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Development of New Military Applicant Profile (MAP) Autobiographical Questionnaires for Use in Predicting Early Army Attrition

Frank W. Erwin

Richardson, Bellows, Henry and Company, Inc.

for

Selection and Classification Technical Area
Newell K. Eaton, Chief

Manpower and Personnel Research Laboratory
Joyce L. Shields, Director

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EDGAR M. JOHNSON
Technical Director

L. NEALE COSBY
Colonel, IN
Commander

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    The Army uses two operational forms of the <u>Military Applicant Profile</u> (MAP) to screen for early attrition among non-high school graduate males. The purpose of this research was to develop new forms of MAP which would be valid predictors of early attrition for women as well as men, and for high school graduates as well as non-graduates. An experimental autobiographical questionnaire of 240 items was prepared, consisting of 85 currently operational MAP items, seven previously developed items, and 148 new (Continued)

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20. (Continued)

items. About one-third of the new items were drawn from experimental ques-
tionnaires developed by the other military services. The questionnaire was
administered to 2,073 Army applicants in 39 Military Entrance Processing
Stations and to 12,024 Army enlistees at seven Reception Stations. Attri-
tion data were available for 9,603 Regular Army cases, which included 8,200
still enlisted at the end of 180 days of service and 1,403 who had been
discharged for failure to adapt. Included were 7,755 men and 1,848 women;
8,312 high school graduates and 1,291 non-high school graduates. The ques-
tionnaires were item analyzed to produce two new forms of MAP for use in
predicting early attrition. Each form includes a subset of keyed items
for use with non-high school graduates. Utility analyses indicate that the
new forms have the potential for making a major contribution to reducing
attrition.

PREFACE

This report describes research conducted to create new and more
comprehensive forms of the Military Applicant Profile (MAP) autobiographical
information questionnaire. Since MAP questionnaires developed earlier
already are being used successfully to identify non-high school graduate
males who are most likely to be separated before completing 180 days of
Army Service, the new questionnaires were developed to provide the option of
extending such usage to males and females of all age and education levels.

EXECUTIVE SUMMARY

.This report describes research designed to develop new and more
comprehensive Military Applicant Profile (MAP) autobiographical questionnaire
forms to identify potential Army enlistees who will complete their first 180
days of service versus those who will not. Since a previously developed MAP
questionnaire already is being used successfully for this purpose with
non-high school graduate male candidates, these new instruments were designed
to permit extending such use to males and females of all age and education
levels.

Procedures

An experimental 240-item questionnaire was administered February through
mid-June, 1982, to Army candidates at 39 Military Entrance Processing Stations
(MEPS), and to Army enlistees at seven Reception Stations. One hundred and
eighty day enlistment status data subsequently secured from Pentagon records
resulted in a final analysis sample of 9,603 cases with questionnaire and
criterion data. Completed questionnaires were subjected to rigorous item
analysis, weighting, and selection procedures, and the items finally selected
were allocated into two new MAP forms. Each form also contains a subset of
keyed items for use with non-high school graduate candidates, if desired.
Validities were computed for each form's scores within the total sample and
all major subgroups. Cross-validities were estimated using two random half
samples constructed for that purpose. Analyses of score reliability and
utility also were conducted.

Results

Enlistees discharged before 180 days because of a failure to adapt to
military service answered approximately 75 percent of the questions in the
experimental form in a significantly different way than enlistees who had
completed 180 days. The two new MAP forms developed from this item pool each
contain 101 items, 23 of which are common to both, plus 78 which are unique
to each. Scores on the two forms show approximately equal means, standard
deviations, validity, and reliability. Validity levels and utility

analysis indicate that scores on the two forms should be useful in predicting 180-day attrition among all applicant groups, regardless of their sex, race or ethnic group, age, or education level.

Recommendations for Further Research

The new MAP forms may be used with varying cut-off scores, depending on enlistment volume and Army policy. This research study sample should continue to be tracked to determine if the MAP questionnaire system also can predict such criteria as longer term attrition, progression, and re-enlistment.

