9

Technical Research Note 147

AD

FACTOR ANALYSIS OF EXPERIMENTAL NONCOGNITIVE MEASURES OF COMBAT POTENTIAL (U)

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FACTOR ANALYSIS OF EXPERIMENTAL NONCOGNITIVE MEASURES OF COMBAT POTENTIAL (U)

BRIEF

Requirement:

To develop new and improved noncognitive tests predictive of performance in combat MOS. The resulting tests are required for inclusion in an across-the-board differential validity analysis of operational and newly developed tests which will provide the basis for a reconstitution of the Army Classification Battery and the aptitude area composites. Such revision is dictated periodically by changes in Army jobs and job structure and by new developments in testing.

Procedure:

To serve as a basis for new measures, personality factors important in combat potential were identified. Scores on 19 noncognitive aptitude tests, 5 measures of avocational information, 7 ACB tests, and one experimental perceptual speed measure were factor-analyzed and results extended to criteria--peer and supervisor ratings on combat potential obtained after 16 weeks of AIT and in an overseus maneuver situation after one year. Comparison was made with a similar study in a Korean combat sample.

Findings:

Two of eight factors identified were valid for the criterion of combat potential. The first of these, general cognitive ability, stood up well in an independent sample. The second, a mechanical-social factor, was somewhat less valid in the cross sample. The two factors valid in the peacetime structure appeared to reflect ratings based more on the individual's overall competence and readiness to do his job and work for group goals, whereas actual combat ratings placed greater emphasis on leadership and emotional stability under stress.

Utilization of Findings:

Results have been applied as the conceptual framework for the development of tests to meas ure the factors identified. Such tests are included in the major analysis and standardization designed to result in a reconstituted aptitude area system programmed for 1966.

FOREWORD

The NEW CLASSIFICATION TECHNIQUES Task applies psychological measurement techniques in a continuing series of studies to attain increasingly accurate and differentiated measures of individual potential so that the Army can make optimum use of the skills and aptitudes of its enlisted personnel. Timeliness and effectiveness of the aptitude area measures used in enlisted classification are maintained by introducing new tests and updated forms of existing tests into the Army Classification Battery. Major revisions of the aptitude area system are based on validity studies of operational and experimental tests on a wide variety of military occupational specialties and integration of results in relation to the Army's job structure. Such a major revision is programmed for operational implementation in 1966.

One objective of the NEW CLASSIFICATION TECHNIQUES Task is to develop improved measures to predict performance in combat assignments. The present publication reports on a completed portion of Subtask a, "Development of new predictors," FY 1964 Work Program.

The entire research task is responsive to special requirements of the Deputy Chief of Staff for Personnel and the U. S. Continental Army Command, as well as to requirements to contribute to achievement of the objectives of DA R&D Project 2J024701A722, Selection and Behavioral Evaluation.

FACTOR ANALYSIS OF EXPERIMENTAL NONCOGNITIVE MEASURES OF COMBAT POTENTIAL (U)

CONTENTS

TABLES

FIGURE

FACTOR ANALYSIS OF EXPERIMENTAL NONCOGNITIVE MEASURES OF COMBAT POTENTIAL (U)

BACKGROUND

Research experience over the years has led to the conclusion that the best results in combat classification were most likely to come from measuring not only technical skills and abilities but also personality, motivation, interest, and attitudinal factors. The present study of noncognitive predictors had its origins in the comprehensive tryout and analysis of measures to predict combat performance in the Korean War. Two major studies--one conducted by the U. S. Army Personnel Research Office (then the Personnel Research Branch) and one by the Human Resources Research Office--yielded data on the relation between a large number of questionnaire-type items reflecting personal history, interests, attitudes, and other personality variables and criterion measures consisting of peer and NCO or officer ratings of proficiency in actual combat. The most valid items were combined into predictor scales, or keys, and cross validated to obtain coefficients of .30 to .34 with the combat criterion rating (1). The items selected as contributing to validity appeared to reflect characteristics of self-confidence, self-assertiveness, emotional stability, leadership, masculine interests, and social responsibility (2).

The development of improved combat predictors continued in the form of a comprehensive study initiated in 1955 with the administration of an extensive battery of cognitive and noncognitive measures to the enlisted input of an entire regimental combat team at Fort Riley, Kansas. The study was longitudinal in design, peer and cadre ratings of expected combat performance being obtained both at the end of 16 weeks of advanced individual training and at the end of one year following maneuvers in Germany.

"Project Riley" provided material for a full-scale analysis of a large number of test items and constructs with a view to delineating factors differentially valid for performance in combat jobs. The analysis described in the present Research Note provided a conceptual framework for the development of new experimental predictors of performance in combat MOS. Such measures will be evaluated for introduction into the ACB or as substitutes for existing ACB measures in a comprehensive validation study of experimental and operational measures across a broad sampling of MOS. The objective is a revised ACB and a modernized aptitude area system geared to current and anticipated Army personnel requirements.

PROCEDURE

Basic data for the factor analysis were measures of 19 psychological constructs delineated by judgmental scales, five scales from a General Information Test, scores on seven cognitive tests of the ACB, one experimental cognitive measure, and by extension, five criterion ratings of potential combat performance.

Predictor Instruments

The Army Self-Description Blank (PRT 2712). The 275 items in this instrument were assembled from noncognitive material found valid for combat performance or for Army job performance in a series of studies prior to the Korean study. In these studies, performance under Arctic conditions (3), performance on maneuver exercises such as Hilltop (4), and job performance in such occupations as mechanic, clerk, and cook (5), constituted the criteria. Some preliminary information from the Korean study was used in item selection.

The Interest Opinion Questionnaire (PT 2817). This instrument contains 287 items drawn from a variety of standard interest and personality measures found valid for combat performance in the Fighter Factor study conducted by the Human Resources Research Office in Korea subsequent to the APRO Korean study.

In the Riley study, the two questionnaires (SDB and IOQ) correlated .34 with the 16-week criterion and .26 with the overseas criterion (N = 1506).

The General Information Test (PT 2839), developed under contract by the American Institute for Research, contained 125 items designed to measure knowledge of avocational areas and military service. In the samples cited above, the GIT correlated .36 with the 16-week criterion measure and .27 with the overseas evaluations (again, N = 1506).

