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Technical Paper 309

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MEASURING MOTIVATION AND JOB SATISFACTION IN A MILITARY CONTEXT

Walter C. Borman
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and

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INDIVIDUAL TRAINING AND SKILL EVALUATION TECHNICAL AREA



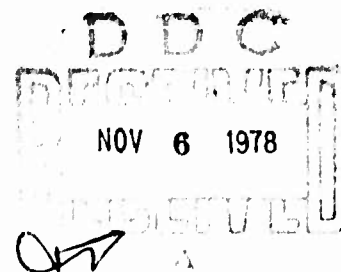
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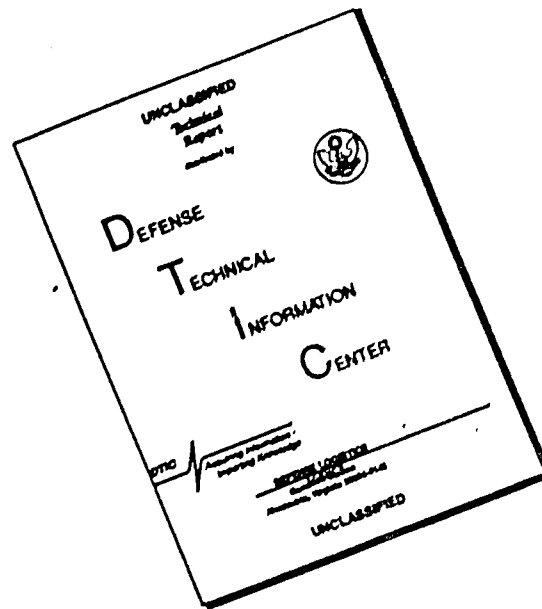
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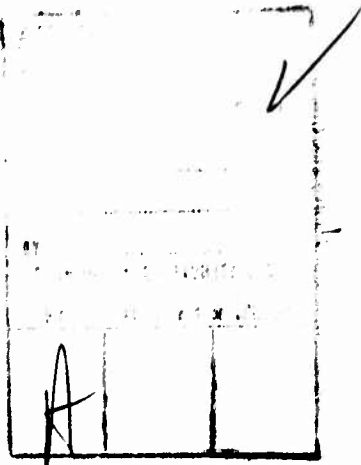
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distinctly separate motivation/satisfaction constructs with acceptable convergent and discriminant validities. Composite measures of these six constructs correlated moderately with self-reports of plans to reenlist and pride in the Army but near zero with self-reported problem behavior. Advantages of such multimethod composite measures are discussed.



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INDIVIDUAL TRAINING & SKILL EVALUATION TECHNICAL AREA

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FOREWORD

High levels of motivation, job satisfaction, and morale are important to the Army for the recruitment, retention, and career productivity of high-quality personnel. This report is the first of several designed to search for, develop, evaluate, and refine ways of understanding and measuring the work motivation, job satisfaction, and productivity of individual soldiers. The project was accomplished jointly by personnel of the Army Research Institute for the Behavioral and Social Sciences (ARI) and Personnel Decisions, Inc., under contract DAHC 19-73-C-0025. Dr. D. Bruce Bell of the Individual Training and Skill Evaluation Technical Area, ARI, was the contracting officer's technical representative. Work was done in response to Army Project 2Q762717A767, Techniques for Increasing Soldier Productivity. Another report, "Motivation, Satisfaction, and Morale in Army Careers: A Review of Theory and Measurement" (ARI Technical Report TR-76-A7), has been produced from this effort.


JOSEPH ZEIDNER
Technical Director

MEASURING MOTIVATION AND JOB SATISFACTION IN A MILITARY CONTEXT

BRIEF

Requirement:

High levels of motivation, job satisfaction, and morale are important to the Army in recruiting and retention of high-quality personnel. The aim of this research was to select, construct, and validate for potential military use the available civilian measures of motivation and job satisfaction.

Procedure:

A review of relevant literature helped to delineate definitions of motivation and job satisfaction and to identify appropriate measures to be administered in the field. A variety of questionnaires, inventories, and rating scales were field tested using 466 enlisted soldiers (representing 104 platoons and 16 companies) stationed in Korea; a replication field tested 614 soldiers (representing 47 platoons and 16 companies) stationed in Germany.

