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Assessing the Utility of Noncognitive Aptitudes as Additional Predictors of Graduation from U.S. Air Force Pararescue Training

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14. ABSTRACT
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1.0 SUMMARY

The present study investigated the utility and incremental validity of noncognitive testing (Bar-On's Emotional Quotient Inventory), as well as cognitive aptitude testing (Armed Services Vocational Aptitude Battery) prior to training for evaluating the suitability of training candidates for the U.S. Air Force pararescuemen career field. A total of 1233 Air Force pararescue training candidates participated in the study. Results of Cox regression survival analyses reveal noncognitive aptitude areas of functioning prior to training as key to performance and that significantly increase the capability to assess the suitability of training candidates for this high-risk, high-demand career field, as well as predict pass versus fail training outcomes beyond measures of cognitive aptitude. Multiple noncognitive aptitudes were identified specific to success in training. Results have direct implications for improving selection and aeromedical screening procedures for training candidates seeking entry into this military career field.

2.0 INTRODUCTION

U.S. Air Force (USAF) pararescuemen represent an elite group of special duty military operators critical to Department of Defense and Joint Military Coalition combat rescue and recovery missions. They serve as combatants and personnel recovery specialists with emergency medical capabilities in a wide range of military humanitarian and combat special operations. They deploy, using any available tactics (e.g., air, land, and sea), into restricted environments to authenticate, extract, treat, stabilize, and rescue injured, wounded, isolated, captured, or killed military and civilian personnel, as well as to recover sensitive information and equipment. USAF pararescuemen engage in a broad and diverse array of rescue and recovery operations, which are required for effectively responding and adapting to the constantly changing global war on terrorism [1,2]. Due to the extreme nature of tasks these medical combatants are expected to execute, pararescuemen are required to maintain a high level of physical fitness with a unique set of skills and abilities. They must also adapt to a unique military aircrew and special operations social milieu, as well as constantly changing group dynamics that make up the myriad of military teams they support. As a result, it has been postulated that aspects of a person's psychological disposition (i.e., cognitive, emotional, social, and behavioral functioning beyond physical abilities) also have an important role in identifying individuals who successfully complete training and become USAF pararescuemen [3,4].

Currently, the initial screening for USAF pararescue candidates is primarily focused on the Armed Services Vocational Aptitude Battery (ASVAB) cognitive assessment, medical standards (e.g., the absence of pathology, disease, and illness [5]), and a high level of general physical fitness, with little attention given to personality traits (i.e., stable and consistent patterns of emotional, social, and behavioral functioning over time and situations). The candidates, once qualified based on their general health, physical, and cognitive aptitude, go through some of the most rigorous training offered in the USAF, and arguably among military career fields across the Department of Defense. Their training pipeline takes approximately 18 months to 2 years to complete and is composed of several physically and psychologically demanding courses. Currently, the overall attrition rate for direct accession training candidates is approximately 86-90%. Such high attrition incurs a significant cost to both training and economic resources [3], as well as negatively affects the USAF's ability to meet trained personnel requirements for operational readiness and joint force military missions in a timely manner. The majority of attrition occurs within the first 2 months of training. Although some attrition may occur later in training due to injury or unforeseen circumstances [6], there are relatively few eliminations at later stages of training over the course of the remaining 18 months [7]. While research clearly supports the value of cognitive abilities in predicting performance and training success in the military [7-12], more research is warranted to identify additional ways to improve the initial screening.

There is a growing body of research suggesting that noncognitive areas of functioning (e.g., stress tolerance, general mood, self-confidence, assertiveness, understanding oneself and others, relating and interacting with others) often predict performance and training outcomes in civilian [13-15] as well as military settings above and beyond cognitive abilities [4,16-22]. Drawing from this literature, we propose the successful completion of USAF pararescue candidate training may also be predicted by measures of noncognitive constructs that are not readily captured in the current screening assessment.

While most studies in the past were built on theories of personality traits, the importance of noncognitive functioning in military training is also articulated by theories of emotional and social intelligence [23-25]. Such theories espouse the importance of an array of abilities (e.g., self-regard, emotional self-awareness, independence, self-actualization, stress tolerance, flexibility, optimism, interpersonal demeanor) that are not measured by tests of general cognitive functioning but perceived as relevant to successfully adapting to the rigors of USAF pararescuemen training and operational requirements.

However, theories of emotional and social intelligence are controversial. It has been argued that such theories are relatively vague [26] and a misinterpretation of the intelligence construct [27]. The most prominent criticism of emotional and social intelligence theories is centered on the results of studies that have found the domains and facets of such constructs to resemble personality traits [28-36]. For example, self-report items, factor structure, item content, and response choices of the Bar-On measure of emotional intelligence appear to have overlapping content and structure with personality traits measured by the 16pf® [37], the Occupational Personality Scale [38], and the NEO Personality Inventory-3 [39]. As a result, the content and factor structure of theories and tests of emotional and social intelligence are likely a mixed model of noncognitive functioning that overlaps with personality traits. Despite the problems with developing an agreed-upon construct of “emotional intelligence” and measurement practices [27], empirical research suggests self-report, mixed-model measures of emotional intelligence tend to do well in predicting performance and well-being in a variety of different work contexts, above measures of cognitive ability [40,41].

The authors’ experiences of consulting with USAF pararescuemen training cadre reveal diverse opinions regarding areas of emotional and social functioning that delineate those who pass versus fail training [3]. Many perceive those who pass training to have higher levels of stress tolerance, independence, assertiveness, and impulse control, whereas others have postulated the small percentage (approximately 10%) of training candidates who pass have higher levels of self-regard and optimism, and notably higher levels of interpersonal functioning. It is difficult to identify the roots of these perceptions, which appear to be based on subjective impressions of each person’s experience and knowledge of training candidates without empirical studies on which to base their judgments.