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INTRODUCTION

Since 1973, the Army has had to rely solely on voluntary enlistments to provide the personnel levels necessary to fulfill its various missions. Concomitant with that change and the increased difficulty of recruiting qualified personnel under a volunteer system, there has been a necessarily increased focus on early, "bad cause" attrition. Of all incoming enlistees, 15 to 20 percent are being discharged prior to completing their first 180 days of service because they cannot adapt to Army life.

Eaton, Weltin, and Wing (1982) quoted a $10,000 per discharge estimate of the cost of this attrition, but even this is likely to be conservative. Over and above base expenses, such as recruiting, accessing, training, clothing, feeding, and paying, separated enlistees incur replacement recruiting and training costs, as well as separating costs. Less directly measurable, but nevertheless major items involve attrition's effect on unit stability, readiness, and effectiveness, as well as the training and attention time taken away from those who can and will adapt, because extra time and attention is required by those who cannot.

The research project described in this report was undertaken in this context and is part of the Army's effort to (a) obtain a fuller understanding of the causes of attrition and the extent to which the personal characteristics of non-adapters differ from those of adapters, (b) seek out selection procedures which measure these differences objectively, and (c) reduce attrition by incorporating such measures into the Army's enlistee selection process. This research also is the fifth in a series of investigations into the feasibility of using untimed autobiographical questionnaires for this purpose. The underlying premise of such work is that many of the questions in these instruments will be answered in significantly different ways by various population subgroups, in this instance those who successfully complete their first 180 days of service versus those who do not because of a failure to adapt. The results of the first four phases of this work are summarized below.

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Phase I

In Phase I (Erwin & Herring, 1977), approximately 3,000 male enlistees entering Forts Dix and Jackson during April through June, 1975, completed one or both of two experimental autobiographical questionnaires. Scoring keys were developed for both instruments on the total available sample and various sub-samples, and the resulting scores were correlated with the criterion of "still enlisted at 180 days" versus "discharged before the conclusion of 180 days because of a failure to adapt." The Phase I findings included the following:

1. Of the total enlistee sample, 16.2 percent were discharged prior to completing 180 days of service. This group responded to approximately two-thirds of the questions in a pattern which was significantly different from that of enlistees who had not been discharged during that period.

2. Enlistee scores on the two instruments were found to be significantly related (r_b=.42 and .32) to the discharged vs. not discharged criterion.

3. Black and white enlistees showed very similar patterns of responses to the questionnaire items. There also were no significant mean score differences between the two groups.

Phase II

Phase II (Frank & Erwin, 1978) was designed to determine the cross-validity of the Phase I outcomes and to develop and evaluate a set of new questionnaire items written as a result of Phase I observations and a factor analysis of the Phase I results. Two questionnaires consisting of the old and new items were administered in November, 1976, through February, 1977, to 4,282 incoming male enlistees at Forts Dix and Sill. Of this group, 14.5 percent did not complete 180 days of service because of a failure to adapt.

After establishing the cross-validity of the combined Phase I item scores (r_b=.32) and the initial validity (r_b=.33) of t e differentiating new items in the Phase II sample, the research focus shifted to Phase II's high school dropout subsample, including those who subsequently had obtained a General Education Development (GED) Certificate. This "non-high school graduate" subsample had a 180-day attrition rate of 19.8 percent, and item analyses conducted within its 2,280 cases yielded 73 weighted items which in combination significantly differentiated (r_b=.40) between those non-high school graduates who did not complete 180 days of service and those who did. For purposes of further research, two 60-item questionnaires--Military Applicant Profile (MAP) Forms 4A and 4B--were developed from the 73 item total. These alternate forms each contained 33 common keyed items, 20 unique keyed items, and 7 additional non-keyed items included for identification and research purposes. The forms also were constructed to have approximately equal validity, content, and score range and distribution.

