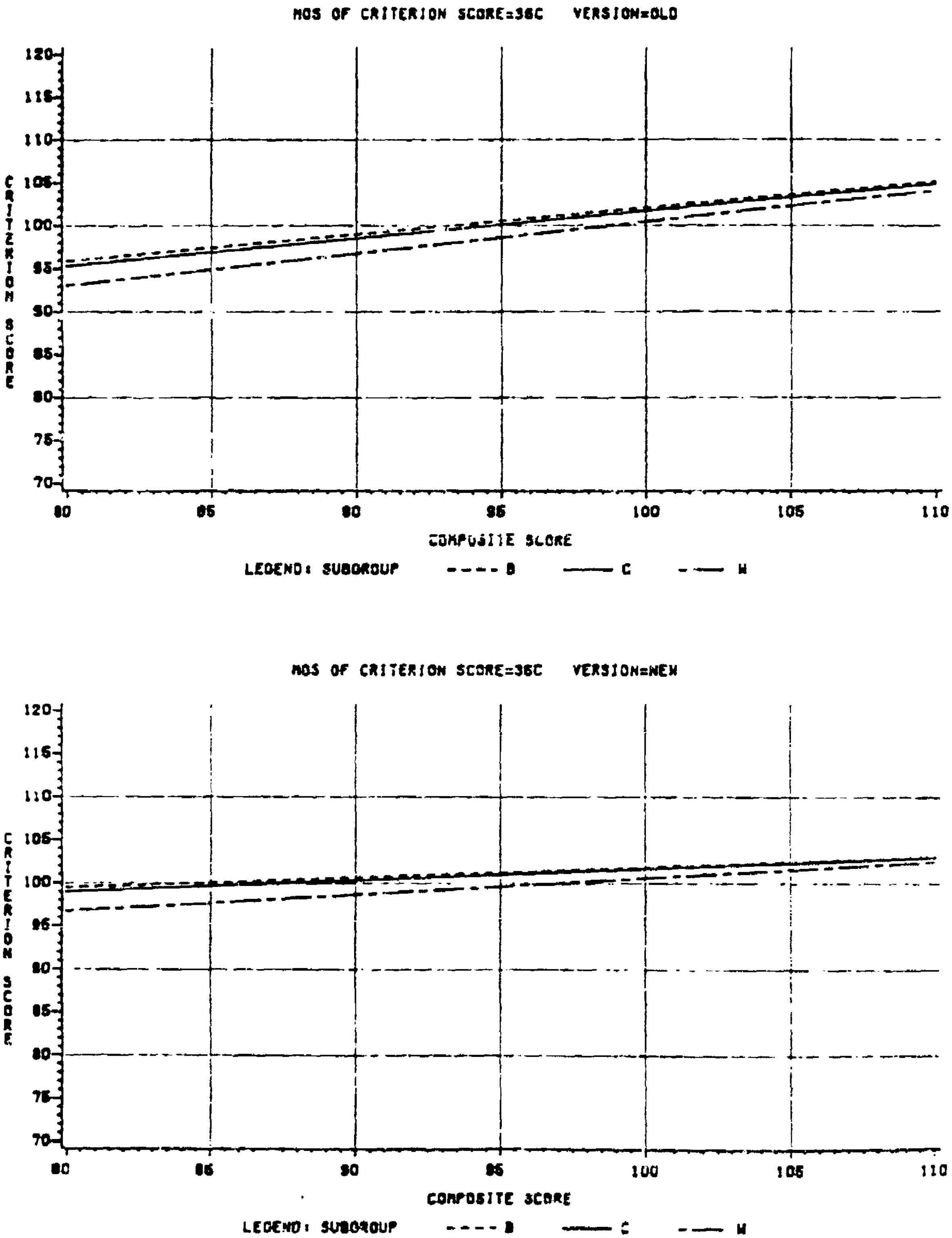
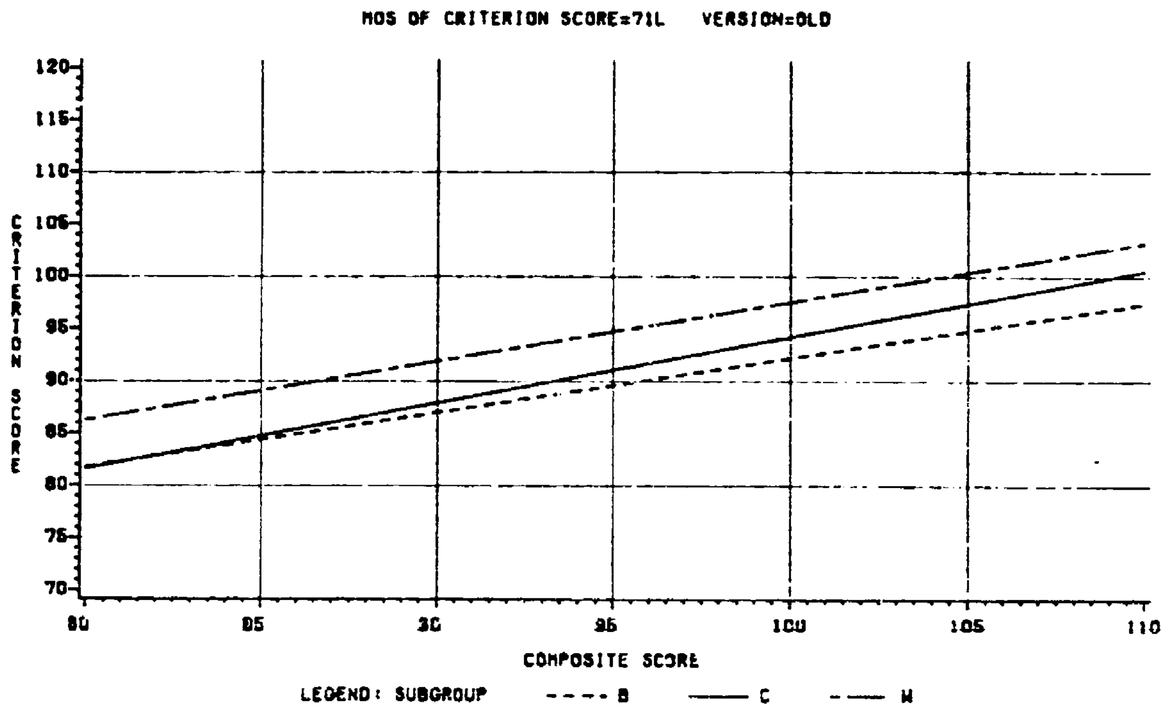


Figure 19 Regress on lines for Current and Alternative (old and new) Composites fcr MOS 36C, by Race



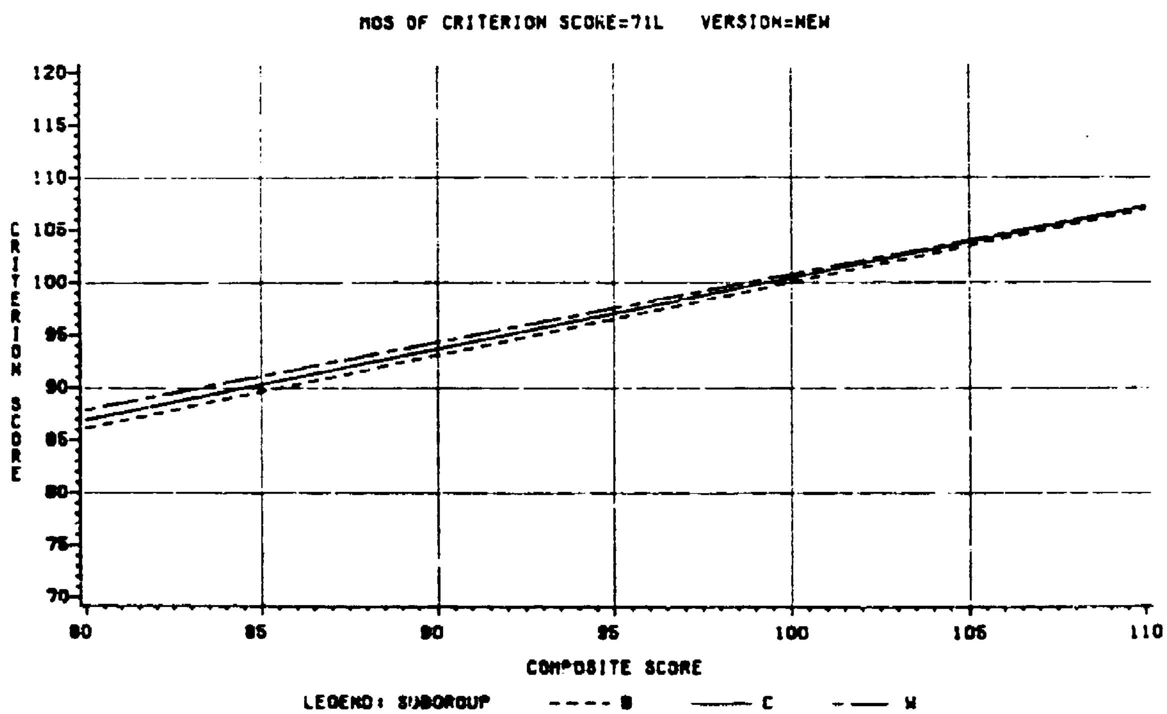


Figure 20 Regression lines for Current and Alternative (old and new) Composites for MOS 71L, by Race

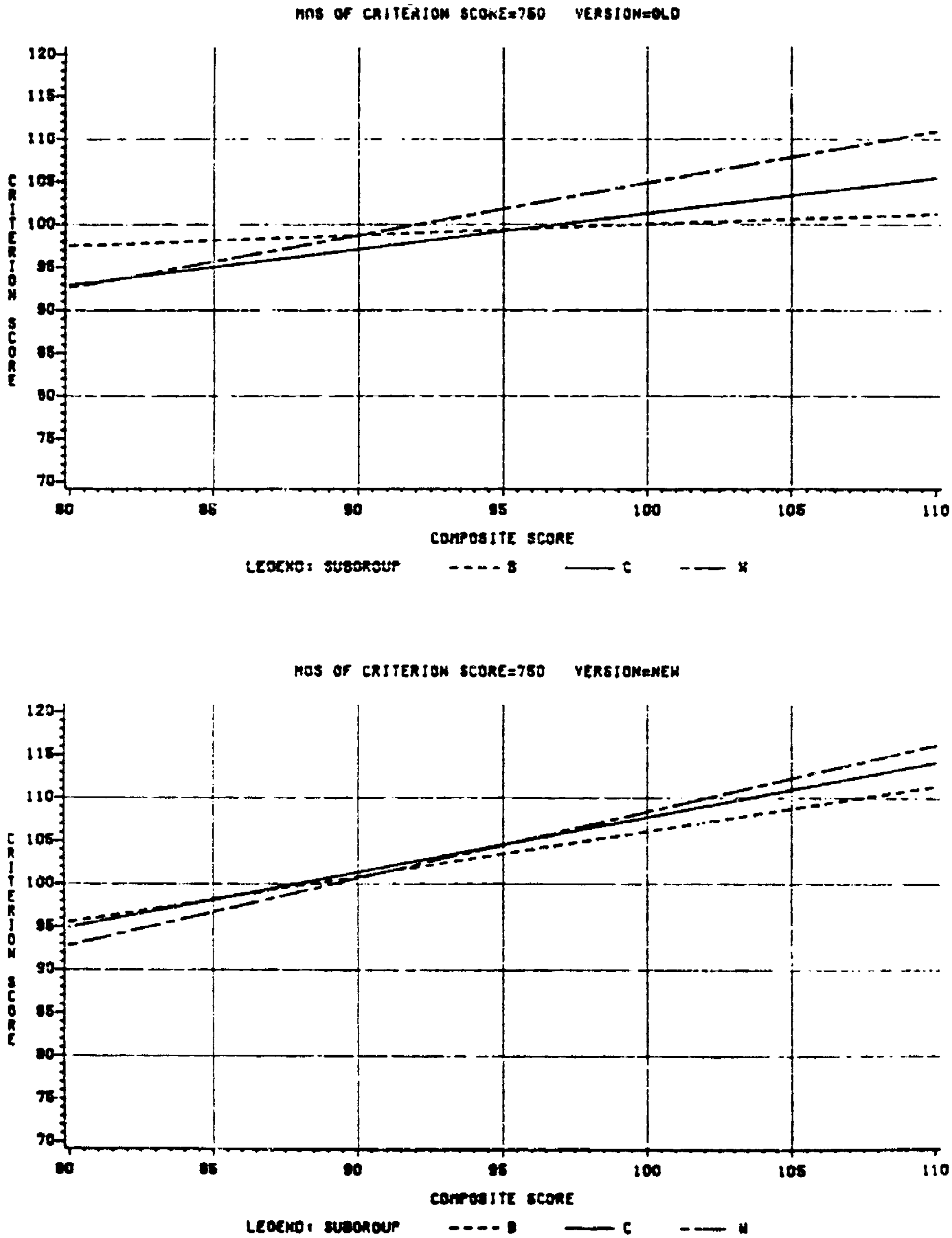
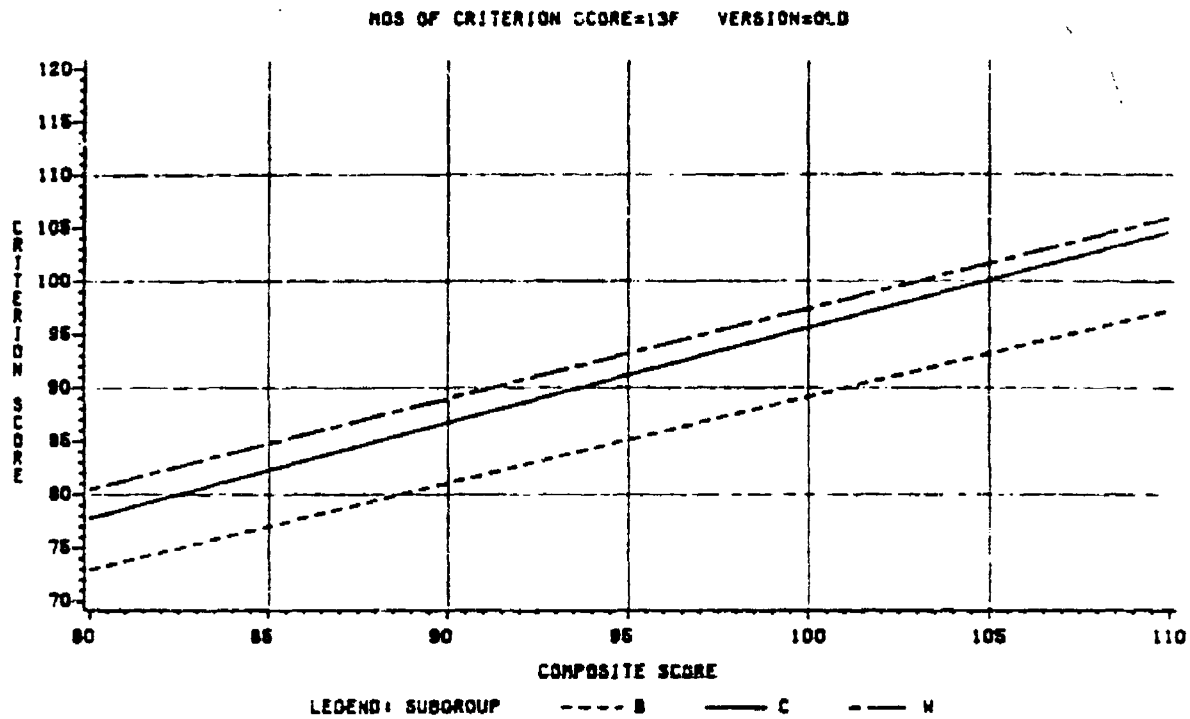


Figure 21 Regression lines for Current and Alternative (old and new) Composites for MOS 75D, by Race



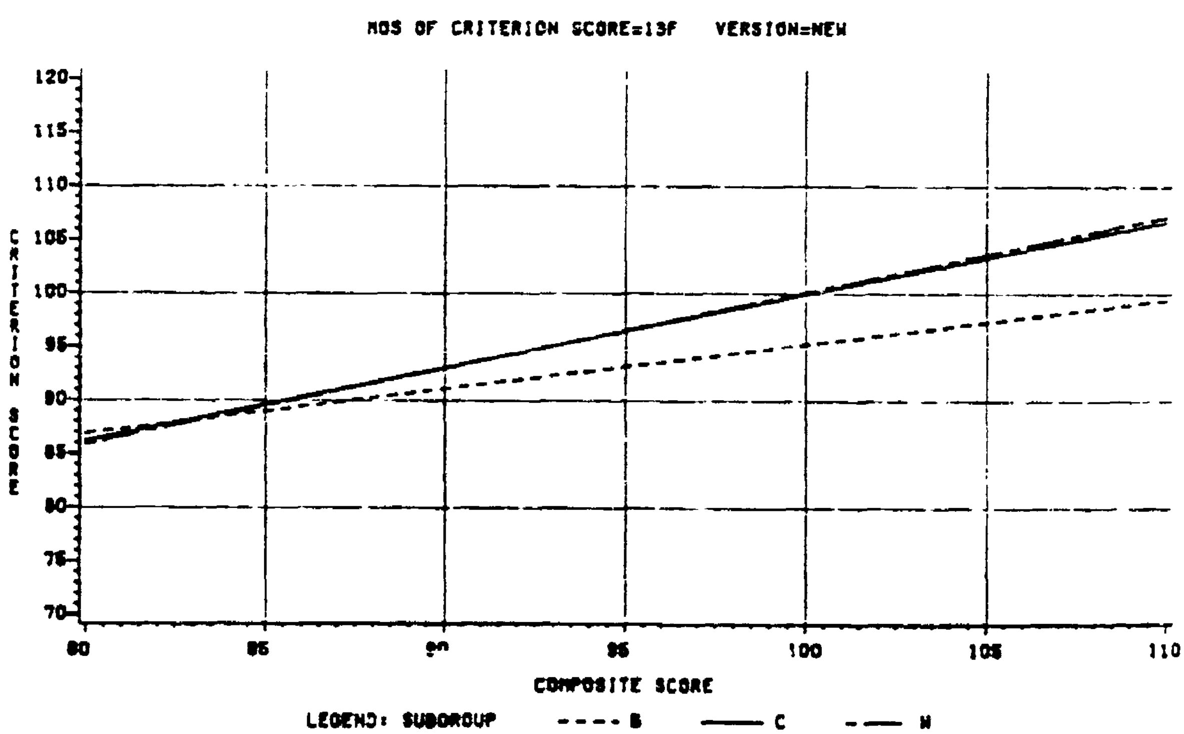


Figure 22 Regression lines for Current and Alternative (old and new) Composites for MOS 13F, by Race

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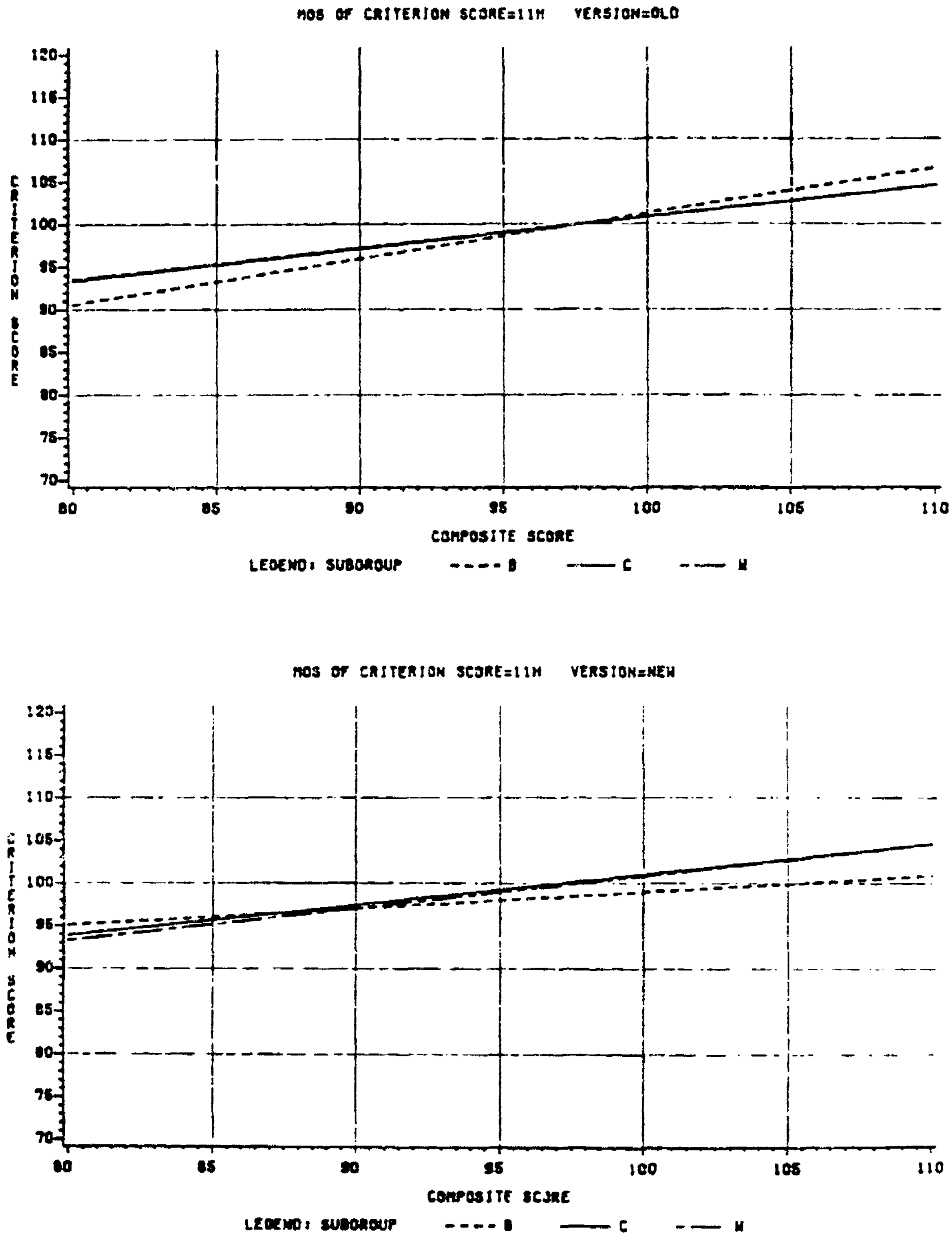
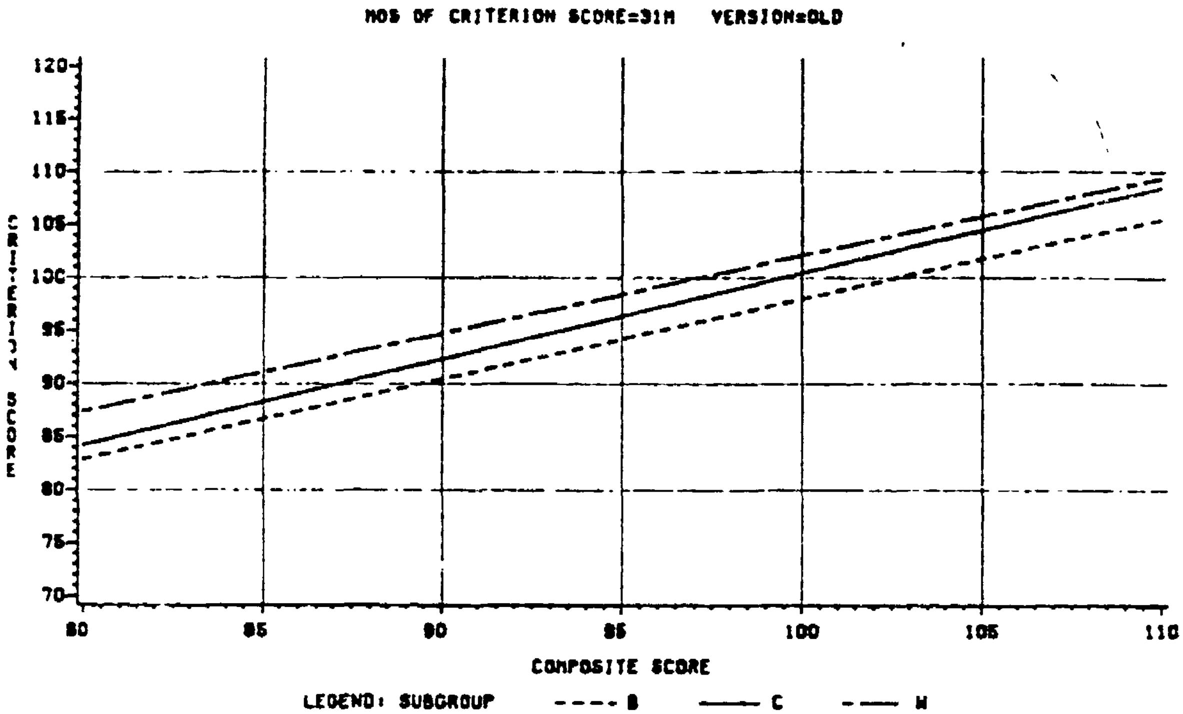


Figure 23 Regression lines for Current and Alternative (old and new) Composites for MOS 11H, by Race



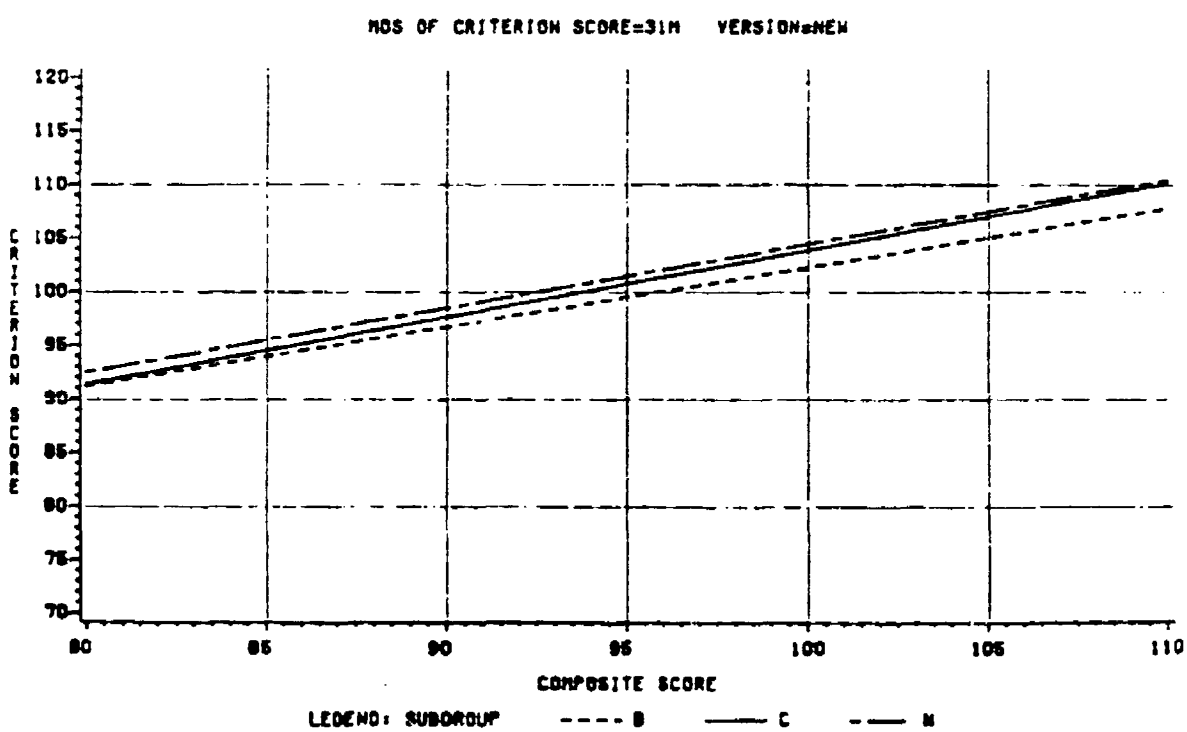
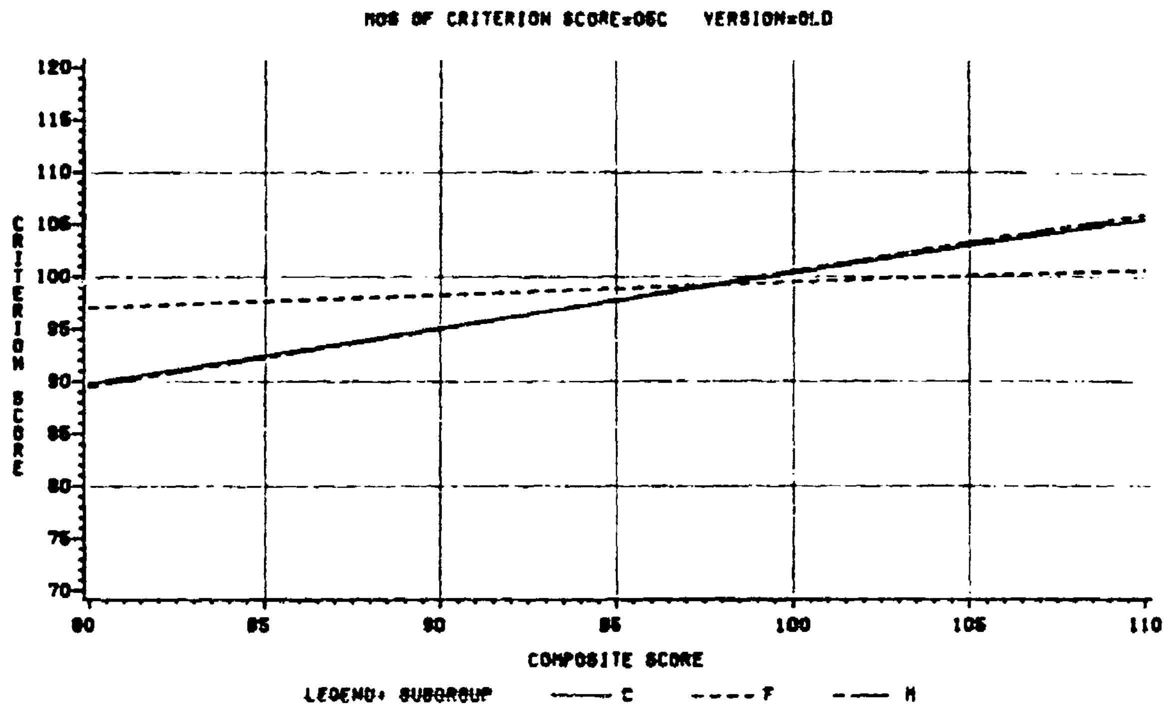


Figure 24 Regression lines for Current and Alternative (old and new) Composites for MOS 31M, by Race



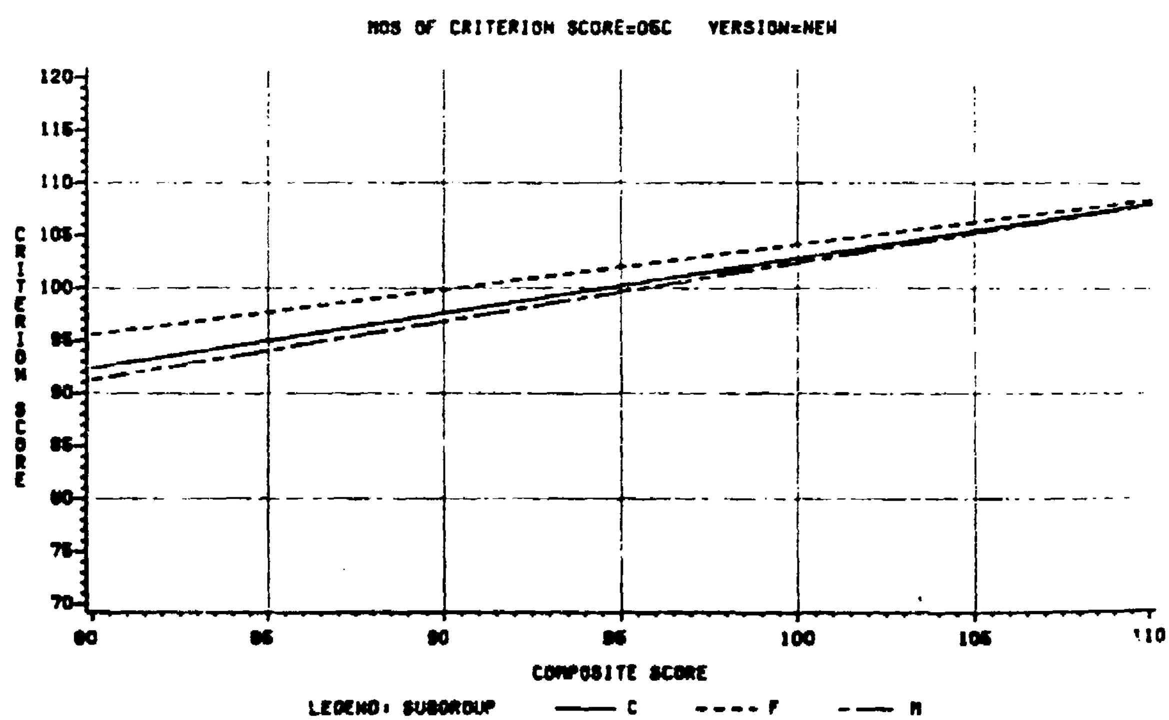
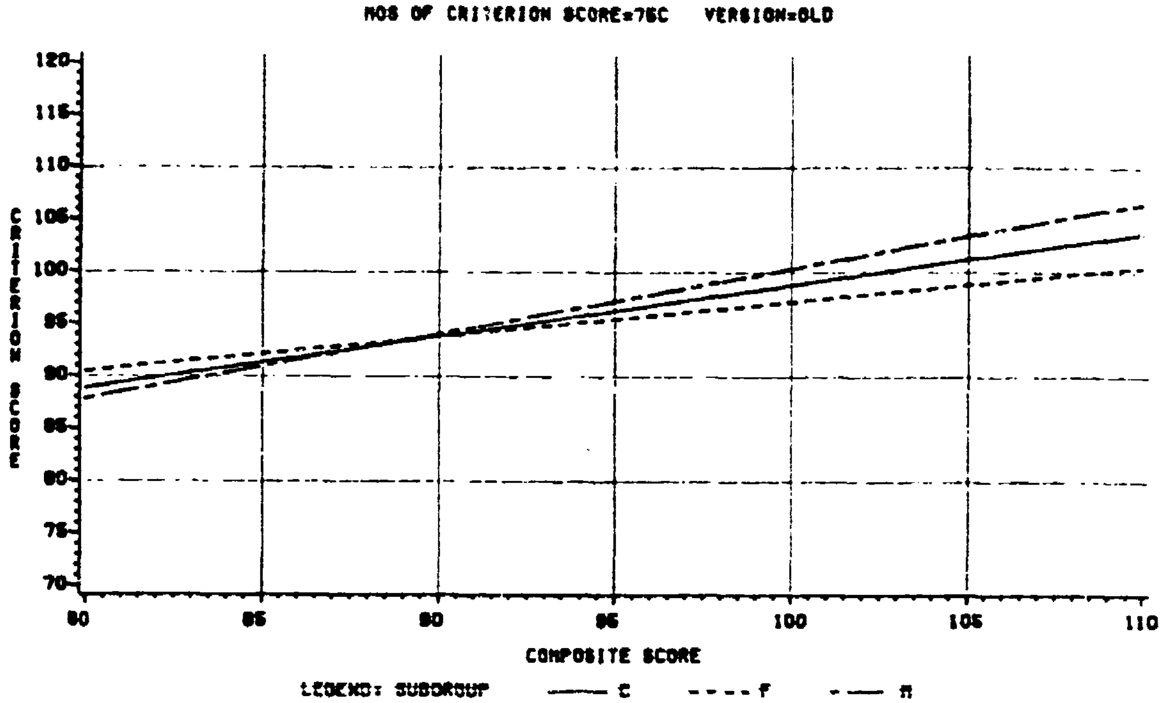


Figure 25 Regression lines for Current and Alternative (old and new) Composites for MOS 05C, by Gender



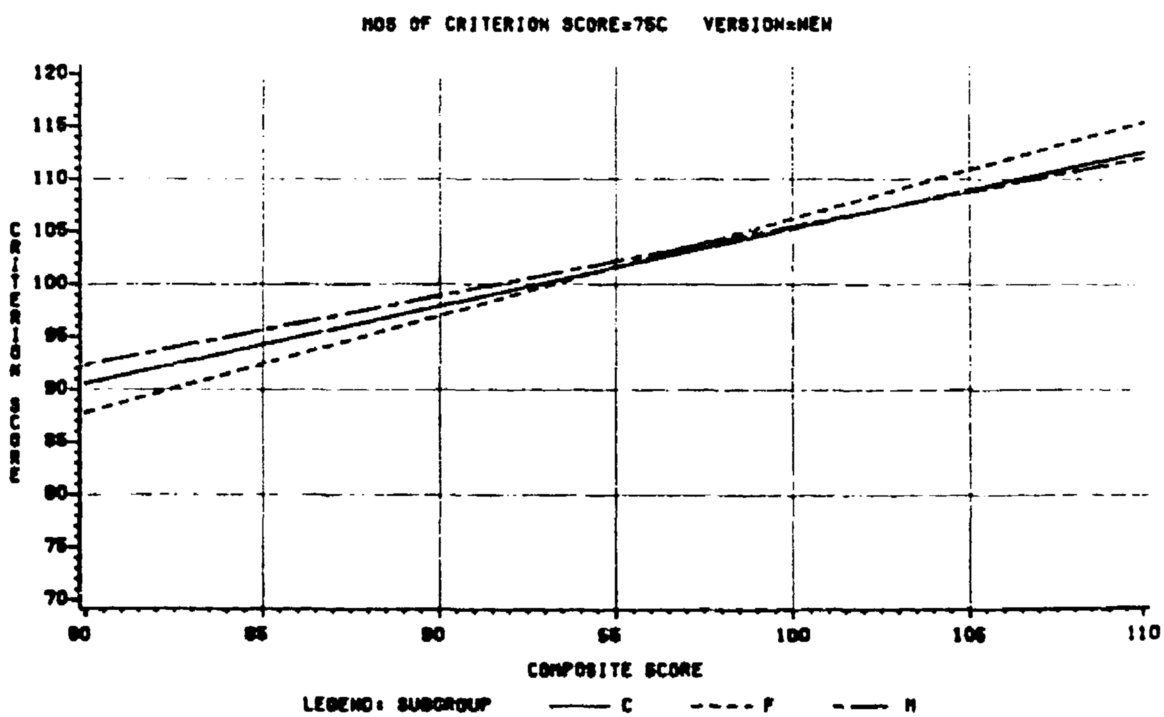


Figure 26 Regression lines for Current and Alternative (old and new) Composites for MOS 75C, by Gender

(116)

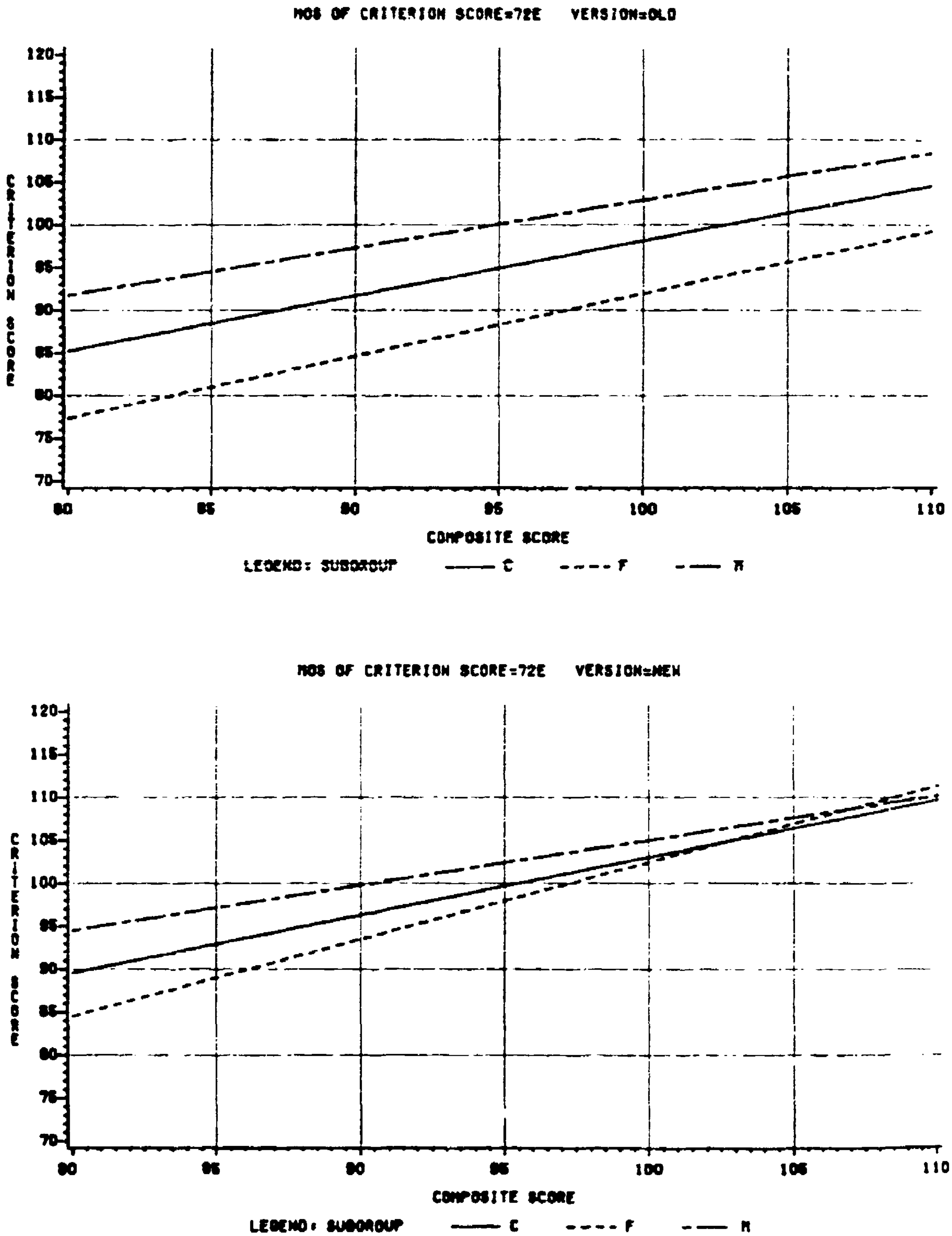
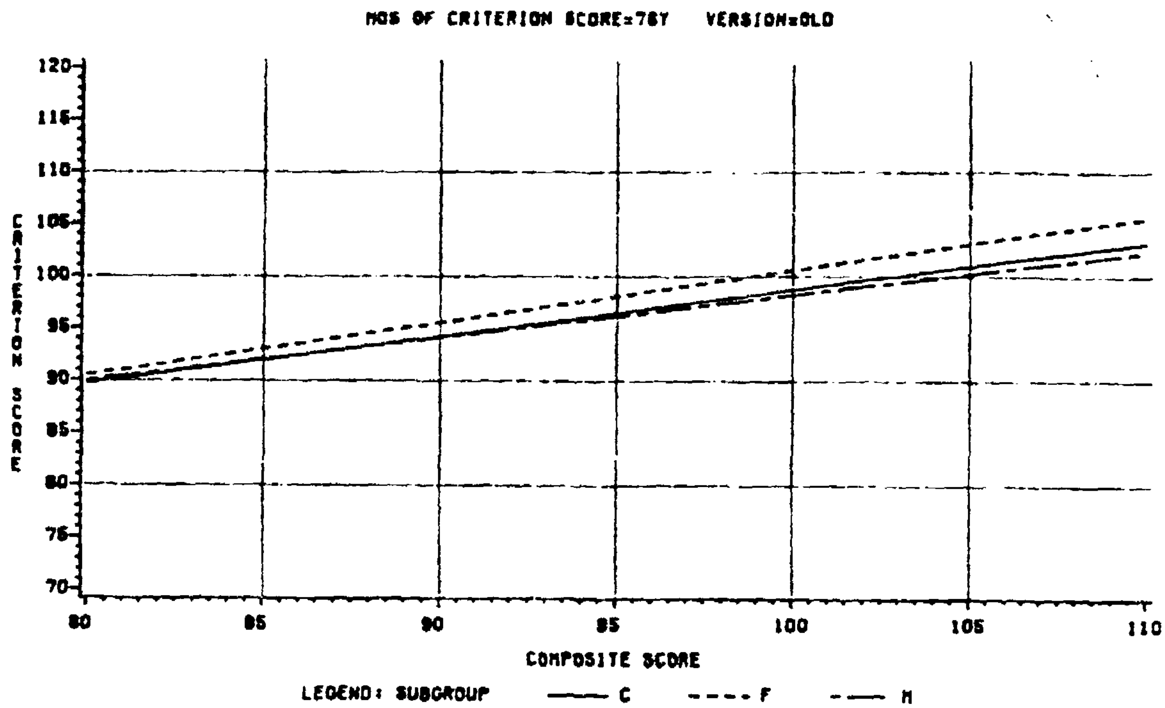


Figure 27 Regression lines for Current and Alternative (old and new) Composites for MOS 72E, by Gender



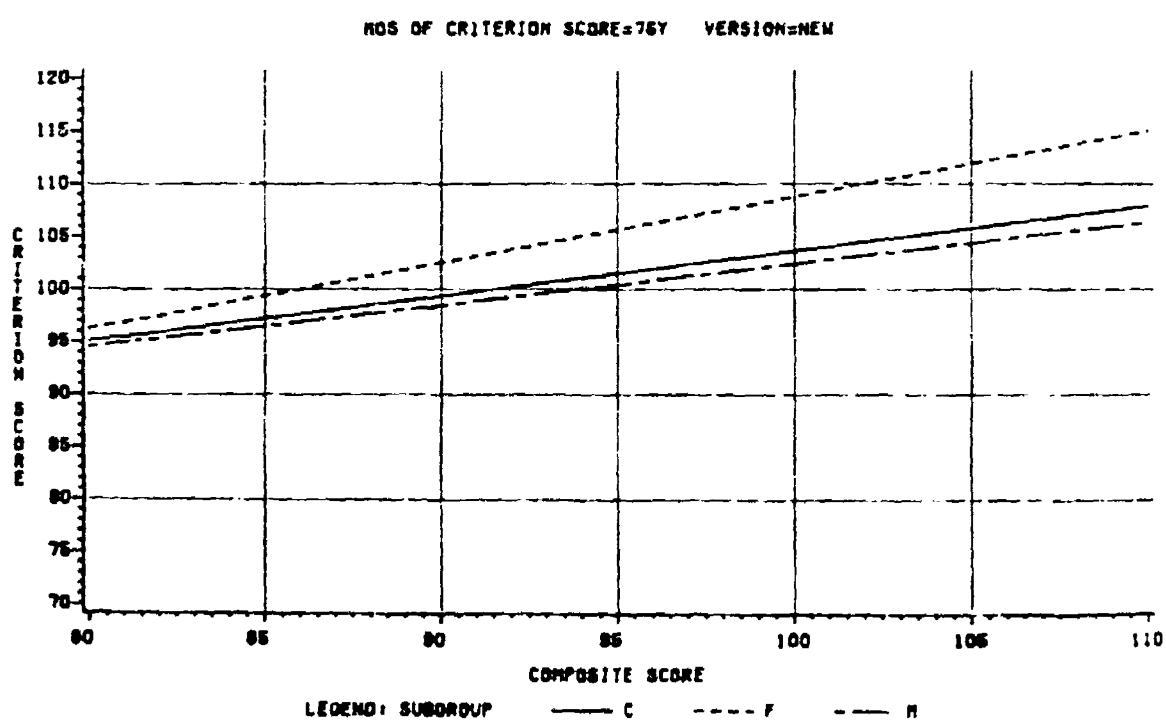


Figure 28 Regression lines for Current and Alternative (old and new) Composites for MOS 76Y, by Gender

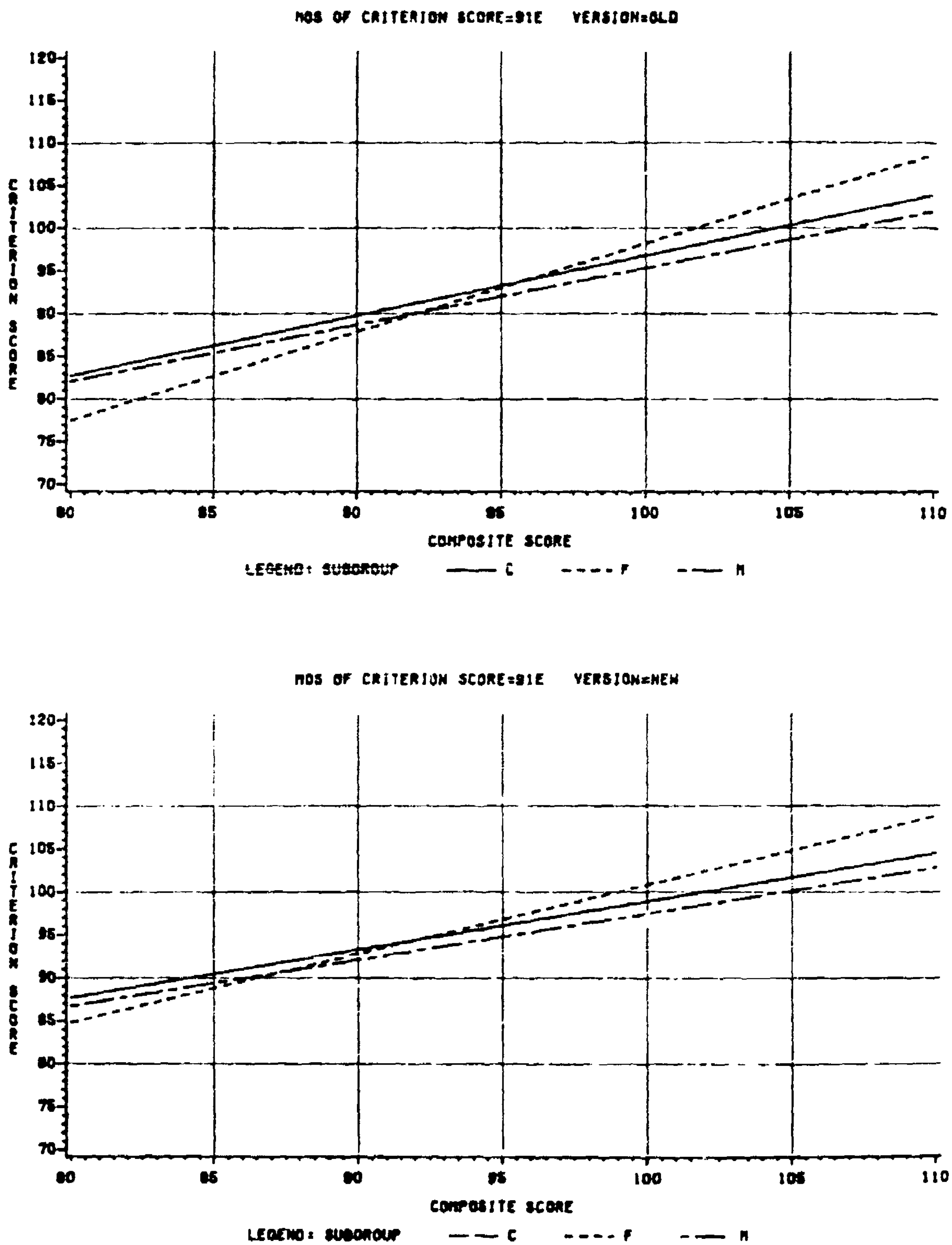


Figure 29 Regression lines for Current and Alternative (old and new) Composites for MOS 91E, by Gender

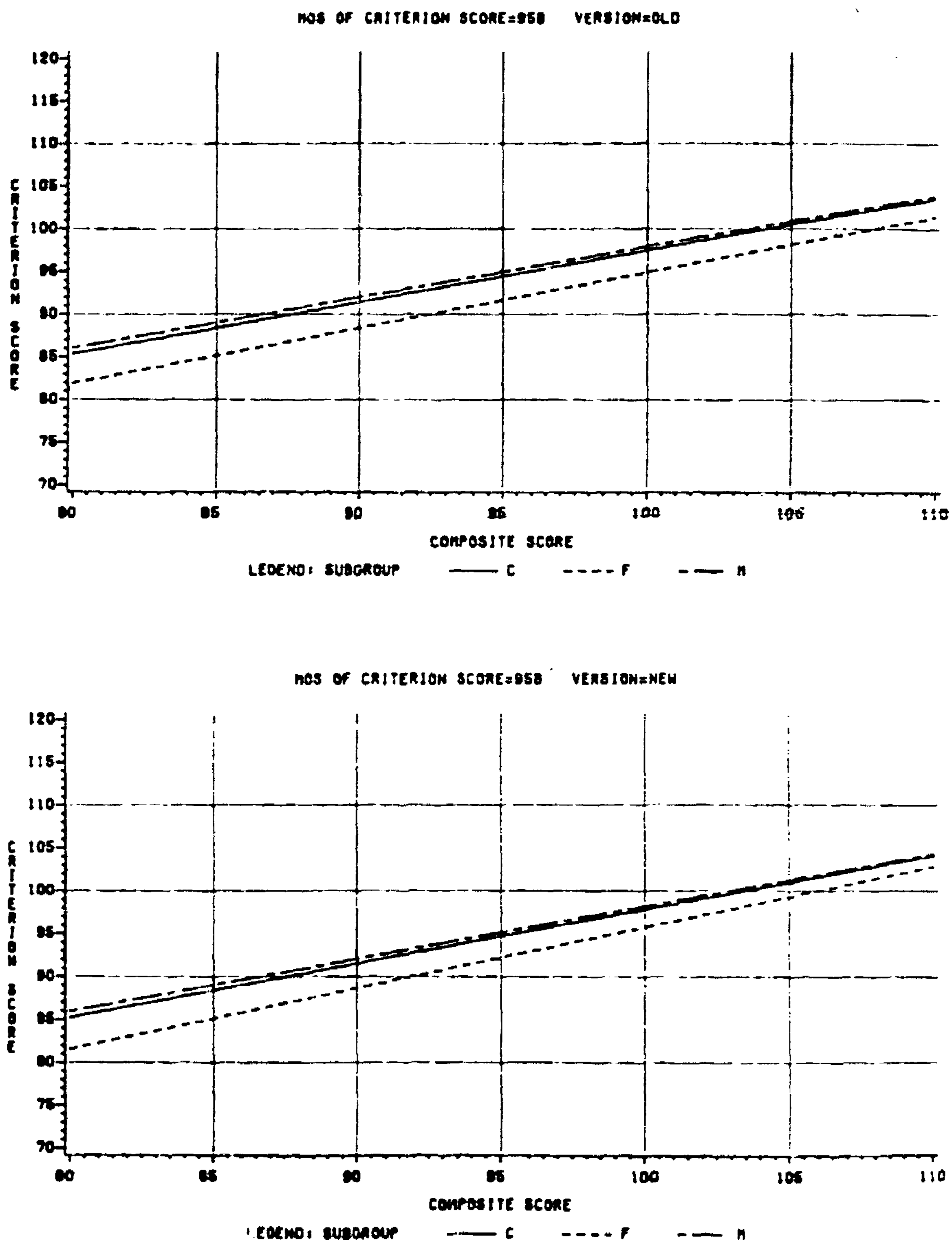


Figure 30. Regression lines for Current and Alternative (old and new) Composites for MOS 95B, by Gender

Table 39

Predicted Score Differences (Diff.) and Standard Errors (SE) of the Difference between Blacks (B) and Whites (W) for Particular MOS: Current Operational Composites

Cluster	N B	N W	Cutoff	85 Diff.	85 SE	95 Diff.	95 SE	105 Diff.	105 SE
CL Cluster									
MOS 71L	1229	1322	95	-4.69	1.44	-5.13	1.07	-5.51	.82
MOS 75D	481	205	95	-2.47	3.32	2.40	2.29	7.26	1.66
CO Cluster									
MOS 11H	122	769	85	2.14	1.89	.46	2.04	-1.21	2.31
MOS 11B	1146	4174	85	1.94	.74	2.46	.71	2.97	.77
EL Cluster									
MOS 31M	563	1185	95	4.38	1.33	4.18	1.03	3.98	.97
MOS 36C	214	132	90	-2.53	3.50	-1.93	2.36	-1.32	2.98
FA Cluster									
MOS 13F	125	657	100	7.74	2.00	8.10	1.67	8.46	1.65
MOS 13B	1814	2471	85	2.08	.80	4.12	.65	6.16	.63

(Composite Score: 85, 95, 105)

lower composite scores using the current composite. With the alternative composite, underprediction is observed for higher scores of the AA composite. The other MOS that showed a noticeable change among the regression line with the alternative composites was 76Y. In this case the alternative composite tends to show somewhat more underprediction of female performance than does the current composite. While the average difference (3.25 points) in underprediction of the alternative versus the current composite for 76Y is small relative to the criterion standard deviation, the difference does approach statistical significance. This finding suggests that as new criterion data become available further attention and research be devoted to analyzing the differences between male and female soldiers in MOS 76Y. In most cases, however, as with the comparisons based upon race, the change to the alternative composite should not result in substantial underprediction of subgroup performance. The new composites could be used operationally without an increase in predictive bias in the selection and classification system.