Findings:

Analysis of the results showed six distinctly separate motivation/satisfaction constructs: Motivation, Overall Satisfaction with the Army, Satisfaction with the Job, Satisfaction with Superiors, and Satisfaction with Coworkers, and Satisfaction with Pay. Within the six scales, 19 variables provide a consistent, meaningful, and empirically valid system. The system is closely related to several self-reported indicators of organizational effectiveness, including pride in the Army and plans to reenlist.

Utilization of Findings:

The final set of instruments can be used to measure attitudes and perceptions of soldiers, and thus assess areas of dissatisfaction or the perceived impact of organizational changes.

MOTIVATION AND JOB SATISFACTION IN A MILITARY CONTEXT

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MEASURING MOTIVATION AND JOB SATISFACTION IN A MILITARY CONTEXT

INTRODUCTION

In this investigation primarily civilian-oriented instruments were selected critically and subsequently validated as measures of motivation and satisfaction of military personnel. The aims of this study were (a) to determine if motivation and satisfaction could be measured in a reliable and valid manner in the Army, (b) to discover the dimension of these domains in the military context, and (c) to assess the relation of motivation and satisfaction to several self-report criteria. The research represents an initial effort to develop a system that military policymakers can use to survey the work-related attitudes and perceptions of enlisted men in their units.

In addition, two general issues are addressed in this research.

1. How should we describe parsimoniously the satisfaction of individuals in an organization or in a group of organizational units? What facets of satisfaction should we measure to reflect in an efficient way organizational members' work-related satisfaction? and
2. Do different standardized instruments of satisfaction purporting to tap the same construct actually correlate highly, or does each measure contain large amounts of instrument-specific method variance?

The development of the Job Description Index (JDI) (Smith, Kendall, and Hulin, 1969) provides perhaps the best model for selecting satisfaction facets to measure. Smith and her colleagues attended carefully to conceptual considerations in deciding which facets of satisfaction to measure initially. Then they conducted a lengthy series of empirical studies using factor analysis and other analytic techniques to investigate the convergent and discriminant validity (Campbell and Fiske, 1959) of their facet measures in a number of different organizational settings. The resultant set of five scales appears salient for members of various organizations, and these facet measures show good convergent and discriminant validity, suggesting that they represent a parsimonious way to summarize individuals' work-related satisfaction in a variety of organizations.

Relationships between different measures of the same facet of satisfaction are low to moderate in magnitude (Evans, 1969; Gillet and Schwab, 1975). Incorporating the JDI and the goal-attainment component of Porter's need-satisfaction measure, Evans (1969) found that corresponding measures of satisfaction with pay, supervision, fellow workers, and the work itself

correlated .16 - .60 (median $r = .39$) in two different samples. Gillet and Schwab (1975), using the Minnesota Satisfaction Questionnaire (Weiss, Dawis, England, and Lofquist, 1967) and the JDI, found that the two methods of measuring satisfaction with pay, promotions, supervision, and coworkers correlated .56, .57, .70, and .49 respectively. Thus, in these two studies at least, it appears that different measurement methods tap somewhat different or substantially different constructs.

This study addressed both these satisfaction-measurement issues. First, a conceptual-empirical approach identified satisfaction constructs appropriate for describing military satisfaction "space." A careful literature review (Motowidlo, Dowell, Hopp, Borman, Johnson, and Dunnette, 1976) suggested the kinds of satisfaction facets most likely to be salient for military personnel. Instruments tapping these facets and the motivation domain were selected and administered to Army soldiers. Factor analyses then provided empirical information about what satisfaction and motivation constructs most parsimoniously reflected the total variance in satisfaction/motivation instrument responses.

Second, multiple measures of each satisfaction and motivation facet were administered. Nine civilian-oriented instruments, two instruments developed in the military, and two scales developed especially for this study provided considerable conceptual overlap in the measurement of individual satisfaction/motivation facets. This overlap made possible an analysis of the convergent and discriminate validity of a relatively large number of measures, thus extending the work of Evans (1969) and Gillet and Schwab (1975).

METHOD

Pretesting

A literature review determined the constructs most widely used in describing aspects of motivation and satisfaction. The following constructs were identified: (a) Morale and discipline, (b) motivation, (c) general satisfaction, (d) pay satisfaction, (e) job satisfaction, (f) satisfaction with superiors, (g) satisfaction with coworkers, (h) satisfaction with career progress, (i) satisfaction with the organization, and (j) satisfaction with the general environment. Next, measures which possessed good reliability and validity in prior research studies and which, as a group, reflected well the content of these 10 constructs were identified. The preliminary pool of scales/items and the variables that they measured are shown in Table 1.