The purpose of the current study is twofold:

1. To evaluate if emotional, social, and behavioral functioning between those who pass versus fail training can improve the ability to predict successful completion of USAF pararescue training above and beyond a measure of general cognitive ability (i.e., ASVAB scores) that is in current use. Due to the rigorous nature of training, the general expectation is that predictors of successful completion in USAF pararescue training will focus on intrapersonal and interpersonal functioning, adaptability, stress management, and general mood and that the collective combination of cognitive and noncognitive areas of functioning would improve the ability to predict training outcomes beyond a single measure of cognitive ability.
2. To identify a set of specific variables reflecting cognitive and noncognitive functioning that best discriminate between those who pass versus fail during the early stages of training, where most attrition occurs.

The results of such findings may help to shape personnel selection and aeromedical practices by targeting specific areas of functioning key to performance for this unique career field.

3.0 METHODS

3.1 Participants

A total of 1233 nonprior-service, direct accession pararescue training candidates were included in this study. Given the pararescue career field excludes females from training, all candidates were male. Training candidates who passed (n = 170, 14%) had a mean age of 21.22 (standard deviation (*SD*) = 2.84) and those who failed (n = 1063, 86%) had a mean age of 20.60 (*SD* = 2.43). Demographic data, such as race, educational level, and marital status, were not available for inclusion in this study.

3.2 Measures

3.2.1 Armed Services Vocational Aptitude Battery. Testing from the ASVAB was used to assess cognitive aptitude [42]. The ASVAB is completed by all individuals seeking to enlist in the U.S. military and is used to assist with occupational assignment. The four composite scores used by the USAF for occupational assignment are based on weighted combinations of eight out of the nine subscales (see Table 1 for descriptions). The ASVAB composite and subscale scores have good reliability, correlate with academic achievement, and are predictive of subsequent military performance [8,43]. Composite and subtest scores are standardized with a mean score of 50 and *SD* of 10. The USAF pararescue training candidates must achieve a General Composite score of 44 to enter training prior to enlistment.

Table 1. Composite Scale and Subtest Descriptions of the ASVAB

Subtest/Composite Scale	Description
Subtest	
General Science (GS)	Knowledge of life, earth, and physical science
Arithmetic Reasoning (AR)	Ability to use mathematics for reasoning
Word Knowledge (WK)[a]	Knowledge of the meaning of words
Paragraph Comprehension (PC)[a]	Reading comprehension skills
Mathematical Knowledge (MK)	Knowledge of high school mathematics principles
Electronics Information (EI)	Knowledge of electricity and electrical principles
Mechanical Comprehension (MC)	Knowledge of mechanical and applied physics
Auto & Shop Information (AS)	Knowledge of automobile technology and hand tools
Assembling Objects (AO)	Visual and spatial reasoning skills
Composite Scale	
General	AR + VE
Mechanical	AR + MC + AS
Electrical	GS + AR + MK + EI
Administrative	MK + VE

[a]Work Knowledge and Paragraph Comprehension are combined to create a Verbal Expression (VE) composite.

3.2.2 Emotional Quotient Inventory (EQ-i). The EQ-i was used to measure a wide array of noncognitive aptitudes [24]. The EQ-i was chosen because the constructs of the test measure areas of noncognitive functioning relevant to pararescue training and operations. The test is composed of 133 items that measure 5 major domains and 15 subscales (see Table 2 for details) of noncognitive functioning. The EQ-i test items use a 5-point Likert scale response set ranging from "Very Seldom True or Not True of Me" to "Very Often True of Me or True of Me." Scale scores are normed for the general population, with a standardized mean score of 100 and *SD* of 15. Internal consistency estimates for the EQ-i subscales are greater than 0.76, with test-retest reliability estimates of 0.85 after 1 month and 0.75 after 4 months [44]. In the current sample of 1233 pararescue training candidates, each domain subscale's Cronbach's alpha reliability estimates are as follows: Interpersonal, $\alpha = 0.88$; Intrapersonal, $\alpha = 0.90$; Stress Management, $\alpha = 0.87$; Adaptability, $\alpha = 0.89$; General Mood, $\alpha = 0.90$. A Cronbach's alpha = 0.80 is considered to be an acceptable reliability estimate.

Higher scores on the EQ-i scales are associated with better coping in stressful situations [45] and higher levels of physical and emotional health [46]. The EQ-i is applied in a variety of settings with acceptable psychometric properties, such as internal consistency, convergent validity, and resistance to response style and bias [47]. Although others suggest such testing is susceptible to faking [48,49], the test has positive impression management scales to assess an individual's response style to test items.

Table 2. Subscale Descriptions of the EQ-i

Domain/Subscale	Subscale Description
Intrapersonal	
Emotional Self-Awareness	The ability to recognize and understand one's feelings and emotions.
Assertiveness	The ability to express feelings, beliefs, and thoughts and to defend one's right in a nondestructive manner.
Self-Regard	The ability to respect and accept oneself with general feelings of a sense of self-adequacy.
Self-Actualization	The ability to realize and strive to achieve one's potential capacities that lead to rich, meaningful experiences.
Independence	The ability to be self-directed and independent in one's thinking and actions and to be free of emotional dependency
Interpersonal	
Empathy	The ability to be aware of, understand, and effectively respond to the emotional disposition of others.
Interpersonal Relationship	The ability to establish and maintain mutually satisfying relationships characterized by closeness and by giving and receiving positive social exchanges.
Social Responsibility	The ability to demonstrate oneself as a cooperative, contributing, and constructive member of one's social group.
Adaptability	
Problem Solving	The ability to identify and define problems as well as to generate and implement potentially effective solutions
Reality Testing	The ability to assess the correspondence between what is experienced and what objectively exists
Flexibility	The ability to adjust one's emotions, thoughts, and behavior to changing situations and conditions
Stress Management	
Stress Tolerance	The ability to withstand adverse events and stressful situations by actively and positively coping with stress
Impulse Control	The ability to resist or delay an impulse, drive, or temptation to act
General Mood	
Happiness	The ability to feel satisfied with one's life, to enjoy oneself and others, and to have fun
Optimism	The ability to look at the brighter side of life and to maintain a positive attitude, even in the face of adversity
Validity Scale	
Positive Impression	The tendency to present oneself in an overly favorable or unrealistically positive manner