The second finding of these analyses is that, as expected, the large MOS (eg. 11B, 13B, etc.) show patterns of under- and overprediction that are quite similar to the summary data presented earlier at the cluster level. For example, the large MOS in Tables 39 and 41 all show overprediction of black performance for both sets of composites. Such results are also presented in Tables 31 and 32 in the subsection discussing differences in the regression lines for the two races at the cluster or composite level. This result is not surprising since the MOS statistics were weighted by sample size when they were pooled to obtain the cluster data.

Table 40

Predicted Score Differences (Diff.) and Standard Errors (SE) of the Difference between Females (F) and Males (M) for Particular MOS: Current Operational Composites

	N			Composite Score					
				85		95		105	
Cluster	F	M	Cutoff	Diff.	SE	Diff.	SE	Diff.	SE
CL Cluster									
MOS 76Y	248	888	95	-.97	3.11	-1.92	1.96	-2.86	1.41
MOS 75C	149	168	95	-2.59	2.88	.04	1.73	2.67	1.40
SC Cluster									
MOS 05C	260	1711	95	-5.44	3.05	-1.14	1.78	3.16	1.26
MOS 72E	237	325	90	13.53	2.72	11.80	1.78	10.07	1.60
ST Cluster									
MOS 95B	426	3269	100	3.84	2.45	3.28	1.55	2.71	.95
MOS 91E	117	184	95	2.71	4.89	-1.02	3.00	-4.74	2.17

The third finding from these analyses is that within a cluster it appears that differences in the subgroup proportions can result in major changes in the pattern among the regression lines. For example, within the SC cluster, use of the alternative composites would result in underpredicting female criterion scores in MOS 05C where the ratio of males to females is 6.6. However, in MOS 72E where this ratio is only 1.4, use of the same composites would result in overprediction of female performance.

This finding suggests that it may be necessary to evaluate predictive bias at the MOS level. Each MOS in the sample could be analyzed using the Johnson-Neyman technique (See Rogosa, 1980) to determine whether a significant difference between the subgroup regression lines exists for any value of the composite. If a region of significance exists and includes the cutoff score for that MOS, further investigation of that MOS would be warranted. The aggregation of results to the cluster level might best be done qualitatively. For example, the proportion of MOS within the cluster that show significant differences around the cutoff score could be reported.

Table 41

Predicted Score Differences (Diff.) and Standard Errors (SE) of the Difference between Blacks (B) and Whites (W) for Particular MOS: Four Alternative Composites

	N			Composite Score					
				85		95		105	
Cluster	B	W	Cutoff	Diff.	SE	Diff.	SE	Diff.	SE
CL Cluster									
MOS 71L	1229	1322	95	-1.47	1.35	-1.00	1.01	-.55	.77
MOS 75D	481	205	95	-1.44	3.14	1.07	2.17	3.57	1.57
CO Cluster									
MOS 11H	122	769	85	-.83	1.89	.99	2.03	2.82	2.30
MOS 11B	1146	4174	85	.79	.73	2.08	.71	3.38	.76
EL Cluster									
MOS 31M	563	1185	95	1.59	1.32	2.03	1.03	2.47	.97
MOS 36C	214	132	90	-2.35	3.51	-1.63	2.37	.90	2.99
FA Cluster									
MOS 13F	125	657	100	45	1.99	3.38	1.67	6.31	1.65
MOS 13B	1814	2471	85	1.16	.79	2.64	.65	4.13	.63

Summary

The current and proposed alternative AA composites were investigated for possible subgroup bias in a number of ways, including analyses of predictive validities, comparisons of subgroup regression lines, and plotting the relationship of the subgroup regressions and the common regression line. All subgroups were found to be well predicted by the composites. Both sets of composites were found to show some small differences in predictive validity as a function of racial background and gender. The comparisons of regression lines indicate that the use of either set of composites to select and classify enlisted personnel for the Army should not result in unfair practices against blacks or women.

Table 42

Predicted Score Differences (Diff.) and Standard Errors (SE) of the Difference between Females (F) and Males (M) for Particular MOS: Four Alternative Composites

				Composite Score					
	N			85		95		105	
Cluster	F	M	Cutoff	Diff.	SE	Diff.	SE	Diff.	SE
CL Cluster									
MOS 76Y	248	888	95	-2.86	3.02	-5.17	1.92	-7.49	1.37
MOS 75C	149	168	95	3.27	3.76	.61	2.52	-2.06	1.93
SC Cluster									
MOS 05C	260	1711	95	-3.63	2.92	-2.35	1.70	-1.07	1.20
MOS 72E	237	325	90	8.18	2.57	4.47	1.68	.76	1.51
ST Cluster									
MOS 95B	426	3269	100	3.90	2.43	2.93	1.54	1.95	.95
MOS 91E	117	184	95	.61	5.00	-2.0[illegible]	[illegible]07	-4.68	2.22

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Alternative Composite Scales and Cutoffs

Composite Scales

For the current composites, the subtest sum scores are converted to scale scores with a mean of 100 and standard deviation of 20 in the 1944 reference population, using a table that gives a somewhat nonlinear mapping. In general, the current conversions compress scores somewhat in the middle range while expanding the more extreme scores. In addition, the current conversions compress a number of different sum scores that are well below guessing rates onto the minimum composite score of 40.

In order for some or all of the new composites to be adopted for operational use, similar conversion tables are needed. Some consideration was given to proposing alternative scalings, in particular a linear adjustment, so as to simplify the calculation of the final composites. The final recommendation, however, is to maintain the current procedures insofar as possible. This choice leaves open the Army's option of adopting only some of the new composites while leaving some of the existing composites intact, and it also keeps relatively constant the implicit conversions between composite and percentile scores.

The conversion tables for the alternative composites were designed to match the distributions of the current composites on a representative sample of 13,319 FY81/82 applicants who were first-time test takers and who completed form 8, 9, or 10. The overall objective in defining conversion tables for the new composites was to make the distribution of scores on the new composites resemble the distribution of scores on the old composites as closely as possible for any group of ASVAB test-takers. To achieve this end, cumulative frequency distributions were computed for each of the existing 9 composites. Table A-20 in the Appendix shows the resulting distributions. These distributions were then averaged to give a target distribution for equipercentile equating of the alternative composites. Thus, each subtest sum score was mapped onto the target composite score with the same percentile. Table A-21 in the Appendix shows these conversions.

The sample size of 13,319 is sufficient to yield maximum sampling errors of less than .5 in percentages estimated from the sample. As shown in Table A-22, the current composite scalings differ from each other by as much as 5 percent in the percentages at or below given score levels. Therefore, the estimated maximum sampling error of .5 percent was judged negligible in comparison.

Cutoff Scores

The cutoff levels reflect two competing concerns. The first is that soldiers scoring above the cutoff level on a particular composite must have a "reasonable" level of expected performance for the MOS in question. The second is that the cutoff criteria should screen out the right proportion of applicants relative to the number of available training slots. It must not be so high that a significant number of slots go unfilled, yet high enough so that, where there are more applicants than slots, only the "best" applicants fill these slots. Because previous information on expected performance levels has been relatively weak, supply and demand considerations have predominated in the setting of composite score cutoff levels.

The setting of a cutoff level for a composite does not presume that soldiers can be sorted into clearly acceptable or unacceptable categories through use of paper-and-pencil tests. In general, the relationship between composite score and subsequent performance level is roughly linear, so that differences at different points on the composite scale reflect similar differences in expected performance. However, Project A has not yet gathered the critical information on the variation in payoff for performance in different MOS. Lacking clear-cut standards for criterion referenced cutoff points, we felt it most appropriate to identify cutoff points that are as consistent as possible with those currently in use, in order to maintain the current balance between MOS in the distribution of available applicants.

The simplest measure of consistency between new cutoffs and the existing cutoffs would be that the percentage of applicants "passing" the cutoff criterion snould be the same. Since we have rescaled the new composites so that the percentage of applicants above or below a given score is the same for each new composite as for the existing composites, this means that the existing cutoff points could be used "as is". The percentage passing for any given applicant group would be the same as it currently is.

We are concerned, however, that since the new composites are more highly correlated with the overall selection criterion, AFQT, and also with each other, some problems might arise. In particular, the greater correlation among composites implies that the different MOS would be more likely to judge the same applicants as eligible, increasing the competition among the MOS. If cutoffs remained the same, more slots might go unfilled as there would be fewer different individuals to draw on. However, because the new composites are more highly correlated with AFQT, those above a given criterion cutoff will tend to have higher AFQT scores on average with the new composites. This means that the cutoff levels could be lowered slightly and still leave the same distribution of mental categories among the eligibles as is currently the case. In a final set of analyses, we set out to determine the cutoff scores that would leave constant the average AFQT scores for those applicants passing the cutoff.

An "average AFQT" score was assigned for each possible composite score for each old and new composite. This average AFQT score was defined as the average of the AFQT percentile scores for all applicants in the sample of 13,319 who scored at or above the given composite score. Then, for each possible score on each of the new composites, we identified the score on each of the existing composites that had the same "average AFQT" score. Table A-22 in the Appendix shows the results of this approach.

Using this table, one can identify the cutoff on any alternative composite that corresponds to a specified cutoff on a current composite. A complete listing of cutoffs for current composites is given in Table A-23 in the Appendix. For example, if the mean AFQT score of eligible applicants is to remain constant, a cutoff of 90 on the current CO composite translates to a cutoff of 89. The major differences betwen the cutoffs for current and proposed compsites is between CL and ACL: the cutoffs for ACL could be roughly 5 points lower than the current cutoffs for CL.

Summary

The purpose of this research was to assess (1) the effectiveness of current ASVAB area composites for personnel selection and classification and (2) the potential for establishing improved enlisted personnel selection and classification rules based on the ASVAB. Current composites were compared to empirically identified favorable alternatives in terms of predictive validity, differential validity between MOS, and predictive bias for different population subgroups.

Validation analyses were performed using training and SQT scores for the FY81/82 cohort of accessions. The results of the analyses are limited by the data base and by the accuracy of necessary, yet untestable assumptions made in carrying out the analyses. Data to be collected in Project A will ultimately allow testing of these assumptions, and despite the limitations, substantive results were obtained which lead to particular recommendations.

Limitations

Information on Criterion Quality. The analyses were carried out as if the measured criteria were the sole, and error-free, criteria to be maximized in selecting and classifying enlisted personnel. To the extent that unmeasured criteria are also important, the validation of composites is incomplete. In the worst case, a combination of ASVAB tests might be highly correlated with unmeasured criteria in an MOS but uncorrelated with the criteria used in this set of analyses.

Neither reliability nor validity figures were available for the criterion measures. However, there were many MOS for which both training and SQT measures were available on the same soldiers; and if the correlations between these measures were high, it would indicate the likelihood of reasonably high criterion reliability and validity. Unfortunately, the correlations were low, ranging from -.12 to .56, over 81 MOS, with a mean of .22. Although it is possible that this merely indicates that training scores and SQT scores measure different aspects of overall performance in the MOS, the need for (1) more systematic coverage of the performance space for an MOS and (2) criterion reliability and validity information is clear. Empirical results obtained without this information are likely to have major inaccuracies.

Information on Utility of Performance. Related to the problem of criterion reliability and validity is the problem of translating results to gains in measurable costs and benefits. The analyses were carried out based on the assumption that the value of a one-standard deviation increase in the performance of a soldier was constant, both across different levels of performance in a single MOS and across different MOS. To the extent that the value of a performance increment varies between MOS, the derived procedures will be inaccurate, and to the extent that utility is a non-linear function of performance, results of linear regression will be inaccurate. Of these two problems, the variation between MOS is of greatest concern, because linear approximations to non-linear relations are frequently quite good.

No information was available on the utility of performance increments. Subsequent analyses will evaluate the sensitivity of the validity of composites to deviations from the equi-utility assumption. During 1985, the project will collect utility-of-performance-increments information to provide the basis for subsequent validations to be carried out in the project.

Sample Size. Although these analyses were based on the largest database yet available for ASVAB validation, with criterion data on more than 100 soldiers in each of 98 MOS, and on more than 500 soldiers in 35 of these MOS, the sample was still not sufficiently large for some of the planned analyses. In particular, the patterns of correlations of expected performance across MOS were not replicable in half-samples. As a consequence, completely empirical determination of clusters of MOS for the purpose of assigning composites was impossible, and assessment of predictive bias was limited.

Samples on the order of 2000 per cell are needed for analyses such as these, and these were attainable when we focused on current clusters of MOS rather than individual MOS. While such samples for individual MOS are extremely costly, they can be accumulated over years if there is sufficient stability of predictors and criteria. Moreover, deviations from that stability can be estimated from a cumulative data base.

Findings

Predictive Validity of Current Composites. The validities for 98 MOS, based on combinations of training and SQT scores, and adjusted to apply to the FY81 and FY82 Army applicants, ranged from .12 to .74, with a mean of .45. Grouping MOS by the current composite clusters, the lowest mean validity was .42, for Surveillance and Communications MOS and for General Maintenance MOS, and the highest was .54, for Skilled Technical MOS. In general, there was almost no tendency among MOS for the currently assigned composite to have a higher validity than other current composites.

Identification of Optimal Alternative Composites. Although the data base did not support purely empirical identification of clusters of MOS for which the same composite could be used, it was possible to evaluate alternative combinations of the nine clusters of MOS associated with the current composites. Only unit-weight alternative composites were considered, after it was found that optimal unit-weight composites for four clusters possessed a root mean square validity 97% as great as the root mean square validity of ridge regression vectors computed separately for each of 98 MOS. The loss due to using only four unit-weighted composites was minimal.

Roughly 700 different sets of composites were evaluated in terms of predictive validity, with a focus on four composite solutions, since four nominal factors of the ASVAB have been identified. The best alternative four-composite solution that we identified, a local optimum that is very likely the actual four-composite optimum, was

Clerical (ACL):	VE + AR + MK
Skilled and Technical (AST):	VE + AR + MK + AS
Operations (AOP):	VE + AR + AS + MC
Combat (ACO):	VE + MK + AS + MC.

The operations composite combines the current SC, OF, and MM clusters; and the combat composite combines the current CO, FA, GM, and EL clusters.

Validity of Alternative Composites. The RMS validity of the four-composite set was .486. This compares with an RMS validity of .489 for the best set of nine unit-weight composites. Variations of validity in the third decimal place are neither statistically significant nor of great practical importance, and a variety of alternatives to the four-composite solution were explored.

Of special interest were the three- and two-composite solutions. The loss in validity which would result from using the new "combat" composite (ACO) for both the "combat" and "operations" MOS is negligible (.001), as is the loss in, further, using the new Clerical composite (ACL) for both clerical MOS and skilled and technical MOS. This two-composite solution captures 97% of the predictive power of the ASVAB for the performance criteria used in these analyses.

Certain of the current composites account for a large part of the difference in validity between current and alternative composites. When compared to validities of optimal composites for the same clusters of MOS, the Clerical composite (CL) appeared to be weak, with a validity of .48 versus a potential of .56. One other composite, Surveillance and Communications (SC), was mildly weak, with a validity of .45 versus a potential of .50.

The gain in expected performance if these composites were changed can only be approximated because of the constrained nature of the selection and classification process. If, however, the choice were purely between assignment to an individual MOS and rejection, application of Cronbach's formula yields an expected gain of .05 standard deviations per person in the two clusters of MOS from introduction of these two revisions to the current composites.

Differential Validity of Current and Alternative Composites

The ability of current and alternative composites to identify the best MOS for each enlistee was assessed, using a variant of Horst's Classification Efficiency index. The current composites and five alternative sets of composites all possessed between 45% and 67% of the differential validity of the ASVAB as a battery. There was essentially no difference between the composite sets, with the exception that the "single composite" solution did not perform as well as others. In particular, the performance of the current composite set was virtually identical to the performance of the alternative which merely replaced the CL and SC composites. In general, the differential validity of the ASVAB as a battery was higher for low-frequency MOS, but this effect was less pronounced for the sets of unit-weight composites.

Predictive Bias of the Current Composites. The validities of the composites are slightly higher overall for whites (.45) than blacks (.38), but there is, if anything, a tendency to underpredict performance of whites more than blacks. The validities of the EL and SC composites are greater for males than for females, but overall the average difference in validity only slightly favors males (.47) over females (.43). Underpredictions of performance were split between males and females, with the most noticeable underprediction being roughly .06 standard deviations for women using the SC composite. In general, the over- and underpredictions were small, especially in the region near the cutoffs.

Predictive Bias of Alternative Composites. In general, the patterns of differential validity and underprediction observed for the current composites also were found for the four alternative composites, ACL, AST, AOP, and ACO. The overall average validity for whites (.47) was somewhat higher than for blacks (.40), but the underpredictions of performance were suffered primarily by whites. An exception to this was the underprediction of blacks' performance by the alternative skilled technical composite (AST). Blacks' criterion scores in the OF cluster were underpredicted by both the current and alternative composites, and the degree of underprediction was slightly greater using the proposed composite.

The alternative composites had a slightly smaller difference in validities between men and women (.48 vs. .42) than the current composites, but again the most noticeable differences were the greater validities for men in the EL and SC clusters. There were also somewhat greater underpredictions of women's performance in the CL, OF, and SC clusters using the alternative composites, although in general the differences were small.

Recommendations

Selection of a Composite Set. First, the statistical results tend to favor the alternative four-composite solution over the current nine composites in terms of overall absolute predictive validity and differential validity for MOS classification. The results for predictive bias are mixed, but the effects are not large in either direction. The average validity of the alternative composites is .48, vs. .45 for the current composites, and there was virtually no difference in differential validity between the alternative sets of composites.

The major source of the relative deficiency of the current composites lay in two of the composites, CL and SC. Depending on the relative costs of implementation of different levels of change in composites, a more favorable proposal might be merely to replace these two composites with the ACL and AOP composites, respectively, keeping intact the nine-composite structure. The average validity of the revised nine composites would be .47, while the differential validity as measured by the criterion adapted from Horst (1954) would be virtually unchanged. This solution would also avoid the introduction of AST, with its small increase in underprediction of blacks' performance in skilled technical MOS.

Relative Value of Composites and Cutoffs. The validation analyses, and particularly the differential validity analyses, indicated that the procedure of assignment to a cluster of MOS on the basis of the highest composite has limited expected payoff. The various composites are highly correlated, and therefore yield little unique predictive variance.

The choice of "cutoffs" is a far more potent procedure for increasing the overall average expected performance than is the choice among composites. Variation in the predictive value of even perfectly correlated composites can yield gains in classification with appropriate cutoffs, when compared to random assignment.

The basic rule for assignment is to assign individuals with a great deal of a particular ability to MOS with the greatest payoff for that ability (e.g., MOS with the highest measure of association) and to assign individuals lacking the particular ability to MOS not requiring that ability (e.g., MOS with minimal measures of association).

If there were clearly valid measures of association between ASVAB scores and payoffs for assigning enlistees to MOS, one would be tempted to recommend the use of these measures of association in the determination of cutoffs. This is not wise at the present time, however, because of the incompleteness of the coverage of the criterion space by available measures and the lack of information on the relations between performance and payoff to the Army (i.e., utility information). The availability of comprehensive, reliable, utility-related criterion measures would make this approach to assigning MOS attractive.

Broadening the Span of Predictors. The current composites, as well as the best alternative composites, account for only about 20 to 25 percent of the variance in the criteria, but they account for over 90% of the variance in the criteria that is predictable from the ASVAB. The ASVAB measures four identifiable common factors, but only two eigenvalues are greater than one, and the first principal component accounts for roughly half the variance. Four of the nine subtests, GS, EI, NO, and CS, played no role in the composition of the proposed unit-weight composites.

This level of predictability is clearly not sufficient for accurate identification of the optimal assignments of enlisted personnel to MOS. While it was impossible to assess the contributions of limitations of the criteria and of the ASVAB separately in these analyses, the adjusted validities were uniformly modest, with only 14 out of 98 greater than .6. There is a need for use of a broader set of predictors in the selection and classification process for enlisted personnel.

Increase the Sample Size. The present analyses combined the data from two years, FY81 and FY82, with a substantial increase in the possible coverage of MOS over the coverage available from one year's accessions. For many MOS, there are not sufficient numbers in any year to support needed parameter estimation for the purposes of deriving optimal assignment procedures. However, with a proper control for trends across years, the data base can be built up over a few years to the point where the needed two thousand cases in each MOS are available for analysis.

Although the replication of these analyses two years hence was to focus on the FY83 and FY84 cohorts (with the addition of utility information), the data base for those analyses will actually be the four-year cohort, FY81 through FY84 accessions. This will provide not only the basis for exploring trends but also an adequate data base for a larger set of MOS.

Conclusion

The major practical result of this investigation was the identification of suitable replacements for the two relatively weak ASVAB Area Composites currently in operational use by the Army. Introduction of new composites for the Clerical & Administrative and Surveillance & Communications MOS will significantly increase the expected performance levels of enlisted personnel entering these MOS, without affecting differential validity of the composites or introducing significant predictive bias.

In addition, this effort resulted in the development of systematic procedures for the validation of ASVAB composites, including data editing, range restriction adjustment, ridge regression estimates of optimal composites, differential validity estimation, predictive bias assessment, and setting of cutoff scores. At the same time, the research effort highlighted needs for additional research and development that would solve several methodological problems.. In particular, there are needs for criterion validity and reliability information, performance utility estimates, cumulative additions to sample sizes, further work on range restriction adjustment and differential validity measurement, and a broadening of the coverage of skills required in different MOS. This coverage must be included in both the criterion measures and the predictors.

Throughout the remainder of this project, work will go forward on the development of better predictors and better criteria; and future validations of enlisted personnel selection and classification procedures can be expected to refine and extend the results presented here.

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APPENDIX A

Table A-1

List of MOS in the Army

MOS Name	Current Composite	MOS Name	Current Composite
71C: SECRETARY	CL	21L: PERSHING ELCT REP	EL
71D: LEGAL CLERK	CL	22L: NIKE TEST EQUIP REP	EL
71G: PATIENT ADMIN SP	CL	22N: NIKE-HERC MAL-LNCH REP	EL
71L: ADMINISTRATIVE SPECIALIST	CL	23N: NIKE TRACE RDR REP	EL
71M: CHAPEL ACTIVITIES SP	CL	23U: NIKE HP RDR SIM REP	EL
71N: TRAFFIC MANAGEMENT COORD	CL	24C: IH FIRING SEC MECH	EL
73C: FINANCE SPECIALIST	CL	24E: IH FIRE CON MECH	EL
74B: CARD & TAPE WRITER	CL	24G: IH COORD CEN MECH	EL
75B: PERSONNEL ADMIN SP	CL	24H: IH FIRE CON REP	EL
75C: PERSONNEL MGT SP	CL	24K: IH CW RDR REP	EL
75D: PERSONNEL REC SP	CL	24L: IH LNCH/MECH SYS REP	EL
75E: PERSONNEL ACT SP	CL	24M: VULCAN SYS MECH	EL
75F: PERS INFO SYS MGT SPEC	CL	24N: CHAPARRAL SYS MECH	EL
76C: EQ REC & PTS SP	CL	24P: DEF ACQ RADAR MECH	EL
76J: MEDICAL SUPPLY SP	CL	24Q: NIKE/HERC FC MECH	EL
76P: MAT CTL ACTG SP	CL	24U: HERCULES ELCT MECH	EL
76V: MAT STOR & HDLG SP	CL	25J: OP CENTRAL REP	EL
76W: PETROLEUM SUPPLY SP	CL	25L: AN/TSQ-73 OP/REP	EL
76X: SUBSISTENCE SUPPLY SP	CL	26B: WEAPONS SPT RDR REP	EL
76Y: UNIT SUPPLY SP	CL	26C: CBT AREA SVL RDR REP	EL
		26D: GCA RADAR REPAIRER	EL
11B: INFANTRYMAN	CO	26E: AERIAL SURVL SEN REP	EL
11C: INDIRECT FIRE INFMN	CO	26H: AIR DEFENSE RDR REP	EL
11H: HV ANTI-ARMOR WPN INFM)	CO	26K: EL WARNING/DEF EQ REP	EL
11M: FV INFANTRYMAN	CO	26L: TAC MWAVE SYS REP	EL
11X: ATTRITED 110	CO	26M: AERIAL SURVL RD REP	EL
12B: COMBAT ENGINEER	CO	26N: AERIAL PHOTO SEN REP	EL
12E: ADM SPECIALIST	CO	26Q: TAC SAT/MW SYS OP	EL
12F: ENGR TRVEH CRMN	CO	26R: STRA MW SYS OP	EL
19D: CAVALRY SCOUT	CO	26T: RDO/TV SYS SP	EL
19E: M48-M60 ARMOR CREWMAN	CO	26V: STRAT MWAVE SYS REP	EL
19F: M48-M60 TANK DRIVER	CO	26Y: SATCOM EQUIP REP	EL
19G: ARMOR RECON. VEH CREWMAN	CO	27B: LCSS TEST SP/LANCE REP	EL
19H: ARMOR RECON. VEH DRIVER	CO	27E: TOW/DRAGON REP	EL
19J: M60A2 ARMOR CREWMAN	CO	27F: VULCAN REPAIRER	EL
19K: M1 ABRAMS ARMOR CRMN	CO	27G: CHAPARRAL/REDEYE REP	EL
		27H: SHILLELAGH REP	EL
17K: GND SURVL RDR CRMN	EL	27N: FAAR REP	EL
17M: REMOTE SENSOR SP	EL	31E: FIELD RADIO REP	EL
21G: PERSHING ELCT MAT SP	EL	31J: TELETYPEWRTER REP	EL

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List of MOS in the Army (cont'd)

MOS Name	Current Composite	MOS Name	Current Composite
31M: MCHAN COMM EQ OP	EL	41J: OFFICE MACHINE REP	GM
31N: TACTICAL CKT CON	EL	42C: ORTHOTIC SPECIALIST	GM
31S: FIELD GEN COMSEC REP	EL	42D: DENTAL LAB SP	GM
31T: FIELD SYS COMSEC REP	EL	43E: PARACHUTE RIGGER	GM
31V: TAC COMM SYSOP/MECH	EL	43M: FABRIC REPAIRER SP	GM
32D: STA TECH CONTROLLER	EL	44B: METAL WORKER	GM
32F: FIXED CIPHONY REP	EL	44E: MACHINIST	GM
32G: FIXED CRYPTO EQ REP	EL	45B: SMALL ARMS REPAIRER	GM
32H: FIXED STA RDO REP	EL	45D: SP FA TRT MECH	GM
34B: PCM REPAIRER	EL	45G: FC SYSTEMS REP	GM
34E: NCR 500 COMPUTER REP	EL	45K: TANK TURRET REPAIRER	GM
34F: DSTE REPAIRER	EL	45L: ARTILLERY REPAIRER	GM
34H: ADMSE REPAIRER	EL	45T: ITV/IFV/CFV TURRET MECH	GM
34Y: FA COMPUTER REP	EL	51B: CARPENTRY & MASONRY SP	GM
35B: ELCT INST REP	EL	51C: STRUCTURES SPECIALIST	GM
35E: SP ELEC DEVICES REP	EL	51G: MATERIALS QUALITY SP	GM
35F: NUC WPN ELCT SP	EL	51K: PLUMBER	GM
35G: BIOMED EQ SP BASIC	EL	51M: FIRE FIGHTER	GM
35H: CALIBRATION SPECIALIST	EL	51R: INTERIOR ELECTRICIAN	GM
35K: AVIONIC MECHANIC	EL	52C: UTIL EQUIP REP	GM
35L: AVIONIC COMM EQ REP	EL	52D: PWR GEN EQUIP REP	GM
35M: AVIONIC NAV/FLT CON EQ REP	EL	53B: INDUSTRIAL GAS PDN SP	GM
35R: AVIONIC SPECIAL EQ REP	EL	54C: SMOKE OP SP	GM
36C: WIRE SYS INST/OP	EL	55B: AMMUNITION SPECIALIST	GM
36D: ANTENNA INSTALLER SP	EL	55D: EOD SPECIALIST	GM
36H: DIAL/MAN CEN OFR R29	EL	55G: NUC WPN MAINT SP	GM
36K: TAC WIRE OP SP	EL	57E: LAUNDRY & BATH SP	GM
36L: ELCT SWITCHING SYS REP	EL	57F: GRAVES REG SP	GM
41E: AV EQUIP REP	EL	57H: CARGO SPECIALIST	GM
41G: SURVL PHOTO EQ REP	EL	61F: MARINE HULL REPAIRER	GM
46N: PERSH ELEC-MECH SUPV	EL	62E: HV CONST EQUIP OP	GM
52G: TRANS & DISTR SP	EL	62F: LIFTING/LOADING EQ OP	GM
93F: FA MET CRMBR	EL	62G: QUARRYING SPECIALIST	GM
		62H: CONC&ASPHALT EQ OP	GM
13B: CANNON CREWMAN	FA	62J: GEN CONST EQUIP OP	GM
13F: FIRE SUPPORT SP	FA	68J: AIRCRAFT FC REPAIRER	GM
15J: MLRS/LANCE OP/FD SP	FA	68M: AIRCRAFT WEAPON SYS REP	GM
41B: TOPO INST REP SP	GM	12C: BRIDGE CREWMAN	MM
41C: FC INSTRUMENT REP	GM	33S: EW/INTEP SYS REP	MM

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List of MOS in the Army (cont'd)

MOS Name	Current Composite	MOS Name	Current Composite
45E: M1 ABRAMS TRT MECH	MM	16S: MANPADS CREWMAN	OF
45N: M60A1/A3 TRT MECH	MM	64C: MOTOR TRANSPORT OP	OF
61B: WATERCRAFT OPERATOR	MM	94B: FOOD SERVICE SP	OF
61C: WATERCRAFT ENGINEER	MM	94F: HOSP FOOD SERVICE SP	OF
62B: CONSTRUCTION EQUIP REP	MM		
63B: LT W VEH & PWR GEN MECH	MM	05B: RADIO OPERATOR	SC
63D: SP FA SYSTEMS MECHANIC	MM	05C: RADIO TT OPERATOR	SC
63E: M1 ABRAMS TANK SYS MECH	MM	05G: SIGSEC SPECIALIST	SC
63H: TRACK VEH REPAIRER	MM	13R: FIREFINDER RADAR OP	SC
63J: QM & CHEM EQ REP	MM	17B: FA RADAR CRMBR	SC
63N: M60A1/A3 TANK SYS MECH	MM	17C: FA TGT ACQ SQ	SC
63S: HVY WHEEL VEH MECH	MM	17L: AERIAL SENSOR SP	SC
63T: ITV/IFV/CFV SYS MECH	MM	72E: CMBT TELECOM CTR OP	SC
63W: WHEEL VEH REP	MM	72G: AUTO DATA TELECOM CEN OP	SC
63Y: TRACK VEH MECH	MM	96H: AER SNS SP OV-ID	SC
67G: AIRPLANE REPAIRER	MM		
67H: OBSN APIN REP	MM	03C: PHY ACTIVITIES SP	ST
67N: UTILITY HEL REPAIRER	MM	05D: EW/SIGINT IDENT/LOC	ST
67T: TAC TRANS HEL REP	MM	05H: EW/SIGINT INTER-IMC	ST
67U: MEDIUM HEL REPAIRER	MM	05K: EW/SIGINT N-M INTEP	ST
67V: OBN/SCOUT HEL REP	MM	13C: TACFIRE OPNS SP	ST
67Y: ATTACK HEL REPAIRER	MM	13E: CANNON FD SP	ST
68B: ACFT POWERPLANT REP	MM	54E: NBC SPECIALIST	ST
68D: ACFT POWERTRAIN REP	MM	71P: FLIGHT OPNS COORDINATOR	ST
68F: AIRCRAFT ELECTRICIAN	MM	71Q: JOURNALIST	ST
68G: AIRCRAFT STRUCTURAL REP	MM	71R: BROADCAST JOURNALIST	ST
68H: AICRAFT PNEUDRAULICS REP	MM	73D: ACCOUNTING SPECIALIST	ST
		74D: COMPUTER/TAPE WRITER	ST
13M: MLRS CREWMEMBER	OF	74F: PROGRAMMER/ANALYST	ST
15D: LANCE CRMB/MLRS SGT	OF	81B: TECH DRAFT SP	ST
15E: PERSHING MEL CRMBR	OF	81C: CARTOGRAPHER	ST
16B: HERCULES MAL CRMBR	OF	81E: ILLUSTRATOR	ST
16C: HERCULES FC CR MBR	OF	82B: CONSTRUCTION SURVEYOR	ST
16D: HAWK MISSILE CREW	OF	82C: FA SURVEYOR	ST
16E: HAWK FC CRMBR	OF	82D: TOPOGRAPHIC SURVEYOR	ST
16F: LIGHT ADA CRWMN	OF	83E: PHOTO & LAYOUT SP	ST
16H: ADA OP-INTEL ASST	OF	83F: PHOTOLITHOGRAPHER	ST
16J: DEF ACQ RADAR OP	OF	84B: STILL PHOTO SP	ST
16P: ADA SHORT RG MSL CRMN	OF	84C: MOPIC SP	ST
16R: ADA SHORT RG GNRY CRMN	OF	84F: AUDIO/TV SP	ST

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List of MOS in the Army (cont'd)

MOS Name	Current Composite	MOS Name	Current Composite
91B: MEDICAL SPECIALIST	ST	02S: SPECIAL BANDSPERSON	AU
91C: PRACTICAL NURSE	ST	02T: GUITAR PLAYER	AU
91D: PHYSICAL THERAPY SP	ST		
91E: DENTAL SPECIALIST	ST	00B: DIVER	
91F: PSYCHIATRIC SPECIALIST	ST	01H: BIOL SCIENCES ASST	
91G: BEHAVIORAL SCIENCE SP	ST	16T: PATRIOT MSL CMBR	
91H: ORTHOPEDIC SPECIALIST	ST	24J: IH PULSE RDR REP	
91J: PHYSICAL THERAPY SP	ST	24T: PATRIOT SYS MECH	
91L: OCC THERAP SP	ST	26F: AERIAL PHOT SEN REP	
91N: CARDIAC SPECIALIST	ST	27M: MLRS REPAIRER	
91P: X-RAY SPECIALIST	ST	34C: DAS3 COMPUTER REP	
91Q: PHARMACY SPECIALIST	ST	34J: UNIVAC SYS REP	
91R: VETERINARY SPECIALIST	ST	34K: IBM 360 REPAIRER	
91S: ENVIRON HEALTH SP	ST	35C: ATE REPAIRER	
91T: ANIMAL CARE SP	ST	35U: BIOMED EQ SP,ADV	
91U: ENT SPECIALIST	ST	36E: CABLE SPLICER	
91V: RESPIRATORY SP	ST	42E: OPTICAL LAB SP	
91Y: EYE SPECIALIST	ST	45R: M60A2 TANK TRT MECH	
92B: MEDICAL LAB SP	ST	51N: WATER TRMT SPEC	
92C: PETROLEUM LAB SP	ST	52E: PRIME POWER PDN SP	
92D: CHEMICAL LAB SP	ST	55R: AMMO STK CON & ACT	
93E: METEROLOGICAL OBSERVER	ST	55X: AMMUNITION INSPECTOR	
93H: ATC TOWER OPERATOR	ST	63G: FUEL & ELEC SYS REP	
93J: ATC RADAR CONTROLLER	ST	63R: M60A2 TANK SYS MECH	
95B: MILITARY POLICE	ST	65B: LOCOMOTIVE REPAIRER	
95C: CORRECTIONAL SP	ST	65D: RAILWAY CAR REPAIRER	
96B: INTELLIGENCE ANALYST	ST	65E: AIRBRAKE REPAIRER	
96C: INTERROGATOR	ST	65F: LOCOMOTIVE ELECTRICIAN	
96D: IMAGE INTERPRETER	ST	65G: RAILWAY SEC REP	
		65H: LOCOMOTIVE OPERATOR	
02B: CORNET TRUMPET PLAYER	AU	65J: TRAIN CREWMEMBER	
02C: BRTN EUPHMN PLAYER	AU	65K: RAILWAY MOV COORD	
02D: FRENCH HORN PLAYER	AU	67X: HEAVY LIFT HEL REP	
02E: TROMBONE PLAYER	AU	71E: COURT REPORTER	
02F: TUBA PLAYER	AU	72H: GEN OFC OPN OP	
02G: FLUTE PICCOLO PLAYER	AU	91W: NUCLEAR MED SP	
02H: OBOE PLAYER	AU	95D: SPECIAL AGENT	
02J: CLARINET PLAYER	AU	97B: CI AGENT	
02K: BASSOON PLAYER	AU	97C: AREA INTELLIGENCE SP	
02L: SAXOPHONE PLAYER	AU	98C: EW/SIGINT ANALYST	
02M: PERCUSSION PLAYER	AU	98G: EQ/SIGINT VOICE INTEP	
02N: PIANO PLAYER	AU	98J: EW/SIGINT NC INTECP	

Table A-2

MOS with Multiple Tracks for SQT Testing

-19E
- TRACK 1 - M48A5/M60, M60A1-Series
- TRACK 2 - M60A3
- TRACK 3 - M551/M551A1

-71L
- TRACK 1
- TRACK 2 - Postal Clerks

-05B
- TRACK 1
- TRACK 2 - (Special Forces)

-11C
- TRACK 1 - 81mm Mortar, Ground-Mounted
- TRACK 2 - 4.2 inch Mortar, Ground-Mounted
- TRACK 3 - Special Forces
- TRACK 4 - 81mm Mortar, Carrier-Mounted
- TRACK 5 - 4.2 inch Mortar, Carrier-Mounted

-13B
- TRACK 1 - M101A1
- TRACK 2 - M102
- TRACK 3 - M114A1
- TRACK 4/8 - M109/M109A1/155mm Atomic Projectile Assembler
- TRACK 5/7 - M107/M110/8-Inch Atomic Projectile Assembler
- TRACK 6 - M198

-12F
- TRACK 1 - APC Driver
- TRACK 2 - AVLB Operator
- TRACK 3 - CEV Driver/Loader

-11H
- TRACK 1 - Tow
- TRACK 2 - ITV (Improved Tow Vehicle)

-12B
- TRACK 1 - APC Driver

-13R
- TRACK 1 - AN/TPQ-36 Operator
- TRACK 2 - AN/TPQ-37 Operator
- TRACK 3 - AN/TPQ-36 Mechanic
- TRACK 4 - AN/TPQ-37 Mechanic

-19D
- TRACK 1 - M113 Series
- TRACK 2 - M151 Series

-17K
- TRACK 1 - AN/PPS-4A
- TRACK 2 - AN/PPS-5/5A
- TRACK 3 - AN/PPS-15
- TRACK 4 - AN/TPS-33A (RC)

-17B
- TRACK 1 - AN/MPQ-4A Radar Crew Member
- TRACK 2 - AN/TPS-25 Radar Crew Member
- TRACK 3 - AN/TPS-58 Radar Crew Member

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MOS with Multiple Tracks for SQT Testing (cont'd)

-26C
TRACK 1 - AN/PPS-5
TRACK 2 - AN/PPS-4A
TRACK 3 - AN/TPS-33A
TRACK 4 - AN/TRS-2
TRACK 5 - AN/PPS-15

-27G
TRACK 1 - Chaparral
TRACK 2 - Redeye
TRACK 2 - Redeye
TRACK 1 - Chaparral
TRACK 2 - Redeye

-31E
TRACK 1 - Active Army
TRACK 2 - Reserve Components

-31M
TRACK 1 - Low Capacity Equipment (6-12 Channels)
TRACK 2 - Medium Capacity Equipment (12-24 Channels)
TRACK 3 - Frequency Division Multiplex (FDM) Equipment

-31N
TRACK 1 - SB-611/MRC
TRACK 2 - AN/TSC-76
TRACK 3 - SB-675/MSC
TRACK 4 - AN/TSQ-84

-31V
TRACK 2 - (Special Forces)

-36C
TRACK 1 - (Operator)
TRACK 2 - (Installer)

-45D
TRACK 1 - M109/M109A1 Howitzer Mechanic
TRACK 2 - M110/M110A1 OR M107 Howitzer Mechanic

-45L
TRACK 1 - Self-Propelled Artillery Repairer
TRACK 2 - Towed Artillery Repairer

-54C
TRACK 1 - Smoke Fuel Handler Tasks
TRACK 2 - Smoke Generator Operator Tasks

-54E
TRACK 1 - Decontamination Tasks
TRACK 2 - Reconnaissance Tasks
TRACK 3 - NBC Operations Tasks

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MOS with Multiple Tracks for SQT Testing (cont'd)

-55B
TRACK 1 - Ammunition Specialist
TRACK 2 - Ammunition Stock Control and Accounting Specialist

-57E
TRACK 1 - Laundry Specialist
TRACK 2 - Bath Specialist

-63D
TRACK 1 - M109/M109A1 Vehicle Mechanic
TRACK 2 - M110A2 Vehicle Mechanic

-63S
TRACK 1 - M123 Vehicle Mechanic
TRACK 2 - M915 Vehicle Mechanic

-16C
TRACK 1 - Director Station
TRACK 2 - Tracking Station
TRACK 3 - AJI HIPAR

-82C
TRACK 1 - Fifth Order Surveyor
TRACK 2 - Fourth Order Surveyor

-76X
TRACK 1 - Accounting
TRACK 2 - Storage

-43M
TRACK 1 - Clothing and Textile Repair
TRACK 2 - Canvas and Web Repair

-24Q
TRACK 1 - Fire Control Mechanic
TRACK 2 - Simulator (T1) Mechanic

-11B
TRACK 1 - SKLVL 1 Rifleman/Others
TRACK 1 - SKLVL 2 Fire Team Leader (Infantry), Assistant Scout Squad Leader
TRACK 1 - SKLVL 3 Infantry Squad Leader
TRACK 1 - SKLVL 4 Platoon SGT Infantry
TRACK 2 - SKLVL 1 M60 Machinegunner
TRACK 2 - SKLVL 2 Fire Team Leader (Mechanized)
TRACK 2 - SKLVL 3 Infantry Squad Leader (Mechanized)
TRACK 2 - SKLVL 4 Platoon SGT (Mechanized)
TRACK 3 - Special Forces
TRACK 4 - SKLVL 1 Squad Gunner
TRACK 5 - SKLVL 1 Scout (Infantry Only)
TRACK 5 - SKLVL 4 Scout (Infantry Only)
TRACK 6 - SKLVL 1 M203 Grenadier
TRACK 7 - SKLVL 1 Dragon Gunner

Table A-3

SAMPLE VALIDITIES FOR CURRENT COMPOSITES
COMBINED CRITERION

MOS	AA	N	CL	SE	CO	SE	EL	SE	FA	SE	GM	SE	MM	SE	OF	SE	SC	SE	ST	SE	NORM SE
71D	CL	114	0.21	0.09	0.33	0.06	0.36	0.09	0.37	0.07	0.33	0.04	0.27	0.07	0.29	0.07	0.27	0.06	0.37	0.08	0.09
71L	CL	2782	0.33	0.02	0.38	0.02	0.43	0.02	0.43	0.02	0.38	0.02	0.31	0.02	0.37	0.02	0.36	0.02	0.42	0.02	0.02
71M	CL	182	0.32	0.07	0.33	0.06	0.34	0.06	0.34	0.06	0.33	0.06	0.32	0.06	0.37	0.05	0.35	0.06	0.38	0.06	0.07
71N	CL	173	0.36	0.06	0.36	0.06	0.38	0.08	0.42	0.06	0.33	0.07	0.30	0.07	0.32	0.07	0.37	0.06	0.35	0.07	0.08
73C	CL	470	0.46	0.03	0.53	0.04	0.53	0.03	0.55	0.03	0.49	0.03	0.47	0.04	0.52	0.03	0.52	0.03	0.52	0.03	0.05
75B	CL	920	0.29	0.01	0.38	0.03	0.42	0.02	0.41	0.03	0.37	0.01	0.32	0.02	0.35	0.03	0.34	0.03	0.39	0.02	0.03
75C	CL	317	0.27	0.05	0.45	0.95	0.51	0.04	0.48	0.04	0.40	0.05	0.40	0.05	0.45	0.05	0.37	0.06	0.50	0.04	0.06
75D	CL	801	0.19	0.03	0.34	0.03	0.41	0.03	0.38	0.03	0.37	0.03	0.30	0.03	0.32	0.03	0.27	0.03	0.39	0.03	0.04
75E	CL	417	0.31	0.05	0.41	0.04	0.45	0.04	0.43	0.04	0.42	0.04	0.38	0.05	0.41	0.04	0.39	0.05	0.45	0.04	0.05
75P	CL	137	0.37	0.08	0.51	0.07	0.55	0.08	0.57	0.07	0.49	0.08	0.45	0.08	0.47	0.07	0.43	0.07	0.53	0.08	0.09
76C	CL	1296	0.18	0.03	0.26	0.02	0.32	0.03	0.20	0.03	0.29	0.02	0.26	0.02	0.28	0.02	0.24	0.03	0.29	0.02	0.03
76P	CL	559	0.26	0.04	0.34	0.03	0.40	0.04	0.44	0.03	0.31	0.04	0.23	0.04	0.27	0.04	0.26	0.04	0.38	0.04	0.04
76V	CL	214	0.20	0.06	0.29	0.06	0.34	0.06	0.28	0.06	0.31	0.06	0.22	0.06	0.26	0.06	0.25	0.06	0.35	0.05	0.07
76W	CL	684	0.21	0.04	0.35	0.04	0.34	0.03	0.32	0.04	0.34	0.03	0.30	0.04	0.31	0.04	0.30	0.04	0.31	0.04	0.04
76X	CL	158	0.07	0.06	0.10	0.06	0.11	0.08	0.14	0.06	0.07	0.08	-0.03	0.06	-0.00	0.07	0.06	0.06	0.07	0.08	0.08
76Y	CL	1136	0.19	0.03	0.25	0.03	0.28	0.03	0.29	0.03	0.25	0.03	0.19	0.03	0.22	0.03	0.23	0.03	0.27	0.03	0.03
11B	CO	5761	0.22	0.01	0.31	0.01	0.31	0.01	0.31	0.01	0.31	0.01	0.29	0.01	0.31	0.01	0.27	0.01	0.33	0.01	0.01
11C	CO	1482	0.25	0.03	0.33	0.02	0.33	0.02	0.33	0.02	0.33	0.02	0.32	0.02	0.33	0.02	0.30	0.03	0.34	0.02	0.03
11H	CO	948	0.22	0.03	0.26	0.03	0.27	0.03	0.27	0.03	0.26	0.03	0.25	0.03	0.26	0.03	0.24	0.03	0.27	0.03	0.03
12B	CO	2411	0.19	0.02	0.33	0.02	0.32	0.02	0.31	0.02	0.32	0.02	0.32	0.02	0.32	0.02	0.25	0.02	0.32	0.02	0.02
12F	CO	224	0.08	0.05	0.21	0.05	0.16	0.06	0.15	0.06	0.18	0.07	0.21	0.06	0.20	0.06	0.15	0.05	0.18	0.07	0.07
19D	CO	1035	0.26	0.03	0.35	0.03	0.36	0.03	0.34	0.03	0.35	0.03	0.33	0.03	0.35	0.03	0.31	0.03	0.36	0.03	0.03
19E	CO	2322	0.30	0.02	0.42	0.02	0.42	0.02	0.38	0.02	0.43	0.02	0.42	0.02	0.44	0.02	0.38	0.02	0.44	0.02	0.02
19F	CO	83	0.24	0.09	0.40	0.09	0.37	0.09	0.32	0.09	0.39	0.09	0.39	0.09	0.40	0.09	0.33	0.09	0.37	0.08	0.11
17K	EL	179	0.21	0.06	0.34	0.07	0.28	0.07	0.33	0.06	0.26	0.07	0.27	0.07	0.32	0.06	0.28	0.06	0.32	0.07	0.07
26Q	EL	142	0.24	0.08	0.26	0.07	0.38	0.06	0.31	0.07	0.36	0.06	0.24	0.06	0.25	0.06	0.27	0.07	0.35	0.06	0.08
27E	EL	305	0.33	0.06	0.32	0.05	0.32	0.05	0.34	0.05	0.30	0.05	0.28	0.05	0.34	0.05	0.36	0.05	0.32	0.05	0.06
31J	EL	130	0.17	0.07	0.29	0.07	0.26	0.08	0.29	0.07	0.21	0.08	0.17	0.09	0.24	0.08	0.21	0.07	0.33	0.07	0.09
31M	EL	1858	0.17	0.02	0.35	0.02	0.36	0.02	0.31	0.02	0.37	0.02	0.34	0.02	0.35	0.02	0.27	0.02	0.36	0.02	0.02
31N	EL	193	0.18	0.08	0.09	0.06	0.05	0.06	0.04	0.07	0.03	0.06	0.07	0.06	0.11	0.07	0.17	0.07	0.05	0.07	0.07
31V	EL	650	0.22	0.04	0.31	0.04	0.33	0.03	0.32	0.03	0.31	0.04	0.30	0.04	0.29	0.04	0.26	0.04	0.29	0.03	0.04
35K	EL	121	0.34	0.08	0.46	0.06	0.41	0.06	0.42	0.06	0.42	0.06	0.44	0.06	0.46	0.06	0.44	0.07	0.39	0.06	0.09
36C	EL	374	0.12	0.05	0.13	0.05	0.10	0.04	0.14	0.05	0.07	0.05	0.10	0.05	0.10	0.05	0.14	0.05	0.03	0.04	0.05
36K	EL	1581	0.16	0.03	0.30	0.02	0.25	0.03	0.26	0.02	0.27	0.02	0.28	0.02	0.29	0.02	0.23	0.02	0.27	0.02	0.03
13B	FA	4776	0.25	0.01	0.38	0.01	0.37	0.01	0.35	0.01	0.38	0.01	0.38	0.01	0.38	0.01	0.33	0.01	0.37	0.01	0.01
13F	FA	824	0.28	0.03	0.42	0.02	0.36	0.03	0.39	0.03	0.36	0.03	0.37	0.03	0.39	0.03	0.35	0.03	0.37	0.03	0.03
41C	GM	103	0.25	0.11	0.26	0.10	0.25	0.07	0.30	0.08	0.21	0.07	0.26	0.08	0.23	0.09	0.27	0.10	0.15	0.08	0.10
43E	GM	'19	0.22	0.10	0.18	0.11	0.25	0.08	0.20	0.09	0.25	0.08	0.21	0.09	0.23	0.09	0.24	0.11	0.22	0.07	0.10
44B	GM	13[illegible]	0.19	0.08	0.30	0.09	0.26	0.08	0.26	0.07	0.25	0.09	0.30	0.09	0.29	0.09	0.24	0.08	0.23	0.09	0.09
45K	GM	428	0.26	0.06	0.35	0.06	0.24	0.07	0.33	0.06	0.25	0.06	0.34	0.05	0.34	0.06	0.30	0.07	0.28	0.07	0.07
51B	GM	195	0.21	0.07	0.27	0.06	0.25	0.06	0.28	0.07	0.27	0.05	0.26	0.05	0.30	0.05	0.26	0.06	0.27	0.06	0.07
51K	GM	167	0.17	0.08	0.22	0.07	0.25	0.07	0.23	0.07	0.26	0.06	0.24	0.06	0.22	0.07	0.22	0.07	0.17	0.09	0.08
52D	GM	176	0.24	0.07	0.33	0.07	0.27	0.06	0.32	0.06	0.27	0.06	0.34	0.06	0.37	0.06	0.28	0.06	0.33	0.06	0.08
55B	GM	366	0.20	0.06	0.24	0.05	0.28	0.05	0.27	0.05	0.26	0.05	0.21	0.05	0.23	0.05	0.21	0.06	0.25	0.05	0.05
57E	GM	126	0.15	0.09	0.29	0.08	0.03	0.09	0.31	0.07	0.02	0.08	0.08	0.09	0.10	0.08	0.16	0.08	0.06	0.11	0.09
57H	GM	224	0.15	0.07	0.14	0.06	0.13	0.05	0.14	0.06	0.14	0.06	0.08	0.06	0.17	0.07	0.16	0.08	0.24	0.05	0.07
62E	GM	230	0.30	0.06	0.43	0.05	0.40	0.05	0.39	0.05	0.42	0.05	0.45	0.05	0.44	0.05	0.38	0.06	0.40	0.05	0.07
62F	GM	200	0.26	0.07	0.32	0.06	0.29	0.06	0.27	0.07	0.33	0.06	0.39	0.06	0.37	0.06	0.31	0.07	0.31	0.07	0.07
68J	GM	188	0.15	0.07	0.34	0.06	0.26	0.07	0.26	0.06	0.33	0.06	0.34	0.07	0.35	0.07	0.25	0.07	0.30	0.07	0.07
68M	GM	132	0.31	0.08	0.47	0.05	0.30	0.06	0.43	0.05	0.33	0.06	0.42	0.05	0.40	0.06	0.40	0.07	0.28	0.05	0.09

(Cont'd)

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SAMPLE VALIDITIES FOR CURRENT COMPOSITES (Cont'd)

