Technical Report 1387

Non-Cognitive Tools for Military Occupational Specialties Qualification

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14. ABSTRACT (Maximum 200 words):
This report updates and expands previous research by the Army Research Institute (ARI) examining whether the Tailored Adaptive Personality Assessment System (TAPAS) may be useful for selecting and classifying recruits into Military Occupational Specialties (MOS). The TAPAS data for this research were collected from Army applicants at the Military Entrance Processing Stations (MEPS) between May 2009 and August 2013. In addition, criterion data were collected in the *Tier One Performance Screen* (TOPS) program up until June 2014. With these data, we first examined the validity of the TAPAS scales for predicting outcomes in five high density MOS including 11B, 31B, 68W, 88M, and 91B. Results indicated that the non-cognitive characteristics measured by the TAPAS are essential to MOS performance but are not fully captured by the ASVAB. Next, we also examined whether the TAPAS scales could be used to differentiate high performers in each MOS from those that would perform better in a different occupation. Results of these analyses indicated that some individuals might perform better in an MOS other than their current MOS. Therefore, the TAPAS may be useful as a supplement to the current procedures for MOS qualification and classification.

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NON-COGNITIVE TOOLS FOR MOS QUALIFICATION

EXECUTIVE SUMMARY

Research Requirement:

The Tailored Adaptive Personality Assessment System (TAPAS) was developed by Drasgow Consulting Group (DCG) under the Army's Small Business Innovation Research (SBIR) grant program. At the heart of the assessment system is a trait taxonomy comprising 21 facets of the Big Five personality factors plus six dimensions that cover military-specific temperament traits (Physical Conditioning, Courage, Team-Orientation, Adventure Seeking, Situational Awareness, and Commitment to Serve). TAPAS tests take advantage of modern psychometric methods and computing technology to offer a new generation of personality measures that (a) are fake-resistant, (b) utilize computer adaptive technology to measure across a broad range of trait continua, and (c) are easily customized to meet the assessment needs of diverse occupations and military occupational specialties (MOS).

In May 2009, the U.S. Army approved the initial operational testing and evaluation (IOT&E) of the TAPAS for use with Army applicants at the Military Entrance Processing Stations (MEPS). Dimensions comprising the MEPS version of the TAPAS were selected with the long term goal of creating personality composites that might be used to improve selection and classification decisions. Since that time, several versions of the TAPAS have been administered to nearly one million applicants. In addition, a growing body of research has demonstrated the validity of the TAPAS for predicting important military outcomes (e.g., Allen, Cheng, Putka, Hunter, & White, 2010; Horgen, Nye, White, LaPort, Hoffman, Drasgow, et al., 2013; Knapp, Owens, Allen, 2011; Nye, Drasgow, Chernyshenko, Stark, Kubisiak, White, & Jose, 2012). Therefore, the primary objective of the TAPAS-MOS Qualification effort was to update and expand this previous research using larger samples and newer versions of the TAPAS to evaluate the effectiveness of the TAPAS as a tool for selecting and classifying Soldiers into MOS when administered in a high-stakes applicant setting. The central activity in this effort involved analyzing TAPAS and criterion data, including job knowledge tests, performance evaluations, attitude measures, and attrition data, to determine whether Soldiers could be effectively classified into high density MOS using the TAPAS. The key questions were whether using the TAPAS scales could improve MOS screening and provide improved estimates of performance potential.

Procedure:

The data for this research included TAPAS and criterion data collected through June 2014 in the *Tier One Performance Screen* (TOPS; Knapp, & LaPort, 2014) program. The total data set consisted of 560,193 respondents. From this sample, we examined relationships between TAPAS scales and various criteria in the five largest MOS: Infantry (11B), Combat Medics (68W), Military Police (31B), Motor Transport Operators (88M), and Wheeled Vehicle Mechanics (91B). Due to the large number of criteria measured, we developed a reduced set of criteria for our analyses by combining outcomes into criterion composites. The goal of this step was to create a small number of criterion composites that could be used as dependent variables

for developing TAPAS composites. Based on previous work (Allen, Cheng, Putka, Hunter, & White, 2010; Campbell & Knapp, 2001; Nye et al., 2012), we categorized the criteria in the TOPS dataset into Can-Do and Will-Do composites. However, because attrition represents a substantial cost for the Army, we also examined this variable as a separate outcome. Thus, three criterion composites were created for our analyses. Can-Do performance was comprised of scores on the Army-wide and MOS-specific job knowledge tests. Will-do performance consisted of the Army Life Questionnaire (ALQ) scales (e.g., adjustment, commitment, reenlistment intentions), Army Physical Fitness Test (APFT) scores, training achievement, training failure, and disciplinary incidents. Given their importance to the Army, APFT scores and disciplinary incidents were double weighted whereas the other components of this criterion composite were unit weighted. Scores for each criterion were first standardized to account for differences in their standard deviations and then summed to create overall scores for the Can-Do and Will-Do composites. Adaptation refers to the recoded 12-month attrition variable (1 = Did Not Attrit, 0 = Attrit).

Using these criteria, three sets of analyses were conducted to evaluate TAPAS for MOS qualification and classification. For the first set of analyses, we used regression analysis to examine the predictive validity of the TAPAS facets and to develop TAPAS composites for predicting the Can-Do, Will-Do, and Adaptation criteria in each MOS. A second set of analyses was then conducted to determine the incremental validity of the TAPAS over the ASVAB Aptitude Area (AA) composites for each MOS. These analyses were conducted to explore potential uses of the TAPAS in combination with the ASVAB, which has been used for MOS qualification for several decades. Finally, a third set of analyses examined whether using TAPAS could improve the classification of Soldiers into MOS. From our analyses, we obtained standardized regression equations for predicting performance in each MOS from the composites of TAPAS scales. Using the MOS-specific TAPAS composites for each individual, we studied whether assignment into an MOS on the basis of TAPAS scores could yield increased performance, improved attitudes, and reduced attrition relative to the Army's current assignment system.

Findings:

The TAPAS scales were valid predictors of the Can-Do, Will-Do, and Adaptation criteria. Across MOS, TAPAS composites were shown to have significant relationships with outcomes such as job knowledge test scores, APFT scores, disciplinary incidents, and 12-month attrition, among other criteria. In addition, the TAPAS composites also showed incremental validity over the ASVAB Aptitude Area composites for each MOS. Finally, results also indicated that the pattern of relationships among the TAPAS scales and criterion composites differed across MOS, particularly for the TAPAS Adaptation composite. Therefore, the TAPAS may be useful for classification. In fact, our results indicated that many Army personnel may have performed better in a different MOS than the one they were assigned. In each of the five MOS we examined, approximately 40% of individuals were predicted to perform substantially better in a different MOS based on their TAPAS scores. Although these findings do not consider other factors in the classification process (e.g., MOS availability, Soldier preference, Army needs), they do provide some initial evidence that the TAPAS may be useful for MOS classification. In addition, these findings are consistent with past research examining TAPAS as a classification tool (Knapp, Owens, & Allen, 2011; Nye et al., 2012).

Utilization and Dissemination of Findings:

These results suggest that the TAPAS composites can be useful as supplements to the Army's current qualification and classification systems. These findings have been disseminated widely to military and civilian Army leaders and both commissioned and noncommissioned officers. In the current research, five MOS were examined and validated primarily against measures of training success. These results, while promising, provide only an initial view of the potential of the TAPAS. To support expanded operational applications, more research is needed to examine the utility of the TAPAS for MOS qualification and classification in these MOS and others using measures of in-unit performance and 36-month attrition.

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BACKGROUND

Interest in personality as a predictor of performance has increased considerably over the past two decades. Much of this interest was galvanized by empirical evidence showing that personality constructs, such as conscientiousness, predict performance across a diverse array of civilian and military occupations (e.g., Barrick & Mount, 1991; Campbell & Knapp, 2001) and provide incremental validity beyond general cognitive ability (e.g., Schmidt & Hunter, 1998).

Despite growing interest and positive empirical support for their validity, personality measures have several limitations when used to make important personnel decisions. A major concern is applicant faking in high-stakes settings. Past research has shown that test takers can easily identify the correct or socially desirable responses on single statement personality measures and increase or decrease their scores when sufficiently motivated (White, Young, & Rumsey, 2001). As a result, faking is a potential threat to the validity of the measure and may affect its utility in operational selection settings (White, Young, Hunter, & Rumsey, 2008).

To help address issues with faking on personality assessments in high-stakes settings, the Tailored Adaptive Personality Assessment System (TAPAS) was developed under the Army's Small Business Innovation Research (SBIR) grant program. This assessment takes advantage of modern psychometric methods and computing technology to offer a new generation of personality measures that (a) are fake-resistant, (b) utilize computer adaptive technology to measure across a broad range of trait continua, and (c) are easily customized to meet the assessment needs of diverse occupations and military occupational specialties (MOS). TAPAS tests utilize a multidimensional pairwise preference (MDPP) format that is designed to be resistant to faking. The MDPP format was chosen because it provides a mathematically tractable alternative for constructing and scoring adaptive tests using item response theory (Stark, Chernyshenko, & Drasgow, 2005; Stark, Chernyshenko, Drasgow, & White, 2012). An advantage of the TAPAS is that it matches the two statements in each item pair on both social desirability and extremity on the dimensions they assess. The purpose of matching on these characteristics is to make identifying and selecting the most socially desirable responses more difficult for test-takers. This approach appears to work as research on the operational use of the TAPAS has found no evidence of score inflation, even when compared to other respondents taking the test for "research purposes only" (Drasgow, Stark, Chernyshenko, Nye, Hulin, & White, 2012).

Another advantage of the TAPAS is that it can measure up to 27 personality dimensions or facets, making this assessment among the most comprehensive measures of personality facets that is currently available (Drasgow et al., 2012). Of the 27 dimensions assessed by the TAPAS, 21 cover the behavioral patterns associated with the well-known Big Five personality framework (Goldberg, 1993). The remaining six dimensions cover military-specific temperament traits (Physical Conditioning, Courage, Team-Orientation, Adventure Seeking, Situational Awareness, and Commitment to Serve). As such, the TAPAS is flexible enough that it can be used to predict a number of performance criteria in a broad range of MOS.

TAPAS VALIDATION EFFORTS

Due to the measurement approach used by the TAPAS, this assessment is expected to demonstrate validity even in high-stakes settings where applicants may be motivated to respond dishonestly. In fact, a growing body of evidence suggests that the TAPAS is useful for predicting a broad range of performance criteria. In 2006, ARI initiated the *Validating Future Force Performance Measures* (Army Class) research program to explore the use of several experimental non-cognitive measures for selection and MOS classification. Results showed that the TAPAS provided significant incremental validity over the Armed Services Vocational Aptitude Battery (ASVAB) for predicting attrition, end of training criteria, and in-unit performance (Knapp & Heffner, 2009; Knapp, Owens, & Allen, 2011). In addition, this research also found that the TAPAS provided non-trivial gains in classification efficiency over the ASVAB alone.

Additional predictive validity evidence for the TAPAS was collected during the U.S. Army's *Expanded Enlistment Eligibility Metrics* (EEEM) research project from 2007-2009 (Knapp & Heffner, 2010). The EEEM effort was conducted in conjunction with ARI's longitudinal validation. Again, the TAPAS dimensions showed incremental validity over the Armed Forces Qualification Test (AFQT) for predicting several performance criteria. For example, when TAPAS trait scores were added into a regression analysis based on a sample of several hundred Soldiers, the multiple correlation increased by .26 for the prediction of physical fitness, by .16 for the prediction of disciplinary incidents, and by .20 for the prediction of 6-month attrition (Allen, Cheng, Putka, Hunter, & White, 2010). None of these criteria were predicted well by AFQT alone (predictive validity estimates were consistently below .10).

Based on the results for the Army Class and EEEM research projects, the U.S. Army approved the initial operational testing and evaluation (IOT&E) of the TAPAS for use with Army applicants at Military Entrance Processing Stations (MEPS). Since this project began in May of 2009, the TAPAS has been administered to nearly one million applicants at the MEPS (650,000 Army and 170,000 Air Force). To evaluate the TAPAS and other non-cognitive measures that are part of the IOT&E, training criterion data were also collected as part of the *Tier One Performance Screen* (TOPS) program (Knapp & Heffner, 2012). With these data, a clearer picture of the validity of the TAPAS in operational settings has emerged. For example, research has shown that the TAPAS has validity for predicting a number of performance criteria including Army Physical Fitness Test (APFT) scores, disciplinary incidents, and attrition from the U.S. Army (Knapp & Heffner, 2012).

The TAPAS has also demonstrated validity for predicting performance in individual MOS. Using the TOPS data, Nye, Drasgow, Chernyshenko et al. (2012) developed MOS-specific composites of TAPAS scales for predicting important performance outcomes in MOS 11B (Infantry), 31B (Military Police), 68W (Combat Medics), and 88M (Motor Vehicle Operators). They found adjusted multiple correlations ranging from .18 to .35 for predicting Can-Do criteria (a combination of job knowledge tests) and from .24 to .36 for predicting Will-Do criteria (a combination of behaviors driven by motivation). Results also showed a relationship between the TAPAS scales and 6-month attrition. For example, in MOS 11B, which was the largest MOS in the sample, results showed that the highest scorers on the TAPAS Attrition composite were 78% less likely to leave the Army during their first 6-months of service than those with the lowest scores. Similar results were obtained for the other MOS examined in that research. These results demonstrated that the TAPAS is useful for predicting performance across a broad range of military specialties.

The finding that the TAPAS scales were useful predictors of performance within specific MOS is important because it indicates that the TAPAS scales may be useful for MOS qualification. Subsequent research has continued to show that the TAPAS is flexible enough to predict performance across a broad range of positions within the military, including for Recruiters (Horgen, Nye, White, LaPort, Hoffman, Drasgow, et al., 2013) and Army Special Operations Forces (Nye, Beal, Drasgow, Dressel, White, & Stark, 2014). The research by Nye et al. (2012) also demonstrated the potential use of the TAPAS scales for MOS classification. Although the TAPAS predicted performance in each MOS, the specific scales that were related to the outcomes varied by MOS. As a result, the TAPAS composites examined by Nye et al. (2012) may be useful for both MOS qualification and classification.

TAPAS COMPOSITES

A key factor in the validity of the TAPAS has been the use of composites of TAPAS scales. These composites have several advantages for predicting performance both at the Army-wide level and in particular MOS. Specifically, these composites are important because Army jobs (as with many civilian jobs) are complex and require a broad range of individual characteristics to perform well. Therefore, we would not expect a single narrow TAPAS dimension to predict all aspects of performance in each MOS. Instead, composites of the TAPAS scales will assess a broader range of individual characteristics that might be relevant to performance outcomes. In other words, although we may find only moderate correlations between individual TAPAS scales and performance, we expect combinations of scales to predict performance well. This expectation is consistent with recent research demonstrating that composites of personality scales are better predictors of work outcomes than individual scales (Judge, Rodell, Klinger, Simon, & Crawford, 2013).

With the benefits of personality composites in mind, the TAPAS provides a unique advantage for predicting performance outcomes because it can be used to assess a broad range of personality characteristics and these dimensions can be combined in a number of different ways to form composites for predicting military outcomes. Consequently, several TAPAS composites have been developed and used to predict performance outcomes. As part of the validation analyses in the EEEM project, an initial Education Tier 1 performance screen was developed from the TAPAS scales for the purpose of testing in an applicant setting (Allen et al., 2010). This was accomplished by (a) identifying key criteria of most interest to the Army, (b) categorizing these criteria into “Can-Do” and “Will-Do” performance, and (c) selecting composite scales corresponding to the Can-Do and Will-Do criteria, taking into account both theoretical rationale and empirical results. The result of this process was two composite scores.

1. TAPAS Can-Do composite: The TAPAS Can-Do composite was designed to predict Can-Do criteria such as military occupational specialty (MOS)-specific job knowledge, Advanced Individual Training (AIT) exam grades, and graduation from AIT/One Station Unit Training (OSUT).

2. TAPAS Will-Do composite: The TAPAS Will-Do composite was designed to predict Will-Do criteria such as physical fitness, adjustment to Army life, effort, and support for peers.

Initial validity results suggested that cut scores based on these two composites were promising for selecting higher performing Soldiers.

More recently, these composites have been updated and expanded using the TOPS database. First, the scales comprising the TAPAS composites have been updated using the larger samples of TAPAS and criterion scores collected in the TOPS program. These larger sample sizes provide more accurate and consistent estimates of the composite weights (Nye, Drasgow, Stark, Chernyshenko, & White, 2012). Second, given the substantial cost of attrition for the military, an Attrition composite was added to the Can-Do and Will-Do composites to predict 6-month attrition from the Army (Nye, Drasgow, Stark et al., 2012). Finally, Nye, Drasgow, Chernyshenko et al. (2012) also developed MOS-specific TAPAS composites for predicting Can-Do, Will-Do, and Attrition criteria in four MOS. As described above, there was some variation in these composites across MOS, particularly for the Attrition composite. This suggests that variation in tasks and the individual characteristics required to perform those tasks at the MOS-level may influence the overall validity of the Army-wide TAPAS composite.

PURPOSE OF THE CURRENT RESEARCH

Given the growing literature on the validity of the TAPAS, the primary objective of this effort was to update and expand previous research on the effectiveness of the TAPAS as a tool for MOS qualification. Specifically, the goal of the present research was to examine the validity of MOS-specific TAPAS composites in larger samples, with additional MOS, and with several versions of the TAPAS that have been administered at the MEPS under high-stakes conditions. Given the promising initial findings regarding MOS classification, we also conducted additional analyses to examine the usefulness of TAPAS for classifying individuals into military occupations. This effort involved analyzing TAPAS data as well as criterion data, including job knowledge tests, performance evaluations, attitude measures and attrition data to determine whether Soldiers can be effectively classified into five high density MOS; Infantry (11B), Combat Medics (68W), Military Police (31B), Motor Transport Operators (88M), and Wheeled Vehicle Mechanics (91B).

This report describes the two broad approaches that were taken to evaluate the usefulness of TAPAS as a qualification and classification tool. First, we examined the *predictive accuracy* of the TAPAS scales for predicting criteria important to the Army. Second, we studied whether placement into an MOS on the basis of TAPAS scores could yield increased performance, improved attitudes, and reduced attrition over the current qualification and classification systems.

TAPAS VERSIONS

Since its initial development, the TAPAS scales have undergone several revisions. New scales were developed to assess promising constructs for predicting important Army outcomes and the item pool has been revised, updated, and expanded. For the initial administration of the TAPAS at the MEPS, ARI developed three computerized forms of the TAPAS. These forms utilized a statement pool containing over 800 personality statements. Such a large item pool is necessary to be able to generate thousands of pairwise preference items tailored to the trait levels of individual applicants for enlistment. The item response theory (IRT) statement parameters that are necessary for adaptive administration were estimated for this pool using data collected from large samples of new recruits between 2006 and 2008 (Drasgow et al., 2012).

The first TAPAS version administered at the MEPS was a 13-dimension computerized adaptive test (CAT) containing 104 pairwise preference items. This version is referred to as the TAPAS-13D-CAT. TAPAS-13D-CAT was administered from May 4, 2009 to July 10, 2009 to about 2,200 Army and Air Force recruits. In July 2009, TAPAS MEPS testing was expanded to 15 dimensions by adding the facets of Adjustment from the Emotional Stability domain and Self Control from the Conscientiousness domain, and test length was increased to 120 items. In both cases, testing time was limited to 30 minutes. The adaptive version, referred to as TAPAS-15D-CAT, was introduced in September of 2009 and was administered to a large number of recruits until July 2011.

In 2011, the most substantial revision of the TAPAS was completed. This revision resulted in a new statement pool that was similar in content to the first but provided an independent pool for dedicated use at the MEPS. Providing an item pool exclusively for MEPS administrations was necessary to increase item and test security. Three new TAPAS forms were created based on this new item pool. These versions were labeled version 5 (v5), version 7 (v7), and version 8 (v8). Table 1 summarizes the scales assessed in each version of the TAPAS. For the present research, we examined data from all four versions of the TAPAS[1].

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[1] Beginning in September 2013, three new forms of TAPAS began to be administered at the MEPS. These new forms changed the configuration of the scales to collect additional data on some of the experimental scales. However, an insufficient amount of data was available for these versions of the TAPAS in the TOPS database at the time of this research. Therefore, these scales are not included in these analyses.

Table 1. TAPAS Dimensions Assessed in the MEPS

	TAPAS Phase 1 Versions (June 2009-July 2011)		**TAPAS Phase 2** Versions (August 2011-August 2013)		
TAPAS Scales	13D-CAT **v4**	15D-CAT **v4**	15D-CAT **v5**	15D-CAT **v7**	15D-CAT **v8**
Achievement	X	X	X	X	X
Adjustment	--	X	X	X	X
Adventure Seeking	--	--	--	X	--
Attention-Seeking	X	X	X	X	X
Commitment to Serve	--	--	--	X	--
Cooperation	X	X	X	X	--
Courage	--	--	--	--	X
Dominance	X	X	X	X	X
Even Tempered	X	X	X	X	X
Intellectual Efficiency	X	X	X	X	X
Non-Delinquency	X	X	X	X	X
Optimism	X	X	X	X	X
Order	X	X	X	X	--
Physical Conditioning	X	X	X	X	X
Responsibility	--	--	--	--	X
Self-Control	--	X	X	--	X
Selflessness	X	X	X	X	--
Situational Awareness	--	--	--	X	--
Sociability	X	X	X	--	X
Team Orientation	--	--	--	--	X
Tolerance	X	X	X	--	X

METHOD

SAMPLE

The data for this research effort included TAPAS and criterion data collected through June 2014 in the *Tier One Performance Screen* (TOPS) program. The data consisted of a total of 560,193 respondents. However, only 232,761 respondents had both TAPAS and criterion scores. Therefore, our analyses were based on this subsample of respondents. Approximately 79% of this sample (N = 183,434) were male and 75% (N = 166,308) were Caucasian. In addition, 59% (N = 136,101) of the sample were Regular Army, 29% (N = 67,856) were Army National Guard, and 12% (N = 28,678) were in the Army Reserve. From this sample, we examined relationships among the TAPAS scales and various criteria in the five largest MOS in the database: Infantry (11B), Combat Medics (68W), Military Police (31B), Motor Transport Operators (88M), and Wheeled Vehicle Mechanics (91B).