3.2.3 Training Outcome. Each candidate's training success was coded as either failed or passed from a 57-day combined training program (10 days of Development followed by 47 days of Indoctrination). Participants who voluntarily dropped out of training (i.e., "self-eliminated") and/or were not allowed to proceed due to insufficient performance were categorized in the nongraduate (i.e., attrition) group. Participants who were removed from training for physical injury, medical, or administrative reasons were not included in this study, which represents less than 6% of those who fail training [7]. Medical reasons for removal may include illness/injury, as well as maladaptive emotional, social, and behavioral areas of functioning (such as poor stress tolerance [5]). The day of training that candidates failed was also recorded.

3.3 Procedures

ASVAB testing was completed prior to the start of basic military training as a routine part of the military entrance screening process. EQ-i testing was administered to candidates upon enlistment in the USAF and prior to entering pararescue training. While in the first week of basic military training, pararescue training candidates were gathered in a large room with several computers, where they were informed about the purpose and methods of the study and provided the informed consent document. Participants were informed the test could be used as an additional assessment tool for evaluating their psychological fitness and suitability for special duty training during their flight medicine evaluations prior to pararescue training and afterwards, and that test results may influence the outcome of such evaluations. Participants then completed the EQ-i via computerized testing. Upon completion of the EQ-i, participants' scores were uploaded into an electronic database and merged with their pre-accession ASVAB scores. All scores were subsequently merged with training outcomes.

3.4 Statistical Analysis

The focus of this study was to identify noncognitive aptitudes and assess the incremental validity of a noncognitive measure when used in combination with a cognitive measure for predicting training outcomes. All analyses were conducted using SAS version 9.3 (SAS Institute, Cary, NC). The vast majority of training attrition for direct accession candidates (86-90% attrition) occurs within the first 57 training days of the 18-month training program. As a result, this study focused on candidates who passed (or failed) the pararescue Development (10 days) and Indoctrination (47 days) courses. This is a critical period during training, given that candidates who complete both courses often complete the entire training pipeline and the attrition rate after such courses is low (approximately 5%).

Initially, point-biserial correlation was used to measure the strength and direction of association that exists between each ASVAB subtest and EQ-i scale with the pass/fail criterion. Since there are minimum ASVAB score requirements to enter pararescue training, truncation in the distribution of ASVAB scores is possible. Therefore, correction for the impact of potential range restriction was considered. Additionally, correction for dichotomous (pass versus fail) outcomes was also considered [50]. As a result, multivariate range restriction correlation adjustments [12,51] were calculated for the ASVAB (see Table 3). However, direct or indirect range restriction with noncognitive aptitude testing is less clear. Since such testing was not used for selection and there are no minimum or maximum requirements for test scores, direct range restriction did not appear to apply to such a measure. If, however, it was determined that there were significant correlations between the ASVAB General Composite score and the noncognitive assessment scores, it might imply indirect range restriction as well. However, this was not the case in that the correlations were considerably small between the ASVAB and EQ-i. The multivariate correction for range restriction treated the ASVAB subtests as explicit selection variables while addressing the potential incidental selection situations based on the EQ-i scales.

Table 3. Descriptive Statistics of ASVAB and EQ-i Scores for Training Candidates

Scale	Failed Training n = 1063		Passed Training n = 170		*r*	*rc*	*rd*	*rcd*
	M	***SD***	***M***	***SD***				
ASVAB								
Composites								
Administrative	75.09	15.07	79.38	14.89				
Mechanical	72.32	18.34	78.42	17.43				
General	74.18	16.03	79.48	15.37				
Electrical	76.62	16.16	82.01	14.32				
Subtests								
General Science	56.85	7.20	58.89	6.53	0.10	0.09	0.15	0.14
Arithmetic Reasoning	57.93	6.12	59.69	5.54	0.10	0.10	0.16	0.15
Electrical Information	55.71	7.49	57.56	7.23	0.09	0.07	0.13	0.12
Auto and Shop	52.17	7.70	53.51	7.32	0.06	0.08	0.09	0.12
Math Knowledge	58.24	5.68	59.39	5.57	0.07	0.06	0.11	0.09
Mechanical Comprehension	58.74	7.32	60.72	6.61	0.09	0.08	0.15	0.12
Verbal Expression	55.70	5.96	57.31	5.86	0.09	0.09	0.15	0.14
Object Assembly	52.89	19.14	54.12	19.02				
EQ-i								
Intrapersonal	106.45	11.24	107.28	10.52				
Self-Regard	106.93	11.09	108.30	9.18	0.04	0.05	0.07	0.08
Emotional Self-Awareness	104.01	13.04	104.83	12.58	0.02	0.03	0.03	0.04
Assertiveness	104.64	13.00	105.49	12.79	0.02	0.03	0.04	0.04
Self-Actualization	107.25	11.42	110.31	8.86	0.09	0.10	0.15	0.16
Independence	98.70	12.99	101.42	12.07	0.07	0.08	0.11	0.13
Interpersonal	105.52	11.64	107.69	9.55				
Empathy	104.78	12.54	105.88	12.74	0.03	0.03	0.05	0.04
Social Responsibility	106.56	10.62	108.19	10.00	0.05	0.06	0.08	0.09
Interpersonal Relationship	105.27	12.48	105.56	11.43	0.01	0.01	0.01	0.02
Stress Management	110.26	12.36	111.94	12.06				
Stress Tolerance	109.93	12.80	111.68	11.88	0.05	0.05	0.07	0.08
Impulse Control	107.79	12.78	109.01	12.73	0.03	0.04	0.05	0.05
Adaptability	107.11	12.73	109.49	11.30				
Reality Testing	104.25	12.57	106.59	11.33	0.06	0.07	0.10	0.11
Flexibility	109.64	14.00	111.45	12.64	0.05	0.05	0.07	0.08
Problem Solving	104.64	12.85	106.54	12.30	0.05	0.06	0.08	0.09
General Mood	107.75	10.84	109.75	9.07				
Optimism	107.38	12.03	109.49	10.38	0.06	0.07	0.10	0.10
Happiness	107.44	10.58	109.06	9.21	0.05	0.06	0.08	0.09
Validity Index								
Positive Impression	109.92	14.80	110.76	14.55				
Inconsistency Index	4.30	2.60	4.06	2.41				