Phase III

In Phase III (Haymaker & Erwin, 1980), the MAP 4A and 4B forms were administered between November, 1978, and April, 1979, to Army candidates in 39 MEPS locations (N=709) and to samples of recruits at the Fort Dix Reception Station (N=748). The purpose of this phase was to (a) evaluate the effects of various faking instructions on the response distributions of MAP items, and (b) determine the extent to which a means could be derived to control for any possible tendency of candidates to exaggerate their qualifications in an attempt to increase their MAP scores and therefore appear more acceptable to the Army. While flawed by small sample sizes, the research did provide estimates of the utility of revised item weighting strategies which could reduce faking effects, if any, without decreasing score validity.

Phase IV

In July of 1979, Form 4B of the MAP was incorporated into the Army's selection procedures to be used with 17-year old, non-high school graduate male candidates, a pool from which relatively few enlistees had been selected in the past. In October, 1979, the Army began to administer the same MAP form to all female candidates for research purposes only. The Phase IV study was designed as an evaluation of MAP's operational effectiveness with non-high school graduate males and possible utility with females. The final analysis sample included 15,343 non-high school graduate, 17-year old males (July, 1979, through June, 1980, enlistees) and 1,153 females of all education and age levels (October, 1979, through June, 1980, enlistees), all of whom had been given the MAP in Military Entrance Processing Stations (MEPS) and subsequently had been accepted as enlistees. Males achieving a MAP score of 62 or higher on a 0 to 106 score range were permitted to enlist. Females meeting other requirements were permitted to enlist, regardless of MAP score.

The use of the MAP 4B form permitted an increase in the number of 17-year old, non-high school graduate accessions from a pre-MAP use level of 5,297 in Fiscal Year 1979, to 19,345 in Fiscal Year 1980, when MAP use was fully instituted. The 180-day attrition in the sample with whom MAP was used, however, was lower than that of any of the research groups previously observed and substantially lower than that of the pre-MAP use non-high school graduate subsamples--14.4 percent versus 19.8 in Phase II and 21.8 in Phase III. On the other hand, MAP score relationships with female attrition were only modest. The reliability of these results for females was questionable because of a small sample size, but it was clear that further research was necessary.

In summary, the use of autobiographical questionnaires in predicting 180-day attrition among Army enlistees has been a productive venture. The fifth research phase, which this report describes, was designed to expand that productivity by developing more comprehensive MAP forms which would prove useful with potential male and female enlistees of all age and education levels.

METHOD

Predictor Development

The **Military Applicant Profile** (MAP) Forms 4A and 4B developed in Phase II contained a total of 73 items weighted to predict attrition among non-high school graduates, plus an additional 12 unweighted items included for identification and further research. In this present work, 7 items from Phase II and 148 new items were added to the **MAP** 4A and 4B group to make up a total pool of 240 items to be used in the Phase V research. It should be noted, too, that in anticipation of joint services research on autobiographical questionnaire utility, 48 of the new items were drawn directly from or represented slightly revised versions of items contained in experimental Navy and Air Force questionnaires. The balance were drawn from instruments being used successfully in business settings, or were newly created items based on previous **MAP** and other research experience. Additionally, in order to evaluate the possible effects of instrument length on questionnaire response patterns, two 240 item booklets with separate, optically scannable answer sheets were prepared--**MAP** 4ABCD and 4CDAB. Items 1 to 120 and 121 to 240 in Form 4ABCD appeared as items 121 to 240 and 1 to 120, respectively, in Form 4CDAB.

During the course of this development stage, the 240-item pool also was grouped into 11 clusters on the basis of a rational content analysis conducted separately and then reviewed jointly by research staff to reach consensus. The cluster descriptions below provide some understanding of what the total item pool was designed to measure.

1. Early Experiences/Influences (21 items): Signs and/or evidence of early stability, independence-developing experiences, leadership, satisfaction with early life experiences.

2. Academic History/Orientation (38 items): Grade level completed, subjects taken, achievement, perceived learning speed, stability, satisfaction with the school-learning experience, reading orientation, plans for further education.

3. Work History/Orientation (26 items): Number and type of jobs held, quality of work, stability, work preferences, employment-seeking history, value placed on work.

4. Physical Activity/Orientation (21 items): Participation in athletics and athletic activities, perceived physical condition and competence, smoking habits, sleep needs, weight.