The largest MOS was Infantry (11B) with a total sample size of 39,132. However, after removing invalid responders (i.e., those that did not answer at least 80% of the items) and individuals identified as potentially unmotivated (e.g., responded too quickly or selected the same response option too many times), the analyses were based on a sample of 36,572 individuals with both TAPAS and criterion scores. The 11B analysis sample was 100% male[2] and 87% Caucasian (N = 15,760). In addition, 76% (N = 14,359) of the sample were Regular Army, 24% (N = 4,431) were Army National Guard, and .3% (N = 52) were Army Reserve.

The total sample size for MOS 31B (Military Police) was 13,536. After removing invalid and unmotivated responders, the analyses were based on a sample of 12,723 individuals with both TAPAS and criterion scores. The analysis sample was 71% (N = 8,981) male and 81% Caucasian (N = 10,339). In addition, 44% (N = 5,585) of the sample were Regular Army, 43% (N = 5,445) were Army National Guard, and 13% (N = 1,693) were Army Reserve.

The total sample size for MOS 68W (Combat Medics) was 15,315. After removing invalid and unmotivated responders, the analyses were based on a sample of 14,529 individuals. The analysis sample was 74% (N = 10,558) male and 78% Caucasian (N = 11,312). In addition, 63% (N = 9,158) of the sample were Regular Army, 25% (N = 3,657) were Army National Guard, and 12% (N = 1,713) were Army Reserve.

The total sample size for MOS 88M (Motor Transport Operators) was 14,991. After removing invalid and unmotivated responders, the analyses were based on a sample of 14,137. The analysis sample was 71% (N = 10,037) male and 67% Caucasian (N = 9,412). In addition, 36% (N = 5,087) of the sample were Regular Army, 44% (N = 6,255) were Army National Guard, and 20% (N = 2,794) were Army Reserve.

The total sample size for MOS 91B (Wheeled Vehicle Mechanic) was 15,436. After removing invalid and unmotivated responders, the analyses were based on a sample of 14,522. The analysis sample was 83% (N = 12,094) male and 74% Caucasian (N = 10,729). In addition,

[2] At the time this research was conducted, females were not able to serve in MOS 11B.

50% (N = 7,220) of the sample were Regular Army, 33% (N = 4,831) were Army National Guard, and 17% (N = 2,471) were Army Reserve.

MEASURES

Predictor Measure: Tailored Adaptive Personality Assessment System (TAPAS). Table 2 lists the descriptions of the personality dimensions assessed by the various TAPAS versions administered at the MEPS.

The administration procedures for all of the TAPAS versions administered in the MEPS were identical. Each testing session was initiated by a test administrator who entered the examinee's identification number into the computer. Next, each examinee was asked to read information related to the purpose of the assessment. After electronically signing the document, examinees saw an instruction page that provided detailed information about answering TAPAS items and then proceeded to answer the actual test items. Detailed results for each TAPAS testing session were then saved and transferred to a central database upon test completion. These included trait scores, the number of minutes taken to complete the test, flags to detect fast responders, and other relevant item response data. Scores were considered "valid" only if an examinee completed at least 80% of the items. (Note that in the event of a test interruption, the administrator could save the session and restart the assessment at the same point).

For comparison with the MOS-specific results presented next, Table 3 shows Army-wide descriptive statistics for the TAPAS dimensions administered at the MEPS. Prior to running all analyses, the TAPAS data were screened for unmotivated responders. Responders were flagged as potentially unmotivated if their observed response patterns contained an unusually low/high number of Statement 1 selections, an unusually large number of patterned responses (e.g., ABABAB…), or their item/test response latencies were unusually fast (e.g., responding to items in less than 1 or 2 seconds).

Table 2. TAPAS Facets

TAPAS Facet Name	Brief Description	"Big Five" Broad Factor
Attention Seeking	High scoring individuals tend to engage in behaviors that attract social attention; they are loud, loquacious, entertaining, and even boastful.	Extraversion
Dominance	High scoring individuals are domineering, "take charge" and are often referred to by their peers as "natural leaders."	
Sociability	High scoring individuals tend to seek out and initiate social interactions.	
Cooperation	High scoring individuals are trusting, cordial, non-critical, and easy to get along with.	Agree.
Selflessness	High scoring individuals are generous with their time and resources.	
Achievement	High scoring individuals are seen as hard working, ambitious, confident, and resourceful.	Conscientiousness
Order	High scoring individuals tend to organize tasks and activities and desire to maintain neat and clean surroundings.	
Non-Delinquency	High scoring individuals tend to comply with rules, customs, norms, and expectations, and they tend not to challenge authority.	
Responsibility	High scoring individuals are dependable, reliable and make every effort to keep their promises.	
Self-Control	High scoring individuals tend to be cautious, levelheaded, able to delay gratification, and patient.	
Adjustment	High scoring individuals are worry free, and handle stress well; low scoring individuals are generally high strung, self-conscious and apprehensive.	Emotional Stability
Even Tempered	High scoring individuals tend to be calm and stable. They don't often exhibit anger, hostility, or aggression.	
Optimism	High scoring individuals have a positive outlook on life and tend to experience joy and a sense of well-being.	
Intellectual Efficiency	High scoring individuals are able to process information quickly and would be described by others as knowledgeable, astute, and intellectual.	Openness To Experience
Tolerance	High scoring individuals are interested in other cultures and opinions that may differ from their own. They are willing to adapt to novel environments and situations.	
Adventure Seeking	High scoring individuals enjoy participating in extreme sports and outdoor activities.	Military Specific Facets
Commitment to Serve	High scoring individuals are more affectively committed to serving in the U.S. Military.	
Courage	High scoring individuals stand up to challenges and are not afraid to face dangerous situations.	
Physical Conditioning	High scoring individuals tend to engage in activities to maintain their physical fitness and are more likely to participate in vigorous sports or exercise.	
Situational Awareness	High scoring individuals pay attention to their surroundings and rarely get lost or surprised.	
Team Orientation	High scoring individuals prefer working in teams and help people to work together better.	

In Table 3, the normed means and standard deviations for the TAPAS scales are presented. To facilitate the comparability of scores across the TAPAS versions, raw dimension scores were normed and transformed into percentile scores and then into standardized scores within each version, so a score of, say, + 1.0 meant that an examinee was 1.0 SD above the mean with respect to the norm group. As can be seen in Table 3, the majority of TAPAS standardized dimension scores had means near zero and standard deviations around one. The normed scores ranged from -2.33 to 2.33. Minor deviations from the expected mean of zero in the total sample were due to slight differences between the Army-wide sample and the norm groups. Each version of the TAPAS used a different norm sample, which was composed of a large sample (ranging from 34,424 for v5 to 60,485 for v4) of Army examinees who completed the TAPAS version during its initial administration at the MEPS. The various forms of TAPAS were not administered an equal number of times at the MEPS so the samples sizes presented in Table 3 vary substantially by scale. The largest samples were obtained for scales administered in v4 because it was the only form administered to every applicant for a little more than two years. In contrast, applicants taking the TAPAS between August 2011 and August 2013 were administered one of three forms (v5, v7, or v8) so not as much data has been collected on these scales during the same period of time.

Table 3. Descriptive Statistics for the TAPAS Dimensions in the Total Sample

TAPAS Facets	N	Normed[a] Mean	Normed[a] Standard Deviations
Achievement	525,441	.00	.98
Adjustment	442,720	-.03	.98
Adventure Seeking	104,936	-.06	.98
Attention Seeking	471,589	-.03	.98
Commitment to Serve	159,222	.00	.98
Cooperation	366,106	.02	.98
Courage	131,962	-.01	.99
Dominance	525,441	-.01	.98
Even Tempered	525,441	.01	.98
Intellectual Efficiency	525,441	-.02	.97
Non-Delinquency	471,155	.03	.98
Optimism	525,441	.00	.98
Order	420,418	.01	.98
Physical Conditioning	525,441	.00	.98
Responsibility	131,936	.00	.99
Self-Control	337,784	.01	.98
Selflessness	420,418	.02	.98
Situational Awareness	131,875	-.02	.98
Sociability	420,505	.01	.98
Team Orientation	132,396	.00	.99
Tolerance	420,505	.01	.98

[a] Scores were standardized based on norming samples of approximately 34,000 to 60,000 (depending on the TAPAS version) Army examinees who completed the TAPAS at the MEPS.

Predictor Measure: Armed Services Vocational Aptitude Battery (ASVAB). Because of its role in the current selection and classification systems, we used ASVAB scores as the baseline for comparing the predictive validity of the TAPAS scales in each MOS. The ASVAB contains 9 subtests that assess multiple aptitudes, which are combined to create composites, and used as the basis for current selection and classification decisions. For example, the Armed Forces Qualification Test (AFQT), which is a composite of the Word Knowledge, Paragraph Comprehension, Arithmetic Reasoning, and Math Knowledge subtests of the ASVAB, is used for enlistment screening. For MOS classification, the ASVAB subtests are used to form nine Aptitude Area (AA) composites that correspond to the various MOS. The Combat (CO) AA composite is used for MOS 11B (Infantry), the Skilled Technical (ST) AA composite is used for both MOS 31B (Military Police) and for MOS 68W (Combat Medics), the Operator and Food Service (OFS) AA composite is used for MOS 88M (Motor Transport Operators), and the Mechanical Maintenance (MM) AA composite is used for MOS 91B (Wheeled Vehicle Mechanics). Applicants must receive a minimum score on each of these composites to qualify for the corresponding MOS. A key part of this research was to develop MOS-specific TAPAS composites for predicting performance in each these five MOS and to investigate their potential for use in MOS qualification. Accordingly, correlations of these TAPAS composites with the corresponding ASVAB AA composite and preliminary evidence of incremental validity are provided to illustrate the potential contribution that TAPAS can make as a supplement to the current MOS qualification procedures.

Criterion Measures. A number of criterion measures were available for evaluation of the criterion-related validity of the TAPAS. These measures were collected as part of the TOPS program and included end of training assessments and administrative criteria (Knapp, Heffner & White, 2010). More specifically, the criteria included the Army-Wide and MOS-Specific Job Knowledge Tests (JKT), the Army Life Questionnaire (ALQ), Army-Wide and MOS-Specific Performance Rating Scales, the Army Physical Fitness Test (APFT) scores, Training Achievement (AIT/OSUT Schoolhouse Grades), Training Failure (AIT/OSUT Graduation), Disciplinary Incidents, and Attrition. Below, we provide an overview of each of these criterion measures. Descriptive statistics for the criterion measures in the total sample are presented in Table 4.

The first end of training criterion measures were the Army-Wide and MOS-Specific JKTs, which were originally developed for the *Future Force Performance Measures* (*Army Class*) project (Knapp & Heffner, 2009). The Army-Wide JKT assessed general aspects of Soldier performance applicable across all Army MOS. The MOS-Specific JKTs assessed knowledge of basic facts, principles, and procedures required of Soldiers during training using a variety of item formats including multiple choice and rank order. MOS-Specific JKTs utilized in this effort were for Infantry (11B), Military Police (31B), Combat Medics (69W), Motor Transport Operators (88M), and Wheeled Vehicle Mechanics (91B). For the current analyses, we used the total score across all MOS-specific JKT items for that MOS.

The next measure included was the ALQ, which assesses Soldiers’ self-reported attitudes and experiences in the Army, and particularly, for these data, in training. For the current effort, the focus was on nine dimensions: Affective Commitment, Normative Commitment, Army Career Intentions, Reenlistment Intentions, Army-Civilian Comparison, Attrition Cognition, Army Life Adjustment, Army Needs-Supply Fit, and MOS Fit. Each of these dimensions is measured with four to nine item scales. Additionally, the ALQ data set included Soldiers’ most recent APFT scores. The APFT is a measure of physical fitness as indexed by ability to perform certain numbers of push-ups and sit-ups, and time taken to complete a two-mile run, adjusted for age. Finally, the ALQ data also included self-reported Disciplinary Incidents. For these, scores were computed by summing the “yes” responses to a list of possible incidents.

End of training Performance Ratings, both MOS-specific and Army-wide, were also available in this dataset. These ratings were provided by drill sergeants or training cadre who rated up to nine dimensions of performance on a Behaviorally Anchored Rating Scales (BARS). Unfortunately, the sample sizes for these ratings were too small to include these variables in our analyses. Although a large number of performance ratings were available for individuals who had completed TAPAS v4, an insufficient number of ratings were available for individuals who had completed v5, v7, or v8. Therefore, correlations were not computed between the TAPAS scales and performance ratings for these analyses[3].

Soldier attrition was also available in the data set. Attrition generally includes voluntary and involuntary separations from the Army for a variety of reasons as designated by the Soldier's Separation Program Designator code. The measure of attrition used here was a single dichotomous variable (1 = Attrit, 0 = Did Not Attrit) that reflected whether the Soldier had separated 12 months into his or her Army career. For the current project, we focused on Adaptation (attrition recoded as 1 = Did Not Attrit, 0 = Attrit), rather than attrition.

Table 4. Descriptive Statistics for the Criterion Measures in the Total Sample

Criteria	N	Mean	Standard Deviation	Min.	Max.
Army Wide JKT	21,654	22.07	4.54	2	36
MOS-Specific JKT (Standardized)	17,395	.00	1.00	-4.78	2.60
Army Physical Fitness Test Score	22,044	253.17	28.20	180	300
ALQ Affective Commitment	22,682	3.90	.67	1.00	5.00
ALQ Normative Commitment	22,682	4.18	.68	1.00	5.00
ALQ Army Career Intentions	22,682	3.20	1.09	1.00	5.00
ALQ Reenlistment Intentions	22,682	3.49	.95	1.00	5.00
ALQ Attrition Cognition	22,682	1.51	.59	1.00	5.00
ALQ Army Life Adjustment	22,682	4.09	.66	1.00	5.00
ALQ MOS Fit	22,682	3.77	.84	1.00	5.00
Training Achievement	22,670	.40	.61	0	2
Training Failure	22,682	.43	.66	0	4
Disciplinary Incidents	20,950	.28	.63	0	7
12-month Attrition	182,709	.08	.28	0	1

The next two administrative criteria were also related to training, and were obtained from the Army Training Requirements and Resources System (ATTRS) and Resident Individual Training Management System (RITMS). The first of these was whether the Soldier had graduated from AIT/OSUT. This variable, Training Failure, was scored dichotomously (0 = Graduate, 1 = Failure). Soldiers who were still enrolled in initial military training (IMT) were excluded from analyses using the "graduation" variable. The second training variable taken from IMT records reflected Training Achievement and included AIT/OSUT School Grades.

[3] Analyses were conducted to examine the differences in prediction both with and without the performance ratings included in the Will-Do composite. Using data from TAPAS v4, we estimated separate regression models for predicting both criteria. Although slight differences did exist, they were not substantial. For example, in MOS 11B, the multiple R for the regression model predicting the Will-Do criterion with performance ratings included was .35 compared to .32 when performance ratings were excluded. Similar results were found for each of the other MOS as well. Although these differences were not substantial, more research is needed to examine the prediction of Will-Do performance when more data on the performance ratings are available.

Criterion Composites. Given the large number of criteria measured, we developed a reduced set of criteria for our analyses by combining outcomes into criterion composites. The goal of this step was to create a small number of variables that could be used as outcomes for developing TAPAS classification composites. To do so, more emphasis was placed on creating a manageable number of criterion composites for prediction rather than a unidimensional combination of dependent variables. Therefore, we created the same three criterion composites that had been developed in earlier TOPS datasets (Nye et al., 2012). The original composites were developed using factor analysis and in consultation with subject matter experts (e.g., Army NCOs, ARI psychologists) to develop a conceptual model of Soldier performance. This model of Soldier performance was based on the conceptual similarities and importance of each criterion to the Army. Therefore, these original composites were viewed as appropriate for the current research as well.

In Project A, two predictor composites labeled Can-Do and Will-Do performance were developed for employee selection (Campbell & Knapp, 2001). Similarly, TAPAS composites were developed to predict Can-Do and Will-Do criteria in the EEEM project (Allen et al., 2010). Based on this work, and previous research on MOS qualification and classification using the TOPS datasets (Nye et al., 2012), we also categorized the criteria in the TOPS dataset into Can-Do and Will-Do composites. However, because attrition represents a substantial cost for the Army, we also examined this variable as a separate outcome. Thus, three criterion composites were created for our analyses. Can-Do performance was comprised of scores on the Army-wide and MOS-specific job knowledge tests. Will-Do performance consisted of the ALQ scales (e.g., adjustment, commitment, reenlistment intentions), Army Physical Fitness Test (APFT) scores, training achievement, training failure, and disciplinary incidents. Given their importance to the Army, APFT scores and disciplinary incidents were double weighted whereas the other components of this criterion composite were unit weighted. Again, although performance ratings have traditionally been included in the Will-Do composite (Nye et al., 2012), they were excluded here due to the small number of ratings available for recent versions of the TAPAS. Scores for each criterion were first standardized to account for differences in their standard deviations and then summed to create overall scores for the Can-Do and Will-Do composites. Adaptation refers to the recoded 12-month attrition variable (1 = Did Not Attrit, 0 = Attrit).

OVERVIEW OF ANALYSES

Two sets of analyses were conducted to evaluate TAPAS as a MOS qualification and classification tool. For the first set of analyses, we used regression analysis to identify the predictive validity of the TAPAS facets. Specifically, we developed TAPAS composites to predict the Can-Do, Will-Do, and Adaptation criterion composites in each MOS. Again, the Can-Do performance criterion was a composite of Army-Wide and MOS-specific job knowledge tests; the Will-Do performance composite was comprised of APFT scores, training achievement and failure, disciplinary incidents, and the ALQ scales; and Adaptation refers to the recoded 12-month attrition from the Army.

One difficulty with analyzing the TAPAS data is that the different versions of TAPAS included different scales. Again, the purpose of administering different versions was to collect data on several new TAPAS scales and to determine the validity of these scales while still administering the facets that were being used operationally. As such, each TAPAS form included a core subset of scales and several additional scales that varied by form. Although this approach provided data on promising new scales, it also presented problems for data analyses.

Specifically, the design of these forms resulted in missing data for some of the scales and, therefore, the raw data could not be analyzed using traditional ordinary least square (OLS) regression and listwise deletion of missing data.

To address this issue, we used a meta-analytic approach to our analyses. First, we estimated correlations between all of the TAPAS scales and criteria for each version of the TAPAS and within each MOS. Because the Adaptation variable was scored dichotomously (1 = Did Not Attrit, 0 = Attrit), calculating regular Pearson correlations with this variable would have resulted in attenuated estimates of the relationships between the TAPAS scales and Adaptation. Therefore, we estimated biserial correlations, which correct the distributional assumptions of dichotomous variables, between the TAPAS scales and Adaptation. Pearson correlations were calculated for all other correlations in the matrix.

Next, we estimated a single correlation matrix for each MOS by calculating the sample size weighted average correlations across TAPAS versions. However, due to the design of the TAPAS forms, none of the experimental TAPAS scales that were administered only in v7 or v8 could be included in our analyses because these scales were never administered together with all of the other scales that were included in the combined correlation matrix. Therefore, including the new scales would have resulted in missing values in the correlation matrices and the analyses could not have been conducted. Using our approach, we were able to calculate a single full correlation matrix for each MOS based on all of the available data for pairs of scales that were administered together in at least one of the TAPAS versions. A similar approach is used to conduct meta-analyses and to estimate correlations across studies in the psychological sciences (Hunter & Schmidt, 2004). An important advantage of this approach is that several scales that were missing on some versions of the TAPAS could still be included in the analyses. In contrast, the meta-analytic approach applied here allowed us to use all of the available information for our analyses.

These meta-analytic correlation matrices were then used to evaluate TAPAS for MOS qualification. In each of the target MOS, we developed three separate TAPAS composites for predicting the three criteria. To do so, we regressed the Can-Do, Will-Do, and Adaptation criterion composites onto the TAPAS scales and estimated the regression weights for each facet. The meta-analytic correlation matrix was used as the input for these analyses and OLS regression was used for predicting all three criteria. One challenge with conducting the analyses in this way was determining the sample size. This is problematic because each correlation in the matrix has a different sample size due to the fact that not all scales were included in all versions of the TAPAS. To determine the sample size for these analyses, we took the average sample size for each correlation involving the dependent variable in the analysis. For example, when predicting the Will-Do criterion, we used the average sample size for all correlations between the TAPAS scales and the Will-Do criterion across all versions of TAPAS. Past research has noted the difficulty with identifying samples sizes for meta-analytic correlation matrices (Cheung & Chan, 2009). An alternative to using the average sample size would be to use the smallest sample size in the matrix, which would be analogous to using listwise deletion where only individuals with data on all variables would be included in the analyses. Another option could be to use the total sample size, which would result in a much larger sample size for the analyses. However, neither of these approaches are ideal because the sample sizes for most correlations would either be overestimated (e.g., when using the total sample size) or underestimated (e.g., when using the smallest sample size). Therefore, we used the average sample size for our analyses because the average is the best approximation of the sample size for each correlation. Based on these analyses, we identified the TAPAS scales that were significant predictors of each criterion and used these scales to form TAPAS composites for use in MOS qualification. Then, we computed predicted scores for each of the three criteria using only these TAPAS scales and the regression weights estimated in each MOS.

After developing MOS-specific composites for each criterion, a second set of analyses was conducted to determine the incremental validity of the TAPAS over the ASVAB Aptitude Area (AA) composites for each MOS. In addition to examining incremental validity, a second goal of these analyses was to determine the combined validity of these two screening measures. These analyses were conducted to explore potential uses of the TAPAS in combination with the ASVAB, which has been used for MOS qualification for several decades.