Note: M = mean; *r* = observed correlations; *rc* = range restriction corrected correlations; *rd* = corrections for dichotomous outcome; *rcd* = corrected correlations for both observed correlation and dichotomization of criterion. All scores for the ASVAB are reported as standard scores with a normative sample *M* = 50 and *SD* = 10.

A Cox regression survival model was used to assess whether the inclusion of noncognitive information provided by the EQ-i scales improved the ability to predict successful completion of USAF pararescue training above and beyond a measure of general cognitive ability. The event of interest was the time until a candidate was removed from the training program, either resulting from performance-related deficiencies or when the trainee self-eliminated from the program. The highest rates of training attrition reportedly occur during the first 10 days of training, known as the developmental stage. Based on discussions with the authors, identification of psychological attributes predictive of those who passed this stage of training was of keen interest to pararescue leadership and operational psychologists within the training squadrons.

4.0 RESULTS

4.1 Passed Versus Failed Group Descriptive Statistics

Means and standard deviations for the ASVAB composites and subscale scores as well as the EQ-i domain and subscale scores for those who graduated and those who did not graduate from pararescue training are displayed in Table 3. As with all self-report inventories, there is a concern with positive impression management, especially when the stakes are as high as they are for entrance into these career fields. Most inventories have items to assess for this possibility and such is true with the EQ-i. In addition, the test publisher stipulates that there were no statistical differences between genders, and the authors' analysis found no effect for age.

Additionally, the EQ-i has an inconsistency index, which assesses for erratic response patterns that can potentially invalidate a given trainee's responses. There was no statistically significant difference between pass versus fail groups on the positive impression index, *Wald* $\chi^2 = 0.09$, $p = 0.75$. Neither were there statistically significant differences on the inconsistency index, *Wald* $\chi^2 = 2.92$, $p = 0.17$. Moreover, there was no significant difference for the interaction between the inconsistency index and positive impression index. While these findings suggest positive impression and inconsistency indices show no differences, there remained the issue if these trainees should be removed from the dataset for analysis. Analysis was conducted both with and without those trainees who scored above the cutoff, for either/both positive impression and inconsistency, with all analyses being nonsignificant. In other words, scoring above the threshold on either the inconsistency index or positive impression index did not influence pass versus fail training outcomes. This suggests that both groups engaged in a similar level of self-disclosure to testing. As such, the authors decided to leave all trainees in the dataset for analysis.

Table 3 provides the observed point-biserial correlation coefficients, corrected correlation, and correction for dichotomization of criterion between each ASVAB subtests and EQ-i scales with the pass/fail criterion. In general, the observed correlation coefficients were very similar to those after the appropriate corrections. Particularly, the observed correlations and the range restriction corrected correlations were almost identical for both the ASVAB and EQ-i, which supports our initial assessment of the lack of true range restriction in our study sample. If range restriction had been observed, we would have expected correlations to increase from their observed correlations reflecting that range restriction was present; this was not the case. As theorized, the very nature of noncognitive assessments would only result in indirect range restriction if, and only if, noncognitive performance was dependent (highly correlated) with cognitive performance. This was not what was observed in this study. Thus, range restriction was not considered an issue in this study.

4.2 Hierarchical Cox (Survival Analysis) Regression

Initial lifetable analysis using the Kaplan-Meier method analyzed the distribution of training failures over time. The results revealed that distribution of training failures was not linear over time. In addition, the Kaplan-Meier assessment also validated the vast majority of attrition occurring during the development stage of training. This finding supported the use of Cox time-to-failure methods. This approach uses time-to-failure, identified in this study as day-of-training elimination, to assess probability of success/failure in training. As in medical studies, this is synonymous to time-to-event, which in this case is the day a trainee was removed from training for either performance deficiencies or self-elimination.

In step 1 of hierarchical Cox regression procedures, only uncorrected ASVAB subtest scores and uncorrected outcomes were analyzed, which yielded a statistically significant model ($p < 0.007$) that accounted for 2.6% of variance accounted for in training outcomes (likelihood ratio (LR) χ^2 (7) = 19.15, $R^2 = 0.0267$, Akaike information criterion (AIC) = 7140.90, -2 log-likelihood = 7126.90, receiver operating characteristic curve (ROC) = 0.61). In step 2, only the uncorrected EQ-i subscale scores and uncorrected outcome variables were analyzed, which yielded a statistically significant model ($p < 0.0001$) that accounted for approximately 3.5% of variance accounted for in training outcomes (LR χ^2 (15) = 51.67, $R^2 = 0.035$, AIC = 7124.80, -2 log-likelihood = 7094.18, ROC = 0.61). In step 3, both the ASVAB and EQ-i subscales were analyzed together using uncorrected test scores and outcome variables. The authors utilized forward, backward, and stepwise procedures along with the SAS “score” procedure for determining the best predictors in the combined model. The resulting best fit model is identified by the 18 combined variables presented in Table 4.