COMBINED CRITERION

MOS	AA	N	CL	SE	CO	SE	EL	SE	FA	SE	GM	SE	MM	SE	OF	SE	SC	SE	ST	SE	NORM SE
12C	MM	355	0.19	0.06	0.31	0.05	0.27	0.05	0.30	0.05	0.26	0.05	0.28	0.05	0.28	0.05	0.24	0.06	0.28	0.05	0.05
61B	MM	183	0.46	0.05	0.62	0.04	0.59	0.03	0.60	0.04	0.57	0.04	0.55	0.04	0.66	0.04	0.58	0.04	0.65	0.04	0.07
61C	MM	136	0.25	0.07	0.47	0.06	0.44	0.05	0.50	0.06	0.36	0.06	0.35	0.07	0.35	0.06	0.30	0.07	0.38	0.06	0.09
62B	MM	355	0.25	0.04	0.44	0.04	0.39	0.04	0.40	0.04	0.41	0.04	0.40	0.04	0.41	0.04	0.36	0.04	0.40	0.05	0.05
63B	MM	1818	0.14	0.02	0.31	0.02	0.30	0.02	0.27	0.02	0.32	0.02	0.33	0.02	0.31	0.02	0.26	0.02	0.28	0.02	0.02
63D	MM	342	0.10	0.07	0.13	0.06	0.04	0.06	0.07	0.06	0.11	0.06	0.10	0.05	0.13	0.05	0.16	0.07	0.08	0.06	0.05
63G	MM	361	0.01	0.08	0.21	0.06	0.09	0.07	0.10	0.07	0.11	0.08	0.18	0.07	0.16	0.08	0.10	0.09	0.07	0.07	0.08
63H	MM	783	0.14	0.04	0.32	0.03	0.33	0.03	0.30	0.03	0.34	0.03	0.33	0.03	0.31	0.03	0.23	0.03	0.33	0.03	0.04
63N	MM	509	0.06	0.04	0.19	0.04	0.12	0.04	0.15	0.04	0.15	0.04	0.21	0.03	0.17	0.03	0.12	0.04	0.10	0.04	0.04
63W	MM	527	0.10	0.04	0.18	0.04	0.19	0.04	0.16	0.04	0.22	0.04	0.17	0.04	0.19	0.05	0.15	0.04	0.22	0.05	0.04
63Y	MM	238	0.09	0.06	0.18	0.07	0.14	0.07	0.17	0.07	0.17	0.06	0.20	0.07	0.21	0.06	0.14	0.07	0.17	0.06	0.06
67N	MM	471	0.22	0.05	0.34	0.04	0.36	0.04	0.35	0.04	0.34	0.04	0.31	0.04	0.33	0.04	0.26	0.05	0.36	0.04	0.05
67T	MM	124	0.44	0.06	0.59	0.07	0.65	0.05	0.59	0.06	0.62	0.05	0.47	0.06	0.53	0.06	0.49	0.05	0.65	0.05	0.09
67U	MM	278	0.20	0.05	0.41	0.04	0.35	0.05	0.39	0.04	0.31	0.05	0.31	0.06	0.31	0.05	0.25	0.05	0.34	0.05	0.06
67V	MM	310	0.30	0.06	0.38	0.06	0.37	0.06	0.37	0.06	0.34	0.06	0.34	0.06	0.36	0.06	0.33	0.06	0.36	0.06	0.06
67Y	MM	241	0.17	0.06	0.25	0.07	0.27	0.06	0.18	0.07	0.32	0.06	0.33	0.07	0.32	0.07	0.25	0.07	0.26	0.06	0.06
68U	MM	121	0.29	0.08	0.55	0.05	0.45	0.06	0.53	0.05	0.44	0.07	0.47	0.06	0.46	0.06	0.38	0.07	0.43	0.06	0.09
68G	MM	121	0.08	0.12	0.24	0.11	0.37	0.07	0.27	0.10	0.34	0.07	0.22	0.10	0.27	0.12	0.14	0.12	0.36	0.08	0.09
15D	OF	406	0.12	0.05	0.24	0.05	0.20	0.05	0.24	0.05	0.20	0.05	0.22	0.04	0.25	0.04	0.18	0.05	0.21	0.04	0.05
15E	OF	280	0.09	0.05	0.19	0.04	0.16	0.05	0.17	0.05	0.18	0.05	0.19	0.05	0.22	0.05	0.15	0.05	0.19	0.05	0.06
16B	OF	288	0.16	0.06	0.30	0.05	0.28	0.05	0.29	0.05	0.27	0.05	0.25	0.05	0.26	0.05	0.23	0.05	0.28	0.05	0.06
16C	OF	118	0.17	0.07	0.29	0.07	0.25	0.09	0.30	0.07	0.21	0.09	0.17	0.09	0.22	0.07	0.23	0.07	0.21	0.09	0.09
16D	OF	112	0.32	0.09	0.48	0.09	0.38	0.07	0.40	0.08	0.46	0.07	0.47	0.09	0.46	0.09	0.45	0.09	0.37	0.07	0.09
16H	OF	104	0.23	0.09	0.44	0.08	0.46	0.08	0.42	0.09	0.43	0.08	0.36	0.09	0.41	0.09	0.31	0.09	0.46	0.08	0.10
16J	OF	119	0.34	0.08	0.34	0.09	0.43	0.06	0.40	0.09	0.37	0.07	0.30	0.07	0.36	0.07	0.36	0.08	0.42	0.07	0.09
16R	OF	404	0.12	0.04	0.20	0.04	0.17	0.04	0.18	0.04	0.19	0.04	0.17	0.04	0.20	0.03	0.18	0.04	0.18	0.04	0.05
16P	OF	592	0.11	0.04	0.30	0.04	0.30	0.03	0.27	0.04	0.32	0.03	0.31	0.03	0.30	0.03	0.21	0.04	0.29	0.03	0.04
64C	OF	2959	0.13	0.02	0.31	0.02	0.30	0.02	0.27	0.02	0.31	0.02	0.29	0.02	0.31	0.02	0.23	0.02	0.30	0.01	0.02
94B	OF	3122	0.15	0.02	0.33	0.02	0.35	0.02	0.30	0.02	0.34	0.02	0.29	0.02	0.32	0.02	0.25	0.02	0.34	0.02	0.02
05B	SC	890	0.09	0.04	0.25	0.03	0.26	0.03	0.24	0.04	0.26	0.03	0.24	0.03	0.27	0.03	0.21	0.03	0.28	0.03	0.03
05C	SC	1971	0.10	0.02	0.37	0.02	0.38	0.02	0.35	0.02	0.37	0.02	0.35	0.02	0.36	0.02	0.26	0.02	0.37	0.02	0.02
05Q	SC	119	0.26	0.10	0.43	0.07	0.27	0.09	0.34	0.09	0.30	0.08	0.36	0.07	0.41	0.08	0.39	0.08	0.33	0.09	0.09
17C	SC	187	0.06	0.07	0.22	0.06	0.22	0.07	0.19	0.06	0.21	0.07	0.18	0.07	0.22	0.07	0.20	0.05	0.23	0.07	0.07
72E	SC	562	0.12	0.04	0.46	0.03	0.49	0.03	0.62	0.03	0.51	0.03	0.51	0.03	0.49	0.03	0.34	0.04	0.47	0.03	0.04
05H	ST	110	0.49	0.07	0.43	0.07	0.43	0.06	0.51	0.05	0.37	0.08	0.33	0.07	0.42	0.07	0.51	0.07	0.45	0.06	0.10
13E	ST	678	0.19	0.03	0.29	0.03	0.31	0.03	0.33	0.03	0.28	0.03	0.22	0.03	0.24	0.03	0.23	0.03	0.30	0.03	0.04
54E	ST	270	0.37	0.05	0.36	0.05	0.36	0.05	0.39	0.05	0.33	0.05	0.33	0.05	0.34	0.05	0.34	0.05	0.36	0.05	0.06
74D	ST	98	0.32	0.10	0.34	0.09	0.37	0.09	0.40	0.09	0.30	0.08	0.22	0.08	0.29	0.09	0.36	0.09	0.37	0.10	0.10
82C	ST	536	0.32	0.04	0.43	0.03	0.43	0.03	0.46	0.03	0.38	0.03	0.38	0.03	0.37	0.04	0.35	0.04	0.36	0.04	0.04
91C	ST	233	0.37	0.05	0.38	0.05	0.39	0.05	0.38	0.05	0.35	0.05	0.34	0.05	0.36	0.05	0.41	0.05	0.35	0.04	0.07
91E	ST	301	0.20	0.05	0.25	0.05	0.32	0.05	0.31	0.05	0.27	0.05	0.21	0.05	0.22	0.05	0.21	0.05	0.32	0.04	0.06
91F	ST	159	0.25	0.08	0.24	0.08	0.24	0.07	0.27	0.08	0.21	0.08	0.25	0.08	0.24	0.08	0.25	0.08	0.22	0.08	0.08
91R	ST	145	0.38	0.07	0.31	0.06	0.26	0.07	0.31	0.07	0.24	0.07	0.23	0.07	0.27	0.07	0.40	0.06	0.24	0.07	0.08
92B	ST	364	0.15	0.04	0.29	0.05	0.34	0.05	0.32	0.05	0.10	0.05	0.24	0.05	0.25	0.05	0.20	0.05	0.32	0.05	0.05
93H	ST	114	0.09	0.09	0.27	0.08	0.30	0.09	0.30	0.09	0.24	0.09	0.24	0.08	0.24	0.08	0.14	0.09	0.31	0.09	0.09
95B	ST	3695	0.21	0.02	0.31	0.01	0.33	0.01	0.31	0.01	0.31	0.01	0.28	0.02	0.30	0.02	0.27	0.02	0.32	0.01	0.02
96B	ST	172	0.32	0.04	0.35	0.07	0.48	0.06	0.41	0.07	0.19	0.07	0.28	0.07	0.32	0.07	0.32	0.07	0.44	0.06	0.08
98C	ST	186	0.30	0.06	0.39	0.06	0.36	0.06	0.52	0.05	0.25	0.07	0.16	0.06	0.25	0.06	0.32	0.07	0.39	0.06	0.07

Table A - 4

ADJUSTED VALIDITIES FOR CURRENT COMPOSITES
COMBINED CRITERION

MOS	AA	N	CL	SE	CO	SE	EL	SE	FA	SE	GM	SE	MM	SE	OF	SE	SC	SE	ST	SE	NORM SE
71D	CL	114	0.26	0.25	0.37	0.18	0.39	0.16	0.38	0.19	0.36	0.15	0.29	0.18	0.32	0.21	0.29	0.24	0.40	0.18	0.09
71L	CL	2782	0.56	0.02	0.55	0.02	0.58	0.02	0.59	0.02	0.52	0.02	0.49	0.02	0.54	0.02	0.56	0.02	0.58	0.02	0.02
71M	CL	182	0.57	0.10	0.54	0.08	0.51	0.07	0.55	0.08	0.49	0.06	0.52	0.08	0.57	0.08	0.58	0.10	0.55	0.07	0.07
71N	CL	273	0.70	0.06	0.66	0.05	0.67	0.05	0.71	0.05	0.60	0.05	0.61	0.05	0.65	0.05	0.70	0.06	0.66	0.05	0.08
73C	CL	478	0.66	0.04	0.65	0.03	0.65	0.02	0.68	0.03	0.60	0.03	0.61	0.03	0.66	0.03	0.68	0.04	0.65	0.03	0.05
75B	CL	920	0.49	0.05	0.52	0.03	0.55	0.03	0.56	0.03	0.51	0.03	0.49	0.03	0.52	0.04	0.52	0.04	0.54	0.03	0.03
75C	CL	317	0.50	0.09	0.59	0.07	0.63	0.06	0.62	0.07	0.60	0.06	0.56	0.07	0.59	0.08	0.55	0.09	0.63	0.06	0.06
75D	CL	801	0.40	0.07	0.47	0.05	0.53	0.05	0.51	0.06	0.48	0.05	0.43	0.06	0.45	0.06	0.43	0.07	0.51	0.05	0.04
75E	CL	417	0.53	0.09	0.55	0.07	0.58	0.06	0.58	0.07	0.54	0.06	0.52	0.07	0.56	0.07	0.55	0.08	0.58	0.06	0.05
75F	CL	137	0.57	0.16	0.61	0.11	0.64	0.10	0.66	0.12	0.57	0.10	0.55	0.11	0.59	0.12	0.58	0.15	0.63	0.11	0.09
76C	CL	1296	0.44	0.05	0.49	0.03	0.52	0.03	0.50	0.04	0.50	0.03	0.48	0.03	0.50	0.04	0.48	0.04	0.51	0.04	0.03
76P	CL	559	0.55	0.05	0.57	0.04	0.62	0.04	0.65	0.04	0.55	0.04	0.50	0.05	0.55	0.05	0.55	0.05	0.62	0.04	0.04
76V	CL	214	0.47	0.10	0.49	0.08	0.52	0.08	0.50	0.08	0.49	0.07	0.44	0.08	0.48	0.09	0.49	0.10	0.53	0.08	0.07
76W	CL	604	0.45	0.09	0.58	0.06	0.58	0.06	0.56	0.07	0.58	0.05	0.55	0.06	0.56	0.07	0.52	0.08	0.56	0.06	0.04
76X	CL	158	0.31	0.26	0.30	0.23	0.31	0.22	0.33	0.23	0.28	0.21	0.26	0.23	0.28	0.25	0.31	0.27	0.30	0.23	0.08
76Y	CL	1136	0.39	0.06	0.41	0.05	0.43	0.04	0.45	0.05	0.40	0.04	0.36	0.05	0.39	0.05	0.40	0.06	0.43	0.05	0.03
11B	CO	5761	0.34	0.02	0.41	0.02	0.41	0.01	0.41	0.02	0.41	0.02	0.40	0.02	0.41	0.02	0.38	0.02	0.42	0.01	0.01
11C	CO	1482	0.36	0.04	0.44	0.03	0.43	0.03	0.43	0.03	0.63	0.01	0.43	0.03	0.44	0.03	0.41	0.04	0.44	0.03	0.03
11H	CO	948	0.34	0.04	0.38	0.04	0.38	0.04	0.38	0.03	0.37	0.04	0.37	0.04	0.38	0.04	0.36	0.04	0.38	0.04	0.03
12B	CO	2411	0.31	0.03	0.46	0.02	0.43	0.02	0.42	0.02	0.43	0.02	0.44	0.02	0.41	0.02	0.38	0.02	0.43	0.02	0.02
12F	CO	224	0.25	0.09	0.36	0.09	0.31	0.09	0.32	0.09	0.33	0.10	0.36	0.09	0.35	0.09	0.31	0.09	0.32	0.10	0.07
19D	CO	1035	0.40	0.04	0.47	0.04	0.47	0.03	0.46	0.03	0.46	0.04	0.45	0.04	0.47	0.04	0.45	0.04	0.48	0.03	0.03
19E	CO	2322	0.45	0.02	0.55	0.02	0.56	0.02	0.52	0.02	0.55	0.02	0.55	0.02	0.57	0.02	0.52	0.02	0.56	0.02	0.02
19F	CO	83	0.37	0.14	0.50	0.13	0.49	0.12	0.45	0.13	0.51	0.12	0.50	0.13	0.51	0.13	0.45	0.14	0.49	0.11	0.11
17K	EL	179	0.47	0.10	0.53	0.10	0.49	0.08	0.52	0.08	0.47	0.10	0.49	0.11	0.52	0.11	0.50	0.11	0.52	0.08	0.07
26Q	EL	142	0.42	0.10	0.47	0.09	0.54	0.09	0.49	0.09	0.53	0.09	0.46	0.08	0.47	0.09	0.46	0.10	0.52	0.10	0.08
27E	EL	305	0.52	0.07	0.52	0.06	0.52	0.06	0.53	0.06	0.51	0.05	0.50	0.05	0.54	0.06	0.55	0.06	0.53	0.06	0.06
31J	EL	130	0.46	0.12	0.58	0.11	0.58	0.13	0.59	0.12	0.55	0.13	0.51	0.12	0.55	0.12	0.51	0.13	0.61	0.12	0.09
31M	EL	1858	0.45	0.03	0.58	0.02	0.60	0.02	0.56	0.02	0.60	0.02	0.57	0.02	0.58	0.02	0.52	0.02	0.59	0.02	0.02
31N	EL	193	0.36	0.11	0.30	0.11	0.29	0.12	0.28	0.11	0.28	0.11	0.31	0.11	0.34	0.12	0.36	0.11	0.30	0.12	0.07
31V	EL	650	0.42	0.05	0.52	0.04	0.54	0.04	0.52	0.04	0.53	0.04	0.52	0.04	0.51	0.04	0.47	0.04	0.52	0.04	0.04
35K	EL	121	0.60	0.08	0.66	0.07	0.64	0.08	0.65	0.07	0.64	0.07	0.66	0.07	0.67	0.07	0.56	0.08	0.61	0.08	0.09
36C	EL	374	0.26	0.09	0.25	0.09	0.24	0.10	0.26	0.09	0.22	0.09	0.23	0.09	0.25	0.09	0.27	0.09	0.21	0.10	0.05
36K	EL	1581	0.30	0.04	0.43	0.04	0.41	0.05	0.40	0.04	0.43	0.04	0.42	0.04	0.42	0.04	0.37	0.04	0.42	0.04	0.03
13B	FA	4778	0.35	0.02	0.46	0.02	0.45	0.02	0.44	0.02	0.46	0.01	0.45	0.02	0.46	0.02	0.41	0.02	0.45	0.02	0.01
13F	FA	824	0.56	0.03	0.67	0.02	0.63	0.02	0.66	0.03	0.62	0.02	0.63	0.03	0.65	0.03	0.52	0.03	0.64	0.02	0.03
41C	GM	102	0.34	0.20	0.38	0.16	0.36	0.16	0.39	0.16	0.33	0.16	0.37	0.14	0.35	0.18	0.36	0.20	0.31	0.17	0.10
43E	GM	99	0.37	0.14	0.36	0.17	0.41	0.15	0.36	0.17	0.41	0.15	0.38	0.15	0.39	0.15	0.40	0.16	0.39	0.15	0.10
44B	GM	137	0.33	0.13	0.41	0.14	0.39	0.14	0.38	0.13	0.38	0.15	0.41	0.14	0.41	0.15	0.38	0.14	0.37	0.15	0.09
45K	GM	228	0.49	0.08	0.56	0.08	0.51	0.09	0.54	0.08	0.50	0.09	0.55	0.08	0.54	0.09	0.53	0.08	0.51	0.09	0.07
51B	GM	195	0.27	0.10	0.37	0.08	0.35	0.08	0.35	0.08	0.38	0.08	0.37	0.09	0.39	0.09	0.36	0.10	0.38	0.08	0.07
51K	GM	167	0.33	0.12	0.44	0.11	0.45	0.12	0.43	0.11	0.45	0.12	0.44	0.11	0.42	0.12	0.40	0.12	0.41	0.12	0.08
52D	GM	176	0.31	0.09	0.42	0.09	0.38	0.09	0.40	0.08	0.39	0.10	0.43	0.09	0.44	0.09	0.37	0.09	0.42	0.09	0.08
55B	GM	366	0.46	0.07	0.56	0.06	0.60	0.06	0.57	0.06	0.58	0.07	0.54	0.06	0.55	0.06	0.51	0.07	0.59	0.06	0.05
57E	GM	126	0.32	0.24	0.38	0.27	0.26	0.30	0.38	0.27	0.23	0.30	0.28	0.28	0.30	0.28	0.33	0.26	0.26	0.30	0.09
57H	GM	224	0.38	0.13	0.41	0.14	0.42	0.15	0.42	0.13	0.42	0.16	0.39	0.15	0.43	0.14	0.41	0.14	0.46	0.14	0.07
62E	GM	230	0.49	0.07	0.60	0.06	0.58	0.05	0.56	0.06	0.60	0.06	0.62	0.06	0.61	0.06	0.56	0.07	0.58	0.05	0.07
62F	GM	200	0.45	0.09	0.54	0.08	0.52	0.09	0.49	0.09	0.55	0.09	0.59	0.08	0.57	0.09	0.52	0.09	0.53	0.09	0.07
68J	GM	188	0.45	0.10	0.61	0.09	0.57	0.09	0.55	0.08	0.61	0.09	0.62	0.09	0.61	0.10	0.55	0.10	0.59	0.09	0.07
68M	GM	132	0.54	0.09	0.65	0.07	0.57	0.09	0.62	0.07	0.59	0.09	0.63	0.08	0.62	0.08	0.61	0.09	0.57	0.08	0.09

(Cont'd)

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ADJUSTED VALIDITIES FOR CURRENT COMPOSITES
COMBINED CRITERION

MOS	AA	N	CL	SE	CO	SE	EL	SE	FA	SE	GM	SE	MM	SE	OF	SE	SC	SE	ST	SE	NORM SE
12C	MM	355	0.38	0.08	0.66	0.07	0.42	0.06	0.45	0.07	0.42	0.06	0.43	0.07	0.44	0.07	0.42	0.07	0.44	0.07	0.05
61B	MM	103	0.61	0.06	0.68	0.05	0.66	0.04	0.66	0.04	0.65	0.04	0.64	0.06	0.71	0.05	0.66	0.06	0.71	0.04	0.07
61C	MM	136	0.53	0.07	0.69	-0.09	0.66	0.08	0.70	0.07	0.64	0.09	0.62	0.10	0.62	0.10	0.59	0.09	0.65	0.08	0.09
62B	MM	355	0.41	0.05	0.56	0.04	0.51	0.05	0.52	0.05	0.54	0.05	0.53	0.05	0.53	0.05	0.50	0.05	0.52	0.05	0.05
63B	MM	1018	0.31	0.03	0.45	0.03	0.43	0.02	0.41	0.03	0.46	0.02	0.47	0.03	0.45	0.03	0.39	0.03	0.42	0.02	0.02
63D	MM	342	0.28	0.12	0.36	0.11	0.28	0.11	0.28	0.11	0.32	0.11	0.32	0.12	0.36	0.12	0.34	0.13	0.29	0.11	0.05
63G	MM	161	0.23	0.13	0.38	0.13	0.30	0.12	0.30	0.12	0.34	0.13	0.38	0.14	0.36	0.14	0.31	0.14	0.29	0.13	0.08
63H	MM	783	0.34	0.05	0.48	0.04	0.48	0.04	0.45	0.04	0.49	0.04	0.48	0.04	0.47	0.04	0.41	0.04	0.48	0.04	0.04
63N	MM	509	0.18	0.07	0.33	0.07	0.28	0.07	0.28	0.07	0.32	0.07	0.35	0.07	0.32	0.07	0.26	0.08	0.27	0.07	0.04
63W	MM	527	0.23	0.07	0.29	0.07	0.29	0.08	0.27	0.07	0.31	0.08	0.28	0.08	0.29	0.08	0.27	0.08	0.31	0.07	0.04
63Y	MM	238	0.37	0.12	0.49	0.14	0.44	0.13	0.44	0.13	0.49	0.13	0.50	0.15	0.50	0.14	0.45	0.14	0.46	0.13	0.06
67N	MM	471	0.50	0.05	0.61	0.05	0.60	0.05	0.60	0.05	0.60	0.05	0.60	0.06	0.60	0.06	0.56	0.06	0.61	0.05	0.05
67T	MM	124	0.73	0.03	0.82	0.04	0.85	0.02	0.82	0.03	0.83	0.03	0.79	0.04	0.82	0.04	0.79	0.03	0.85	0.03	0.09
67U	MM	278	0.43	0.08	0.61	0.08	0.56	0.07	0.59	0.06	0.57	0.08	0.57	0.09	0.57	0.09	0.52	0.08	0.56	0.07	0.06
67V	MM	310	0.54	0.07	0.62	0.07	0.60	0.06	0.60	0.06	0.59	0.07	0.60	0.08	0.61	0.08	0.59	0.07	0.60	0.07	0.06
67Y	MM	241	0.52	0.09	0.63	0.09	0.63	0.07	0.56	0.08	0.67	0.07	0.68	0.09	0.67	0.09	0.62	0.09	0.63	0.08	0.06
68D	MM	121	0.51	0.09	0.74	0.07	0.66	0.07	0.71	0.06	0.67	0.08	0.69	0.08	0.69	0.08	0.62	0.09	0.66	0.07	0.09
68J	MM	121	0.29	0.19	0.38	0.19	0.48	0.16	0.19	0.18	0.46	0.16	0.40	0.19	0.43	0.20	0.35	0.20	0.46	0.17	0.09
15D	OF	406	0.38	0.08	0.48	0.07	0.44	0.06	0.45	0.06	0.45	0.07	0.46	0.08	0.48	0.08	0.44	0.08	0.45	0.07	0.05
15E	OF	280	0.34	0.09	0.42	0.09	0.39	0.08	0.39	0.08	0.41	0.09	0.42	0.09	0.44	0.10	0.40	0.09	0.42	0.09	0.06
16B	OF	288	0.36	0.10	0.46	0.08	0.46	0.07	0.45	0.08	0.45	0.07	0.43	0.09	0.44	0.09	0.41	0.10	0.45	0.08	0.06
16C	OF	118	0.22	0.16	0.29	0.15	0.29	0.14	0.32	0.14	0.25	0.15	0.19	0.17	0.23	0.17	0.24	0.17	0.27	0.15	0.09
16D	OF	112	0.46	0.12	0.62	0.09	0.56	0.10	0.54	0.09	0.60	0.09	0.61	0.08	0.60	0.10	0.57	0.10	0.55	0.10	0.09
16H	OF	104	0.62	0.12	0.73	0.10	0.73	0.09	0.72	0.09	0.72	0.09	0.70	0.10	0.74	0.11	0.69	0.12	0.75	0.09	0.10
16J	OF	119	0.56	0.13	0.57	0.13	0.61	0.10	0.60	0.11	0.58	0.11	0.54	0.13	0.59	0.14	0.59	0.14	0.62	0.12	0.09
16R	OF	404	0.30	0.07	0.36	0.06	0.33	0.05	0.34	0.06	0.35	0.05	0.34	0.06	0.37	0.06	0.35	0.07	0.35	0.06	0.05
16S	OF	592	0.36	0.07	0.49	0.05	0.50	0.05	0.47	0.05	0.52	0.05	0.51	0.05	0.49	0.06	0.44	0.06	0.49	0.05	0.06
64C	OF	2959	0.37	0.02	0.48	0.02	0.47	0.02	0.44	0.02	0.47	0.02	0.47	0.02	0.47	0.02	0.43	0.02	0.47	0.02	0.02
94B	OF	3322	0.41	0.02	0.52	0.02	0.52	0.02	0.49	0.02	0.52	0.02	0.49	0.02	0.51	0.02	0.48	0.02	0.52	0.02	0.02
05B	SC	890	0.38	0.07	0.42	0.06	0.42	0.05	0.41	0.06	0.41	0.05	0.41	0.06	0.44	0.06	0.42	0.07	0.43	0.05	0.03
05C	SC	1971	0.38	0.04	0.48	0.03	0.49	0.03	0.47	0.03	0.48	0.03	0.47	0.03	0.47	0.04	0.43	0.04	0.48	0.03	0.02
05G	SC	119	0.64	0.13	0.72	0.09	0.61	0.11	0.68	0.10	0.62	0.10	0.67	0.10	0.71	0.11	0.70	0.12	0.67	0.12	0.09
17C	SC	107	0.35	0.14	0.38	0.11	0.35	0.10	0.36	0.11	0.34	0.10	0.34	0.11	0.38	0.12	0.38	0.13	0.37	0.11	0.07
72E	SC	562	0.40	0.07	0.56	0.05	0.54	0.04	0.52	0.05	0.59	0.04	0.58	0.05	0.56	0.06	0.49	0.07	0.56	0.05	0.04
05H	ST	110	0.75	0.07	0.72	0.06	0.70	0.07	0.75	0.04	0.66	0.07	0.66	0.07	0.73	0.08	0.77	0.07	0.73	0.07	0.10
13E	ST	678	0.39	0.04	0.46	0.04	0.47	0.04	0.48	0.04	0.45	0.04	0.43	0.04	0.45	0.04	0.43	0.04	0.47	0.05	0.04
54E	ST	270	0.46	0.08	0.49	0.07	0.50	0.08	0.52	0.07	0.47	0.07	0.47	0.07	0.49	0.08	0.49	0.08	0.51	0.08	0.06
74D	ST	98	0.65	0.10	0.69	0.09	0.71	0.10	0.70	0.09	0.67	0.10	0.62	0.10	0.69	0.11	0.69	0.10	0.72	0.11	0.10
82C	ST	536	0.47	0.06	0.56	0.05	0.56	0.05	0.58	0.05	0.53	0.05	0.54	0.05	0.54	0.06	0.52	0.06	0.53	0.06	0.04
91C	ST	233	0.55	0.06	0.58	0.05	0.57	0.05	0.57	0.05	0.55	0.05	0.55	0.05	0.57	0.05	0.58	0.05	0.56	0.06	0.07
91E	ST	301	0.49	0.07	0.53	0.06	0.57	0.06	0.56	0.06	0.54	0.06	0.50	0.06	0.52	0.06	0.51	0.06	0.57	0.06	0.06
91P	ST	159	0.44	0.12	0.40	0.12	0.39	0.12	0.43	0.12	0.36	0.12	0.41	0.11	0.41	0.13	0.43	0.12	0.38	0.14	0.08
91R	ST	145	0.61	0.09	0.59	0.09	0.56	0.11	0.59	0.09	0.55	0.10	0.54	0.09	0.59	0.10	0.54	0.09	0.58	0.12	0.08
92B	ST	364	0.33	0.08	0.41	0.07	0.45	0.07	0.43	0.07	0.42	0.07	0.37	0.08	0.38	0.08	0.36	0.08	0.44	0.07	0.05
93H	ST	114	0.54	0.13	0.58	0.11	0.60	0.11	0.60	0.12	0.57	0.11	0.56	0.12	0.59	0.13	0.56	0.13	0.62	0.12	0.09
95B	ST	3695	0.50	0.02	0.58	0.02	0.59	0.02	0.57	0.02	0.58	0.02	0.56	0.02	0.58	0.02	0.55	0.02	0.59	0.02	0.02
96B	ST	172	0.60	0.07	0.62	0.05	0.70	0.05	0.64	0.05	0.65	0.06	0.57	0.06	0.63	0.07	0.63	0.07	0.70	0.06	0.08
98C	ST	186	0.68	0.08	0.73	0.07	0.73	0.08	0.78	0.06	0.68	0.08	0.63	0.08	0.70	0.09	0.71	0.08	0.75	0.09	0.07

Table A - 5

SAMPLE CORRELATIONS FOR THE CURRENT COMPOSITES
TRAINING CRITERION

TCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
71NL1551	CL	0.36	0.36	0.38	0.42	0.33	0.30	0.32	0.37	0.35
73C5R121	CL	0.43	0.46	0.48	0.51	0.42	0.35	0.43	0.45	0.47
75B5E121	CL	0.17	0.23	0.26	0.24	0.24	0.19	0.21	0.22	0.23
75D5D805	CL	0.14	0.35	0.41	0.38	0.36	0.30	0.31	0.23	0.36
75E5E805	CL	0.40	0.46	0.49	0.49	0.46	0.41	0.46	0.48	0.47
76CEC101	CL	0.16	0.25	0.30	0.26	0.28	0.25	0.27	0.22	0.28
76P5F101	CL	0.26	0.34	0.40	0.44	0.31	0.23	0.27	0.26	0.38
76VEV101	CL	0.02	0.01	0.04	0.04	0.06	-0.01	0.04	0.02	0.12
76WDB101	CL	0.20	0.20	0.08	0.13	0.10	0.22	0.18	0.25	0.03
76WPW101	CL	0.23	0.38	0.37	0.37	0.36	0.31	0.36	0.32	0.35
76XSX101	CL	0.07	0.10	0.11	0.14	0.07	-0.03	-0.00	0.06	0.07
76YEY101	CL	0.21	0.25	0.25	0.30	0.21	0.17	0.19	0.22	0.24
76Y5G101	CL	0.26	0.42	0.52	0.44	0.48	0.35	0.40	0.37	0.52
76Y6Y805	CL	0.12	0.14	0.14	0.19	0.13	0.11	0.11	0.13	0.13
11OIN809	CO	0.14	0.18	0.18	0.19	0.17	0.16	0.16	0.15	0.19
11BIN809	CO	0.18	0.26	0.23	0.26	0.22	0.21	0.24	0.21	0.26
11CIN809	CO	0.24	0.30	0.26	0.27	0.28	0.30	0.30	0.29	0.28
11HIN809	CO	0.17	0.24	0.24	0.23	0.23	0.23	0.24	0.21	0.23
12BAB807	CO	0.08	0.15	0.13	0.13	0.14	0.16	0.13	0.12	0.10
12FAF807	CO	0.08	0.21	0.16	0.15	0.18	0.21	0.20	0.15	0.18
19D9D804	CO	0.22	0.25	0.25	0.24	0.26	0.26	0.26	0.26	0.24
19E9E804	CO	0.29	0.35	0.33	0.29	0.36	0.35	0.41	0.37	0.38
19F9F804	CO	0.24	0.40	0.37	0.32	0.39	0.39	0.40	0.33	0.37
17KGA301	EL	0.25	0.40	0.37	0.41	0.35	0.29	0.37	0.34	0.44
27E7E093	EL	0.31	0.40	0.33	0.35	0.34	0.37	0.39	0.39	0.32
31M4D113	EL	0.19	0.25	0.25	0.27	0.20	0.19	0.23	0.22	0.25
31N4C113	EL	0.18	0.09	0.05	0.04	0.03	0.07	0.11	0.17	0.05
31V1V061	EL	0.25	0.37	0.36	0.38	0.34	0.35	0.34	0.31	0.31
36CAA113	EL	0.12	0.13	0.10	0.14	0.07	0.10	0.10	0.14	0.03
36KAC113	EL	0.13	0.24	0.16	0.22	0.19	0.22	0.21	0.18	0.16
13B3B810	FA	0.13	0.22	0.18	0.20	0.20	0.24	0.21	0.18	0.18
13F3F810	FA	0.40	0.53	0.50	0.53	0.48	0.45	0.49	0.48	0.51
41CG7091	GM	0.25	0.26	0.25	0.30	0.21	0.26	0.23	0.27	0.15
44BJ1091	GM	0.19	0.30	0.26	0.26	0.25	0.30	0.29	0.24	0.23
45KK8091	GM	0.27	0.33	0.18	0.32	0.18	0.31	0.30	0.30	0.20
45KK9091	GM	0.26	0.36	0.29	0.34	0.32	0.37	0.37	0.30	0.34
51KBK807	GM	0.17	0.22	0.25	0.23	0.26	0.24	0.22	0.22	0.17
54CSS031	GM	0.04	0.05	0.01	0.01	0.08	0.08	0.03	0.07	-0.02
55B5B093	GM	0.28	0.32	0.38	0.32	0.35	0.30	0.32	0.30	0.33
57EPE101	GM	0.15	0.29	0.03	0.31	0.02	0.08	0.10	0.16	0.06
57HG1551	GM	0.15	0.14	0.13	0.14	0.14	0.08	0.17	0.16	0.24
62ECE807	GM	0.30	0.45	0.47	0.40	0.48	0.48	0.46	0.38	0.45
62FCF807	GM	0.16	0.29	0.27	0.25	0.30	0.38	0.34	0.24	0.25
68JW6551	GM	0.22	0.44	0.44	0.39	0.53	0.49	0.46	0.35	0.44
68MW8551	GM	0.31	0.47	0.30	0.43	0.33	0.42	0.40	0.40	0.28

(cont'd)

SAMPLE CORRELATIONS FOR THE CURRENT COMPOSITES
TRAINING CRITERION (Continued)

TCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
61BG6551	MM	0.46	0.62	0.59	0.60	0.57	0.55	0.66	0.58	0.65
61CH1551	MM	0.25	0.47	0.44	0.50	0.36	0.35	0.35	0.30	0.38
62BCB807	MM	0.22	0.43	0.36	0.39	0.39	0.38	0.37	0.33	0.35
63B3D003	MM	0.16	0.32	0.28	0.26	0.32	0.34	0.34	0.28	0.29
63B3B805	MM	-0.01	0.18	0.17	0.11	0.21	0.19	0.15	0.09	0.14
63DSA171	MM	0.10	0.13	0.06	0.07	0.11	0.10	0.13	0.16	0.08
63GM7091	MM	0.01	0.21	0.09	0.10	0.11	0.18	0.16	0.10	0.07
63HH1091	MM	0.12	0.33	0.33	0.31	0.33	0.33	0.31	0.21	0.33
63NTS171	MM	0.06	0.19	0.12	0.15	0.15	0.21	0.17	0.12	0.10
63TFI171	MM	-0.03	0.08	0.08	0.10	0.10	0.07	0.02	-0.01	0.07
63WW1091	MM	0.11	0.17	0.19	0.17	0.20	0.15	0.16	0.14	0.21
63YTV171	MM	0.07	0.11	0.10	0.11	0.13	0.14	0.13	0.10	0.11
67N65011	MM	0.55	0.58	0.60	0.62	0.54	0.50	0.61	0.60	0.61
67TL6551	MM	0.44	0.59	0.65	0.59	0.62	0.47	0.53	0.49	0.65
67UP1551	MM	0.35	0.48	0.40	0.49	0.33	0.35	0.38	0.37	0.40
67V18011	MM	0.47	0.59	0.63	0.61	0.57	0.53	0.58	0.51	0.61
67YS1551	MM	0.25	0.23	0.24	0.17	0.30	0.39	0.33	0.33	0.20
68DT1551	MM	0.29	0.55	0.45	0.53	0.44	0.47	0.46	0.38	0.43
15D5D810	OF	0.09	0.18	0.12	0.16	0.13	0.16	0.19	0.14	0.13
15E5E810	OF	0.09	0.19	0.16	0.17	0.18	0.19	0.22	0.15	0.19
16BBA811	OF	0.10	0.30	0.31	0.26	0.31	0.29	0.27	0.21	0.27
16BBC811	OF	0.22	0.29	0.26	0.33	0.22	0.19	0.26	0.25	0.31
16CCA811	OF	0.17	0.29	0.25	0.30	0.21	0.17	0.22	0.23	0.21
16DDB811	OF	0.32	0.48	0.38	0.40	0.46	0.47	0.46	0.45	0.37
16EEB811	OF	-0.17	-0.10	0.03	-0.11	0.04	-0.04	-0.08	-0.14	-0.01
16HHB811	OF	0.23	0.44	0.44	0.42	0.43	0.36	0.41	0.31	0.46
16JJA811	OF	0.34	0.34	0.43	0.40	0.37	0.30	0.36	0.36	0.42
16PPA811	OF	-0.02	0.07	0.01	-0.00	0.09	0.12	0.14	0.08	0.05
16RRA811	OF	0.12	0.20	0.17	0.18	0.19	0.17	0.20	0.18	0.18
16SSA811	OF	0.11	0.30	0.30	0.27	0.32	0.31	0.30	0.21	0.29
64CEC807	OF	-0.03	0.09	0.03	0.04	0.10	0.12	0.15	0.06	0.09
64C4C803	OF	0.05	0.14	0.14	0.11	0.16	0.12	0.13	0.11	0.14
94BKA101	OF	0.16	0.21	0.20	0.20	0.20	0.19	0.20	0.21	0.18
94B4B803	OF	0.24	0.43	0.44	0.44	0.39	0.34	0.36	0.31	0.43
94B4B805	OF	0.06	0.17	0.22	0.15	0.21	0.17	0.18	0.13	0.20
05B2A113	SC	0.10	0.17	0.16	0.17	0.14	0.14	0.17	0.16	0.18
05C2D113	SC	0.15	0.26	0.31	0.31	0.27	0.23	0.24	0.22	0.27
17C7C061	SC	0.06	0.22	0.22	0.19	0.21	0.18	0.22	0.20	0.23
72E3G113	SC	0.07	0.13	0.14	0.15	0.11	0.04	0.12	0.10	0.16
13E3E810	ST	0.16	0.27	0.30	0.31	0.25	0.17	0.19	0.19	0.27
54ESA031	ST	0.32	0.36	0.36	0.39	0.33	0.33	0.34	0.34	0.36
82C2C810	ST	0.37	0.47	0.48	0.51	0.43	0.43	0.40	0.41	0.39
91B01929	ST	0.09	0.13	0.09	0.11	0.10	0.10	0.11	0.11	0.10
91C02929	ST	0.37	0.38	0.39	0.38	0.35	0.34	0.36	0.41	0.35
91E05929	ST	0.26	0.33	0.38	0.41	0.30	0.22	0.26	0.28	0.37
92B25929	ST	0.18	0.48	0.49	0.49	0.45	0.42	0.40	0.30	0.47
95BSB813	ST	0.24	0.37	0.41	0.32	0.41	0.37	0.42	0.34	0.43

Table A - 6

ADJUSTED CORRELATIONS FOR THE CURRENT COMPOSITES
TRAINING CRITERION

TCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
71NL1551	CL	0.70	0.66	0.67	0.71	0.60	0.61	0.65	0.70	0.66
73C5R121	CL	0.56	0.52	0.54	0.58	0.47	0.46	0.52	0.55	0.53
75B5E121	CL	0.29	0.33	0.35	0.34	0.33	0.31	0.32	0.32	0.33
75D5D805	CL	0.26	0.38	0.44	0.41	0.40	0.34	0.35	0.31	0.40
75E5E805	CL	0.63	0.61	0.63	0.65	0.59	0.58	0.63	0.65	0.63
76CEC101	CL	0.44	0.49	0.52	0.51	0.50	0.48	0.50	0.48	0.52
76P5F101	CL	0.55	0.57	0.62	0.65	0.55	0.50	0.55	0.55	0.62
76VEV101	CL	0.13	0.13	0.15	0.16	0.15	0.11	0.14	0.13	0.18
76WDB101	CL	0.58	0.58	0.51	0.54	0.52	0.58	0.59	0.62	0.51
76WPW101	CL	0.56	0.67	0.68	0.67	0.66	0.64	0.67	0.63	0.67
76XSX101	CL	0.31	0.30	0.31	0.33	0.28	0.26	0.28	0.31	0.30
76YEY101	CL	0.40	0.40	0.41	0.44	0.37	0.35	0.38	0.41	0.41
76Y5G101	CL	0.47	0.55	0.64	0.58	0.60	0.50	0.53	0.51	0.63
76Y6Y805	CL	0.31	0.30	0.30	0.34	0.27	0.28	0.29	0.31	0.30
11OIN809	CO	0.20	0.22	0.23	0.24	0.22	0.20	0.21	0.20	0.24
11BIN809	CO	0.32	0.38	0.35	0.38	0.33	0.33	0.36	0.35	0.37
11CIN809	CO	0.35	0.41	0.37	0.39	0.39	0.41	0.41	0.40	0.39
11HIN809	CO	0.29	0.35	0.35	0.34	0.35	0.35	0.36	0.33	0.35
12BAB807	CO	0.10	0.18	0.16	0.16	0.18	0.20	0.16	0.14	0.13
12FAF807	CO	0.25	0.36	0.31	0.32	0.33	0.36	0.35	0.31	0.32
19D9D804	CO	0.31	0.35	0.35	0.34	0.36	0.36	0.36	0.35	0.34
19E9E804	CO	0.57	0.58	0.54	0.54	0.55	0.57	0.62	0.61	0.59
19F9F804	CO	0.37	0.50	0.49	0.45	0.51	0.50	0.51	0.45	0.49
17KGA301	EL	0.53	0.60	0.57	0.59	0.55	0.54	0.59	0.57	0.62
27E7E093	EL	0.49	0.57	0.53	0.53	0.54	0.55	0.56	0.55	0.52
31M4D113	EL	0.43	0.48	0.49	0.49	0.46	0.45	0.47	0.46	0.49
31N4C113	EL	0.36	0.30	0.29	0.28	0.28	0.31	0.34	0.36	0.30
31V1V061	EL	0.43	0.55	0.55	0.55	0.55	0.55	0.54	0.50	0.53
36CAA113	EL	0.26	0.25	0.24	0.26	0.22	0.23	0.25	0.27	0.21
36KAC113	EL	0.23	0.32	0.28	0.30	0.30	0.31	0.30	0.28	0.28
13B3B810	FA	0.18	0.29	0.25	0.25	0.27	0.30	0.27	0.23	0.24
13F3F810	FA	0.68	0.77	0.75	0.78	0.72	0.71	0.75	0.74	0.76
41CG7091	GM	0.34	0.38	0.36	0.39	0.33	0.37	0.35	0.36	0.31
44BJ1091	GM	0.33	0.41	0.39	0.38	0.38	0.41	0.41	0.38	0.37
45KK8091	GM	0.40	0.42	0.30	0.41	0.29	0.39	0.38	0.41	0.30
45KK9091	GM	0.57	0.66	0.64	0.63	0.64	0.66	0.66	0.63	0.65
51KBK807	GM	0.33	0.44	0.45	0.43	0.45	0.44	0.42	0.40	0.41
54CSS031	GM	0.16	0.22	0.20	0.18	0.24	0.24	0.21	0.21	0.19
55B5B093	GM	0.55	0.64	0.69	0.64	0.68	0.64	0.65	0.61	0.68
57EPE101	GM	0.32	0.38	0.26	0.38	0.23	0.28	0.30	0.33	0.26
57HG1551	GM	0.38	0.41	0.42	0.42	0.42	0.39	0.43	0.41	0.46
62ECE807	GM	0.46	0.60	0.60	0.55	0.62	0.63	0.61	0.55	0.59
62FCF807	GM	0.36	0.49	0.48	0.43	0.50	0.55	0.53	0.45	0.46
69JW6551	GM	0.53	0.72	0.73	0.67	0.77	0.75	0.73	0.65	0.73
68MW8551	GM	0.54	0.65	0.57	0.62	0.59	0.63	0.62	0.61	0.57

(cont'd)

ADJUSTED CORRELATIONS FOR THE CURRENT COMPOSITES
TRAINING CRITERION (Continued)

TCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
61BG6551	MM	0.61	0.68	0.66	0.66	0.65	0.64	0.71	0.66	0.71
61CH1551	MM	0.53	0.69	0.66	0.70	0.64	0.62	0.62	0.59	0.65
62BCB807	MM	0.37	0.55	0.48	0.49	0.52	0.52	0.50	0.47	0.46
63B3B803	MM	0.37	0.50	0.46	0.43	0.50	0.52	0.51	0.46	0.47
63B3B805	MM	0.08	0.22	0.21	0.16	0.24	0.23	0.20	0.15	0.18
63DSA171	MM	0.28	0.34	0.28	0.28	0.32	0.32	0.34	0.34	0.29
63GM7091	MM	0.23	0.38	0.30	0.30	0.34	0.38	0.36	0.31	0.29
63HH1091	MM	0.33	0.48	0.48	0.46	0.49	0.49	0.47	0.40	0.48
63NTS171	MM	0.18	0.33	0.28	0.28	0.32	0.35	0.32	0.26	0.27
63TFI171	MM	0.01	0.12	0.12	0.12	0.13	0.12	0.08	0.05	0.11
63WW1091	MM	0.23	0.27	0.28	0.27	0.29	0.25	0.26	0.26	0.30
63YTV171	MM	0.26	0.34	0.31	0.31	0.34	0.35	0.34	0.32	0.32
67N65011	MM	0.79	0.83	0.81	0.82	0.80	0.80	0.85	0.84	0.83
67TL6551	MM	0.73	0.82	0.85	0.82	0.83	0.79	0.82	0.79	0.85
67UP1551	MM	0.58	0.68	0.62	0.68	0.60	0.6[illegible]	0.64	0.63	0.63
67V18011	MM	0.68	0.78	0.80	0.78	0.77	0.76	0.78	0.75	0.78
67YS1551	MM	0.59	0.68	0.66	0.60	0.70	0.75	0.72	0.69	0.63
68DT1551	MM	0.53	0.74	0.66	0.71	0.67	0.69	0.69	0.62	0.66
15D5D810	OF	0.31	0.39	0.34	0.36	0.36	0.38	0.39	0.37	0.36
15E5E810	OF	0.34	0.42	0.39	0.39	0.41	0.42	0.44	0.40	0.42
16BBA811	OF	0.31	0.45	0.45	0.41	0.45	0.44	0.42	0.38	0.42
16BBC811	OF	0.39	0.42	0.40	0.44	0.39	0.36	0.40	0.41	0.43
16CCA811	OF	0.22	0.29	0.29	0.32	0.25	0.19	0.23	0.24	0.27
16DDB811	OF	0.46	0.62	0.56	0.54	0.60	0.61	0.6[illegible]	0.57	0.5[illegible]
16EEB811	OF	-0.15	-0.06	0.01	-0.09	0.04	-0.02	-0.04	-0.10	-0.01
16HHB811	OF	0.62	0.73	0.73	0.72	0.72	0.70	0.74	0.69	0.75
16JJA811	OF	0.56	0.57	0.61	0.60	0.58	0.54	0.59	0.59	0.62
16PPA811	OF	0.11	0.20	0.13	0.12	0.20	0.23	0.24	0.18	0.17
16RRA811	OF	0.30	0.36	0.33	0.34	0.35	0.34	0.37	0.35	0.35
16SSA811	OF	0.36	0.49	0.50	0.47	0.52	0.51	0.49	0.44	0.49
64CEC807	OF	0.19	0.26	0.21	0.22	[illegible]	0.28	0.29	0.25	0.25
64C4C803	OF	0.17	0.23	0.23	0.2[illegible]	[illegible]	0.22	0.22	0.21	0.24
94BKA101	OF	0.35	0.39	0.38	0.38	0.38	0.37	0.38	0.39	0.37
94B4B803	OF	0.49	0.60	0.61	0.61	[illegible]	0.54	0.56	0.54	0.61
94B4B805	OF	0.26	0.32	0.35	0.31	[illegible]	0.32	0.33	0.30	0.34
05B2A113	SC	0.35	0.35	0.34	0.36	0.32	0.33	0.37	0.37	0.36
05C2D113	SC	0.35	0.38	0.41	0.41	0.38	0.37	0.37	0.37	0.39
17C7C061	SC	0.35	0.38	0.35	0.36	0.34	0.34	0.38	0.36	0.37
72E3G113	SC	0.21	0.22	0.21	0.22	0.19	0.17	0.22	0.22	0.23
13E3E810	ST	0.32	0.40	0.41	0.41	0.39	0.35	0.37	0.35	0.40
54ESA031	ST	0.46	0.49	0.50	0.52	0.47	0.47	0.49	0.49	0.51
82C2C810	ST	0.48	0.56	0.56	0.58	0.53	0.54	0.53	0.52	0.52
91B01929	ST	0.16	0.19	0.17	0.18	0.17	0.17	0.18	0.18	0.18
91C02929	ST	0.55	0.58	0.57	0.57	0.55	0.55	0.57	0.58	0.56
91E05929	ST	0.57	0.63	0.65	0.66	0.61	0.57	0.61	0.60	0.65
92B25929	ST	0.36	0.52	0.53	0.52	0.51	0.48	0.47	0.42	0.51
95BSB813	ST	0.63	0.71	0.73	0.68	0.73	0.70	0.74	0.70	0.75

Table A - 7

SAMPLE VALIDITIES FOR CURRENT COMPOSITES
SQT CRITERION

PCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
71D0182	CL	0.21	0.33	0.36	0.37	0.33	0.27	0.29	0.27	0.37
71L1183	CL	0.34	0.39	0.44	0.44	0.38	0.32	0.38	0.37	0.43
71L2183	CL	0.19	0.27	0.34	0.36	0.26	0.21	0.23	0.19	0.32
71M0182	CL	0.32	0.33	0.34	0.34	0.33	0.32	0.37	0.35	0.38
73C0182	CL	0.44	0.54	0.54	0.57	0.51	0.47	0.50	0.49	0.52
73C0183	CL	0.50	0.57	0.54	0.56	0.52	0.52	0.57	0.57	0.55
75B0182	CL	0.33	0.43	0.49	0.46	0.43	0.38	0.41	0.37	0.45
75B0183	CL	0.37	0.45	[illegible]	0.49	0.44	0.38	0.42	0.40	0.46
75C0182	CL	0.39	0.45	[illegible]	0.50	0.48	0.42	0.48	0.45	0.49
75C0183	CL	0.22	0.45	0.52	0.48	0.48	0.38	0.43	0.34	0.51
75D0182	CL	0.15	0.26	0.32	0.26	0.30	0.27	0.26	0.22	0.28
75D0183	CL	0.23	0.38	0.47	0.44	0.41	0.31	0.35	0.30	0.45
75E0182	CL	0.26	0.31	0.39	0.31	0.37	0.31	0.35	0.32	0.40
75E0183	CL	0.25	0.42	0.46	0.45	0.42	[illegible]	0.41	0.34	0.45
75F0183	CL	0.37	0.51	0.55	0.57	0.49	0.45	0.47	0.43	0.53
76C0183	CL	0.25	0.30	0.37	0.32	0.34	0.30	0.32	0.30	0.33
76V0183	CL	0.20	0.29	0.34	0.28	0.31	0.22	0.26	0.25	0.35
76W0182	CL	0.09	0.30	0.25	0.25	0.28	0.22	0.21	0.21	0.21
76W0183	CL	0.29	0.41	0.46	0.39	0.45	0.37	0.40	0.36	0.45
11B 181	CO	0.22	0.29	0.26	0.28	0.25	0.28	0.27	0.25	0.24
11B0183	CO	0.23	0.42	0.46	0.40	0.46	0.40	0.34	0.33	0.48
11B1182	CO	0.25	0.33	0.34	0.33	0.33	0.31	0.32	0.29	0.34
11B2182	CO	0.13	0.21	0.24	0.20	0.25	0.23	0.23	0.18	0.24
11B6182	CO	0.18	0.25	0.28	0.28	0.27	0.25	0.28	0.21	0.32
11B7182	CO	0.25	0.30	0.28	0.28	0.32	0.30	0.34	0.30	0.36
11C 181	CO	0.22	0.26	0.26	0.27	0.23	0.24	0.24	0.24	0.24
11C0183	CO	0.24	0.32	0.39	0.34	0.39	0.28	0.33	0.30	0.41
11C1182	CO	0.23	0.36	0.35	0.36	0.33	0.32	0.36	0.27	0.38
11C2182	CO	0.27	0.33	0.38	0.32	0.37	0.36	0.34	0.32	0.33
11C4182	CO	0.23	0.26	0.26	0.26	0.26	0.25	0.26	0.25	0.26
11C5182	CO	0.33	0.45	0.45	0.44	0.44	0.42	0.42	0.39	0.43
11H 181	CO	0.28	0.39	0.40	0.43	0.39	0.30	0.36	0.30	0.45
11H1182	CO	0.25	0.29	0.31	0.30	0.30	0.29	0.30	0.27	0.33
11H2182	CO	0.23	0.26	0.26	0.28	0.23	0.23	0.24	0.24	0.24
12B0183	CO	0.19	0.33	0.32	0.32	0.32	0.31	0.31	0.25	0.33
12B1182	CO	0.18	0.33	0.32	0.30	0.32	0.34	0.33	0.26	0.30
19D 181	CO	-0.01	0.10	0.14	0.12	0.16	0.07	0.08	0.05	0.14
19D0183	CO	0.28	0.40	0.40	0.37	0.41	0.38	0.41	0.35	0.42
19D1182	CO	0.27	0.35	0.37	0.35	0.35	0.32	0.35	0.31	0.37
19E1182	CO	0.26	0.34	0.32	0.31	0.33	0.33	0.36	0.32	0.35
19E1183	CO	0.38	0.53	0.52	0.49	0.53	0.53	0.55	0.47	0.56
19E2183	CO	0.30	0.46	0.48	0.41	0.50	0.47	0.48	0.39	0.49
19E3182	CO	0.22	0.31	0.29	0.26	0.31	0.31	0.32	0.28	0.30
C35KL83	EL	0.34	0.46	0.41	0.42	0.42	0.44	0.46	0.44	0.39
17K2182	EL	0.15	0.27	0.17	0.25	0.15	0.25	0.26	0.21	0.18
26Q0183	EL	0.24	0.26	0.38	0.31	0.36	0.24	0.25	0.27	0.35
27E0182	EL	0.18	0.23	0.09	0.18	0.15	0.19	0.24	0.23	0.19
27E0183	EL	0.34	0.26	0.32	0.33	0.27	0.21	0.29	0.33	0.33
31J0183	EL	0.17	0.29	0.26	0.29	0.21	0.17	0.24	0.21	0.33
31M0183	EL	0.19	0.48	0.47	0.38	0.54	0.50	0.49	0.36	0.48
31M1182	EL	0.14	0.21	0.26	0.23	0.20	0.17	0.20	0.17	0.25
31M2182	EL	0.13	0.19	0.23	0.20	0.22	0.18	0.20	0.17	0.25
31V0183	EL	0.25	0.31	0.43	0.33	0.39	0.33	0.32	0.29	0.36
31V1182	EL	0.16	0.24	0.26	0.25	0.23	0.22	0.22	0.19	0.24
35C2182	EL	0.13	0.16	0.09	0.15	0.09	0.15	0.15	0.15	[illegible]
36K0182	EL	0.11	0.24	0.18	0.20	0.20	0.22	0.23	[illegible]	0.20
36K0183	EL	0.23	0.40	0.39	0.35	0.40	0.38	0.40	0.33	0.40

(cont'd)

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SAMPLE VALIDITIES FOR CURRENT COMPOSITES
SQT CRITERION (Continued)

PCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
13B 181	FA	0.06	0.25	0.30	0.16	0.37	0.33	0.32	0.21	0.32
13B0183	FA	0.30	0.43	0.44	0.41	0.45	0.44	0.44	0.39	0.45
13B1182	FA	0.33	0.41	0.30	0.36	0.36	0.42	0.41	0.43	0.33
13B2182	FA	0.28	0.35	0.37	0.35	0.38	0.37	0.37	0.33	0.38
13B3182	FA	0.20	0.43	0.40	0.40	0.39	0.41	0.40	0.31	0.38
13B4182	FA	0.19	0.30	0.29	0.29	0.30	0.28	0.29	0.26	0.29
13B5182	FA	0.14	0.23	0.22	0.20	0.24	0.24	0.24	0.20	0.23
13F0182	FA	0.13	0.29	0.20	0.23	0.23	0.28	0.27	0.20	0.22
43EC183	GM	0.22	0.18	0.25	0.29	0.25	0.21	0.23	0.24	0.22
51B0182	GM	0.21	0.27	0.25	0.28	0.27	0.26	0.30	0.26	0.27
52D0182	GM	0.24	0.33	0.27	0.32	0.27	0.34	0.37	0.28	0.33
55B1182	GM	0.11	0.15	0.19	0.22	0.16	0.10	0.12	0.11	0.17
57H0183	GM	0.03	0.12	0.14	0.19	0.06	0.09	0.02	0.01	0.04
62E0182	GM	0.30	0.41	0.34	0.37	0.36	0.43	0.43	0.38	0.36
62F0182	GM	0.36	0.34	0.31	0.30	0.36	0.40	0.41	0.38	0.38
68J0182	GM	0.08	0.23	0.06	0.12	0.10	0.18	0.23	0.15	0.16
12C0182	MM	0.12	0.32	0.25	0.27	0.26	0.31	0.27	0.19	0.25
12C0183	MM	0.24	0.30	0.28	0.31	0.27	0.26	0.29	0.27	0.30
62B0182	MM	0.29	0.45	0.41	0.41	0.44	0.42	0.46	0.40	0.46
63B0182	MM	0.13	0.31	0.30	0.28	0.32	0.32	0.30	0.23	0.28
63H0182	MM	0.17	0.32	0.33	0.28	0.34	0.32	0.33	0.26	0.33
63N0182	MM	0.02	0.08	0.14	0.10	0.12	0.08	0.12	0.05	0.15
63W0182	MM	0.09	0.21	0.20	0.14	0.25	0.23	0.26	0.19	0.25
63Y0182	MM	0.12	0.30	0.20	0.26	0.26	0.30	0.33	0.21	0.27
67N 181	MM	0.16	0.36	0.29	0.33	0.28	0.30	0.29	0.21	0.32
67N0182	MM	0.06	0.24	0.25	0.23	0.25	0.23	0.20	0.10	0.25
67U0182	MM	0.06	0.33	0.29	0.28	0.30	0.26	0.24	0.13	0.27
67V0182	MM	0.16	0.19	0.14	0.16	0.14	0.18	0.18	0.18	0.14
67Y0182	MM	0.11	0.26	0.28	0.19	0.33	0.29	0.31	0.19	0.32
68G0182	MM	0.08	0.24	0.37	0.27	0.34	0.22	0.27	0.14	0.36
15D0182	OF	0.14	0.35	0.30	0.32	0.29	0.30	0.32	0.22	0.30
64C0182	OF	0.17	0.38	0.37	0.34	0.37	0.36	0.37	0.28	0.37
64C0183	OF	0.11	0.26	0.26	0.22	0.26	0.25	0.25	0.19	0.24
94B0182	OF	0.09	0.28	0.29	0.24	0.30	0.25	0.28	0.18	0.30
94B0183	OF	0.20	0.42	0.44	0.38	0.42	0.36	0.39	0.31	0.42
05B1182	SC	0.09	0.32	0.35	0.29	0.36	0.32	0.35	0.26	0.36
05C0182	SC	0.13	0.32	0.31	0.32	0.30	0.28	0.31	0.25	0.31
05C0183	SC	0.05	0.47	0.49	0.41	0.51	0.47	0.47	0.30	0.48
05G0183	SC	0.26	0.43	0.27	0.34	0.30	0.36	0.41	0.39	0.33
72E0183	SC	0.12	0.46	0.49	0.42	0.51	0.51	0.49	0.34	0.47
C74D823	ST	0.32	0.34	0.37	0.40	0.30	0.22	0.29	0.24	0.37
05H1183	ST	0.49	0.43	0.43	0.51	0.37	0.33	0.42	0.51	0.45
13EC182	ST	0.23	0.31	0.29	0.34	0.27	0.26	0.27	0.27	0.28
13E0183	ST	0.20	0.30	0.40	0.36	0.36	0.25	0.28	0.23	0.42
82C1182	ST	0.23	0.37	0.39	0.40	0.37	0.33	0.32	0.27	0.36
82C2182	ST	0.29	0.39	0.33	0.41	0.26	0.31	0.32	0.31	0.29
91E0182	ST	0.15	0.18	0.29	0.24	0.25	0.20	0.13	0.16	0.28
91P0182	ST	0.25	0.24	0.24	0.27	0.21	0.25	0.34	0.25	0.22
91R0182	ST	0.38	0.31	0.26	0.31	0.24	0.23	0.27	0.40	0.24
92B0182	ST	0.14	0.20	0.27	0.25	0.23	0.16	0.18	0.16	0.26
93H0182	ST	0.09	0.27	0.30	0.30	0.24	0.24	0.24	0.14	0.31
95B0182	ST	0.13	0.25	0.26	0.25	0.24	0.21	0.21	0.18	0.24
95B0183	ST	0.26	0.34	0.36	0.34	0.33	0.30	0.34	0.32	0.35
96B0183	ST	0.32	0.35	0.48	0.41	0.39	0.28	0.32	0.32	0.44
98C0182	ST	0.30	0.39	0.36	0.52	0.25	0.16	0.25	0.32	0.39