Finally, the third set of analyses examined whether using TAPAS could improve the classification of Soldiers into MOS. From our analyses of predictive accuracy, we obtained standardized regression equations for predicting the criterion variables in each MOS from the composites of TAPAS scales. Using these equations, we computed scores on the Can-Do, Will-Do, and Adaptation criteria for each person in each MOS. Individuals were then (hypothetically) assigned to the MOS for which they had the highest potential for performance and satisfaction. Finally, we evaluated whether using TAPAS in this way could improve performance potential across MOS. Although this approach provides an overly simplified view of the classification process (i.e., it does not consider factors like Soldier preference, MOS needs, or training availability), these analyses illustrate the potential gains in performance that can be obtained by using the TAPAS.

PREDICTIVE VALIDITY: MOS 11B (INFANTRY)

Table 5 shows the descriptive statistics for the TAPAS scales and the criterion composites for the largest MOS in this sample (11B). Again, raw dimension scores were normed and transformed into standardized scores within each version, so a score of, say, + 1.0 meant that an examinee was 1.0 SD above the mean with respect to the norm group. In other words, departures from the mean of zero indicate differences between this group and the Army-wide samples of applicants used for norming. As such, Table 5 suggests that the Infantry Soldiers in this sample had higher mean scores on Physical Conditioning, Courage, and Adventure Seeking but slightly lower mean scores on Tolerance, Selflessness, and Order relative to the norming sample of Army applicants. Table 6 shows the meta-analytic correlation matrix between the TAPAS scales and the three criteria. Again, this matrix was used as input for our regression analyses and these correlations were estimated by calculating the sample-size weighted average correlations across each TAPAS version.

Table 5. Descriptive Statistics for the TAPAS Scales and Criterion Composites in MOS 11B

TAPAS Scales	N	Normed[a] Mean	Normed[a] Standard Deviation
Achievement	36,547	.04	.99
Adjustment	32,320	.16	.97
Adventure Seeking	6,867	.29	.97
Attention Seeking	33,839	.02	1.00
Commitment to Serve	9,628	.19	.95
Cooperation	27,182	-.07	.98
Courage	7,961	.27	.95
Dominance	36,547	.05	1.01
Even Tempered	36,547	.01	.99
Intellectual Efficiency	36,547	-.04	.97
Non-Delinquency	33,786	-.02	.99
Optimism	36,547	.04	.97
Order	29,937	-.15	.95
Physical Conditioning	36,547	.28	.98
Responsibility	7,967	.05	.97
Self-Control	25,453	-.05	.99
Selflessness	29,937	-.13	.98
Situational Awareness	8,218	.06	.98
Sociability	29,680	-.01	1.00
Team Orientation	8,014	.11	.98
Tolerance	29,680	-.14	.98
Criterion Composites			
Will-Do Criterion[b]	8,186	.00	4.07
Can-Do Criterion[b]	7,880	-.10	1.67
Adaptation[b]	23,868	.91	.28

[a] TAPAS scores were standardized based on norming samples of approximately 34,000 to 60,000 (depending on the TAPAS version) Army examinees who completed the TAPAS at the MEPS.
[b] The criterion composites were not normed and, therefore, only the raw scores are reported.

Table 6. Correlations Between the TAPAS Facet Scales and Each Criterion Composite in MOS 11B

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Achievement	1.00																		
2. Adjustment	0.10	1.00																	
3. Attention Seeking	0.06	0.11	1.00																
4. Cooperation	0.08	0.07	-0.01	1.00															
5. Dominance	0.31	0.10	0.22	-0.04	1.00														
6. Even Tempered	0.07	0.19	-0.04	0.27	-0.08	1.00													
7. Intellectual Eff.	0.24	0.19	0.09	-0.01	0.26	0.06	1.00												
8. Non-Delinquency	0.17	-0.01	-0.15	0.21	-0.03	0.21	0.02	1.00											
9. Optimism	0.15	0.25	0.11	0.14	0.11	0.15	0.09	0.10	1.00										
10. Order	0.15	-0.05	-0.06	0.05	0.06	0.00	0.07	0.12	-0.01	1.00									
11. Physical Cond.	0.22	0.06	0.11	-0.05	0.22	-0.11	0.09	-0.04	0.07	0.07	1.00								
12. Self-Control	0.21	0.06	-0.10	0.12	0.04	0.21	0.18	0.26	0.07	0.19	-0.03	1.00							
13. Selflessness	0.11	-0.02	-0.07	0.21	0.03	0.13	0.01	0.16	0.06	0.05	-0.02	0.10	1.00						
14. Sociability	0.07	0.10	0.35	0.18	0.22	0.02	0.02	-0.02	0.19	-0.03	0.08	-0.07	0.09	1.00					
15. Tolerance	0.08	0.04	0.03	0.15	0.04	0.15	0.08	0.06	0.09	0.02	-0.04	0.11	0.29	0.12	1.00				
16. Can-Do Criterion Composite	0.04	0.08	0.01	-0.03	0.02	0.06	0.19	-0.02	0.02	-0.07	0.02	0.02	-0.02	-0.12	-0.02	1.00			
17. Will-Do Criterion Composite	0.15	0.04	0.09	-0.01	0.17	-0.04	0.07	0.00	0.07	0.04	0.26	0.00	0.01	0.03	0.00	0.07	1.00		
18. Adaptation Criterion Composite	0.06	0.02	0.07	-0.03	0.07	-0.02	0.01	-0.04	0.04	-0.03	0.15	-0.05	-0.05	0.02	-0.04	0.03	0.25	1.00	
19. ASVAB CO AA Composite	0.09	0.12	0.04	-0.10	0.11	0.06	0.33	-0.06	0.05	-0.13	0.07	-0.01	-0.09	-0.11	-0.05	0.49	0.08	0.09	1.00

The scales comprising the TAPAS composites for predicting the Can-Do, Will-Do, and Adaptation criteria in MOS 11B are indicated in Table 7. The values presented in this table represent the standardized regression weights for each of the TAPAS facets that were significant predictors of the criterion composite. The multiple R's for the three criteria ranged from .18 to .30 and the adjusted R's ranged from .18 to .29, indicating that the TAPAS composites were moderate predictors of performance in the Infantry.

Because personality is an antecedent for motivation to perform well on the job (Judge & Ilies, 2002; White et al., 2001), TAPAS scales were expected to be particularly strong predictors of Will-Do criteria. As shown in Table 7, this was the case in MOS 11B. The multiple R for the Will-Do composite was .30 and was larger than either of the other criterion composites. In addition, the Physical Conditioning scale was the best predictor of the Will-Do performance criterion. Physical Conditioning was also the strongest predictor of Adaptation with high scores on this scale leading to a greater probability of completing the first year of enlistment. The TAPAS Intellectual Efficiency scale emerged as the best predictor of Can-Do performance. This was expected given the cognitive content of the Intellectual Efficiency scale.

Table 7. Standardized Regression Weights for the TAPAS Facets in each Composite for MOS 11B

TAPAS Facets	Criteria: Can-Do	Will-Do	Adaptation[a]
TAPAS: Achievement		.07	.03
TAPAS: Adjustment			
TAPAS: Attention Seeking	.04	.04	.03
TAPAS: Cooperation			
TAPAS: Dominance		.09	.03
TAPAS: Even Tempered	.05		
TAPAS: Intellectual Efficiency	.19		
TAPAS: Non-delinquency			
TAPAS: Optimism		.03	.04
TAPAS: Order	-.09		-.03
TAPAS: Physical Conditioning		.22	.13
TAPAS: Self-Control			-.05
TAPAS: Selflessness			-.02
TAPAS: Sociability	-.14		-.03
TAPAS: Tolerance			-.03
Multiple R	.25	.30	.18
Adjusted Multiple R	.24	.29	.18

Note: Samples sizes: Can-Do N = 1,863; Will-Do N = 1,932; Adaptation N: 5,216. To provide a more complete estimate of performance with each composite, scales were included in the composite if p < .10.
[a] In contrast to analyses in previous research (e.g., Nye et al., 2012), these analyses were conducted using regular OLS regression instead of logistic regression. To account for the dichotomous nature of the Adaptation variable in our meta-analytic correlation matrix, we calculated biserial correlations for the correlations between the TAPAS scales and Adaptation.

Table 8 shows the significant correlations between the three TAPAS composites for Infantry and various performance outcomes in that specialty. Overall, the TAPAS composites for the Will-Do and Adaptation criteria showed the largest number of significant correlations across the performance outcomes. However, the TAPAS Can-Do composite was also significantly correlated with measures of job knowledge. For comparison, significant correlations between the ASVAB Combat (CO) Aptitude Area (AA) composite for MOS 11B and both the TAPAS composites and the criteria are also included. As expected, the ASVAB CO composite was most highly correlated with the TAPAS Can-Do composite and Can-Do criteria.

Table 8. Significant Correlations Between the Criterion Measures and the TAPAS Composites in MOS 11B

Criteria	MOS 11B TAPAS Composites			
	Can-Do TAPAS Composite	Will-Do TAPAS Composite	Adaptation TAPAS Composite	ASVAB CO AA Composite
ASVAB CO AA Composite	.41	.13	.16	--
Can-Do Criterion Composite	.26	.04	.06	.49
MOS-Specific Job Knowledge Test	.24	.04	.06	.45
Army-Wide Job Knowledge Test	.21	.04	.05	.44
Will-Do Criterion Composite		.30	.26	.08
APFT Scores		.33	.29	.10
Overall ALQ	.04	.13	.09	
Training Achievement	-.06	.13	.09	-.11
Training Failure	-.03	-.15	-.16	-.11
Disciplinary Incidents		-.10	-.09	-.07
12-Month Attrition		-.09	-.11 [a]	-.07

Note: Correlations included if $p < .05$. [a] This value is based on the Pearson correlation between the predicted score and attrition. Due to the dichotomous attrition variable, this value was expected to be lower than the multiple R in Table 7 which was based on a regression analysis using biserial correlations.

Figure 1 illustrates the magnitude of these relationships. This figure shows quintile plots predicting MOS-specific job knowledge, 12-month attrition, Army Physical Fitness Test (APFT) scores, and disciplinary incidents as examples of the relationships between the criteria and the TAPAS composites developed here. On the X-axes of these plots are the quintiles for the predicted scores from the three TAPAS composites described above. On the Y-axes are scores on the criterion variable. Because attrition and disciplinary incidents were dichotomous variables, the Y-axes for these graphs represent the percentage of individuals in each quintile that left the Army or were involved in disciplinary incidents. Note that attrition and disciplinary incidents were negatively related to the composites described above. Therefore, lower TAPAS scores (i.e., the bottom quintiles) should lead to higher percentages of attrition and disciplinary incidents. The Y-axes for APFT and job knowledge plots are scaled to range from +/- 1 standard deviation from the mean of the criterion.

As shown in Figure 1, TAPAS was useful for identifying high performers on the APFT and MOS-specific job knowledge test in 11B. Soldiers in the bottom 20% of the Will-Do composite averaged 27 points lower on the APFT than those in the highest 20%. Similarly, individuals with scores in the lowest quintile for the TAPAS Can-Do composite scored an average of 13 points lower on the MOS-specific job knowledge test. In addition, 15% of individuals in the lowest quintile of the TAPAS Adaptation composite were separated from the Army during their first 12 months of service while only 6% of those in the highest quintile ended their service during this time frame. Finally, only 11% of the highest scorers on the TAPAS Will-Do composite were involved in disciplinary incidents compared with 20% of the lowest scorers. These results suggest that the apparently modest correlations illustrated in Table 8 can have substantial practical importance when used for MOS qualification and assignment. This was particularly evident for 12-month attrition where the correlations were generally small but the attrition rates were substantially different between the highest and lowest scoring groups on the Adaptation composite (i.e., from just 6% attrition to 15% attrition, respectively).

We also examined the incremental validity of the TAPAS composites for predicting important Army criteria over the AA composite used for qualification into MOS 11B. Because aptitude tests like the ASVAB and the aptitude area composites created from its subscales have been shown to be strong predictors of job knowledge (Hunter & Hunter, 1984; Campbell & Knapp, 2001), we expected the TAPAS to provide little incremental validity when predicting the Can-Do criterion composite. However, given the relationship between personality and performance motivation (Judge & Ilies, 2002), we expected the TAPAS to provide substantial incremental validity for predicting Will-Do and Adaptation criteria.

Figure 2 provides the results from hierarchical regression analyses using both the Combat AA composite used for MOS 11B and the TAPAS composites shown in Table 7 to predict Can-Do, Will-Do, and Adaptation criteria. In these analyses, the Combat AA Composite was included in Step 1 and the TAPAS scales were added in Step 2. As expected, the TAPAS did not contribute substantially to the prediction of Can-Do criteria when the Combat AA composite was already included in the model. However, the TAPAS composites did contribute substantial incremental validity to the prediction of Will-Do and Adaptation criteria. Adding the TAPAS composites to the regression equations for these outcomes increased the multiple R's by .22 and .09, respectively, when predicting these criteria. Thus, the TAPAS composites developed here can contribute to the prediction of a broader range of criteria. The validities of the TAPAS composites alone are also illustrated for comparison with the hierarchical regression results.

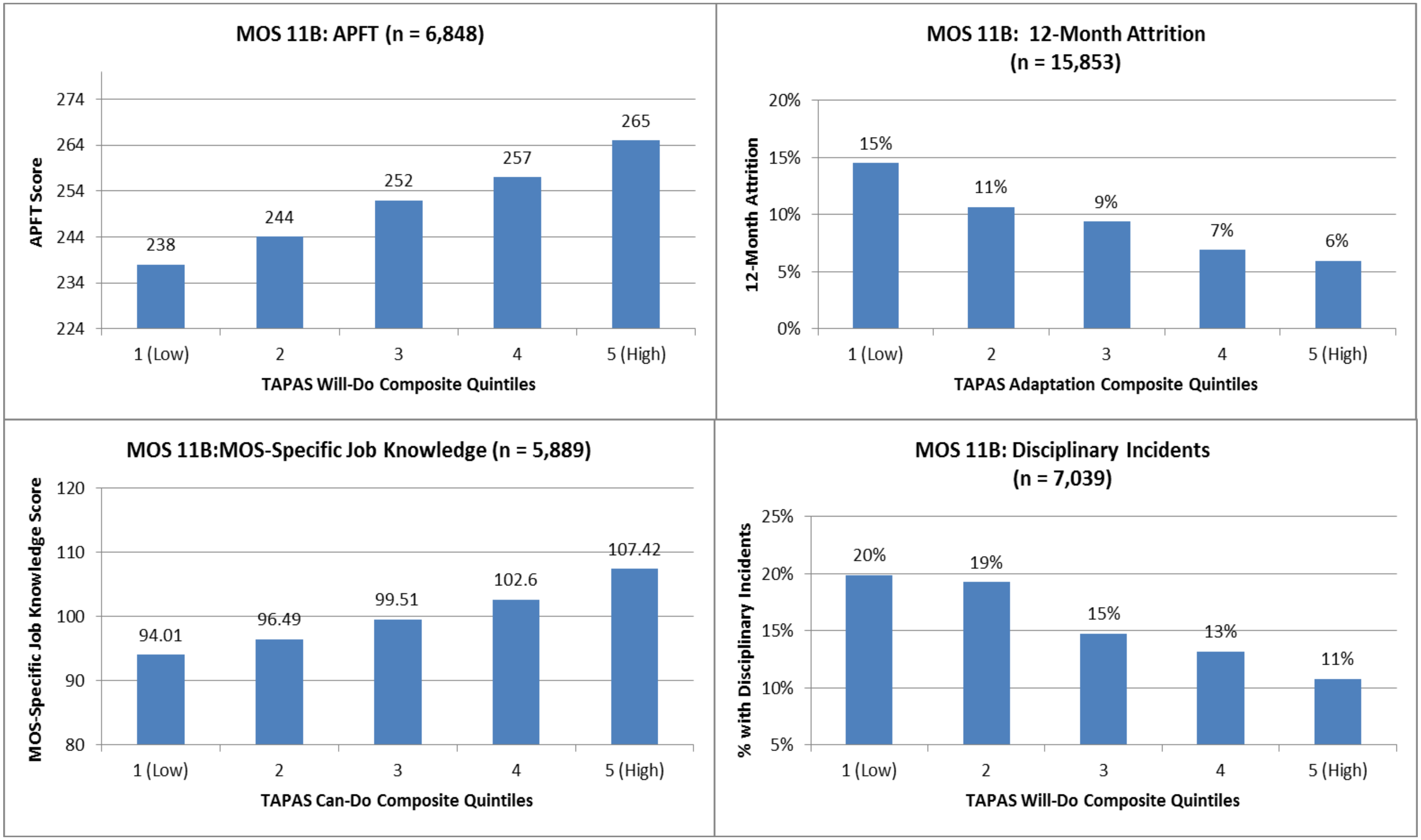

Figure 1. MOS 11B TAPAS Composite Quintile Plots for APFT scores, 12-Month Attrition, MOS-Specific Job Knowledge Scores, and Disciplinary Incidents.

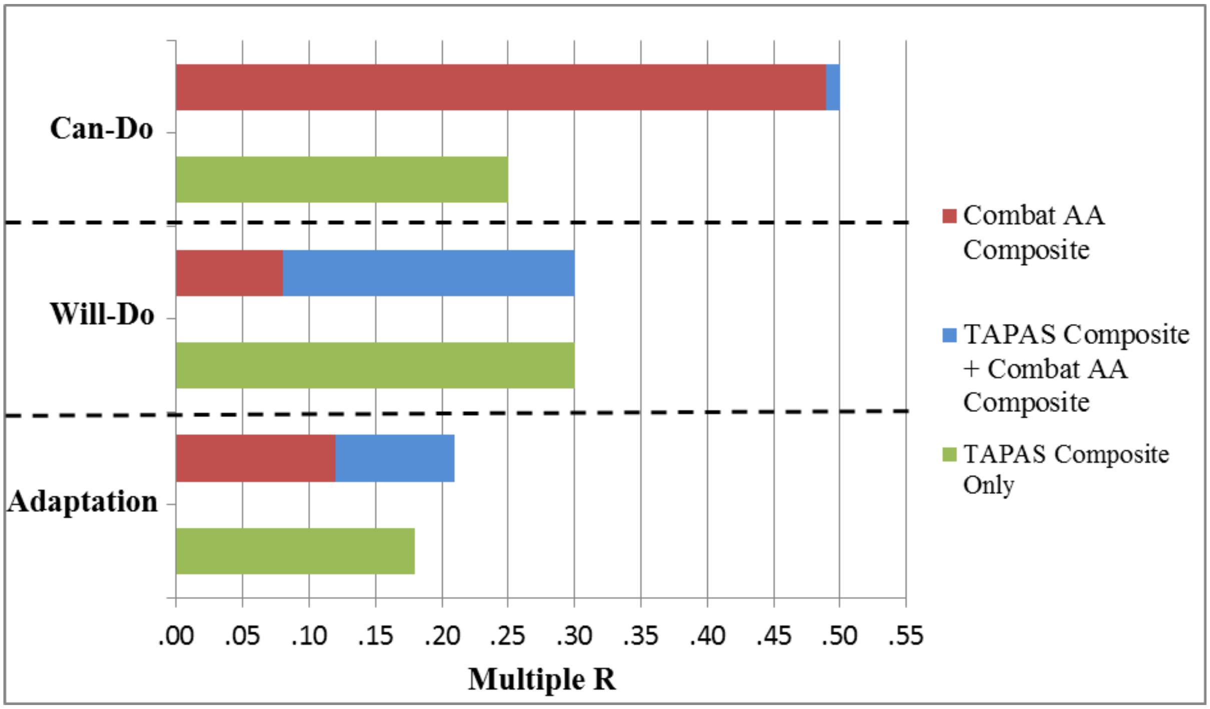

Figure 2. Incremental Validity of the TAPAS Composites over the Combat AA Composite for Predicting the Can-Do, Will-Do, and Adaptation Criteria in MOS 11B.

Next, we conducted analyses to examine if TAPAS can better identify high performing Soldiers who, based on their low ASVAB AA scores (at or near the minimum qualification score), would not have been predicted to perform well. For these analyses, scores on the three MOS-Specific TAPAS composites were standardized and combined to create an overall MOS 11B TAPAS composite. This TAPAS score represents an individual's overall performance potential in MOS 11B.

Figure 3 illustrates the links between the CO AA composite, the overall TAPAS composite, and selected performance outcomes. In this figure, the Combat AA composite scores were broken down into quintiles and presented on the X-axis, rather than the TAPAS quintiles as in previous figures. For this analysis, the lowest ASVAB CO quintile was broken down further into those individuals who scored high on the overall TAPAS composite (i.e., top 80%: samples sizes ranging from 755 to 2,255) and those who scored low (i.e., the bottom 20%: samples sizes ranging from 179 to 534). Results are shown for the average APFT scores as well as the percentage of disciplinary incidents, training failures, and 12-month attrition in each group. These plots show that the AA composite predicts the Will-Do outcomes, albeit weakly.

As shown in Figure 3, using the TAPAS in this way can help to identify the applicants with low scores on the AA composite who will perform as well as, or better than, other applicants who scored higher on the cognitive tests. As shown in this figure, individuals who scored high on the overall TAPAS composite variable performed as well on the APFT as individuals with AA composite scores between the 20^{th} and 80^{th} percentiles. By comparison, Soldiers who scored low on the TAPAS composite averaged 11 points lower on the APFT than those who scored higher. Similarly, 24% of Soldiers in the bottom quintile on the AA composite who scored low on the TAPAS composite engaged in disciplinary incidents while the rates of disciplinary incidents for Soldiers who scored higher on the overall TAPAS composite were more comparable to individuals who scored higher on the AA composite. Similar results were also obtained for both training failures and 12-month attrition.

The results presented in Figures 2 and 3 suggest that using both the TAPAS and the ASVAB AA composite will results in higher validity than using either of these predictors alone. Figure 2 suggests that both can add to the prediction of important work outcomes. Figure 3 helps to elaborate on this relationship and suggests that high motivation (as indicated by high scores on the TAPAS composites) can compensate, at least partially, for low AA scores. Individuals scoring in the bottom 20% on the ASVAB AA composite who were highly motivated (i.e., passed the TAPAS composite) performed substantially better than those who failed the TAPAS composite. In fact, in some cases, individuals in the lowest scoring AA group who passed the TAPAS performed better than other individuals who scored in the top 80% on the AA composite.