The pretest booklet was completed by 141 enlisted persons (Specialist 5 and below) from support units in a foreign location. On the basis of pretest experience, 54 of the 67 pretest measures of satisfaction and motivation were retained for subsequent research steps.

Table 1
Initial Pool of Scales and Items

Instrument	Variable measured
Brayfield-Rothe Job Satisfaction Scales (Brayfield & Rothe, 1951)	Job satisfaction
Cureton Air Force Questionnaire (Cureton, 1960)	Satisfaction with army Satisfaction with community Satisfaction with job Satisfaction with military Satisfaction with pay Satisfaction with unit
Job Descriptive Index (Smith, Kendall, & Hulin, 1969)	Satisfaction with coworkers Satisfaction with pay Satisfaction with promotions Satisfaction with supervisor Satisfaction with work
Job Involvement Scale (Lodahl & Kejner, 1965)	Involvement with job
Military Morale Index	Morale
Minnesota Job Description Questionnaire (Weiss, Dawis, England, & Lofquist, 1967)	Job satisfaction
Minnesota Satisfaction Questionnaire (Weiss, Dawis, England, & Lofquist, 1967)	Extrinsic satisfaction Intrinsic satisfaction
Patchen Motivation Scale (Patchen, 1965)	Motivation
Protestant Ethic Scale (Blood, 1969)	Motivation

Table 1 (continued)

Instrument	Variable measured
Sears Questionnaire (Smith, 1963)	Satisfaction with amount of work Satisfaction with career future and security Satisfaction with company identification Satisfaction with coworkers Satisfaction with financial rewards Satisfaction with kind of work Satisfaction with physical surroundings Satisfaction with supervision
Self-Ratings	Present mood about Army life Own morale Unit morale Effort Performance Job satisfaction in Army Life satisfaction in Army Effort for promotion How worthwhile to try hard
Sum of Prior Expectancies About Army Life Sum of "Is Present Now" in Army Life Difference Between Prior Expectancies and "Is Present Now"	General satisfaction
Sum of Expectancies Sum of Valences (Desirability) Sum of Valences x Expectancies	Motivation
Survey of Organizations (Taylor & Bowers, 1972)	Communications flow Decisionmaking Group process Motivation conditions Opportunities for getting ahead Overall conditions to encourage hard work Overall satisfaction

Table 1 (continued)

Instrument	Variable measured
Survey of organizations (cont'd) (Taylor & Bowers, 1972)	Peer goal emphasis Peer interaction facilitation Peer support Peer work facilitation Satisfaction with career progress Satisfaction with coworkers Satisfaction with job Satisfaction with organization Satisfaction with pay Satisfaction with supervisor Supervisory goal emphasis Supervisory interaction Facilitation Supervisory needs Supervisory support Supervisory work facilitation

Field Testing: Sample I

The revised booklet was administered to 466 enlisted persons (Specialist 5 and below) assigned to 104 platoons and 16 companies in combat support and air defense artillery units. (Sample I). These respondents formed a convenience sample; they were those persons available during the researchers' visits to each unit. Thus, the degree to which Sample I represents the Army population is unknown.

Responses to satisfaction and motivation measures were intercorrelated and factor analyzed to investigate the underlying dimensionality of these domains in a military context. Factor analyses results provided one scheme for identifying constructs that summarize the motivation/satisfaction of enlisted military personnel.

Besides satisfaction and motivation measures, the questionnaire booklet contained several self-report questions. Two items asked soldiers to report their intentions to reenlist (yes, not sure, or no) and their pride in the Army (on a 5-point scale). Also included were two questions about the number of disciplinary actions (AWOL's, Article 15's) taken against the respondent over the preceding 12 months and two inquiries about problem behaviors exhibited by the respondent (number of sick calls the preceding month and number of times lowered in rank - i.e., "busted"). With this information, relationships between self-report criteria and motivation/satisfaction in the Army could be assessed.