Derivation of Construct Variables

The 19 noncognitive construct keys and the five keys from the General Information Test were selected on the following basis. First, two judges allocated items to clusters, working independently and without prior agreement as to nature of the constructs. Next, working together to arrive at consensual judgments on items, the judges re-examined and re-selected items for a given cluster. All items on which agreement as to cluster membership could not be reached, and items which judges keyed in opposite direction to the sign of the expected validity of the construct for combat, were eliminated. For example, certain items

judged as describing psychopathic deviate behavior and originally keyed as positive for the criterion were eliminated because pre-Riley studies had shown that, as a category, psychopathic deviate scales have negative validity. Clusters in which fewer than eight items were accepted were also eliminated. These procedures resulted in the 19 noncognitive keys. Four of the five avocational information tests and seven tests of the Army Classification Battery (ACB) were selected because of promise of validity shown previously, as was the one experimental aptitude measure, the Dials Test. One avocational information test, variable 23, was included because of its potential as a suppressor variable.

Criterion Measures

Criterion scores were obtained using the Combat Aptitude Rating Scale, developed from information gained in nominating good and poor fighters to form the Korean criterion group (6), and in subsequent experimentation (7). The five criteria consisted of peer and superior average ratings at each point (16-week and 1-year) and the average of 1-year ratings. A high degree of correlation was found among the criteria, with the result that little factorial separation appeared.

List of Variables

Questionnaire Predictor Scales

1. Interest in outdoor activities (16 items)
2. Skill, experience in athletics, outdoor activities (14 items)
3. Prudence (13 items)
4. Social responsibility (10 items)
5. Acceptance of authority (10 items)
6. Lack of psychopathic deviate tendencies (8 items)
7. Lack of neurotic and psychotic symptoms (13 items)
8. Lack of hypochondriacal symptoms (16 items)
9. Social initiative (13 items)
10. Social skills (18 items)
11. Physical alertness-high activity level (14 items)
12. Mental alertness (12 items)
13. Rugged masculinity (19 items)
14. Lack of anxious fearfulness (18 items)
15. Mechanical interests (23 items)
16. Lack of aesthetic interests (15 items)
17. Lack of business or office-detail interests (16 items)
18. Non-excitability (10 items)
19. Non-avoidance of people (13 items)

General Information Test Scales

20. Knowledge of the military (24 items)
21. Knowledge of firearms, hunting, fishing (15 items)
22. Knowledge of tools, mechanical equipment, and models (19 items)
23. Knowledge of literature, music, home arts (17 items)
24. Knowledge of team sports (10 items)

Army Classification Battery Tests

25. Reading and Vocabulary
26. Arithmetic Reasoning
27. Pattern Analysis
28. Mechanical Aptitude
29. Army Clerical Speed
30. Shop Mechanics
31. Automotive Information

Experimental Cognitive Test

32. Dials Test. A perceptual speed test in which examinee identifies a dial reading in a "danger zone" as shown by shading (PT 2786).

Criterion Combat Aptitude Ratings

33. Average peer rating, 16-weeks
34. Average peer rating, 1-year (overseas manuever)
35. Average supervisor rating, 16-weeks
36. Average supervisor rating, 1-year (overseas manuever)
37. Average peer-supervisor rating, 1-year (overseas maneuver)

Sample

The analysis sample consisted of 550 English-speaking Caucasian Infantrymen (MOS 111, Infantry Heavy Mortar Leader and MOS 112, Infantry Leader), tested in the first week of basic combat training at Ft. Riley, Kansas. The men represented a randomly-selected sample from all enlisted men so selected on whom original test data, 16-week ratings, and post-maneuver overseas ratings were available. The remaining cases meeting these requirements were held for cross validation purposes. The cross sample consisted of 375 enlisted men.

STATISTICAL ANALYSES

Procedures in the present study were as follows:

1. An intercorrelation matrix of the 32 predictors was obtained, using Pearson product-moment correlations.

2. The matrix was factored by the principal components method, employing unity in the diagonal cells. Eleven factors were obtained.

3. The factor matrix was rotated to orthogonal simple structure "blind"--that is, without identification of variables--by personnel not familiar with the content of the study.

4. Seven factors with sufficient definition were obtained.

5. All 11 factors were extended to the five criterion variables.

6. A major portion of the criterion communality appeared to be scattered through the four "residual" factors. A new factor axis was then projected into the space defined by the four residual factors, collinear with the most comprehensive criterion (average of overseas ratings). Loadings of all variables on this new factor (labeled XII) were then determined.

7. The seven defined factors and the new factor were rotated to simple structure. In this rotation, the criterion variables were included, and variables were identified in the rotation process. Despite this identification, however, the rotations were dictated by the requirements of simple structure. From a content standpoint, the authors would have preferred to find criterion variance distributed over several factors, but the final structure showed criterion loadings on only two.

8. Factors obtained in the preceding analysis were cross validated in an independent sample and also compared with those obtained in a similar study in which criterion measures were ratings of combat performance in Korea.

RESULTS

Resulting Factor Structure

Eight factors were identified of which only two (V and XII) showed appreciable loadings for the criterion variables. Variables with loadings of .20 or higher--admittedly an arbitrary cut-point--are listed in Table 1. Factor V is clearly a broad general cognitive ability factor, involving all the ACB tests, the Dials Test, and the scales of the General Information Test. The ACB tests highest in "g"--Arithmetic Reasoning and Reading and Vocabulary--showed the highest loadings on this

factor. Factor XII is more noncognitive in nature, with a dual emphasis: (1) orientation to mechanics, evidenced by factor loadings of mechanical interest, tool and mechanical avocational knowledge, and automotive information variables, and (2) an acceptance of group structure and group goals, evidenced by loadings of acceptance of authority, non-avoidance of people, social responsibility, and a lack of psychopathic-deviate tendencies. The prudence scale is not incompatible with the remaining factor components, since at least 8 of the 13 items in the scale suggested conscientiousness in work and social conduct (planning ahead, concern with exactness and details, acting in terms of long-term future goals, committing few impulsive acts causing later regret).