The results presented here indicate that the TAPAS may be useful as an MOS qualification tool for MOS 11B. Individuals who scored high on the TAPAS Infantry composites had lower rates of 12-month attrition, fewer disciplinary incidents, higher APFT scores, and higher levels of MOS-specific job knowledge than individuals who scored lower on these composites. Therefore, the Can-Do, Will-Do, and Adaptation TAPAS composites may be useful for identifying high potential individuals who are motivated to perform well and be successful on the job. Importantly, these results also indicated that the TAPAS scales could provide incremental validity over the ASVAB AA composite that is currently used to screen candidates for MOS 11B. In other words, the TAPAS composites appear to assess individual characteristics that are not assessed by the ASVAB but that are related to success in MOS 11B. Therefore, these TAPAS composites may also be useful for identifying high potential individuals who may not have qualified for MOS 11B using ASVAB scores alone.

This pattern of findings strongly suggests that a broader “whole person” assessment that incorporates both temperament and cognitive factors would provide a better indication of an applicant’s qualification for Infantry. Therefore, a composite of ASVAB AA and TAPAS scores would be more useful for determining qualification for MOS 11B than AA scores alone. A combined composite would do a better job of identifying applicants who are a good fit for the Infantry MOS and screening out applicants with undesirable characteristics. In addition, to minimize the impact on recruiting, the minimum passing score could be adjusted so that the expected number of applicants who would qualify for Infantry under this new standard would not change from the current system.

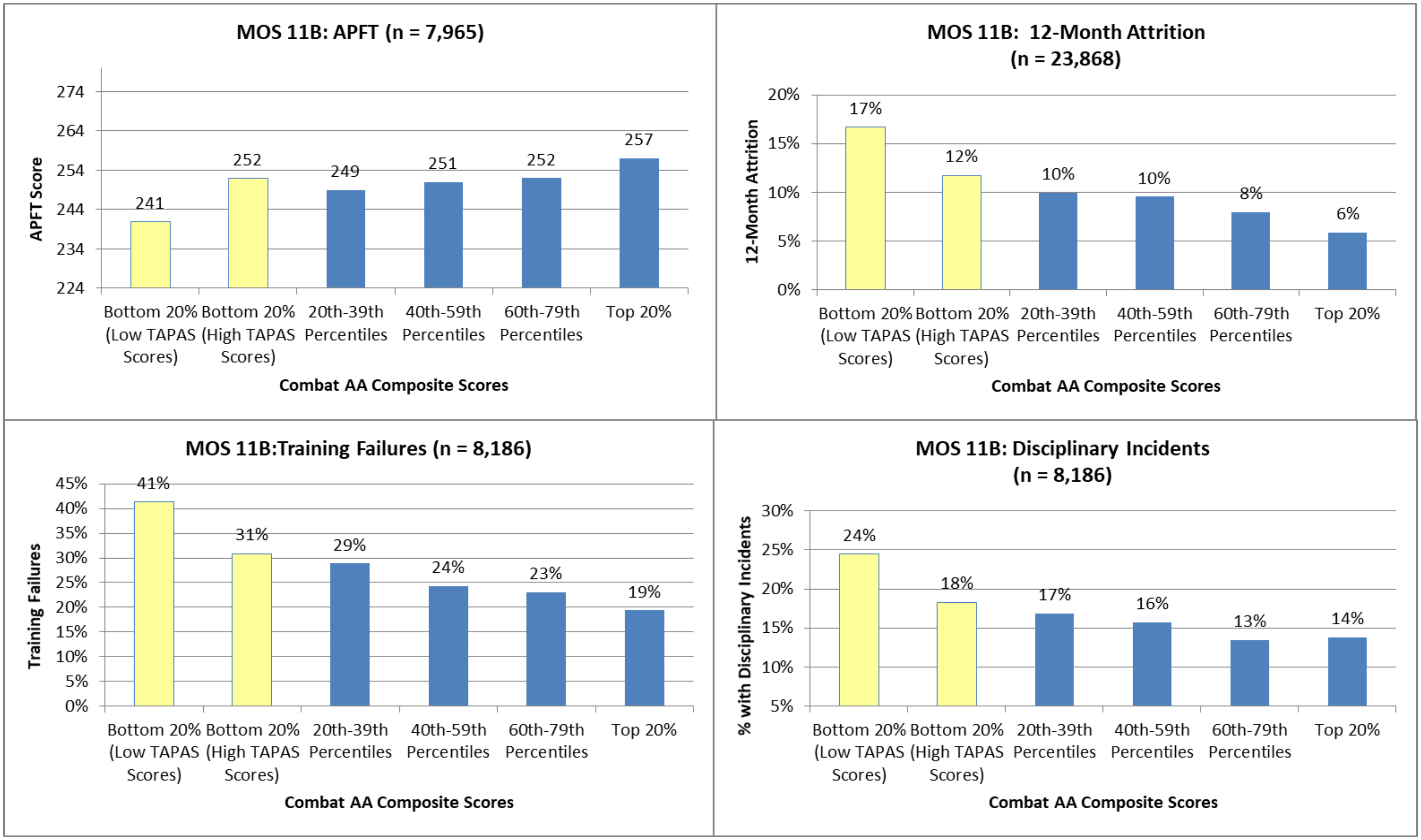

Figure 3. Comparisons using the Overall MOS 11B TAPAS Composite to Supplement AA Composite Scores for Infantry.

PREDICTIVE VALIDITY: MOS 31B (MILITARY POLICE)

Table 9 shows the descriptive statistics for the TAPAS scales and the criterion composites in MOS 31B. Again, raw dimension scores were normed and transformed into standardized scores within each version, so a score of, say, + 1.0 meant that an examinee was 1.0 SD above the mean with respect to the norm group. In other words, departures from the mean of zero indicate differences between this group and the Army-wide sample of applicants used for norming. As such, Table 9 suggests that the Military Police in this sample had higher mean scores on Courage, Non-Delinquency, and Responsibility but lower mean scores on Tolerance and Intellectual Efficiency relative to the Army-wide sample used for norming. Table 10 shows the meta-analytic correlation matrix between the TAPAS scales and the three criteria that was used as input for our regression analyses.

Table 9. Descriptive Statistics for the TAPAS Scales and Criterion Composites in MOS 31B

TAPAS Scales	N	Normed[a] Mean	Normed[a] Standard Deviation
Achievement	12,710	.04	.97
Adjustment	10,919	.00	.99
Adventure Seeking	2,656	-.04	.97
Attention Seeking	11,540	-.08	.99
Commitment to Serve	3,865	.01	.94
Cooperation	8,823	.03	.98
Courage	3,291	.12	.97
Dominance	12,710	.05	.99
Even Tempered	12,710	.05	.99
Intellectual Efficiency	12,710	-.12	.95
Non-Delinquency	11,501	.20	.97
Optimism	12,710	.10	.97
Order	9,976	-.08	.99
Physical Conditioning	12,710	.09	1.00
Responsibility	3,347	.14	.98
Self-Control	8,263	-.01	.99
Selflessness	9,976	.05	.99
Situational Awareness	3,213	.03	1.00
Sociability	10,054	.04	1.01
Team Orientation	3,330	.01	1.00
Tolerance	10,054	-.11	1.00
Criterion Composites			
Will-Do Composite[b]	3,183	.00	3.95
Can-Do Composite[b]	3,140	.39	1.46
Adaptation[b]	7,120	.88	.33

[a] TAPAS scores were standardized based on norming samples of approximately 34,000 to 60,000 (depending on the TAPAS version) Army examinees who completed the TAPAS at the MEPS.
[b] Will-Do, Can-Do, and Adaptation criteria were not normed and, therefore, only the raw scores are reported.

Table 10. Correlations Between the TAPAS Facet Scales and Each Criterion Composite in MOS 31B

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Achievement	1.00																		
2. Adjustment	0.10	1.00																	
3. Attention Seeking	0.02	0.11	1.00																
4. Cooperation	0.10	0.09	-0.04	1.00															
5. Dominance	0.29	0.08	0.21	-0.04	1.00														
6. Even Tempered	0.08	0.25	-0.03	0.29	-0.06	1.00													
7. Intellectual Eff.	0.25	0.18	0.08	0.01	0.25	0.07	1.00												
8. Non-Delinquency	0.16	0.04	-0.14	0.24	-0.02	0.22	0.04	1.00											
9. Optimism	0.12	0.25	0.09	0.14	0.11	0.18	0.09	0.11	1.00										
10. Order	0.16	-0.07	-0.07	0.06	0.06	0.01	0.07	0.11	-0.01	1.00									
11. Physical Cond.	0.16	0.03	0.08	-0.05	0.17	-0.09	0.03	-0.05	0.05	0.06	1.00								
12. Self-Control	0.20	0.09	-0.09	0.15	0.03	0.22	0.17	0.25	0.08	0.17	-0.03	1.00							
13. Selflessness	0.11	-0.02	-0.06	0.21	0.04	0.11	0.01	0.13	0.04	0.06	-0.04	0.09	1.00						
14. Sociability	0.07	0.11	0.33	0.14	0.22	0.04	0.05	-0.04	0.14	-0.06	0.07	-0.07	0.08	1.00					
15. Tolerance	0.10	0.03	0.05	0.15	0.03	0.14	0.10	0.06	0.08	0.03	-0.07	0.11	0.30	0.14	1.00				
16. Can-Do Criterion Composite	0.02	0.10	0.00	0.00	0.00	0.05	0.20	0.00	-0.01	-0.11	-0.04	0.03	-0.09	-0.11	-0.04	1.00			
17. Will-Do Criterion Composite	0.11	0.03	0.06	-0.02	0.11	0.01	0.02	-0.02	0.06	0.04	0.24	0.00	-0.05	0.04	-0.03	0.07	1.00		
18. Adaptation Criterion Composite	0.06	0.02	0.07	-0.03	0.07	-0.02	0.01	-0.04	0.04	-0.03	0.15	-0.05	-0.05	0.02	-0.04	0.03	0.25	1.00	
19. ASVAB ST AA Composite	0.00	0.11	0.02	-0.07	0.06	0.04	0.25	-0.03	0.02	-0.14	0.04	-0.04	-0.12	-0.11	-0.07	0.56	0.01	0.09	1.00

The scales comprising the TAPAS composites for predicting the Can-Do, Will-Do, and Adaptation criteria in MOS 31B are shown in Table 11. The values presented in this table represent the standardized regression weights for each of the TAPAS facets that were significant predictors of the criterion composite. The multiple R's for the three criteria ranged from .15 to .29 and the adjusted R's ranged from .14 to .28, indicating that the TAPAS composites developed here were moderate predictors of Can-Do, Will-Do, and Adaptation criteria in this sample of Military Police.

The largest effects were observed for the Can-Do criteria where the multiple R was .29. Not surprisingly, the Intellectual Efficiency scale was the best predictor of this criterion composite. However, consistent with the results in MOS 11B, the multiple correlation for predicting the Will-Do criterion was also substantial and the Physical Conditioning scale played a significant role in both the Will-Do and Adaptation composites. This result reflects the physical nature of military training and performance in MOS 31B.

Table 11. Standardized Regression Weights for the TAPAS Facets in each Composite for MOS 31B

TAPAS Facet	Criteria		
	Can-Do	Will-Do	Adaptation[a]
TAPAS: Achievement		.06	
TAPAS: Adjustment	.07		
TAPAS: Attention Seeking			
TAPAS: Cooperation			
TAPAS: Dominance		.06	
TAPAS: Even Tempered			
TAPAS: Intellectual Efficiency	.20		
TAPAS: Non-delinquency			
TAPAS: Optimism			
TAPAS: Order	-.12		-.05
TAPAS: Physical Conditioning		.22	.12
TAPAS: Self-Control			
TAPAS: Selflessness	-.07	-.05	
TAPAS: Sociability	-.13		
TAPAS: Tolerance			-.07
Multiple R	.29	.26	.15
Adjusted Multiple R	.28	.25	.14

Note: Samples sizes: Can-Do N = 749; Will-Do N = 759; Adaptation N: 1,540. To provide a more complete estimate of performance with each composite, scales were included in the composite if p < .10.
[a] In contrast to analyses in previous research (e.g., Nye et al., 2012), these analyses were conducted using regular OLS regression instead of logistic regression. To account for the dichotomous nature of the Adaptation variable in our meta-analytic correlation matrix, we calculated biserial correlations for the correlations between the TAPAS scales and Adaptation.

Table 12 shows the significant correlations between the three TAPAS composites for Military Police and the various criteria measured in this dataset. As shown in this table, the scores on Can-Do, Will-Do, and Adaptation composites were significantly correlated with a number of outcomes. Again, the TAPAS composite for the Will-Do criterion showed the largest number of correlations across the three criteria. This is not surprising given the breadth of the Will-Do criterion. However, the TAPAS composites for the Can-Do and Adaptation criteria were also significantly correlated with a number of outcomes. For comparison, significant correlations between the ASVAB Skilled Technical (ST) Aptitude Area (AA) composite and both the TAPAS composites and the criteria were also included. As expected, the ASVAB ST composite was most highly correlated with the TAPAS Can-Do composite and Can-Do criteria.

Table 12. Significant Correlations Between the Criterion Measures and the Scores on the TAPAS Composites in MOS 31B

	MOS 31B TAPAS Composites			
Criteria	**Can-Do TAPAS Composite**	**Will-Do TAPAS Composite**	**Adaptation TAPAS Composite**	**ASVAB ST AA Composite**
ASVAB ST AA Composite	.35	.07	.10	--
Can-Do Criterion Composite	.30			.56
MOS-Specific Job Knowledge Test	.28			.52
Army-Wide Job Knowledge Test	.20			.45
Will-Do Criterion Composite		.26	.21	
APFT Scores	-.04	.26	.22	
Overall ALQ		.05		
Training Achievement	-.05	.16	.09	-.08
Training Failure	-.08	-.11	-.12	-.14
Disciplinary Incidents		-.13	-.10	
12-Month Attrition	-.05	-.09	-.09[a]	-.12

Note: Correlations included if $p < .05$. [a] This value is based on the Pearson correlation between the predicted score and attrition. Due to the dichotomous attrition variable, this value was expected to be lower than the multiple R in Table 11 which was based on a regression analysis using biserial correlations.

Figure 4 illustrates the practical importance of these relationships for performance in MOS 31B. These graphs examine the same outcomes explored in Figure 1 and, therefore, provide a point of comparison with MOS 11B. On the X-axes are quintiles for the scores on the TAPAS Can-Do, Will-Do, or Adaptation composites. On the Y-axes are scores on the criterion variables. Because attrition and disciplinary incidents were dichotomous variables, the Y-axes for these graphs represent the percentage of individuals in each quintile that left the Army or were involved in disciplinary incidents. Again, note that attrition and disciplinary incidents are negatively related to the TAPAS composites described above. Therefore, lower TAPAS scores (i.e., the bottom quintiles) should lead to higher percentages of attrition and disciplinary incidents. The Y-axes for APFT and job knowledge plots are scaled to range from +/- 1 standard deviation from the mean of the criterion.

As shown in Figure 4, the TAPAS was useful for differentiating high scores on the APFT and MOS-specific job knowledge test. Soldiers with scores in the bottom 20% on the TAPAS Will-Do composite had an average score that was 19 points lower on the APFT than those in the highest 20%. Similarly, Soldiers with scores in the lowest quintile for the TAPAS Can-Do composite scored on average nearly a full standard deviation (15 points) lower on the job knowledge test for MOS 31B than those in the highest quintile. The TAPAS composites also predicted disciplinary incidents and 12-month attrition in this MOS. Only 7% of individuals in the upper quintile of the Adaptation composite left the Army within 12 months compared to 15% of individuals in the lowest scoring group. For disciplinary incidents, Soldiers who scored in the top 20% on the Will-Do composite were less likely to be involved in disciplinary incidents relative to their peers in the lowest quintiles (22% compared to 36%, respectively). Overall, it appears that the TAPAS composites developed here have important practical implications for Army outcomes.

Figure 5 illustrates the incremental validity of the TAPAS composites in MOS 31B. Consistent with our approach in MOS 11B, the ASVAB ST AA composite was included in Step 1 of the hierarchical analyses and the TAPAS scales were added in Step 2. As expected, the TAPAS did not contribute substantially to the prediction of Can-Do criteria when the ST AA composite was already in the model. In contrast, the TAPAS composites did provide incremental validity for predicting Will-Do and Adaptation criteria. Adding the TAPAS composites to the regression equations increased the multiple R's by .25 and .04 for Will-Do and Adaptation, respectively. These results indicate that the TAPAS composites developed in this MOS can contribute to the prediction of important criteria even after controlling for the MOS qualification measure that is currently used in MOS 31B. Most notably, the AA composite was only weakly correlated with Will-Do performance in this MOS but adding the TAPAS composite increased the multiple correlation by .25. The validities of the TAPAS composites alone are also illustrated for comparison with the hierarchical regression results.

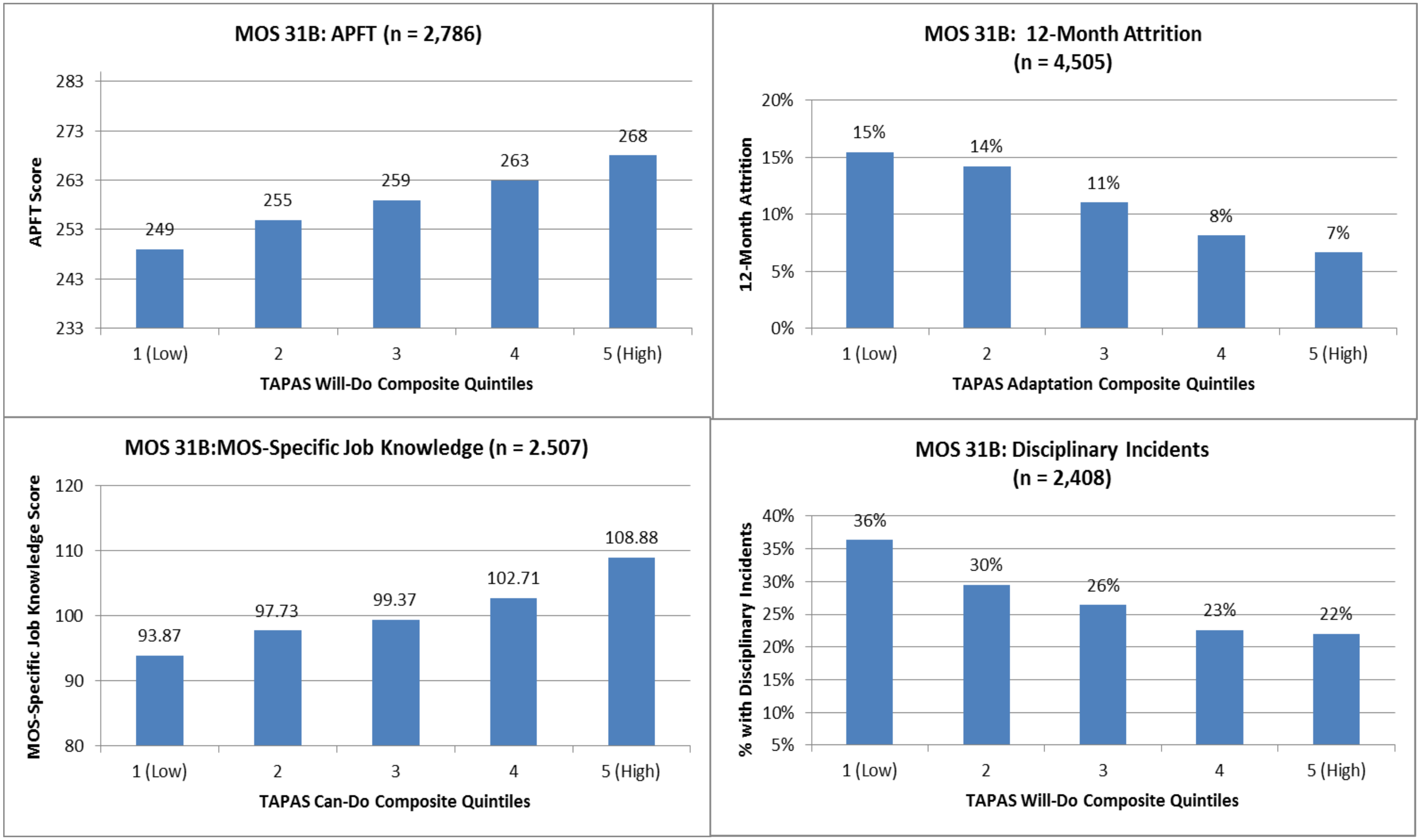

Figure 4. MOS 31B TAPAS Composite Quintile Plots for APFT scores, 12-Month Attrition, MOS-Specific Job Knowledge Scores, and Disciplinary Incidents.