Field Testing: Sample II

A replication study was performed to determine if the motivation/satisfaction construct framework developed in Sample I provided a reasonable means of structuring data obtained from an independent sample of soldiers. We also intended to evaluate the generalizability of relationships between motivation/satisfaction and criterion variables. To accomplish these goals, many of the motivation, satisfaction, and criterion measures included in the field test booklet were administered in Sample II to 614 enlisted personnel randomly selected from 16 company and 47 platoon-sized units. Half the units were combat-support troops; the rest were air-defense artillery units.

Selecting Measures to Represent Constructs

One important purpose of this research was to identify scales and items best suited for measuring salient satisfaction and motivation constructs in the Army. Therefore, several criteria were used to select these measures.

1. The content of each scale/item was required to have a priori conceptual similarity to the construct it purported to measure.
2. The scale/item had to load on the same factor as other variables thought to measure that construct.
3. Each scale was to be characterized by high internal consistency.
4. Each construct was to be represented by no more than a single measure from any one instrument. Through this criterion we sought to prevent common method variance from artificially raising within-construct correlations among measures.
5. The items or scales had to possess good convergent and discriminant validity (Campbell & Fiske, 1959). To develop relatively "pure" composites, only those scales/items showing comparatively high correlations with other measures of the same construct (convergent validity) and relatively low correlations with measures of other constructs (discriminant validity) were retained.

RESULTS

Identifying Valid Motivation/Satisfaction Constructs in Sample I and Selecting Scales and Items to Measure Those Constructs

For Sample I data, a five-factor principal-components solution rotated to the varimax criterion made best conceptual sense of the several solutions tried, and accounted for approximately 74% of the total variance in the correlations among satisfaction and motivation measures. The

factor labels, with percent of variance accounted for by each, are (a) Motivation (11%), (b) Overall Satisfaction with the Army (29%), (c) Satisfaction with the Job (13%), (d) Satisfaction with Superiors (7%), (e) Satisfaction with Coworkers (13%).

Table 2 shows the scales and items that loaded most highly on each factor. Measures associated with pay satisfaction loaded on the Overall Satisfaction factor. Since previous research suggested that Satisfaction with Pay should be treated as a separate construct, and since it emerged as an identifiable factor in a pretest factor analysis, Satisfaction with Pay was treated separately in subsequent analyses.

Applying the five scale/item selection criteria previously set forth, 22 measures (numbered in Table 2) were selected to represent the 6 motivation and satisfaction constructs. A multiconstruct-multimethod matrix (see Table 3) was developed to summarize the convergent and discriminant validity obtained with this 22-variable system. Diagonal indexes in the matrix were formed by transforming the correlations among variables within the construct to Fisher z scores and then computing the mean of these z's. The numbers on the diagonal are the mean z's transformed back to correlations. The off-diagonal correlations, representing the means of all the across-construct correlations between variables, also were calculated using z transformations. In all cases, the diagonal correlations differ significantly from zero (.10 significance level) and are greater than are the off-diagonal indexes in the corresponding row or column. Further, for each pair of constructs, none of the across-construct correlations between individual measures is greater than any of the within-construct correlations between individual measures assigned to those constructs. Thus, the 22 variables included in this system demonstrate acceptable levels of convergent and discriminant validity as well as satisfying the other criteria set forth above.

Identifying Valid Motivation/Satisfaction Constructs in the Replication Sample

As in the Sample I analyses, a principal components analysis was performed on responses to the questionnaire booklet, with the resultant factors rotated to the varimax criterion. A six-factor solution appeared most psychologically meaningful for Sample II data; it accounted for 60% of the total variance in the responses. This solution included not only the five factors originally identified in the Sample I data, but also a Satisfaction with Pay factor.

Correlations between factor loadings of the same named factors from Sample I and Sample II were as follows: Motivation, .73; Overall Satisfaction with the Army, .75; Satisfaction with the Job, .85; Satisfaction with Superiors, .67; Satisfaction with Coworkers, .85. Thus, the six-construct framework originally derived from Sample I received some confirmation from the Sample II factor analytic results.