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ADJUSTED VALIDITIES FOR CURRENT COMPOSITES
SQT CRITERION

PCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
71D0182	CL	0.26	0.37	0.39	0.38	0.36	0.29	0.32	0.29	0.40
71L1183	CL	0.57	0.55	0.58	0.60	0.53	0.50	0.55	0.57	0.59
71L2183	CL	0.43	0.42	0.47	0.49	0.41	0.38	0.42	0.42	0.47
71M0182	CL	0.57	0.54	0.51	0.55	0.49	0.52	0.57	0.58	0.55
73C0182	CL	0.60	0.63	0.63	0.66	0.59	0.58	0.61	0.62	0.63
73C0183	CL	0.72	0.71	0.69	0.71	0.66	0.69	0.74	0.75	0.71
75B0182	CL	0.52	0.56	0.60	0.60	0.55	0.53	0.56	0.54	0.59
75B0183	CL	0.59	0.62	0.64	0.65	0.59	0.58	0.61	0.61	0.63
75C0182	CL	0.66	0.67	0.66	0.70	0.64	0.65	0.69	0.70	0.68
75C0183	CL	0.41	0.55	0.61	0.57	0.58	0.52	0.54	0.47	0.60
75D0182	CL	0.33	0.38	0.42	0.39	0.40	0.38	0.37	0.36	0.40
75D0183	CL	0.49	0.55	0.61	0.60	0.55	0.49	0.52	0.51	0.60
75E0182	CL	0.54	0.50	0.55	0.52	0.52	0.50	0.55	0.55	0.57
75E0183	CL	0.43	0.51	0.54	0.54	0.49	0.48	0.50	0.46	0.53
75F0183	CL	0.57	0.61	0.64	0.66	0.57	0.55	0.59	0.58	0.63
76C0183	CL	0.42	0.47	0.52	0.49	0.48	0.46	0.48	0.45	0.49
76V0183	CL	0.47	0.49	0.52	0.50	0.49	0.44	0.48	0.49	0.53
76W0182	CL	0.11	0.34	0.31	0.28	0.34	0.30	0.27	0.21	0.28
76W0183	CL	0.46	0.59	0.63	0.58	0.62	0.57	0.58	0.53	0.62
11B 181	CO	0.33	0.41	0.38	0.39	0.37	0.40	0.39	0.37	0.37
11B0183	CO	0.40	0.51	0.55	0.50	0.54	0.50	0.53	0.46	0.56
11B1182	CO	0.37	0.44	0.43	0.44	0.43	0.42	0.43	0.41	0.44
11B2182	CO	0.21	0.28	0.30	0.27	0.31	0.30	0.29	0.25	0.30
11B6182	CO	0.29	0.32	0.35	0.35	0.33	0.32	0.34	0.31	0.37
11B7182	CO	0.37	0.40	0.37	0.39	0.39	0.39	0.42	0.41	0.43
11C 181	CO	0.35	0.39	0.39	0.40	0.37	0.37	0.38	0.38	0.38
11C0183	CO	0.31	0.38	0.41	0.38	0.42	0.34	0.38	0.36	0.43
11C1182	CO	0.35	0.46	0.46	0.46	0.44	0.45	0.47	0.40	0.48
11C2182	CO	0.36	0.41	0.46	0.41	0.45	0.44	0.43	0.40	0.43
11C4182	CO	0.34	0.37	0.37	0.37	0.35	0.36	0.36	0.37	0.36
11C5182	CO	0.41	0.53	0.53	0.52	0.52	0.51	0.51	0.47	0.51
11H 181	CO	0.45	0.55	0.54	0.57	0.52	0.48	0.52	0.49	0.57
11H1182	CO	0.37	0.41	0.42	0.42	0.41	0.40	0.41	0.40	0.43
11H2182	CO	0.33	0.35	0.36	0.37	0.33	0.34	0.34	0.34	0.34
12B0183	CO	0.31	0.43	0.42	0.42	0.42	0.42	0.41	0.36	0.42
12B1182	CO	0.33	0.46	0.45	0.43	0.46	0.47	0.46	0.40	0.44
19D 181	CO	-0.09	0.05	0.07	0.06	0.10	0.01	0.00	-0.03	0.05
19D0183	CO	0.45	0.55	0.54	0.52	0.54	0.53	0.56	0.51	0.56
19D1182	CO	0.41	0.47	0.48	0.47	0.46	0.45	0.47	0.45	0.48
19E1182	CO	0.40	0.47	0.44	0.45	0.44	0.45	0.48	0.45	0.47
19E1183	CO	0.55	0.66	0.65	0.63	0.66	0.65	0.68	0.62	0.68
19E2183	CO	0.43	0.57	0.58	0.53	0.60	0.58	0.58	0.52	0.59
19E3182	CO	0.35	0.43	0.41	0.39	0.42	0.43	0.44	0.41	0.42
C35KL83	EL	0.50	0.66	0.64	0.65	0.64	0.66	0.67	0.66	0.63
17X2182	EL	0.39	0.42	0.36	0.42	0.34	0.42	0.43	0.41	0.37
26Q0183	EL	0.42	0.47	0.54	0.49	0.53	0.46	0.47	0.46	0.52
27E0182	EL	0.18	0.20	0.13	0.18	0.16	0.19	0.23	0.21	0.19
27E0183	EL	0.54	0.49	0.52	0.54	0.49	0.47	0.53	0.54	0.54
31J0182	EL	0.46	0.58	0.58	0.59	0.55	0.51	0.55	0.51	0.61
31M0183	EL	0.49	0.69	0.70	0.63	0.73	0.70	0.69	0.61	0.70
31M1182	EL	0.36	0.43	0.47	0.44	0.44	0.41	0.43	0.39	0.47
31M2182	EL	0.36	0.41	0.44	0.42	[illegible]	0.40	0.41	0.39	0.45
31V0183	EL	0.45	0.56	0.64	0.57	0.62	0.57	0.56	0.51	0.60
31V1182	EL	0.35	0.43	0.45	0.43	0.44	0.42	0.42	0.39	0.44
36C2182	EL	0.18	0.18	0.13	0.17	0.13	0.18	0.16	0.19	0.14
36K0182	EL	0.20	0.32	0.29	0.29	0.30	0.32	0.31	0.26	0.30
36K0183	EL	0.40	0.56	0.57	0.53	0.58	0.55	0.56	0.49	0.58

(cont'd)

ADJUSTED VALIDITIES FOR CURRENT COMPOSITES
SQT CRITERION (Continued)

PCELL	AA	CL	CO	EL	FA	GM	MM	OF	SC	ST
13B 181	FA	0.14	0.26	0.31	0.21	0.37	0.33	0.32	0.23	0.32
13B0183	FA	0.41	0 52	0.52	0.50	0.53	0.51	0.52	0.48	0.53
13B1182	FA	0.44	0.49	0.42	0.45	0.45	0.49	0.49	0.50	0.43
13B2182	FA	0.37	0.43	0.44	0.43	0.44	0.44	0.45	0.41	0.45
13B3182	FA	0.31	0.50	0.48	0.46	0.48	0.51	0.50	0.40	0.47
13B4182	FA	0.29	0.38	0.37	0.37	0.37	0.36	0.37	0.34	0.37
13B5182	FA	0.19	0.27	0.27	0.24	0.29	0.29	0.28	0.24	0.27
13F0182	FA	0.37	0.50	0.44	0.47	0.46	0.49	0.48	0.43	0.45
43E0183	GM	0.37	0.36	0.41	0.36	0.41	0.38	0.39	0.40	0.39
51B0182	GM	0.27	0.37	0.35	0.36	0.38	0.37	0.39	0.34	0.38
52D0182	GM	0.31	0.42	0.38	0.40	0.39	0.43	0.44	0.37	0.42
55B1182	GM	0.32	0.40	0.44	0.45	0.42	0.36	0.38	0.35	0.44
57H0183	GM	0.05	0.13	0.13	0.17	0.09	0.10	0.06	0.05	0.09
62E0182	GM	0.51	0.60	0.56	0.57	0.57	0.61	0.61	0.57	0.57
62F0182	GM	0.55	0.57	0.57	0.53	0.58	0.61	0.62	0.59	0.59
68J0182	GM	0.26	0.38	0.29	0.31	0.32	0.36	0.37	0.32	0.33
12C0182	MM	0.35	0.51	0.44	0.46	0.45	0.50	0.47	0.42	0.44
12C0183	MM	0.41	0.44	0.42	0.45	0.40	0.40	0.43	0.43	0.44
62B0182	MM	0.48	0.59	0.56	0.56	0.57	0.56	0.59	0.55	0.59
63B0182	MM	0.28	0.44	0.43	0.40	0.45	0.45	0.43	0.37	0.41
63H0182	MM	0.37	0.49	0.49	0.45	0.50	0.48	0.49	0.44	0.49
63N0182	MM	0.11	0.16	0.19	0.16	0.18	0.16	0.18	0.14	0.20
63W0182	MM	0.26	0.35	0.32	0.28	0.37	0.37	0.39	0.33	0.36
63Y0182	MM	0.47	0.64	0.59	0.58	0.65	0.67	0.67	0.58	0.63
67N 181	MM	0.39	0.59	0.52	0.55	0.53	0.57	0.55	0.47	0.53
67N0182	MM	0.30	0.44	0.44	0.42	0.45	0.44	0.42	0.36	0.44
67U0182	MM	0.28	0.53	0.49	0.47	0.52	0.50	0.48	0.40	0.47
67V0182	MM	0.37	0.42	0.37	0.39	0.38	0.41	0.41	0.41	0.38
67Y0182	MM	0.47	0.61	0.61	0.54	0.65	0.62	0.64	0.57	0.64
68G0182	MM	0.29	0.38	0.48	0.39	0.46	0.40	0.43	0.35	0.46
15D0182	OF	0.44	0.57	0.53	0.54	0.53	0.54	0.55	0.51	0.54
64C0182	OF	0.45	0.57	0.56	0.54	0.56	0.56	0.57	0.52	0.57
64C0183	OF	0.30	0.40	0.39	0.36	0.40	0.39	0.39	0.36	0.39
94B0182	OF	0.35	0.46	0.46	0.42	0.47	0.45	0.46	0.41	0.47
94B0183	OF	0.47	0.59	0.60	0.57	0.60	0.56	0.58	0.54	0.59
05B1182	SC	0.39	0.47	0.47	0.44	0.48	0.46	0.48	0.45	0.48
05C0182	SC	0.41	0.48	0.46	0.47	0.45	0.45	0.47	0.45	0.47
05C0183	SC	0.34	0.53	0.54	0.49	0.56	0.52	0.52	0.44	0.54
05G0183	SC	0.64	0.72	0.61	0.68	0.62	0.67	0.71	0.70	0.67
72E0183	SC	0.40	0.56	0.56	0.52	0.59	0.58	0.56	0.49	0.56
C74D823	ST	0.65	0.69	0.71	0.70	0.67	0.62	0.69	0.69	0.72
05H1183	ST	0.75	0.72	0.70	0.75	0.66	0.66	0.73	0.77	0.73
13E0182	ST	0.42	0.47	0.45	0.48	0.44	0.44	0.46	0.45	0.45
13E0183	ST	0.49	0.55	0.61	0.58	0.58	0.52	0.56	0.53	0.63
82C1182	ST	0.44	0.56	0.57	0.57	0.56	0.54	0.54	0.50	0.56
82C2182	ST	0.44	0.51	0.47	0.52	0.43	0.46	0.47	0.47	0.46
91E0182	ST	0.43	0.45	0.51	0.48	0.49	0.45	0.47	0.45	0.52
91P0182	ST	0.44	0.40	0.39	0.43	0.36	0.41	0.41	0.43	0.38
91R0182	ST	0.61	0.59	0.56	0.59	0.55	0.54	0.59	0.64	0.58
92B0182	ST	0.31	0.34	0.40	0.38	0.36	0.30	0.33	0.32	0.39
93H0182	ST	0.54	0.58	0.60	0.60	0.57	0.56	0.59	0.56	0.62
95B0182	ST	0.32	0.41	0.42	0.41	0.41	0.39	0.39	0.36	0.41
95B0183	ST	0.57	0.63	0.64	0.62	0.63	0.61	0.65	0.62	0.65
96B0183	ST	0.60	0.62	0.70	0.64	0.65	0.57	0.63	0.63	0.70
98C0182	ST	0.68	0.73	0.73	0.78	0.68	0.63	0.70	0.71	0.75

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Table A - 9

Ridge Regression Coefficients for Training Criterion

TCELL	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
05B-2A-113	SC	519	.04	.02	.05	.16	.21	.09	.07	.06	.07	.11	-.05
05C-2D-113	SC	[illegible]	.11	.10	.06	.29	.00	.13	.08	.01	.31	.04	.19
11B-IN-809	CO	976	.09	.08	.24	.20	.03	-.01	.22	.09	.10	.36	-.24
11C-IN-809	CO	578	.10	.09	.11	-.03	.05	.17	.15	.27	.14	.21	.05
11H-IN-809	CO	444	.08	.05	-.10	.21	.22	.06	-.03	.15	.14	.12	.10
12B-AB-807	CO	143	.04	-.04	-.01	.03	-.07	.06	.04	.13	.09	.06	.10
12F-AF-807	CO	224	.05	.01	.07	.06	.03	.04	.04	.17	-.01	.23	.08
13B-3B-810	FA	1080	.07	.06	-.08	.06	-.17	.09	.08	.16	-.00	.39	.25
13E-3E-810	ST	483	.11	.09	.16	.40	.02	-.09	.15	.16	.31	.05	-.06
13F-3F-810	FA	679	.33	.32	.19	.55	.35	.05	.52	.29	.38	.43	-.01
15D-5D-810	OF	295	.05	.01	.09	.10	-.03	.13	.07	.27	.09	.22	-.14
15E-5E-810	OF	283	.06	.02	.04	.01	.11	.09	.02	.28	.18	.25	-.08
16B-BA-811	OF	165	.12	.06	.14	.24	.03	-.05	.06	.21	.07	.14	.20
16B-BC-811	OF	131	.14	.06	.13	.08	.10	.06	.23	.17	.40	.21	-.21
16C-CA-811	OF	118	.16	.07	-.05	.49	.09	-.09	.16	.29	.39	-.13	-.23
16D-DB-811	OF	112	.28	.21	.14	.16	-.02	.10	.28	.71	.15	.13	.12
16E-EB-811	OF	137	.06	-.02	.14	.02	-.06	-.09	-.29	.04	-.01	-.09	.08
16H-HB-811	OF	105	.25	.16	.19	.32	.33	.01	.16	.24	.31	.31	.18
16J-JA-811	OF	119	.21	.13	.24	.19	.24	.11	.18	.02	.35	.06	.14
16P-PA-811	OF	115	.12	.02	.18	-.19	-.11	.20	-.14	.51	-.03	.19	-.30
16R-RA-811	OF	407	.06	.03	.05	.08	.15	.02	.08	.31	.16	.08	-.11
16S-SA-811	OF	596	.12	.11	.09	.07	.05	-.01	.07	.26	.26	.28	.31
17C-7C-061	SC	188	.08	.02	.18	.21	.14	.03	.05	.14	.03	.04	-.08
17K-GA-301	EL	136	.25	.18	.40	.16	.36	-.12	.34	.02	.12	.51	-.18
19D-9D-804	CO	215	.09	.04	.06	.04	.07	.13	.08	.20	.19	.02	.11
19E-9E-804	CO	171	.21	.15	.37	.01	.45	.25	.18	.22	-.17	.29	-.05
19F-9F-804	CO	128	.19	.12	.24	.22	.13	.05	-.03	.27	-.03	.19	.10
27E-7E-093	EL	184	.18	.13	.15	.19	.05	.22	.23	.42	.13	.15	.02
31M-4D-113	EL	604	.09	.07	.11	.27	.18	.09	.13	.12	.24	.14	.00
31N-4C-113	EL	193	.08	.03	.03	.19	.42	.20	.13	-.06	-.39	-.05	.19
31V-1V-061	EL	457	.19	.17	.01	.24	-.13	.21	.06	.38	.51	.23	.17
36C-AA-113	EL	376	.05	.02	-.06	.32	-.04	.23	.07	.21	.09	-.12	-.06
36K-AC-113	EL	660	.07	.06	.04	.06	-.18	.08	.14	.30	.18	.28	-.03
41C-07-091	GM	105	.15	.05	-.05	.35	-.17	.35	.12	.17	.20	.03	.09
44B-J1-091	GM	137	.11	.04	.02	.28	.06	.17	-.01	.17	.01	.16	.11
45K-K8-091	GM	101	.16	.06	-.04	.12	-.19	.31	.40	.13	-.01	.44	.04
45K-K9-091	GM	129	.18	.11	.31	.08	.09	.21	25	.18	.09	.47	.19
51K-8K-807	GM	167	.11	.05	-.06	.19	-.07	.19	.02	.36	.42	-.03	.16
54C-5S-031	GM	183	.05	-.02	-.09	-.11	-.00	-.03	.17	.19	.04	-.07	.27
54E-5A-031	ST	272	.17	.14	.27	.21	-.01	.24	.16	.07	.24	.22	-.03

(cont'd)

Ridge Regression Coefficients for Training Criterion (Continued)

TCELL	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
55B-5B-093	GM	236	.15	.11	.29	.30	.20	.15	.10	.14	.25	.15	.29
57E-PE-101	GM	126	.14	.06	-.01	.27	-.25	.02	.56	.22	.15	.38	-.36
57H-G1-551	GM	224	.06	.02	.20	.01	.29	.00	.11	.04	.12	.16	-.08
61B-G6-551	MM	186	.47	.44	.15	.37	.70	.11	.03	.30	.15	.37	-.33
61C-H1-551	MM	138	.27	.21	.09	.49	-.07	-.07	.36	.22	.63	.41	.06
62B-CB-807	MM	264	.22	.19	-.10	.26	-.15	-.09	.33	.67	.30	.16	.16
62E-CE-807	GM	133	.26	.20	.34	.26	.00	.21	-.02	.28	.05	.27	.25
62F-CF-807	GM	149	.18	.12	-.28	.20	.17	.28	-.20	.31	.01	.35	.50
63B-3B-803	MM	555	.14	.12	.03	.09	.13	.14	.01	.60	.07	.22	.05
63B-3B-805	MM	381	.07	.04	.16	.11	-.22	-.06	-.02	.36	.02	.06	.12
63D-5A-171	MM	342	.05	.01	.04	.01	.19	-.01	.20	.41	-.05	-.05	-.03
63G-M7-091	MM	161	.09	.02	.05	.31	-.18	.09	.04	.41	-.22	.24	-.02
63H-H1-091	MM	706	.14	.13	.05	.12	.03	-.08	.08	.15	.21	.47	.31
63N-TS-171	MM	509	.06	.04	-.16	.07	-.15	.08	.01	.37	.10	.31	.21
63T-FI-171	MM	572	.04	.02	-.06	-.08	-.25	-.18	.11	.05	.33	.23	.21
63W-W1-091	MM	481	.07	.04	.10	-.08	.23	-.19	.20	.03	.19	.08	.16
63Y-TV-171	MM	175	.04	-.02	-.10	-.07	.11	-.01	.09	.15	.22	.11	.14
64C-EC-807	OF	202	.06	.01	-.07	-.20	.11	.09	-.11	.39	.18	.25	-.19
64C-4C-803	OF	561	.04	.02	.06	.05	.11	-.10	.06	.16	.10	.01	.07
67N-65-011	MM	163	.47	.43	.23	.31	.65	.39	.41	.33	.39	.30	.14
67T-L6-551	MM	124	.50	.45	.53	.43	.54	-.07	.49	.15	.37	.24	.41
67U-P1-551	MM	210	.27	.23	-.15	.33	.25	-.03	.53	.08	.33	.64	.11
67V-18-011	MM	194	.45	.42	.10	.67	.38	.23	.12	.26	.37	.22	.28
67Y-51-551	MM	144	.21	.15	.35	.08	-.09	.60	-.02	.72	-.08	-.06	.58
68D-T1-551	MM	121	.36	.30	.25	.44	-.48	.18	.32	.64	.45	.78	-.20
68J-W6-551	GM	120	.30	.24	.33	-.05	-.03	.15	.02	.55	.50	.48	.40
68M-W8-551	GM	134	.25	.18	.03	.25	-.17	.23	.45	.44	.15	.38	.09
71N-L1-551	CL	175	.22	.17	.08	.41	.32	.26	.44	-.07	.39	.05	.23
72E-3G-113	SC	143	.10	.02	.16	.29	.17	.01	-.05	.14	.10	-.04	-.41
73C-5R-121	CL	202	.32	.29	-.00	.61	.39	.21	.14	.03	.37	-.08	-.20
75B-5E-121	CL	494	.08	.06	.09	.22	.08	.04	.05	.18	.28	-.07	.01
75D-5D-805	CL	233	.21	.17	.02	.65	.10	-.16	-.04	.04	.28	.02	.15
75E-5E-805	CL	276	.30	.27	.02	.32	.48	.25	.17	.24	.54	-.07	-.07
76C-EC-101	CL	1142	.10	.10	.01	.23	.28	.14	-.02	.12	.40	.13	.16
76P-5F-101	CL	560	.23	.22	-.07	.50	.40	-.06	.24	-.23	.07	.24	-.00
76V-EV-101	CL	401	.03	.00	.15	-.19	.13	-.08	.05	-.03	.25	.11	-.13
76W-DB-101	CL	138	.08	.00	.00	.18	.01	.31	.25	.29	-.13	.11	.19
76W-PW-101	CL	344	.20	.18	-.09	.54	.39	-.02	.11	.39	.42	.19	.15
76X-5X-101	CL	158	.05	-.02	-.13	.18	.17	-.17	.13	-.00	.17	-.06	.12
76Y-EY-101	CL	381	.10	.08	.06	.19	.15	-.00	.25	.04	.41	.05	-.07

(cont'd)

Ridge Regression Coefficients for Training Criterion (Continued)

TCELL	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
76Y-5G-101	CL	298	.32	.30	.48	.38	.42	-.35	.20	-.07	.43	-.06	.18
76Y-6Y-805	CL	470	.06	.04	.06	-.02	-.11	.18	.18	.07	.47	.12	-.09
82C-2C-810	ST	390	.30	.29	-.09	.57	-.19	.30	.13	.24	.42	.08	.27
91B-01-929	ST	783	.02	.01	.09	.07	.01	.03	.10	.09	.00	.08	-.03
91C-02-929	ST	233	.20	.16	.18	.35	.17	.22	.27	.20	.11	.00	.15
91E-05-929	ST	162	.19	.13	.19	.34	.23	-.02	.31	.04	.41	.17	.08
92B-25-929	ST	133	.28	.22	.16	.41	-.02	-.12	.15	.08	.22	.35	.20
94B-KA-101	OF	627	.06	.05	.04	.08	.13	.03	.22	.17	.14	.02	.18
94B-4B-803	OF	237	.24	.20	.39	.39	.08	-.14	.37	.07	.23	.30	.11
94B-4B-805	OF	416	.05	.03	.12	.14	.10	.02	-.04	.12	.12	.02	.10
95B-5B-813	ST	725	.23	.22	.44	.28	.81	.17	.03	.31	.06	.16	.20

Table A - 10

Ridge Regression Coefficients for SQT Criterion

PCELL	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
05B/1/1/82	SC	613	.15	.14	.04	.20	.38	-.05	.00	.25	.12	.11	.10
05C/0/1/82	SC	1197	.12	.11	-.05	.29	.29	.00	.17	.12	.11	.24	.12
05C/0/1/83	SC	1156	.28	.27	.15	.27	.12	-.20	-.02	.37	.27	.26	.19
05G/0/1/83	SC	119	.24	.17	.14	.12	.32	.15	.57	.38	-.12	.76	-.20
05H/1/1/83	ST	110	.37	.30	-.26	.15	.84	.23	.52	.32	.70	-.00	-.03
11B/ /1/81	CO	606	.10	.08	-.06	.25	.02	.13	.12	.11	.05	.25	.22
11B/0/1/83	CO	423	.25	.23	.21	.24	.32	.00	-.14	.17	.30	.25	-.00
11B/1/1/82	CO	3896	.13	.12	.21	.15	.04	.05	.15	.17	.25	.24	-.01
11B/2/1/82	CO	611	.07	.05	.07	.02	.09	.01	-.03	.11	.17	.13	.15
11B/6/1/82	CO	419	.11	.09	.09	-.03	.23	.05	-.03	-.06	.30	.32	.03
11B/7/1/82	CO	228	.18	.14	.17	-.47	.39	-.06	.30	.12	.29	.45	-.04
11C/ /1/81	CO	171	.08	.02	.03	.16	.10	.08	.09	.04	.13	.10	.12
11C/0/1/83	CO	112	.20	.12	.27	.06	.26	-.13	.04	.21	.38	-.01	-.06
11C/1/1/82	CO	555	.18	.16	.10	.25	.18	.09	-.12	.08	.22	.58	-.19
11C/2/1/82	CO	186	.16	.11	.14	.16	.06	.19	-.02	.12	.17	.03	.30
11C/4/1/82	CO	246	.08	.04	.09	.10	.10	.07	.12	.05	.09	.10	.13
11C/5/1/82	CO	217	.22	.18	.09	.27	.13	-.02	.13	.18	.18	.20	.20
11H/ /1/81	CO	124	.26	.19	.47	.14	.02	-.05	.24	.09	.46	.51	-.33
11H/1/1/82	CO	442	.13	.11	.40	-.01	.03	.09	.21	-.04	.10	.30	.11
11H/2/1/82	CO	321	.09	.06	.14	.18	-.03	.18	.13	.02	.16	.11	.08
12B/0/1/83	CO	1978	.13	.12	.04	.20	-.01	-.04	.07	.17	.25	.40	.09
12B/1/1/82	CO	1103	.14	.13	.04	.37	-.07	.22	-.12	.34	.08	.29	.12
12C/0/1/82	MM	175	.13	.07	.04	.23	-.09	-.01	.20	.19	-.05	.54	.17
12C/0/1/83	MM	271	.11	.07	.14	.13	.13	.07	.20	.08	.19	.20	-.01
13B/ /1/81	FA	130	.18	.10	.29	-.12	.04	.07	-.28	.35	.13	.10	.11
13B/0/1/83	FA	3902	.22	.22	.11	.16	.19	.07	.01	.25	.27	.26	.12
13B/1/1/82	FA	109	.21	.12	-.05	-.04	.09	.18	.27	.40	.13	.19	.13
13B/2/1/82	FA	263	.15	.12	.16	.08	.11	.12	.02	.12	.17	.18	.11
13B/3/1/82	FA	136	.25	.19	-.07	.40	-.05	.15	-.22	.38	.23	.42	.01
13B/4/1/82	FA	1184	.11	.10	.20	.22	-.05	.05	.06	.28	.20	.16	-.10
13B/5/1/82	FA	627	.06	.05	.11	.05	.03	.06	-.03	.18	.07	.12	.07
13E/0/1/82	ST	415	.13	.10	-.07	.15	.11	.05	.25	.21	.40	.18	.07
13E/0/1/83	ST	194	.20	.15	.28	.14	.34	-.06	.05	.00	.57	.18	.05
13F/0/1/82	FA	593	.11	.10	-.26	.14	.13	-.01	.23	.17	.05	.59	.34
15D/0/1/82	OF	259	.14	.10	.10	.31	.06	.03	.14	.28	.13	.33	.02
17K/2/1/82	EL	110	.11	.01	-.66	.22	-.04	.27	.05	.10	.04	.37	-.04
19D/ /1/81	CO	104	.12	.02	-.16	.02	.03	-.39	.00	.31	.57	-.13	-.07
19D/0/1/83	CO	334	.20	.18	.16	.21	.37	-.01	.08	.18	.04	.27	.12
19D/1/1/82	CO	742	.15	.14	.11	.21	.27	.01	.12	.11	.18	.17	.09
19E/1/1/82	CO	676	.14	.12	.12	.12	.28	.07	.11	.19	.05	.27	-.02

(cont'd)

Ridge Regression Coefficients for SQT Criterion (Continued)

PCELL	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
19E/1/1/83	CO	1010	.33	.32	.20	.15	.46	.15	.03	.29	.17	.48	.01
19E/2/1/83	CO	855	.26	.26	.31	.19	.18	.04	-.05	.29	.13	.33	.17
19E/3/1/82	CO	611	.11	.10	.24	.11	.06	.14	.06	.25	.01	.19	.04
26Q/0/1/83	EL	142	.18	.11	.31	.02	.18	-.08	.21	.06	.43	-.10	.32
27E/0/1/82	EL	132	.10	.02	-.03	-.09	.21	.08	.12	.32	.06	.28	-.33
27E/0/1/83	EL	225	.21	.18	-.31	-.03	.86	.16	.12	.09	.71	-.13	.12
31J/0/1/83	EL	130	.15	.07	.32	.25	.27	-.20	.30	.01	.17	.46	-.06
31M/0/1/83	EL	1449	.32	.31	.31	.19	.15	-.06	.02	.54	.30	.35	.39
31M/1/1/82	EL	573	.08	.06	.22	.37	.18	.01	-.03	.02	.14	.14	.03
31M/2/1/82	EL	404	.07	.05	.13	.02	.23	-.03	.09	.02	.26	.15	.18
31V/0/1/83	EL	151	.23	.17	-.03	.35	.31	-.00	-.04	.06	.46	-.03	.59
31V/1/1/82	EL	356	.08	.05	.11	.18	.05	.06	.07	.07	.18	.18	.14
35K/ / /	EL	112	.28	.20	-.22	.29	.34	.27	.17	.39	.31	.12	.32
36C/2/1/82	EL	390	.04	.01	-.15	.15	.08	.11	.10	.08	-.08	.16	.05
36K/0/1/82	EL	939	.07	.06	-.11	.16	.12	-.08	.06	.20	.01	.37	.11
36K/0/1/83	EL	847	.20	.19	.16	.34	.20	-.05	-.06	.35	.21	.35	.06
43E/0/1/83	GM	100	.11	.01	.20	.09	.10	.27	-.02	.18	.22	-.19	.05
51B/0/1/82	GM	196	.14	.09	-.19	.02	.25	.07	-.09	.41	.46	.20	-.12
52D/0/1/82	GM	176	.17	.11	-.04	.10	.13	.23	-.10	.22	.17	.55	-.11
55B/1/1/82	GM	230	.08	.04	-.07	.09	.12	-.10	.11	.06	.69	.17	-.02
57H/0/1/83	GM	194	.09	.04	-.21	.31	-.31	-.07	.14	-.19	.23	.25	.25
62B/0/1/82	MM	220	.24	.21	.14	.13	.31	-.01	.15	.36	.24	.32	-.07
62E/0/1/82	GM	172	.20	.15	-.04	.11	.18	.20	.15	.29	.14	.39	.23
62F/0/1/82	GM	117	.25	.17	.34	-.17	.35	.30	.20	.00	-.18	.41	.44
63B/0/1/82	MM	1471	.13	.12	-.15	.25	.01	.03	-.07	.40	.22	.23	.28
63H/0/1/82	MM	335	.14	.12	.05	.24	.27	-.06	.04	.22	.08	.16	.25
63N/0/1/82	MM	286	.05	.01	-.01	.17	.21	.00	-.23	.06	.13	.05	-.05
63W/0/1/82	MM	180	.10	.04	.23	-.03	.16	.06	-.08	.35	.01	.15	-.07
63Y/0/1/82	MM	108	.18	.09	-.13	-.12	.28	.14	-.04	.73	.48	.55	-.14
64C/0/1/82	OF	1573	.17	.16	.03	.30	.31	-.02	.12	.28	.12	.33	.19
64C/0/1/83	OF	2043	.09	.08	-.07	.32	.26	-.06	.04	.24	-.01	.11	.20
67N/ /1/81	MM	123	.17	.09	.01	.21	-.02	-.10	.23	.14	.12	.71	.16
67N/0/1/82	MM	386	.09	.06	.10	.16	.03	-.11	.06	.09	.16	.36	.23
67U/0/1/82	MM	207	.16	.12	-.01	.46	-.10	-.31	.13	.54	.26	.34	.04
67V/0/1/82	MM	232	.05	-.00	.04	.10	.08	.07	.16	.09	.00	.12	.11
67Y/0/1/82	MM	194	.16	.11	.33	.10	.44	-.08	-.03	.34	-.04	.25	.21
68G/0/1/82	MM	121	.20	.12	.23	.39	.20	.13	-.42	.16	.41	-.02	-.01
68J/0/1/82	GM	119	.11	.02	.02	.12	.20	-.09	.15	.23	-.25	.45	-.04
71D/0/1/82	CL	115	.23	.14	-.25	.29	.66	-.63	.32	-.21	.25	.26	.29
71L/1/1/83	CL	2628	.24	.24	.01	.49	.65	.03	.26	-.10	.38	-.01	-.00

(cont'd)

Ridge Regression Coefficients for SQT Criterion (Continued)

PCELL	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
71L/2/1/83	CL	167	.20	.14	-.23	.33	.46	-.15	.13	-.29	.50	.11	.27
71M/0/1/82	CL	182	.17	.12	.22	.08	.39	.22	.17	-.00	.04	.29	-.05
72E/0/1/83	SC	564	.28	.27	.06	.15	.12	.00	-.01	.26	.18	.33	.44
73C/0/1/82	CL	268	.34	.31	.10	.40	.17	.15	.27	.08	.39	.19	.08
73C/0/1/83	CL	415	.38	.36	-.04	.32	.69	.36	.32	.24	.14	.22	.05
74D/ / /	ST	132	.24	.17	.19	.60	.67	-.05	.36	.07	.24	-.02	.04
75B/0/1/82	CL	423	.27	.25	.08	.59	.25	.16	-.02	-.01	.35	.10	.09
75B/0/1/83	CL	631	.28	.27	.07	.55	.29	.19	.15	.02	.40	.11	.09
75C/0/1/82	CL	118	.33	.27	-.00	.07	.34	.37	.13	.35	.78	.13	-.07
75C/0/1/83	CL	289	.29	.27	.21	.45	.23	-.15	-.02	.05	.40	.25	.13
75D/0/1/82	CL	370	.12	.09	.07	.27	.14	-.02	.04	-.00	.12	.02	.36
75D/0/1/83	CL	450	.27	.26	.10	.47	.42	-.29	.24	-.15	.63	.09	.14
75E/0/1/82	CL	175	.19	.13	.29	.09	.41	.10	.02	-.03	.17	.04	.14
75E/0/1/83	CL	279	.24	.21	-.00	.42	.25	-.01	.03	-.09	.27	.31	.20
75F/0/1/83	CL	144	.35	.30	.03	.51	.28	.03	.16	-.07	.42	.22	.13
76C/0/1/83	CL	320	.17	.14	-.02	.50	.22	.21	-.16	.17	.37	-.13	.17
76V/0/1/83	CL	216	.17	.13	.27	.27	.44	-.25	.28	-.04	.08	.06	.13
76W/0/1/82	CL	295	.13	.09	.33	.39	-.42	-.27	.24	.47	.08	.17	.01
76W/0/1/83	CL	321	.23	.20	.35	.34	.18	-.06	.09	.21	.22	.17	.17
82C/1/1/82	ST	209	.18	.14	.08	.31	.66	.02	.13	.14	.32	.28	.23
82C/2/1/82	ST	133	.19	.12	.03	.48	-.03	.22	.20	.13	.16	.23	-.05
91E/0/1/82	ST	203	.11	.06	.34	-.02	.08	.09	.10	-.08	.39	.12	.24
91P/0/1/82	ST	159	.11	.05	.05	.09	-.02	.34	.20	-.03	.13	.18	.22
91R/0/1/82	ST	145	.19	.12	.22	.12	.23	.21	.51	.30	.18	-.09	-.02
92B/0/1/82	ST	310	.11	.07	.03	.34	.32	-.17	.07	-.07	.32	-.09	.15
93H/0/1/82	ST	114	.15	.05	-.02	.29	.38	-.02	.14	-.19	.18	.39	.35
94B/0/1/82	OF	1543	.11	.11	.25	.28	.22	-.09	.07	.22	-.02	.21	.07
94B/0/1/83	OF	2306	.23	.23	.07	.57	.41	-.20	.18	.28	.07	.09	.24
95B/0/1/82	ST	1853	.08	.07	.14	.29	-.02	-.01	.11	.08	.20	.21	.17
95B/0/1/83	ST	2580	.16	.16	.10	.32	.57	.12	.15	.26	.24	.16	.14
96B/0/1/83	ST	172	.29	.24	.45	.58	.69	-.14	.16	-.15	.23	-.19	.22
98C/0/1/82	ST	186	.32	.28	-.14	.53	.62	-.23	.66	.17	1.05	.25	-.25

Table A - 11

Ridge Regression Coefficients for Combined Criteria

MOS	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
05B	SC	1132	.09	.08	.02	.18	.38	.03	.06	.19	.10	.10	-.06
05C	SC	2966	.16	.16	.05	.29	.17	-.04	.09	.18	.22	.20	.18
05G	SC	119	.24	.17	.14	.12	.32	.15	.57	.38	-.12	.76	-.20
05H	ST	110	.37	.30	-.26	.15	.84	.23	.52	.32	.70	-.00	-.08
11B	CO	6553	.11	.11	.19	.10	.10	.03	.11	.14	.25	.28	-.04
11C	CO	1894	.12	.12	.11	.14	.11	.10	.06	.17	.20	.27	.04
11H	CO	1207	.08	.07	.14	.13	.08	.11	.10	.05	.12	.17	.10
12B	CO	3081	.13	.12	.04	.27	-.05	.05	-.00	.24	.19	.37	.10
12C	MM	446	.10	.08	.09	.17	.06	.03	.21	.13	.12	.36	.03
12F	CO	224	.05	.01	.07	.06	.03	.04	.04	.17	-.01	.23	.08
13B	FA	6694	.16	.16	.10	.16	.05	.08	.04	.25	.23	.29	.09
13E	ST	1092	.12	.11	.08	.26	.13	-.05	.19	.17	.43	.13	-.00
13F	FA	1272	.19	.19	-.07	.37	.26	.03	.39	.25	.22	.34	.16
15D	OF	554	.08	.06	.11	.22	.02	.09	.12	.33	.09	.31	-.11
15E	OF	283	.06	.02	.04	.01	.11	.09	.02	.28	.18	.25	-.08
16B	OF	296	.10	.07	.13	.21	.06	-.01	.14	.19	.22	.17	.06
16C	OF	118	.16	.07	-.05	.49	.09	-.09	.16	.29	.39	-.13	-.23
16D	OF	112	.28	.21	.14	.16	-.02	.10	.28	.71	.13	.13	.12
16H	OF	105	.25	.16	.19	.32	.33	.01	.16	.24	.31	.31	.18
16J	OF	119	.21	.13	.24	.19	.24	.11	.18	.02	.35	.06	.14
16R	OF	407	.06	.03	.05	.08	.15	.02	.08	.31	.16	.08	-.11
16S	OF	595	.12	.11	.09	.07	.05	-.01	.07	.26	.26	.28	.31
17C	SC	188	.08	.02	.18	.21	.14	.03	.05	.14	.03	.04	-.08
17K	EL	246	.14	.11	.20	.21	.17	.07	.23	.07	.04	.49	-.13
19D	CO	1291	.14	.14	.10	.18	.28	.02	.11	.15	.17	.17	.09
19E	CO	3323	.21	.21	.24	.13	.28	.12	.05	.29	.08	.37	-.01
19F	CO	128	.19	.12	.24	.22	.13	.05	-.03	.27	-.03	.19	.10
26Q	EL	142	.18	.11	.31	.02	.18	-.08	.21	.06	.43	-.10	.32
27E	EL	409	.16	.14	-.05	.08	.45	.19	.19	.26	.43	-.01	.05
31J	EL	130	.15	.07	.32	.25	.27	-.20	.30	.01	.17	.46	-.06
31M	EL	3030	.16	.15	.24	.25	.19	-.02	.05	.27	.29	.25	.23
31N	EL	193	.08	.03	.03	.19	.42	.20	.13	-.06	-.39	-.05	.19
31V	EL	964	.13	.12	.03	.28	-.00	.13	.05	.20	.40	.19	.30
35K	EL	112	.28	.20	-.22	.29	.34	.27	.17	.39	.31	.12	.32
36C	EL	376	.05	.02	-.06	.32	-.04	.23	.07	.21	.09	-.12	-.06
36K	EL	2446	.10	.10	.03	.20	.06	-.02	.04	.29	.14	.38	.05
41C	GM	105	.15	.05	-.05	.35	-.17	.35	.12	.17	.20	.03	.09
43E	GM	100	.11	.01	.20	.09	.10	.27	-.02	.18	.22	-.19	.05
44B	GM	137	.11	.04	.02	.28	.06	.17	-.01	.17	.01	.16	.11
45K	GM	230	.15	.11	.17	.99	-.06	.25	.33	.14	.05	.43	.15

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Ridge Regression Coefficients for Combined Criteria (Continued)

MOS	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
51B	GM	196	.14	.09	-.19	.02	.25	.07	-.09	.41	.46	.20	-.12
51K	GM	167	.11	.05	-.06	.19	-.07	.19	.02	.36	.42	-.03	.16
52D	GM	176	.17	.11	-.04	.10	.13	.23	-.10	.22	.17	.55	-.11
54E	ST	272	.17	.14	.27	.21	-.01	.24	.16	.07	.24	.22	-.03
55B	GM	466	.10	.08	.12	.22	.16	.03	.11	.12	.51	.17	.19
57E	GM	126	.14	.06	-.01	.27	-.25	.02	.56	.22	.15	.38	-.36
57H	GM	224	.06	.02	.20	.01	.29	.00	.11	.04	.12	.16	-.08
61B	MM	186	.47	.44	.15	.37	.70	.11	.03	.30	.15	.37	-.33
61C	MM	138	.27	.21	.09	.49	-.07	-.07	.36	.22	.63	.41	.06
62B	MM	484	.21	.20	.02	.18	.07	-.07	.26	.55	.30	.24	.02
62E	GM	305	.21	.19	.14	.17	.09	.22	.07	.31	.10	.36	.26
62F	GM	266	.17	.14	-.04	.02	.27	.30	-.00	.18	-.07	.38	.54
63B	MM	2026	.13	.12	-.12	.20	.04	.08	-.05	.49	.18	.23	.22
63D	MM	342	.05	.01	.04	.01	.19	-.01	.20	.41	-.05	-.05	-.03
63G	MM	161	.09	.02	.05	.31	-.18	.09	.04	.41	-.22	.24	-.02
63H	MM	1041	.14	.13	.03	.18	.12	-.09	.06	.18	.16	.37	.31
63H	MM	509	.05	.04	-.16	.07	-.15	.08	.01	.37	.10	.31	.21
63W	MM	661	.06	.04	.13	-.05	.19	-.12	.12	.13	.13	.10	.09
63Y	MM	283	.08	.04	-.18	-.12	.20	.05	.08	.45	.36	.31	.07
64C	OF	3616	.12	.12	-.04	.32	.30	-.05	.07	.27	.04	.22	.20
67N	MM	549	.15	.14	.13	.22	.18	.04	.19	.12	.25	.41	.23
67T	MM	124	.50	.45	.53	.43	.54	-.07	.49	.15	.37	.24	.41
67U	MM	417	.18	.16	-.11	.42	.07	-.20	.33	.35	.30	.52	.07
67V	MM	426	.17	.15	.09	.37	.23	.13	.23	.18	.10	.23	.21
67Y	MM	338	.14	.11	.32	.07	.26	.29	-.02	.50	-.08	.13	.39
68D	MM	121	.36	.30	.25	.44	-.48	.18	.32	.64	.45	.78	-.20
68G	MM	121	.20	.12	.23	.32	.29	.13	-.42	.16	.41	-.02	-.01
68J	GM	239	.15	.11	.19	.08	.12	.04	.09	.42	.09	.48	.14
68M	GM	134	.25	.18	.03	.25	-.17	.23	.45	.44	.15	.38	.09
71D	CL	115	.23	.14	-.25	.29	.66	-.63	.32	-.21	.25	.26	.29
71L	CL	2795	.23	.23	-.02	.48	.66	.02	.25	-.12	.39	.00	.02
71M	CL	182	.17	.12	.22	.08	.39	.22	.17	-.00	.04	.29	-.05
71N	CL	175	.22	.17	.08	.41	.32	.26	.44	-.07	.39	.05	.23
72E	SC	564	.28	.27	.06	.15	.12	.00	-.01	.26	.18	.33	.44
73C	CL	885	.34	.33	-.01	.44	.52	.30	.27	.15	.27	.13	-.03
74D	ST	132	.24	.17	.19	.60	.67	-.05	.36	.07	.24	-.02	.04
75B	CL	1548	.20	.19	.08	.47	.23	.15	.10	.08	.39	.02	.06
75C	CL	407	.28	.27	.15	.34	.27	.01	.02	.13	.52	.22	.06
75D	CL	1253	.19	.19	.06	.50	.29	-.22	.15	-.11	.42	.03	.25
75E	CL	730	.23	.22	.06	.30	.44	.13	.08	.02	.36	.11	.09

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Ridge Regression Coefficients for Combined Criteria (Continued)

MOS	AA	N	R2	RR2	GS	AR	VE	NO	CS	AS	MK	MC	EI
75F	CL	144	.35	.30	.03	.51	.28	.03	.16	-.07	.42	.22	.13
76C	CL	1462	.12	.11	-.01	.29	.28	.16	-.05	.13	.41	.06	.17
76P	CL	560	.23	.22	-.07	.30	.40	-.06	.24	-.23	.87	.24	-.00
76V	CL	216	.17	.13	.27	.27	.44	-.25	.28	-.04	.08	.06	.13
76W	CL	1098	.14	.13	.18	.43	.07	-.04	.18	.38	.22	.16	.14
76X	CL	158	.05	-.02	-.13	.18	.17	-.17	.13	-.00	.17	-.06	.12
76Y	CL	1149	.10	.09	.15	.15	.13	-.03	.25	.34	.49	.06	-.04
82C	ST	732	.23	.22	-.03	.53	-.11	.20	.16	.18	.35	.21	.22
91C	ST	233	.20	.16	.18	.35	.17	.22	.27	.20	.11	.00	.16
91E	ST	365	.13	.10	.31	.13	.15	.03	.21	-.05	.42	.13	.18
91P	ST	159	.11	.05	.05	.09	-.02	.34	.20	-.03	.13	.18	.22
91R	ST	145	.19	.12	.22	.12	.23	.21	.51	.30	.18	-.09	-.02
92B	ST	443	.14	.12	.07	.41	.21	-.18	.11	-.04	.28	.06	.17
93H	ST	114	.15	.05	-.02	.29	.38	-.02	.14	-.19	.18	.39	.35
9 B	OF	5129	.15	.14	.14	.40	.30	-.12	.15	.25	.07	.10	.16
95B	ST	5158	.13	.12	.17	.31	.37	.07	.13	.19	.20	.19	.16
96B	ST	172	.29	.24	.45	.58	.69	-.14	.16	-.15	.23	-.19	.22
98C	ST	186	.32	.28	-.14	.53	.62	-.23	.66	.17	1.05	.25	-.25

AA = Current Composite

N = Sample Size

R2 = Ordinary Least Square Squared Multiple Correlation

RR2 = Ridge Regression Squared Multiple Correlation

Table A - 12

Matrix of Correlations of Expected Outcome Functions for MOS, Combined Training and SQT Criteria