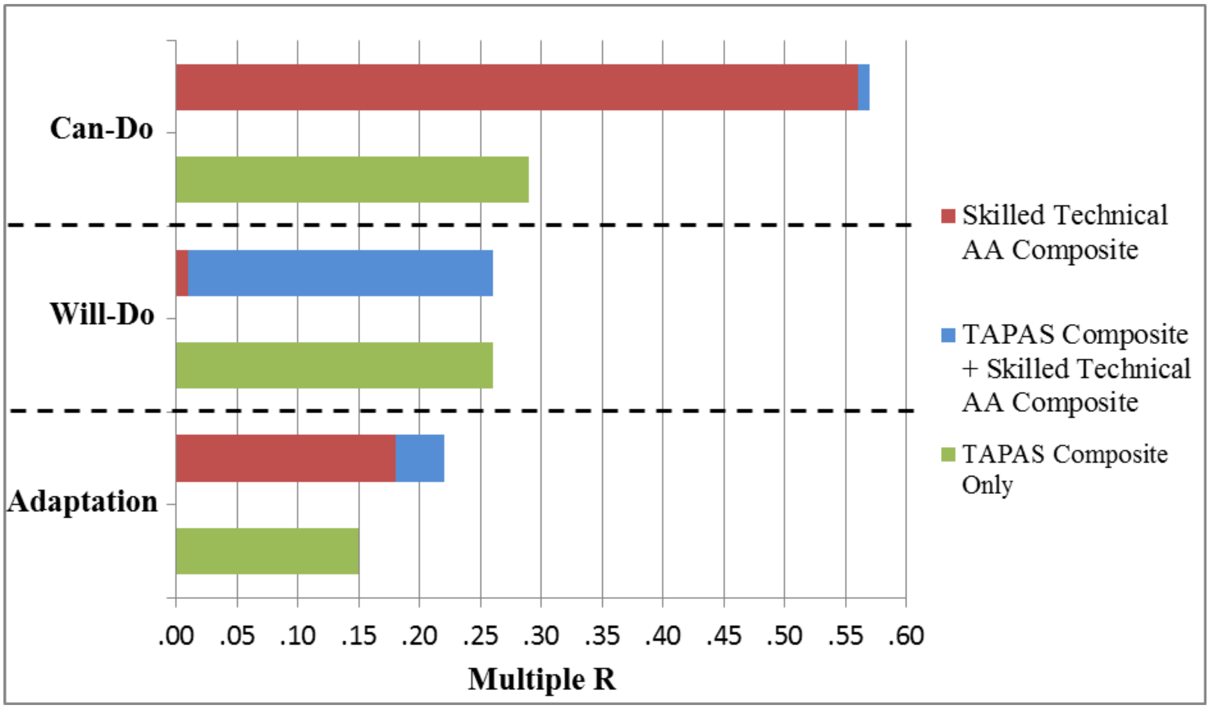

Figure 5. Incremental Validity of the TAPAS Composites over the Skilled Technical AA Composite for Predicting the Can-Do, Will-Do, and Adaptation Criteria in MOS 31B.

Next, we conducted analyses to examine if TAPAS can better identify high performing Soldiers who, based on their low ASVAB AA scores (at or near the minimum qualification score), would not have been predicted to perform well. To do so, we calculated the same overall performance composite that was examined for MOS 11B but using the three TAPAS composites for MOS 31B. This score represents an individual's expected performance in MOS 31B and is the value that could be used for qualification into this MOS.

Figure 6 illustrates the links between the ST AA composite, the overall TAPAS composite, and selected performance outcomes. Similar to the graph presented for 11B, the AA composite scores were broken down into quintiles and presented on the X-axes. However, the lowest quintile is broken down further into those individuals who scored high on the TAPAS overall performance composite (i.e., top 80%: samples sizes ranging from 273 to 728) and those who scored low (i.e., the bottom 20%: samples sizes ranging from 66 to 178). Results are shown for the average APFT scores as well as the percentage of disciplinary incidents, training failures, and 12-month attrition in each group.

As shown in Figure 6, using the TAPAS composites in this way can help to identify the applicants with low scores on the AA composite who will perform as well as, or better than, other applicants who scored higher on these cognitive tests. For example, Soldiers in the bottom 20% on the AA composite who scored high on the overall TAPAS composite performed better on the APFT than individuals who scored in the top 80% on the AA composite. Similarly, 38% of Soldiers in the bottom quintile on the AA composite who scored low on the TAPAS composite engaged in disciplinary incidents compared to only 28% for Soldiers who scored high on the TAPAS composite. In fact, the rates of disciplinary incidents for individuals who scored high on the TAPAS composite were comparable to those scoring between the 40^{th} and 80^{th} percentiles on the AA composite. Similar results were also obtained for training failures. For predicting 12-month attrition, individuals who scored in the bottom 20% on the AA composite but scored high on the TAPAS composite had similar attrition rates to Soldiers who scored low on the TAPAS composite. This is likely due to the stronger relationship between the AA composite and attrition in this sample of Military Police than in Infantry. Nevertheless, these results demonstrate that the overall predicted performance scores based on the TAPAS composites may be useful for expanding the potential pool of accessions to meet personnel requirements in MOS 31B.

The results presented in Figures 5 and 6 suggest that using both the TAPAS and the ASVAB AA composite will results in higher validity than using either of these predictors alone. Again, Figure 6 helps to elaborate on this relationship and suggests that high motivation (as indicated by high scores on the TAPAS composites) can compensate, at least partially, for low AA scores.

Consistent with the results for MOS 11B, the results presented here indicate that the TAPAS may also be useful as an MOS qualification tool for MOS 31B. Individuals who scored high on the TAPAS Military Police composites had lower rates of 12-month attrition, fewer disciplinary incidents, higher APFT scores, and higher levels of MOS-specific job knowledge than individuals who scored lower on these composites. Again, these results also indicated that the TAPAS scales could provide incremental validity over the ASVAB AA composite that is currently used to screen candidates for MOS 31B. In other words, the TAPAS composites appear to assess individual characteristics that are not assessed well by the ASVAB but that are related to success in MOS 31B. Therefore, these TAPAS composites may also be useful for identifying high potential individuals who may not have qualified for MOS 31B using ASVAB scores alone. Again, these results suggest that a combined composite of ASVAB AA and TAPAS scores would do a better job of identifying applicants who are a good fit for MOS 31B and screening out applicants with undesirable characteristics.

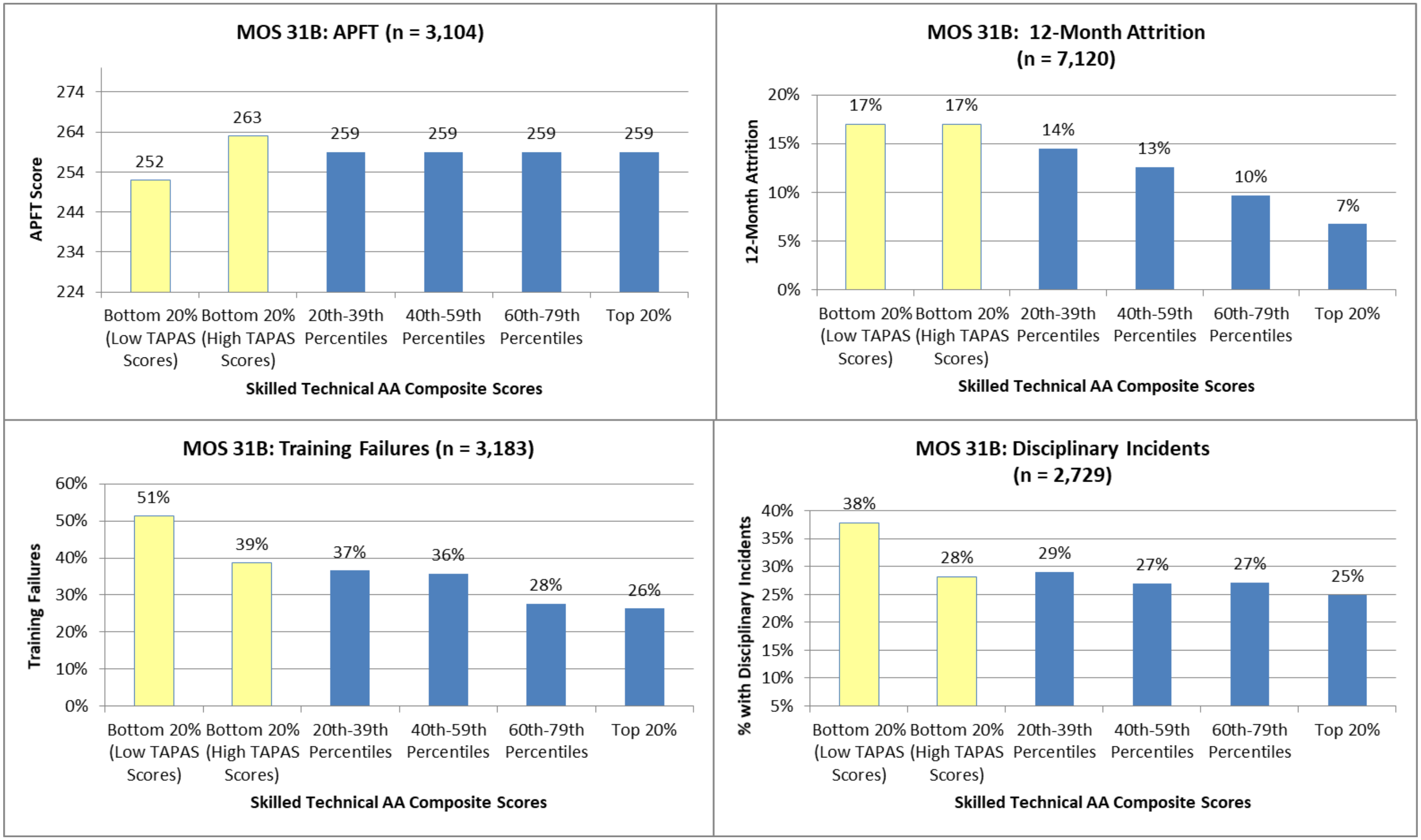

Figure 6. Comparisons using the Overall MOS 31B TAPAS Composite to Supplement AA Composite Scores for Military Police.

PREDICTIVE VALIDITY: MOS 68W (COMBAT MEDICS)

Table 13 shows the descriptive statistics for the TAPAS scales and the criterion composites in MOS 68W. Again, raw dimension scores were normed and transformed into standardized scores within each version, so a score of, say, + 1.0 means that an examinee is 1.0 SD above the mean with respect to the norm group. In other words, departures from the mean of zero indicate differences between this group and the Army-wide sample of applicants used for norming. As such, Table 13 suggests that the Combat Medics in this sample had higher mean scores on Intellectual Efficiency, Even Temperedness, and Tolerance but a lower mean score on the Order facet relative to the Army-wide sample used for norming. Table 14 shows the meta-analytic correlation matrix between the TAPAS scales and the three criteria estimated across the different versions of the TAPAS.

Table 13. Descriptive Statistics for the TAPAS Scales and Criterion Composites in MOS 68W

TAPAS Scales	N	Normed[a] Mean	Normed[a] Standard Deviation
Achievement	14,524	.07	1.00
Adjustment	13,008	.08	1.00
Adventure Seeking	2,789	.04	1.01
Attention Seeking	13,552	.04	.98
Commitment to Serve	3,760	-.11	.97
Cooperation	10,533	.00	.98
Courage	3,490	.04	.96
Dominance	14,524	.04	1.02
Even Tempered	14,524	.16	.97
Intellectual Efficiency	14,524	.30	.96
Non-Delinquency	13,553	.04	.99
Optimism	14,524	.09	.98
Order	11,536	-.16	1.00
Physical Conditioning	14,524	.02	1.03
Responsibility	3,458	.16	.99
Self-Control	10,219	-.02	.99
Selflessness	11,536	.09	1.02
Situational Awareness	3,291	-.05	1.00
Sociability	11,735	-.04	1.02
Team Orientation	3,489	-.08	.95
Tolerance	11,735	.13	1.00
Criterion Composites			
Will-Do Criterion[b]	3,705	.00	3.86
Can-Do Criterion[b]	3,570	.28	1.63
Adaptation[b]	9,615	.91	.29

[a] TAPAS scores were standardized based on norming samples of approximately 34,000 to 60,000 (depending on the TAPAS version) Army examinees who completed the TAPAS at the MEPS.
[b] Will-Do, Can-Do, and Adaptation composites were not normed and, therefore, only the raw scores are reported.

Table 14. Correlations Between the TAPAS Facet Scales and Each Criterion Composite in MOS 68W

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Achievement	1.00																		
2. Adjustment	0.08	1.00																	
3. Attention Seeking	0.05	0.12	1.00																
4. Cooperation	0.07	0.07	-0.01	1.00															
5. Dominance	0.29	0.09	0.26	-0.07	1.00														
6. Even Tempered	0.08	0.24	-0.02	0.26	-0.08	1.00													
7. Intellectual Eff.	0.21	0.18	0.09	-0.02	0.23	0.06	1.00												
8. Non-Delinquency	0.20	0.00	-0.15	0.20	-0.04	0.19	0.00	1.00											
9. Optimism	0.13	0.25	0.12	0.16	0.11	0.17	0.06	0.11	1.00										
10. Order	0.19	-0.10	-0.05	0.03	0.05	0.01	0.02	0.13	0.01	1.00									
11. Physical Cond.	0.15	0.03	0.12	-0.06	0.16	-0.08	0.02	-0.06	0.05	0.05	1.00								
12. Self-Control	0.23	0.06	-0.11	0.12	0.01	0.19	0.13	0.26	0.06	0.18	-0.06	1.00							
13. Selflessness	0.10	-0.03	-0.05	0.20	0.01	0.09	-0.05	0.12	0.06	0.02	-0.04	0.06	1.00						
14. Sociability	0.06	0.11	0.38	0.15	0.25	0.02	0.04	-0.05	0.17	-0.04	0.09	-0.10	0.07	1.00					
15. Tolerance	0.08	0.03	0.05	0.15	0.03	0.11	0.05	0.04	0.07	0.01	-0.08	0.06	0.28	0.12	1.00				
16. Can-Do Criterion Composite	0.02	0.02	-0.02	0.00	0.04	0.03	0.11	-0.01	-0.02	-0.03	-0.01	0.01	-0.03	-0.07	0.01	1.00			
17. Will-Do Criterion Composite	0.13	0.01	0.08	-0.01	0.13	-0.03	0.04	-0.01	0.04	0.03	0.27	-0.02	0.01	0.04	0.00	0.11	1.00		
18. Adaptation Criterion Composite	0.06	0.02	0.07	-0.03	0.07	-0.02	0.01	-0.04	0.04	-0.03	0.15	-0.05	-0.05	0.02	-0.04	0.03	0.25	1.00	
19. ASVAB ST AA Composite	0.03	0.09	-0.01	-0.03	0.04	0.06	0.27	-0.05	0.00	-0.10	0.03	-0.02	-0.06	-0.10	-0.02	0.36	0.12	0.09	1.00

The scales comprising the TAPAS composites for predicting the Can-Do, Will-Do, and Adaptation criteria in MOS 68W are indicated in Table 15. As noted previously, the values presented in this table represent the standardized regression weights for each of the TAPAS facets that were significant predictors of the criterion composites. The multiple R's for these composites ranged from .14 to .29 and the adjusted R's ranged from .13 to .29 indicating that the TAPAS composites developed here were moderate predictors of performance for Medics.

Consistent with results in MOS 11B, Will-Do criteria were predicted best by the TAPAS scales. The multiple R for the TAPAS Will-Do composite was nearly twice as large as the R's for the Can-Do or Adaptation composites. Again, Physical Conditioning was one of the strongest predictors of both Will-Do and Adaptation. Thus, despite some differences in the composites across MOS, the Physical Conditioning scale appears to be a consistent predictor for each group.

Table 15. Standardized Regression Weights for the TAPAS Facets in Each Composite for MOS 68W

	Criteria		
TAPAS Facets	**Can-Do**	**Will-Do**	**Adaptation[a]**
TAPAS: Achievement		.07	
TAPAS: Adjustment			
TAPAS: Attention Seeking			
TAPAS: Cooperation			
TAPAS: Dominance	.04	.07	.06
TAPAS: Even Tempered			
TAPAS: Intellectual Efficiency	.11		
TAPAS: Non-delinquency			-.06
TAPAS: Optimism			.05
TAPAS: Order	-.04		-.04
TAPAS: Physical Conditioning		.25	.10
TAPAS: Self-Control			
TAPAS: Selflessness			
TAPAS: Sociability	-.09		-.08
TAPAS: Tolerance			
Multiple R	.14	.29	.16
Adjusted Multiple R	.13	.29	.15

Note: Samples sizes: Can-Do N = 849; Will-Do N = 880; Adaptation N: 2,090. To provide a more complete estimate of performance with each composite, scales were included in the composite if $p < .10$.
[a] In contrast to analyses in previous research (e.g., Nye et al., 2012), these analyses were conducted using regular OLS regression instead of logistic regression. To account for the dichotomous nature of the Adaptation variable in our meta-analytic correlation matrix, we calculated biserial correlations for the correlations between the TAPAS scales and Adaptation.

Using the composites illustrated in Table 15, we calculated the scores on all three TAPAS composites for each individual in MOS 68W. Table 16 shows the significant correlations between the TAPAS composites for Combat Medics and the criteria measured in this dataset. Again, the TAPAS composites were significantly correlated with a number of outcomes.

Table 16. Significant Correlations Between the Criterion Measures and the Scores on the TAPAS Composites in MOS 68W

	MOS 68W TAPAS Composites			
Criteria	Can-Do TAPAS Composite	Will-Do TAPAS Composite	Adaptation TAPAS Composite	ASVAB ST AA Composite
ASVAB ST AA Composite	.28	.05	.12	--
Can-Do Criterion Composite	.13			.34
MOS-Specific Job Knowledge Test	.08			.26
Army-Wide Job Knowledge Test	.14		.04	.33
Will-Do Criterion Composite		.29	.23	.13
APFT Scores		.30	.25	
Overall ALQ		.05		.04
Training Achievement		.19	.14	.10
Training Failure	-.09	-.17	-.17	-.18
Disciplinary Incidents	-.06	-.08	-.05	-.10
12-Month Attrition	-.04	-.06	-.09[a]	-.09

Note: Correlations included if $p < .05$. [a] This value is based on the Pearson correlation between the TAPAS composite score and attrition. Due to the dichotomous attrition variable, this value was expected to be lower than the multiple R in Table 15 which was based on a regression analysis using biserial correlations.

For comparison, quintile plots with MOS-specific job knowledge, 12-month attrition, Army Physical Fitness Test (APFT) scores, and disciplinary incidents are provided in Figure 7 to illustrate the practical importance of these TAPAS composites. As shown here, TAPAS was useful for predicting high performance on the APFT. Soldiers scoring in the bottom 20% on the TAPAS Will-Do composite averaged 24 points less on the APFT than those in the highest 20%. In contrast, TAPAS had a much smaller effect on the MOS-specific job knowledge test. Despite the lower magnitude of the effect, individuals with scores in the lowest quintile for the TAPAS Can-Do composite still had average scores on the MOS-specific job knowledge test that were nearly 5 points lower than those in the highest quintile. On the Adaptation composite, 13% of individuals in the lowest quintile left the Army whereas only 6% of individuals in the highest quintile did. Similarly, only 22% of Soldiers with the highest scores on the TAPAS Will-Do composite were involved in disciplinary incidents compared with 36% of Soldiers in the lowest scoring TAPAS group. Based on these results, it appears that a Soldier's personality, as measured by the TAPAS composites developed here, has important implications for performance in MOS 68W.

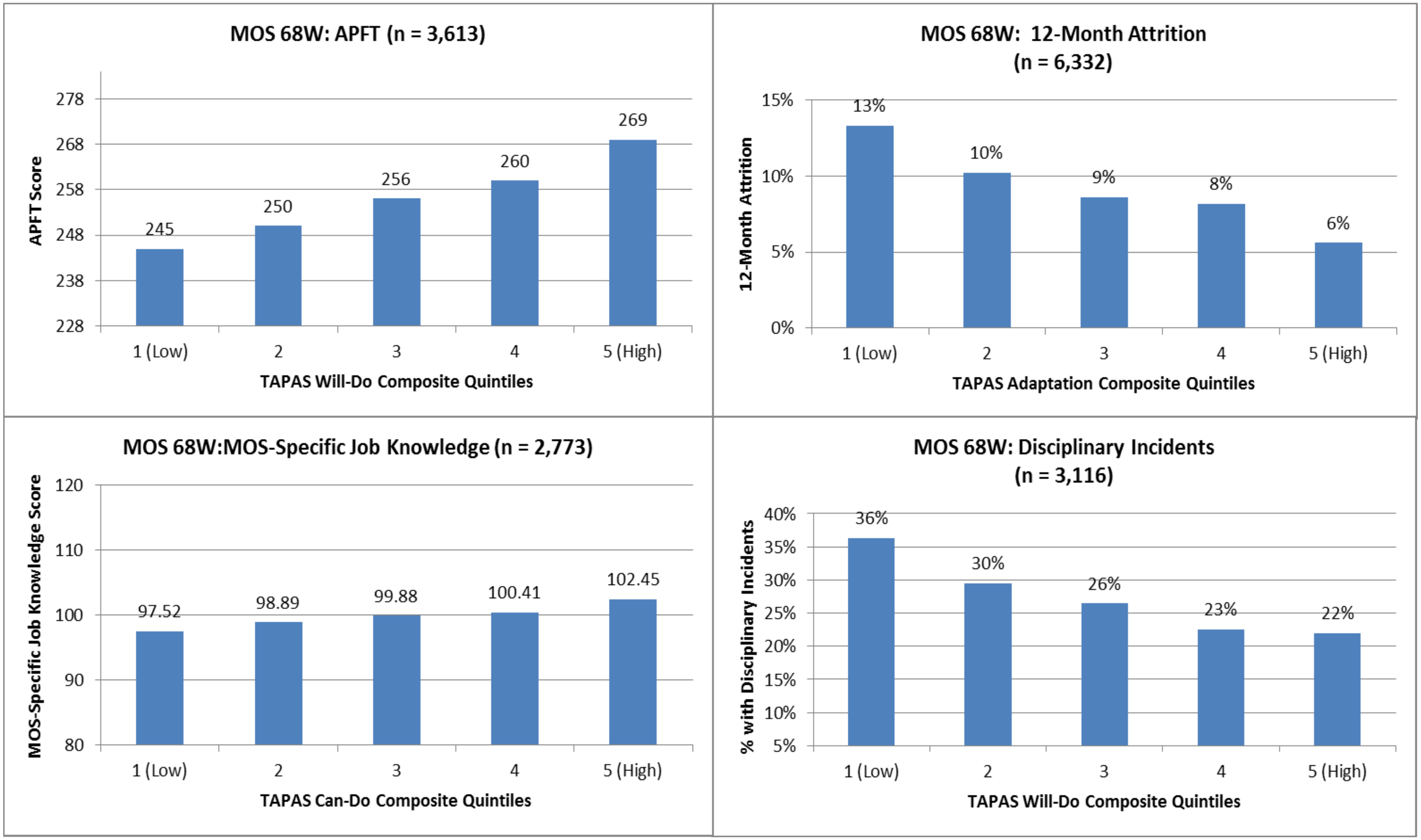

Figure 7. MOS 68W TAPAS Composite Quintile Plots for APFT scores, 12-Month Attrition, MOS-Specific Job Knowledge Scores, and Disciplinary Incidents.