Table 1

LOADINGS OF VARIABLES ON FACTORS V AND XII (VALID FACTORS)

Factor V		Factor XII	
Arithmetic Reasoning (ACB)	.79	Mechanical Interest	.53
Reading and Vocabulary (ACB)	.77	Acceptance of Authority	.32
Shop Mechanics (ACB)	.69	Non-avoidance of People	.29
Pattern Analysis (ACB)	.68	Prudence	.26
Knowledge of Military (GIT)	.65	Knowledge of Tools, Mechanical Equipment (GIT)	.26
Army Clerical Speed (ACB)	.63	Social Responsibility	.24
Mechanical Aptitude (ACB)	.61	Automotive Information (ACB)	.23
Knowledge of Literature, Music, Home Arts (GIT)	.57	Lack of Psychopathic-deviate Tendencies	.22
Knowledge of Team Sports (GIT)	.51		
Knowledge of Firearms, Hunting, Fishing (GIT)	.50	Combined peer-supervisor rating, 1-year	.38
Automotive Information (ACB)	.49	Peer rating, 16-week	.37
Knowledge of Tools, Mechanical Equipment (GIT)	.46	Supervisor rating, 16-week	.37
Dials Test	.45	Peer rating, 1-year	.33
		Supervisor rating, 1-year	.32
Peer rating, 16-week	.30		
Peer rating, 1-year	.26		
Supervisor rating, 1-year	.24		
Combined peer-supervisor rating, 1-year	.24		
Supervisor rating, 16-week	.21		

Among the other factors delineated but not valid for the criterion--loadings being negligible--Factors I and II also correlated with the major defining variables of one or the other of the two content areas of Factor XII. Loadings of .20 or over are shown in Table 2. Factor I is a clear-cut mechanical interest-aptitude constellation. Factor II reflected sound personal-social adjustment with an undertone of adaptation to the military role (acceptance of authority, physical alertness, rugged masculinity)--a likely first-choice as a noncognitive factor valid for a peacetime combat-MOS criterion. Loadings of the mechanical components of Factor I and the noncognitive components of Factor II were for the most part substantially higher than the loadings of these components on valid Factor XII. (The substantial loadings of mechanical information tests on Factor V were presumably due more to the general ability variance contained in these tests than to the mechanical aspect per se.)

Table 2

LOADINGS OF VARIABLES ON FACTORS I AND II

Factor I		Factor II	
Automotive Information	.69	Lack of Neurotic, Psychotic Symptoms	.74
Knowledge of Tools, Mechanical Equipment	.58	Non-excitability	.69
Mechanical Interest	.50	Lack of Hypochondriacal Symptoms	.68
Mechanical Aptitude	.48	Lack of Anxious Fearfulness	.64
Shop Mechanics	.41	Mental Alertness	.62
		Lack of Psychopathic-deviate Tendencies	.56
Range of Criterion Loadings	-.01 to .04	Prudence	.52
		Non-avoidance of People	.48
		Acceptance of Authority	.45
		Physical Alertness	.44
		Social Skills	.39
		Social Responsibility	.37
		Rugged Masculinity	.33
		Range of Criterion Loadings	.02 to .07

Loadings on the remaining four non-valid factors are given in Table 3. Factor III appears to reflect an active, outgoing relation to the physical and social environment. Factor IV has an orientation toward outdoor activity, emphasizing independence and freedom from the constraints involved in team participation. Factor VI is difficult to interpret and is, in any event, narrow in scope. Finally, Factor VII appears to reflect a perceptual-spatial ability, possibly related to orderliness or even compulsiveness of approach, with a corresponding negative orientation to the more individualistic, self-reliant pursuits.

Table 3

LOADINGS OF VARIABLES ON FACTORS III, IV, VI AND VII

Factor III		Factor IV	
Social Initiative	.68	Outdoor Interests	.70
Physical Alertness	.63	Athletic-Outdoor Skill, Experience	.58
Social Skills	.54	Mechanical Interests	.36
Rugged Masculinity	.54	Knowledge of Firearms, Hunting, Fishing	.25
Athletic-Outdoor Skill, Experience	.51	Knowledge of Team Sports	-.26
Mental Alertness	.42		
Lack of Aesthetic Interests	-.26	Range of Criterion Loadings	-.05 to .02
Range of Criterion Loadings	-.04 to .12		
Factor VI		**Factor VII**	
Lack of Business, Office-detail Interests	.87	Dials Test	.68
Lack of Aesthetic Interests	.49	Army Clerical Speed	.40
		Pattern Analysis	.29
Range of Criterion Loadings	-.01 to .04	Knowledge of Military	-.25
		Knowledge of Firearms, Hunting, Fishing	-.26
		Range of Criterion Loadings	.03 to .10

Table A-1 of the Appendix presents the original correlation matrix among predictor and criterion variables. Table A-2 shows the principal components factor matrix; A-3, the first transformation; A-4, the resultant 11 x 37 rotated factor matrix extended to criterion variables, and the loadings for the 12th factor employed to collect the criterion variance from residual factors VIII to XI; A-5, the transformation for the eight selected factors; and A-6, the final 8 x 37 factor matrix.

Cross Validation of the Factor Structure

In order to cross validate the factor structure obtained in the analysis, matrices of predictor intercorrelations and predictor-criterion correlations were computed in a cross sample of 375 enlisted men tested during the same period as the analysis sample at Fort Riley, Kansas. Two approaches to cross validation were used.

For one approach, the cross sample predictor intercorrelation matrix was factored by a principal components procedure. An orthogonal transformation was applied to the largest eight principal components to approximate the eight rotated factors for the predictor variables in the first sample. The factors obtained in the cross sample predictor space were extended to the criterion variables and the same transformation applied to these loadings. While the transformation was applied to the loadings of the criteria, the criterion variables were not used in fitting the cross sample solution to the analysis sample solution. The loadings of predictor and criterion variables on the eight transformed factors are given in Table 4.

The second approach involved application to the cross sample data of regression weights for predicting the rotated orthogonal factor scores obtained in the analysis sample. Intercorrelations among the predicted factor scores (Table 5) and correlation coefficients between the predicted factor scores and the criterion variables (Table 6) were obtained.

Results from the two approaches were in agreement. The factors defined by predictor variables were reproduced well by both procedures. Further, criterion loadings on five of the eight factors were much like those in the original analysis. The loadings on Factor V were of the same overall magnitude on cross validation, and loadings on Factors III, IV, VI, and VII were near zero, as in the original analysis. Loadings on Factor XII, however, dropped from about .35 to about .18 in the cross sample, a drop probably due to maximizing the amount of criterion variance swept up on this factor in the original analysis. Factors I and II showed small increases in the cross sample, and had only slightly less criterion variance than Factor XII. Factor V appeared to be the most consistently important factor in rating peacetime performance in combat units. Factors I, II, and XII showed promise of validity for ratings of combat potential or performance, but will require further study for proper definition and evaluation. In general, results indicated a general cognitive ability factor consistently valid at a level of about .25, and marginal validity for factors involving mechanical knowledge and interest and personal-social adjustment with orientation to group goals.