5. General Self Esteem (20 items): Perceptions of confidence level, leadership ability, memory, tenacity, assertiveness, speaking ability, response to pressure, skills in writing and mathematics.

6. General Self Description (34 items): Views of present life status, habits, luck, spending habits, reaction to criticism, risk-taking, credit received for accomplishments, reaction to authority.

7. Social Orientation/Skills (39 items): General social schedule, participation in organizations, clubs, and groups, number and age of friends, estimate of popularity, trust in others, ability to get along with others, perceptions of acceptance by others, ability to control temper, understanding of why others behave the way they do.

8. Enlistment Influences/Motivation (10 items): Reasons for enlisting, employment status at time of enlistment, ties to home, family and friends' approval of action, length of interest in enlisting.

9. Service Perceptions/Orientation (12 items): Estimates of success in the military, long-range service plans (i.e., duration of stay and re-enlistment plans), views on the value of discipline and service.

10. General Perceptions/Values (11 items): General views on society, satisfaction with present times, control over his or her own future and opportunities.

11. Unassigned (8 items): Age, possession of driver's license, having
   a bank account, frequency of recent residence changes, activities
   of friends.

Finally, while no analysis of the reading difficulty of this item pool was
conducted, it was estimated to be between the 7th and 8th grade level based on
analyses of similar questionnaires in other situations.

Criterion

The criterion utilized in all phases of this research has been "still
enlisted at 180 days" versus "separated prior to 180 days for failure or
inability to adapt to military service." While the Confidential designation
given by the Army to its separation codes and descriptions precludes their
being specifically described in this report, it can be said that discharges for
failure to adapt fall into three major categories: (a) those incurred as part
of the Trainee Discharge Program (TDP), which covers general unsuitability,
rather than any form of serious misconduct; (b) inability to meet Army fitness
standards, not including medical problems; and (c) actual misconduct serious
enough to warrant discharge. Not included in this definition or in analysis
samples are such discharges as hardship, erroneous enlistment, and medical
problems, all of which can be described as "good cause" separations. Finally,
while determinations of "suitability" and "fitness" are subjective, the separation
system does have clearly defined procedures and sufficient structure to warrant
confidence in its meaningfulness.

Psychometrically, however, the still enlisted/separated criterion does have
its shortcomings. The ideal situation would be 50 percent in each criterion
category, but this research typically has had to be undertaken with only 15 to
20 percent of the total sample in the separated criterion group. This severely
uneven "split" tends to mask the true validity of predictors and demands that
developmental research be conducted with exceptionally large samples.

Data Collection

While the exact dates for each location varied, Army personnel at 39 MEPS and seven Reception Stations administered the experimental questionnaires between February 1, and June 16, 1982. Each location used Standard Operating Procedures (SOP) materials and an Administrative Manual developed for this research (see Appendix). Each location also was allocated only one form and had a completion quota so as to ensure a sufficient number of cases with each form to make any desired comparisons feasible within the final analysis sample.

Upon their receipt, all answer sheets were reviewed for completeness and then were optically scanned, with the resulting data converted to tape form. When 180 days had passed since the last administration date, a tape containing name, Social Security Number, and administration location for all cases was transmitted to the Army's Military Personnel Center (MILPERCEN) for matching with Army records. Enlistment status, including separation codes, if any, age and education codes, as well as Armed Forces Qualification Test (AFQT) scores, were added to the data file for those cases which MILPERCEN was able to match.

General Analysis Strategy

As stated at the outset, this research had as its objective the development of more comprehensive MAP forms for use in predicting attrition among males and females of all age and education levels. Phase II showed that a MAP prediction system had the potential to be useful with males of all ages and education levels. Phase II and IV demonstrated that a subset of the same items weighted specifically to reflect non-high school graduate response-attrition patterns are useful with non-high school graduate males, even with an age subgroup (17 year olds) for which separate developmental analyses had not been conducted. Since female subsamples were not included in the original MAP scoring system development, and the Phase IV research conducted among females was inconclusive, primarily because of limited sample size, the present research was designed to fill that gap.