Figure 8 illustrates the incremental validity of the TAPAS composites in MOS 68W. As expected, the TAPAS did not contribute substantially to the prediction of Can-Do criteria when the Skilled Technical (ST) AA composite was already in the model. In contrast, the TAPAS composites did provide incremental validity for predicting Will-Do criteria and Adaptation. Adding the TAPAS composites to the regression equations for these criteria increased the multiple R's by .19 and .06 for Will-Do and Adaptation, respectively. Thus, consistent with our analyses in other MOS, the TAPAS composites provided incremental validity over the AA composite that is currently used for qualification into MOS 68W.

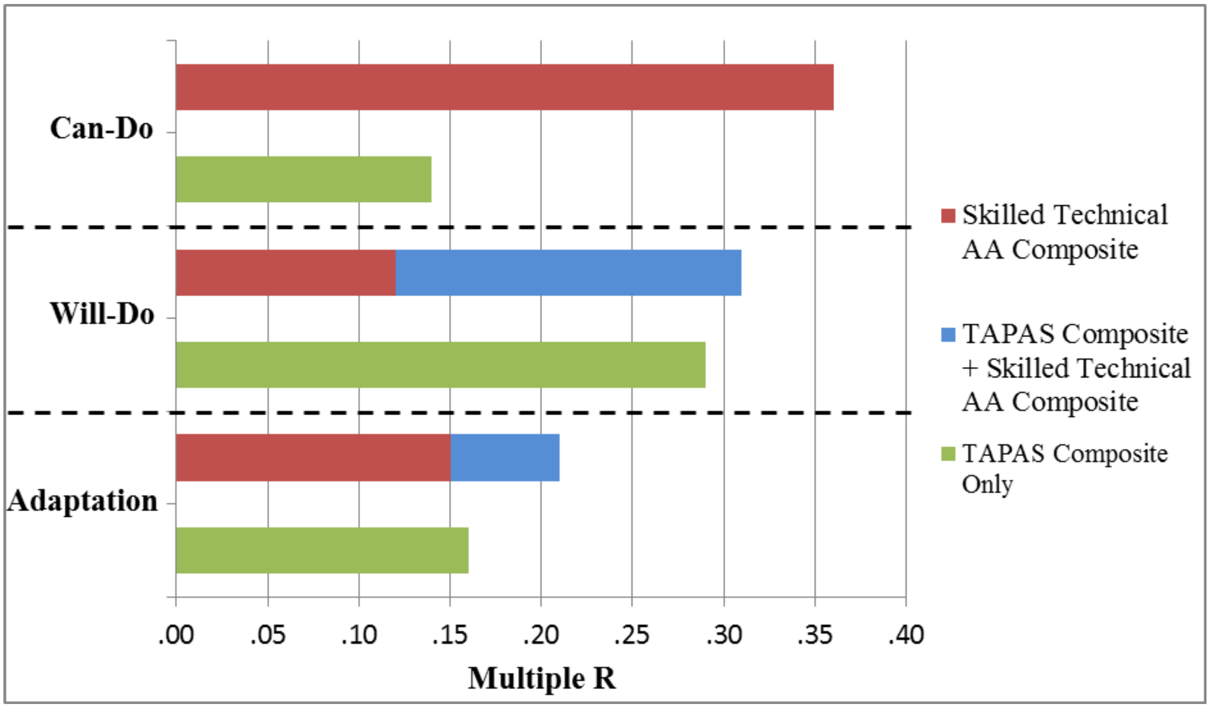

Figure 8. Incremental Validity of the TAPAS Composites over the Skilled Technical AA Composite for Predicting the Can-Do, Will-Do, and Adaptation Criteria in MOS 68W.

Next, we conducted analyses to examine if TAPAS can better identify high performing Soldiers who would not have been predicted to perform well based on their low ASVAB AA scores (at or near the minimum qualification score). To do so, we calculated the same overall TAPAS composite that was calculated for the previous MOS but using the MOS-specific composites for Combat Medics. This score represents an individual's potential for performance in MOS 68W and is the value that could be used for qualification into this MOS.

Figure 9 illustrates the links between the ST AA composite, the overall TAPAS composite for MOS 68W, and actual performance criteria in this MOS. Again, the AA composite scores were broken down into quintiles and presented on the X-axes. In addition, the lowest quintile was broken down further into those individuals who scored high on the overall TAPAS performance composite (i.e., top 80%: samples sizes ranging from 330 to 1,038 across criteria) and those who scored low (i.e., the bottom 20%: samples sizes ranging from 84 to 254 across criteria). Results are shown for the average APFT scores as well as the percentages of disciplinary incidents, training failures, and 12-month attrition in each group. These plots demonstrate the potential utility of the TAPAS composites for expanding the number of high potential accessions in MOS 68W.

As shown in Figure 9, using the TAPAS composites in this way can help to identify the applicants with low scores on the AA composite who will perform as well as, or better than, other applicants who scored higher on these cognitive tests. For example, Soldiers in the bottom 20% on the ASVAB ST composite who scored high on the overall TAPAS performance composite (top 80%) performed better on the APFT, had lower rates of 12-month attrition, fewer training failures, and engaged in fewer disciplinary incidents than less motivated individuals with lower TAPAS scores. In addition, Soldiers in the bottom quintile on the AA composite with higher TAPAS scores also performed nearly as well as individuals who scored higher on the AA composite. In fact, for nearly all of the criteria shown in Figure 9, individuals in the bottom quintile on the AA composite who scored high on the overall TAPAS composite performed just as well as individuals in the next highest quintile on the ASVAB ST composite. Consistent with the other MOS examined in this report, these results demonstrate that the overall predicted performance scores based on the MOS 68W TAPAS composites may be useful for expanding the potential pool of accessions to meet personnel requirements in this MOS. In other words, it appears that high motivation (as indicated by high scores on the TAPAS composites) can compensate, at least partially, for low AA scores.

The results presented for MOS 68W suggest that the TAPAS may also be useful as an MOS qualification tool for Combat Medics. Individuals who scored high on the TAPAS Can-Do, Will-Do, and Adaptation composites had lower rates of 12-month attrition, fewer disciplinary incidents, higher APFT scores, and higher levels of MOS-specific job knowledge than individuals who scored lower on these composites. Consistent with results for other MOS, these results also indicated that the TAPAS scales could provide incremental validity over the ASVAB ST composite that is currently used to screen candidates for this MOS. In other words, the TAPAS composites appear to assess individual characteristics that are not assessed well by the ASVAB but that are related to success in MOS 68W. Therefore, these TAPAS composites may also be useful for identifying high potential individuals who may not have qualified for MOS 68W using ASVAB scores alone. Consequently, a combined composite of ASVAB AA and TAPAS scores would do a better job of identifying applicants who are a good fit for MOS 68W and screening out applicants with undesirable characteristics.

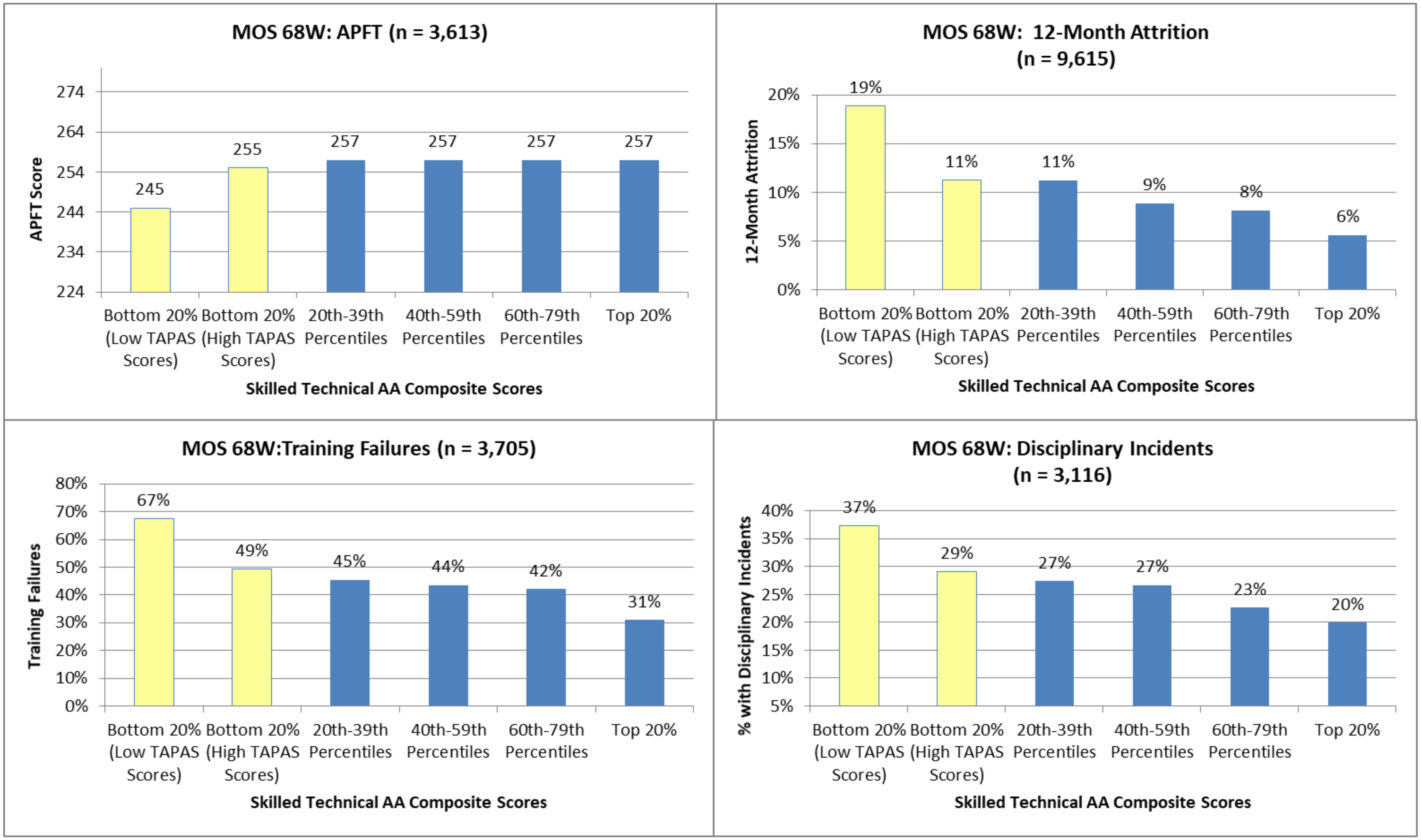

Figure 9. Comparisons using the Overall 68W TAPAS Composite to Supplement AA Composite Scores for Combat Medics.

PREDICTIVE VALIDITY: MOS 88M (MOTOR TRANSPORT OPERATORS)

Table 17 shows the descriptive statistics for the TAPAS scales and the criterion composites in MOS 88M. As with the other MOS, raw dimension scores were normed and transformed into standardized scores within each version. As such, Table 17 suggests that the Motor Transport Operators in this sample had average scores that were similar to the means in the overall sample on most of the TAPAS dimensions. However, they did score slightly higher on Non-Delinquency and slightly lower on Adventure Seeking and Intellectual Efficiency. Table 18 shows the meta-analytic correlation matrix between the TAPAS scales and the three criteria estimated in this MOS across the different versions of TAPAS.

Table 17. Descriptive Statistics for the TAPAS Scales and Criterion Composites in MOS 88M

TAPAS Facets	N	Normed[a] Mean	Normed[a] Standard Deviation
Achievement	14,124	.02	.96
Adjustment	12,050	-.04	.97
Adventure Seeking	2,999	-.13	.98
Attention Seeking	12,779	-.05	.99
Commitment to Serve	4,316	.08	.95
Cooperation	9,894	.09	.97
Courage	3,582	.01	.98
Dominance	14,124	-.04	.96
Even Tempered	14,124	.04	.97
Intellectual Efficiency	14,124	-.13	.94
Non-Delinquency	12,807	.12	.97
Optimism	14,124	.06	.97
Order	11,218	.07	.97
Physical Conditioning	14,124	-.01	.95
Responsibility	3,575	.06	.96
Self-Control	9,051	.02	.97
Selflessness	11,218	.08	.98
Situational Awareness	3,675	.01	.98
Sociability	11,125	.04	.97
Team Orientation	3,554	.04	.99
Tolerance	11,125	-.04	.98
Criterion Composites			
Will-Do Criterion[b]	2,679	.00	3.96
Can-Do Criterion[b]	2,555	-.16	1.65
Adaptation[b]	7,841	.94	.24

[a] TAPAS scores were standardized based on norming samples of approximately 34,000 to 60,000 (depending on the TAPAS version) Army examinees who completed the TAPAS at the MEPS.
[b] Will-Do, Can-Do, and Adaptation composites were not normed and, therefore, only the raw scores are reported.

Table 18. Correlations Between the TAPAS Facet Scales and Each Criterion Composite in MOS 88M

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Achievement	1.00																		
2. Adjustment	0.09	1.00																	
3. Attention Seeking	0.03	0.10	1.00																
4. Cooperation	0.11	0.07	-0.05	1.00															
5. Dominance	0.28	0.10	0.22	-0.04	1.00														
6. Even Tempered	0.11	0.23	-0.04	0.28	-0.05	1.00													
7. Intellectual Eff.	0.25	0.18	0.08	0.02	0.25	0.09	1.00												
8. Non-Delinquency	0.20	0.02	-0.14	0.25	-0.01	0.23	0.06	1.00											
9. Optimism	0.15	0.25	0.08	0.14	0.11	0.18	0.12	0.12	1.00										
10. Order	0.18	-0.05	-0.06	0.06	0.08	0.01	0.07	0.12	-0.02	1.00									
11. Physical Cond.	0.15	0.04	0.09	-0.04	0.16	-0.09	0.04	-0.05	0.05	0.06	1.00								
12. Self-Control	0.24	0.10	-0.10	0.17	0.06	0.23	0.19	0.26	0.10	0.22	-0.03	1.00							
13. Selflessness	0.13	-0.02	-0.08	0.21	0.03	0.12	0.02	0.17	0.08	0.08	-0.01	0.12	1.00						
14. Sociability	0.07	0.10	0.31	0.17	0.19	0.03	0.06	-0.02	0.17	-0.04	0.09	-0.04	0.08	1.00					
15. Tolerance	0.10	0.04	0.03	0.15	0.04	0.13	0.11	0.10	0.10	0.02	-0.05	0.14	0.28	0.15	1.00				
16. Can-Do Criterion Composite	0.03	0.07	0.02	-0.01	0.03	0.01	0.18	-0.02	-0.03	-0.11	-0.01	-0.03	-0.08	-0.07	-0.09	1.00			
17. Will-Do Criterion Composite	0.11	0.05	0.05	-0.03	0.12	0.01	0.02	-0.01	0.05	0.00	0.24	0.04	0.00	0.04	0.00	0.03	1.00		
18. Adaptation Criterion Composite	0.06	0.02	0.07	-0.03	0.07	-0.02	0.01	-0.04	0.04	-0.03	0.15	-0.05	-0.05	0.02	-0.04	0.03	0.25	1.00	
19. ASVAB OFS AA Composite	0.04	0.13	-0.01	-0.09	0.04	0.05	0.21	-0.05	0.02	-0.15	0.04	-0.06	-0.13	-0.10	-0.10	0.55	0.02	0.09	1.00

The scales comprising the TAPAS composites for predicting the Can-Do, Will-Do, and Adaptation criteria in MOS 88M are shown in Table 19. The values presented in this table represent the standardized regression weights for each of the TAPAS facets that were significant predictors of the criterion composite. The multiple R's for these composites ranged from .16 to .26 and the adjusted R's ranged from .15 to .25 indicating that the TAPAS composites developed here were moderate predictors of performance in MOS 88M.

As shown in Table 19, Can-Do performance was predicted well by the TAPAS composite. The multiple R for the Will-Do criterion was also .26 and the multiple R for the Adaptation composite was .16. Thus, all three criteria were predicted moderately well. Again, the TAPAS Physical Conditioning scale was the best predictor of Will-Do and Adaptation, reflecting the importance of fitness in military training.

Table 19. Standardized Regression Weights for the TAPAS Facets in Each Composite for MOS 88M

	Criteria		
TAPAS Facet	**Can-Do**	**Will-Do**	**Adaptation[a]**
TAPAS: Achievement		.06	
TAPAS: Adjustment			-.04
TAPAS: Attention Seeking			
TAPAS: Cooperation			
TAPAS: Dominance		.07	
TAPAS: Even Tempered			
TAPAS: Intellectual Efficiency	.20		.05
TAPAS: Non-delinquency			
TAPAS: Optimism			.07
TAPAS: Order	-.13		
TAPAS: Physical Conditioning		.22	.09
TAPAS: Self-Control			
TAPAS: Selflessness			-.05
TAPAS: Sociability	-.07		
TAPAS: Tolerance	-.10		-.07
Multiple R	.25	.26	.16
Adjusted Multiple R	.24	.25	.15

Note: Samples sizes: Can-Do N = 602; Will-Do N = 630; Adaptation N: 1,683. To provide a more complete estimate of performance with each composite, scales were included in the composite if $p < .10$.
[a] In contrast to analyses in previous research (e.g., Nye et al., 2012), these analyses were conducted using regular OLS regression instead of logistic regression. To account for the dichotomous nature of the Adaptation variable in our meta-analytic correlation matrix, we calculated biserial correlations for the correlations between the TAPAS scales and Adaptation.

As shown in Table 20, the TAPAS composites for predicting the Can-Do, Will-Do, and Adaptation criteria were significantly correlated with a number of outcomes. Significant correlations between the Operator and Food Service (OFS) AA composite and both the TAPAS composites and the performance outcomes are also included. As expected, the OFS AA composite was most highly correlated with the TAPAS Can-Do composite and the Can-Do criteria.

Table 20. Significant Correlations Between the Criterion Measures and the Scores on the TAPAS Composites in MOS 88M

	MOS 88M TAPAS Composites			
Criteria	Can-Do TAPAS Composite	Will-Do TAPAS Composite	Adaptation TAPAS Composite	ASVAB OFS AA Composite
ASVAB OFS AA Composite	.33	.05	.18	--
Can-Do Criterion Composite	.28	.00	.11	.55
MOS-Specific Job Knowledge Test	.26		.10	.51
Army-Wide Job Knowledge Test	.23		.10	.47
Will-Do Criterion Composite		.26	.15	
APFT Scores		.28	.18	
ALQ		.05		
Training Achievement	-.05	.12	.09	-.12
Training Failure	-.09	-.16	-.15	-.15
Disciplinary Incidents		-.13	-.06	
12-Month Attrition	-.05	-.05	-.10[a]	-.09

Note: Correlations included if $p < .05$. [a] This value is based on the Pearson correlation between the composite score and attrition. Due to the dichotomous attrition variable, this value was expected to be lower than the multiple R in Table 19 which was based on a regression analysis using biserial correlations.

For comparison with the results in the other MOS, Figure 10 illustrates the quintile plots for MOS-specific job knowledge, 12-month attrition, Army Physical Fitness Test (APFT) scores, and disciplinary incidents. On the X-axes of these plots are the quintiles for the Can-Do, Will-Do, or Adaptation TAPAS composites. On the Y-axes are average scores on the APFT and MOS-specific job knowledge test and percentages of attrition and disciplinary incidents. Again, note that attrition and disciplinary incidents are negatively related to the TAPAS composites described above. Therefore, lower scores (i.e., the bottom quintiles) should lead to higher percentages of attrition and disciplinary incidents. In contrast, we expect individuals in the bottom quintile to score lower on the APFT and job knowledge tests. The Y-axes for APFT and job knowledge plots are scaled to range from +/- 1 standard deviation from the mean of the criterion.

As shown in Figure 10, TAPAS was useful for differentiating high scores on the APFT and job knowledge test for 88M. Soldiers with scores in the bottom 20% on the TAPAS Will-Do composite averaged 22 points less on the APFT than those scoring in the highest 20%. Similarly, individuals scoring in the lowest quintile for the TAPAS Can-Do composite averaged slightly more than 13 points less on the job knowledge test for 88M than those in the highest quintile. This represents more than a half a standard deviation difference between the highest and lowest scoring individuals. In addition, 11% of Soldiers in the lowest quintile of the TAPAS Adaptation composite were separated from the Army compared to only 3% of Soldiers in the highest quintile. Finally, Soldiers with scores in the highest quintile on the TAPAS Will-Do composite were almost half as likely to be involved in disciplinary incidents as those in the lowest quintile (17% compared to 33%). In sum, quintile plots of these relationships indicated that the characteristics measured by the TAPAS are significantly related to important Army performance outcomes. These plots are particularly important for interpreting the relationship between the Adaptation composite and attrition. Although the correlation presented in Table 20 is attenuated due to the non-normal distribution inherent in the dichotomous attrition variable, the attrition plot in Figure 10 shows that the relationship is still substantial when the observed attrition rates are examined. As such, these plots illustrate the potential utility of the TAPAS composites for selecting Soldiers.

Figure 11 illustrates the incremental validity of the TAPAS composites over the AA composite. As in the other MOS, the TAPAS did not contribute substantially to the prediction of Can-Do criteria when the OFS AA composite was already in the model. In contrast, the TAPAS composites did provide incremental validity for predicting Will-Do and Adaptation criteria. Adding the TAPAS composites to the regression equations for these criteria increased the multiple R’s by .24 and .05 for Will-Do and Adaptation, respectively. Thus, these results suggest that the TAPAS composites in MOS 88M can provide substantial incremental validity over the AA composite that is currently used for qualification into MOS 88M. The validities of the TAPAS composites alone are also shown for comparison.