Table 4

FACTOR LOADINGS IN CROSS VALIDATION SAMPLE

Factor I	
Predictors	
Automotive Information	.65
Knowledge of Tools, Mechanical Equipment	.62
Mechanical Interest	.51
Shop Mechanics	.44
Mechanical Aptitude	.31
Knowledge of Firearms, Hunting, Fishing	.27
Knowledge of Team Sports	-.30
Criteria	
Combined peer-supervisor rating, 1-year	.18
Peer rating, 1-year	.17
Supervisor rating, 16-week	.16
Supervisor rating, 1-year	.13
Peer rating, 16-week	.11

Factor II	
Predictors	
Lack of Neurotic, Psychotic Symptoms	.78
Lack of Hypochondriacal Symptoms	.75
Lack of Anxious Fearfulness	.70
Non-excitability	.68
Lack of Psychopathic-deviate tendencies	.65
Mental Alertness	.63
Non-avoidance of People	.56
Prudence	.55
Social Responsibility	.45
Social Skills	.43
Acceptance of Authority	.42
Physical Alertness	.40
Social Initiative	.31
Outdoor Skill and Experience	.28
Criteria	
Supervisor rating, 16-week	.12
Combined peer-supervisor rating, 1-year	.11
Peer rating, 16-week	.11
Peer rating, 1-year	.10
Supervisor rating, 1-year	.10

Factor III	
Physical Alertness	.70
Rugged Masculinity	.63
Social Initiative	.63
Social Skills	.58
Outdoor Skill, Experience	.46
Mental Alertness	.40
Range of Criterion Loadings	-.02 to .07

Factor IV	
Outdoor Interests	.79
Outdoor Skill, Experience	.59
Mechanical Interests	.29
Knowledge of Firearms, Hunting, Fishing	.25
Social Skills	-.25
Knowledge of Team Sports	-.26
Range of Criterion Loadings	-.11 to .00

Table 4 (continued)

Factor V	
Predictors	
Arithmetic Reasoning	.81
Reading and Vocabulary	.80
Shop Mechanics	.68
Mechanical Aptitude	.65
Pattern Analysis	.65
Knowledge of Military	.64
Knowledge of Literature, Music, Fine Arts	.61
Army Clerical Speed	.60
Knowledge of Firearms, Hunting, Fishing	.57
Knowledge of Team Sports	.55
Automotive Information	.45
Dials Test	.44
Knowledge of Tools, Mechanical Equipment	.43
Social Responsibility	.33
Criteria	
Supervisor rating, 16-week	.28
Peer rating, 1-year	.28
Peer rating, 16-week	.23
Combined peer-supervisor rating, 1-year	.22
Supervisor rating, 1-year	.19

Factor VII	
Dials Test	.59
Army Clerical Speed	.50
Pattern Analysis	.41
Knowledge of Literature, Music, Home Arts	-.31
Knowledge of Military	-.40
Knowledge of Firearms, Hunting, Fishing	-.42
Range of Criterion Loadings	.01 to .06

Factor VI	
Lack of Aesthetic Interests	.76
Lack of Business Office-detail Interests	.70
Rugged Masculinity	.26
Range of Criterion Loadings	-.04 to .06

Factor XII	
Predictors	
Acceptance of Authority	.51
Social Responsibility	.48
Mechanical Interest	.43
Prudence	.39
Automotive Information	.34
Non-avoidance of People	.34
Knowledge of Tools, Mechanical Equipment	.29
Lack of Anxious Fearfulness	-.25
Criteria	
Supervisor ratings, 1-year	.21
Combined peer-supervisor rating, 1-year	.20
Supervisor rating, 16-week	.18
Peer rating, 16-week	.16
Peer rating, 1-year	.14

Table 5

INTERCORRELATIONS AMONG PREDICTED FACTOR SCORES
IN CROSS VALIDATION SAMPLE

Factor	Intercorrelations							
I	I							
II	.03	II						
III	-.04	.08	III					
IV	.11	-.03	.02	IV				
V	.02	.09	.12	.04	V			
VI	-.01	.02	.03	.13	.08	VI		
VII	-.02	.04	.05	.09	.01	-.02	VII	
XII	.19	.10	.00	-.02	-.04	-.11	-.04	XII

Table 6

CORRELATION OF PREDICTED FACTOR SCORES WITH CRITERIA
IN CROSS VALIDATION SAMPLE

Factor	Peer Rating 16-week	Peer Rating 1-year	Supv Rating 16-week	Supv Rating 1-year	Peer-Supv Rating 1-year
I	.11	.15	.15	.17	.21
II	.13	.13	.14	.12	.13
III	.10	.09	.10	.02	.02
IV	-.08	-.09	-.10	-.01	.02
V	.24	.29	.29	.20	.22
VI	.00	-.02	-.01	.05	-.01
VII	.06	.02	.06	.02	.02
XII	.17	.13	.18	.19	.16

COMPARISON WITH FINDINGS FROM KOREAN COMBAT STUDIES

The above findings relate, of course, to ratings of combat potential made in peacetime. Since side-by-side actual combat experience is lacking, the peer and associate ratings are likely to reflect factors underlying the confidence that the ratee's behavior has engendered in his buddies and immediate supervisors. What interpretation may be postulated to account for the nature of both valid and non-valid factors found in the present analysis?

Two kinds of characteristics may be inferred from the behavior observable in a combat unit in peacetime: (1) characteristics related to a man's competence in carrying out Army training, defensive guardian duty in Europe, and the simulated combat of maneuvers, and (2) characteristics related to a man's readiness to fill his own assigned role and to keep group goals paramount. In other words, a soldier will rate his fellow-soldier in terms of whether he knows what to do, how to do it, and is willing to do it for the sake of the group. Thus, the broad gamut of abilities reflected in Factor V, plus the practical interest and know-how and the identification with group goals reflected in Factor XII, would be expected to correlate with criterion ratings in the peacetime situation.

A factor analysis using data obtained in the Korean study of combat prediction had previously been carried out (Johnson, unpublished study). Although instruments and scales used in the Korean study were not identical with those in the Riley study, there was sufficient common content and coverage to make a comparison of results worthwhile. Figure 1 shows the comparability of the samples with respect to predictor and criterion variables. The Personel Inventory (PRT 2401) administered in the Korean and Dix-Jackson studies consisted of 500 items selected to fit several rationales regarding qualities of a good combat Infantryman. A "best" 50-item key selected empirically from this instrument yielded a validity coefficient of .30 against rated combat potential in an independent trainee sample, comparing favorably with a similarly selected 50-item key from a commercially available "personality" test of approximately the same number of items ($r = .19$), and indicating that the rationales held up quite well. In a factor analysis in a combat sample, eight factors were identified of which two, designated Leader Syndrome (Factor I) and Emotional Stability (Factor VIII) showed combat criterion loadings of .19 (Table 7). A principal component factor solution applied to a sample of trainees then in basic training at Fort Dix and Fort Jackson, and involving the same variables as the combat study, was fitted to the rotated combat factor solution by means of an orthogonal transformation. Both factor solutions were then extended to the available criterion variables--either rated performance in actual combat or rated combat potential. The latter criterion involved essentially the same rating scale as was used at Fort Riley.