MOS	05B	05C	05G	05H	11B	11C	11H	12B	12C	12F	13B	13E	13F	15D	15E	16B	16C	16D	16H	16J	16R	16S	17C	17K	19D	19E	19F	26Q	27E	31J	31M	31N	31V	35K	36C	36K	41C	43E	44E	45K	51B	51K	52D	54E	55B	57E	57H	61B	61C
05C	98
05G	94	92
05H	94	91	91
11B	97	98	95	93
11C	98	99	95	92	99
11H	97	98	95	94	99	99
12B	94	98	91	85	97	98	96
12C	96	98	98	92	99	99	99	97
12F	94	96	94	83	96	97	95	98	97
13B	97	99	94	85	99	99	98	99	98	98
13E	87	96	64	95	98	98	98	95	97	91	97
13F	97	98	97	94	98	99	98	97	99	96	98	97
15D	96	97	97	94	98	99	97	98	99	97	93	96	98
15E	96	97	95	89	94	99	96	93	97	92	99	95	97	99
16B	98	99	94	92	99	99	99	98	99	96	99	99	99	98	97
16C	88	88	88	91	89	87	87	85	86	77	86	94	88	88	85	98
16D	94	96	94	88	95	96	95	96	94	97	97	93	96	98	97	96	83
16H	99	99	91	91	99	99	99	97	98	96	99	98	98	97	97	99	88	96
16J	87	96	92	96	97	97	99	91	96	98	95	98	94	93	93	97	98	91	98
16R	98	97	95	91	98	98	96	95	97	95	98	96	97	98	99	98	98	97	98	94
16S	95	98	91	86	97	98	96	98	96	96	99	94	96	96	97	98	81	97	98	92	95
17C	98	96	91	92	97	97	97	93	96	91	98	96	95	96	95	97	98	91	98	97	97	91
17K	96	96	98	91	98	98	98	94	99	94	98	96	98	97	96	97	86	91	97	96	96	93	97
19D	99	99	95	94	99	99	99	96	98	96	98	98	98	97	97	99	88	95	99	98	98	97	98	97
19E	98	98	96	94	98	99	98	97	98	98	99	95	97	98	98	98	83	96	99	95	98	97	98	97	99
19F	96	92	92	84	96	97	95	97	95	98	98	92	94	96	97	97	88	96	97	92	96	98	96	94	97	99
26Q	95	96	87	92	95	95	96	98	93	89	93	96	93	98	98	96	85	91	97	98	92	94	94	91	97	91	93
27E	97	95	92	99	96	96	97	98	95	09	94	97	96	93	93	96	98	92	96	98	96	91	95	94	97	94	98	95
31J	96	97	94	[illegible]	98	97	97	94	98	91	95	97	97	95	84	97	86	91	98	96	95	94	96	98	98	97	94	95	92
31M	98	99	92	89	98	99	98	98	97	97	99	97	97	97	97	99	86	96	99	96	97	99	97	95	99	99	99	94	94	97
31N	84	76	81	81	76	70	82	60	70	75	73	71	80	75	72	76	61	76	80	82	76	72	82	81	82	80	70	70	81	77	76
31V	95	99	98	91	97	98	98	98	97	95	99	98	97	96	96	99	89	95	98	96	95	98	94	94	97	96	95	95	95	93	98	73
35K	97	97	91	95	96	98	98	95	96	94	97	96	98	96	96	97	88	96	97	96	96	95	94	94	98	96	94	91	98	92	96	82	98
36C	81	88	79	88	81	82	84	79	82	73	81	85	81	84	88	83	90	82	88	85	83	74	81	81	81	78	74	75	88	73	77	72	85	88
36K	95	98	91	85	97	98	95	99	97	99	99	94	97	98	98	97	84	94	97	91	96	99	94	95	96	98	98	98	98	94	98	69	96	94	75
41C	85	86	85	87	97	85	87	85	91	88	98	98	88	86	89	88	87	87	98	86	83	86	87	87	84	88	82	91	81	84	73	92	93	97	83
43E	93	98	86	93	92	93	95	87	89	85	91	92	89	98	98	92	87	89	92	96	92	87	94	89	93	91	89	91	96	96	82	93	94	98	85	92
44E	96	98	93	98	96	98	98	98	97	96	98	95	97	98	96	97	86	96	97	95	96	96	96	95	97	97	97	91	94	97	97	81	98	98	87	97	92	91
45K	93	94	98	91	96	97	98	94	98	95	96	93	98	97	95	96	81	95	95	94	93	94	92	97	95	95	92	98	93	93	93	81	95	96	81	93	91	89	96
51B	93	94	87	88	94	95	91	95	92	91	96	94	92	94	97	94	88	92	93	89	96	93	98	89	93	91	91	87	92	88	94	62	94	94	79	95	84	87	91	87
51K	91	95	86	98	93	95	94	95	93	98	96	95	93	94	94	95	89	94	94	92	94	98	94	98	93	91	98	98	94	86	94	68	98	97	98	93	94	93	96	91	95
52D	93	95	93	86	96	97	94	97	96	96	97	92	95	97	98	95	82	91	95	98	95	94	92	95	94	96	94	85	98	91	94	78	95	94	79	97	86	86	96	94	95	92
54E	94	94	94	95	97	97	99	93	97	98	95	97	96	94	94	97	89	92	96	98	94	91	96	97	96	95	91	93	97	94	94	79	96	95	89	91	94	95	96	97	89	93	93
55B	97	99	91	94	99	99	98	96	97	93	98	99	97	95	95	99	91	93	99	98	96	96	96	95	99	96	94	97	97	96	98	75	99	97	83	95	89	94	96	94	94	96	93	97
57E	70	71	84	88	77	75	76	73	81	69	73	79	81	88	74	76	88	75	72	74	76	67	72	82	72	78	63	65	76	75	67	55	73	75	81	71	84	68	73	83	69	74	74	82	73
57H	98	94	94	94	97	96	97	89	95	91	93	95	95	93	93	96	88	90	97	97	95	91	97	97	98	97	93	95	93	98	95	87	91	92	75	91	84	91	92	91	92	88	95	98	95	71
61B	99	96	94	94	91	97	97	97	93	96	93	95	96	96	96	96	88	92	98	96	97	92	99	97	98	98	95	92	96	97	96	82	93	94	81	94	84	92	95	92	93	89	94	95	95	72	98
61C	94	97	92	91	91	97	97	96	98	92	97	99	98	96	95	98	93	97	97	96	95	95	94	96	96	94	91	93	94	96	96	69	98	95	89	95	91	89	95	95	93	95	93	97	98	83	92	93
62B	96	98	97	94	89	97	98	95	97	97	98	96	98	98	98	98	88	99	97	92	98	98	94	94	97	97	96	92	93	94	97	72	96	96	88	98	86	88	96	94	95	95	94	92	96	77	92	94	96
62E	96	90	95	89	97	99	90	98	98	99	99	95	98	98	98	98	82	98	98	95	96	98	95	96	98	99	98	93	94	94	98	88	98	98	81	98	88	91	99	97	93	94	96	55	96	72	93	95	95
62F	94	95	92	85	92	95	95	94	94	97	95	88	94	93	94	93	72	94	95	98	91	96	98	91	95	96	96	90	98	89	95	81	94	35	74	94	83	87	96	94	88	90	93	89	92	62	89	98	88
63B	92	96	88	81	92	95	91	98	93	97	97	98	93	95	96	94	88	97	94	86	94	98	89	88	93	91	94	96	87	87	96	67	95	94	76	98	81	84	96	90	95	94	94	86	92	64	84	89	93
63D	91	87	92	85	87	88	86	84	88	98	88	84	88	98	98	88	76	95	88	84	93	88	89	86	89	91	98	94	68	85	88	81	83	89	74	87	75	83	87	87	84	83	82	82	83	68	87	88	82
63G	81	84	85	67	87	85	81	98	86	92	88	77	84	91	88	84	69	92	83	72	86	87	82	82	81	86	89	78	73	78	84	62	83	83	72	91	76	72	88	85	81	81	87	77	77	68	73	79	88
63H	91	95	98	91	94	96	97	95	96	98	98	91	96	95	96	97	98	95	97	91	94	89	93	96	98	95	97	97	92	89	95	99	72	96	94	71	99	84	95	92	92	91	94	89	95	65	91	92	94
63N	88	87	82	74	81	86	82	93	86	93	98	88	86	89	98	85	68	92	84	74	85	92	76	88	82	85	87	74	76	77	87	54	88	86	68	93	78	71	89	85	88	88	98	77	82	65	71	77	84
63W	96	96	91	86	95	95	91	92	94	95	95	91	93	95	94	95	79	93	97	92	95	96	93	92	97	96	96	96	91	96	97	76	92	91	65	94	73	85	90	94	95	96	84	88	94	67	95	93	98
63Y	93	95	92	87	94	96	92	96	94	96	97	92	95	96	98	95	61	96	94	88	96	97	89	91	94	95	93	88	91	98	95	68	94	95	75	97	82	85	93	92	97	93	95	88	71	71	88	91	92
64C	98	99	93	88	96	97	96	97	97	98	98	95	97	97	96	98	84	96	98	97	96	98	96	94	98	98	98	93	91	95	99	79	96	96	77	98	83	88	97	93	93	92	94	91	96	67	93	96	94
67N	98	99	95	92	99	99	99	98	99	97	99	98	99	97	97	99	86	95	99	97	96	98	96	98	99	98	97	96	95	98	99	79	98	98	88	97	88	91	98	97	93	94	95	96	99	74	96	96	97
67T	98	98	94	94	98	98	99	93	97	94	96	97	97	95	94	98	87	94	99	96	96	98	95	97	99	97	95	96	98	97	98	83	96	96	85	91	95	94	93	91	98	96	98	72	98	97	96
67U	94	98	94	88	97	97	95	98	96	98	96	98	97	96	98	95	97	92	96	97	93	95	96	95	94	98	91	96	96	96	95	70	98	85	91	95	95	94	93	94	92	96	79	98	91	98
67V	98	98	96	93	98	99	95	99	95	98	97	99	97	96	98	98	96	98	96	97	96	99	96	95	97	96	98	84	98	99	85	95	91	94	98	97	91	94	94	97	98	76	96	97	97
67Y	95	95	91	85	91	95	94	91	93	97	96	89	93	94	95	94	75	97	96	91	94	96	94	91	96	97	98	91	98	97	87	92	93	94	75	95	81	91	96	93	89	99	97	98	92	69	91	97	88
68B	98	94	91	86	96	94	97	97	94	97	94	96	98	96	97	95	94	98	95	94	91	95	93	94	92	86	89	92	93	64	95	93	84	96	98	86	95	95	97	94	96	94	91	85	87	98	97
68G	94	91	74	88	96	98	88	86	85	91	96	94	88	88	94	82	91	89	88	91	81	88	98	88	86	92	62	91	66	74	88	77	89	89	78	98	88	88	98	86	92	49	86	98	87
68J	95	97	94	84	76	97	95	98	97	99	98	92	96	98	98	97	79	98	97	91	96	99	94	95	96	95	99	91	98	98	96	94	97	94	71	99	81	86	96	93	91	96	91	94	88	92	94	92
68M	91	93	96	91	95	96	96	94	97	94	95	93	97	97	95	95	85	97	94	92	93	91	91	95	94	93	98	88	93	91	97	76	95	96	88	93	94	89	96	99	89	94	93	95	93	87	89	99	95
71D	84	85	75	77	81	88	76	84	88	81	75	75	82	75	72	84	81	77	81	78	88	84	79	78	84	78	38	83	64	79	77	58	88	57	64	74	72	75	69	71	77	83	53	83	81	82
71L	91	92	87	97	97	92	92	94	85	91	81	88	96	92	87	86	92	92	81	91	97	98	85	94	92	94	89	84	91	97	91	98	81	91	92	85	84	87	92	89	87	85	87	84	94	95	73	94	94
71M	97	93	76	95	96	94	98	89	96	98	91	94	95	93	93	91	98	96	97	93	89	96	98	97	96	96	94	97	97	95	93	98	92	94	82	89	87	91	93	95	94	91	91	97	94	75	98	97	92
71N	93	92	91	98	93	93	97	87	94	94	98	96	95	98	88	94	89	97	94	98	98	87	93	94	94	98	85	93	98	92	98	84	92	94	89	85	91	94	92	91	84	91	86	97	95	88	91	92	94
72E	94	98	89	81	95	97	94	98	98	92	95	95	96	70	95	97	91	94	99	92	91	96	97	90	93	89	91	99	73	97	94	71	98	88	86	96	92	92	92	94	89	95	97	92	98	91	92
73C	96	94	91	98	95	96	97	98	95	88	93	96	96	91	92	95	91	98	96	98	94	89	96	96	97	93	89	91	98	93	92	86	94	97	88	89	91	95	95	89	92	94	98	96	79	95	96	95
74D	98	95	91	98	96	96	95	97	89	94	88	97	97	85	92	98	96	91	89	97	99	94	98	97	95	98	94	91	91	96	97	96	94	86	93	95	88	89	86	91	93	91	87	89	87	95	96	73	97
75B	96	96	89	96	96	96	97	92	94	87	94	98	95	93	97	92	97	94	89	96	94	99	94	96	95	97	93	91	96	94	96	97	96	94	86	93	95	84	89	86	91	93	91	87	89	87	95	96	73
75C	97	99	98	91	99	98	98	96	96	92	87	99	96	95	95	99	98	94	92	99	98	96	95	97	95	98	96	94	96	96	97	98	74	98	96	82	95	87	91	96	92	94	94	98	96	99	71	96	97
75D	94	96	84	91	94	91	94	98	92	85	97	97	91	89	87	95	91	85	96	96	98	91	93	91	95	98	89	96	91	95	94	73	94	92	78	89	81	88	98	86	83	89	85	92	97	67	92	92	95
75E	96	96	91	97	97	97	98	92	95	85	95	96	96	91	91	97	91	97	93	96	98	95	95	92	96	94	96	98	92	97	94	95	95	82	94	97	85	91	90	95	95	97	92	91	97	98	71	97	97
75F	96	95	98	95	97	96	97	93	96	88	94	99	96	93	91	97	93	88	97	98	93	91	95	95	97	93	98	95	96	95	95	78	97	95	86	91	91	92	94	92	98	91	95	97	98	76	94	95	98
76C	97	98	89	94	97	98	98	95	95	91	97	98	96	94	94	97	91	91	98	98	95	94	96	94	98	95	93	95	98	93	97	78	98	98	86	91	91	96	97	92	96	98	91	94	99	69	94	96	96
76P	98	91	83	94	92	91	92	86	98	79	88	96	91	86	85	92	93	88	93	95	87	84	98	98	92	86	81	91	94	91	88	69	92	98	83	84	87	88	87	86	86	88	85	93	93	76	90	98	95
76V	96	95	98	98	94	93	94	87	93	89	91	94	93	89	88	94	84	87	96	95	92	91	95	93	96	94	92	96	97	97	94	83	98	98	71	89	76	87	89	98	93	82	81	98	94	65	97	95	91
76W	97	99	93	98	98	59	98	98	98	97	99	98	98	98	97	99	98	97	99	96	98	98	97	96	99	98	98	95	94	96	99	76	98	97	82	98	88	91	98	94	94	99	94	95	98	74	94	96	99
76X	87	89	76	87	84	83	84	88	83	75	82	81	87	79	78	87	89	78	87	88	83	83	83	81	87	88	78	89	87	86	85	67	86	86	72	81	75	77	88	76	81	87	73	86	89	64	83	83	88
76Y	93	.4	89	96	96	94	96	89	94	84	92	99	94	91	98	96	93	87	95	98	93	89	94	94	95	91	86	95	97	95	92	73	94	93	84	88	89	92	98	91	89	91	97	97	97	88	95	93	97
82C	91	96	98	92	96	97	97	96	96	91	96	97	97	95	93	97	92	91	96	96	93	93	93	94	95	93	91	93	95	93	96	74	99	97	91	93	96	92	97	95	91	97	93	97	97	81	89	92	98
91C	97	95	94	96	96	97	99	92	96	91	95	96	97	95	93	97	89	94	97	98	95	92	97	96	97	95	91	95	98	98	95	87	96	98	98	93	93	96	97	96	98	74	98	98	96	78	95	95	95
91E	96	76	91	95	98	97	98	92	96	98	95	98	96	93	92	97	88	98	98	99	91	93	96	96	98	95	92	98	97	97	96	79	96	95	81	91	88	94	91	94	88	92	98	98	99	74	97	95	97
91P	89	89	91	93	91	92	96	87	91	86	98	91	93	98	88	91	81	88	91	94	87	87	88	92	91	89	94	69	94	87	88	83	91	95	89	85	96	93	93	97	87	91	88	97	97	91	88	88	92
91Q	92	89	94	97	92	92	95	84	93	85	89	93	93	91	89	97	86	91	97	96	92	86	93	93	93	91	86	92	97	98	89	87	98	94	89	84	91	94	98	94	83	89	84	76	91	82	91	92	91
92B	95	97	85	98	95	94	95	92	93	88	94	97	94	98	89	96	91	87	97	96	91	93	94	92	96	92	91	96	93	96	96	73	95	92	77	92	83	88	92	87	49	98	87	92	98	67	91	93	96
93H	96	97	91	92	96	97	97	94	96	92	95	96	97	93	92	97	84	89	98	97	92	95	94	96	98	95	93	95	94	97	96	81	96	95	76	93	85	88	95	93	88	89	92	94	97	70	95	95	95
94B	99	99	93	98	97	97	97	96	97	96	97	96	97	96	95	98	87	95	99	96	97	97	98	95	99	98	98	96	94	97	99	81	96	96	78	97	87	98	96	92	91	91	92	93	97	68	95	97	95
95B	99	99	94	97	99	99	99	96	98	95	98	98	98	97	96	99	88	95	99	98	97	97	98	97	99	99	97	97	97	97	99	83	97	98	82	96	87	94	98	95	97	93	94	96	99	71	97	98	96
96B	95	93	85	51	93	92	94	85	98	84	89	94	91	87	86	93	87	84	95	97	98	88	86	91	95	91	98	96	93	94	93	84	98	98	76	85	79	92	89	85	82	84	82	92	94	82	96	94	98
98C	91	93	89	97	94	93	94	88	91	81	98	98	94	98	89	94	95	86	93	96	92	87	92	93	94	89	84	92	96	94	90	72	93	92	85	87	88	89	89	89	89	98	84	94	96	82	93	91	96

(cont'd)

Matrix of Correlations of Expected Outcome Functions for MOS, Combined Training and SQT Criteria (Continued)

MOS	62B	62E	62F	63B	63D	63G	63H	63N	63W	63Y	64C	67N	67T	67U	67V	67Y	68D	68G	68J	68M	71D	71L	71M	71N	72E	73C	74D	75B	75C	75D	75E	75F	76C	76P	76V	76W	76X	76Y	82C	91C	91E	91P	91R	92G	93H	94B	95B	96B
62E	97																																															
62F	93	98																																														
63B	97	97	95																																													
63D	93	90	88	88																																												
63G	89	89	86	97	85																																											
63H	97	97	96	97	86	87																																										
63N	91	98	89	96	88	93	91																																									
63W	95	94	92	91	91	78	96	81																																								
63Y	98	96	94	97	98	87	96	93	93																																							
64C	97	98	96	97	91	87	99	88	96	95																																						
67N	97	99	96	94	87	81	98	86	96	95	98																																					
67T	95	96	93	98	88	78	95	78	97	91	97	99																																				
67U	98	96	91	95	86	87	97	98	93	96	97	97	94																																			
67V	96	98	95	93	89	83	95	84	94	93	97	99	99	96																																		
67Y	94	98	98	95	93	88	95	87	95	91	97	95	94	98	95																																	
68D	97	95	89	93	84	98	93	91	97	94	92	95	98	97	94	89																																
68G	85	87	83	87	71	71	80	73	85	83	89	88	88	84	87	86	83																															
68J	98	99	97	97	91	91	98	92	96	97	98	97	95	96	96	98	94	86																														
68M	96	96	92	91	89	88	91	88	87	93	92	95	93	95	96	91	97	76	93																													
71D	79	76	75	74	69	55	85	62	87	76	85	84	85	85	81	72	69	72	78	69																												
71L	86	87	83	70	70	63	84	61	86	81	88	92	95	87	94	81	83	85	82	86	84																											
71M	98	94	91	81	86	74	88	72	91	87	92	96	97	89	97	91	88	83	91	92	77	95																										
71N	88	91	87	81	86	68	85	70	65	84	88	94	95	89	96	96	87	81	85	92	77	98	96																									
72E	96	98	97	98	87	87	99	92	96	96	98	97	65	95	95	97	92	89	98	91	81	83	88	85																								
73C	91	93	89	85	85	74	88	73	88	87	92	95	96	91	98	89	89	85	88	93	77	98	98	99	87																							
74D	91	97	88	84	86	72	89	70	92	86	94	95	98	91	97	89	86	87	89	98	85	99	97	97	88	98																						
75B	92	93	88	87	88	73	89	74	88	87	92	96	96	92	97	88	98	98	88	91	79	98	95	98	89	98	98																					
75C	95	95	98	91	87	77	95	88	93	97	96	98	98	95	97	91	93	94	93	91	84	95	94	94	94	95	97	98																				
75D	98	89	85	85	76	68	91	71	98	84	92	95	96	92	94	85	86	98	87	85	98	96	98	93	98	73	97	97	98																			
75E	97	94	98	87	87	72	91	74	91	89	94	97	98	97	98	98	89	90	90	91	82	98	97	98	91	99	99	99	98	97																		
75F	97	93	88	86	78	72	91	79	89	87	91	97	97	93	97	87	91	89	89	91	84	98	95	97	98	78	78	79	98	98	99																	
76C	91	95	97	91	83	76	91	88	91	91	95	97	97	93	97	92	91	94	97	91	88	95	94	95	93	97	96	99	99	96	99	98																
76P	89	85	79	78	69	68	88	65	83	91	89	91	92	88	91	77	89	86	88	85	83	97	98	99	87	94	99	97	95	97	96	98	95															
76V	98	98	87	83	85	78	91	69	96	84	94	95	98	98	95	89	83	84	98	89	91	94	94	91	98	97	98	97	94	96	95	94	92	98														
76W	99	98	94	96	98	87	97	87	95	95	97	99	98	98	98	95	96	98	97	95	87	98	93	93	97	94	99	99	98	94	95	95	97	89	94													
76X	84	79	75	77	71	98	84	65	84	79	86	86	88	87	86	74	75	77	77	78	94	91	80	87	88	86	91	89	89	95	89	91	88	91	98	87												
76Y	91	98	83	83	79	67	83	78	69	86	89	94	96	91	95	84	98	85	86	98	81	97	94	97	86	96	97	98	97	96	98	94	96	98	93	93	98											
82C	94	95	98	91	81	83	92	85	86	91	93	94	94	95	97	89	94	87	91	96	79	93	91	95	97	96	93	97	96	93	96	97	97	93	97	96	86	95										
91C	94	94	97	88	89	79	98	78	98	89	94	97	98	97	99	93	91	84	97	96	79	95	97	98	91	99	97	98	95	97	97	96	96	91	93	96	85	95	97									
91E	97	94	98	86	82	71	97	74	91	88	91	97	99	92	97	99	98	88	93	91	83	96	96	97	91	96	97	98	98	97	99	98	97	96	96	96	88	98	95	97								
91P	87	97	98	87	79	73	84	76	81	85	86	97	91	86	95	87	89	76	85	95	85	95	94	97	89	96	98	95	89	85	93	93	92	89	84	89	76	92	95	96	93							
91R	98	91	86	81	98	73	81	78	47	85	88	97	94	87	95	88	87	75	86	94	78	93	96	97	81	97	95	94	98	87	94	92	91	88	98	91	81	94	91	98	94	95						
92G	91	91	86	87	78	72	93	75	92	86	94	96	97	94	95	87	87	91	89	86	91	95	98	92	92	93	97	96	99	99	97	98	96	95	96	96	94	95	94	91	97	85	86					
93H	92	95	93	89	81	74	95	79	91	98	96	98	98	64	98	93	89	87	93	98	89	95	95	99	94	95	96	96	97	97	97	98	96	94	96	95	98	94	94	95	97	91	89	97				
94B	97	97	94	94	91	86	97	93	97	93	99	98	98	96	98	96	91	98	97	92	86	92	91	91	97	93	96	94	97	95	96	95	96	89	97	99	88	92	93	96	95	86	98	96	96			
95B	96	98	95	93	89	81	96	82	96	93	98	99	99	95	99	96	92	91	76	93	81	95	97	95	96	97	98	97	98	95	98	97	98	92	96	99	87	95	95	98	98	92	93	96	98	99		
96B	84	89	85	88	88	65	88	83	93	98	93	91	97	86	94	88	88	89	86	83	86	97	94	93	87	94	98	95	95	97	97	95	95	97	92	98	97	94	89	94	96	85	94	97	95	95	96	
96C	98	88	83	81	79	86	86	78	87	84	89	91	94	92	94	81	89	81	84	98	84	97	92	96	84	96	96	97	95	95	97	98	94	98	97	92	92	92	99	94	94	96	89	93	95	93	91	93	92

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Table A - 13

Adjusted Validities for Current and Alternative Composites, by Current Cluster and MOS

AA=CL

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
1	71B	0.390	0.383	0.388	0.382	0.269	0.389	0.298	0.384	0.326	0.357	0.378	0.358	0.379	416	G	H
2	71L	0.412	0.383	0.394	0.346	0.358	0.375	0.353	0.447	0.239	0.340	0.387	0.315	0.372	9369	G	H
3	71M	0.437	0.436	0.433	0.433	0.430	0.458	0.447	0.416	0.447	0.432	0.437	0.411	0.428	647	G	H
4	71N	0.372	0.355	0.322	0.328	0.339	0.346	0.364	0.288	0.339	0.345	0.381	0.389	0.354	475		
5	73C	0.658	0.651	0.623	0.624	0.635	0.634	0.632	0.398	0.641	0.635	0.658	0.598	0.629	928		
6	75B	0.354	0.345	0.313	0.313	0.478	0.327	0.302	0.481	0.509	0.313	0.341	0.388	0.339	1835	G	H
7	75C	0.605	0.609	0.589	0.597	0.477	0.604	0.328	0.566	0.568	0.569	0.586	0.581	0.605	453		
8	75D	0.524	0.311	0.463	0.486	0.399	0.383	0.428	0.428	0.446	0.469	0.501	0.478	0.519	2107	G	H
9	75E	0.364	0.356	0.331	0.536	0.492	0.351	0.318	0.497	0.329	0.320	0.344	0.316	0.349	951	G	H
10	75F	0.607	0.392	0.383	0.563	0.511	0.584	0.536	0.524	0.551	0.563	0.608	0.545	0.592	382		
11	76C	0.503	0.506	0.484	0.489	0.415	0.491	0.433	0.461	0.478	0.468	0.442	0.478	0.499	4458	E	J
12	76P	0.638	0.608	0.551	0.567	0.527	0.595	0.531	0.493	0.534	0.555	0.629	0.531	0.608	2287	E	J
13	76V	0.452	0.452	0.446	0.443	0.381	0.463	0.411	0.396	0.422	0.430	0.421	0.438	0.453	2738	E	J
14	76W	0.540	0.569	0.567	0.564	0.440	0.551	0.518	0.340	0.546	0.262	0.541	0.559	0.564	1785	E	J
15	76X	0.164	0.163	0.164	0.149	0.125	0.149	0.133	0.125	0.132	0.147	0.137	0.143	0.156	328		
16	76Y	0.421	0.410	0.381	0.393	0.368	0.409	0.342	0.332	0.377	0.391	0.423	0.380	0.408	7211	E	J

AA=CO

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
17	11B	0.406	0.416	0.413	0.419	0.342	0.420	0.381	0.393	0.407	0.410	0.409	0.405	0.410	22325	L	G
18	11C	0.413	0.430	0.430	0.425	0.353	0.428	0.397	0.417	0.427	0.425	0.417	0.429	0.423	6218	C	G
19	11H	0.347	0.333	0.330	0.331	0.314	0.335	0.340	0.343	0.353	0.351	0.352	0.344	0.336	4468	C	F
20	12B	0.488	0.437	0.448	0.438	0.312	0.421	0.373	0.429	0.423	0.434	0.419	0.428	0.425	4266	L	E
21	12F	0.223	0.246	0.260	0.257	0.188	0.243	0.227	0.258	0.255	0.255	0.231	0.253	0.241	342		
22	19D	0.446	0.462	0.459	0.460	0.385	0.459	0.428	0.434	0.451	0.446	0.441	0.447	0.453	5629	L	G
23	19E	0.320	0.351	0.343	0.342	0.447	0.355	0.313	0.341	0.359	0.345	0.316	0.346	0.337	4976	C	F
24	19F	0.392	0.424	0.438	0.431	0.314	0.422	0.377	0.428	0.424	0.416	0.388	0.431	0.418	221		

AA=EL

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
25	17K	0.455	0.466	0.451	0.449	0.409	0.454	0.432	0.428	0.451	0.458	0.494	0.421	0.434	597		
26	26B	0.451	0.456	0.434	0.447	0.381	0.462	0.415	0.414	0.425	0.424	0.434	0.459	0.468	547	D	H
27	27E	0.321	0.326	0.493	0.388	0.489	0.309	0.318	0.481	0.312	0.380	0.311	0.488	0.383	792	A	B
28	31J	0.479	0.487	0.490	0.491	0.480	0.383	0.441	0.443	0.469	0.483	0.485	0.471	0.485	985	A	A
29	31M	0.354	0.387	0.338	0.390	0.442	0.384	0.315	0.361	0.367	0.366	0.546	0.388	0.385	4126	D	H
30	31N	0.235	0.235	0.240	0.224	0.277	0.239	0.278	0.238	0.260	0.238	0.224	0.218	0.228	494		
31	31V	0.493	0.510	0.499	0.504	0.405	0.493	0.457	0.494	0.498	0.497	0.498	0.501	0.511	2134	D	I
32	35K	0.372	0.395	0.364	0.385	0.323	0.363	0.377	0.383	0.393	0.387	0.376	0.369	0.374	244		
33	36C	0.211	0.211	0.193	0.188	0.213	0.181	0.220	0.193	0.205	0.211	0.218	0.188	0.197	2148	D	H
34	36K	0.388	0.420	0.433	0.433	0.308	0.413	0.369	0.418	0.410	0.424	0.397	0.419	0.408	4497	D	I

AA=FA

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
35	13B	0.432	0.457	0.461	0.464	0.353	0.452	0.411	0.451	0.452	0.454	0.438	0.455	0.458	11822	C	F
36	13F	0.607	0.628	0.633	0.632	0.544	0.619	0.601	0.613	0.627	0.646	0.634	0.603	0.612	2352	C	G

AA=GM

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
37	41C	0.341	0.341	0.322	0.329	0.338	0.313	0.331	0.338	0.341	0.351	0.369	0.312	0.336	393		
38	43E	0.320	0.323	0.301	0.309	0.301	0.312	0.319	0.300	0.316	0.297	0.303	0.309	0.323	638	E	C
39	44B	0.329	0.346	0.341	0.342	0.286	0.322	0.324	0.346	0.348	0.346	0.331	0.325	0.339	486	M	S
40	45K	0.446	0.466	0.477	0.477	0.447	0.472	0.485	0.493	0.496	0.503	0.490	0.462	0.465	523	B	J
41	51B	0.359	0.382	0.375	0.387	0.274	0.362	0.328	0.356	0.367	0.359	0.350	0.362	0.353	879	M	S
42	51K	0.343	0.381	0.363	0.371	0.304	0.352	0.348	0.369	0.363	0.369	0.367	0.370	0.372	321		
43	52D	0.392	0.419	0.428	0.431	0.327	0.416	0.378	0.421	0.438	0.418	0.403	0.408	0.397	1139	B	E
44	55B	0.502	0.308	0.490	0.500	0.512	0.503	0.453	0.464	0.479	0.484	0.497	0.492	0.509	1131	E	J
45	57E	0.297	0.260	0.236	0.255	0.292	0.246	0.297	0.252	0.268	0.319	0.331	0.228	0.243	282		
46	57H	0.308	0.302	0.299	0.202	0.273	0.314	0.259	0.276	0.299	0.290	0.291	0.289	0.295	379	E	J
47	62E	0.510	0.344	0.356	0.355	0.449	0.339	0.316	0.359	0.358	0.351	0.320	0.348	0.328	771	I	P
48	62F	0.457	0.494	0.516	0.512	0.618	0.494	0.481	0.335	0.326	0.381	0.461	0.510	0.491	360	I	P
49	62J	0.465	0.310	0.536	0.533	0.385	0.312	0.446	0.325	0.323	0.328	0.479	0.325	0.499	486		
50	62H	0.448	0.319	0.325	0.523	0.463	0.308	0.333	0.341	0.348	0.364	0.343	0.387	0.384	366	J	Q

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Adjusted Validities for Current and Alternative Composites,
by Current Cluster and MOS (Continued)

AA=MM

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
51	12C	0.379	0.394	0.400	0.400	0.339	0.395	0.376	0.389	0.397	0.409	0.401	0.384	0.388	1890		
52	[illegible]	0.646	0.700	0.698	0.693	0.389	0.697	0.644	0.634	0.698	0.668	0.658	0.649	0.664	468		
53	41C	0.611	0.619	0.642	0.669	0.306	0.605	0.556	0.572	0.582	0.628	0.638	0.569	0.619	336		
54	62B	0.465	0.526	0.532	0.534	0.486	0.505	0.463	0.516	0.517	0.536	0.503	0.521	0.503	1283	B	D
55	63B	0.396	0.443	0.456	0.454	0.383	0.416	0.384	0.455	0.440	0.441	0.399	0.456	0.425	6789	B	D
56	63D	0.211	0.241	0.246	0.245	0.212	0.227	0.232	0.243	0.232	0.291	0.214	0.240	0.216	738	B	D
57	63E	0.282	0.244	0.269	0.254	0.170	0.223	0.227	0.275	0.282	0.274	0.225	0.250	0.225	325		
58	63H	0.431	0.462	0.477	0.476	0.329	0.461	0.398	0.462	0.493	0.461	0.434	0.473	0.462	1939	B	D
59	63N	0.223	0.264	0.284	0.283	0.179	0.249	0.235	0.303	0.278	0.288	0.249	0.280	0.253	1063	B	D
60	63W	0.256	0.273	0.277	0.282	0.209	0.280	0.245	0.239	0.266	0.255	0.249	0.280	0.278	1149	B	D
61	63T	0.344	0.381	0.388	0.399	0.290	0.369	0.351	0.388	0.387	0.383	0.336	0.383	0.337	835	B	D
62	67N	0.531	0.548	0.551	0.533	0.493	0.551	0.506	0.534	0.542	0.547	0.540	0.540	0.547	1496	J	G
63	67T	0.777	0.791	0.740	0.782	0.640	0.798	0.742	0.738	0.766	0.778	0.767	0.776	0.794	296		
64	67U	0.519	0.549	0.558	0.557	0.414	0.532	0.687	0.528	0.529	0.367	0.548	0.532	0.532	583	J	G
65	67V	0.333	0.546	0.546	0.541	0.482	0.539	0.527	0.531	0.545	0.548	0.539	0.529	0.541	733	J	G
66	67Y	0.496	0.547	0.564	0.559	0.442	0.542	0.523	0.370	0.564	0.540	0.483	0.508	0.539	751	J	G
67	68D	0.618	0.652	0.661	0.667	0.518	0.634	0.603	0.657	0.653	0.697	0.669	0.639	0.638	319		
68	68B	0.425	0.432	0.312	0.417	0.277	0.425	0.227	0.372	0.387	0.362	0.378	0.417	0.432	375		

AA=OF

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
69	15D	0.371	0.396	0.404	0.401	0.323	0.387	0.373	0.372	0.400	0.408	0.387	0.384	0.388	1363	C	F
70	15E	0.268	0.310	0.315	0.319	0.244	0.306	0.284	0.307	0.314	0.309	0.292	0.333	0.294	1228	C	F
71	16B	0.388	0.402	0.398	0.400	0.323	0.396	0.365	0.379	0.287	0.397	0.392	0.393	0.378	321		
72	16C	0.361	0.336	0.324	0.324	0.223	0.321	0.308	0.279	0.304	0.333	0.334	0.386	0.335	297		
73	16D	0.587	0.562	0.572	0.578	0.456	0.535	0.543	0.576	0.572	0.382	0.528	0.369	0.539	266		
74	16H	0.559	0.575	0.575	0.577	0.467	0.575	0.525	0.546	0.561	0.362	0.553	0.564	0.571	192		
75	16J	0.494	0.489	0.467	0.474	0.443	0.491	0.466	0.444	0.443	0.466	0.485	0.467	0.492	382		
76	16R	0.280	0.298	0.297	0.299	0.248	0.280	0.278	0.288	0.296	0.293	0.278	0.286	0.238	2321	C	F
77	16S	0.436	0.463	0.471	0.477	0.341	0.464	0.409	0.467	0.457	0.460	0.435	0.477	0.463	1558	C	F
78	44C	0.446	0.470	0.486	0.479	0.368	0.461	0.429	0.461	0.466	0.468	0.438	0.468	0.461	7992	I	F
79	94B	0.304	0.328	0.329	0.322	0.409	0.316	0.471	0.491	0.384	0.312	0.469	0.376	0.318	7664	E	L

AA=SC

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
80	05B	0.386	0.398	0.396	0.394	0.332	0.391	0.369	0.367	0.389	0.380	0.369	0.378	0.381	2614	B	H
81	05C	0.463	0.484	0.442	0.482	0.371	0.474	0.425	0.457	0.462	0.471	0.461	0.474	0.478	5339	B	H
82	05G	0.521	0.352	0.375	0.370	0.329	0.357	0.379	0.365	0.391	0.399	0.366	0.338	0.323	311		
83	17C	0.270	0.278	0.274	0.279	0.232	0.274	0.297	0.252	0.268	0.287	0.261	0.283	0.270	666		
84	72E	0.302	0.344	0.359	0.360	0.387	0.339	0.472	0.352	0.353	0.336	0.499	0.363	0.343	1881	B	H

AA=ST

OBS	MOS	ACL	AST	AOP	ACO	CL	ST	SC	MM	OF	CO	FA	GM	EL	TOTFREQ	TSC15	TSC23
85	93H	0.640	0.638	0.591	0.689	0.630	0.609	0.644	0.363	0.619	0.689	0.639	0.564	0.599	877	F	H
86	13E	0.461	0.464	0.445	0.452	0.381	0.456	0.417	0.434	0.431	0.447	0.462	0.438	0.457	1991		
87	94E	0.446	0.447	0.434	0.437	0.420	0.449	0.441	0.427	0.446	0.447	0.442	0.425	0.449	1395	G	H
88	74D	0.612	0.605	0.381	0.376	0.345	0.396	0.372	0.320	0.369	0.374	0.306	0.356	0.393	311		
89	82C	0.552	0.559	0.341	0.340	0.478	0.332	0.328	0.336	0.337	0.360	0.373	0.329	0.398	733		
90	11C	0.516	0.324	0.309	0.305	0.495	0.509	0.327	0.301	0.320	0.222	0.321	0.499	0.317	1978		
91	91E	0.492	0.487	0.466	0.477	0.638	0.497	0.494	0.444	0.462	0.466	0.469	0.473	0.497	781	H	G
92	[illegible]	0.765	0.312	0.333	0.335	0.345	0.341	0.371	0.354	0.360	0.357	0.371	0.323	0.347	781		
93	91R	0.463	0.469	0.449	0.491	0.493	0.458	0.310	0.444	0.475	0.477	0.468	0.448	0.453	933		
94	92B	0.425	0.428	0.403	0.403	0.318	0.416	0.349	0.338	0.372	0.389	0.407	0.397	0.425	1038	H	J
95	93N	0.460	0.458	0.435	0.456	0.309	0.466	0.417	0.430	0.443	0.445	0.457	0.448	0.463	428		
96	95B	0.372	0.387	0.382	0.381	0.491	0.383	0.344	0.352	0.373	0.368	0.359	0.369	0.379	11054	A	C
97	96B	0.628	0.610	0.580	0.376	0.322	0.610	0.347	0.311	0.356	0.349	0.374	0.374	0.617	327	F	H
98	98C	0.710	0.689	0.643	0.660	0.619	0.672	0.641	0.377	0.429	0.663	0.716	0.613	0.665	1131	F	H

Table A - 14

Sample Validities for the Proposed Composites
Combined Criterion

MOS	AA	N	ACL	SE	AST	SE	ACO	SE	AOP	SE	NORM SE
71D	CL	114	0.38	0.09	0.36	0.08	0.36	0.07	0.35	0.08	0.09
71L	CL	2782	0.47	0.02	0.44	0.02	0.41	0.02	0.40	0.02	0.02
71M	CL	182	0.35	0.06	0.35	0.06	0.36	0.06	0.36	0.06	0.07
71N	CL	173	0.39	0.07	0.37	0.07	0.33	0.07	0.33	0.07	0.08
73C	CL	478	0.56	0.03	0.55	0.03	0.53	0.03	0.53	0.03	0.05
75B	CL	920	0.44	0.03	0.43	0.03	0.39	0.03	0.38	0.03	0.03
75C	CL	317	0.52	0.04	0.52	0.04	0.50	0.05	0.49	0.05	0.06
75D	CL	801	0.42	0.03	0.41	0.03	0.37	0.03	0.37	0.03	0.04
75E	CL	417	0.47	0.04	0.46	0.04	0.44	0.04	0.44	0.04	0.05
75F	CL	137	0.58	0.07	0.55	0.07	0.52	0.07	0.52	0.07	0.09
76C	CL	1296	0.32	0.03	0.33	0.02	0.30	0.02	0.30	0.02	0.03
76P	CL	559	0.45	0.04	0.40	0.04	0.36	0.04	0.34	0.04	0.04
76V	CL	214	0.34	0.06	0.33	0.06	0.32	0.05	0.34	0.05	0.07
76W	CL	684	0.32	0.04	0.36	0.03	0.34	0.04	0.35	0.03	0.04
76X	CL	158	0.17	0.08	0.15	0.09	0.10	0.08	0.11	0.07	0.08
76Y	CL	1136	0.29	0.03	0.28	0.03	0.26	0.03	0.24	0.03	0.03
11B	CO	5761	0.31	0.01	0.32	0.01	0.32	0.01	0.32	0.01	0.01
11C	CO	1482	0.32	0.02	0.34	0.02	0.34	0.02	0.34	0.02	0.03
11H	CO	948	0.26	0.03	0.26	0.03	0.26	0.03	0.26	0.03	0.03
12B	CO	2411	0.31	0.02	0.33	0.02	0.33	0.02	0.34	0.02	0.02
12F	CO	224	0.12	0.06	0.16	0.06	0.19	0.07	0.20	0.06	0.07
19D	CO	1035	0.35	0.03	0.37	0.03	0.37	0.03	0.37	0.03	0.03
19E	CO	2322	0.40	0.02	0.43	0.02	0.45	0.02	0.45	0.02	0.02
19F	CO	83	0.33	0.09	0.39	0.09	0.39	0.09	0.42	0.09	0.11
17K	EL	179	0.29	0.06	0.29	0.06	0.31	0.06	0.32	0.06	0.07
26Q	EL	142	0.33	0.07	0.33	0.06	0.31	0.06	0.26	0.06	0.08
27E	EL	305	0.36	0.05	0.37	0.04	0.34	0.05	0.31	0.05	0.06
31J	EL	130	0.25	0.07	0.27	0.07	0.30	0.07	0.29	0.07	0.09
31M	EL	1858	0.30	0.02	0.37	0.02	0.38	0.02	0.38	0.02	0.02
31N	EL	193	0.06	0.06	0.06	0.06	0.03	0.07	0.09	0.07	0.07
31V	EL	650	0.31	0.03	0.33	0.03	0.32	0.04	0.30	0.04	0.04
35K	EL	121	0.42	0.07	0.48	0.06	0.46	0.06	0.46	0.06	0.09
36C	EL	374	0.13	0.05	0.14	0.05	0.08	0.05	0.10	0.05	0.05
36K	EL	1581	0.23	0.02	0.28	0.02	0.30	0.02	0.31	0.02	0.03
13B	FA	4778	0.35	0.01	0.38	0.01	0.39	0.01	0.38	0.01	0.01
13F	FA	824	0.34	0.03	0.38	0.03	0.40	0.03	0.40	0.02	0.03
41C	GM	103	0.24	0.08	0.25	0.08	0.19	0.08	0.19	0.09	0.10
43E	GM	99	0.25	0.09	0.26	0.09	0.22	0.08	0.20	0.09	0.10
44B	GM	137	0.25	0.08	0.28	0.08	0.26	0.09	0.30	0.09	0.09
45K	GM	228	0.22	0.07	0.25	0.07	0.30	0.06	0.30	0.07	0.07
51B	GM	195	0.29	0.07	0.32	0.06	0.33	0.05	0.30	0.05	0.07
51K	GM	167	0.23	0.08	0.26	0.07	0.23	0.07	0.21	0.08	0.08
52D	GM	176	0.29	0.06	0.31	0.06	0.36	0.06	0.35	0.07	0.08
55B	GM	366	0.28	0.05	0.27	0.05	0.26	0.05	0.24	0.05	0.05
57E	GM	126	0.06	0.09	0.09	0.09	0.11	0.10	0.09	0.09	0.09
57H	GM	224	0.18	0.05	0.17	0.06	0.20	0.06	0.17	0.06	0.07
62E	GM	230	0.37	0.05	0.41	0.05	0.43	0.05	0.44	0.05	0.07
62F	GM	200	0.24	0.07	0.29	0.07	0.34	0.07	0.34	0.06	0.07
68J	GM	188	0.22	0.07	0.29	0.07	0.35	0.07	0.35	0.07	0.07
68M	GM	132	0.29	0.05	0.35	0.05	0.37	0.05	0.37	0.05	0.09

(cont'd)

Sample Validities for the Proposed Composites
Combined Criterion (Continued)

MOS	AA	N	ACL	SE	AST	SE	ACO	SE	AOP	SE	NORM SE
12C	MM	355	0.26	0.05	0.28	0.05	0.29	0.05	0.29	0.05	0.05
61B	MM	183	0.64	0.03	0.65	0.03	0.65	0.03	0.66	0.03	0.07
61C	MM	136	0.44	0.05	0.44	0.06	0.41	0.06	0.39	0.07	0.09
62B	MM	355	0.39	0.05	0.43	0.04	0.44	0.04	0.43	0.04	0.05
63B	MM	1818	0.28	0.02	0.32	0.02	0.33	0.02	0.33	0.02	0.02
63D	MM	342	0.07	0.06	0.11	0.06	0.12	0.06	0.12	0.06	0.05
63G	MM	161	0.06	0.08	0.12	0.07	0.12	0.07	0.18	0.07	0.08
63H	MM	783	0.30	0.03	0.33	0.03	0.35	0.03	0.35	0.03	0.04
63N	MM	509	0.10	0.04	0.14	0.04	0.17	0.04	0.17	0.04	0.04
63W	MM	527	0.19	0.05	0.20	0.05	0.22	0.04	0.21	0.04	0.04
63Y	MM	238	0.16	0.07	0.19	0.07	0.23	0.06	0.19	0.07	0.06
67N	MM	471	0.34	0.04	0.35	0.04	0.36	0.04	0.35	0.04	0.05
67T	MM	124	0.62	0.06	0.63	0.06	0.61	0.06	0.62	0.06	0.09
67U	MM	278	0.36	0.04	0.37	0.04	0.37	0.05	0.38	0.04	0.06
67V	MM	310	0.37	0.06	0.38	0.06	0.37	0.06	0.38	0.06	0.06
67Y	MM	241	0.22	0.06	0.26	0.06	0.28	0.06	0.29	0.07	0.06
68D	MM	121	0.43	0.06	0.47	0.06	0.49	0.06	0.48	0.06	0.09
68G	MM	121	0.37	0.08	0.38	0.08	0.35	0.09	0.33	0.10	0.09
15D	OF	406	0.20	0.05	0.23	0.04	0.24	0.04	0.26	0.04	0.05
15E	OF	280	0.16	0.05	0.19	0.05	0.22	0.05	0.20	0.05	0.06
16B	OF	288	0.28	0.05	0.30	0.05	0.30	0.05	0.29	0.05	0.06
16C	OF	118	0.32	0.07	0.32	0.07	0.25	0.08	0.26	0.07	0.09
16D	OF	112	0.32	0.07	0.44	0.07	0.46	0.08	0.45	0.08	0.09
16H	OF	104	0.43	0.09	0.47	0.09	0.47	0.08	0.46	0.08	0.10
16J	OF	119	0.43	0.07	0.42	0.07	0.37	0.07	0.35	0.08	0.09
16R	OF	404	0.18	0.04	0.21	0.04	0.21	0.04	0.20	0.04	0.05
16S	OF	592	0.26	0.04	0.30	0.04	0.33	0.03	0.31	0.04	0.04
64C	OF	2959	0.28	0.02	0.32	0.02	0.32	0.01	0.34	0.01	0.02
94B	OF	3322	0.33	0.02	0.36	0.02	0.35	0.01	0.37	0.02	0.02
05B	SC	890	0.27	0.04	0.29	0.04	0.28	0.03	0.28	0.03	0.03
05C	SC	1971	0.36	0.02	0.39	0.02	0.38	0.02	0.38	0.02	0.02
05G	SC	119	0.23	0.09	0.31	0.08	0.36	0.08	0.38	0.08	0.09
17C	SC	187	0.23	0.07	0.24	0.07	0.22	0.07	0.23	0.07	0.07
72E	SC	562	0.42	0.03	0.48	0.03	0.50	0.03	0.50	0.03	0.04
05H	ST	110	0.53	0.05	0.50	0.06	0.43	0.07	0.37	0.07	0.10
13E	ST	678	0.33	0.03	0.33	0.03	0.30	0.03	0.28	0.04	0.04
54E	ST	270	0.34	0.05	0.35	0.05	0.34	0.05	0.32	0.05	0.06
74D	ST	98	0.44	0.09	0.42	0.09	0.33	0.09	0.33	0.09	0.10
82C	ST	536	0.42	0.04	0.43	0.04	0.39	0.03	0.39	0.04	0.04
91C	ST	233	0.37	0.05	0.39	0.05	0.34	0.05	0.36	0.05	0.07
91E	ST	301	0.31	0.05	0.29	0.05	0.26	0.04	0.23	0.05	0.06
91P	ST	159	0.21	0.08	0.21	0.07	0.20	0.08	0.20	0.08	0.08
91R	ST	145	0.27	0.07	0.29	0.06	0.23	0.07	0.22	0.07	0.08
92B	ST	364	0.35	0.05	0.33	0.05	0.31	0.05	0.31	0.05	0.05
93H	ST	114	0.30	0.09	0.28	0.09	0.28	0.08	0.28	0.08	0.09
95B	ST	3695	0.31	0.01	0.34	0.01	0.32	0.01	0.33	0.01	0.02
96B	ST	172	0.49	0.06	0.45	0.06	0.37	0.07	0.39	0.06	0.08
98C	ST	186	0.50	0.06	0.43	0.06	0.36	0.06	0.31	0.06	0.07

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Table A - 15

Adjusted Validities for the Proposed Composites
Combined Criterion

MOS	AA	N	ACL	SE	AST	SE	ACO	SE	AOP	SE	NORM SE
71D	CL	114	0.41	0.18	0.40	0.17	0.40	0.17	0.40	0.16	0.09
71L	CL	2782	0.62	0.02	0.59	0.02	0.55	0.02	0.55	0.02	0.02
71M	CL	182	0.54	0.08	0.53	0.07	0.53	0.07	0.53	0.07	0.07
71N	CL	173	0.70	0.05	0.67	0.05	0.63	0.05	0.62	0.05	0.08
73C	CL	478	0.68	0.03	0.67	0.03	0.64	0.03	0.64	0.03	0.05
75B	CL	920	0.57	0.03	0.56	0.03	0.53	0.03	0.53	0.03	0.03
75C	CL	317	0.64	0.06	0.64	0.06	0.62	0.06	0.61	0.06	0.06
75D	CL	801	0.53	0.05	0.52	0.05	0.49	0.05	0.49	0.05	0.04
75E	CL	417	0.60	0.06	0.59	0.06	0.57	0.06	0.56	0.06	0.05
75F	CL	137	0.67	0.11	0.64	0.11	0.61	0.10	0.61	0.10	0.09
76C	CL	1296	0.53	0.04	0.53	0.03	0.51	0.03	0.50	0.03	0.03
76P	CL	559	0.66	0.04	0.62	0.04	0.59	0.04	0.57	0.04	0.04
76V	CL	214	0.53	0.08	0.52	0.08	0.50	0.08	0.50	0.08	0.07
76W	CL	684	0.55	0.06	0.58	0.06	0.58	0.06	0.58	0.06	0.04
76X	CL	158	0.34	0.23	0.32	0.22	0.29	0.22	0.29	0.22	0.08
76Y	CL	1136	0.44	0.05	0.43	0.05	0.41	0.04	0.40	0.04	0.03
11B	CO	5761	0.41	0.01	0.42	0.01	0.42	0.01	0.42	0.01	0.01
11C	CO	1482	0.42	0.03	0.44	0.03	0.45	0.03	0.44	0.03	0.03
11H	CO	948	0.37	0.04	0.38	0.04	0.37	0.04	0.37	0.04	0.03
12B	CO	2411	0.41	0.02	0.44	0.02	0.44	0.02	0.45	0.02	0.02
12F	CO	224	0.28	0.09	0.32	0.09	0.35	0.09	0.36	0.09	0.07
19D	CO	1035	0.47	0.03	0.48	0.03	0.48	0.04	0.48	0.04	0.03
19E	CO	2322	0.53	0.02	0.56	0.02	0.57	0.02	0.57	0.02	0.02
19F	CO	83	0.46	0.12	0.50	0.12	0.51	0.12	0.53	0.12	0.11
17K	EL	179	0.49	0.08	0.50	0.09	0.51	0.09	0.52	0.09	0.07
26Q	EL	142	0.51	0.09	0.51	0.09	0.50	0.08	0.48	0.09	0.08
27E	EL	305	0.55	0.06	0.55	0.05	0.53	0.05	0.52	0.06	0.06
31J	EL	130	0.58	0.13	0.58	0.13	0.58	0.12	0.59	0.12	0.09
31M	EL	1858	0.57	0.02	0.60	0.02	0.60	0.02	0.60	0.02	0.02
31N	EL	193	0.31	0.12	0.30	0.12	0.29	0.12	0.32	0.12	0.07
31V	EL	650	0.52	0.04	0.53	0.04	0.53	0.04	0.52	0.04	0.04
35K	EL	121	0.65	0.08	0.68	0.08	0.66	0.07	0.66	0.07	0.09
36C	EL	374	0.26	0.10	0.26	0.10	0.22	0.09	0.23	0.09	0.05
36K	EL	1581	0.39	0.04	0.43	0.04	0.44	0.04	0.44	0.04	0.03
13B	FA	4[illegible]78	0.43	0.02	0.46	0.01	0.47	0.01	0.46	0.01	0.01
13F	FA	624	0.63	0.03	0.65	0.02	0.65	0.02	0.65	0.02	0.03
41C	GM	103	0.35	0.17	0.36	0.17	0.32	0.17	0.33	0.16	0.10
43E	GM	99	0.39	0.15	0.40	0.16	0.37	0.15	0.36	0.16	0.10
44B	GM	137	0.38	0.14	0.41	0.15	0.39	0.15	0.41	0.15	0.09
45K	GM	228	0.48	0.09	0.50	0.09	0.52	0.09	0.52	0.09	0.07
51B	GM	195	0.37	0.08	0.40	0.08	0.42	0.08	0.40	0.08	0.07
51K	GM	167	0.43	0.12	0.46	0.12	0.44	0.11	0.43	0.12	0.08
52D	GM	176	0.39	0.09	0.41	0.09	0.44	0.09	0.44	0.09	0.08
55B	GM	366	0.59	0.06	0.59	0.06	0.58	0.06	0.57	0.06	0.05
57E	GM	126	0.28	0.29	0.29	0.30	0.28	0.30	0.29	0.29	0.09
57H	GM	224	0.43	0.14	0.44	0.15	0.44	0.15	0.43	0.14	0.07
62E	GM	230	0.54	0.05	0.59	0.05	0.60	0.05	0.61	0.05	0.07
62F	GM	200	0.49	0.10	0.53	0.09	0.55	0.09	0.56	0.08	0.07
68J	GM	188	0.53	0.09	0.59	0.09	0.62	0.09	0.62	0.09	0.07
68M	GM	132	0.54	0.08	0.59	0.08	0.60	0.08	0.60	0.08	0.09

(cont'd)

Adjusted Validities for the Proposed Composites
Combined Criterion (Continued)

MOS	AA	N	ACL	SE	AST	SE	ACO	SE	AOP	SE	NORM SE
12C	MM	355	0.41	0.06	0.43	0.06	0.44	0.07	0.45	0.06	0.05
61B	MM	183	0.70	0.04	0.72	0.04	0.71	0.04	0.71	0.04	0.07
61C	MM	136	0.66	0.07	0.67	0.08	0.67	0.09	0.66	0.09	0.09
62B	MM	355	0.49	0.05	0.54	0.05	0.55	0.05	0.55	0.04	0.05
63B	MM	1818	0.40	0.03	0.45	0.02	0.47	0.02	0.47	0.02	0.02
63D	MM	342	0.27	0.11	0.32	0.11	0.32	0.11	0.33	0.11	0.05
63G	MM	161	0.26	0.12	0.33	0.13	0.34	0.13	0.37	0.13	0.08
63H	MM	783	0.45	0.04	0.48	0.04	0.50	0.04	0.50	0.04	0.04
63N	MM	509	0.24	0.07	0.30	0.07	0.32	0.07	0.32	0.07	0.04
63W	MM	527	0.28	0.07	0.30	0.08	0.31	0.08	0.30	0.08	0.04
63Y	MM	238	0.43	0.12	0.48	0.13	0.51	0.14	0.50	0.14	0.06
67N	MM	471	0.58	0.05	0.60	0.05	0.61	0.05	0.61	0.05	0.05
67T	MM	124	0.83	0.02	0.84	0.03	0.83	0.04	0.83	0.04	0.09
67U	MM	278	0.55	0.06	0.59	0.07	0.60	0.08	0.60	0.08	0.06
67V	MM	310	0.59	0.06	0.61	0.07	0.61	0.07	0.62	0.07	0.06
67Y	MM	241	0.57	0.07	0.64	0.08	0.65	0.08	0.66	0.08	0.06
68D	MM	121	0.63	0.07	0.68	0.07	0.70	0.07	0.70	0.07	0.09
68G	MM	121	0.48	0.16	0.49	0.17	0.46	0.18	0.45	0.18	0.09
15D	OF	406	0.43	0.06	0.46	0.07	0.47	0.07	0.48	0.07	0.05
15E	OF	280	0.39	0.09	0.42	0.09	0.44	0.10	0.43	0.10	0.06
16B	OF	288	0.45	0.08	0.46	0.08	0.46	0.08	0.46	0.08	0.06
16C	OF	118	0.34	0.14	0.33	0.15	0.28	0.15	0.27	0.15	0.09
16D	OF	112	0.52	0.11	0.59	0.10	0.60	0.09	0.60	0.10	0.09
16H	OF	104	0.73	0.10	0.75	0.09	0.75	0.09	0.75	0.10	0.10
16J	OF	119	0.63	0.11	0.61	0.12	0.60	0.13	0.58	0.13	0.09
16R	OF	404	0.34	0.05	0.37	0.05	0.37	0.06	0.37	0.06	0.05
16S	OF	592	0.46	0.06	0.50	0.05	0.52	0.05	0.51	0.05	0.04
64C	OF	2959	0.45	0.02	0.48	0.02	0.49	0.02	0.49	0.02	0.02
94B	OF	3322	0.51	0.02	0.53	0.02	0.53	0.02	0.53	0.02	0.02
05B	SC	890	0.43	0.05	0.44	0.06	0.44	0.06	0.44	0.06	0.03
05C	SC	1971	0.47	0.03	0.49	0.03	0.49	0.03	0.49	0.03	0.02
05G	SC	119	0.62	0.12	0.65	0.11	0.68	0.10	0.69	0.10	0.09
17C	SC	187	0.37	0.11	0.38	0.11	0.36	0.10	0.38	0.11	0.07
72E	SC	562	0.52	0.05	0.56	0.05	0.58	0.05	0.58	0.05	0.04
05H	ST	110	0.76	0.07	0.75	0.07	0.73	0.07	0.71	0.07	0.10
13E	ST	678	0.48	0.04	0.48	0.04	0.47	0.04	0.46	0.05	0.04
54E	ST	270	0.50	0.08	0.50	0.08	0.49	0.08	0.48	0.08	0.06
74D	ST	98	0.75	0.10	0.74	0.10	0.70	0.11	0.71	0.10	0.10
82C	ST	536	0.55	0.06	0.56	0.06	0.54	0.05	0.54	0.06	0.04
91C	ST	233	0.57	0.05	0.58	0.05	0.55	0.05	0.56	0.05	0.07
91E	ST	301	0.56	0.06	0.55	0.06	0.54	0.06	0.53	0.06	0.06
91P	ST	159	0.38	0.13	0.37	0.13	0.36	0.13	0.36	0.13	0.08
91R	ST	145	0.58	0.11	0.59	0.11	0.57	0.11	0.57	0.11	0.08
92B	ST	364	0.46	0.07	0.45	0.07	0.42	0.07	0.43	0.07	0.05
93H	ST	114	0.62	0.12	0.61	0.12	0.60	0.12	0.60	0.12	0.09
95B	ST	3695	0.58	0.02	0.60	0.02	0.59	0.02	0.59	0.02	0.02
96B	ST	172	0.72	0.06	0.70	0.06	0.66	0.06	0.67	0.06	0.08
98C	ST	186	0.79	0.08	0.77	0.08	0.74	0.08	0.72	0.09	0.07

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Sample Validities for the MAGE Compcsites
Combined Criterion

MOS	AA	N	M	SE	A	SE	G	SE	E	SE	NORM SE
71D	CL	114	0.29	0.08	0.21	0.09	0.38	0.09	0.36	0.09	0.09
71L	CL	2782	0.33	0.02	0.33	0.02	0.46	0.02	0.43	0.02	0.02
71M	CL	182	0.34	0.05	0.32	0.07	0.36	0.06	0.34	0.06	0.07
71N	CL	173	0.28	0.07	0.36	0.06	0.35	0.07	0.38	0.08	0.08
73C	CL	478	0.46	0.04	0.46	0.03	0.55	0.03	0.53	0.03	0.05
75B	CL	920	0.32	0.02	0.29	0.03	0.41	0.03	0.42	0.02	0.03
75C	CL	317	0.44	0.05	0.27	0.05	0.48	0.04	0.51	0.04	0.06
75D	CL	801	0.32	0.03	0.19	0.03	0.41	0.03	0.41	0.03	0.04
75E	CL	417	0.38	0.04	0.31	0.05	0.45	0.04	0.45	0.04	0.05
75F	CL	137	0.44	0.08	0.37	0.08	0.55	0.07	0.55	0.08	0.09
76C	CL	1296	0.25	0.02	0.18	0.03	0.29	0.02	0.32	0.03	0.03
76P	CL	559	0.24	0.04	0.26	0.04	0.39	0.04	0.40	0.04	0.04
76V	CL	214	0.30	0.05	0.20	0.06	0.37	0.06	0.34	0.06	0.07
76W	CL	684	0.32	0.04	0.21	0.04	0.31	0.04	0.34	0.03	0.04
76X	CL	158	-0.02	0.07	0.07	0.06	0.15	0.08	0.11	0.08	0.08
76Y	CL	1136	0.21	0.03	0.19	0.03	0.25	0.03	0.28	0.03	0.03
11B	CO	5761	0.30	0.01	0.22	0.01	0.29	0.01	0.31	0.01	0.01
11C	CO	1482	0.32	0.02	0.25	0.03	0.31	0.03	0.33	0.02	0.03
11H	CO	948	0.24	0.03	0.22	0.03	0.25	0.03	0.27	0.03	0.03
12B	CO	2411	0.31	0.02	0.19	0.02	0.29	0.02	0.32	0.02	0.02
12F	CO	224	0.21	0.07	0.08	0.05	0.14	0.06	0.16	0.06	0.07
19D	CO	1035	0.33	0.03	0.26	0.03	0.35	0.03	0.36	0.03	0.03
19E	CO	2322	0.44	0.02	0.30	0.02	0.41	0.02	0.42	0.02	0.02
19F	CO	83	0.42	0.09	0.24	0.09	0.37	0.09	0.37	0.09	0.11
17K	EL	179	0.30	0.07	0.21	0.06	0.29	0.06	0.28	0.07	0.07
26Q	EL	142	0.24	0.07	0.24	0.08	0.28	0.07	0.38	0.06	0.08
27E	EL	305	0.25	0.06	0.33	0.06	0.32	0.05	0.32	0.05	0.06
31J	EL	130	0.25	0.08	0.17	0.07	0.25	0.07	0.26	0.08	0.09
31M	EL	1858	0.35	0.02	0.17	0.02	0.30	0.02	0.36	0.02	0.02
31N	EL	193	0.04	0.06	0.18	0.08	0.16	0.07	0.05	0.06	0.07
31V	EL	650	0.26	0.04	0.22	0.04	0.26	0.03	0.33	0.03	0.04
35K	EL	121	0.36	0.07	0.34	0.08	0.42	0.07	0.41	0.06	0.09
36C	EL	374	0.05	0.05	0.12	0.05	0.10	0.05	0.10	0.04	0.05
36K	EL	1581	0.29	0.02	0.16	0.03	0.23	0.02	0.25	0.03	0.03
13B	FA	4779	0.37	0.01	0.25	0.01	0.34	0.01	0.37	0.01	0.01
13F	FA	824	0.35	0.03	0.28	0.03	0.35	0.03	0.36	0.03	0.03
41C	GM	103	0.12	0.10	0.25	0.11	0.19	0.09	0.25	0.07	0.10
43E	GM	99	0.17	0.08	0.22	0.10	0.23	0.09	0.25	0.08	0.10
44B	GM	137	0.25	0.10	0.19	0.08	0.28	0.08	0.26	0.08	0.09
45K	GM	228	0.29	0.06	0.26	0.06	0.20	0.07	0.24	0.07	0.07
51B	GM	195	0.25	0.05	0.21	0.07	0.25	0.07	0.25	0.06	0.07
51K	GM	167	0.16	0.08	0.17	0.08	0.17	0.09	0.25	0.07	0.08
52D	GM	176	0.32	0.06	0.24	0.07	0.26	0.07	0.27	0.06	0.08
55B	GM	366	0.20	0.05	0.20	0.06	0.23	0.05	0.28	0.05	0.05
57E	GM	126	0.10	0.08	0.15	0.09	-0.01	0.09	0.03	0.09	0.09
57H	GM	224	0.16	0.06	0.15	0.07	0.18	0.06	0.13	0.05	0.07
62E	GM	230	0.42	0.05	0.30	0.06	0.37	0.05	0.40	0.05	0.07
62F	GM	200	0.32	0.07	0.26	0.07	0.26	0.06	0.29	0.06	0.07
68J	GM	188	0.37	0.06	0.15	0.07	0.22	0.07	0.26	0.07	0.07
68M	GM	132	0.34	0.06	0.31	0.08	0.26	0.06	0.30	0.06	0.09