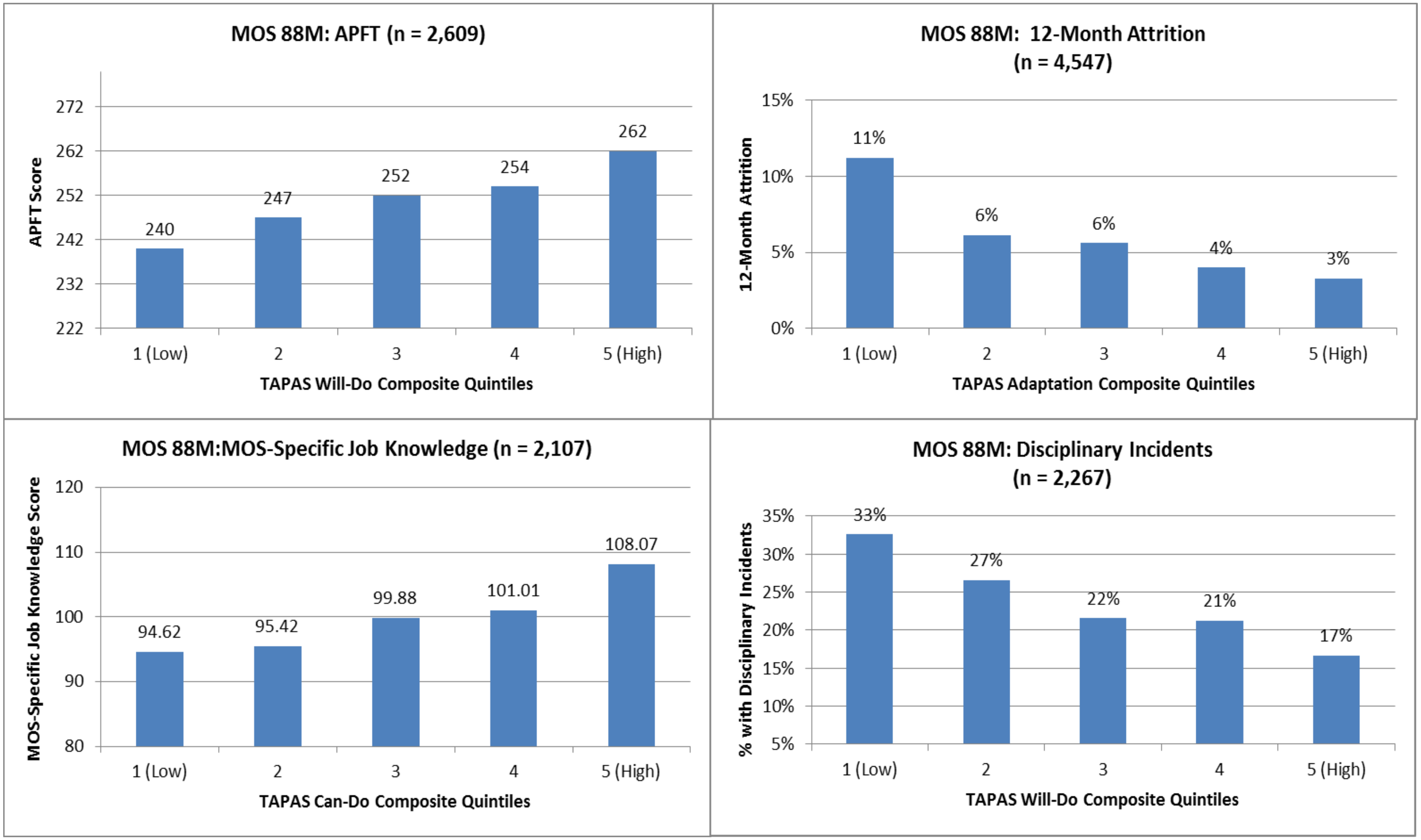

Figure 10. MOS 88M TAPAS Composite Quintile Plots for APFT scores, 12-Month Attrition, MOS-Specific Job Knowledge Scores, and Disciplinary Incidents.

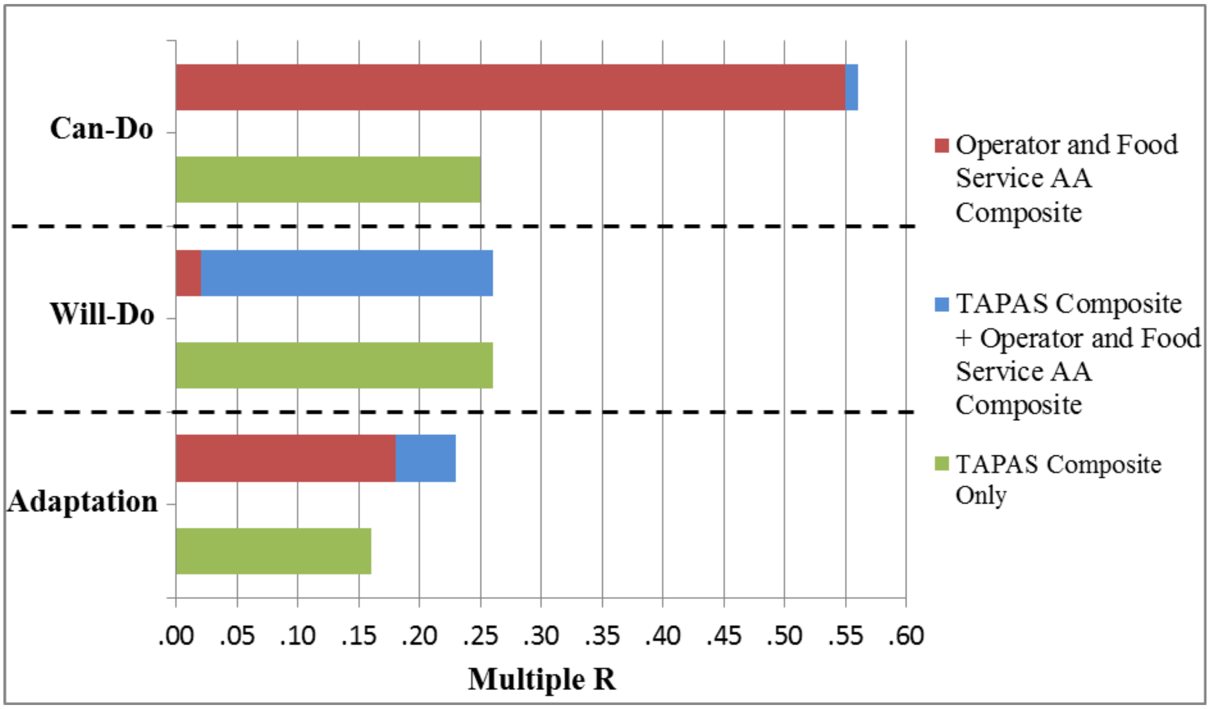

Figure 11. Incremental Validity of the TAPAS Composites over the Operator and Food Service AA Composite for Predicting the Can-Do, Will-Do, and Adaptation Criteria in MOS 88M.

To illustrate the potential utility of the TAPAS composites as supplements to the ASVAB scores in MOS 88M, we calculated the same overall TAPAS performance score that was examined for previous MOS but using the three MOS-specific TAPAS composites for Motor Transport Operators. The standardized regression weights presented in Table 19 were used to calculate scores on the TAPAS composites for 88M. These scores were then standardized and summed to get an overall estimate of performance potential as a Motor Transport Operator for each individual. This overall score is the value that could be used for qualification into this MOS.

Figure 12 illustrates the links between the OFS AA composite, the overall TAPAS composite score for MOS 88M, and actual performance criteria in this job. Again, the AA composite scores were broken down into quintiles and presented on the X-axes. In addition, for this example, the lowest quintile was broken down further into those individuals who scored high on the overall TAPAS performance composite (i.e., top 80%: samples sizes ranging from 194 to 702 across criteria) and those who scored low (i.e., the bottom 20%: samples sizes ranging from 48 to 193 across criteria). Results are shown for the average APFT scores as well as the percentages of disciplinary incidents, training failures, and 12-month attrition in each group. These plots demonstrate the potential utility of the TAPAS composites for expanding the number of high potential accessions in MOS 88M.

As shown in Figure 12, using the TAPAS composites in this way can help to identify the applicants with low scores on the OFS AA composite who will perform as well as, or better than, other applicants who scored higher on these cognitive tests. For example, Soldiers in the bottom 20% on the AA composite who scored high on the overall TAPAS composite performed better on the APFT, had lower rates of 12-month attrition, fewer training failures, and engaged in fewer disciplinary incidents than less motivated individuals who scored lower on the TAPAS composite. In addition, Soldiers in the bottom quintile on the AA composite who scored high on the TAPAS composite also performed nearly as well as individuals who scored higher on the AA composite. In fact, for nearly all of the criteria shown in Figure 12, individuals in the bottom quintile on the AA composite who scored high on the TAPAS composite performed just as well as individuals in the next highest quintile on the ASVAB AA composite. For example, individuals who scored high on the TAPAS performance composite had average APFT scores that were as high as or higher than individuals scoring in the top 80% on the AA composite. Similarly, Soldiers in the bottom quintile on the AA composite but with high TAPAS composite scores engaged in fewer disciplinary incidents than Soldiers scoring in the top 80% on the AA composite. Consistent with the other MOS examined in this research, these results demonstrate that the overall predicted performance scores based on the TAPAS composites may be useful for expanding the potential pool of accessions to meet personnel requirements in MOS 88M.

This pattern of findings strongly suggests that a more “whole person” assessment that incorporates temperament and attitudes in addition to cognitive factors would provide a better indication of an applicant’s qualification for the Motor Transport Operator MOS. In other words, using a composite of ASVAB AA and TAPAS scores would provide a more valid measure for qualification into MOS 88M than the AA scores alone. To minimize impact on recruiting, the minimum passing score could be adjusted so that the expected number of applicants who would qualify for MOS 88M under this new standard would not change from the current system.

The results presented here suggest that the TAPAS may be useful as an MOS qualification tool for Motor Transport Operators. Individuals who scored high on the TAPAS Can-Do, Will-Do, and Adaptation composites had lower rates of 12-month attrition, fewer disciplinary incidents, higher APFT scores, and higher levels of MOS-specific job knowledge than individuals who scored lower on these composites. Consistent with results for other MOS, these results also indicated that the TAPAS scales could provide incremental validity over the ASVAB AA composite that is currently used to screen candidates for this MOS. In other words, the TAPAS composites appear to assess individual characteristics that are not assessed well by the ASVAB but that are related to success in MOS 88M. Therefore, these TAPAS composites may also be useful for identifying high potential individuals who may not have qualified for MOS 88M using ASVAB scores alone.

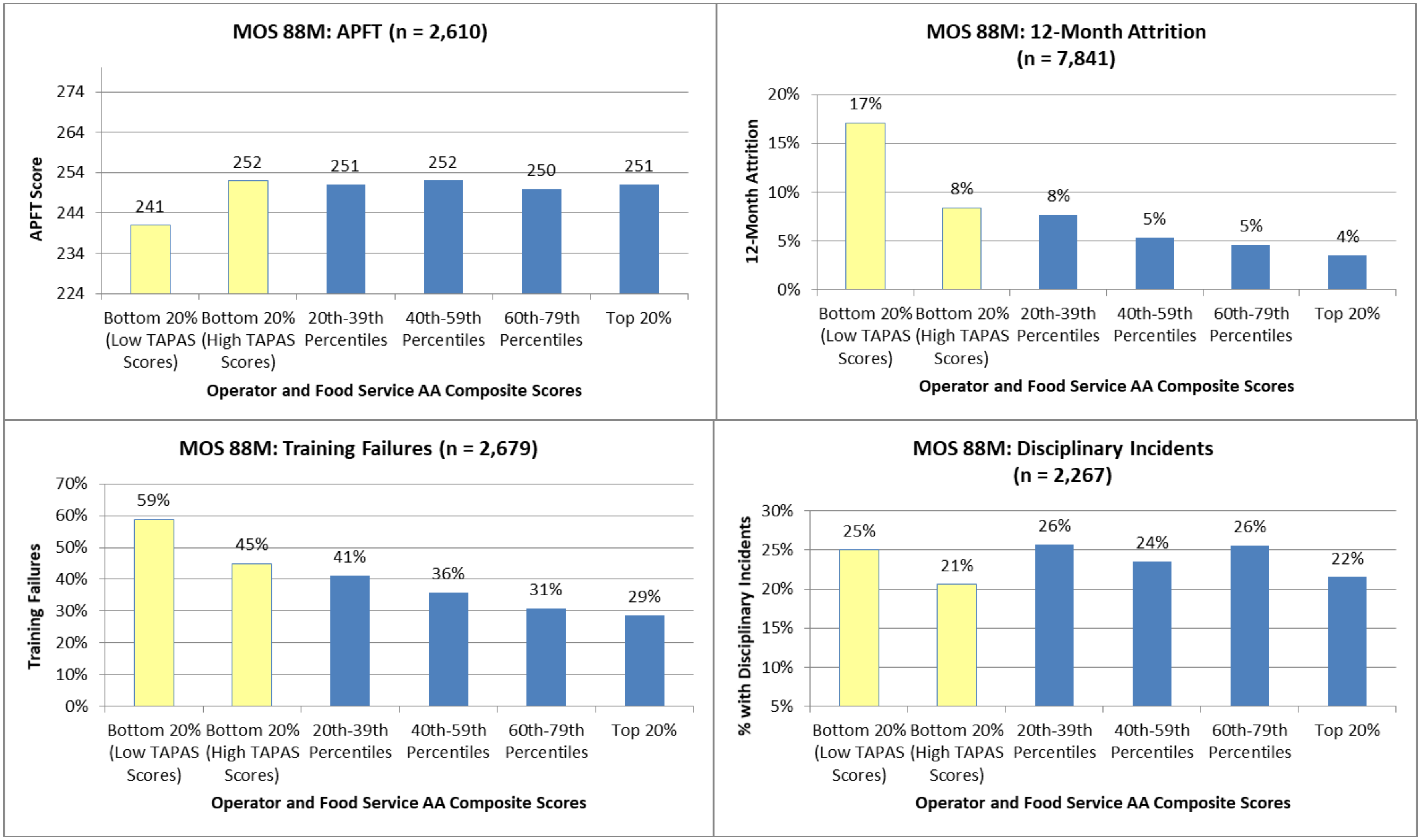

Figure 12. Comparisons using the Overall 88M TAPAS Composite to Supplement AA Composite Scores for Motor Transport Operators.

PREDICTIVE VALIDITY: MOS 91B (WHEELED VEHICLE MECHANICS)

Table 21 shows the descriptive statistics for the TAPAS scales and the criterion composites for the smallest MOS in this sample (91B). Again, raw dimension scores were normed and transformed into standardized scores within each version. As such, Table 21 suggests that the Soldiers in this sample had slightly lower mean scores on Attention Seeking, Dominance, Intellectual Efficiency, and Tolerance relative to the Army-wide sample used for norming. Table 22 shows the meta-analytic correlation matrix between the TAPAS scales and the three criteria. As with the other MOS, this matrix was used as input for our regression analyses and these correlations were estimated by calculating the sample-size weighted average correlations across each TAPAS version.

Table 21. Descriptive Statistics for the TAPAS Scales and Criterion Composites in MOS 91B

TAPAS Scales	N	Normed[a] Mean	Normed[a] Standard Deviation
Achievement	14,511	-.03	.97
Adjustment	12,577	.01	.96
Adventure Seeking	3,173	-.09	.95
Attention Seeking	13,269	-.14	.98
Commitment to Serve	4,486	.05	.94
Cooperation	10,036	.02	.97
Courage	3,804	-.06	.97
Dominance	14,511	-.17	.96
Even Tempered	14,511	.01	.97
Intellectual Efficiency	14,511	-.14	.93
Non-Delinquency	13,198	.04	.97
Optimism	14,511	.01	.96
Order	11,307	-.02	.94
Physical Conditioning	14,511	-.01	.93
Responsibility	3,846	-.03	.96
Self-Control	9,404	-.01	.98
Selflessness	11,307	-.03	.96
Situational Awareness	3,773	-.06	.95
Sociability	11,338	-.03	.97
Team Orientation	3,875	-.07	1.02
Tolerance	11,338	-.11	.98
Criterion Composites			
Will-Do Criterion [b]	679	.00	3.70
Can-Do Criterion [b]	663	-.48	1.55
Adaptation [b]	8,424	.93	.25

[a] TAPAS scores were standardized based on norming samples of approximately 34,000 to 60,000 (depending on the TAPAS version) Army examinees who completed the TAPAS at the MEPS.
[b] The criterion composites were not normed and, therefore, only the raw scores are reported.

Table 22. Correlations Between the TAPAS Facet Scales and Each Criterion Composite in MOS 91B

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Achievement	1.00																		
2. Adjustment	0.10	1.00																	
3. Attention Seeking	0.02	0.11	1.00																
4. Cooperation	0.09	0.06	-0.05	1.00															
5. Dominance	0.27	0.07	0.21	-0.07	1.00														
6. Even Tempered	0.09	0.23	-0.04	0.28	-0.06	1.00													
7. Intellectual Eff.	0.23	0.19	0.10	-0.01	0.25	0.08	1.00												
8. Non-Delinquency	0.17	0.01	-0.15	0.22	-0.03	0.23	0.04	1.00											
9. Optimism	0.14	0.24	0.09	0.12	0.10	0.18	0.09	0.11	1.00										
10. Order	0.16	-0.05	-0.05	0.07	0.08	0.02	0.07	0.10	0.00	1.00									
11. Physical Cond.	0.16	0.03	0.10	-0.06	0.17	-0.09	0.05	-0.05	0.04	0.06	1.00								
12. Self-Control	0.23	0.08	-0.09	0.15	0.06	0.22	0.16	0.26	0.09	0.21	-0.03	1.00							
13. Selflessness	0.13	-0.02	-0.09	0.19	0.04	0.11	0.02	0.18	0.06	0.07	-0.02	0.10	1.00						
14. Sociability	0.07	0.10	0.32	0.14	0.20	0.04	0.06	-0.03	0.16	-0.07	0.09	-0.05	0.07	1.00					
15. Tolerance	0.08	0.03	0.01	0.11	0.04	0.13	0.08	0.08	0.08	0.04	-0.03	0.13	0.29	0.13	1.00				
16. Can-Do Criterion Composite	0.09	0.04	0.00	-0.14	0.07	0.00	0.12	-0.03	0.04	-0.07	-0.09	-0.02	0.00	-0.07	-0.12	1.00			
17. Will-Do Criterion Composite	0.19	0.00	0.09	0.02	0.22	-0.03	0.08	0.01	0.11	0.10	0.23	0.10	0.07	0.12	0.02	0.07	1.00		
18. Adaptation Criterion Composite	0.06	0.02	0.07	-0.03	0.07	-0.02	0.01	-0.04	0.04	-0.03	0.15	-0.05	-0.05	0.02	-0.04	0.03	0.25	1.00	
19. ASVAB MM AA Composite	0.08	0.11	-0.04	-0.07	0.01	0.04	0.17	-0.04	0.03	-0.10	-0.04	-0.03	-0.12	-0.08	-0.12	0.52	-0.05	0.09	1.00

The scales comprising the TAPAS composites for the Can-Do, Will-Do, and Adaptation criteria in MOS 91B are indicated in Table 23. The values presented in this table represent the standardized regression weights for each of the TAPAS facets that were significant predictors of the criterion composite. The multiple R's for the three criteria ranged from .18 to .32 and the adjusted R's ranged from .17 to .28, indicating that the TAPAS composites were moderate predictors of performance for Wheeled Vehicle Mechanics. Despite the smaller sample sizes in this MOS, the results are comparable to the other MOS that we examined here.

The multiple R for the Will-Do composite was .32. As with the other MOS, this was the largest of the three criteria examined here. In addition, the Physical Conditioning scale was the best predictor of the Will-Do and Adaptation criteria. However, Dominance was also a substantial predictor of Will-Do performance. Not surprisingly, the TAPAS Intellectual Efficiency scale was the best predictor of Can-Do performance.

Table 23. Standardized Regression Weights for the TAPAS Facets in each Composite for MOS 91B

	Criteria		
TAPAS Facets	Can-Do	Will-Do	Adaptation[a]
TAPAS: Achievement	.11		-.03
TAPAS: Adjustment		.11	
TAPAS: Attention Seeking			.05
TAPAS: Cooperation	-.14		
TAPAS: Dominance		.15	
TAPAS: Even Tempered			
TAPAS: Intellectual Efficiency	.11		
TAPAS: Non-delinquency			
TAPAS: Optimism		.07	.09
TAPAS: Order			
TAPAS: Physical Conditioning	-.13	.18	.11
TAPAS: Self-Control			
TAPAS: Selflessness			-.08
TAPAS: Sociability			
TAPAS: Tolerance	-.13		
Multiple R	.26	.32	.18
Adjusted Multiple R	.19	.28	.17

Note: Samples sizes: Can-Do N = 154; Will-Do N = 158; Adaptation N: 1,759. To provide a more complete estimate of performance with each composite, scales were included in the composite if p < .10.
[a] In contrast to analyses in previous research (e.g., Nye et al., 2012), these analyses were conducted using regular OLS regression instead of logistic regression. To account for the dichotomous nature of the attrition variable in our meta-analytic correlation matrix, we calculated biserial correlations for the correlations between the TAPAS scales and 12-month Adaptation.

Using the TAPAS composites shown in Table 23, we calculated the scores on all three of these composites for each individual in MOS 91B. Table 24 shows the significant correlations between these scores and the various outcomes measured in this dataset. As with many of the MOS examined in this report, the TAPAS composite for the Will-Do criterion showed the largest number of significant correlations across the performance criteria. However, the TAPAS composites for the Can-Do and Adaptation criteria were also significantly correlated with a number of outcomes. For comparison, significant correlations between the ASVAB Mechanical Maintenance (MM) AA composite and both the TAPAS composites and the performance outcomes are also included. As expected, the MM composite was most highly correlated with the TAPAS Can-Do composite and Can-Do criteria.