Sample	Objective	Criterion	Predictor Variables
1. Korean Combat	Factor analysis	Ratings of combat performance	PT 2401 - 600 personality items ACB
2. Dix-Jackson trainees	Cross validation of factor structure in (1)	Ratings of combat potential, after 16 weeks training	PT 2401 - 600 personality items ACB
3. Ft. Riley trainees	Factor analysis	Trainee ratings-16-weeks; Ratings of combat potential (Maneuvers) 1 year	PT 2712 - IOQ (PT 2817) ACB GIT subtests
4. Ft. Riley trainees	Cross validation of factor structure in (3)	Trainee ratings-16 weeks; Ratings of combat potential (Maneuvers) 1 year	PT 2712 - IOQ (PT 2817) ACB GIT subtests

Figure 1. Samples used in factor analyses reported.

Table 7

LOADINGS OF VARIABLES ON TWO VALID FACTORS IN KOREAN COMBAT STUDY

Factor I - Leader Syndrome		Factor VIII - Emotional Stability	
Masculine Toughness	.74	Lack of Hypochondria	.79
Quick and easy Decisions	.68	Emotional Stability	.58
Social Skills	.65	Army Radio Code (ACB)	.35
Outdoor Skills	.60	White-collar Intellectual	.32
Physical Activity	.58	Physical Activity	.26
Social Awareness or Responsibility	.44	Social Skills	.22
Caution, carefulness	.40	Pattern Analysis (ACB)	.21
Emotional Stability	.28	Combat Rating	.19
Combat Rating	.19		
(Trainee Rating	.07)	(Trainee Rating	.24)

The Leader Syndrome factor resembles Factor III of the Riley analysis--representing criterion emphasis--or a more active leadership orientation than the "group goals" element of Factor XII which resulted as one of the valid factors in the present study. The Emotional Stability factor resembles Factor II in the present study more than it does Factor XII. The shift in emphasis seems reasonable in that the importance of a broadly-based emotional stability may be enhanced by the actual combat situation, as compared to a peacetime duty situation.

Three other factors resulting from analysis of the Korean data showed moderate loading for the criterion of rated combat potential but not for the combat criterion: Mechanical Ability (Factor II), General Intelligence (Factor IV), and Radio Information (Factor VII) (Table 8). The Mechanical Ability factor was similar to Factor I of the Riley study; what validity Factor I had for a training criterion in the present study seemed to be incorporated in Factor XII. The General Intelligence factor in the Korean analysis paralleled the valid Factor V in the Riley analysis. The Radio Information factor could not appear in the Riley study because the variables Electrical Information and Radio Information were omitted from the analysis.

Table 9 completes the results of the Korean analysis, with the three factors labeled Lone Wolf (III), Intellectual Orientation (V), and Masculine Interests (VI). The Lone Wolf factor contains more in the way of social orientation than the name implies; Factor IV in the Riley study seems to combine aspects of the Lone Wolf and Masculine Interest factors. Factor VI in the Riley study accounts for the other aspect of Masculine Interests more directly. Finally, the Intellectual Interests factor and Factor VII in the Riley analysis were relatively specific to the particular study. The point made earlier that these single-aspect factors relating to Need for Concrete Freedom and Masculinity of Interests are not valid per se was supported. Only in the context of leadership qualities or group goal-orientation do these aspects appear valid.

SUMMARY OF RESULTS

Rotation of the factors to simple structure yielded eight identifiable factors, of which two showed criterion loadings over .20. These were identified as measuring general mental ability and a combination of practical-mechanical orientation with an acceptance of group structure and group goals. The other factors--mechanical ability, personal-social adjustment, outgoing relation to physical and social environment, need for outdoor activity and concrete freedom, passive adaptability to immediate requirements, and speed of visual-spatial perception--were not valid for the criterion in the anslysis sample. Cross validation showed that the factors could be reproduced well on a different sample of infantrymen, with the exception of the factor of personal-social adjustment which displayed marginal validity in the cross sample and the combined mechanical-social factor on which criterion loadings were reduced from about .35 to .18.

Table 8

LOADINGS OF VARIABLES ON THREE FACTORS VALID FOR TRAINING BUT NOT FOR COMBAT PERFORMANCE IN KOREAN STUDY

Factor II		Factor IV		Factor VII	
Mechanical Ability		General Intelligence		Radio Information	
Automotive Information	.79	Army Clerical Speed	.81	Radio Information	.84
Shop Mechanics	.79	Reading and Vocabulary	.62	White Collar Intellectual	.46
Mechanical Aptitude	.65	Arithmetic Reasoning	.62	Electrical Information	.38
Electrical Information	.58	Pattern Analysis	.60	Army Radio Code	.36
Arithmetic Reasoning	.41	Army Radio Code	.47	Physical Activity	.27
Reading and Vocabulary	.38	Mechanical Aptitude	.43	Trainee Rating	.26
Pattern Analysis	.34	Electrical Information	.27	Pattern Analysis	.25
Trainee Rating	.20	Trainee Rating	.27	Mechanical Aptitude	.20
(Combat Rating	.11)	Shop Mechanics	.26	(Combat Rating	.00)
		(Combat Rating	.08)		

Table 5

LOADINGS ON THREE FACTORS UNRELATED TO COMBAT OR TRAINING CRITERIA IN KOREAN STUDY

Factor III		Factor V		Factor VI	
Lone Wolf		Intellectual Interests		Masculine Interests	
Self-reliance, Independence	.83	Caution-carefulness	.66	Lack of Feminine Interests	.81
Lack of psychopathic-deviate Tendencies	.72	White-collar Intellectual	.64	Outdoor Skills	.49
Supervisor-tolerance	.61	Social Awareness, Responsibility	.56	Masculine Toughness	.34
Social Awareness, Responsibility	.41	Supervisor-tolerance	.25	Physical Activity	.28
Emotional Stability	.36	Emotional stability	.23	Automotive Information	.22
Social Skills	.35	(Trainee Rating	.07)	Supervisor Tolerance	.21
Arithmetic Reasoning	.25	(Combat Rating	.01)	(Combat Rating	.09)
Caution-carefulness	.24			(Trainee Rating	.07)
Lack of Feminine Interests	.20				
Automotive Information	.20				
(Combat Rating	.14)				
(Trainee Rating	.12)				