(cont'd)

Sample Validities for the MAGE Composites
Combined Criterion (Continued)

MOS	AA	N	M	SE	A	SE	G	SE	E	SE	NORM SE
12C	MM	355	0.27	0.05	0.19	0.06	0.25	0.05	0.27	0.05	0.05
61B	MM	183	0.61	0.04	0.46	0.05	0.66	0.04	0.59	0.03	0.07
61C	MM	136	0.28	0.08	0.25	0.07	0.36	0.07	0.44	0.05	0.09
62B	MM	355	0.41	0.04	0.25	0.04	0.38	0.05	0.39	0.04	0.05
63B	MM	1818	0.31	0.02	0.14	0.02	0.27	0.02	0.30	0.02	0.02
63D	MM	342	0.12	0.05	0.10	0.07	0.09	0.06	0.06	0.06	0.05
63G	MM	161	0.18	0.08	0.01	0.08	0.10	0.08	0.09	0.07	0.08
63H	MM	783	0.33	0.03	0.14	0.04	0.30	0.03	0.33	0.03	0.04
63N	MM	509	0.16	0.04	0.06	0.04	0.09	0.04	0.12	0.04	0.04
63W	MM	527	0.21	0.04	0.10	0.04	0.18	0.05	0.19	0.04	0.04
63Y	MM	238	0.17	0.06	0.09	0.06	0.12	0.07	0.14	0.07	0.06
67N	MM	471	0.30	0.04	0.22	0.05	0.33	0.04	0.36	0.04	0.05
67T	MM	124	0.54	0.06	0.44	0.06	0.62	0.06	0.65	0.05	0.09
67U	MM	278	0.29	0.05	0.20	0.05	0.34	0.04	0.35	0.05	0.06
67V	MM	310	0.32	0.06	0.30	0.06	0.38	0.06	0.37	0.06	0.06
67Y	MM	241	0.31	0.06	0.17	0.06	0.24	0.07	0.27	0.06	0.06
68D	MM	121	0.45	0.06	0.29	0.08	0.37	0.06	0.45	0.06	0.09
68G	MM	121	0.29	0.09	0.08	0.12	0.34	0.09	0.37	0.07	0.09
15D	OF	406	0.23	0.04	0.12	0.05	0.19	0.04	0.20	0.05	0.05
15E	OF	280	0.20	0.05	0.09	0.05	0.14	0.06	0.16	0.05	0.06
16B	OF	288	0.26	0.05	0.16	0.06	0.25	0.05	0.28	0.05	0.06
16C	OF	118	0.14	0.08	0.17	0.07	0.30	0.07	0.25	0.09	0.09
16D	OF	112	0.46	0.09	0.32	0.09	0.29	0.07	0.38	0.07	0.09
16H	OF	104	0.37	0.08	0.23	0.09	0.43	0.08	0.44	0.08	0.10
16J	OF	119	0.27	0.08	0.34	0.08	0.40	0.08	0.43	0.06	0.09
16R	OF	404	0.19	0.04	0.12	0.04	0.17	0.04	0.17	0.04	0.05
16S	OF	592	0.31	0.03	0.11	0.04	0.24	0.04	0.30	0.03	0.04
64C	OF	2959	0.30	0.02	0.13	0.02	0.30	0.02	0.30	0.02	0.02
94B	OF	3322	0.32	0.02	0.15	0.02	0.34	0.02	0.35	0.02	0.02
05B	SC	890	0.25	0.03	0.09	0.04	0.28	0.04	0.26	0.03	0.03
05C	SC	1971	0.35	0.02	0.10	0.02	0.36	0.02	0.38	0.02	0.02
05G	SC	119	0.37	0.08	0.26	0.10	0.27	0.09	0.27	0.09	0.09
17C	SC	187	0.22	0.07	0.06	0.07	0.24	0.08	0.22	0.07	0.07
72E	SC	562	0.49	0.03	0.12	0.04	0.41	0.03	0.49	0.03	0.04
05H	ST	110	0.26	0.09	0.49	0.07	0.48	0.06	0.43	0.06	0.10
13E	ST	678	0.21	0.04	0.19	0.03	0.29	0.04	0.31	0.03	0.04
54E	ST	270	0.30	0.05	0.32	0.05	0.30	0.05	0.36	0.05	0.06
74D	ST	98	0.22	0.09	0.32	0.10	0.47	0.08	0.37	0.09	0.10
82C	ST	536	0.30	0.04	0.32	0.04	0.38	0.04	0.43	0.03	0.04
91C	ST	233	0.29	0.05	0.37	0.05	0.38	0.05	0.39	0.05	0.07
91E	ST	301	0.19	0.05	0.20	0.05	0.26	0.05	0.32	0.05	0.06
91P	ST	159	0.16	0.08	0.25	0.08	0.19	0.08	0.24	0.07	0.08
91R	ST	145	0.16	0.08	0.38	0.07	0.27	0.06	0.26	0.07	0.08
92B	ST	364	0.25	0.05	0.15	0.04	0.34	0.05	0.34	0.05	0.05
93H	ST	114	0.22	0.09	0.09	0.09	0.30	0.09	0.30	0.09	0.09
95B	ST	3695	0.26	0.01	0.21	0.02	0.31	0.01	0.33	0.01	0.02
96B	ST	172	0.30	0.07	0.32	0.06	0.50	0.05	0.48	0.06	0.08
98C	ST	186	0.17	0.07	0.39	0.06	0.42	0.06	0.36	0.06	0.07

Table A - 17

Adjusted Validities for the MAGE Composites
Combined Criterion

MOS	AA	N	M	SE	A	SE	G	SE	E	SE	NORM SE
71D	CL	114	0.33	0.14	0.26	0.25	0.43	0.18	0.39	0.16	0.09
71L	CL	2782	0.47	0.02	0.56	0.02	0.61	0.02	0.58	0.02	0.02
71M	CL	182	0.48	0.06	0.57	0.10	0.55	0.08	0.51	0.07	0.07
71N	CL	173	0.54	0.05	0.70	0.06	0.69	0.05	0.67	0.05	0.08
73C	CL	478	0.57	0.03	0.66	0.04	0.68	0.03	0.65	0.02	0.05
75B	CL	920	0.46	0.03	0.49	0.05	0.55	0.03	0.55	0.03	0.03
75C	CL	317	0.56	0.06	0.50	0.09	0.61	0.07	0.63	0.06	0.06
75D	CL	801	0.43	0.05	0.40	0.07	0.52	0.06	0.53	0.05	0.04
75E	CL	417	0.50	0.06	0.53	0.09	0.59	0.06	0.58	0.06	0.05
75F	CL	137	0.52	0.09	0.57	0.16	0.65	0.11	0.64	0.10	0.09
76C	CL	1296	0.45	0.03	0.44	0.05	0.51	0.04	0.52	0.03	0.03
76P	CL	559	0.48	0.04	0.55	0.05	0.62	0.04	0.62	0.04	0.04
76V	CL	214	0.46	0.07	0.47	0.10	0.54	0.08	0.52	0.08	0.07
76W	CL	684	0.56	0.05	0.45	0.09	0.55	0.07	0.58	0.06	0.04
76X	CL	158	0.22	0.21	0.31	0.28	0.33	0.23	0.31	0.22	0.08
76Y	CL	1136	0.36	0.04	0.39	0.06	0.42	0.05	0.43	0.04	0.03
11B	CO	5761	0.40	0.01	0.34	0.01	0.40	0.01	0.41	0.01	0.01
11C	CO	1482	0.43	0.03	0.36	0.04	0.42	0.03	0.43	0.03	0.03
11H	CO	948	0.35	0.04	0.34	0.04	0.37	0.04	0.38	0.04	0.03
12B	CO	2411	0.43	0.02	0.31	0.03	0.40	0.02	0.43	0.02	0.02
12F	CO	224	0.36	0.09	0.25	0.09	0.29	0.09	0.31	0.09	0.07
19D	CO	1035	0.45	0.04	0.40	0.04	0.47	0.03	0.47	0.03	0.03
19E	CO	2322	0.56	0.02	0.45	0.02	0.53	0.02	0.54	0.02	0.02
19F	CO	83	0.52	0.11	0.37	0.14	0.48	0.12	0.49	0.12	0.11
17K	EL	179	0.49	0.10	0.47	0.10	0.50	0.08	0.49	0.08	0.07
26Q	EL	142	0.47	0.09	0.42	0.10	0.49	0.10	0.54	0.09	0.08
27E	EL	305	0.46	0.06	0.52	0.07	0.53	0.06	0.52	0.06	0.06
31J	EL	130	0.56	0.11	0.46	0.12	0.58	0.13	0.58	0.13	0.09
31M	EL	1858	0.58	0.02	0.45	0.03	0.56	0.03	0.60	0.02	0.02
31N	EL	193	0.27	0.11	0.36	0.11	0.35	0.12	0.29	0.12	0.07
31V	EL	650	0.49	0.04	0.42	0.05	0.50	0.04	0.54	0.04	0.04
35K	EL	121	0.59	0.07	0.6[illegible]	0.09	0.65	0.09	0.64	0.08	0.09
36C	EL	374	0.19	0.09	0.26	0.09	0.25	0.10	0.24	0.10	0.05
36K	EL	1581	0.43	0.04	0.30	0.04	0.39	0.04	0.41	0.05	0.03
13B	FA	4778	0.45	0.01	0.35	0.02	0.43	0.02	0.45	0.02	0.01
13F	FA	824	0.61	0.02	0.56	0.03	0.62	0.03	0.63	0.02	0.03
41C	GM	103	0.29	0.16	0.34	0.20	0.33	0.17	0.36	0.16	0.10
43E	GM	99	0.36	0.15	0.37	0.14	0.37	0.15	0.41	0.15	0.10
44B	GM	137	0.38	0.16	0.33	0.13	0.39	0.15	0.39	0.14	0.09
45K	GM	228	0.51	0.09	0.49	0.08	0.47	0.09	0.51	0.09	0.07
51B	GM	195	0.37	0.08	0.27	0.10	0.35	0.08	0.35	0.08	0.07
51K	GM	167	0.41	0.11	0.33	0.12	0.39	0.12	0.45	0.12	0.08
52D	GM	176	0.42	0.09	0.31	0.09	0.38	0.09	0.38	0.09	0.08
55B	GM	366	0.53	0.07	0.46	0.07	0.56	0.06	0.60	0.06	0.05
57E	GM	126	0.26	0.28	0.32	0.24	0.26	0.28	0.26	0.30	0.09
57H	GM	224	0.41	0.15	0.38	0.13	0.43	0.13	0.42	0.15	0.07
62E	GM	230	0.59	0.06	0.49	0.07	0.55	0.05	0.58	0.05	0.07
62F	GM	200	0.54	0.08	0.45	0.09	0.50	0.09	0.52	0.09	0.07
68J	GM	188	0.63	0.08	0.45	0.10	0.54	0.09	0.57	0.09	0.07
68M	GM	132	0.58	0.08	0.54	0.09	0.53	0.08	0.57	0.09	0.09

(cont'd)

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Adjusted Validities for the MAGE Composites
Combined Criterion (Continued)

MOS	AA	N	M	SE	A	SE	G	SE	E	SE	NORM SE
12C	MM	355	0.43	0.06	0.38	0.08	0.41	0.06	0.42	0.06	0.05
61B	MM	183	0.65	0.04	0.61	0.06	0.72	0.04	0.66	0.04	0.07
61C	MM	136	0.61	0.10	0.53	0.07	0.62	0.07	0.66	0.08	0.03
62B	MM	355	0.53	0.04	0.41	0.05	0.49	0.05	0.51	0.05	0.05
63B	MM	1818	0.46	0.02	0.31	0.03	0.40	0.03	0.43	0.02	0.02
63D	MM	342	0.33	0.10	0.28	0.12	0.29	0.11	0.28	0.11	0.05
63G	MM	161	0.38	0.13	0.23	0.13	0.28	0.13	0.30	0.12	0.08
63H	MM	783	0.49	0.03	0.34	0.05	0.45	0.04	0.48	0.04	0.04
63N	MM	509	0.33	0.07	0.18	0.07	0.23	0.07	0.28	0.07	0.04
63W	MM	527	0.30	0.07	0.23	0.07	0.28	0.07	0.29	0.08	0.04
63Y	MM	238	0.49	0.13	0.37	0.12	0.42	0.13	0.44	0.13	0.06
67N	MM	471	0.58	0.06	0.50	0.05	0.58	0.05	0.60	0.05	0.05
67T	MM	124	0.79	0.04	0.73	0.03	0.83	0.03	0.85	0.02	0.09
67U	MM	278	0.57	0.08	0.43	0.08	0.54	0.07	0.56	0.07	0.06
67V	MM	310	0.57	0.07	0.54	0.07	0.60	0.06	0.60	0.06	0.06
67Y	MM	241	0.66	0.08	0.52	0.09	0.60	0.08	0.63	0.07	0.06
68D	MM	121	0.70	0.08	0.53	0.09	0.60	0.07	0.66	0.07	0.09
68G	MM	121	0.42	0.17	0.29	0.19	0.46	0.17	0.48	0.16	0.09
15D	OF	406	0.46	0.07	0.38	0.08	0.43	0.07	0.44	0.06	0.05
15E	OF	280	0.43	0.09	0.34	0.09	0.38	0.09	0.39	0.08	0.06
16B	OF	288	0.44	0.08	0.36	0.10	0.43	0.08	0.46	0.07	0.06
16C	OF	118	0.21	0.15	0.22	0.16	0.31	0.15	0.29	0.14	0.09
16D	OF	112	0.60	0.08	0.46	0.12	0.52	0.12	0.56	0.10	0.09
16H	OF	104	0.70	0.09	0.62	0.12	0.73	0.10	0.73	0.09	0.10
16J	OF	119	0.53	0.13	0.56	0.13	0.61	0.12	0.61	0.10	0.09
16R	OF	404	0.35	0.06	0.30	0.07	0.34	0.06	0.33	0.05	0.05
16S	OF	592	0.50	0.05	0.36	0.07	0.45	0.06	0.50	0.05	0.04
64C	OF	2959	0.47	0.02	0.37	0.02	0.46	0.02	0.47	0.02	0.02
94B	OF	3322	0.50	0.02	0.41	0.02	0.52	0.02	0.52	0.02	0.02
05B	SC	890	0.40	0.05	0.38	0.07	0.44	0.06	0.42	0.05	0.03
05C	SC	1971	0.46	0.03	0.38	0.04	0.47	0.03	0.49	0.03	0.02
05G	SC	119	0.66	0.09	0.64	0.13	0.64	0.12	0.61	0.11	0.09
17C	SC	187	0.35	0.09	0.35	0.14	0.38	0.11	0.35	0.10	0.07
72E	SC	562	0.57	0.04	0.40	0.07	0.52	0.05	0.56	0.04	0.04
05H	ST	110	0.61	0.07	0.75	0.07	0.76	0.08	0.70	0.07	0.10
13E	ST	675	0.42	0.04	0.39	0.04	0.46	0.05	0.47	0.04	0.04
54E	ST	270	0.46	0.07	0.46	0.08	0.48	0.09	0.50	0.08	0.06
74D	ST	98	0.63	0.10	0.65	0.10	0.76	0.10	0.71	0.10	0.10
82C	ST	536	0.49	0.05	0.47	0.06	0.53	0.06	0.56	0.05	0.04
91C	ST	233	0.52	0.05	0.55	0.06	0.58	0.05	0.57	0.05	0.07
91E	ST	301	0.50	0.05	0.49	0.07	0.54	0.07	0.57	0.06	0.06
91P	ST	159	0.33	0.12	0.44	0.12	0.36	0.13	0.39	0.12	0.08
91R	ST	145	0.52	0.11	0.61	0.09	0.58	0.11	0.56	0.11	0.08
92B	ST	364	0.38	0.07	0.33	0.08	0.45	0.07	0.45	0.07	0.05
93H	ST	114	0.53	0.12	0.54	0.13	0.63	0.12	0.60	0.11	0.09
95B	ST	3695	0.56	0.02	0.50	0.02	0.58	0.02	0.59	0.02	0.02
96B	ST	172	0.60	0.06	0.60	0.07	0.73	0.06	0.70	0.05	0.08
98C	ST	186	0.62	0.09	0.68	0.08	0.76	0.09	0.73	0.08	0.07

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Table A - 18

Sample Validities for High School Composites
Combined Criterion

MOS	AA	N	HSAA	SE	HSMT	SE	HSOS	SE	HSSS	SE	HSEE	SE	NORM SE
71D	CL	114	0.38	0.09	0.33	0.07	0.39	0.07	0.38	0.08	0.36	0.01	0.09
71L	CL	2782	0.46	0.02	0.36	0.02	0.45	0.02	0.43	0.02	0.43	0.00	0.02
71M	CL	182	0.36	0.06	0.32	0.06	0.35	0.07	0.37	0.06	0.34	0.01	0.07
71N	CL	173	0.35	0.07	0.32	0.07	0.42	0.06	0.35	0.07	0.38	0.01	0.08
73C	CL	478	0.55	0.03	0.50	0.04	0.54	0.03	0.54	0.03	0.53	0.00	0.05
75B	CL	920	0.41	0.03	0.37	0.02	0.39	0.03	0.40	0.03	0.42	0.00	0.03
75C	CL	317	0.48	0.04	0.47	0.05	0.46	0.05	0.50	0.04	0.51	0.00	0.06
75D	CL	801	0.41	0.03	0.36	0.03	0.37	0.03	0.40	0.03	0.41	0.00	0.04
75E	CL	417	0.45	0.04	0.41	0.04	0.43	0.04	0.45	0.04	0.45	0.00	0.05
75F	CL	137	0.55	0.07	0.50	0.08	0.54	0.08	0.56	0.07	0.55	0.01	0.09
76C	CL	1296	0.29	0.02	0.29	0.02	0.26	0.03	0.30	0.02	0.32	0.00	0.03
76P	CL	559	0.39	0.04	0.32	0.04	0.42	0.03	0.39	0.04	0.40	0.00	0.04
76V	CL	214	0.37	0.06	0.30	0.06	0.33	0.06	0.36	0.05	0.34	0.01	0.07
76W	CL	684	0.31	0.04	0.35	0.04	0.28	0.04	0.33	0.04	0.34	0.00	0.04
76X	CL	158	0.15	0.08	0.09	0.06	0.18	0.07	0.12	0.07	0.11	0.01	0.08
76Y	CL	1136	0.25	0.03	0.23	0.03	0.30	0.03	0.25	0.03	0.28	0.00	0.03
11B	CO	5761	0.29	0.01	0.30	0.01	0.29	0.01	0.32	0.01	0.31	0.00	0.01
11C	CO	1482	0.31	0.03	0.33	0.02	0.30	0.02	0.33	0.02	0.33	0.00	0.03
11H	CO	948	0.25	0.03	0.25	0.03	0.25	0.03	0.27	0.03	0.27	0.00	0.03
12B	CO	2411	0.29	0.02	0.34	0.02	0.26	0.02	0.33	0.02	0.32	0.00	0.02
12F	CO	224	0.14	0.06	0.21	0.06	0.10	0.06	0.18	0.06	0.16	0.01	0.07
19D	CO	1035	0.35	0.03	0.35	0.03	0.34	0.03	0.36	0.03	0.36	0.00	0.03
19E	CO	2322	0.41	0.02	0.43	0.02	0.37	0.02	0.44	0.02	0.42	0.00	0.02
19F	CO	83	0.37	0.09	0.41	0.09	0.27	0.09	0.39	0.08	0.37	0.01	0.11
17K	EL	179	0.29	0.06	0.29	0.07	0.28	0.06	0.34	0.06	0.28	0.01	0.07
26Q	EL	142	0.28	0.07	0.25	0.06	0.34	0.07	0.26	0.06	0.38	0.01	0.08
27E	EL	305	0.32	0.05	0.27	0.06	0.37	0.05	0.31	0.05	0.32	0.00	0.06
31J	EL	130	0.25	0.07	0.22	0.08	0.25	0.07	0.32	0.07	0.26	0.01	0.09
31M	EL	1858	0.30	0.02	0.37	0.02	0.26	0.02	0.36	0.02	0.36	0.00	0.02
31N	EL	193	0.16	0.07	0.05	0.06	0.10	0.08	0.11	0.07	0.05	0.01	0.07
31V	EL	650	0.26	0.03	0.31	0.04	0.28	0.03	0.30	0.03	0.33	0.00	0.04
35K	EL	121	0.42	0.07	0.44	0.06	0.39	0.07	0.43	0.06	0.41	0.01	0.09
36C	EL	374	0.10	0.05	0.09	0.04	0.10	0.05	0.08	0.05	0.10	0.00	0.05
36K	EL	1581	0.23	0.02	0.30	0.02	0.21	0.03	0.29	0.02	0.25	0.00	0.03
13B	FA	4778	0.34	0.01	0.38	0.01	0.32	0.01	0.37	0.01	0.37	0.00	0.01
13F	FA	824	0.35	0.03	0.39	0.03	0.34	0.03	0.40	0.02	0.36	0.00	0.03
41C	GM	103	0.19	0.09	0.21	0.09	0.22	0.10	0.18	0.08	0.25	0.01	0.10
43E	GM	99	0.23	0.09	0.17	0.09	0.23	0.10	0.19	0.08	0.25	0.01	0.10
44B	GM	137	0.28	0.08	0.30	0.09	0.16	0.07	0.29	0.09	0.26	0.01	0.09
45K	GM	228	0.20	0.07	0.30	0.06	0.26	0.06	0.29	0.07	0.24	0.01	0.07
51B	GM	195	0.25	0.07	0.27	0.05	0.26	0.07	0.27	0.06	0.25	0.01	0.07
51K	GM	167	0.17	0.09	0.24	0.07	0.20	0.07	0.17	0.08	0.25	0.01	0.08
52D	GM	176	0.26	0.07	0.33	0.06	0.25	0.07	0.34	0.06	0.27	0.01	0.08
55B	GM	366	0.23	0.05	0.23	0.05	0.25	0.06	0.25	0.05	0.28	0.00	0.05
57E	GM	126	-0.01	0.09	0.09	0.09	0.18	0.11	0.08	0.10	0.03	0.01	0.09
57H	GM	224	0.18	0.06	0.09	0.06	0.19	0.07	0.19	0.06	0.13	0.01	0.07
62E	GM	230	0.37	0.05	0.44	0.05	0.32	0.05	0.41	0.05	0.40	0.00	0.07
62F	GM	200	0.26	0.06	0.36	0.06	0.24	0.07	0.32	[illegible]	0.29	0.01	0.07
68J	GM	188	0.22	0.07	0.35	0.06	0.19	0.07	0.31	0.06	0.26	0.01	0.07
68M	GM	132	0.26	0.06	0.39	0.05	0.32	0.07	0.34	0.05	0.30	0.01	0.09

(Cont'd)

Sample Validities for High School Composites
Combined Criterion (Continued)

MOS	AA	N	HSAA	SE	HSMT	SE	HSOS	SE	HSSS	SE	HSEE	SE	NORM SE
12C	MM	355	0.25	0.05	0.28	0.05	0.26	0.06	0.29	0.05	0.27	0.00	0.05
61B	MM	183	0.66	0.04	0.58	0.04	0.59	0.04	0.67	0.04	0.59	0.00	0.07
61C	MM	136	0.36	0.07	0.39	0.07	0.40	0.06	0.40	0.07	0.44	0.01	0.09
62B	MM	355	0.38	0.05	0.42	0.04	0.37	0.05	0.41	0.05	0.39	0.00	0.05
63B	MM	1818	0.27	0.02	0.34	0.02	0.22	0.02	0.30	0.02	0.30	0.00	0.02
63D	MM	342	0.09	0.06	0.10	0.05	0.11	0.07	0.08	0.06	0.06	0.01	0.05
63G	MM	161	0.10	0.08	0.20	0.07	0.00	0.07	0.14	0.07	0.09	0.01	0.08
63H	MM	783	0.30	0.03	0.36	0.03	0.26	0.03	0.34	0.03	0.33	0.00	0.04
63N	MM	509	0.09	0.04	0.21	0.04	0.07	0.04	0.14	0.04	0.12	0.00	0.04
63W	MM	527	0.18	0.05	0.19	0.04	0.19	0.04	0.19	0.04	0.19	0.00	0.04
63Y	MM	238	0.12	0.07	0.18	0.07	0.17	0.07	0.16	0.07	0.14	0.01	0.06
67N	MM	471	0.33	0.04	0.34	0.04	0.32	0.05	0.36	0.04	0.36	0.00	0.05
67T	MM	124	0.62	0.06	0.57	0.07	0.61	0.05	0.62	0.07	0.65	0.01	0.09
67U	MM	278	0.34	0.04	0.38	0.05	0.34	0.04	0.38	0.04	0.35	0.00	0.06
67V	MM	310	0.38	0.06	0.36	0.06	0.35	0.06	0.39	0.06	0.37	0.01	0.06
67Y	MM	241	0.24	0.07	0.30	0.07	0.20	0.06	0.25	0.07	0.27	0.01	0.06
68D	MM	121	0.37	0.06	0.48	0.06	0.40	0.07	0.45	0.06	0.45	0.01	0.09
68G	MM	121	0.34	0.09	0.30	0.09	0.24	0.10	0.33	0.10	0.37	0.01	0.09
15D	OF	406	0.19	0.04	0.24	0.04	0.18	0.05	0.23	0.04	0.20	0.00	0.05
15E	OF	280	0.14	0.06	0.18	0.05	0.15	0.05	0.18	0.05	0.16	0.00	0.06
16B	OF	288	0.25	0.05	0.28	0.05	0.25	0.06	0.28	0.05	0.28	0.01	0.06
16C	OF	118	0.30	0.07	0.21	0.09	0.26	0.06	0.25	0.08	0.25	0.01	0.09
16D	OF	112	0.29	0.07	0.46	0.09	0.35	0.08	0.36	0.08	0.38	0.01	0.09
16H	OF	104	0.43	0.08	0.42	0.08	0.39	0.10	0.47	0.08	0.44	0.01	0.10
16J	OF	119	0.40	0.08	0.31	0.07	0.43	0.07	0.38	0.08	0.43	0.01	0.09
16R	OF	404	0.17	0.04	0.18	0.04	0.18	0.04	0.18	0.04	0.17	0.00	0.05
16S	OF	592	0.24	0.04	0.33	0.04	0.23	0.04	0.28	0.04	0.30	0.00	0.04
64C	OF	2959	0.30	0.02	0.33	0.02	0.23	0.02	0.32	0.02	0.30	0.00	0.02
94B	OF	3322	0.34	0.02	0.34	0.01	0.27	0.02	0.35	0.02	0.35	0.00	0.02
05B	SC	890	0.28	0.04	0.26	0.03	0.22	0.04	0.29	0.04	0.26	0.00	0.03
05C	SC	1971	0.36	0.02	0.38	0.02	0.29	0.02	0.38	0.02	0.38	0.00	0.02
05G	SC	119	0.27	0.09	0.34	0.08	0.27	0.09	0.36	0.09	0.27	0.01	0.09
17C	SC	187	0.24	0.08	0.21	0.07	0.16	0.06	0.23	0.07	0.22	0.01	0.07
72E	SC	562	0.41	0.03	0.52	0.02	0.31	0.04	0.47	0.03	0.49	0.00	0.04
05H	ST	110	0.48	0.06	0.30	0.08	0.57	0.05	0.41	0.06	0.43	0.01	0.10
13E	ST	678	0.29	0.04	0.26	0.03	0.31	0.03	0.29	0.04	0.31	0.00	0.04
54E	ST	270	0.30	0.05	0.32	0.05	0.34	0.05	0.33	0.05	0.36	0.00	0.06
74D	ST	98	0.47	0.08	0.26	0.08	0.41	0.10	0.39	0.09	0.37	0.01	0.10
82C	ST	536	0.38	0.04	0.40	0.03	0.38	0.04	0.40	0.04	0.43	0.00	0.04
91C	ST	233	0.38	0.05	0.34	0.05	0.38	0.05	0.37	0.05	0.39	0.00	0.07
91E	ST	301	0.26	0.05	0.22	0.05	0.30	0.05	0.27	0.05	0.32	0.00	0.06
91P	ST	159	0.19	0.08	0.21	0.08	0.23	0.09	0.22	0.07	0.24	0.01	0.08
91R	ST	145	0.27	0.06	0.18	0.07	0.37	0.07	0.22	0.07	0.26	0.01	0.08
92B	ST	364	0.34	0.05	0.30	0.05	0.30	0.04	0.33	0.05	0.34	0.01	0.05
93H	ST	114	0.30	0.09	0.28	0.08	0.22	0.09	0.33	0.09	0.30	0.01	0.09
95B	ST	3655	0.31	0.01	0.30	0.01	0.27	0.01	0.33	0.01	0.33	0.00	0.02
96B	ST	172	0.50	0.05	0.34	0.06	0.43	0.06	0.43	0.06	0.48	0.01	0.08
98C	ST	186	0.42	0.06	0.22	0.06	0.51	0.05	0.39	0.06	0.36	0.01	0.07

Table A- 19

Adjusted Validities for High School Composites
Combined Criterion

OS	AA	N	HSAA	SE	HSMT	SE	HSOS	SE	HSSS	SE	HSEE	SE	NORM SE
71D	CL	114	0.43	0.18	0.38	0.14	0.39	0.22	0.43	0.18	0.39	0.02	0.09
71L	CL	2783	0.61	0.02	0.50	0.02	0.61	0.02	0.59	0.02	0.58	0.00	0.02
71M	CL	182	0.55	0.06	0.48	0.06	0.57	0.09	0.56	0.07	0.51	0.01	0.07
71N	CL	173	0.69	0.05	0.58	0.05	0.73	0.05	0.66	0.05	0.67	0.01	0.08
73C	CL	478	0.68	0.03	0.59	0.03	0.68	0.03	0.67	0.03	0.65	0.00	0.05
75B	CL	920	0.55	0.03	0.49	0.03	0.54	0.04	0.54	0.03	0.55	0.00	0.03
75C	CL	317	0.61	0.07	0.58	0.06	0.59	0.08	0.62	0.06	0.63	0.01	0.06
75D	CL	801	0.52	0.06	0.46	0.05	0.49	0.06	0.51	0.05	0.53	0.01	0.04
75E	CL	417	0.59	0.06	0.52	0.06	0.58	0.08	0.58	0.06	0.58	0.01	0.05
75F	CL	137	0.65	0.11	0.57	0.09	0.64	0.14	0.65	0.10	0.64	0.01	0.09
76C	CL	1296	0.51	0.04	0.48	0.03	0.49	0.04	0.51	0.03	0.52	0.00	0.03
76P	CL	559	0.62	0.04	0.52	0.04	0.64	0.04	0.62	0.04	0.62	0.00	0.04
76V	CL	214	0.54	0.08	0.46	0.07	0.53	0.09	0.53	0.08	0.52	0.01	0.07
76W	CL	684	0.55	0.07	0.58	0.05	0.51	0.08	0.57	0.06	0.58	0.01	0.04
76X	CL	158	0.33	0.23	0.27	0.21	0.35	0.25	0.31	0.23	0.31	0.02	0.08
76Y	CL	1136	0.42	0.05	0.37	0.04	0.45	0.06	0.41	0.05	0.43	0.00	0.03
11B	CO	5761	0.40	0.02	0.40	0.02	0.39	0.02	0.42	0.02	0.41	0.00	0.01
11C	CO	1482	0.42	0.03	0.43	0.03	0.40	0.03	0.44	0.03	0.43	0.00	0.03
11H	CO	948	0.37	0.04	0.36	0.04	0.36	0.04	0.38	0.04	0.38	0.00	0.03
12B	CO	2411	0.40	0.02	0.45	0.02	0.36	0.02	0.44	0.02	0.43	0.00	0.02
12F	CO	224	0.29	0.09	0.36	0.09	0.27	0.10	0.34	0.09	0.31	0.01	0.07
19D	CO	1035	0.47	0.03	0.46	0.04	0.45	0.03	0.48	0.04	0.47	0.00	0.03
19E	CO	2322	0.53	0.02	0.55	0.02	0.50	0.02	0.56	0.02	0.54	0.00	0.02
19F	CO	83	0.48	0.12	0.52	0.12	0.40	0.14	0.50	0.12	0.49	0.01	0.11
17K	EL	179	0.50	0.08	0.48	0.10	0.50	0.09	0.53	0.08	0.49	0.01	0.07
26Q	EL	142	0.49	0.10	0.47	0.08	0.50	0.09	0.48	0.09	0.54	0.01	0.08
27E	EL	305	0.53	0.06	0.48	0.06	0.56	0.06	0.53	0.06	0.52	0.01	0.06
31J	EL	130	0.58	0.13	0.55	0.12	0.55	0.12	0.61	0.12	0.58	0.01	0.09
31M	EL	1858	0.56	0.03	0.59	0.02	0.52	0.02	0.59	0.02	0.60	0.00	0.02
31N	EL	193	0.35	0.12	0.29	0.11	0.32	0.11	0.33	0.12	0.29	0.01	0.07
31V	EL	650	0.50	0.04	0.53	0.04	0.48	0.04	0.52	0.04	0.54	0.00	0.04
35K	EL	121	0.65	0.09	0.64	0.07	0.64	0.08	0.65	0.08	0.64	0.01	0.09
36C	EL	374	0.25	0.10	0.22	0.09	0.24	0.09	0.23	0.09	0.24	0.01	0.05
36K	EL	1581	0.39	0.04	0.44	0.04	0.35	0.04	0.43	0.04	0.41	0.00	0.03
13B	FA	4778	0.43	0.02	0.46	0.01	0.40	0.02	0.45	0.02	0.45	0.00	0.01
13F	FA	824	0.62	0.03	0.64	0.02	0.62	0.03	0.66	0.03	0.63	0.00	0.03
41C	GM	103	0.33	0.17	0.35	0.15	0.33	0.19	0.33	0.16	0.36	0.02	0.10
43E	GM	99	0.37	0.15	0.35	0.15	0.38	0.16	0.35	0.15	0.41	0.01	0.10
44B	GM	137	0.39	0.15	0.41	0.15	0.34	0.14	0.41	0.15	0.39	0.01	0.09
45K	GM	228	0.47	0.09	0.52	0.08	0.50	0.08	0.52	0.09	0.51	0.01	0.07
51B	GM	195	0.35	0.08	0.38	0.08	0.33	0.09	0.37	0.08	0.35	0.01	0.07
51K	GM	167	0.39	0.12	0.44	0.11	0.39	0.12	0.41	0.12	0.45	0.01	0.08
52D	GM	176	0.38	0.09	0.42	0.09	0.34	0.09	0.43	0.09	0.38	0.01	0.08
55B	GM	366	0.56	0.06	0.56	0.07	0.55	0.06	0.57	0.06	0.60	0.01	0.05
57E	GM	126	0.26	0.28	0.27	0.29	0.33	0.27	0.29	0.29	0.26	0.03	0.09
57H	GM	224	0.43	0.13	0.39	0.15	0.43	0.14	0.44	0.14	0.42	0.02	0.07
62E	GM	230	0.55	0.05	0.61	0.05	0.52	0.06	0.59	0.05	0.58	0.01	0.07
62F	GM	200	0.50	0.09	0.56	0.08	0.46	0.10	0.54	0.09	0.52	0.01	0.07
68J	GM	188	0.54	0.09	0.62	0.08	0.50	0.09	0.59	0.09	0.57	0.01	0.07
68M	GM	132	0.53	0.08	0.60	0.08	0.56	0.08	0.58	0.08	0.57	0.01	0.09

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Adjusted Validities for High School Composites
Combined Criterion (Continued)

MOS	AA	N	HSAA	SE	HSMT	SE	HSOS	SE	HSSS	SE	HSEE	SE	NORM SE
12C	MM	355	0.41	0.06	0.44	0.06	0.41	0.07	0.45	0.06	0.42	0.01	0.05
61B	MM	183	0.72	0.04	0.65	0.05	0.66	0.04	0.72	0.04	0.66	0.00	0.07
61C	MM	136	0.62	0.07	0.65	0.10	0.63	0.06	0.66	0.08	0.66	0.01	0.09
62B	MM	355	0.49	0.05	0.55	0.04	0.48	0.05	0.52	0.05	0.51	0.00	0.05
63B	MM	1818	0.40	0.03	0.48	0.02	0.36	0.03	0.44	0.02	0.43	0.00	0.02
63D	MM	342	0.29	0.11	0.32	0.11	0.29	0.12	0.30	0.11	0.28	0.01	0.05
63G	MM	161	0.28	0.13	0.39	0.13	0.23	0.12	0.33	0.13	0.30	0.01	0.08
63H	MM	783	0.45	0.04	0.51	0.03	0.41	0.04	0.49	0.04	0.48	0.00	0.04
63N	MM	509	0.23	0.07	0.35	0.07	0.21	0.07	0.28	0.07	0.28	0.01	0.04
63W	MM	527	0.28	0.07	0.29	0.08	0.28	0.07	0.29	0.07	0.29	0.01	0.04
63Y	MM	238	0.42	0.13	0.50	0.14	0.42	0.13	0.46	0.13	0.44	0.01	0.06
67N	MM	471	0.58	0.05	0.60	0.05	0.56	0.05	0.61	0.05	0.60	0.00	0.05
67T	MM	124	0.83	0.03	0.80	0.04	0.81	0.02	0.84	0.03	0.85	0.00	0.09
67U	MM	278	0.54	0.07	0.60	0.08	0.52	0.06	0.59	0.07	0.56	0.01	0.06
67V	MM	310	0.60	0.06	0.60	0.07	0.58	0.06	0.62	0.07	0.60	0.01	0.06
67Y	MM	241	0.60	0.08	0.66	0.08	0.54	0.08	0.63	0.08	0.63	0.01	0.06
68D	MM	121	0.60	0.07	0.70	0.07	0.59	0.08	0.67	0.07	0.66	0.01	0.09
68G	MM	121	0.46	0.17	0.43	0.18	0.36	0.17	0.45	0.18	0.48	0.02	0.09
15D	OF	406	0.43	0.07	0.46	0.07	0.41	0.07	0.46	0.07	0.44	0.01	0.05
15E	OF	280	0.38	0.09	0.41	0.09	0.37	0.08	0.42	0.09	0.39	0.01	0.06
16B	OF	288	0.43	0.08	0.45	0.08	0.42	0.08	0.45	0.08	0.46	0.01	0.06
16C	OF	118	0.31	0.15	0.24	0.15	0.31	0.14	0.28	0.15	0.29	0.01	0.09
16D	OF	112	0.52	0.12	0.61	0.09	0.50	0.11	0.55	0.10	0.56	0.01	0.09
16H	OF	104	0.73	0.10	0.72	0.09	0.69	0.10	0.75	0.10	0.73	0.01	0.10
16J	OF	119	0.61	0.12	0.54	0.12	0.62	0.11	0.60	0.13	0.61	0.01	0.09
16R	OF	404	0.34	0.06	0.34	0.05	0.33	0.06	0.35	0.06	0.33	0.01	0.05
16S	OF	592	0.45	0.06	0.52	0.05	0.43	0.06	0.49	0.05	0.50	0.01	0.04
64C	OF	2959	0.46	0.02	0.49	0.02	0.42	0.02	0.48	0.02	0.47	0.00	0.02
94B	OF	3322	0.52	0.02	0.52	0.02	0.47	0.02	0.53	0.02	0.52	0.00	0.02
05B	SC	890	0.44	0.06	0.41	0.05	0.41	0.06	0.44	0.06	0.42	0.01	0.03
05C	SC	1971	0.47	0.03	0.48	0.03	0.44	0.03	0.49	0.03	0.49	0.00	0.02
05G	SC	119	0.64	0.12	0.64	0.09	0.66	0.12	0.69	0.11	0.61	0.01	0.09
17C	SC	187	0.38	0.11	0.34	0.10	0.36	0.12	0.38	0.11	0.35	0.01	0.07
72E	SC	562	0.52	0.05	0.59	0.04	0.47	0.06	0.56	0.05	0.56	0.00	0.04
05H	ST	110	0.76	0.08	0.64	0.06	0.80	0.06	0.73	0.07	0.70	0.01	0.10
13E	ST	678	0.46	0.05	0.44	0.04	0.46	0.04	0.47	0.05	0.47	0.00	0.04
54E	ST	270	0.48	0.09	0.45	0.07	0.49	0.08	0.50	0.08	0.50	0.01	0.06
74D	ST	98	0.76	0.10	0.65	0.09	0.72	0.10	0.74	0.10	0.71	0.01	0.10
82C	ST	536	0.53	0.06	0.54	0.05	0.52	0.06	0.55	0.06	0.56	0.01	0.04
91C	ST	233	0.58	0.05	0.54	0.05	0.57	0.05	0.57	0.06	0.57	0.00	0.07
91E	ST	301	0.54	0.07	0.50	0.06	0.56	0.06	0.55	0.06	0.57	0.01	0.06
91P	ST	159	0.36	0.13	0.36	0.11	0.41	0.14	0.38	0.13	0.39	0.01	0.08
91R	ST	145	0.58	0.11	0.51	0.10	0.63	0.10	0.57	0.11	0.56	0.01	0.08
92B	ST	364	0.45	0.07	0.41	0.07	0.42	0.07	0.44	0.07	0.45	0.01	0.05
93H	ST	114	0.63	0.12	0.57	0.10	0.60	0.12	0.64	0.12	0.60	0.01	0.09
95B	ST	3695	0.58	0.02	0.57	0.02	0.55	0.02	0.59	0.02	0.59	0.00	0.02
96B	ST	172	0.73	0.06	0.61	0.06	0.68	0.06	0.70	0.06	0.70	0.01	0.00
98C	ST	186	0.76	0.09	0.65	0.08	0.79	0.07	0.75	0.09	0.73	0.01	0.07

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Table A - 20

Cumulative Distributions for the Current Composites
Based on a 2% Sample of all FY81/82 Applicants

SCORE	PCTCL	PCTCO	PCTEL	PCTFA	PCTGM	PCTMM	PCTOF	PCTSC	PCTST
40	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.1
41	0.8	0.5	0.4	0.3	0.6	0.7	0.9	0.8	0.6
42	0.8	0.5	0.4	0.3	0.6	0.7	1.0	0.8	0.6
43	0.9	0.5	0.5	0.3	0.6	0.8	1.0	0.8	0.7
44	0.9	0.5	0.5	0.4	0.7	0.8	1.0	0.8	0.7
45	1.0	0.6	0.6	0.4	0.7	0.9	1.1	0.9	0.8
46	1.0	0.6	0.6	0.4	0.7	0.9	1.1	0.9	0.8
47	1.1	0.6	0.6	0.5	0.9	0.9	1.2	1.0	1.0
48	1.2	0.8	0.7	0.5	0.9	1.0	1.2	1.1	1.0
49	1.2	0.8	0.7	0.5	0.9	1.0	1.3	1.2	1.1
50	1.3	0.9	0.8	0.6	1.1	1.1	1.5	1.3	1.3
51	1.5	0.9	1.0	0.7	1.3	1.2	1.5	1.4	1.5
52	1.7	1.0	1.1	0.7	1.3	1.4	1.6	1.6	1.8
53	1.9	1.1	1.4	0.9	1.5	1.6	1.8	1.7	2.1
54	2.0	1.3	1.7	1.0	2.0	2.0	2.3	2.0	2.1
55	2.2	1.4	2.0	1.1	2.3	2.3	2.5	2.3	2.4
56	2.6	1.7	2.3	1.5	2.7	2.7	3.0	2.7	3.1
57	3.1	2.2	3.1	2.0	3.4	3.2	3.5	3.1	4.0
58	3.6	2.4	3.6	2.3	3.8	3.8	4.0	3.5	4.6
59	4.2	2.9	4.8	3.1	4.8	4.4	4.8	4.2	5.1
60	4.5	3.2	5.4	3.5	5.4	4.7	5.6	4.7	5.5
61	5.3	4.0	6.0	3.9	6.7	5.6	6.3	5.2	6.8
62	6.1	5.2	7.3	4.9	8.0	6.5	7.2	5.8	8.0
63	6.5	5.7	8.1	5.2	8.6	7.4	8.1	6.4	8.6
64	7.5	6.2	8.9	5.7	9.4	8.5	8.9	7.3	10.1
65	8.4	7.3	10.5	6.8	10.9	9.6	10.0	8.4	11.6
66	9.3	8.5	11.4	7.9	11.8	10.9	11.1	9.7	13.0
67	10.6	9.2	12.2	8.6	12.7	11.5	12.4	10.5	13.8
68	11.2	10.6	13.1	9.3	14.5	12.8	13.5	11.7	14.6
69	11.9	12.0	14.1	10.1	15.2	14.3	14.7	12.9	16.5
70	13.4	13.4	16.2	11.6	17.1	15.8	16.0	13.8	18.4
71	15.1	15.0	17.1	12.4	19.0	17.5	17.5	15.1	20.1
72	15.9	16.0	18.1	13.1	20.0	18.2	19.0	16.4	21.1
73	17.6	17.0	20.2	14.1	20.9	19.9	20.9	17.9	23.2
74	19.3	18.9	22.2	16.0	23.0	21.9	22.5	19.3	25.1
75	20.9	21.1	24.6	18.3	25.2	23.8	24.4	21.6	27.0
76	23.0	23.3	27.0	20.7	27.4	25.8	27.3	24.2	29.2
77	24.0	25.6	28.1	22.1	27.4	28.2	29.3	26.0	31.4
78	26.2	26.7	30.4	24.4	29.5	29.2	31.5	28.0	32.5
79	27.4	29.0	31.4	27.2	31.7	31.5	33.4	29.7	34.7
80	29.9	31.2	33.9	28.3	33.9	33.6	34.4	31.9	36.8
81	31.2	32.5	36.3	29.6	36.0	36.1	36.7	32.7	38.9
82	32.3	34.8	37.5	31.0	39.1	37.2	39.0	34.9	39.9
83	33.7	36.2	38.8	32.2	40.3	38.3	40.1	36.2	41.0
84	34.9	37.4	40.0	34.8	42.5	40.7	41.1	38.6	43.1
85	37.9	39.8	42.3	36.2	43.6	43.2	43.4	40.7	45.2
86	39.2	40.9	43.3	37.6	45.6	44.4	45.8	41.8	46.1
87	40.7	43.3	44.5	40.2	46.9	46.7	46.8	43.0	47.2
88	42.2	44.6	46.9	41.5	49.1	47.8	47.9	45.3	49.3
89	43.9	47.0	47.9	42.9	50.1	49.0	49.9	46.5	50.2
90	45.3	48.2	48.9	45.3	52.2	51.4	52.1	47.8	51.1
91	46.8	49.5	51.1	46.5	54.2	53.5	54.3	49.1	53.1
92	49.6	51.8	53.3	49.2	56.1	55.9	56.5	51.8	55.2
93	51.3	54.1	55.2	50.5	58.0	58.0	58.7	54.5	57.3
94	52.9	56.2	57.3	53.1	59.8	60.1	59.7	57.1	59.2
95	56.1	58.3	59.3	55.5	60.3	62.3	61.6	58.4	60.9
96	57.7	60.5	60.2	57.5	62.9	64.3	63.9	60.7	62.9
97	59.2	61.6	61.1	58.9	63.8	65.3	64.9	62.1	63.7

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Cumulative Distributions for the Current Composites
Based on a 2% Sample of all FY81/82 Applicants (Continued)

SCORE	PCTCL	PCTCO	PCTEL	PCTFA	PCTGM	PCTMM	PCTOF	PCTSC	PCTST
98	61.1	63.7	62.2	61.3	65.7	67.3	67.1	63.4	65.4
99	62.9	64.7	64.6	63.6	67.6	69.4	69.3	65.8	67.1
100	66.2	66.5	66.5	65.6	69.5	71.3	71.3	68.3	68.9
101	67.5	68.5	68.2	66.6	71.1	72.3	72.3	69.5	70.8
102	69.0	70.5	70.0	63.4	72.8	73.3	73.3	70.7	71.6
103	70.4	72.5	71.5	70.1	74.6	75.4	75.3	73.0	73.1
104	71.9	74.5	73.2	72.0	76.3	77.1	77.2	75.5	74.8
105	73.3	76.2	74.8	73.9	78.0	79.1	78.1	76.6	76.3
106	74.8	77.2	76.3	74.7	78.9	80.0	79.1	77.7	77.1
107	76.0	78.0	77.7	76.4	80.3	81.7	80.9	80.0	78.4
108	77.5	79.0	78.3	77.8	81.1	82.7	81.8	80.9	79.3
109	78.9	80.7	79.9	79.3	82.6	83.3	82.8	81.9	80.8
110	80.2	81.4	81.2	79.9	83.2	84.4	83.7	82.7	81.5
111	81.5	83.1	82.6	81.4	84.0	85.2	84.6	83.7	82.2
112	82.7	83.9	83.9	82.6	84.7	86.9	85.5	84.7	83.6
113	85.1	85.5	85.2	84.0	86.2	87.6	87.3	86.5	84.9
114	86.2	87.1	86.2	85.4	87.5	88.9	88.1	87.4	86.2
115	87.2	87.7	87.3	86.5	88.1	89.6	88.9	88.1	87.3
116	88.2	89.1	88.3	87.7	89.2	91.0	90.5	88.9	88.5
117	89.2	90.4	89.4	88.7	90.2	91.6	91.1	89.7	89.6
118	90.1	91.2	90.7	89.8	91.2	92.8	91.9	91.3	90.8
119	91.0	91.8	91.6	91.0	92.2	93.5	92.5	92.0	91.8
120	91.9	92.5	92.5	91.9	93.1	94.1	93.0	92.7	92.7
121	93.6	93.6	93.8	93.3	94.1	95.0	94.3	93.9	93.6
122	94.2	94.6	94.6	94.2	95.2	95.5	95.0	95.0	94.4
123	95.4	95.7	95.6	95.5	96.2	96.4	96.0	96.0	95.6
124	96.0	96.5	96.7	96.2	96.9	97.2	96.8	97.0	96.4
125	96.5	96.9	97.2	96.9	97.3	97.5	97.6	97.4	97.1
126	97.0	97.5	97.7	97.4	97.8	98.1	97.9	98.0	97.6
127	97.9	98.2	98.3	97.9	98.3	98.6	98.5	98.5	98.2
128	98.3	98.5	98.5	98.4	98.6	98.8	98.7	98.8	98.4
129	98.6	98.8	98.7	98.6	98.8	99.0	98.9	99.0	98.7
130	98.8	99.1	98.9	99.0	99.0	99.1	99.2	99.2	99.0
131	99.0	99.3	99.0	99.2	99.2	99.3	99.4	99.3	99.2
132	99.0	99.3	99.2	99.2	99.3	99.3	99.4	99.3	99.3
133	99.2	99.4	99.4	99.3	99.4	99.5	99.5	99.5	99.4
134	99.2	99.4	99.5	99.4	99.4	99.5	99.5	99.6	99.4
135	99.4	99.5	99.6	99.5	99.5	99.6	99.7	99.6	99.5
136	99.4	99.6	99.6	99.6	99.5	99.6	99.7	99.7	99.6
137	99.5	99.7	99.7	99.6	99.6	99.7	99.8	99.7	99.6
138	99.7	99.7	99.7	99.7	99.7	99.8	99.8	99.8	99.8
139	99.7	99.8	99.7	99.8	99.7	99.8	99.8	99.8	99.8
141	99.7	99.8	99.8	99.9	99.8	99.8	99.8	99.8	99.8
142	99.7	99.8	99.8	99.9	99.8	99.8	99.8	99.8	99.8
143	99.7	99.9	99.8	99.9	99.8	99.9	99.8	99.8	99.8
144	99.8	99.9	99.8	99.9	99.8	99.9	99.9	99.9	99.8
145	99.8	99.9	99.8	99.9	99.9	99.9	99.9	99.9	99.9
147	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9	100.0
148	99.9	99.9	99.9	99.9	99.9	100.0	99.9	99.9	100.0
149	99.9	99.9	99.9	99.9	99.9	100.0	99.9	99.9	100.0
150	99.9	99.9	100.0	99.9	99.9	100.0	100.0	99.9	100.0
151	99.9	99.9	100.0	100.0	100.0	100.0	100.0	99.9	100.0
152	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
153	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
154	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
155	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table A - 21

Conversions from Sum Scores to Composite Scores

ACL SUM	AST SUM	AOP SUM	ACO SUM	COMPOSITE	CUM%
1- 91	1-123	1-117	1-118	40	0.1
92- 93	124-125	118-119	119-121	41	0.6
.	126	.	.	42	0.6
94	.	120	122	43	0.7
.	.	.	123	45	0.8
95	127	121	.	46	0.8
.	128	122	124	48	0.9
96	129	123	125	50	1.1
.	130	.	.	51	1.2
97	.	124	126	52	1.4
98	131	125	127	53	1.6
.	.	126	128	54	1.8
99	132	127	129	55	2.1
100	133-134	128	130-131	56	2.5
101	135	129	132	57	3.1
102	136	130-131	133	58	3.5
.	137	132	134	59	4.3
103	138-139	133	135	60	4.7
104	140	134-135	136-137	61	5.5
105	141	136	138-139	62	6.5
106	142	137	140	63	7.3
107	143-144	138-139	141-142	64	8.1
108	145	140	143	65	9.4
109	146	141-142	144-145	66	10.5
110	147-148	143	146	67	11.4
111	149	144-145	147	68	12.5
112	150	146	148-149	69	13.6
113	151-152	147-148	150	70	15.1
114	153	149-150	151-152	71	16.6
115	154	151	153	72	17.7
116-117	155-156	152-153	154-155	73	19.2
118	157-158	154-155	156-157	74	21.0
119-120	159-160	156-157	158-159	75	23.1
121	161-162	158-159	160-161	76	25.3
122	163	160-161	162	77	26.9
123	164-165	162-163	163-164	78	28.8
124-125	166	164-165	165-166	79	30.7
126	167-168	166-167	167-168	80	32.7
127	169-170	168	169	81	34.4
128	171	169-170	170-171	82	36.2
129	172	171	172	83	37.5
130-131	173-174	172-173	173-174	84	39.3
132	175	174-175	175	85	41.5
133	176-177	176	176-177	86	42.9
134	178	177-178	178	87	44.5
135	179-180	179-180	179-180	88	46.0
136	181	181	181	89	47.5
137-138	182-183	182-183	182-183	90	49.2
139	184-185	184-185	184-185	91	50.9
140-141	186-187	186-187	186-187	92	53.2
142	188-189	188-189	188-189	93	55.2
143-144	190-191	190-192	190-191	94	57.1