Table 24. Significant Correlations Between the Criterion Measures and the Scores on the TAPAS Composites in MOS 91B

	MOS 91B TAPAS Composites			
Criteria	**Can-Do TAPAS Composite**	**Will-Do TAPAS Composite**	**Adaptation TAPAS Composite**	**ASVAB MM AA Composite**
ASVAB MM AA Composite	.22		.06	--
Can-Do Criterion Composite	.28			.50
MOS-Specific Job Knowledge Test	.33			.53
Army-Wide Job Knowledge Test	.19			.37
Will-Do Criterion Composite		.32	.14	-.08
APFT Scores		.26	.15	-.10
Overall ALQ	.11	.13		
Training Achievement		.15		-.14
Training Failure		-.18	-.13	
Disciplinary Incidents		-.06		
12-Month Attrition		-.06	-.10 [a]	-.05

Note: Correlations included if $p < .05$. [a] This value is based on the Pearson correlation between the predicted score and attrition. Due to the dichotomous attrition variable, this value was expected to be lower than the multiple R in Table 23 which was based on a regression analysis using biserial correlations.

For comparison with the other MOS, Figure 13 illustrates the quintile plots predicting MOS-specific job knowledge, 12-month attrition, Army Physical Fitness Test (APFT) scores, and disciplinary incidents as examples of the relationships between the criteria and the composites developed here. These plots provide the same information and are scaled in the same way as in the other MOS. Therefore, the interpretation of these plots is the same.

As shown in Figure 13, the TAPAS was useful for identifying high scorers on the APFT and job knowledge test in MOS 91B. Soldiers in the bottom 20% of the Will-Do composite averaged 18 points lower on the APFT than those in the highest 20%. Similarly, individuals with scores in the lowest quintile for the TAPAS Can-Do composite scored an average of approximately 16 points lower on the MOS-specific job knowledge test. In addition, 12% of individuals in the lowest quintile of the TAPAS Adaptation composite left the Army while only 4% of those in the highest quintile ended their service within 12 months. Finally, the highest scorers on the TAPAS Will-Do composite were approximately 50% less likely to engage in disciplinary incidents than the lowest scoring Soldiers on this composite. These results suggest that Soldiers who score high on the TAPAS composites are likely to perform better, engage in fewer disciplinary incidents, and stay in the Army longer than those who score lower on these composites.

We also examined the incremental validity of the TAPAS composites for predicting important Army criteria over the ASVAB AA composite used for qualification into MOS 91B. Figure 14 provides the results from the hierarchical regression analyses using both the ASVAB

MM AA composite and the TAPAS composites shown in Table 23 to predict Can-Do, Will-Do, and Adaptation criteria. As expected, the TAPAS did not contribute substantially to the prediction of Can-Do criteria when the ASVAB MM composite was already included in the model. However, the TAPAS composites did contribute substantial incremental validity to the prediction of Will-Do and Adaptation criteria. Adding the TAPAS composites to the regression equations for these outcomes increased the multiple R's by .28 and .13, respectively, when predicting these criteria. Thus, the TAPAS composites developed here can improve the prediction of performance above and beyond the ASVAB AA composite that is already used.

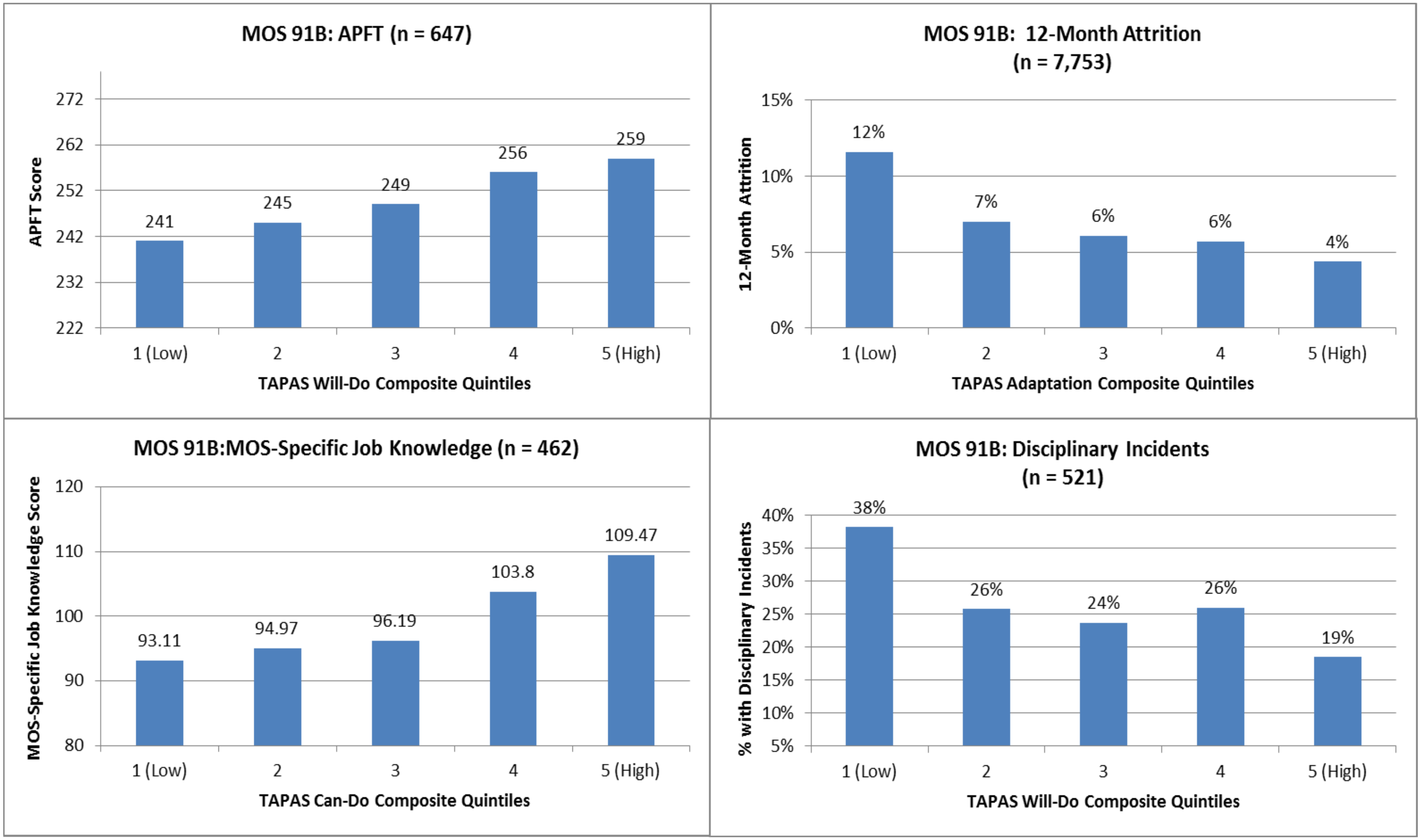

Figure 13. MOS 91B TAPAS Composite Quintile Plots for APFT scores, 12-Month Attrition, MOS-Specific Job Knowledge Scores, and Disciplinary Incidents.

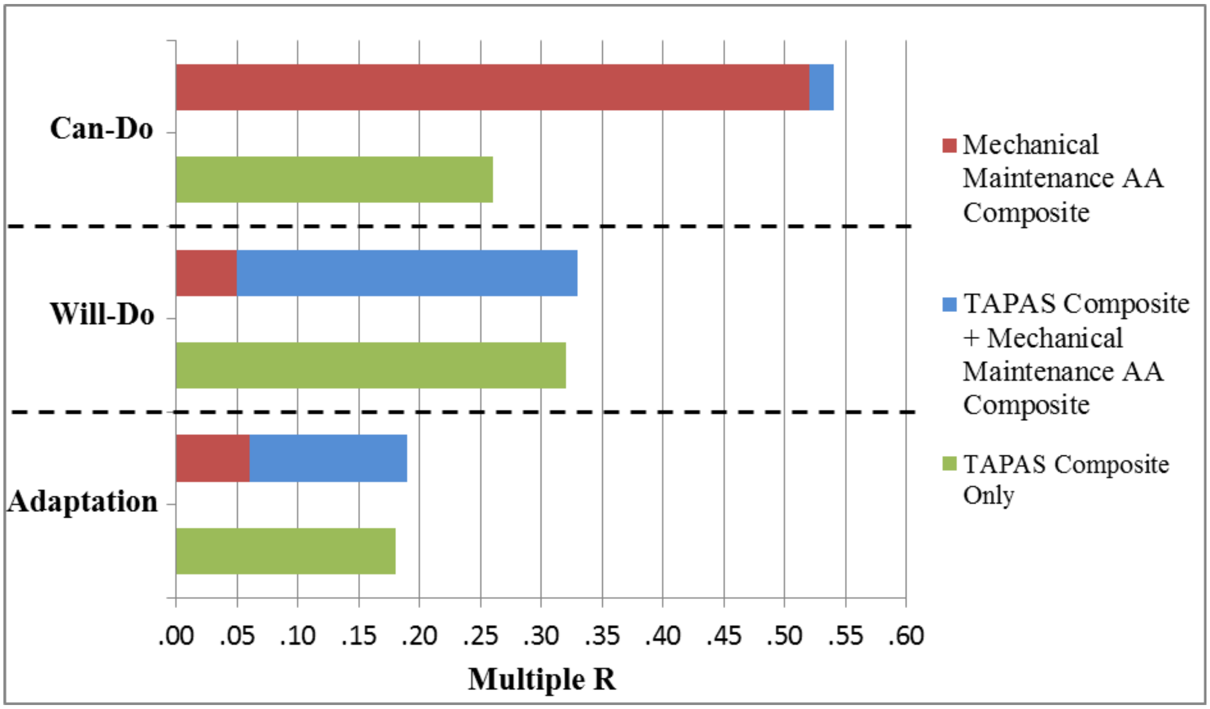

Figure 14. Incremental Validity of the TAPAS Composites over the Mechanical Maintenance AA Composite for Predicting the Can-Do, Will-Do, and Adaptation Criteria in MOS 91B.

The results presented for MOS 91B suggest that the TAPAS may also be useful as an MOS qualification tool for Wheeled Vehicle Mechanics. Individuals who scored high on the TAPAS Can-Do, Will-Do, and Adaptation composites had lower rates of 12-month attrition, fewer disciplinary incidents, higher APFT scores, and higher levels of MOS-specific job knowledge than individuals who scored lower on these composites. Consistent with results for other MOS, these results also indicated that the TAPAS scales could provide incremental validity over the ASVAB AA composite, particularly for predicting Will-Do and Adaptation criteria. In other words, the TAPAS composites appear to assess individual characteristics that are not assessed well by the ASVAB but that are related to success in MOS 91B. Therefore, these TAPAS composites may also be useful for identifying high potential individuals who may not have qualified for MOS 91B using ASVAB scores alone. Unfortunately, graphs illustrating the use of TAPAS to supplement the ASVAB scores (e.g., like those reported for the other MOS) were not possible due to the smaller sample sizes in this MOS. Nevertheless, given the findings presented above, the results are likely to be similar to the other MOS examined here.

MOS CLASSIFICATION

COMPARISONS ACROSS MOS

A primary objective of this research was to expand previous research and examine ways to improve MOS qualification in larger samples and with a broader range of MOS. As such, the results reported above suggest that TAPAS may be useful for this purpose and can potentially improve the validity of the current qualification procedures. In this section, we also explore the potential for using TAPAS as a classification tool. A necessary, but not sufficient, condition for TAPAS to be used for MOS classification is that it predicts important aspects of performance in each MOS. Again, the results presented above indicate that this is the case. In this section we summarize findings from analyses assessing the usefulness of TAPAS for *differential classification*. Note that a selection tool is *not* useful for classification if it provides essentially the same rank-order of individuals across all jobs. In this case, it might be useful for selection into the Army, but with no differences in predicted performance across jobs, no benefit would be obtained for classification. Thus, we next explored the degree to which MOS-specific TAPAS composites identified Soldiers that might perform better in a different MOS than the one to which they are assigned.

TAPAS WILL-DO COMPOSITES

The findings presented above for each MOS indicate that several TAPAS facets were significantly related to Will-Do performance in all MOS. For example, the Physical Conditioning scale was predictive in each MOS. The consistency of this predictor is an indicator of the physical nature of these occupations and of the military training that was completed during this time frame. In addition, both Achievement and Dominance were also significant predictors in most MOS.

Using the weights reported above for each MOS, scores on each of the MOS-specific TAPAS Will-Do composites were calculated for each individual in the total sample. Table 25 shows the correlations among these scores. As shown here, the Will-Do composites were highly correlated. Thus, the rank-order of individuals based on these scores will be similar.

Table 25. Correlations Between the TAPAS Will-Do Composites in the Total Sample

MOS	11B	31B	68W	88M	91B
11B	1.00				
31B	.96	1.00			
68W	.98	.98	1.00		
88M	.98	.98	1.00	1.00	
91B	.88	.81	.82	.83	1.00

Note. All correlations reported here were significant at the .05 level.

TAPAS CAN-DO COMPOSITES

The results reported above for each MOS also suggested several similarities in the TAPAS Can-Do composites across MOS. Not surprisingly, Intellectual Efficiency was a consistent predictor of Can-Do performance in all MOS presented. Again, individuals who score high on Intellectual Efficiency are able to process information efficiently and are considered knowledgeable and intellectual. Therefore, this scale should predict scores on the job knowledge tests that comprise the Can-Do criterion. Order and Sociability were also facets of the TAPAS Can-Do composites in all MOS except for 91B. Both these facets were negatively related to the Can-Do criterion.

Again, the MOS-specific regression weights were used to calculate scores for each individual in the total sample and the correlations between these scores are shown in Table 26. For the Can-Do composites, the scores were strongly correlated in four of the five MOS we examined. Thus, it appears that the predictors of the Can-Do criterion are somewhat similar in each MOS. In contrast, correlations with the Can-Do composite in 91B were relatively small. This indicates that the TAPAS composites may be able to differentiate performance for this MOS. However, these results are likely to be due to the relatively small sample size in this MOS and the sampling error that results. Therefore, these results should be viewed as preliminary and future research should examine this issue further.

Table 26. Correlations Between the TAPAS Can-Do Composites in the Total Sample

MOS	11B	31B	68W	88M	91B
11B	1.00				
31B	.92	1.00			
68W	.93	.88	1.00		
88M	.86	.89	.83	1.00	
91B	.39	.41	.44	.54	1.00

Note. All correlations reported here were significant at the .05 level.

TAPAS ADAPTATION COMPOSITES

For the TAPAS Adaptation composite, Physical Conditioning played a significant role in the composites estimated for each MOS. However, given the differential patterns of relationships across MOS, results indicated that the TAPAS scales could be useful for classification. In fact, the correlations among the TAPAS Adaptation composite scores in the total sample are provided in Table 27 and are the lowest of the three TAPAS composites developed here. These correlations ranged from .58 to .83, suggesting that the Adaptation composites will potentially result in rank-order differences for each MOS. In other words, the Adaptation composites may be the most useful for MOS classification.

Table 27. Correlations Between the TAPAS Adaptation Composites in the Total Sample

MOS	11B	31B	68W	88M	91B
11B	1.00				
31B	.83	1.00			
68W	.79	.65	1.00		
88M	.77	.74	.58	1.00	
91B	.78	.61	.59	.79	1.00

Note. All correlations reported here were significant at the .05 level.

MOS CLASSIFICATION

Given the predictive validity results reported above for each MOS, the TAPAS may be useful for classification purposes. Therefore, we next examined the extent to which the TAPAS composites could improve the classification of Soldiers to MOS. To answer this question, we used the composites described above to predict performance in MOS 11B, 31B, 68W, 88M, and 91B. We then compared predicted performance scores in the Soldier's current MOS to his or her performance potential in the other four MOS.

First, the MOS-specific regression weights presented above were used to calculate scores on the TAPAS Can-Do, Will-Do, and Adaptation composites for each individual and for each MOS. In other words, every Soldier had three TAPAS composite scores for each of the five MOS we examined here (i.e., 15 total). Then, the scores from the MOS-specific Can-Do, Will-Do, and Adaptation composites were standardized and summed (i.e., using unit weights for each composite) to get an overall MOS performance potential score that can be compared across 11B, 31B, 68W, 88M, and 91B. These overall TAPAS composite scores were the same values that were used to examine the potential utility of the TAPAS as a supplement to the AA composites for each MOS. The correlations between these overall TAPAS scores are provided in Table 28. We then compared an individual's performance potential for each MOS to the performance potential for his or her current MOS.

Table 28. Correlations Between the TAPAS Overall Performance Composites in the Total Sample

MOS	11B	31B	68W	88M	91B
11B	1.00				
31B	.91	1.00			
68W	.93	.87	1.00		
88M	.90	.93	.84	1.00	
91B	.78	.74	.69	.80	1.00

Note. All correlations reported here were significant at the .05 level.

Table 29 shows the percentages of Soldiers who, based on their TAPAS scores, had their highest potential in an MOS (columns) other than their current MOS (rows). In other words, the percentages shown here illustrate the percent of individuals in each MOS with their highest potential for performance in one of the other four MOS. Because some score differences will be too small to have any practical importance, we only report these percentages for Soldiers whose predicted future performance based on their TAPAS scores was at least one half standard deviation larger in another MOS than in their current MOS. The standard deviations for these composites ranged from approximately 1.90 to 2.31.

The results indicate that many Soldiers were likely to have performed better in a different MOS than in their current job. For example, the TAPAS data indicate that 14% of individuals in MOS 11B would have performed at a much higher level (at least ½ SD higher) as motor transport operators (88M). Across all MOS, the results indicated that 41% of Soldiers in MOS 11B would have performed at least half of a standard deviation higher in one of the other four MOS; 8% would have performed more than 1 standard deviation higher. Moreover, these results were similar across MOS—39% to 43% of individuals in each MOS had at least a half standard deviation difference between their highest potential scores in another MOS and in their current MOS.

Overall, it is clear that a number of individuals were predicted to perform better in a different MOS than the one in which they were currently serving. In Table 29, 39% to 43% of Soldiers in a particular MOS would have been classified into a different MOS using the TAPAS composites. In addition, around 8% to 20% of the total sample in an MOS were predicted to perform one full standard deviation higher in another MOS. Given the validity results reported above, these results appear to have important potential implications for MOS classification.

It should be noted that the approach used here to examine classification was necessarily simplified and did not consider other factors in the classification process such as ASVAB scores, Soldier preference, the personnel needs of each MOS, or the availability of training seats in each MOS. These factors affect the accuracy of the current classification process and, therefore, would also mitigate the impact of using TAPAS for MOS classification. Nevertheless, the results presented here illustrate the potential gains in performance that could be obtained by using the TAPAS.

It is surprising that roughly 40% of the Soldiers were predicted to perform substantially better (at least half a standard deviation) in another MOS when the overall TAPAS performance composites were so highly correlated across the MOS. In part, this is due to the relative dissimilarity of the Adaptation composites across MOS. In addition, each Soldier's performance potential was compared across five MOS, so there were four opportunities for a significantly higher predicted performance in an MOS other than his or her current MOS.

These results, while promising, provide only an initial view of the potential of TAPAS for MOS classification. To support operational applications, more research is needed to examine the utility of the TAPAS for MOS qualification and classification in these MOS and others using measures of in-unit performance and 36-month attrition.

Table 29. Percent of Soldiers with their Highest Potential in an MOS other than their Current MOS

Current MOS	Alternative Possible MOS: 11B .50 SD	11B 1 SD	31B .50 SD	31B 1 SD	68W .50 SD	68W 1 SD	88M .50 SD	88M 1 SD	91B .50 SD	91B 1 SD	Total % with their Highest Potential in Another MOS .50 SD	Total % 1 SD
11B	N/A	N/A	12%	1%	10%	1%	14%	2%	22%	6%	41%	8%
31B	12%	1%	N/A	N/A	18%	3%	8%	1%	22%	7%	39%	11%
68W	9%	1%	17%	3%	N/A	N/A	19%	4%	25%	8%	39%	12%
88M	14%	2%	10%	1%	20%	4%	N/A	N/A	21%	5%	40%	9%
91B	24%	8%	26%	10%	28%	13%	23%	8%	N/A	N/A	43%	20%

Note: Potential is indicated by the overall TAPAS scores.

DISCUSSION

The Army is conducting an IOT&E of the TAPAS. As part of this effort, the TAPAS has been administered to approximately 650,000 Army applicants testing at MEPS locations. In addition, a number of performance, attitude, and attrition criteria have been measured as part of the *Tier One Performance Screen (TOPS)* program. The bulk of the effort to this point has focused on validating the TAPAS as a selection tool and the results appear promising.

The goal of the current research effort was to update and expand previous research on the TAPAS as an MOS qualification tool for the U.S. Army. In addition, we also provided an expanded look at whether this assessment can be used to classify recruits into MOS. To be useful for these purposes, the TAPAS scales need to be valid predictors of Army criteria and must be able to predict that some individuals will be high performers in one or more MOS *but not in others*. Using the TOPS data, we examined these issues across the five largest MOS in the dataset: 11B, 31B, 68W, 88M, and 91B.

In sum, TAPAS scores were useful predictors of Can-Do, Will-Do, and Adaptation outcomes. MOS-specific TAPAS composites were correlated with a number of important behaviors such as attrition, APFT scores, job knowledge scores, and disciplinary incidents. In addition, quintile plots showed the important practical implications of these relationships. For example, even though the Pearson correlations with attrition were attenuated due to the categorical nature of this variable, plots of these relationships showed that Soldiers scoring in the bottom TAPAS quintiles had attrition rates that were as much as three times (MOS 88M) higher than Soldiers scoring in the highest quintile. This reduction in attrition has the potential to substantially reduce the costs associated with training and maintaining a sufficient number of Army personnel.

Perhaps the most important finding of this research was that about 39% to 43% of the Soldiers were predicted to perform better in an MOS other than the one to which they were assigned. Again, these analyses assumed that Soldiers would be classified into the MOS for which they had the highest potential for performance and, therefore, did not account for the practical limitations that are inherent in the classification process. Therefore, these results should be viewed as preliminary and more work is needed to examine the potential utility of TAPAS under real-world classification conditions. Despite this limitation, this preliminary evidence indicates that using the TAPAS composites for classification has the potential to improve performance, lower attrition, and improve the overall fit of a Soldier with his or her MOS.

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