These findings suggested that the underlying characteristics being rated as good combat potential in the peacetime study differed from those in the actual combat study in certain respects. The raters observing behavior in training, overseas guardian duty, and maneuvers may have emphasized competence of overall military performance and readiness to do one's job in the light of group goals, in that these qualities would engender confidence in a ratee's combat potential. Raters observing actual combat behavior may well have emphasized leadership and decision-making qualities and maintaining emotional stability under stress. Thus, while there was considerable overlap in the characteristics valid for the two types of criterion, the focal centers as reflected by the factor analysis may well differ in such aspects as these. Analysis of items against the factors found in the present study may be expected to throw some light on the interpretations suggested, and to yield data useful in developing noncognitive measures differentially valid for combat MOS.

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APPENDIX

Intercorrelation Matrix and Results of Factor Analysis in Analysis Sample

Table A-1

MATRIX OF INTERCORRELATIONS FOR PREDICTOR AND CRITERION VARIABLES IN ANALYSIS SAMPLE

(N = 550)

Variable No.[a]	Intercorrelations[b]																	
1	1																	
2	526	2																
3	020	092	3															
4	063	076	313	4														
5	162	184	322	345	5													
6	073	071	372	354	318	6												
7	180	158	470	318	296	490	7											
8	176	159	240	228	281	352	554	8										
9	124	329	189	205	175	128	223	153	9									
10	116	268	253	281	238	173	334	253	564	10								
11	198	461	282	177	307	171	210	271	436	438	11							
12	154	288	430	317	337	328	424	369	427	483	616	12						
13	213	425	107	140	257	079	170	219	439	402	503	381	13					
14	195	157	262	343	239	378	590	484	281	320	197	408	222	14				
15	292	245	075	020	106	034	032	001	-022	081	141	112	116	011	15			
16	052	-025	093	020	086	165	154	115	-201	-108	-042	043	-085	128	069	16		
17	153	102	-028	008	011	014	030	025	-109	-134	012	-035	-064	065	-004	329	17	
18	194	299	344	220	310	365	488	507	247	292	369	476	331	444	031	085	067	18
19	126	109	335	299	332	388	345	395	137	285	290	337	223	314	095	115	030	291
20	062	009	088	241	147	100	125	186	198	170	099	186	161	206	-002	-135	-036	127
21	252	235	139	263	164	176	182	180	159	126	075	181	116	283	120	-002	096	169
22	088	049	199	250	129	251	172	120	033	124	051	145	-016	169	349	111	082	081
23	-084	-131	054	290	049	123	117	128	188	179	052	110	055	143	-203	-135	-035	018
24	-113	-055	118	158	072	092	083	053	186	166	103	100	132	044	-126	-067	-102	018
25	006	-119	128	286	123	223	215	219	159	228	048	189	131	246	-062	-028	006	086
26	-016	-122	132	318	143	177	168	148	116	139	027	167	035	204	-034	-001	-022	061
27	-027	-055	145	230	151	186	179	160	108	085	003	115	010	201	015	-039	021	084
28	079	036	157	237	131	203	154	116	090	088	073	159	066	181	212	076	057	112
29	-051	-104	078	138	090	094	086	074	109	122	077	118	051	089	-032	-015	-069	011
30	056	-014	202	274	162	215	195	163	068	174	082	181	052	200	160	098	133	142
31	073	023	244	238	157	201	160	103	053	122	055	167	-023	141	378	149	099	090
32	-018	001	033	088	028	034	103	130	154	070	124	138	079	101	-002	-023	-009	-010
33	041	029	103	102	104	067	097	137	026	114	075	140	120	063	121	020	-057	032
34	011	-015	102	120	090	112	086	081	137	133	105	179	100	070	085	028	-056	085
35	047	-006	099	046	076	116	108	136	002	112	077	164	103	034	086	071	-001	103
36	026	-042	100	074	063	145	072	096	015	081	063	165	062	028	046	072	-018	071
37	037	-025	105	060	080	135	107	136	004	108	073	175	096	040	079	082	-048	096

[a] Definitions of variables are presented on pages 3 and 4 of the Report. See also Tables A-4 and A-6.

[b] Decimal points omitted.

19																		
154	20																	
221	493	21																
235	284	416	22															
138	437	273	146	23														
151	354	183	206	366	24													
275	489	347	306	465	380	25												
229	387	326	403	419	406	665	26											
137	324	312	376	307	251	483	591	27										
162	347	406	514	252	185	431	487	474	28									
153	290	144	224	309	378	478	572	461	379	29								
245	370	421	573	308	344	509	594	504	632	419	30							
210	239	398	692	184	153	325	444	411	606	391	656	31						
090	239	142	165	182	209	266	341	380	260	497	267	171	32					
156	193	115	286	164	272	199	278	218	227	292	290	249	155	33				
110	119	115	247	140	227	167	256	218	239	283	269	238	147	666	34			
182	143	123	205	108	244	151	204	132	195	200	240	189	099	643	490	35		
166	127	092	217	132	231	147	255	161	230	252	249	226	149	575	610	674	36	
189	141	118	236	124	261	162	248	160	230	247	267	227	134	678	585	949	856	37