The uncorrected combined ASVAB + EQ-i 18-variable model that was built on a random sample of training candidates (n = 750) was statistically significant ($p < 0.0001$) and accounted for 6.3% of variance accounted for in training outcomes (LR χ^2 (18) = 55.23, $R^2 = 0.063$) with moderate to good fit (AIC = 4273.46, -2 log-likelihood = 4237.46, ROC = 0.65). The overall resulting classification accuracies were 59% correct reject and 41% incorrect accept for those who failed training and 0% incorrect reject and 100% correct accept for those who passed training. This was based on an initial cutoff probability of failure/success at 0.50. Had the decision rule probability been set at 0.60, the resulting classification accuracies would be 73% correct reject and 2% incorrect reject with 27% incorrect accept and 98% correct accept (see Table 5).

In step 4, the combined uncorrected scores for the ASVAB + EQ-i model were validated on a hold-out independent random sample of trainees (n = 483) using the weights from the initial sample (n = 750). The model was statistically significant ($p < 0.0001$) and accounted for 6.2% of training outcomes (LR χ^2 (18) = 59.62) and was of moderate to good fit (AIC = 7544.10, -2 log-likelihood = 7508.10, ROC = 0.65). The resulting classification accuracies were 58% correct reject and 2% incorrect reject, with 42% incorrect accept and 98% correct accept, both well within the 10% guideline for shrinkage in assessing model fit. As previously suggested, had the decision rule been set at 0.60, the resulting classification accuracies would be 72% correct reject and 4% incorrect reject, with 28% incorrect accept and 96% correct accept, again within guidelines for good model fit.

Table 4. Cox Survival Analysis Combined Model

Measure	Wald χ^2	Rank STB
ASVAB Subscales		
Arithmetic Reasoning	2.009	9.13
General Science	1.187	7.54
Mechanical Comprehension	0.631	4.90
Verbal Expression	0.443	4.56
Mathematical Knowledge	0.033	1.09
EQ-i Subscales		
Self-Actualization	7.732	22.02
Interpersonal Relationship	3.127	13.51
Happiness	1.922	11.39
Independence	2.000	8.51
Stress Tolerance	1.027	7.95
Assertiveness	1.399	7.70
Self-Regard	0.553	6.09
Social Responsibility	0.517	5.56
Reality Testing	0.500	4.98
Optimism	0.123	2.90
Empathy	0.100	2.43
Flexibility	0.087	1.96
Problem Solving	0.004	0.39

Note: STB = standard beta estimate, one measure used to indicate variable importance in the model. While the STB is unitless, it is a relative measure of the magnitude of importance.

Table 5. Cox Regression Survival Analysis Using Combined ASVAB + EQ-i Model Validation (n = 750)

Training Candidates	Classification Category for Initial Model Building Predictive Values for Combined Model						Total
	0.0-0.50	0.51-0.60	0.61-0.70	0.71-0.80	0.81-0.90	0.91-1.0	
Failed Training	372 (50%)	83 (11%)	75 (10%)	60 (8%)	33 (4%)	3 (<1%)	626 (83%)
Passed Training	0	3 (<1%)	19 (3%)	43 (6%)	48 (7%)	11 (15%)	124 (17%)

Note: The overall resulting classification accuracies of the model with a 0.50 or less cutoff were 59% correct reject and 41% incorrect accept for those who failed training and 0% incorrect reject and 100% correct accept for those who passed training. The outcome results of classifying training candidate outcomes with their individual predictive values and grouping according to deciles from the combined model provided increased understanding of the candidate pool's suitability and level of risk for training failure.

When applying Cox regression time-to-failure survival analysis, both probability of survival and probability of failure (1-survival) are calculated. For purposes of this study, the authors used the 1-survival probabilities to predict time-to-failure and classify trainees as pass or fail. The outcome probability results for the ASVAB + EQ-i for participants in the initial sample (n = 750) and validation sample (n=483) were used to subsequently categorize those with a predictive value of less than or equal to 0.50 and those above 0.50. Those above 0.50 were then classified into the following categories (0.60-0.69, 0.70-0.79, 0.80-0.89, and 0.90-1.0). The outcome results of classifying training candidate outcomes with their individual predictive values from the combined model for both the training dataset and validation dataset provided increased understanding of the candidate pool and level of risk for training failure (see Tables 5 and 6). These tables increase our understanding of the overall suitability of training candidates suitable and ready for training.

Table 6. Cox Regression Survival Analysis Using Combined ASVAB + EQ-i Model Validation (n = 483)

Training Candidates	Classification Category for Validation of Predictive Values for Combined Model						Total
	0.0-0.50	0.51-0.60	0.61-0.70	0.71-0.80	0.81-0.90	0.91-1.0	
Failed Training	255 (53%)	60 (12%)	33 (7%)	41 (8%)	35 (7%)	13 (3%)	437 (90%)
Passed Training	1 (<1%)	1 (<1%)	3 (<1%)	11 (2%)	22 (5%)	8 (2%)	46 (10%)

Note: The overall resulting classification accuracies of the model with a 0.50 or less cutoff were 53% correct reject and 47% incorrect accept for those who failed training and 2% incorrect reject, and 98% correct accept for those who passed training. The outcome results of classifying training candidate outcomes with their individual predictive values and grouping according to deciles from the combined model provided increased understanding of the candidate pool's suitability and level of risk for training failure.

5.0 DISCUSSION

The training of USAF pararescuemen is a complex process influenced by several factors, such as unforeseen life events, illness and injury, major life stressors, motivational level of training candidates, as well as recruiting and training processes. Improvements to these areas may help increase the number of candidates who complete training. However, it is reasonable to also consider improvements to the selection processes. Current selection standards result in a group of candidates with high levels of fitness and cognitive aptitude. Yet, not all highly intelligent and physically fit candidates successfully adapt to rigorous training tasks.

The current study sought to determine if the assessment of noncognitive areas of functioning (as measured by the EQ-i) in addition to cognitive areas of functioning (as measured by the ASVAB) would improve the ability to predict training outcomes. The results of analyses as delineated in Tables 3 and 4 were consistent with the hypotheses that those who passed training had higher levels of intrapersonal and interpersonal functioning, adaptability, stress management, and general mood and that the inclusion of noncognitive aptitude testing improved the ability to predict training outcomes.