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In this context, then, and assuming that a sufficient number of items would be related to the criterion in the same direction across different populations, the analysis strategy adopted was one which would develop item scoring weights using the largest sample available; i.e., the total, while using item data from the major subsamples to influence, but not totally control final keying decisions. The product to be sought was two new alternate MAP forms, each with more scored items than the present 4A and 4B versions, each with a single total scoring system equally applicable to males and females, and each containing an approximately equal number of items keyed on the basis of total sample data, but identified as most applicable to non-high school graduate candidates. As with the present MAP Forms 4A and 4B, it also was expected that there would be a subset of items so predictive as to warrant including them in both forms. The two new forms therefore would both include a "core" of common items, plus some larger number of items unique to each.

Item Analysis

The underlying logic of autobiographical questionnaire research is that many of the questions such instruments contain will be answered in a significantly different fashion by various subsamples within the population studied. In this instance, the research design and analysis called for a systematic, item by item comparison of the questionnaire responses of those still enlisted at 180 days versus those who were not. The most unique characteristic of the autobiographical questionnaire, therefore, is that its validity is established at the item level. No MAP item receives a weight unless response pattern differences on one or more of its answer alternatives have been observed repeatedly to be significantly related to the attrition criterion.

The primary technique utilized to develop MAP item weights, or scores, is a tailored item analysis program which supplies various descriptive statistics for each questionnaire item, including frequency and percentage of responses by criterion category, as well as the mean criterion level of those selecting each alternative. The program also generates point-biserial correlations (or phi-coefficients in the case of dichotomous criteria) for each item alternative by correlating the criterion variable with the predictor variable categorized as responses to the item alternative versus responses

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to all other alternatives of the same item. The output also includes Pearson product-moment correlations (point-biserials with dichotomous criteria) which are useful for autobiographical items in which the alternatives constitute a continuum. Escape options or "outs" are coded so as to permit separating them from every item in which the remaining alternatives constitute a continuum. In the item which follows, for example, the age responses form a continuum; the escape option is "I have not learned to drive." The analysis program permits an evaluation of the continuum by itself; i.e., is there any pattern similarity between age at which individuals learned to drive and their attrition rate. The escape option allows comparisons between attrition rates of those who learned to drive, no matter their age, and those who have not learned to drive at all.

<u>How old were you when you learned to</u>

<u>drive a car?</u>

a. 12 years or younger

b. 13 or 14 years

c. 15 or 16 years

d. 17 years or older

e. I have not learned to drive

Effects of Questionnaire Length

Before proceeding to the item weighting stage, it was necessary to investigate the extent to which the length of the two experimental forms affected examinee responses. While the final forms would be shorter, the focus of concern was whether examinee sample members might have grown increasingly fatigued as they worked through the longer experimental forms so that their answer patterns toward the end of the form would have been affected as a result. As indicated earlier, the two forms had been constructed so as to make such an investigation possible: those items which appeared in the first half of 4ABCD were in the last half of 4CDAB, and vice versa.

One of the more effective methods for estimating predictor length effects is a simple frequency count by item of non-responses within form, and in this instance, across forms as well. Examinee fatigue effects within form would be evidenced by a significantly increasing number of

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non-responses to each item toward the end of the instrument. The across-form comparisons conducted here are more precise, since the comparison is undertaken with identical items, but arranged in different order in the forms involved.

Item Weighting

For purposes of this research, item analyses were generated for four samples considered essential to the item weighting process—the total analysis sample, two random half samples controlled for sex group, discharge type, and education level, and the total female subsample. While item analyses were to be developed in the non-high school graduate, the MEPS, and the 4ABCD and 4CDAB groups, these were for other informational type reviews. In addition, the MEPS and non-high school graduate samples were not seen as being very useful for item weighting decisions, since the former was expected to be too small and the latter would include 17 year olds with whom the MAP 4B items had been used for selection.

Again, item weights were to be assigned on the basis of observed relationships within the largest sample available, the total sample, but the decision process on the weighting of each item was to include a simultaneous review and consideration of the item's statistics in the other three samples. They would guide, but not control. It also should be noted that the process included two steps. The first of these, item weighting in the total sample while reviewing half sample and female sample data, was designed to maximize validity stability by giving primary emphasis to the largest, most representative sample available. The second step, adopted for the same purpose, was to compute the validity of each keyed item in each of the four essential samples and to select items for the final forms based on these data.