Table A-2

UNROTATED FACTOR MATRIX

Variable No.	Factors I	II	III	IV	V	VI	VII	VIII	IX	X	XI
1	204[a]	-336	-301	316	-345	-107	-261	166	182	-045	069
2	224	-543	-152	480	-254	-004	-071	-006	122	139	-087
3	439	-247	-068	-223	265	047	099	-009	-035	146	075
4	504	-071	024	-142	071	-120	063	005	017	090	201
5	416	-280	-054	-090	087	021	051	197	051	258	167
6	471	-197	-118	-359	120	-031	-029	035	020	085	076
7	548	-358	-064	-403	010	011	-184	-092	004	-106	019
8	483	-334	-011	-315	-117	015	-221	066	-073	-058	-146
9	412	-350	391	302	028	-019	128	-325	039	-140	092
10	473	-361	262	163	149	-034	129	-115	065	-231	086
11	411	-528	151	280	042	213	238	089	-042	115	-085
12	569	-464	110	011	127	128	127	-024	-072	020	-036
13	338	-423	208	297	-064	033	069	093	035	-028	-084
14	539	-309	-025	-290	-134	-083	-201	-175	-015	-204	024
15	161	-104	-546	437	302	069	-163	184	-060	-190	192
16	059	-041	-441	-313	-145	232	200	132	-035	-152	-104
17	033	000	-430	-109	-611	113	452	-115	-039	-010	179
18	452	-481	-041	-189	-060	-002	-050	-041	-017	078	-236
19	491	-196	-047	-170	070	012	046	212	-009	009	081
20	528	235	212	136	-178	-346	-067	107	-350	077	007
21	529	114	-160	160	-192	-316	-078	-041	-143	101	003
22	550	291	-425	130	202	-090	039	-078	-107	-011	-001
23	415	284	331	-050	-103	-219	092	005	-063	-014	072
24	386	267	335	042	019	-043	196	196	-061	-011	-081
25	637	374	218	-074	-138	-127	022	183	150	-212	040
26	644	488	134	-039	-041	056	018	103	265	-039	-007
27	570	433	032	-021	-060	150	-183	-234	257	270	096
28	599	363	-252	146	035	004	-019	-126	020	050	-210
29	473	415	234	057	-034	356	-053	153	085	-051	-038
30	671	400	-205	061	023	001	124	-028	035	-022	-136
31	581	338	-460	153	244	-005	109	-133	-035	-050	-057
32	365	266	209	131	-176	594	-261	-059	-333	003	119

[a]Decimal points omitted.

Table A-3

FIRST TRANSFORMATION MATRIX

Factors	I_A	II_A	III_A	IV_A	V_A	VI_A	VII_A	$VIII_A$	IX_A	X_A	XI_A	XII_A[a]
I	.21	.54	.37	.14	.61	-.12	.34	.00	.02	.00	.10	.09
II	.17	-.44	-.45	-.38	.53	.08	.38	-.07	-.08	.03	-.10	-.11
III	-.72	-.19	.31	-.29	.13	-.44	.12	-.03	.01	-.04	.12	.10
IV	.28	-.65	.45	.46	.02	-.15	.10	.07	.07	.03	-.15	-.09
V	.52	.04	.12	-.47	-.15	-.57	-.22	-.26	.00	.13	.05	.09
VI	.08	.09	.15	-.20	-.54	.15	.77	-.05	.15	-.04	-.06	.04
VII	-.01	-.08	.53	-.42	.13	.61	-.25	-.18	.06	.17	-.12	-.02
VIII	-.05	-.02	-.16	.09	.09	-.02	-.05	-.35	.91	-.02	.04	.62
IX	-.08	-.03	-.01	.27	-.03	.07	.07	-.87	-.36	-.07	.07	.00
X	-.15	.04	-.08	.15	-.02	-.04	.11	-.01	-.02	.97	.05	.09
XI	.12	-.19	.03	-.01	-.04	.16	.02	.08	.00	-.01	.96	.74

[a] XII_A is orthogonal to I_A thru VII_A but oblique to $VIII_A$ thru XI_A

Table A-4

ROTATED FACTOR MATRIX EXTENDED TO CRITERION VARIABLES

Variables No.	Designation	FACTORS I_A	II_A	III_A	IV_A	V_A	VI_A	VII_A	XII_A	$VIII_A$	IX_A	X_A	XI_A
1	Outdoor Interest	098[a]	084	057	739	-003	077	-003	117	-014	105	-134	074
2	Athlete - Outdoor skill, experience	026	090	413	707	-134	015	-007	-056	043	023	086	-086
3	Prudence	168	503	236	-092	066	-089	-006	167	-047	027	182	169
4	Social Responsibility	072	343	184	006	323	-046	024	229	-031	-012	101	284
5	Acceptance of Authority	067	391	216	141	083	-034	029	348	-120	186	251	258
6	Non-Psychopathic Deviate	103	589	049	-006	153	-048	003	180	-057	015	080	198
7	Freedom from Neurotic, Psychotic Symptoms	018	738	092	093	090	-113	048	071	060	-082	-152	175
8	Freedom from Hypochondriasis	-099	655	045	177	106	-126	079	030	100	091	-123	002
9	Social Initiative	-113	077	701	112	114	-206	037	-059	093	-241	-124	136
10	Social Skills	014	226	612	057	136	-207	-033	075	-038	-068	-200	155
11	Physical Alertness	-026	266	700	196	-084	-070	084	095	-015	212	137	-044
12	Mental Alertness	039	500	562	072	045	-142	068	086	036	081	040	059
13	Rugged Masculinity	-112	143	532	293	027	-139	024	058	-023	145	-041	-033
14	Freedom from Anxious Fearfulness	-033	615	110	180	182	-079	035	-014	156	-159	-259	152
15	Mechanical Interests	743	-062	086	304	-108	-084	-010	204	077	230	-145	104
16	Lack of Aesthetic Interests	183	348	-126	-074	-107	454	053	-023	-038	161	-134	-146
17	Lack of Business Office Detail Interests	005	089	038	130	035	871	063	-029	166	-058	000	040
18	Freedom from Excitability	-078	637	245	226	020	-084	-024	-091	056	-002	045	-106
19	Freedom from Tendencies to Avoid People	091	452	181	041	191	-031	044	274	-084	214	012	172
20	Knowledge of Military	-071	030	088	093	700	-178	076	080	329	169	079	045
21	Knowledge of Firearms, Hunting, Fishing	165	141	055	310	553	-006	042	-038	226	-029	098	013
22	Knowledge of Tools, Mechanical Equipment	619	166	045	019	457	014	131	-073	067	-051	064	-046
23	Knowledge of Literature, music, home arts	-173	025	112	-135	591	-076	110	079	047	-014	-005	121
24	Knowledge of Team Sports	-112	-006	213	-208	490	-097	174	092	-086	198	024	-049
25	Reading and Vocabulary	-047	143	065	-044	720	-036	283	151	-189	079	-229	107
26	Arithmetic Reasoning	072	125	039	-076	649	-032	473	074	-303	-019	-055	044
27	Pattern Analysis	109	140	-049	059	447	-072	596	-037	-128	-324	214	145
28	Mechanical Aptitude	400	164	050	080	514	-016	335	-250	-004	-133	078	-227
29	Army Clerical Speed	017	026	085	-137	360	-096	639	090	-162	142	-081	-018
30	Shop Mechanics	370	201	103	-029	610	077	325	-130	-077	-046	024	-151
31	Automotive Information	689	166	099	-031	449	056	199	-154	-009	-111	041	-119
32	Dials Test	010	011	085	-073	065	-107	807	078	367	137	-061	091
33	Average Peer Rating (16-week)	190	011	088	-010	229	-036	207	322	-064	171	038	267
34	Average Peer Rating (1-year)	185	020	161	-068	177	-017	211	255	-058	029	040	288
35	Average Supervisor Rating (16-week)	161	061	073	-035	172	-003	125	329	-044	205	012	257
36	Average Supervisor Rating (1-year)	162	055	078	-083	174	024	190	265	-051	149	031	214
37	Combined Peer-Supv Rating (1-year)	183	068	076	-057	184	002	173	332	-060	195	017	265

[a]Decimal points omitted.