In regard to cognitive functioning, the results from Cox regression survival analyses and the standard beta estimates from logistic regression revealed five ASVAB subtests (i.e., Arithmetic Reasoning, Mathematical Knowledge, General Science, Mechanical Comprehension, and Verbal Reasoning) as significant predictors of training outcomes. These findings reveal those who pass training have greater knowledge of the functioning and spatial analyses of physical and mechanical properties, as well as greater ability to solve arithmetic word problems. The findings align with an earlier study by Manacapilli et al., who also found ASVAB subscales to be predictors of pararescuemen training outcomes [7]. Arithmetic Reasoning and Mathematical Knowledge, for example, appear to be essential aptitudes for pararescuemen training candidates and operators required to calculate distance and altitude, weight of load and materials, as well as departure-arrival times when traversing terrain. Additionally, such aptitude is considered critical to effectively calculating bandage pressure and medication dosages while responding to critically injured personnel during high stress situations. Mechanical Comprehension is an essential skill for assessing spatial relationships and likely an important aptitude for understating the working properties of various forms of combatant and medically oriented equipment they travel with and operate. Furthermore, general knowledge of physical and biological sciences appears important to understanding and implementing various medical conditions and procedures within a limited period of time. Furthermore, verbal comprehension and expression are likely relevant to clear and decisive communication in a diverse set of demanding conditions. Regardless of the various tools and procedures available to assist candidates with acquiring a complex set of skills within a limited time, the cognitive aptitudes above were predictors of performance and reasonably perceived as important to operational requirements on the battlefield.

In terms of noncognitive functioning, the results of regression analyses (see Table 4) suggest the ability to respect and accept oneself (i.e., self-regard), realize and strive to achieve one's potential capacities (i.e., self-actualization), be self-directed and self-controlled in one's thinking and actions without needing to rely on others emotionally (i.e., independence and impulse control), as well as having a generally positive mood (i.e., happiness) with the capacity to sustain a positive emotional demeanor under demanding conditions (i.e., stress tolerance and optimism) are especially important aptitudes of successful pararescuemen training candidates. Such findings are consistent with previous research revealing general emotional "hardiness" to be a predictor and general characteristic of candidates who graduate from U.S. Army Special Forces training [16].

Although the results of the study reveal that characteristics of emotional maturity are important to success, the results also reveal the ability to express feelings, beliefs, and thoughts and to defend one's right in a nondestructive manner (i.e., assertiveness); the ability to establish and maintain mutually satisfying relationships characterized by closeness and the giving and receiving of positive exchanges (i.e., interpersonal relationship); the ability to demonstrate socially cooperative, constructive, and responsible (i.e., social responsibility) behaviors in a group; and the ability to be aware of, understand, and effectively respond to the emotional disposition of others (i.e., empathy) are also important aptitudes. Such aptitudes may be particularly relevant to effectively adapting to the requirement of operating independently, as well as in small, constantly changing teams under demanding and diverse conditions.

Furthermore, the results of the study reveal one's approach to unexpected life events and challenges is important. This includes the ability to effectively adjust one's emotions, thoughts, and behavior to changing situations and conditions (i.e., flexibility), as well as identifying and defining problems and implementing potentially effective solutions (i.e., problem solving) to changing conditions. Such aptitudes are likely particularly relevant to operating in uncertain environments that call for spontaneous solutions to unanticipated challenges.

The second part of this study was to assess for the incremental validity and utility of noncognitive psychological testing with regard to predicting training outcomes as a function of day-of-training elimination. The results of this study reveal that, in general, the inclusion of noncognitive aptitude testing and utilization of Cox regression survival analyses improve the ability to predict training outcomes and may be utilized to improve selection processes. Furthermore, when candidates are separated into predictive probabilities (i.e., the likelihood of completing training) and further into deciles of 0.50 or less, 0.5 -0.60, 0.61-0.70, 0.71-0.80, 0.81-0.90, and 0.91-1.0, based on the variables within the Cox regression survival model, the capability to identify candidates at high risk for failure significantly improves. For instance, when using a decision rule criterion of 0.50 or less to select out candidates at high risk for failure (using the current model in Table 4), a total of 372 out of 626 candidates who did not graduate could have been removed prior to training. This would reduce attrition by 50% without rejecting any candidates who successfully passed training. The results were replicated in the external validation sample (n = 483) using the same Cox survival regression model. Furthermore, the classification results in Table 4 suggest that removing training candidates with a predictive value of 0.50 or less prior to training would improve overall efficiency of the selection process and serve as a potential solution for reducing the current high attrition rate of 86-90% [52].

5.1 Limitations of the Study

There are limitations of the study that bear discussion. First, caution is warranted when generalizing the results of this study to other military special operations training candidates. The selection process, type of missions, and requirements can differ significantly. Second, repeated studies are needed to assess the impact of noncognitive testing on the minority status of training candidates to ensure selection processes are not having an adverse impact on certain groups. Third, the study did not account for differing levels of motivation that influence performance. High levels of motivation and drive to succeed may help to compensate for vulnerabilities or weaknesses. Objective measures assessing motivational level for pursuing the pararescue career field may improve screening procedures. Fourth, unforeseen life events (e.g., injury, death of a loved one) that occur during training and interfere with performance may also, to some degree, cause those who would have otherwise graduated training to have performance problems, fail, or self-eliminate from training. Fifth, consideration of testing circumstances must also be considered. Testing occurring in a “higher stakes” condition may influence responses to test items, thereby making it difficult to generalize the results of this study to such conditions. Sixth, there are likely other physical (e.g., aerobic and anaerobic fitness; genetic data influencing physical recovery processes) and psychological (e.g., speed and accuracy of information processing during duress) areas of functioning not adequately evaluated during the selection process affecting training outcomes. Finally, the replacement of candidates at high risk for failure with those who are more suited for adapting to training rigors during post-accession procedures is predicated on how well operational psychologists can evaluate training candidates. There are many airmen who arrive at basic training without a specified career field assignment. It is entirely possible to identify airmen within this group who are psychologically suited (i.e., have a score of 0.51 or higher) for pararescue training to replace those training candidates who are currently assigned to the career field but not well suited and at high risk for failure (i.e., a cutoff score of 0.50 or less). However, it is unknown how many candidates during basic training with an unassigned career field have a high cutoff score and if every candidate with a score of 0.50 or less could be replaced.