Table 2

Summary of Sample I and Sample II Factor Analysis Results^a

Satisfaction/motivation factors	Sample loadings	
	Sample I	Sample II
Overall Satisfaction With the Army		
• ^b Cureton satisfaction with the Army as a whole ^c	.84	.66
Sum of effort expectancies	.83	.34
• Prior expectations	.68	.56
Cureton satisfaction with community	.66	.61
• Survey of organizations overall satisfaction	.60	.43
SOO opportunities for getting ahead	.59	.38
Minnesota satisfaction questionnaire extrinsic	.55	.29
Own morale	.55	.70
Cureton job satisfaction	.52	.49
SOO satisfaction with pay	.52	.17
• MSQ Total	.51	.33
Satisfaction With Coworkers		
• SOO peer support	.76	.76
SOO peer goal emphasis	.71	.48
SOO satisfaction with coworkers	.68	.66
• Job Descriptive Index Coworkers	.55	.71
• (Sears Coworkers)	.47	.53
Motivation		
• Sum of valencies x expectancies	.70	.73
• Self-rating of effort	.63	.66
Self-rating of performance	.59	.66
Self-rating of overall effectiveness as a soldier	.56	.60
• Self-rating of how worthwhile it is to try hard	.56	.55
• (Patchen motivation scale)	.42	.42
Job Satisfaction		
• Sears kind of work	.72	.74
• SOO satisfaction with the job	.64	.67
• Brayfield-Rothe job satisfaction	.63	.71
• JDI work	.62	.67
• (Cureton job satisfaction)	.49	.66

Table 2 (continued)

Satisfaction/motivation factors	Sample loadings	
	Sample I	Sample II
Satisfaction With Superiors		
• SOO supervisory support	.58	.81
• JDI supervision	.56	.70
• SOO supervisory goal emphasis	.51	.64
• Sears supervision	.50	.57
Satisfaction With Pay ^d		
• SOO satisfaction with pay	--	.78
• JDI pay	--	.67
• Sears financial rewards	--	.60

^a Only scales/items contained in both sample questionnaire booklets are included.

^b Marked scales or items were selected to represent constructs based on Sample I data.

^c Scales/items are in order of the magnitude of loadings for Sample I.

^d Satisfaction with Pay emerged as a separate factor only in Sample II.

Table 3
Multiconstruct-Multimethod Results for Field
Test (Sample I) and Replication (Sample II) Data^a

Factor	1	2	3	4	5	6
1. Motivation	$\frac{45}{48}$					
2. Overall satisfaction with the Army	$\frac{37}{42}$	$\frac{64}{61}$				
3. Satisfaction with the job	$\frac{40}{46}$	$\frac{53}{55}$	$\frac{66}{70}$			
4. Satisfaction with superiors	$\frac{29}{28}$	$\frac{41}{44}$	$\frac{37}{40}$	$\frac{58}{61}$		
5. Satisfaction with coworkers	$\frac{19}{21}$	$\frac{26}{22}$	$\frac{27}{27}$	$\frac{34}{27}$	$\frac{44}{39}$	
6. Satisfaction with pay	$\frac{15}{17}$	$\frac{41}{36}$	$\frac{30}{22}$	$\frac{22}{25}$	$\frac{16}{10}$	$\frac{44}{44}$

^aAll upper entries are derived from Sample I data; lower entries are derived from Sample II replication data.

Cross Validation: Multiconstruct-Multimethod Results

Another approach to cross validating Sample I's construct framework was attempted using the 22 variables selected to represent the motivation/satisfaction constructs in Sample I. As an independent check on the convergent and discriminant validity of these variables, the construct framework represented by these 22 measures was submitted to a multiconstruct-multimethod analysis using the Sample II data. The results (see Table 3) indicate that construct measurement within this framework possesses consistent convergent and discriminant validities. All within-construct correlations differ significantly from zero at the .05 level and are greater than the off-diagonal correlations in corresponding rows and columns. Thus, in the independent replication sample, the 22 variables provided relatively "pure" construct measurement of the six motivation/satisfaction dimensions.

Final Selection of Variables

Although adequate cross-validity was shown for construct measurement, a decision was made to use data from both Samples I and II to form one final "best" group of variables to represent the six motivation/satisfaction constructs. Therefore, the five criteria for selecting measures of constructs were applied to the various scales and items using Sample II data. Measures were deleted from or added to the construct-measurement system if the criteria were better met in Sample II as a result of the additions/deletions as long as these revisions did not cause the criteria to be less well met in Sample I. Using this approach, four scales/items were deleted from the list of variables and one was added. Those deleted were: (10) "Worthwhile to Try Hard" (single item), (4) Minnesota Satisfaction Questionnaire, (22) Sears Financial Rewards, and (7) Sears Coworker. The measure added was Survey of Organizations Single Item Measure of Satisfaction with Coworkers.