Table A-5

SECOND TRANSFORMATION MATRIX FOR EIGHT SELECTED FACTORS

Factors	I_B	II_B	III_B	IV_B	V_B	VI_B	VII_B	XII_B
I_A	.83	-.14	-.04	.09	.00	-.01	-.01	.51
II_A	.15	.93	-.25	-.06	.00	.17	.00	.01
III_A	.08	.21	.93	-.22	.00	.10	.02	.04
IV_A	.00	.12	.21	.95	.00	.02	-.11	-.12
V_A	.00	.01	.00	-.05	.87	-.05	-.47	.00
VI_A	-.02	-.19	-.05	.00	.00	.96	-.13	.00
VII_A	.00	-.02	.00	.10	.49	.10	.86	.00
XII_A	-.52	.07	.00	.09	.00	.00	-.01	.84

Table A-6

FINAL FACTOR MATRIX FROM SECOND TRANSFORMATION

Variables No.	Designation	Factors I_B	II_B	III_B	IV_B	V_B	VI_B	VII_B	XII_B
1	Outdoor Interest	.03	.15	.17	.70	.00	.11	-.09	.06
2	Athlete - Outdoor skill, experience	.09	.24	.51	.58	-.11	.10	-.01	-.09
3	Prudence	.14	.52	.07	-.14	.05	.01	-.01	.26
4	Social Responsibility	.00	.37	.08	-.04	.29	.01	-.12	.24
5	Acceptance of Authority	-.05	.45	.13	.09	.09	.05	-.02	.32
6	Non-Psychopathic Deviate	.08	.56	-.10	-.04	.14	.05	-.06	.22
7	Freedom from Neurotic, Psychotic Symptoms	.10	.74	-.07	.02	.10	.03	.00	.07
8	Freedom from Hypochondriasis	.01	.68	-.07	.11	.13	.01	.01	-.03
9	Social Initiative	.01	.28	.68	-.07	.12	-.10	.00	-.08
10	Social Skills	.06	.39	.54	-.09	.10	-.10	-.05	.09
11	Physical Alertness	.02	.44	.63	.03	-.02	.06	.11	.08
12	Mental Alertness	.10	.62	.42	-.07	.07	.01	.06	.11
13	Rugged Masculinity	-.05	.33	.54	.14	.04	-.04	.01	-.01
14	Freedom from Anxious Fearfulness	.08	.64	.00	.09	.18	.04	-.06	-.04
15	Mechanical Interests	.50	-.07	.13	.36	-.09	-.08	.00	.53
16	Lack of Aesthetic Interests	.19	.16	-.26	-.03	-.06	.49	.04	.08
17	Lack of Business Office Detail Interests	.02	-.06	.00	.10	.06	.87	-.08	-.03
18	Freedom from Excitability	.09	.69	.12	.10	.01	.06	-.03	-.12
19	Freedom from Tendencies to Avoid People	.01	.48	.06	.00	.19	.06	-.04	.29
20	Knowledge of Military	-.08	.11	.11	.03	.65	-.18	-.25	.02
21	Knowledge of Firearms, Hunting, Fishing	.18	.15	.07	.25	.50	.00	-.26	.02
22	Knowledge of Tools, Mechanical Equipment	.58	.07	-.02	.03	.46	.02	-.11	.26
23	Knowledge of Literature, music, home arts	-.17	.08	.08	-.19	.57	-.07	-.15	.00
24	Knowledge of Team Sports	-.12	.05	.17	-.26	.51	-.09	-.03	.05
25	Reading and Vocabulary	-.08	.17	.01	-.06	.77	-.01	-.09	.11
26	Arithmetic Reasoning	.04	.11	-.01	-.06	.79	.00	.10	.11
27	Pattern Analysis	.12	.11	-.07	.10	.68	-.01	.29	.02
28	Mechanical Aptitude	.48	.09	.00	.07	.61	.01	.03	.00
29	Army Clerical Speed	-.02	.04	.04	-.09	.63	-.03	.40	.10
30	Shop Mechanics	.41	.12	.01	-.04	.69	.10	-.01	.09
31	Automotive Information	.69	.04	.01	-.01	.49	.07	-.04	.23
32	Dials Test	-.02	.03	.06	.00	.45	-.01	.68	.08
33	Average Peer Rating (16-week)	.00	.03	.07	.02	.30	-.01	.06	.37
34	Average Peer Rating (1-year)	.04	.04	.12	-.05	.26	.01	.10	.33
35	Average Supervisor Rating (16-week)	-.01	.07	.04	.00	.21	.01	.03	.37
36	Average Supervisor Rating (1-year)	.00	.05	.03	-.04	.24	.04	.08	.32
37	Combined Peer-Supv Rating (1-year)	-.01	.02	-.04	.00	.24	.01	.06	.38

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13. ABSTRACT

As a means of identifying personality factors important in combat potential, scores on 19 noncognitive aptitude tests, 5 measures of avocational information, 7 cognitive tests of the ACB, and one experimental perceptual speed measure were factor-analyzed. Results were extended to criteria--peer and supervisor ratings on combat potential obtained after 16 weeks of AIT and in an overseas maneuver situation after one year. Comparison was made with a similar study in a Korean combat sample. Two of eight factors identified--general cognitive ability and a mechanical-social factor--were valid for the criterion of combat potential. The first factor stood up well in an independent sample while the second was somewhat less valid in the cross sample. The two factors valid in the peacetime structure appeared to reflect ratings based more on the individual's overall competence and readiness to do his job and work for group goals, whereas actual combat ratings placed greater emphasis on leadership and emotional stability under stress. Results have been applied as a conceptual framework for the development of experimental tests to measure the factors identified.

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