5.2 Conclusion

The selection of high-risk, high-demand personnel is not based on exact formulas. While human behavior is difficult to fully predict, evaluating both cognitive and noncognitive aptitudes through standardized psychological tests and procedures yields a profile of qualities that distinguish those who fail versus pass critical areas in the training pipeline. The current study represents an attempt to understand noncognitive areas of functioning that influence training outcomes. Although this is not a final solution, it warrants investigation into further refinement of predictors to allow for greater accuracy and increased understanding of the psychological profiles distinguishing those who pass versus fail pararescue training. While this study evaluated the EQ-i as a viable instrument for assessing noncognitive aptitudes, it is recognized that there may be other instruments as likely or better able to assess such qualities and that this is only an initial introduction into predicting and improving successful training outcomes.

6.0 REFERENCES

1. DePalo LK. USAF combat search and rescue: untapped combat power. Maxwell AFB (AL): Air War College, Air University; 2005. Maxwell Paper No. 35.
2. U.S. Air Force. Enlisted classification. Washington (DC): Department of the Air Force; 2004. Air Force Manual 36-2108.
3. Chappelle WL, McDonald K, Thompson W. Fitness, cognitive aptitude, and personality traits that distinguish successful U.S. Air Force pararescue training candidates. Wright-Patterson AFB (OH): U.S. Air Force School of Aerospace Medicine; 2012. Technical Report AFRL-SA-WP-TR-2012-0005. Available to those with access.
4. Picano JJ, Williams TJ, Roland RR. Assessment and selection of high-risk operational personnel: identifying essential psychological attributes. In: Kennedy CA, Zillmer EA, editors. Military psychology: clinical and operational applications, 2nd ed. New York (NY): Guilford Press; 2012:50-72.
5. U.S. Air Force. Medical examinations and standards. Washington (DC): Department of the Air Force; 2013. Air Force Instruction 48-123.
6. Nishikawa BR, Sjoberg PA, Maupin GM. Medical attrition of battlefield airmen trainees. Brooks City-Base (TX): U.S. Air Force School of Aerospace Medicine; 2010. Technical Report AFRL-SA-BR-TR-2010-0009.
7. Manacapilli T, Matthies CF, Miller LW, Howe P, Perez PJ, et al. Reducing attrition in selected Air Force training pipelines. Santa Monica (CA): RAND Corporation; 2012. Technical Report TR-955-AF.
8. Carretta TR, Ree MJ, Teachout MS. Training affects variability in training performance both within and across jobs. International Journal of Selection and Assessment. 2016; 24(1):71-76.
9. Ree MJ, Earles JA. Differential validity of a differential aptitude test. Brooks AFB (TX): Air Force Human Resources Laboratory, Manpower and Personnel Division; 1990. Technical Report AFHRL-TR-89-59.
10. Ree MJ, Earles JA. Predicting training success: not much more than g. Pers Psychol. 1991; 44(2):321-332.
11. Ree MJ, Earles JA. Intelligence is the best predictor of job performance. Curr Dir Psychol Sci. 1992; 1(3):86-89.

12. Ree MJ, Earles JA, Teachout MS. Predicting job performance: not much more than g. J Appl Psychol. 1994; 79(4):518-524.
13. Barrick MR, Mount MK. Yes, personality matters: moving on to more important matters. Hum Perform. 2005; 18(4):359-372.
14. Burch GSJ, Anderson N. Personality as a predictor of work-related behavior and performance: recent advances and directions for future research. In: Hodgkinson GP, Ford JK, editors. International review of industrial and organizational psychology 2008, vol. 23. Chichester (UK): John Wiley & Sons, Ltd.; 2008:261-305.
15. Le H, Oh IS, Robbins SB, Ilies R, Holland E, Westrick P. Too much of a good thing: curvilinear relationships between personality traits and job performance. J Appl Psychol. 2011; 96(1):113-133.
16. Bartone PT, Roland RR, Picano JJ, Williams TJ. Psychological hardiness predicts success in US Army Special Forces candidates. International Journal of Selection and Assessment. 2008; 16(1):78-81.
17. Bartone PT, Kelly DR, Matthews MD. Psychological hardiness predicts adaptability in military leaders: A prospective study. International Journal of Selection and Assessment. 2013; 21(2):200-210.
18. Christian JR, Picano JJ, Roland RR, Williams TJ. Guiding principles for assessing and selecting high-risk operational personnel. In: Bartone PT, Johnsen BH, Eid J, Violanti JM, Laberg JC, editors. Enhancing human performance in security operations: international and law enforcement perspectives. Springfield (IL): Charles C Thomas Publisher, Ltd.; 2010:121-142.
19. Flin R. Selecting the right stuff: personality and high-reliability job occupations. In: Hogan R, Roberts BR, editors. Personality psychology in the workplace. Washington (DC): American Psychological Association; 2001:253-275.
20. Hartmann E, Sunde T, Kristensen W, Martinussen M. Psychological measures as predictors of military training performance. J Pers Assess. 2003; 80(1):87-98.
21. Kilcullen RN, Mael FA, Goodwin GF, Zazanis MM. Predicting U.S. Army special forces field performance. Hum Perf Extrem Environ. 1999; 4:53-63.
22. McDonald DG, Norton JP, Hodgdon JA. Training success in U.S. Navy special forces. Aviat Space Environ Med. 1990; 61(6):548-554.
23. Goleman D. Emotional intelligence. New York (NY): Bantam Books Inc.; 1995.
24. Bar-On R. The Bar-On Emotional Quotient Inventory (EQ-i): rationale, description, and psychometric properties. In: Geher G, editor. Measuring emotional intelligence: common ground and controversy. Hauppauge (NY): Nova Science Publishers; 2004:115-145.
25. Mayer JD, Salovey P, Caruso DR. Emotional intelligence: theory, findings, and implications. Psychol Inq. 2004; 15(3):197-215.
26. Matthews G, Zeidner M, Roberts RD. Emotional intelligence: science and myth. Cambridge (MA): MIT Press; 2002.
27. Locke EA. Why emotional intelligence is an invalid concept. J Organ Behav. 2005; 26(4):425-431.
28. Brackett MA, Mayer JD. Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. Pers Soc Psychol Bull. 2003; 29(9):1147-1158.
29. Cooper A, Petrides KV. A psychometric analysis of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF) using item response theory. J Pers Assess. 2010; 92(5):449-457.