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Conversions from Sum Scores to Composite Scores (Continued)

ACL SUM	AST SUM	AOP SUM	ACO SUM	COMPOSITE	CUM%
145	192-193	193-194	192-193	95	59.1
146	194-195	195-196	194-195	96	61.0
147-148	196	197	196	97	62.2
149	197-199	198-199	197-198	98	64.1
150-151	200-201	200-202	199-201	99	66.0
152-153	202-203	203-204	202-203	100	68.0
154	204	205	204	101	69.3
155-156	205-206	206-207	205-206	102	70.7
157-158	207-209	208-210	207-208	103	72.5
159	210-211	211-212	209-210	104	74.3
160-161	212-213	213	211	105	76.0
162	214-215	214-215	212-213	106	77.1
163-164	216	216-217	214-215	107	78.6
165	217-218	218	216	108	79.5
166	219-220	219	217-218	109	80.9
167-168	221	220-221	219	110	81.8
169	222-223	222	220-221	111	82.9
170-171	224-225	223-224	222	112	84.1
172-173	226-228	225-226	223-224	113	85.6
174-175	229-230	227	225-226	114	86.8
176	231-232	228	227	115	87.7
177	233	229-230	228-229	116	88.8
178-179	234-236	231-232	230	117	89.8
180-181	237	233	231-232	118	90.9
182	238-239	234-235	233-234	119	91.8
183-184	240-241	236	235-236	120	92.6
185-186	242-243	237-238	237-238	121	93.8
187-188	244-246	239-240	239-240	122	94.6
189	247-248	241-242	241-243	123	95.7
190-191	249-250	243-244	244-245	124	96.4
192	251	245-246	246	125	97.0
193	252-253	247	247-248	126	97.6
194	254-255	248-249	249-250	127	98.1
195	256	250	251	128	98.4
196	257	251	252	129	98.6
.	258	252	253	130	98.9
197	259	.	254	131	99.1
.	.	253	.	133	99.3
.	260	.	255	134	99.3
198	261	254	256	135	99.5
.	262	255	257	137	99.6
.	.	.	258	140	99.7
199	.	256	259	142	99.7
.	263	257	.	143	99.8
.	.	.	260	144	99.8
.	264	.	.	145	99.9
.	265	258	261	149	99.9
200	.	.	.	151	99.9
.	266	.	.	152	99.9
.	.	.	262	153	100.0
.	.	259	263	154	100.0
201-300	267-300	260-300	264-300	155	100.0

Table A - 22

New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants

	NEWCOMP=ACL									
MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
39.4	40	40	40	40	40	40	40	40	40	40
39.5	42	43	43	46	44	42	41	42	43	41
39.6	42	44	45	50	44	43	41	43	43	43
39.6	43	50	50	52	47	43	42	43	46	46
39.7	43	52	51	54	50	48	42	43	48	50
39.8	47	54	53	56	52	51	46	48	50	52
39.9	50	56	54	57	54	53	50	51	51	53
40.0	53	57	55	58	55	54	53	54	53	55
40.1	55	58	57	58	56	55	54	55	55	56
40.3	57	60	58	59	57	57	56	57	56	57
40.5	58	61	58	60	58	58	57	58	57	58
40.8	59	62	59	62	59	59	58	59	58	60
41.1	61	63	60	63	61	61	60	61	59	61
41.4	62	64	62	65	61	62	61	62	61	62
41.6	63	65	62	66	62	63	62	64	62	63
42.0	65	66	63	67	63	64	63	65	62	64
42.3	65	67	64	68	64	65	64	66	63	65
42.6	67	68	65	69	65	66	65	66	64	66
43.0	68	69	66	70	66	67	66	68	65	67
43.5	69	70	68	71	68	68	67	69	66	68
43.8	70	71	69	73	69	69	68	70	67	69
44.3	71	72	70	74	70	70	69	71	68	70
44.8	72	73	71	75	71	71	70	72	69	71
45.2	73	74	72	75	71	72	71	73	70	72
45.7	74	75	73	76	72	73	72	74	71	73
46.7	76	76	74	77	75	75	74	75	72	74
47.2	76	77	75	78	75	76	74	76	73	75
48.3	78	78	76	79	78	77	76	77	75	76
48.9	79	79	77	80	78	78	77	78	76	77
49.5	80	80	78	81	79	79	77	79	76	78
50.1	81	81	79	82	80	80	78	80	77	79
51.4	83	83	81	84	81	82	79	81	79	80
52.0	84	84	81	85	82	83	80	82	80	81
52.7	85	85	82	86	83	84	81	83	80	82
53.4	86	86	83	87	84	85	82	84	81	83
54.1	87	87	84	88	85	86	83	85	82	84
55.5	89	88	86	90	87	88	85	87	84	85
56.2	90	89	87	91	88	89	86	88	85	86
56.9	91	90	88	91	89	90	87	89	86	87
57.6	92	91	89	92	90	91	88	90	87	88
58.4	93	92	90	93	91	92	89	91	88	89
59.1	94	93	91	94	92	93	90	92	89	90
60.6	95	94	93	95	93	94	91	93	92	91
61.5	96	95	93	96	94	95	92	94	92	92

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

------------------------------ NEWCOMP=ACL ------------------------------

MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
62.8	98	96	95	97	96	97	93	95	94	93
63.6	99	97	95	98	97	98	94	96	94	94
65.1	100	99	98	99	99	99	96	97	96	95
65.8	101	100	99	100	100	100	97	98	97	96
66.6	101	101	99	100	100	101	98	99	98	97
68.1	103	102	101	102	102	103	99	100	99	98
68.7	104	103	101	102	103	104	100	101	100	99
70.1	106	104	103	104	104	105	101	103	101	100
71.3	107	105	104	105	105	106	103	104	103	101
71.9	108	106	104	105	106	107	103	104	104	102
73.2	109	107	106	107	108	108	105	105	105	103
74.5	111	109	107	108	109	111	106	107	107	104
75.2	112	110	108	109	110	111	107	107	107	105
76.4	113	111	109	110	113	113	109	108	109	106
77.0	114	112	110	111	113	114	110	109	110	107
78.2	115	114	111	112	115	115	111	111	112	108
78.7	115	114	112	113	115	116	112	112	113	109
79.3	116	115	112	113	116	117	113	113	113	110
80.5	118	116	114	115	118	118	114	114	115	111
81.0	118	117	114	115	118	119	115	115	115	112
82.2	120	118	116	116	119	121	116	117	116	113
83.0	121	119	117	117	120	122	117	118	117	114
83.9	122	121	118	119	121	123	119	119	119	115
84.4	123	122	119	119	122	123	120	120	119	116
84.9	123	122	119	120	123	124	121	121	120	117
85.9	124	123	121	121	123	125	122	122	121	118
86.9	126	124	122	122	125	125	123	123	122	119
87.5	127	125	123	123	126	126	124	124	123	120
88.2	128	126	124	123	128	127	124	124	124	121
89.2	130	127	125	124	130	128	125	125	125	122
90.0	132	128	127	126	132	130	126	127	127	123
90.6	133	128	128	126	137	133	127	128	128	124
91.5	136	130	131	128	138	140	128	129	131	125
91.8	137	131	132	128	140	142	129	129	132	126
92.5	137	133	155	129	142	144	131	130	136	127
93.0	143	135	155	130	155	144	133	133	145	128
93.7	148	138	155	134	155	145	135	134	155	129
94.3	148	152	155	144	155	145	137	135	155	131
94.5	149	152	155	145	155	145	137	143	155	135
94.8	149	153	155	147	155	148	137	144	155	142
95.0	149	153	155	148	155	149	140	144	155	151
94.1	149	153	155	148	155	149	140	144	155	155

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

---------- NEWCOMP=AST ----------										
MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
39.4	40	40	40	40	40	40	40	40	40	40
39.5	42	43	43	46	44	42	41	42	43	41
39.6	43	47	47	50	44	43	42	43	43	42
39.6	43	49	50	52	47	43	42	43	45	46
39.7	43	51	51	53	50	47	42	43	48	48
39.7	45	53	52	54	50	50	42	46	49	50
39.8	48	54	53	56	52	51	47	49	50	51
39.9	50	55	54	57	54	52	49	50	51	53
40.0	52	57	55	57	55	54	52	53	52	55
40.1	54	58	56	58	55	55	54	55	55	56
40.3	57	60	58	59	57	57	56	57	56	57
40.5	58	61	58	60	58	58	57	58	57	58
40.6	59	61	59	61	59	58	58	59	57	59
40.8	59	62	59	62	60	59	59	59	58	60
41.2	62	63	61	64	61	62	60	62	60	61
41.4	62	64	62	65	62	62	61	63	61	62
41.6	63	65	62	66	62	63	62	64	62	63
41.9	64	66	63	66	63	64	63	65	62	64
42.4	66	68	65	68	65	65	64	66	64	65
42.7	67	68	66	70	66	66	65	67	65	66
43.1	68	69	66	70	66	67	66	68	65	67
43.6	70	70	68	72	68	69	67	69	66	68
43.9	71	71	69	73	69	69	68	70	67	69
44.2	71	72	70	74	69	70	69	71	68	70
44.9	72	73	71	75	71	71	70	72	70	71
45.3	73	74	72	75	71	72	71	73	70	72
45.6	74	75	73	76	72	73	72	74	71	73
46.5	75	76	74	77	74	74	73	75	72	74
47.3	76	77	75	78	75	76	75	76	73	75
48.1	78	78	76	79	77	77	76	77	75	76
49.0	79	80	77	80	79	78	77	78	76	77
49.4	80	80	78	81	79	79	77	79	76	78
50.4	81	81	79	83	80	80	78	80	77	79
50.9	82	82	80	84	81	81	79	81	78	80
51.9	84	83	81	85	82	82	80	82	79	81
52.9	85	85	82	86	83	84	82	84	81	82
53.4	86	86	83	87	84	85	82	84	81	83
53.9	87	86	84	88	85	85	83	85	82	84
55.0	88	88	85	89	86	87	85	86	84	85
55.6	89	89	86	90	87	88	85	87	84	86
56.7	91	90	88	91	89	90	86	88	86	87
57.2	92	91	89	92	83	91	87	89	86	88
58.3	93	92	90	93	91	92	89	91	88	89
58.8	93	93	91	93	91	92	90	92	89	90
59.9	95	94	92	94	92	94	91	93	91	91
61.1	96	95	93	95	94	95	92	94	92	92
62.1	97	96	94	96	95	96	93	94	93	93

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

---------------------------- NEWCOMP=AST ----------------------------

MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
63.2	98	97	95	97	96	97	94	95	94	94
64.2	99	98	96	98	98	99	95	96	95	95
65.3	100	99	98	99	99	100	96	98	96	96
66.5	101	101	99	100	100	101	98	99	97	97
67.0	102	101	100	100	101	101	98	100	98	98
68.5	104	103	101	102	102	104	99	101	100	99
69.6	105	104	102	103	104	105	100	102	101	100
70.6	106	105	103	104	105	106	102	103	102	101
71.1	107	105	104	105	105	106	103	104	103	102
72.1	108	106	105	105	106	107	104	104	104	103
73.5	110	108	106	107	108	109	105	105	105	104
74.5	111	109	107	108	109	111	106	107	107	105
75.5	112	110	108	109	111	112	108	108	108	106
76.5	113	112	110	110	113	113	109	108	109	107
77.0	114	112	110	111	113	114	110	109	110	108
77.9	114	113	111	112	114	115	111	111	111	109
78.8	115	114	112	113	116	116	112	112	113	110
79.3	116	115	112	113	116	117	113	113	113	111
80.2	117	116	113	114	117	118	114	114	114	112
81.1	118	117	114	115	118	119	115	115	115	113
82.3	120	118	116	117	119	121	117	117	117	114
83.1	121	119	117	118	120	122	117	118	118	115
83.7	122	121	118	118	121	123	118	119	118	116
84.1	122	121	118	119	122	123	119	119	119	117
85.3	124	123	120	120	123	124	121	121	120	118
85.7	124	123	120	121	123	124	122	122	121	119
86.6	125	124	121	122	124	125	122	122	122	120
87.2	127	124	122	122	125	126	123	123	123	121
88.1	128	125	124	123	128	127	124	124	124	122
89.2	130	127	125	125	130	128	125	125	125	123
89.8	132	128	126	125	132	129	126	126	127	124
90.2	132	128	127	126	133	130	126	127	127	125
90.6	133	128	128	126	137	132	126	128	128	126
91.3	135	130	129	128	138	138	128	129	130	127
91.8	137	131	132	128	140	142	129	129	132	128
92.1	137	132	137	129	141	143	129	130	133	129
92.6	138	133	155	129	143	144	131	131	144	130
92.9	138	135	155	130	155	144	133	133	145	131
93.3	143	136	155	131	155	144	134	133	150	134
93.6	144	138	155	133	155	145	135	134	155	135
93.4	144	138	155	133	155	145	135	134	155	137
93.5	144	138	155	133	155	145	135	134	155	143
93.7	148	138	155	134	155	145	135	134	155	145
94.3	148	152	155	144	155	145	137	135	155	149
95.1	151	153	155	149	155	149	140	144	155	152
94.0	151	153	155	149	155	149	140	144	155	155

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

				NEWCOMP= AOP						
MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
39.4	40	40	40	40	40	40	40	40	40	40
39.5	42	43	43	46	44	42	41	42	43	41
39.6	43	48	48	50	46	43	42	43	43	43
39.6	43	49	50	52	47	43	42	43	45	46
39.7	43	52	51	54	50	47	42	43	48	48
39.7	46	53	52	55	50	50	44	47	49	50
39.8	48	54	53	56	53	51	47	49	50	52
39.9	50	56	54	57	54	53	50	51	51	53
40.0	52	57	55	57	55	54	53	53	52	54
40.1	54	58	56	58	55	55	54	55	55	55
40.2	56	58	57	59	56	56	55	56	55	56
40.3	57	59	57	59	57	57	55	56	56	57
40.4	57	60	58	60	58	57	57	57	57	58
40.7	59	62	59	62	59	59	58	59	58	59
40.9	60	62	60	63	60	60	59	60	59	60
41.1	61	63	60	63	61	61	60	61	59	61
41.4	62	65	62	65	62	62	61	63	61	62
41.6	63	65	62	66	62	63	62	64	62	63
41.8	64	66	63	66	63	64	63	64	62	64
42.3	66	67	65	68	64	65	64	56	64	65
42.6	67	68	65	69	65	66	65	66	64	66
43.1	68	69	66	71	67	67	66	68	65	67
43.3	69	70	67	71	67	68	67	68	66	68
43.9	71	71	69	73	69	69	68	70	67	69
44.2	71	71	70	74	69	70	69	71	68	70
44.7	72	73	71	75	71	71	70	72	69	71
45.3	73	74	72	76	72	72	71	73	70	72
45.7	74	75	73	76	72	73	72	74	71	73
46.4	75	76	74	77	74	74	73	75	72	74
47.1	76	77	75	78	75	75	74	75	73	75
47.7	77	77	76	79	76	76	75	76	74	76
48.5	78	79	76	80	78	77	76	77	75	77
49.2	80	80	77	81	79	79	77	78	76	78
50.0	81	81	79	82	80	80	78	79	77	79
50.8	82	82	80	84	81	81	79	80	78	80
51.6	84	83	81	85	82	82	80	82	79	81
52.0	84	84	81	85	82	82	80	82	80	82
52.9	85	85	82	86	83	84	82	84	81	83
53.4	86	86	83	87	84	85	82	84	81	84
54.2	87	87	84	88	85	86	83	85	82	85
55.1	99	88	86	89	86	87	85	86	84	86
55.6	89	89	86	90	87	88	85	87	85	87
56.5	91	90	88	91	88	90	86	88	85	88
57.4	92	91	89	92	90	91	87	89	87	89
57.9	92	92	89	92	90	91	88	90	88	90
58.8	93	93	91	93	91	92	90	91	89	91
59.7	94	94	92	94	92	93	90	92	90	92

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

NEWCOMP=AOP										
MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
60.6	95	94	93	95	93	94	91	93	92	93
61.6	96	95	94	96	94	95	92	94	93	94
62.8	98	96	95	97	96	97	93	95	94	95
63.8	99	98	96	98	97	98	95	96	95	96
64.8	100	99	97	99	99	99	96	97	96	97
65.2	100	99	98	99	99	100	96	97	96	98
66.1	101	101	99	100	100	100	97	99	97	99
67.5	102	102	100	101	101	102	99	100	99	100
68.5	104	103	101	102	103	104	99	101	100	101
69.0	104	103	102	103	103	104	100	101	100	102
70.0	106	104	102	104	104	105	101	102	101	103
71.4	107	105	104	105	105	106	103	104	103	104
72.4	108	106	105	106	106	108	104	104	104	105
72.9	109	107	105	106	107	108	104	105	105	106
73.8	110	108	106	107	109	110	105	106	106	107
74.9	112	110	107	108	110	111	107	107	107	108
75.2	112	110	108	109	110	112	107	107	108	109
75.6	112	110	108	109	111	112	108	108	108	110
76.6	113	112	110	110	113	113	109	109	109	111
77.1	114	112	110	111	114	114	110	109	110	112
78.1	114	114	111	112	115	115	111	111	112	113
79.2	116	114	112	113	116	117	113	113	113	114
79.8	117	115	113	114	117	117	113	113	114	115
80.3	117	116	113	114	117	118	114	114	114	116
81.6	119	117	115	116	119	119	116	116	116	117
82.5	120	118	116	117	120	121	117	117	117	118
82.9	121	119	117	117	120	122	117	118	117	119
84.1	122	121	118	119	122	123	119	119	119	120
84.5	123	122	119	119	122	124	120	120	119	121
85.4	124	123	120	121	123	124	121	121	120	122
86.1	124	124	121	121	124	125	122	122	121	123
86.9	126	124	122	122	125	125	123	123	122	124
87.7	127	125	123	123	126	127	124	124	124	125
88.9	130	127	125	124	130	128	125	125	125	126
89.3	130	127	125	125	130	128	125	125	126	127
90.2	132	128	127	126	133	130	126	127	127	128
90.5	133	128	128	126	137	131	126	128	128	129
90.4	133	128	128	126	137	131	126	128	128	130
90.6	133	128	128	126	137	132	127	128	128	133
91.0	134	129	129	127	137	137	127	128	129	135
91.8	136	130	132	128	140	142	129	129	132	137
92.5	137	133	155	129	142	144	131	130	136	142
92.7	138	134	155	130	143	144	132	132	144	143
94.0	148	139	155	135	155	145	136	134	155	149
94.4	149	152	155	145	155	145	137	143	155	154
90.3	149	152	155	145	155	145	137	143	155	155

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

NEWCOMP=ACO										
MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
39.4	40	40	40	40	40	40	40	40	40	40
39.5	42	43	43	44	43	42	41	42	42	41
39.6	43	47	47	50	44	43	42	43	43	43
39.6	43	49	50	52	47	43	42	43	45	45
39.7	43	50	51	53	49	45	42	43	47	48
39.7	45	53	52	54	50	50	42	46	49	50
39.8	47	54	53	56	52	51	47	48	50	52
39.8	50	55	54	56	53	52	49	50	51	53
39.9	51	56	54	57	54	53	51	52	52	54
40.0	53	57	55	58	55	54	53	54	53	55
40.1	55	58	56	58	56	55	54	55	55	56
40.4	57	60	58	60	57	57	56	57	56	57
40.5	58	61	58	60	58	58	57	58	57	58
40.6	58	61	59	61	59	58	58	59	57	59
40.8	59	62	59	62	59	59	59	59	58	60
41.0	61	63	60	63	60	61	59	60	59	61
41.3	62	64	62	65	61	62	61	62	61	62
41.7	64	66	63	66	62	63	62	64	62	63
42.0	65	66	63	67	63	64	63	65	62	64
42.4	66	67	65	68	65	65	64	66	64	65
42.6	67	68	65	69	65	66	65	66	64	66
43.2	68	69	67	71	67	67	66	68	65	67
43.4	69	70	67	71	67	68	67	69	66	68
43.7	70	70	68	72	68	69	68	69	66	69
44.3	71	72	70	74	69	70	69	71	68	70
44.6	72	72	70	75	70	71	70	71	69	71
45.2	73	74	72	75	71	72	71	73	70	72
45.6	74	75	73	76	72	73	72	74	71	73
46.3	75	76	74	77	74	74	73	75	72	74
47.0	76	77	75	78	75	75	74	76	73	75
47.7	77	77	76	79	76	76	75	76	74	76
48.5	79	79	76	80	78	77	76	77	75	77
48.9	79	79	77	80	78	78	77	78	76	78
49.7	80	80	78	82	79	80	77	79	77	79
50.5	81	81	79	83	80	81	78	80	77	80
51.4	83	83	81	84	82	82	79	81	79	81
51.8	84	83	81	85	82	82	80	82	79	82
52.8	85	85	82	86	83	84	81	83	80	83
53.2	86	86	83	87	84	85	82	84	81	84
54.2	87	87	84	88	85	86	83	85	82	85
54.6	88	87	85	88	86	86	84	85	83	86
55.5	89	89	86	90	87	88	85	87	84	87
56.1	90	89	87	90	88	89	86	88	85	88
57.0	91	90	88	91	89	90	87	89	86	89
57.5	92	91	89	92	90	91	87	89	87	90
58.5	93	92	91	93	91	92	89	91	88	91
59.6	94	93	92	94	92	93	90	92	90	92
60.5	95	94	93	95	93	94	91	93	91	93
61.4	96	95	93	96	94	95	92	94	92	94

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New and Current Composite Scores
Maintaining Constant AFQT Means for Eligibles
Based on a 2% Sample of FY81/82 Applicants (Continued)

NEWCOMP=ACO

MNAFQT	CL	CO	EL	FA	GM	MM	OF	SC	ST	NEWSCORE
62.4	97	96	94	96	96	96	93	94	93	95
63.4	98	97	95	97	97	97	94	95	94	96
64.4	99	98	96	98	98	99	95	97	95	97
64.8	100	99	97	99	99	99	96	97	96	98
65.8	100	100	98	99	100	100	97	98	96	99
67.1	102	101	100	101	101	101	98	100	98	100
68.0	103	102	101	102	102	103	99	100	99	101
68.6	104	103	101	102	103	104	100	101	100	102
69.6	105	104	102	103	104	105	100	102	101	103
70.8	107	105	103	104	105	106	102	103	102	104
72.0	108	106	104	105	106	107	103	104	104	105
72.5	109	106	105	106	107	108	104	104	104	106
73.6	110	108	106	107	108	109	105	105	105	107
74.6	111	109	107	108	109	111	106	107	107	108
75.0	112	110	107	108	110	111	107	107	107	109
75.8	113	111	109	109	111	112	108	108	108	110
76.3	113	111	109	110	112	113	109	108	109	111
77.3	114	113	110	111	114	114	110	110	110	112
77.7	114	113	111	112	114	115	111	110	111	113
78.8	115	114	112	113	116	116	112	112	113	114
79.8	117	115	113	114	117	117	[illegible]	113	114	115
80.4	118	116	114	115	117	118	114	114	114	116
81.3	119	117	115	116	119	119	116	115	116	117
82.0	120	118	116	116	119	120	116	116	116	118
82.8	121	119	117	117	120	121	117	118	117	119
83.8	122	121	118	119	121	123	119	119	118	120
84.7	123	122	119	120	122	124	120	120	119	121
85.3	124	123	120	121	123	124	121	121	120	122
86.2	125	124	121	121	124	125	122	122	121	123
87.3	127	124	122	122	125	126	123	123	123	124
88.0	128	125	124	123	127	127	124	124	124	125
88.5	129	126	124	124	129	127	124	124	124	126
89.1	130	127	125	124	130	128	125	125	125	127
89.7	131	127	126	125	131	129	126	126	126	128
90.2	132	128	127	126	133	130	126	127	127	129
90.6	133	128	128	126	137	132	127	128	128	130
91.1	134	129	129	127	137	138	127	128	129	131
91.7	136	130	131	128	138	142	128	129	131	134
91.7	136	130	131	128	138	142	128	129	131	135
92.2	137	132	137	129	141	143	130	130	133	137
92.7	138	134	155	130	143	[illegible]	132	132	[illegible]	140
93.3	144	136	155	131	155	144	134	133	150	142
93.3	144	136	155	131	155	144	134	133	150	144
93.0	144	136	155	131	155	144	134	133	150	149
92.3	144	136	155	131	155	144	134	133	150	.153
92.3	144	136	155	131	155	144	134	133	150	154
94.0	148	139	155	135	155	145	136	134	155	155

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Aptitude Area Composite Cutoffs by MOS

AA	MOS	CUTOFF	AA	MOS	CUTOFF	AA	MOS	CUTOFF	AA	MOS	CUTOFF	AA	MOS	CUTOFF	AA	MOS	CUTOFF
CL	71C	95	EL	24K	95	EL	34Y	95	GM	51G	95	MM	67U	100	ST	74D	100
CL	71D	110	EL	24L	95	EL	35B	90	GM	51K	85	MM	67V	100	ST	74F	100
CL	71G	95	EL	24M	105	EL	35E	95	GM	51M	85	MM	67Y	100	ST	81B	95
CL	71L	95	EL	24N	105	EL	35F	95	GM	51N	85	MM	68B	100	ST	81C	85
CL	71M	95	EL	24P	105	EL	35G	110	GM	51R	95	MM	68D	100	ST	81E	95
CL	71N	95	EL	24Q	105	EL	35H	120	GM	52C	95	MM	68F	100	ST	82B	95
CL	73C	95	EL	24U	105	EL	35K	95	GM	52D	95	MM	68G	100	ST	82C	95
CL	74B	95	EL	25J	85	EL	35L	100	GM	53B	90	MM	68H	100	ST	82D	95
CL	75B	95	EL	25L	95	EL	35M	100	GM	54C	95	OF	13M	100	ST	83E	85
CL	75C	95	EL	26B	95	EL	35R	100	GM	55B	85	OF	15D	95	ST	83F	85
CL	75D	95	EL	26C	95	EL	36C	90	GM	55D	100	OF	15E	95	ST	84B	95
CL	75E	95	EL	26D	85	EL	36D	90	GM	55G	95	OF	16B	85	ST	84C	85
CL	75F	105	EL	26E	110	EL	36E	90	GM	57E	80	OF	16C	95	ST	84F	95
CL	76C	95	EL	26H	95	EL	36H	100	GM	57F	85	OF	16D	85	ST	91B	95
CL	76J	95	EL	26K	110	EL	36K	90	GM	57H	85	OF	16E	95	ST	91C	95
CL	76P	90	EL	26L	100	EL	36L	110	GM	61F	85	OF	16F	85	ST	91D	95
CL	76V	90	EL	26M	95	EL	41E	95	GM	62E	85	OF	16H	95	ST	91E	95
CL	76W	90	EL	26N	95	EL	41G	85	GM	62F	85	OF	16J	95	ST	91F	95
CL	76X	85	EL	26Q	95	EL	45G	95	GM	62G	90	OF	16P	85	ST	91G	105
CL	76Y	95	EL	26R	95	EL	46N	95	GM	62H	85	OF	16R	85	ST	91H	95
CO	11B	85	EL	26T	95	EL	52G	95	GM	62J	95	OF	16S	85	ST	91J	95
CO	11C	85	EL	26V	95	EL	93F	95	GM	68J	95	OF	64C	85	ST	91L	95
CO	11H	85	EL	25Y	100	FA	13B	85	GM	68M	90	OF	94B	85	ST	91N	95
CO	11M	85	EL	27B	95	FA	13F	100	MM	12C	85	OF	94F	95	ST	91P	100
CO	11X	85	EL	27E	95	FA	15J	100	MM	33S	95	SC	05B	90	ST	91Q	95
CO	12B	85	EL	27F	95	GM	41B	95	MM	45E	95	SC	05C	95	ST	91R	100
CO	12E	95	EL	27G	95	GM	41C	90	MM	45N	95	SC	05G	95	ST	91S	95
CO	12F	85	EL	27H	95	GM	41J	85	MM	61B	85	SC	13R	100	ST	91T	95
CO	19A	85	EL	27N	95	GM	41K	85	MM	61C	100	SC	17B	100	ST	91U	95
CO	19D	85	EL	31E	110	GM	42C	95	MM	62B	85	SC	17C	95	ST	91V	95
CO	19E	85	EL	31J	110	GM	42D	95	MM	63B	85	SC	17L	95	ST	91Y	95
CO	19F	85	EL	31M	95	GM	42E	95	MM	63D	100	SC	72E	90	ST	92B	95
CO	19K	85	EL	31N	95	GM	43E	85	MM	63E	95	SC	72G	90	ST	92C	95
EL	17K	85	EL	31S	115	GM	43M	80	MM	63G	100	SC	96H	95	ST	92D	95
EL	17M	85	EL	31T	105	GM	44B	85	MM	63H	85	ST	03C	85	ST	93E	95
EL	21G	95	EL	31V	95	GM	44E	95	MM	63J	85	ST	05D	95	ST	93H	100
EL	21L	[illegible]	EL	32D	95	GM	45B	85	MM	63N	95	ST	05H	95	ST	93J	100
EL	22L	95	EL	32F	110	GM	45D	95	MM	63S	100	ST	05K	95	ST	95B	100
EL	22N	95	EL	32G	100	GM	45G	95	MM	63T	100	ST	13C	95	ST	95C	85
EL	23N	95	EL	32H	95	GM	45K	95	MM	63W	85	ST	13E	95	ST	96B	95
EL	23U	95	EL	34B	95	GM	45L	95	MM	63Y	100	ST	54E	90	ST	96C	95
EL	24C	105	EL	34E	110	GM	45R	95	MM	67G	100	ST	71P	95	ST	96D	95
EL	24E	105	EL	34F	110	GM	45T	90	MM	67H	100	ST	71Q	105	ST	97B	105
EL	24G	105	EL	34G	95	GM	51B	85	MM	67N	100	ST	71R	105	ST	98C	105
EL	24H	95	EL	34H	110	GM	51C	85	MM	67T	100	ST	73D	105	ST	98J	105

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ASVAB Subtest Means by Training Criterion Cell

TCELL	N	GS	AR	VE	NO	CS	AS	MK	MC	EI
					Subtest					
05B2A113	520	48.65	50.34	51.39	54.43	55.37	49.75	49.25	47.88	48.74
05C2D113	616	50.40	52.30	53.22	55.30	55.66	51.28	50.96	49.64	50.42
11BIN809	978	50.15	51.44	50.59	50.86	51.49	52.14	49.53	50.92	50.51
11CIN809	579	50.75	52.49	51.08	51.68	52.39	52.29	50.53	51.97	50.97
11HIN809	446	51.28	52.29	52.04	51.73	52.08	53.02	50.56	51.32	51.92
11OIN809	325	50.08	52.10	50.30	52.41	52.54	51.15	49.64	50.89	50.26
12BAB807	143	47.69	50.34	49.13	48.83	50.71	52.71	47.97	49.73	49.64
12FAF807	225	44.08	47.86	44.37	47.79	50.56	49.23	45.44	47.95	47.02
13B3B810	1080	43.69	48.70	45.13	49.83	50.70	43.18	48.52	45.77	44.88
13E3E810	487	54.58	56.21	54.94	52.91	53.01	53.26	55.87	54.29	53.63
13F3F810	679	51.39	56.03	52.13	53.22	53.97	52.84	53.90	54.14	52.36
15D5D810	295	52.44	52.89	53.39	52.90	51.92	54.71	51.24	53.30	52.54
15E5E810	283	52.48	52.44	52.81	53.31	51.57	54.84	51.27	53.82	53.11
16BBA811	166	46.56	46.95	48.74	50.04	48.23	48.30	46.12	46.63	47.56
16BBC811	131	56.54	58.11	55.82	53.98	52.74	55.32	56.75	54.89	56.19
16CCA811	118	52.64	52.04	53.30	52.61	52.76	54.63	51.14	53.42	53.15
16DDB811	112	56.24	57.25	55.33	53.39	53.02	54.31	55.76	54.63	56.61
16EEB811	139	56.22	58.67	55.55	53.04	53.19	55.37	58.33	55.53	56.99
16HHB811	105	53.86	56.35	55.30	54.67	53.73	54.46	55.03	54.50	55.46
16JJA811	119	52.35	52.68	53.57	51.70	49.69	53.76	50.71	53.98	52.98
16PPA811	115	46.51	47.23	48.80	52.16	48.81	47.78	46.26	47.00	48.41
16RRA811	420	47.24	46.96	48.29	50.11	47.21	49.31	46.11	47.89	48.05
16SSA811	597	46.45	47.09	47.49	50.53	48.72	49.58	46.42	48.48	47.74
17C7C061	188	45.35	48.36	49.31	56.20	59.83	45.71	48.73	44.52	45.60
17KGA301	136	52.96	52.94	52.96	53.55	53.94	54.15	50.89	52.13	52.49
19D9D804	215	49.77	51.40	50.20	50.77	51.83	51.95	49.40	50.67	49.87
19E9E804	171	49.58	51.23	49.97	50.61	51.03	51.71	48.12	50.80	50.65
19F9F804	129	49.17	50.70	49.79	50.95	50.93	51.68	47.96	50.39	50.29
27E7E093	185	52.26	53.79	50.99	50.38	50.26	50.83	51.94	50.21	52.48
31M4D113	604	51.64	53.30	51.67	50.95	51.36	48.29	51.87	48.97	51.10
31N4C113	195	51.86	53.19	51.51	50.99	51.27	48.81	51.60	49.36	51.72
31V1V061	458	52.24	53.62	51.26	49.94	50.31	51.39	52.04	51.79	53.41
36CAA113	377	47.00	48.91	46.34	48.73	48.19	43.63	48.35	44.91	47.72
36KAC113	664	46.08	48.02	45.21	47.55	46.84	44.43	47.54	44.41	47.32
41CG7091	106	47.56	45.70	45.77	46.32	46.50	47.70	46.67	45.42	48.65
44BJ1091	137	50.28	49.58	49.09	49.31	49.07	51.57	48.20	50.24	50.96
45KK8091	101	51.47	49.90	50.09	47.83	49.11	56.01	49.45	51.33	53.75
45KK9091	130	53.01	50.98	52.11	48.26	48.85	55.48	49.42	52.44	53.11
51KBK807	168	46.58	44.75	45.51	45.20	46.44	47.83	45.43	44.57	48.02
54CSS031	183	52.57	50.72	51.63	48.71	48.72	54.34	49.70	50.77	53.63
54ESA031	272	51.33	50.91	52.66	49.46	49.68	47.15	50.77	48.85	48.76
55B5B093	236	47.28	43.85	47.34	44.56	46.45	45.97	45.75	42.70	47.39
57EPE101	126	43.37	41.98	44.34	45.45	45.93	40.29	44.68	40.00	44.02
57HG1551	224	46.58	44.05	45.92	45.40	46.84	45.20	45.83	42.56	47.17

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ASVAB Subtest Means by Training Criterion Cell (Continued)

		Subtest								
TCELL	N	GS	AR	VE	NO	CS	AS	MK	MC	EI
61BG6551	186	45.14	46.86	46.05	52.20	49.87	47.89	46.29	46.95	48.78
61CH1551	139	52.36	52.65	51.82	51.74	51.68	56.83	49.86	54.68	54.75
62BCB807	264	47.41	47.83	46.75	48.98	49.09	52.77	46.95	50.61	50.99
62ECE807	134	48.60	47.78	47.86	47.72	48.37	53.30	47.87	50.14	51.08
62FCF807	149	47.68	45.52	46.04	46.93	47.17	50.52	46.44	47.79	48.36
63B3B803	555	46.27	47.52	46.42	50.25	49.34	51.76	46.62	48.83	49.63
63B3B805	382	46.04	47.09	46.02	51.23	49.74	50.63	46.49	48.30	49.81
63DSA171	349	50.05	51.01	49.84	50.52	50.37	57.13	48.45	54.23	53.45
63GM7091	161	48.91	50.36	49.71	50.78	50.47	55.70	48.19	54.03	53.62
63HH1091	708	46.94	48.18	47.25	49.64	49.32	53.55	47.20	50.21	50.90
63NTS171	514	49.20	49.43	48.60	49.69	49.40	55.25	47.93	51.60	51.74
63TFI171	573	50.88	51.85	50.37	51.79	50.67	58.02	49.29	55.40	54.50
63WW1091	481	45.01	47.23	45.76	50.65	49.38	50.85	46.42	49.08	49.31
63YTV171	177	51.73	52.02	51.28	51.67	51.39	58.47	49.70	54.81	55.05
64CEC807	203	46.99	49.06	49.10	50.51	50.02	51.76	47.14	49.16	49.26
64C4C803	561	46.01	47.42	47.23	51.02	50.33	50.45	46.98	48.67	47.76
67N65011	164	55.06	55.06	54.16	52.96	52.52	58.04	53.80	57.20	56.62
67TL6551	125	55.50	54.40	54.62	52.32	52.54	58.90	54.11	58.26	56.72
67UP1551	211	55.49	55.38	55.00	52.99	53.24	58.27	54.65	57.06	56.14
67V18011	195	53.23	54.67	53.28	53.65	53.66	56.87	53.12	55.99	55.73
67YS1551	144	54.72	55.35	54.06	53.56	53.22	57.75	54.99	56.96	56.33
68DT1551	122	55.07	55.00	54.60	52.93	52.38	58.13	53.84	56.55	56.93
68JW6551	121	54.02	53.51	53.74	51.37	51.01	55.09	52.59	53.83	54.69
68MW8551	134	49.52	47.18	48.68	47.54	49.10	52.78	47.76	48.65	51.50
71NL1551	176	41.90	44.70	45.38	55.84	56.63	40.20	45.98	40.88	42.25
72E3G113	214	47.24	50.15	51.48	56.21	57.36	43.47	49.51	44.42	44.58
73C5R121	204	46.24	51.33	48.89	56.62	56.59	43.09	51.74	44.45	44.90
75B5E121	497	45.28	48.66	48.34	56.37	56.60	44.48	48.96	44.57	46.00
75D5D805	233	43.06	47.35	46.37	56.01	56.27	42.19	47.05	42.90	44.18
75E5E805	277	45.47	48.54	48.70	56.42	56.76	43.34	49.16	45.34	45.76
76CEC101	1146	41.96	45.06	44.89	54.12	54.25	41.28	45.42	41.89	43.03
76P5F101	560	40.90	43.96	43.65	52.91	52.65	39.30	44.81	40.31	41.38
76VEV101	402	39.00	42.14	42.25	50.98	50.97	38.24	43.24	39.07	39.80
76WDB101	138	38.71	41.89	40.97	51.26	50.68	37.69	43.08	39.10	39.12
76WPW101	344	39.77	42.95	42.53	51.73	51.28	38.32	43.86	39.31	40.47
76XSX101	158	38.34	41.41	41.53	49.98	48.92	37.62	42.45	38.11	39.15
76YEY101	381	43.65	47.18	46.51	56.41	56.20	42.80	47.17	44.29	43.74
76Y5G101	298	45.43	48.49	48.70	55.36	56.06	44.58	47.28	44.75	46.01
76Y6Y805	470	44.51	47.42	47.26	55.63	55.79	43.57	46.94	44.24	44.07
82C2C810	390	53.79	52.91	53.79	50.13	50.51	52.53	52.64	53.61	52.51
91B01929	803	54.38	53.32	54.88	52.50	52.67	49.30	53.83	51.61	50.69
91C02929	234	53.93	54.29	54.99	52.97	53.77	49.10	54.27	51.11	50.50
91E05929	163	54.26	53.88	55.01	53.24	54.28	49.42	54.96	51.88	51.31
92B25929	134	55.76	55.99	56.16	54.31	55.13	48.46	58.61	50.40	51.53
94BKA101	627	47.12	48.61	49.16	51.16	49.78	48.09	47.16	48.23	47.07
94B4B803	237	47.50	48.20	49.90	50.81	49.58	48.22	46.78	47.86	47.79
94B4B805	417	46.81	47.71	48.52	51.03	49.22	47.93	47.02	47.43	46.69
95BSB813	728	54.77	54.80	55.63	53.09	53.58	53.62	53.16	53.53	52.62

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ASVAB Means by SQT Criterion Cell

		Subtest								
PCELL	N	GS	AR	VE	NO	CS	AS	MK	MC	EI
C35KL83	112	53.60	55.24	53.54	52.72	52.05	52.44	54.81	52.54	55.15
C74D823	132	56.29	58.80	56.93	55.82	56.76	50.13	60.09	54.20	52.77
05B1182	617	48.83	50.41	51.19	54.04	54.51	49.87	49.96	48.00	49.04
05C0182	1203	50.07	52.30	52.45	55.86	56.02	50.63	51.39	49.07	49.86
05C0183	1160	50.17	52.63	52.64	56.18	56.11	50.60	51.87	49.15	50.30
05G0183	119	54.32	57.83	56.33	57.22	58.26	53.39	59.36	54.64	53.18
05H1183	110	55.54	56.93	57.15	54.75	57.03	49.56	56.93	52.00	51.41
11B 181	608	49.75	51.58	50.28	51.18	51.93	51.67	49.46	50.72	50.54
11B0183	426	48.91	50.83	49.53	50.45	51.67	50.68	48.96	50.31	49.46
11B1182	3912	49.30	51.36	49.84	50.99	52.08	51.50	49.46	50.53	50.01
11B2182	614	49.40	51.05	50.04	50.15	51.44	51.23	49.22	50.57	49.83
11B6182	422	49.15	50.97	49.64	51.45	52.29	50.49	49.51	50.32	49.45
11B7182	229	51.00	51.85	50.59	51.69	52.06	52.09	49.93	51.31	50.51
11C 181	171	49.02	50.91	49.94	50.51	50.90	51.31	48.65	50.27	49.66
11C0183	112	50.45	52.30	50.94	51.80	52.21	52.24	50.28	51.41	51.20
11C1182	559	50.62	52.80	51.36	51.96	52.60	52.18	51.02	52.10	50.86
11C2182	187	50.26	51.78	50.50	50.57	52.30	51.33	50.28	50.66	50.51
11C4182	247	50.89	53.04	51.23	51.77	52.46	51.41	50.98	51.19	50.67
11C5182	217	50.31	52.00	50.47	52.17	52.86	51.25	50.62	50.65	50.31
11H 181	124	52.60	53.34	52.71	51.40	51.40	55.53	51.48	53.26	53.62
11H1182	443	52.36	53.18	52.56	51.98	52.25	53.88	51.69	52.27	52.63
11H2182	321	51.52	52.01	51.80	51.28	52.05	53.24	50.98	51.57	51.97
12B0183	1985	49.22	51.91	49.76	51.30	51.90	52.41	49.85	51.11	50.34
12B1182	1112	49.32	51.36	49.63	50.76	51.45	52.03	49.03	50.56	50.22
12C0182	176	45.98	49.43	46.38	50.00	49.98	51.75	47.11	49.97	49.22
12C0183	272	47.54	50.14	47.86	50.11	51.07	53.07	47.85	50.89	50.29
13B 181	130	45.15	48.55	46.83	49.75	50.91	47.13	48.43	46.95	46.72
13B0183	3907	46.85	50.80	47.88	51.38	51.43	47.03	50.01	48.38	47.92
13B1182	110	48.25	50.79	48.39	51.63	52.05	47.19	50.00	48.91	48.55
13B2182	264	48.84	52.88	49.36	51.70	51.90	50.02	51.63	50.72	50.05
13B3182	156	45.90	50.42	47.23	50.33	51.96	46.67	48.85	48.54	47.46
13B4182	1189	44.63	49.41	45.87	50.76	50.68	45.11	48.76	46.96	46.33
13B5182	629	45.34	49.86	46.31	51.10	51.24	45.44	49.32	47.18	46.76
13E0182	417	54.88	56.54	55.34	53.22	53.41	53.32	56.47	53.98	53.79
13E0183	194	54.84	56.71	54.93	53.87	53.85	53.10	56.68	54.44	53.69
13F0182	596	51.59	56.39	52.17	53.76	54.31	53.06	54.46	54.13	52.57
15D0182	259	52.23	52.22	52.91	53.09	52.41	54.00	51.05	53.17	52.23
17K2182	110	52.59	54.45	53.25	54.53	54.14	53.75	52.09	52.72	52.54
19D 181	104	47.72	50.88	49.27	50.59	51.18	51.11	48.93	50.65	50.11
19D0183	336	51.96	53.69	52.23	52.18	52.26	53.86	51.69	52.89	52.48
19D1182	746	50.55	52.24	51.07	51.19	52.18	52.02	50.70	51.83	50.95
19E1182	680	49.62	51.60	49.74	50.92	51.96	51.76	49.41	50.87	50.40

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ASVAB Means by SQT Criterion Cell (Continued)

PCELL	N	GS	AR	VE	NO	CS	AS	MK	MC	EI
					Subtest					
19E1183	1011	49.93	52.10	50.42	51.20	52.11	52.17	49.59	51.01	50.82
19E2183	858	49.85	52.20	50.18	51.86	52.23	51.87	50.26	51.02	50.47
19E3182	612	48.52	50.69	49.11	51.03	51.80	51.13	48.54	49.88	49.58
26Q0183	142	53.60	55.24	53.29	52.97	53.02	50.50	54.27	51.35	53.54
27E0182	133	51.56	54.42	50.35	50.93	50.98	51.24	52.38	50.71	52.17
27E0183	226	52.35	54.92	51.85	51.69	51.53	51.39	52.82	51.17	52.71
31J0183	132	57.71	59.67	56.85	53.70	53.88	54.63	59.02	55.07	56.90
31M0183	1453	51.94	53.58	51.80	51.37	51.50	49.14	52.70	49.61	51.78
31M1182	576	51.74	53.24	51.47	50.76	50.94	48.85	52.42	49.37	51.60
31M2182	407	51.56	52.98	51.37	50.92	51.55	47.73	52.30	49.12	51.34
31V0183	152	52.59	55.20	51.65	51.24	51.40	51.61	53.89	52.41	54.09
31V1182	360	52.55	54.41	51.78	50.95	51.14	51.39	52.79	51.43	53.08
36C2182	390	47.17	49.52	46.49	48.57	48.46	44.42	48.66	45.17	48.46
36K0182	942	46.34	48.42	45.12	48.01	47.56	44.18	48.33	44.93	47.59
36K0183	850	47.15	49.23	46.12	48.93	48.02	45.14	49.00	45.62	48.35
43E0183	100	49.30	50.01	48.37	48.87	50.15	50.54	48.47	49.63	49.48
51B0182	197	49.81	50.18	49.41	49.01	49.04	51.23	49.68	49.96	50.06
52D0182	176	50.43	48.79	49.94	46.94	47.73	53.30	49.06	49.29	51.88
55B1182	231	45.95	42.61	44.94	44.05	45.12	45.49	45.53	41.42	47.47
57H0183	194	47.02	44.85	46.25	45.93	46.83	46.20	46.37	43.49	47.39
62B0182	222	48.27	48.60	47.32	49.29	49.58	53.36	47.39	51.30	51.33
62E0182	173	49.21	49.27	48.61	48.40	48.47	53.62	48.33	49.82	51.20
62F0182	118	48.58	47.58	47.82	48.56	47.65	51.84	46.93	48.86	50.14
63B0182	1478	46.38	48.23	46.55	50.96	49.82	51.63	47.22	49.17	49.83
63H0182	335	46.70	47.88	46.75	49.80	49.59	53.15	47.33	49.99	50.99
63N0182	286	49.58	49.81	48.83	49.85	50.38	55.76	48.23	52.57	52.70
63W0182	180	45.01	46.86	45.27	50.35	48.92	50.84	46.21	48.05	48.96
63Y0182	108	51.96	53.39	51.39	51.85	50.71	58.22	50.25	55.06	55.63
64C0182	1583	47.08	48.24	48.31	50.68	50.07	51.63	47.06	49.26	48.57
64C0183	2053	47.14	48.58	48.48	50.87	50.33	51.46	47.56	49.40	48.51
67N 181	124	54.76	55.35	54.23	52.53	52.40	58.40	53.23	57.36	56.68
67N0182	389	55.48	55.76	54.77	53.57	53.14	57.95	55.01	56.73	56.47
67U0182	207	55.70	55.40	55.26	53.16	52.66	58.20	55.06	57.02	56.09
67V0182	236	54.17	55.78	53.64	53.75	54.08	57.08	54.22	56.45	55.69
67Y0182	194	54.71	55.76	54.26	53.77	53.39	57.93	54.92	57.29	56.06
68G0182	121	53.79	54.37	53.00	53.31	53.12	56.50	53.47	57.13	55.42
68J0182	119	53.71	54.29	52.71	51.29	51.41	55.57	53.29	53.74	54.42
71D0182	116	53.45	56.66	56.46	59.35	61.53	48.07	56.99	49.68	49.78
71L1183	2629	46.96	50.71	50.85	56.97	58.04	42.51	50.99	44.47	44.82
71L2183	167	45.48	48.54	49.10	55.63	56.42	41.98	49.10	43.29	44.18
71M0182	183	47.97	51.70	51.61	55.93	56.95	44.56	51.51	46.64	47.09
72E0183	564	48.33	50.43	51.66	55.79	56.34	46.15	50.41	45.58	46.94
73C0182	268	45.91	50.99	48.80	56.96	57.18	43.04	51.57	44.43	44.40
73C0183	415	45.65	50.68	48.84	56.81	57.07	42.32	51.63	44.05	44.30
75B0182	424	45.27	49.00	48.33	56.53	56.63	43.73	49.55	44.40	45.60

ASVAB Means by SQT Criterion Cell (Continued)

PCELL	N	Subtest GS	AR	VE	NO	CS	AS	MK	MC	EI
75B0183	631	45.27	48.88	48.43	56.72	56.83	42.92	49.47	44.01	45.23
75C0182	118	45.06	48.03	48.46	55.89	56.50	41.77	49.11	43.54	44.07
75C0183	290	44.95	48.12	49.13	56.02	56.45	40.93	48.24	42.65	44.06
75D0182	371	44.34	47.88	47.19	56.32	56.63	42.46	47.96	43.88	44.65
75D0183	650	43.67	47.65	47.36	56.34	56.54	41.48	47.98	43.12	43.86
75E0182	175	46.35	49.57	49.66	56.16	56.53	44.58	50.10	45.82	46.09
75E0183	280	46.18	49.42	49.64	56.31	57.10	43.21	49.80	44.85	45.07
75F0183	144	48.38	52.17	52.07	58.62	59.39	45.19	53.04	46.69	47.09
76C0183	322	41.95	45.87	45.07	54.69	53.95	41.48	46.66	42.70	42.96
76V0183	220	40.62	44.80	43.62	53.07	52.55	40.69	45.43	41.44	42.25
76W0182	295	39.50	43.61	42.47	52.17	51.83	38.42	44.38	39.72	40.38
76W0183	324	41.15	44.36	43.85	53.60	52.59	39.85	45.14	40.16	41.98
82C1182	209	54.07	55.11	53.84	51.58	51.70	53.11	54.64	53.98	53.49
82C2182	133	54.59	54.06	53.78	52.05	52.25	52.79	53.80	54.06	52.55
91E0182	204	53.86	53.92	54.19	52.99	54.70	47.50	54.50	50.69	50.17
91P0182	159	56.08	57.55	56.79	55.70	55.65	51.89	58.98	53.66	52.55
91R0182	145	54.99	55.10	56.26	53.25	54.54	49.28	54.48	51.14	51.11
92B0182	313	56.55	57.49	56.58	56.04	56.63	48.89	59.92	51.23	51.83
93H0182	114	55.89	58.68	56.84	57.87	57.91	53.01	59.41	54.76	53.96
94B0182	1552	46.66	47.57	48.76	51.43	49.65	47.37	47.09	47.32	46.66
94B0183	2324	46.57	47.67	48.88	52.18	50.43	47.19	47.46	47.03	46.35
95B0182	1861	54.75	55.24	55.40	53.44	53.87	53.33	54.02	53.66	52.96
95B0183	2590	55.40	55.79	55.74	53.92	53.99	53.60	55.01	54.11	53.42
96B0183	172	56.65	56.88	57.70	54.63	55.06	51.55	57.97	53.67	53.18
98C0182	186	59.64	62.24	59.59	57.37	58.57	54.62	63.26	57.46	56.93

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APPENDIX B

26 May 1983 (Revised: 11 July 1983)

TO: Gloria Guth (cc: DBrandt, DMcLaughlin, WYoung, LLWise, PRossmeisal)

FROM: Ming-mei Wang

SUBJECT: Editing of Training Outcome Scores

In an effort to make sense out of the performance scores in the training data file and to transform these scores into data that can facilitate the upcoming validation analyses, I have worked out the following rules for editing the three variables presently named T1SCORE, T1RANK, and T1RANK2. (A variable T1NRANK also exists in GGI's TRN81V3D, and I will make use of it in the editing). The development of these editing rules is based on existing information extracted from Mike Rumsey's summary, ARI's project document, and a series of frequency and crosstab runs made by GGI at my request. They should be applied to TRN81V3D in order to complete the editing of ARI's training data.

Defining Score Types

First, two new variables (T1STYPE1 and T1STYPE2; 1 character code) are created to indicate what kinds of performance scores are available for each MOS at a given school/ATC. A third variable (T1STYPE3; 1 character code) is also created to preserve the additional information on MOS 05B, 05C, and 110. In MOS 05B and 05C, a small number of trainees received International Morse Code training and will be identified by T1STYPE3 = 'M'.

For training MOS 110, the specific training assignment (e.g., 11B, 11C, 11H) for the students was originally recorded in column 46 and entered into the existing SAS file as the second byte of T1RANK2. This information will also be kept as T1STYPE3 in the edited training file (see a later section for further explanation). In an earlier editing run, T1MOSAWD = 110 was changed, where appropriate, to specific codes 11B, 11C, 11H, or 11X on the basis of this information. At the same time, T1RANK2 for these trainees in MOS 110 was recoded to G (guaranteed), S (selected), GS (guaranteed and selected), S2 (selected for 11BC2), and A (attrited). This run created an intermediate edited file TRN81V3D which will be the base file for the current editing.

The definition of the three score-type variables (T1STYPE1, T1STYPE2, and T1STYPE3) are given in the attachment to this memo. The values of T1STYPE1 and T1STYPE2 are explicitly defined for each MOS/school in that attachment. The value of T1STYPE3 for MOS 05B, 05C, and 110 can be obtained from T1MOSAWD and T1RANK2 (as found in TRN81V3D) using the following table:

Variables in TRN81V3D		New Variable
T1MOSAWD	T1RANK2	T1STYPE3
05B	'2G'	M
05C	'2G'	M
11B	'G '	A
11C	'G '	B
11H	'G '	C
11B	'GS'	D
11B	'S '	E
11C	'S '	F
11H	'S '	G
11B	'S2'	H
11X	'A '	I
110	' '	blank
all others	not relevant	blank

I would suggest that a score-type file containing T1MOSAWD, T1SCHOOL, T1STYPE1, and T1STYPE2 be setup using the definitions given in the attachment. This score-type file can then be merged with TRN81V3D by T1MOSAWD and T1SCHOOL to create the first two score-type variables for each record.

Special Notes for Training MOS 110

Training MOS 110 (at school 809) represents a mixture of MOS codes within the 11 series. These students can be divided into subgroups according to their specific training assignments:

- Students who entered the school with MOS 11B, 11C, or 11H guaranteed and received training in the respective MOS.
- Students who arrived with MOS 11B guaranteed but were subsequently selected for training as 11BC2 (Dragon gunner).
- Students who arrived with MOS code 11X and were subsequently assigned to training as 11B, 11C, 11H, or 11BC2.
- Students who were attrited prior to assignment for training in a specific MOS.

- Students for whom there was no information on their specific training assignments in the school. (There are 569 such cases in the current training file, including multiple record counts.)

For the first three groups of students, T1MOSAWD has been changed to correspond to the specific MOS code in which the student received training. Because only three characters are used for T1MOSAWD, MOS code 11BC2 is also recorded as 11B. The variable T1STYPE3 may be used to differentiate between trainees for 11BC2 and those for 11B. (Those with T1STYPE3 = A or E received training as 11B whereas those with T1STYPE3 = D or H received training as 11BC2.) T1MOSAWD was recoded as 11X for the fourth group, while no recoding was made for the fifth group (i.e., T1MOSAWD = 110 for this group).

Additionally, it should also be noted that T1MOSAWD = 11X indicates that the students arrived at the school to be trained in CMF 11, but were attrited prior to the assignment for training in a specific MOS code. This meaning of 11X for T1MOSAWD should not be confused with the 11X for A1PRMMOS, A1TRNMOS, and A1TNGMOS in the accessions file. I assume that MOS 11X in the accessions data indicates that the soldiers were generally assigned to training and subsequently to the first-tour service in CMF 11. The exact meaning of 11X (which represents about 4.7%, approximately 6300, of FY81 accessions) is not clear at this time. When we have learned what it really represents in the accessions file, we may have to change 11X for T1MOSAWD to some other code such as 11Z (which as far as I know does not exist in the accessions data).