Compared to the 22-variable system, the 19 variables provided somewhat purer measures of motivation/satisfaction in Sample II without adversely affecting the Sample I multiconstruct-multimethod results. Thus, the 19-variable system was used in subsequent analyses involving self-report Army criteria.

Relations Among Motivation/Satisfaction Constructs and Army Criteria

Table 4 depicts relationships between each motivation/satisfaction construct and several self-report criteria from Sample II. Two criteria, "Plans to Reenlist" and "Pride in the Army," are significantly related to all six constructs, with correlations ranging as high as .68. Relationships between construct composites and self-report problem behaviors are much lower. Twenty of the 24 correlations are in the predicted direction but only 10 reach significance at the .05 level. Further, the magnitude of these relationships is very small, with the maximum of approximately 2% of the criterion variance accounted for. Motivation is the only construct consistently related to problem behaviors, though again, the magnitude of these correlations is very low.

CONCLUSIONS

The primary practical intent of this project was to recommend questionnaire measures suitable for assessing the motivation and satisfaction of enlisted persons in the Army. The first step in selecting these instruments was to develop for the motivation/satisfaction "space" a comprehensive framework capable of describing the multivariate domain represented by these broad constructs. Although conceptual issues dictated the initial selection of an extensive set of psychometric instruments, the final delineation of appropriate measures of the underlying constructs was determined empirically via a field test and a replication.

Table 4

Correlations Between Motivation/Satisfaction
Constructs and Six Self-Report Criteria^a

Self-Report criteria	Motivation	Overall satisfaction	Job satisfaction	Satisfaction superior	Satisfaction coworkers	Satisfaction pay
1. Plans to reenlist	42** 46**	61** 62**	43** 42**	27** 34**	07* 19**	26** 34**
2. Pride in Army	57** 61**	68** 68**	54** 48**	39** 41**	14** 21**	31** 29**
3. AWOL's last year	-14** -12*	-11* 09	01 01	-08 -03	-08 -10	-03 04
4. Article 15's last year	-12** -06	-07 08	-10* -01	-11* 03	-04 -08	-11* 05
5. Sick calls last month	-10* -18**	-04 -11*	-06 -02	-09* -11*	-08* -15**	00 -03
6. Times demoted	-06 -10*	01 03	-05 02	-07 -04	01 -06	-09* 05

^aUpper correlations are for Sample I, lower correlations for Sample II.

* p < .05

** p < .01

Factor analyses and conceptual considerations provided the rationale for selecting six constructs of practical and theoretical interest. Next, field test and replication data were examined to insure that the measures selected to tap these constructs met several reliability and validity criteria.

The 19-variable/6-construct system developed in the present project appears to provide a consistent, conceptually meaningful, and empirically valid framework for representing the motivation/satisfaction domains of individual soldiers or of Army units. The final set of instruments can measure feeling states and perceptions of soldiers, and can be incorporated into a theoretically and pragmatically useful framework for summarizing responses. The availability of such instrumentation makes possible the establishment of a formal audit procedure for evaluating Army motivation and satisfaction on a continuing basis. Such feedback regarding the psychological orientation of enlisted personnel may enhance organizational effectiveness by identifying potential areas of dissatisfaction. The instruments also may provide assessments of the impact of modifications on current training programs.

Further research is needed to assess the ability of satisfaction and motivation construct measures to predict relevant criteria. In this study soldiers' construct scores and their self-reported disciplinary outcomes and problem behavior showed low relationship. However, this finding may reflect the low base rates associated with these criterion measures and the difficulty in obtaining accurate self-reports of this kind of behavior. We advocate further attempts to predict individual and unit-level criteria using this construct system.

Finally, the multiconstruct-multimethod approach taken in this study has broad implications for motivation and satisfaction measurement. Multimethod composite measures of individual motivation and work-related satisfaction constructs allow for largely instrument-free measurement of these constructs. Relatively instrument-free measurement means that relationships between satisfaction/motivation constructs and other variables will not depend so much upon the particular scales or items employed. Multimethod composite measures with good convergent and discriminant validity should therefore lead to purer and more refined measurement of work motivation and satisfaction, and, eventually, to better understanding of these concepts.

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