30. Fiori M, Antonakis J. The ability model of emotional intelligence: searching for valid measures. Pers Individ Dif. 2011; 50(3):329-334.
31. Landy FJ. Some historical and scientific issues related to research on emotional intelligence. J Organ Behav. 2005; 26(4):411-424.
32. Mikolajczak M, Luminet O, Leroy C, Roy E. Psychometric properties of the Trait Emotional Intelligence Questionnaire: factor structure, reliability, construct, and incremental validity in a French-speaking population. J Pers Assess. 2007; 88(3):338-353.
33. Newsome S, Day AL, Catano VM. Assessing the predictive validity of emotional intelligence. Pers Individ Dif. 2000; 29(6):1005-1016.
34. Petrides KV, Pita R, Kokkinaki F. The location of trait emotional intelligence in personality factor space. Br J Psychol. 2007; 98(Pt 2):273-289.
35. Petrides KV, Furnham A. Trait emotional intelligence: psychometric investigation with reference to established trait taxonomies. Eur J Pers. 2001; 15(6):425-448.
36. Siegling AB, Saklofske DH, Vesely AK, Nordstokke DW. Relations of emotional intelligence with gender-linked personality: implications for a refinement of EI constructs. Pers Individ Dif. 2012; 52(7):776-781.
37. Cattell RB, Cattell AK, Cattell HE. 16pf® fifth edition. San Antonio (TX): Pearson; 1999.
38. Furnham A, Race MC, Rosen A. Emotional intelligence and the Occupational Personality Questionnaire (OPQ). Front Psychol. 2014; 5:935.
39. McCrae RR. Emotional intelligence from the perspective of the five-factor model of personality. In: Bar-On R, Parker JD, editors. The handbook of emotional intelligence: the theory and practice of development, evaluation, education, and application at home, school, and in the workplace. San Francisco (CA): Jossey-Bass; 2000:263-276.
40. Côté S. Miners CT. Emotional intelligence, cognitive intelligence, and job performance. Adm Sci Q. 2006; 51(1):1-28.
41. O'Boyle EH Jr, Humphrey RH, Pollack JM, Hawver TH, Story PA. The relation between emotional intelligence and job performance: a meta-analysis. J Organ Behav. 2011; 32(5):788-818.
42. Defense Manpower Data Center. ASVAB Technical Bulletin No. 3: CAT-ASVAB forms 5-9. Seaside (CA): Defense Manpower Data Center; 2008. [Accessed 3 Jan 2016]. Available from http://official-asvab.com/docs/asvab_techbulletin_3.pdf.
43. Welsh JR Jr, Kucinkas SK, Curran LT. Armed services vocational battery (ASVAB): Integrative review of validity studies. Brooks AFB (TX): Air Force Human Resources Laboratory; 1990. AFHRL-TR-90-22. [Accessed 3 Jan 2016]. Available from http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA225074.
44. Bar-On R. Emotional and social intelligence: insights from the Emotional Quotient Inventory (EQ-i). In: Bar-On R, Parker JD, editors. Handbook of emotional. San Francisco (CA): Jossey-Bass; 2000:363-388.
45. Slaski M, Cartwright S. Emotional intelligence training and its implications for stress, health and performance. Stress Health. 2003; 19(4):233-239.
46. Day AL, Therrien DL, Carroll SA. Predicting psychological health: assessing the incremental validity of emotional intelligence beyond personality, Type A behaviour, and daily hassles. Eur J Pers. 2005; 19(6):519-536.
47. Dawda D, Hart SD. Assessing emotional intelligence: reliability and validity of the Bar-On Emotional Quotient Inventory (EQ-i) in university students. Pers Individ Dif. 2000; 28(4):797-812.

48. Grubb WL 3rd, McDaniel MA. The fakability of Bar-On's Emotional Quotient Inventory short form: catch me if you can. Hum Perform. 2007; 20(1):43-59.
49. Day AL, Carroll SA. Faking emotional intelligence (EI): comparing response distortion on ability and trait-based EI measures. J Organ Behav. 2008; 29(6):761–784.
50. Cohen J. The cost of dichotomization. Appl Psychol Meas. 1983; 7(3):249-253.
51. Lawley DN. A note on Karl Pearson's selection formulae. Proceedings of the Royal Society of Edinburgh. 1943; 62(Section A, Pt 1):28-30.
52. Slojkowski M. Improving fitness standards and evaluation methodologies for combat rescue officers and pararescuemen. Maxwell AFB (AL): Air War College, Air University; 2009.

LIST OF ABBREVIATIONS AND ACRONYMS

AIC	Akaike information criterion
ASVAB	Armed Services Vocational Aptitude Battery
EQ-i	Emotional Quotient Inventory
LR	likelihood ratio
ROC	receiver operating characteristic curve
SD	standard deviation
USAF	U.S. Air Force