The training scores for students in this MOS also require special editing. In an earlier editing run to split T1MOSAWD 110 into 11B, 11C, 11H, 11X and 110, the third byte of the second performance scores for these trainees was lost when the variable T1RANK2 was redefined. A subsequent rerun was made to restore this information and create a temporary variable T1NRANK (which is a numeric equivalent of a character variable formed by concatenating T1RANK and the first byte of T1RANK2). Note that T1RANK and T1RANK2 are arbitrary variables designated to store the information in columns 43-44 and 45-46, respectively, when the first SAS training file was created. It has been verified that all the lost information originally contained in T1RANK2 has been recaptured with T1NRANK. Thus in the editing specifications below, T1NRANK will be used to define a second performance score for this MOS where appropriate.

Editing the First Performance Score (T1SCORE1)

1. For T1STYPE1 = 1, 2, 3, 4, 5, 6, 7, 8, D, P, or Q:

- If T1SCORE LE 0, set T1SCORE to missing.
- If T1SCORE GT 100, list the data. Then if it appears that values exceed 100 because of failure to round the scores to integers, set T1SCORE = ROUND(T1SCORE/10); otherwise, set T1SCORE to missing.
- Rename T1SCORE to T1SCORE1.

2. For T1STYPE1 = A, B, or C:

- Concatenate T1SCORE and T1RANK in character form, then convert the resulting character variable to numeric form (with format 5.2).
- Name the new variable T1SCORE1.
- If T1SCORE1 LE 0, set T1SCORE1 to missing.
- Obtain frequency distribution of T1SCORE1 by T1MOSAWD and T1SCHOOL to determine needs for further editing of unusual and/or out-of-range scores. (Except for a few obviously unreasonable values, I recommend that most of the scores be retained to allow the analysts choices of various methods to treat outliers, such as trimming, at the time of analysis.)

3. For T1STYPE1 = E:

- If T1SCORE LE 0, set T1SCORE to missing.
- Set T1SCORE = T1SCORE/10.
- Rename T1SCORE to T1SCORE1.

(Note that T1SCORE1 is either 23 or 36 for 76V, and all equal to 16 for Course EY of MOS 76Y in school 101.)

4. For T1STYPE1 = X:

Obtain a frequency distribution of T1SCORE by T1MOSAWD, and rename T1SCORE to T1SCORE1. Our current information indicates that there are very few records (only 2 as far as we know) for MOS 12B in school 061. The scores for these cases are left unedited as it is unlikely that they will be useful in our analysis. (Note that we have now found that school 061 does not provide training for 12B and both records have thus been edited on the basis of other information, such as T1COURSE.) For T1MOSAWD = 09J, we have found that all such cases are data entry errors and accordingly have been eliminated from the edited file.

Editing the Second Performance Score (T1SCORE2)

A new variable T1SCORE2 will be created to contain this second performance score. Upon completion of this editing step, drop T1RANK, T1RANK2, and T1NRANK from the data file.

1. For T1STYPE2 = 1 (progression index):

- Convert T1RANK to numeric and name the resulting variable T1SCORE2.
- If T1SCORE2 LE 0, set T1SCORE2 to missing.
- Obtain frequency distribution of T1SCORE2 by T1MOSAWD and T1SCHOOL to determine if further editing of unusual scores is required. (Note that inspection of the score distributions by T1MOSAWD suggests that the scores may not be meaningful progression indices with a standard of 1 as the schools reported.)

2. For T1STYPE2 = 2:

- If T1DISP = A, B, or C, convert T1RANK to numeric and name the resulting variable T1SCORE2; otherwise, set T1SCORE2 to 0.
- Obtain frequency distribution of T1SCORE2 by T1MOSAWD to determine if further editing of unusual values is required. (In general, the scores do not appear to require additional editing.)

3. For T1STYPE2 = C, set T1SCORE2 to missing.

4. For T1STYPE2 = D:

- Convert T1RANK to numeric and name the resulting variable T1SCORE2.
- If T1SCORE2 LE 0, set T1SCORE2 to missing.
- Obtain frequency distribution of T1SCORE2 to make sure that all scores fall within the specified range (1-12 for MOS 91B; 1-13 for MOS 94F. Note that all scores have been verified to be within the range.)

5. For T1STYPE2 = E:

- Convert T1RANK to numeric and name the resulting variable T1SCORE2.
- If T1SCORE2 LE 0, set T1SCORE2 to missing.
- Obtain frequency distribution to determine if further editing of unexpected values is required. (Note that T1SCORE2 ranges from 23 to 41 for 76V, and from 16 to 23 for 76Y.)

6. For T1STYPE2 = P:

- Concatenate T1RANK and the first byte of T1RANK2 and convert the resulting character variable to a numeric variable named T1SCORE2.
- If T1SCORE2 LE 0, set T1SCORE2 to missing.
- If T1SCORE2 GT 100, list the data. Then if it appears that values exceed 100 because of failure to round the scores to integers, set T1SCORE2 = ROUND(T1SCORE2/10); otherwise, set T1SCORE2 to missing.

7. For T1STYPE2 = Q:

- Convert T1RANK to a numeric variable T1SCORE2.
- If T1SCORE2 LE 0, set T1SCORE2 to missing.

8. For T1STYPE2 = X and the first two bytes of T1MOSAWD EQ '11':

- set T1SCORE2 = T1NRANK.
- If T1SCORE2 LE 0, set T1SCORE2 to missing.
- If T1SCORE2 GT 100, list data. Then if it appears that values exceed 100 because of failures to round the scores to integers, set T1SCORE2 to ROUND(T1SCORE2/10); otherwise, set T1SCORE2 to missing.

For all other cases with T1STYPE2 = X, set T1SCORE2 to missing unless other information becomes available later to allow sensible editing of the data.

9. For T1STYPE2 = Y or Z, set T1SCORE2 to missing.

Additional Editing for MOS 110 (school 809)

If T1MOSAWD EQ '110' or '11X' (as found in TRN81V3D), obtain crosstabs of T1SCORE1 (recoded to missing versus nonmissing after editing of T1SCORE1 as specified earlier in this memo) and T1DISP by T1MOSAWD in order to determine needs for further editing. (Note that T1SCORE1 was found to be all missing for 11X, and for about 11%, 62 cases, for 110; while T1SCORE2 was known to be missing for all cases in 11X and 110.)

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M. Wang -- Editing Memo
July 11, 1983 (revision)

ATTACHMENT

Definitions of Score Types for the ARI Training Outcome Data

T1STYPE1 (For 176 MOS/School)

This variable indicates the score type for the first training performance measure (T1SCORE1, in the edited file.

1 = Course GPA derived from averaging percents of "first-time GO's" attained by students on each test; (Col. 40-42 in the raw data file)

School 061 : 13C, 13R, 17C
School 101 : 76X
School 113 : 05B, 05C, 31J, 31N, 31S, 31T, 32G, 35L, 36C, 36K, 72E
School 121 : 71D, 75B, 75C
School 161 : 71M
School 171 : 45N, 45T, 63D, 63N, 63T, 63Y
School 301 : 17K, 96B, 96D,
School 441 : 24C
School 804 : 19D, 19E, 19F
School 807 : 12F, 51B, 51C, 51K, 51M, 51N, 51R, 62B, 62E, 62F, 62G, 62H, 62J, 63B, 64C
School 810 : 13E, 15E

Total : 49 MOS/School

---

2 = percent of "first-time GO's" achieved on End of Course Comprehensive Test (EOCCT); (Col. 40-42 in the raw data file)

School 061 : 15J, 17B, 26B, 93F*
School 551 : 67U
School 803 : 63B
School 805 : 63B, 76Y, 94B
School 807 : 12B, 12C
School 809 : 110 (also 11B, 11C, 11H, 11X as in the edited file)
School 810 : 13B, 15D, 82C
School 811 : 16P, 16S

(* We have two conflicting informations on the scores for 93F: Mike Rumsey's document summary indicates that the scores are percent of "first-time GO's" on EOCCT; but the original ARI document indicates that they are initial percentage score on EOCCT. Inspection of the score distribution does not reveal evidence for choosing one type over the other. Assuming that Rumsey's information is more up-to-date, we decided to classify these scores under T1STYPE1 = 2. If further information becomes available later or evidence from subsequent data analysis support classification of these scores under other types, we will revise this document accordingly.)

Total : 17 MOS/School (not counting 11B, 11C, 11H, & 11X)

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE1

3 = Course GPA derived from averaging initial percentage scores attained by students on each test; (Col 40-42 in the raw data file)

School 011 : 67N, 67V. 71P, 93H, 93J
School 093 : 21L, 24K, 27E, 27F, 27G, 55B, 55G
School 101 : 43E, 43M, 57E, 76W, 92C, 94B
School 113 : 26L, 26Q, 26V, 31E, 31M, 32D, 32H, 35K, 35M, 36H
School 121 : 71C, 73C, 73D
School 441 : 24E, 24G, 24M, 24Q, 24U
School 551 : 61B, 61C, 67G, 67T, 68D, 68F, 68J, 68M, 71N
School 805 : 63S, 75D, 75E
School 810 : 13F
School 906 : 05D, 05G, 05H, 33S, 98C, 98J

Total : 55 MOS/school

4 = Initial percentage score achieved on End of Course Comprehensive Test (EOCCT); (Col. 40-42 in the raw data file)

School 061 : 31V, 45D
School 101 : 76C, 76P, 76Y (for course '5G' only)
School 121 : 74D, 74F
School 803 : 94B
School 811 : 16B, 16C, 16D, 16E, 16H, 16J, 16R

Total : 14 MOS/school

5 = Second percentage score achieved on End of Course Comprehensive Test (EOCCT); (Col. 40-42 in the raw data file)

School 803 : 64C

6 = Average of percent of "first-time GO's" achieved on End of Course Comprehensive Test (EOCCT) and time progression index (standard of 1), each with 50% weight; (Col. 40-42 in the raw data file)

School 551 : 67Y

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Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE1

7 = Average of Course GPA and time progression index, each with 50% weight. Course GPA is derived from averaging initial percentage scores attained by student on each test. Time progression index has a standard of 1 (100%); (Col 40-42 in the raw data file)

School 551 : 68B, 68G

8 = percent of total points achieved on the first time tested (not phased); (Col. 40-42 in the raw data file)

School 929 : 35G, 42D, 71G, 76J, 91E, 91G, 91Q, 91R, 91S, 92B

Total : 10 MOS/school

A = Course GPA derived from averaging the number of tries required to pass each exam. The score is recorded with implicit decimal point after the third digit (009.99) with the standard being 1.00 (one try per exam). As such, this performance measure is expressed in a reversed direction, i.e., lower values represent better performances. Our preliminary analysis reveals negative correlations with ASVAB subtest scores. We suggest that the reciprocal of this score be used as the criterion measure in the validation.; (Col 40-44 in the raw data file)

School 091 : 34G, 41C, 44B, 44E, 45B, 45K, 45L, 63G, 63H, 63J, 63W

Total : 11 MOS/school

B = Initial or second percentage score achieved on End of Course Comprehensive Test (EOCCT), recorded with two implicit decimal places (999.99); (Col. 40-44 in the raw data file)

School 813 : 95B, 95C

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE1

C = Course GPA derived from averaging initial percentage scores achieved on each test, recorded with two implicit decimal places; (Col. 40-44 in the raw data file)

School 031 : 54C, 54E*
School 551 : 57H

(* inferred on the basis of the data.)

D = first time pass rate (0 to 100%) on performance tests (for lock-step modules); (Col. 40-42 in the raw data file)

School 929 : 91B, 94F

E = Number of tests given in the course. This score by itself is not a meaningful performance indicator. It should be used in conjunction with a second measure (T1SCORE2, see later description for T1SCORE2 = E) to define an appropriate performance measure, such as T1SCORE2/T1SCORE1 representing the average number of tries required to pass each test; (Col 40-41 in the raw data file)

School 101 : 76V, 76Y (for course 'EY' only)

(The number of tests is either 23 or 36 for MOS 76V; and 16 for course EY of MOS 76Y.)

P = Percent of total points achieved on the first time tested in Phase I of the course; (Col. 40-42 in the raw data file)

School 929 : 91C, 91D, 91F, 91P

(The training courses for these MOSs are divided into two phases: Phase I consists of 4, 6, 6, and 13 weeks for 91C, 91D, 91F, and 91P respectively.)

Q = Course GPA derived from averaging initial percentage scores attained by student on each test for Part A of the course; (Col. 40-42 in the raw data file)

School 906 : 05K

(The training course for this MOS consists of two parts, each scored the same way; see also T1STYPE2 = Q.)

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE1

X = Uncertain (not documented)

School 061 : 12B
School 803 : 09J

(Note that all records with T1MOSAWD = 09J have been found to be data entry errors and therefore have been eliminated from the current file. It has also been determined that school 061 does not provide training for 12B and thus the two cases with T1MOSAWD = 12B in this school are data entry errors and have been edited on the basis of other information, i.e. T1COURSE.)

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE2

1 = Progression Index. This index is defined as the ratio of the time spent to complete the (self-paced) course to the expected time for completion, or the reciprocal of this ratio. (Std. 1, with an implicit decimal place); (Col. 43-44 in the raw data file)

School 113 : 05B, 05C
School 811 : 16P, 16S

(Note that inspection of the score distribution suggests that these scores may not conform to the given definition. Be cautious when using these scores in the analysis.)

2 = Number of weeks repeated or recycled in the course (mostly 00, indicating graduation without repeat or recycle); (Col. 43-44 in the raw data file)

School 113 : 26Q, 26V*, 31M*, 31S, 31T*, 32D, 32G, 32H, 35K*, 35M*, 36C*, 36K, 72E*

(* = all 00 in the training data file)

C = No second performance score: Col. 43-44 in the raw data file have been used in combination with col. 40-42 to record a single performance score with format F5.2 (see T1STYPE1 = A, B, or C)

School 031 : 54C, 54E (T1STYPE1 = C)
School 091 : 34G, 41C, 44B, 44E, 45B, 45K, 45L, 63G, 63H, 63J, 63W (T1STYPE1 = A)
School 551 : 57H (T1STYPE1 = C)
School 813 : 95B, 95C (T1STYPE1 = B)

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE2

D = Number of tests successfully passed (or number of self-paced tasks completed) on the first trial; (Col. 43-44 in the raw data file)

School 929 : 91B, 94F

(The number ranges from 1 to 12 for 91B, and 1 to 13 for 94F; see also T1STYPE1 = D.)

E = Total number of tries required to pass all exams given in the course; (Col. 43-44 in the raw data file)

School 101 : 76V, 76Y (for course 'EY' only)

(The number ranges from 23 to 41 for 76V, and 16 to 23 for course EY of MOS 76Y; See T1STYPE1 = E for suggestion of appropriate use of this index as a performance indicator.)

P = Percentage of total points achieved in Phase II of the course; (Col. 43-45 in the raw data file)

School 929 : 91C, 91D, 91F, 91P

(Note that the training courses for these MOSs are divided into two phases. Phase II consists of 12 weeks for 91C, and 6 weeks for 91D, 91F, and 91P. See also T1STYPE1 = P.)

Q = Course GPA derived from averaging initial percentage scores attained by student on each test for Part B of the course (same as Part A, see T1STYPE1 = Q); (Col. 43-44 in the raw data file)

School 906 : 05K

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Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE2

X = Uncertain (data do not agree with documents and discrepancies cannot be resolved at this point, need further checking)

School 061 : 12B (no longer exists in the edited file; see T1STYPE1 = X for explanation)
13C (should be '00', but there are nonzero entries)
School 803 : 09J (invalid MOS, no longer exists in the edited file)
School 805 : 76Y (should be ' ', but there are a large no. of nonblank entries)
School 809 : 110 (Col. 43-45 may be '000' or initial percentage score on the MOS unique test; Because of some unplanned earlier editing which overrides data in Col. 45, special editing of the second performance score for this MOS has been made to recover the information. See page 5 of the editing memo.)

School 906 : 98C (should be ' ', but there are miscellaneous nonzero entries in the data file, we should ignore the scores here.)

(Note that except for T1MOSAWD = 110 in school 809, we have decided to leave T1SCORE2 unedited for T1STYPE2 = X. Current information suggests that these data have little analytical values.)

Y = Three zeros; (Col. 43-45)

School 929 : 35G, 71G, 76J, 91E, 91G, 91Q, 91R, 91S, 92B

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE2

Z = Two zeros; (Col. 43-44)

School 093 : 27E, 27F, 27G, 55B, 55G
School 101 : 43E, 43M, 57E, 76C, 76P, 76W, 76X, 92C, 94B
School 113 : 26L, 31E, 31J, 31N, 35L, 36H
School 121 : 71C, 71D, 73C, 73D, 74D, 74F, 75B, 75C
School 171 : 45N, 45T, 63D, 63N, 63T, 53Y
School 441 : 24C*, 24G, 24M, 24Q, 24U
School 551 : 67U, 67Y, 68B, 68G
School 803 : 94B**
School 805 : 94B
School 811 : 16B, 16C, 16D, 16E, 16H, 16J, 16R
School 929 : 42D
(* = Progression index indicated in the document, but data are all zeros;
** = document indicates that this field contains course completion time, but our data show all zeros)

Total : 53 MOS/school

' ' = blanks; (Col. 43-46)

School 011 : 67N*, 67V*, 71P*, 93H*, 93J*
School 061 : 13R, 15J, 17B, 17C, 26B, 31V, 45D, 93F
School 093 : 21L, 24K
School 161 : 71M
School 301 : 17K, 96B, 96D
School 441 : 24E
School 551 : 61B, 61C, 67G, 67T, 68D, 68F, 68J, 68M, 71N
School 803 : 63B*, 64C*
School 804 : 19D, 19E, 19F
School 805 : 63B, 63S, 75D, 75E
School 807 : 12B, 12C, 12F, 51B, 51C, 51K, 51M, 51N, 51R, 62B, 62E,
62F, 62G, 62H, 62J, 63B, 64C
School 810 : 13B, 13E, 13F, 15D, 15E, 82C
School 906 : 05D, 05G, 05H, 33S, 98J
(* = Progression index indicated in document, but all zeros in data file)

Total 66 MOS/School

Definitions of Score Types for the
ARI Training Outcome Data (Cont.)

T1STYPE3

M = Took International Morse Code training; (Col. 45-46 = '2G')

School 113 : 05B, 05C

Special Codes for T1MOSAWD = '110' (school 809)

A = Arrived with MOS code 11B (Light Weapons Infantry) guaranteed

B = Arrived with MOS code 11C (Indirect Fire Crewman) guaranteed

C = Arrived with MOS code 11H (Heavy Antiarmor Crewman) guaranteed

D = Arrived with MOS code 11B guaranteed and was selected for training as MOS Code 11BC2 (Dragon Gunner)

E = Arrived with MOS code 11X (CMF 11) and was selected in the fifth week of training as MOS code 11B

F = Arrived with MOS code 11X and was selected in the fifth week of training as MOS code 11C

G = Arrived with MOS code 11X and was selected in the fifth week of training as MOS code 11H

H = Arrived as MOS code 11X and was selected in the fifth week of training as MOS code 11BC2

I = Arrived as MOS code 11X and was attrited prior to selection for training in a specific MOS code

(Note that blank means no information on specific assignment at the training school is available for the trainee.)

These codes are originally recorded either in column 45 or 46 and will be kept as T1STYPE3 in the edited training data file.

For all other MOS/school, T1STYPE3 will be blank.

APPENDIX C

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED CO COMPOSITE

(CO = CS + AR + MC + AS)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	57	182	89	233	121
81	40	132	57	183	89	234	121
82	40	133	58	184	90	235	122
83	40	134	59	185	91	236	123
84	40	135	59	186	91	237	123
85	40	136	60	187	92	238	124
86	40	137	60	188	93	239	125
87	40	138	61	189	93	240	125
88	40	139	62	190	94	241	126
89	40	140	62	191	94	242	126
90	40	141	63	192	95	243	127
91	40	142	64	193	96	244	128
92	40	143	64	194	96	245	128
93	40	144	65	195	97	246	129
94	40	145	65	196	98	247	130
95	40	146	66	197	98	248	130
96	40	147	67	198	99	249	131
97	40	148	67	199	99	250	132
98	40	149	68	200	100	251	132
99	40	150	69	201	101	252	133
100	40	151	69	202	101	253	133
101	40	152	70	203	102	254	134
102	40	153	70	204	103	255	135
103	40	154	71	205	103	256	135
104	40	155	72	206	104	257	136
105	40	156	72	207	104	258	137
106	41	157	73	208	105	259	137
107	42	158	74	209	106	260	138
108	42	159	74	210	106	261	138
109	43	160	75	211	107	262	139
110	43	161	76	212	108	263	140
111	44	162	76	213	108	264	140
112	45	163	77	214	109	265	141
113	45	164	77	215	109	266	142
114	46	165	78	216	110	267	142
115	47	166	79	217	111	268	143
116	47	167	79	218	111	269	143
117	48	168	80	219	112	270	144
118	48	169	81	220	113	271	145
119	49	170	81	221	113	272	145
120	50	171	82	222	114	273	146
121	50	172	82	223	115	274	147
122	51	173	83	224	115	275	147
123	52	174	84	225	116	276	148
124	52	175	84	226	116	277	148
125	53	176	85	227	117	278	149
126	53	177	86	228	118	279	150
127	54	178	86	229	118	280	150
128	55	179	87	230	119	281	151
129	55	180	87	231	120	282	152
130	56	181	88	232	120	283	152
284	153	293	159	302	160	311	160
285	154	294	159	303	160	312	160
286	154	295	160	304	160	313	160
287	155	296	160	305	160	314	160
288	155	297	160	306	160	315	160
289	156	298	160	307	160	316	160
290	157	299	160	308	160	317	160
291	157	300	160	309	160	318	160
292	158	301	160	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED EL COMPOSITE
(EL = AR + EI + MK + GS)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	61	182	90	233	119
81	40	132	62	183	90	234	119
82	40	133	62	184	91	235	120
83	40	134	63	185	92	236	120
84	40	135	63	186	92	237	121
85	40	136	64	187	93	238	122
86	40	137	64	188	93	239	122
87	40	138	65	189	94	240	123
88	40	139	66	190	94	241	123
89	40	140	66	191	95	242	124
90	40	141	67	192	96	243	124
91	40	142	67	193	96	244	125
92	40	143	68	194	97	245	126
93	40	144	68	195	97	246	126
94	40	145	69	196	98	247	127
95	41	146	70	197	98	248	127
96	41	147	70	198	99	249	128
97	42	148	71	199	100	250	128
98	42	149	71	200	100	251	129
99	43	150	72	201	101	252	129
100	44	151	72	202	101	253	130
101	44	152	73	203	102	254	131
102	45	153	74	204	102	255	131
103	45	154	74	205	103	256	132
104	46	155	75	206	103	257	132
105	46	156	75	207	104	258	133
106	47	157	76	208	105	259	133
107	47	158	76	209	105	260	134
108	48	159	77	210	106	261	135
109	49	160	77	211	106	262	135
110	49	161	78	212	107	263	136
111	50	162	79	213	107	264	136
112	50	163	79	214	108	265	137
113	51	164	80	215	109	266	137
114	51	165	80	216	109	267	138
115	52	166	81	217	110	268	139
116	53	167	81	218	110	269	139
117	53	168	82	219	111	270	140
118	54	169	83	220	111	271	140
119	54	170	83	221	112	272	141
120	55	171	84	222	113	273	141
121	55	172	84	223	113	274	142
122	56	173	85	224	114	275	143
123	57	174	85	225	114	276	143
124	57	175	86	226	115	277	144
125	58	176	87	227	115	278	144
126	58	177	87	228	116	279	145
127	59	178	88	229	116	280	145
128	59	179	88	230	117	281	146
129	60	180	89	231	118	282	146
130	60	181	89	232	118	283	147
284	148	293	153	302	158	311	160
285	148	294	153	303	158	312	160
286	149	295	154	304	159	313	160
287	149	296	154	305	159	314	160
288	150	297	155	306	160	315	160
289	150	298	156	307	160	316	160
290	151	299	156	308	160	317	160
291	152	300	157	309	160	318	160
292	152	301	157	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORE: ADJUSTED GM COMPOSITE

(GM = MK + EI + GS + AS)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	60	182	90	233	119
81	40	132	60	183	90	234	120
82	40	133	61	184	91	235	121
83	40	134	61	185	91	236	121
84	40	135	62	186	92	237	122
85	40	136	63	187	92	238	122
86	40	137	63	188	93	239	123
87	40	138	64	189	94	240	123
88	40	139	64	190	94	241	124
89	40	140	65	191	95	242	125
90	40	141	66	192	95	243	125
91	40	142	66	193	96	244	126
92	40	143	67	194	97	245	126
93	40	144	67	195	97	246	127
94	40	145	68	196	98	247	128
95	40	146	68	197	98	248	128
96	40	147	69	198	99	249	129
97	40	148	70	199	100	250	129
98	40	149	70	200	100	251	130
99	41	150	71	201	101	252	131
100	42	151	71	202	101	253	131
101	42	152	72	203	102	254	132
102	43	153	73	204	102	255	132
103	43	154	73	205	103	256	133
104	44	155	74	206	104	257	133
105	44	156	74	207	104	258	134
106	45	157	75	208	105	259	135
107	46	158	76	209	105	260	135
108	46	159	76	210	106	261	136
109	47	160	77	211	107	262	136
110	47	161	77	212	107	263	137
111	48	162	78	213	108	264	138
112	49	163	78	214	108	265	138
113	49	164	79	215	109	266	139
114	50	165	80	216	109	267	139
115	50	166	80	217	110	268	140
116	51	167	81	218	111	269	140
117	52	168	81	219	111	270	141
118	52	169	82	220	112	271	142
119	53	170	83	221	112	272	142
120	53	171	83	222	113	273	143
121	54	172	84	223	114	274	143
122	54	173	84	224	114	275	144
123	55	174	85	225	115	276	145
124	55	175	85	226	115	277	145
125	56	176	86	227	116	278	146
126	57	177	87	228	116	279	146
127	57	178	87	229	117	280	147
128	58	179	88	230	118	281	147
129	59	180	88	231	118	282	148
130	59	181	89	232	119	283	149
284	149	293	155	302	160	311	160
285	150	294	155	303	160	312	160
286	150	295	156	304	160	313	160
287	151	296	156	305	160	314	160
288	152	297	157	306	160	315	160
289	152	298	157	307	160	316	160
290	153	299	158	308	160	317	160
291	153	300	159	309	160	318	160
292	154	301	159	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED ST COMPOSITE

(ST = VE + MK + MC + GS)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	60	182	90	233	119
81	40	132	61	183	90	234	120
82	40	133	62	184	91	235	120
83	40	134	62	185	91	236	121
84	40	135	63	186	92	237	121
85	40	136	63	187	93	238	122
86	40	137	64	188	93	239	122
87	40	138	64	189	94	240	123
88	40	139	65	190	94	241	124
89	40	140	66	191	95	242	124
90	40	141	66	192	95	243	125
91	40	142	67	193	96	244	125
92	40	143	67	194	97	245	126
93	40	144	68	195	97	246	126
94	40	145	68	196	98	247	127
95	40	146	69	197	98	248	128
96	40	147	70	198	99	249	128
97	41	148	70	199	99	250	129
98	42	149	71	200	100	251	129
99	42	150	71	201	101	252	130
100	43	151	72	202	101	253	131
101	43	152	73	203	102		131
102	44	153	73	204	102		132
103	44	154	74	205	103	256	132
104	45	155	74	206	104	257	133
105	46	156	75	207	104	258	133
106	46	157	75	208	105	259	134
107	47	158	76	209	105	260	135
108	47	159	77	210	106	261	135
109	48	160	77	211	106	262	136
110	48	161	78	212	107	263	136
111	49	162	78	213	108	264	137
112	50	163	79	214	108	265	137
113	50	164	79	215	109	266	138
114	51	165	80	216	109	267	139
115	51	166	81	217	110	268	139
116	52	167	81	218	110	269	140
117	52	168	82	219	111	270	140
118	53	169	82	220	112	271	141
119	54	170	83	221	112	272	141
120	54	171	83	222	113	273	142
121	55	172	84	223	113	274	143
122	55	173	85	224	114	275	143
123	56	174	85	225	114	276	144
124	56	175	86	226	115	277	144
125	57	176	86	227	116	278	145
126	58	177	87	228	116	279	145
127	58	178	87	229	117	280	146
128	59	179	88	230	117	281	147
129	59	180	89	231	118	282	147
130	60	181	89	232	118	283	148
284	148	293	153	302	159	311	160
285	149	294	154	303	159	312	160
286	149	295	155	304	160	313	160
287	150	296	155	305	160	314	160
288	151	297	156	306	160	315	160
289	151	298	156	307	160	316	160
290	152	299	157	308	160	317	160
291	152	300	157	309	160	318	160
292	153	301	158	310	160	319	160
						320	160

C24

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED FA COMPOSITE

(FA = AR + CS + MC + MK)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	58	182	89	233	120
81	40	132	59	183	90	234	121
82	40	133	60	184	90	235	121
83	40	134	60	185	91	236	122
84	40	135	61	186	92	237	122
85	40	136	61	187	92	238	123
86	40	137	62	188	93	239	124
87	40	138	63	189	93	240	124
88	40	139	63	190	94	241	125
89	40	140	64	191	95	242	125
90	40	141	64	192	95	243	126
91	40	142	65	193	96	244	127
92	40	143	66	194	96	245	127
93	40	144	66	195	97	246	128
94	40	145	67	196	98	247	128
95	40	146	67	197	98	248	129
96	40	147	68	198	99	249	130
97	40	148	69	199	99	250	130
98	40	149	69	200	100	251	131
99	40	150	70	201	101	252	131
100	40	151	70	202	101	253	132
101	40	152	71	203	102	254	133
102	41	153	72	204	102	255	133
103	42	154	72	205	103	256	134
104	42	155	73	206	104	257	134
105	43	156	73	207	104	258	135
106	43	157	74	208	105	259	136
107	44	158	75	209	105	260	136
108	45	159	75	210	106	261	137
109	45	160	76	211	107	262	137
110	46	161	77	212	107	263	138
111	46	162	77	213	108	264	139
112	47	163	78	214	108	265	139
113	48	164	78	215	109	266	140
114	48	165	79	216	110	267	140
115	49	166	80	217	110	268	141
116	49	167	80	218	111	269	142
117	50	168	81	219	111	270	142
118	51	169	81	220	112	271	143
119	51	170	82	221	113	272	143
120	52	171	83	222	113	273	144
121	52	172	83	223	114	274	145
122	53	173	84	224	115	275	145
123	54	174	84	225	115	276	146
124	54	175	85	226	116	277	146
125	55	176	86	227	116	278	147
126	55	177	86	228	117	279	148
127	56	178	87	229	118	280	148
128	57	179	87	230	118	281	149
129	57	180	88	231	119	282	149
130	58	181	89	232	119	283	150
284	151	293	156	302	160	311	160
285	151	294	157	303	160	312	160
286	152	295	157	304	160	313	160
287	152	296	158	305	160	314	160
288	153	297	159	306	160	315	160
289	154	298	159	307	160	316	160
290	154	299	160	308	160	317	160
291	155	300	160	309	160	318	160
292	156	301	160	310	160	319	160
						320	160

CONVERSION OF SUM OB SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED OF COMPOSITE
(OF = NO + AS + MC + VE)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	57	182	89	233	120
81	40	132	58	183	89	234	121
82	40	133	58	184	90	235	122
83	40	134	59	185	91	236	122
84	40	135	60	186	91	237	123
85	40	136	60	187	92	238	124
86	40	137	61	188	93	239	124
87	40	138	62	189	93	240	125
88	40	139	62	190	94	241	125
89	40	140	63	191	94	242	126
90	40	141	63	192	95	243	127
91	40	142	64	193	96	244	127
92	40	143	65	194	96	245	128
93	40	144	65	195	97	246	129
94	40	145	66	196	98	247	129
95	40	146	67	197	98	248	130
96	40	147	67	198	99	249	130
97	40	148	68	199	99	250	131
98	40	149	68	200	100	251	132
99	40	150	69	201	101	252	132
100	40	151	70	202	101	253	133
101	40	152	70	203	102	254	134
102	40	153	71	204	102	255	134
103	40	154	71	205	103	256	135
104	40	155	72	206	104	257	135
105	41	156	73	207	104	258	136
106	42	157	73	208	105	259	137
107	42	158	74	209	106	260	137
108	43	159	75	210	106	261	138
109	44	160	75	211	107	262	138
110	44	161	76	212	107	263	139
111	45	162	76	213	108	264	140
112	45	163	77	214	109	265	140
113	46	164	78	215	109	266	141
114	47	165	78	216	110	267	142
115	47	166	79	217	111	268	142
116	48	167	80	218	111	269	143
117	49	168	80	219	112	270	143
118	49	169	81	220	112	271	144
119	50	170	81	221	113	272	145
120	50	171	82	222	114	273	145
121	51	172	83	223	114	274	146
122	52	173	83	224	115	275	147
123	52	174	84	225	116	276	147
124	53	175	85	226	116	277	148
125	53	176	85	227	117	278	149
126	54	177	86	228	117	279	149
127	55	178	86	229	118	280	150
128	55	179	87	230	119	281	150
129	56	180	88	231	119	282	151
130	57	181	88	232	120	283	151
284	152	293	158	302	160	311	160
285	153	294	158	303	160	312	160
286	153	295	159	304	160	313	160
287	154	296	160	305	160	314	160
288	155	297	160	306	160	315	160
289	155	298	160	307	160	316	160
290	156	299	160	308	160	317	160
291	156	300	160	309	160	318	160
292	157	301	160	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED SC COMPOSITE

(SC = VE + AR + AS + MC)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	60	182	89	233	119
81	40	132	60	183	90	234	120
82	40	133	61	184	91	235	121
83	40	134	61	185	91	236	121
84	40	135	62	186	92	237	122
85	40	136	62	187	92	238	122
86	40	137	63	188	93	239	123
87	40	138	64	189	94	240	124
88	40	139	64	190	94	241	124
89	40	140	65	191	95	242	125
90	40	141	65	192	95	243	125
91	40	142	66	193	96	244	126
92	40	143	67	194	97	245	126
93	40	144	67	195	97	246	127
94	40	145	68	196	98	247	128
95	40	146	68	197	98	248	128
96	40	147	69	198	99	249	129
97	40	148	70	199	99	250	129
98	40	149	70	200	100	251	130
99	41	150	71	201	101	252	131
100	41	151	71	202	101	253	131
101	42	152	72	203	102	254	132
102	42	153	72	204	102	255	132
103	43	154	73	205	103	256	133
104	44	155	74	206	104	257	134
105	44	156	74	207	104	258	134
106	45	157	75	208	105	259	135
107	45	158	75	209	105	260	135
108	46	159	76	210	106	261	136
109	47	160	77	211	107	262	136
110	47	161	77	212	107	263	137
111	48	162	78	213	108	264	138
112	48	163	78	214	108	265	138
113	49	164	79	215	109	266	139
114	50	165	79	216	109	267	139
115	50	166	80	217	110	268	140
116	51	167	81	218	111	269	141
117	51	168	81	219	111	270	141
118	52	169	82	220	112	271	142
119	52	170	82	221	112	272	142
120	53	171	83	222	113	273	143
121	54	172	84	223	114	274	144
122	54	173	84	224	114	275	144
123	55	174	85	225	115	276	145
124	55	175	85	226	115	277	145
125	56	176	86	227	116	278	146
126	57	177	87	228	117	279	146
127	57	178	87	229	117	280	147
128	58	179	88	230	118	281	148
129	58	180	88	231	118	282	148
130	59	181	89	232	119	283	149
284	149	293	155	302	160	311	160
285	150	294	155	303	160	312	160
286	151	295	156	304	160	313	160
287	151	296	156	305	160	314	160
288	152	297	157	306	160	315	160
289	152	298	158	307	160	316	160
290	153	299	158	308	160	317	160
291	154	300	159	309	160	318	160
292	154	301	159	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED MM COMPOSITE
(MM = NO + AS + MC + EI)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	58	182	89	233	120
81	40	132	59	183	90	234	121
82	40	133	59	184	90	235	121
83	40	134	60	185	91	236	122
84	40	135	60	186	91	237	122
85	40	136	61	187	92	238	123
86	40	137	62	188	93	239	124
87	40	138	62	189	93	240	124
88	40	139	63	190	94	241	125
89	40	140	63	191	95	242	126
90	40	141	64	192	95	243	126
91	40	142	65	193	96	244	127
92	40	143	65	194	96	245	127
93	40	144	66	195	97	246	128
94	40	145	66	196	98	247	129
95	40	146	67	197	98	248	129
96	40	147	68	198	99	249	130
97	40	148	68	199	99	250	131
98	40	149	69	200	100	251	131
99	40	150	70	201	101	252	132
100	40	151	70	202	101	253	132
101	40	152	71	203	102	254	133
102	40	153	71	204	102	255	134
103	41	154	72	205	103	256	134
104	41	155	73	206	104	257	135
105	42	156	73	207	104	258	135
106	43	157	74	208	105	259	136
107	43	158	74	209	106	260	137
108	44	159	75	210	106	261	137
109	44	160	76	211	107	262	138
110	45	161	76	212	107	263	138
111	46	162	77	213	108	264	139
112	46	163	77	214	109	265	140
113	47	164	78	215	109	266	140
114	48	165	79	216	110	267	141
115	48	166	79	217	110	268	141
116	49	167	80	218	111	269	142
117	49	168	80	219	112	270	143
118	50	169	81	220	112	271	143
119	51	170	82	221	113	272	144
120	51	171	82	222	113	273	145
121	52	172	83	223	114	274	145
122	52	173	84	224	115	275	146
123	53	174	84	225	115	276	146
124	54	175	85	226	116	277	147
125	54	176	85	227	116	278	148
126	55	177	86	228	117	279	148
127	55	178	87	229	118	280	149
128	56	179	87	230	118	281	149
129	57	180	88	231	119	282	150
130	57	181	88	232	120	283	151
284	151	293	157	302	160	311	160
285	152	294	157	303	160	312	160
286	152	295	158	304	160	313	160
287	153	296	159	305	160	314	160
288	154	297	159	306	160	315	160
289	154	298	160	307	160	316	160
290	155	299	160	308	160	317	160
291	156	300	160	309	160	318	160
292	156	301	160	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED CL COMPOSITE

(CL = VE + AR + MK)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
60	40	109	70	158	106	199	136
61	40	110	71	159	107	200	[illegible]
62	40	111	71	160	107	201	[illegible]
63	40	112	72	161	108	202	[illegible]
64	40	113	73	162	109	203	139
65	40	114	74	163	110	204	140
66	40	115	74	164	110	205	140
67	40	116	75	165	111	206	141
68	40	117	76	166	112	207	142
69	41	118	77	167	113	208	143
70	41	119	77	168	113	209	143
71	42	120	78	169	114	210	144
72	43	121	79	170	115	211	145
73	44	122	80	171	115	212	145
74	44	123	80	172	116	213	146
75	45	124	81	173	117	214	[illegible]
76	46	125	82	174	118	215	148
77	47	126	82	175	118	216	148
78	47	127	83	176	119	217	149
79	48	128	84	177	120	218	150
80	49	129	85	178	121	219	151
81	49	130	85	179	121	220	[illegible]
82	50	131	86	180	122	221	[illegible]
83	51	132	87	181	123	222	153
84	52	133	88	182	124	223	154
85	52	134	88	183	124	224	154
86	53	135	89	184	125	225	155
87	54	136	90	185	126	226	156
88	55	137	91	186	126	227	156
89	55	138	91	187	127	228	157
90	56	139	92	188	128	229	158
91	57	140	93	189	129	230	159
92	58	141	93	190	129	231	159
93	58	142	94	191	130	232	160
94	59	143	95	192	131	233	160
95	60	144	96	193	132	234	160
96	60	145	96	194	132	235	160
97	61	146	97	195	133	236	160
98	62	147	98	196	134	237	160
99	63	148	99	197	134	238	160
100	63	149	99	198	135	239	160
101	64	150	100			240	160
102	65	151	101				
103	66	152	102				
104	66	153	102				
105	67	154	103				
106	68	155	104				
107	69	156	104				
108	69	157	105				

CONVERSION OF SUM OF SUBTEST STANDARD SCORES TO ARMY STANDARD SCORES ADJUSTED GT COMPOSITE

(GT = VE + AR)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
40	40	91	90	142	145
41	40	92	91	143	146
42	40	93	93	144	148
43	40	94	94	145	149
44	40	95	95	146	150
45	41	96	96	147	151
46	42	97	97	148	152
47	43	98	98	149	153
48	44	99	99	150	154
49	45	100	100	151	155
50	46	101	101	152	156
51	47	102	102	153	157
52	48	103	103	154	158
53	49	104	104	155	159
54	50	105	105	156	160
55	52	106	107	157	160
56	53	107	108	158	160
57	54	108	109	159	160
58	55	109	110	160	160
59	56	110	111		
60	57	111	112		
61	58	112	113		
62	59	113	114		
63	60	114	115		
64	61	115	116		
65	62	116	117		
66	63	117	118		
67	64	118	120		
68	66	119	121		
69	67	120	122		
70	68	121	123		
71	69	122	124		
72	70	123	125		
73	71	124	126		
74	72	125	127		
75	73	126	128		
76	74	127	129		
77	75	128	130		
78	76	129	131		
79	77	130	132		
80	78	131	134		
81	80	132	135		
82	81	133	136		
83	82	134	137		
84	83	135	138		
85	84	136	139		
86	85	137	140		
87	86	138	141		
88	87	139	142		
89	88	140	143		
90	89	141	144		

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED OF COMPOSITE
(OF = NO + AS + MC + VE)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	57	182	89	233	120
81	40	132	58	183	90	234	121
82	40	133	58	184	90	235	122
83	40	134	59	185	91	236	122
84	40	135	60	186	91	237	123
85	40	136	60	187	92	238	124
86	40	137	61	188	93	239	124
87	40	138	62	189	93	240	125
88	40	139	62	190	94	241	125
89	40	140	63	191	94	242	126
90	40	141	63	192	95	243	127
91	40	142	64	193	96	244	127
92	40	143	65	194	96	245	128
93	40	144	65	195	97	246	129
94	40	145	66	196	98	247	129
95	40	146	67	197	98	248	130
96	40	147	67	198	99	249	130
97	40	148	68	199	99	250	131
98	40	149	68	200	100	251	132
99	40	150	79	201	101	252	132
100	40	151	70	202	101	253	133
101	40	152	70	203	102	254	134
102	40	153	71	204	102	255	134
103	40	154	71	205	103	256	135
104	40	155	72	206	104	257	135
105	41	156	73	207	104	258	136
106	42	157	73	208	105	259	137
107	42	158	74	209	106	260	137
108	43	159	75	210	106	261	138
109	44	160	75	211	107	262	138
110	44	161	76	212	107	263	139
111	45	162	76	213	108	264	140
112	45	163	77	214	109	265	140
113	46	164	78	215	109	266	141
114	47	165	78	216	110	267	142
115	47	166	79	217	111	268	142
116	48	167	80	218	111	269	143
117	49	168	80	219	112	270	143
118	49	169	81	220	112	271	144
119	50	170	81	221	113	272	145
120	50	171	82	222	114	273	145
121	51	172	83	223	114	274	146
122	52	173	83	224	115	275	147
123	52	174	84	225	116	276	147
124	53	175	85	226	116	277	148
125	53	176	85	227	117	278	148
126	54	177	86	228	117	279	149
127	55	178	86	229	118	280	150
128	55	179	87	230	119	281	150
129	56	180	88	231	119	282	151
130	57	181	88	232	120	283	151

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED OF COMPOSITE
(OF = NO + AS + MC + VE)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
284	152	293	158	302	160	311	160
285	153	294	158	303	160	312	160
286	153	295	159	304	160	313	160
287	154	296	160	305	160	314	160
288	155	297	160	306	160	315	160
289	155	298	160	307	160	316	160
290	156	299	160	308	160	317	160
291	156	300	160	309	160	318	160
292	157	301	160	310	160	319	160
						320	160

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CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED SC COMPOSITE
(SC = VE + AR + AS + MC)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	60	182	89	233	119
81	40	132	60	183	90	234	120
82	40	133	61	184	91	235	121
83	40	134	61	185	91	236	121
84	40	135	62	186	92	237	122
85	40	136	62	187	92	238	122
86	40	137	63	188	93	239	123
87	40	138	64	189	94	240	124
88	40	139	64	190	94	241	124
89	40	140	65	191	95	242	125
90	40	141	65	192	95	243	125
91	40	142	66	193	96	244	126
92	40	143	67	194	97	245	126
93	40	144	67	195	97	246	127
94	40	145	68	196	98	247	128
95	40	146	68	197	98	248	128
96	40	147	69	198	99	249	129
97	40	148	70	199	99	250	129
98	40	149	70	200	100	251	130
99	41	150	71	201	101	252	131
100	41	151	71	202	101	253	131
101	42	152	72	203	102	254	132
102	42	153	72	204	102	255	132
103	43	154	73	205	103	256	133
104	44	155	74	206	104	257	134
105	44	156	74	207	104	258	134
106	45	157	75	208	105	259	135
107	45	158	75	209	105	260	135
108	46	159	76	210	106	261	136
109	47	160	77	211	107	262	136
110	47	161	77	212	107	263	137
111	48	162	78	213	108	264	138
112	48	163	78	214	108	265	138
113	49	164	79	215	109	266	139
114	50	165	79	216	109	267	139
115	50	166	80	217	110	268	140
116	51	167	81	218	111	269	141
117	51	168	81	219	111	270	141
118	52	169	82	220	112	271	142
119	52	170	82	221	112	272	142
120	53	171	83	222	113	273	143
121	54	172	84	223	114	274	144
122	54	173	84	224	114	275	144
123	55	174	85	225	115	276	145
124	55	175	85	226	115	277	145
125	56	176	86	227	116	278	146
126	57	177	87	228	117	279	146
127	57	178	87	229	117	280	147
128	58	179	88	230	118	281	148
129	58	180	88	231	118	282	148
130	59	181	89	232	119	283	149

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED SC COMPOSITE
(SC = VE + AR + AS + MC)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
284	149	293	155	302	160	311	160
285	150	294	155	303	160	312	160
286	151	295	156	304	160	313	160
287	151	296	156	305	160	314	160
288	152	297	157	306	160	315	160
289	152	298	158	307	160	316	160
290	153	299	158	308	160	317	160
291	154	300	159	309	160	318	160
292	154	301	159	310	160	319	160
						320	160

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CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED MM COMPOSITE
(MM = NO + AS + MC + EI)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
80	40	131	58	182	89	233	120
81	40	132	59	183	90	234	121
82	40	133	59	184	90	235	121
83	40	134	60	185	91	236	122
84	40	135	60	186	91	237	123
85	40	136	61	187	92	238	123
86	40	137	62	188	93	239	124
87	40	138	62	189	93	240	124
88	40	139	63	190	94	241	125
89	40	140	63	191	95	242	126
90	40	141	64	192	95	243	126
91	40	142	65	193	96	244	127
92	40	143	65	194	96	245	127
93	40	144	66	195	97	246	128
94	40	145	66	196	98	247	129
95	40	146	67	197	98	248	129
96	40	147	68	198	99	249	130
97	40	148	68	199	99	250	131
98	40	149	69	200	100	251	131
99	40	150	70	201	101	252	132
100	40	151	70	202	101	253	132
101	40	152	71	203	102	254	133
102	40	153	71	204	102	255	134
103	41	154	72	205	103	256	134
104	41	155	73	206	104	257	135
105	42	156	73	207	104	258	135
106	43	157	74	208	105	259	136
107	43	158	74	209	106	260	137
108	44	159	75	210	106	261	137
109	44	160	76	211	107	262	138
110	45	161	76	212	107	263	138
111	46	162	77	213	108	264	139
112	46	163	77	214	109	265	140
113	47	164	78	215	109	266	140
114	48	165	79	216	110	267	141
115	48	166	79	217	110	268	141
116	49	167	80	218	111	269	142
117	49	168	80	219	112	270	143
118	50	169	81	220	112	271	143
119	51	170	82	221	113	272	144
120	51	171	82	222	113	273	145
121	52	172	83	223	114	274	145
122	52	173	84	224	115	275	146
123	53	174	84	225	115	276	146
124	54	175	85	226	116	277	147
125	54	176	85	227	116	278	148
126	55	177	86	228	117	279	148
127	55	178	87	229	118	280	149
128	56	179	87	230	118	281	149
129	57	180	88	231	119	282	150
130	57	181	88	232	120	283	151

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED MM COMPOSITE
(MM = NO + AS + MC + EI)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
284	151	293	157	302	160	311	160
285	152	294	157	303	160	312	160
286	152	295	158	304	160	313	160
287	153	296	159	305	160	314	160
288	154	297	159	306	160	315	160
289	154	298	160	307	160	316	160
290	155	299	160	308	160	317	160
291	156	300	160	309	160	318	160
292	156	301	160	310	160	319	160
						320	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED CL COMPOSITE
(CL = VE + AR + MK)

SSSS	ARMY SS	SSSS	ARMY SS
60	40	109	70
61	40	110	71
62	40	111	71
63	40	112	72
64	40	113	73
65	40	114	74
66	40	115	74
67	40	116	75
68	40	117	76
69	41	118	77
70	41	119	77
71	42	120	78
72	43	121	79
73	44	122	80
74	44	123	80
75	45	124	81
76	46	125	82
77	47	126	82
78	47	127	83
79	48	128	84
80	49	129	85
81	49	130	85
82	50	131	86
83	51	132	87
84	52	133	88
85	52	134	88
86	53	135	89
87	54	136	90
88	55	137	91
89	55	138	91
90	56	139	92
91	57	140	93
92	58	141	93
93	58	142	94
94	59	143	95
95	60	144	96
96	60	145	96
97	61	146	97
98	62	147	98
99	63	148	99
100	63	149	99
101	64	150	100
102	65	151	101
103	66	152	102
104	66	153	102
105	67	154	103
106	68	155	104
107	69	156	104
108	69	157	105

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED CL COMPOSITE
(CL = VE + AR + MK)

SSSS	ARMY SS	SSSS	ARMY SS
158	106	199	136
159	107	200	137
160	107	201	137
161	108	202	138
162	109	203	139
163	110	204	140
164	110	205	140
165	111	206	141
166	112	207	142
167	113	208	143
168	113	209	143
169	114	210	144
170	115	211	145
171	115	212	145
172	116	213	146
173	117	214	147
174	118	215	148
175	118	216	148
176	119	217	149
177	120	218	150
178	121	219	151
179	121	220	151
180	122	221	152
181	123	222	153
182	124	223	154
183	124	224	154
184	125	225	155
185	126	226	156
186	126	227	156
187	127	228	157
188	128	229	158
189	129	230	159
190	129	231	159
191	130	232	160
192	131	233	160
193	132	234	160
194	132	235	160
195	133	236	160
196	134	237	160
197	134	238	160
198	135	239	160
		240	160

CONVERSION OF SUM OF SUBTEST STANDARD SCORES
TO ARMY STANDARD SCORES ADJUSTED GT COMPOSITE
(GT = VE + AR)

SSSS	ARMY SS	SSSS	ARMY SS	SSSS	ARMY SS
40	40	91	90	142	145
41	40	92	91	143	146
42	40	93	93	144	148
43	40	94	94	145	149
44	40	95	95	146	150
45	41	96	96	147	151
46	42	97	97	148	152
47	43	98	98	149	153
48	44	99	99	150	154
49	45	100	100	151	155
50	46	101	101	152	156
51	47	102	102	153	157
52	48	103	103	154	158
53	49	104	104	155	159
54	50	105	105	156	160
55	52	106	107	157	160
56	53	107	108	158	160
57	54	108	109	159	160
58	55	109	110	160	160
59	56	110	111		
60	57	111	112		
61	58	112	113		
62	59	113	114		
63	60	114	115		
64	61	115	116		
65	62	116	117		
66	63	117	118		
67	64	118	120		
68	66	119	121		
69	67	120	122		
70	68	121	123		
71	69	122	124		
72	70	123	125		
73	71	124	126		
74	72	125	127		
75	73	126	128		
76	74	127	129		
77	75	128	130		
78	76	129	131		
79	77	130	132		
80	78	131	134		
81	80	132	135		
82	81	133	136		
83	82	134	137		
84	83	135	138		
85	84	136	139		
86	85	137	140		
87	86	138	141		
88	87	139	142		
89	88	140	143		
90	89	141	144		

ADDENDUM

Alternative Validity Estimation Procedures

The procedure used to estimate the validities of the current composites are described on pages 21 and 22, and this procedure was repeated in estimating the validities of alternative composites. Briefly, this procedure involved (1) computing composites by table look-up for sums of ASVAB subtest standard scores, (2) computing correlations between the scaled composites and the criteria in each MOS, (3) adjusting these correlations for restriction of range, and (4) combining across MOS to estimate an average for all MOS using a given composite, weighting the adjusted validities for each MOS by the number of FY81/82 accessions for the MOS. The validities presented in Tables 8, 10, 11, 12, 13, 19, 21, and 22 reflect this approach. The validities of MAGE and HS composites, presented in Tables 23 and 24, differ only in that simple sums of subtest standard scores were used, rather than table look-ups, in step 1.

In searching for optimal alternative composites and in comparing the differential validities of alternative composite sets, a slightly streamlined procedure was used, to allow both efficient and reliable estimation of validities for a large number of alternatives. The computation of composite-criterion correlations was changed in two ways, and these changes were applied uniformly to both current and alternative composites whenever comparisons were made.

First, both current and alternative composites were computed as simple sums of subtest standardscores, because of the computational cost in creating a rescaling of the "sum-of-subtest-standard" scores to make them exactly comparable to the scalings of the current composites. The current procedures for computing composite scores involve reference to conversion tables that give slightly nonlinear translations of the "sum-of-subtest-standard" scores in obtaining the operational composite scores. It should be noted that all analyses in this report were carried out using traditional conversion tables developed using test scores for military personnel who served in World War II. New conversion tables have now been adopted for operational use, based on a new 1980 reference population (see Appendix C).

Second, ridge regressions were used in the process of estimating validities. The composite-criterion validity for an MOS can be estimated as the product of (1) the correlation of the composite with the "best linear predictor" of the criterion using the ASVAB subtest scores and (2) the correlation of that "best linear predictor" with the criterion. Traditionally, the "best linear predictor" is taken to be the ordinary least squares regression function. In carrying out these calculations, however, ridge regression functions, as described on page 31 of the report, were used to estimate the "best linear predictor" rather than the ordinary least squares regression functions. The ridge regression functions have been found to hold up better in cross-validation analyses in comparison to ordinary least squares functions, particularly for smaller samples. The result is that the validities presented

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in Tables 16, 17, and 18, for both current and alternative composites, tend to be slightly smaller in comparison to validities computed directly. The differential validity estimates presented in Tables 27 and 28 were also computed in this way.

Alternative Composite Scales and Cutoffs

After alternative composites were identified, conversion tables were developed that yielded applicant distributions for the new composites that were as similar as possible to the applicant distributions averaged across the existing composites. Further, the new composites were equated to their existing counterparts on the basis of average AFQT levels so that alternative cutoff points could be identified on these new scales (holding constant the AFQT level of selected applicants). The procedures used in developing these conversion and equating tables are described in detail in pages 103-104 of the report.

As these analyses were being completed, ARI was independently preparing a new set of conversion tables based on the NORC 1980 reference population rather than on the current WWII norm group. These new conversion tables involve a simple standardization rather than a nonlinear conversion, except for truncation at three standard deviations. The conversion tables resulting from this effort are presented in Appendix C. These will become the official conversion tables at the beginning of FY85. The conversion tables derived as part of this report and presented in Appendix A do not reflect the switch to a new norm population. They were included here for comparison to the current, soon-to-be-obsolete conversion tables. The development of the new norms presented in Appendix C is described in Mitchell and Hanser (1984).

Methods of Combining Criteria

Separate validations were performed using training scores as criteria and SQT scores as criteria. In addition, as described on pages 17 and 20 of the report, a third set of validations was based on a combined file, using both SQT and training scores as criteria. Two different methods were used for combining criteria. To understand these methods, one must first realize that an initial step in the validation analyses was to standardize the criterion scores in each "cell" to a mean of 100 and standard deviation of 20. A "cell" was defined, on pages 13 and 16, as a group of soldiers in the same MOS who either were in the same training course, for training criteria, or took the same SQT form (year and track), for SQT criteria. For reasons stated in the report, an individual soldier was included in only one training cell, even though he or she may have had scores from more than one course, while he or she could have been included in more than one SQT cell.

The combined criterion analyses used the scores from the cells included in the separate training and SQT analyses, combining all cells in the same MOS. For analyses that relied only on the predictor-criterion covariance matrices (all analyses except the estimation of differential validity and the bootstrap estimation of standard errors), the method of combination was to compute the

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weighted average of the covariance matrices; that is, to compute the pooled within-cell covariance matrix for each MOS. The weights used were the sample sizes for the individual cells.

For those analyses for which the covariance matrix was not sufficient, a file of individual cases was constructed, one record per individual. For soldiers represented more than once in the data base, this entailed selecting among multiple records, each with a different criterion. The selection was arbitrarily set to be the record with the highest criterion score, based on the assumption that the soldier would spend a greater portion of his or her career in the MOS, track, and duty position where his or her performance was best.