Four general decision rules were adopted to establish the parameters, or limits, of the item weighting process.

1. Unit weights (-1, 0, +1) would be used, with a constant added to eliminate negative values.

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2. No item would be entered for weighting unless the response-criterion relationship of the item or one of its alternatives was significant at least at the .05 level, or if it were judged that the item could be keyed in a logical fashion which would result in an item validity significant at least at that level.

3. If only one alternative within an item met item weighting standards, the alternative involved was required to have been selected by at least five percent of the total sample in order to be weighted. The exceptions to this rule, if any, would be those instances where the response-criterion relationship was exceptionally strong and in the same direction in all subsamples.

4. Response-criterion relationships in the subsamples would be considered, particularly if patterns in the female subsample differed from the total for understandable reasons. In these situations, an attempt was to be made to accomodate or minimize the difference by alternative weighting schemes, rather than by dropping the item.

To all of these rules was added a caveat that no item or item alternative was to be weighted on the basis of pure empiricism. Weights which could not be explained in rational, behavioral terms were not to be assigned.

Final Item Selection and Form Development

Upon completion of the item weighting step, the mean, standard deviation, and validity of each of the weighted items was computed within five samples—the total, two random halves, and the female and non-high school graduate subsamples. To facilitate their allocation into the new forms, the items then were arranged within cluster in rank order according to their validity in the total sample.

Again, decision rules were adopted to minimize validity shrinkage, and
in this step, to maximize final form comparability.

1. The validity of each item selected for final forms was to have a
    significance level of .001 in the total sample.

2. The validity of each item selected was to have a significance level
    of approximately .05 or better in each of the two random half samples.

3. The validity of each item selected was to be in a positive direction
    in the female subsample.

4. The allocation of items to final forms was to be done within cluster.
    To the extent the smaller number of items in each cluster would permit,
    cluster mean scores and validities were to be approximately equal.

5. Those items selected to be common to both forms within cluster were
    to have a substantial response-criterion relationship in the total
    sample.

6. The validity of items selected for inclusion in the non-high school
    graduate subset within each form was to be in a positive direction.
    Items were to be allocated to forms in such a way as to equalize
    mean scores and validities within cluster. Again, this objective
    was to be met to the extent that the smaller number of items within
    cluster would permit.

Non-High School Graduate Item Subset

In terms of general stability and performance, the non-high school
graduate population is the last from which the Army fills its needs.
When economic conditions are negative or patriotism surges, the Army
can expect increased enlistment levels and may be more selective.
On the other hand, when economic conditions are positive and/or patriotism
wanes, Army enlistment levels will go down, interest in the non-high school
graduate population is restored and greater numbers are screened in. It was
in this context that the MAP first became of interest. The presently operational

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MAP system was designed to permit the Army the option of using its scores to increase non-high school graduate acceptances substantially without suffering equally substantial increases in attrition. The present research was designed to produce more comprehensive forms, applicable to more groups, but was to do so without losing the separate non-high school graduate use option.

The strategy adopted to meet this objective was essentially to create forms within forms. There would be two new MAP instruments, but within each would be a subset of non-high school graduate items approximately equal in score distributions, content and validity. These items were not to be separately keyed in this program's non-high school graduate sample. They were to be weighted using the total sample data and selected for non-high school graduate use on the basis of the validity of the total sample weights within the non-high school graduate sample. As indicated in the preceding section, the validities of the items selected for such use were to be in a positive direction in the non-high school graduate group and were to be allocated to forms within cluster so as to equalize the mean scores, validities and construct measurement of the two item subsets.

Cross-Validation

The most essential objective in the development of scoring systems for instruments such as MAP is to ensure that the items selected for weighting will yield a combined, or total, score which will be maximally valid in future applications of the test involved. There is no exact mathematical procedure, however, for estimating the validity of such scoring systems within new samples without multiple replication.

One response to this difficulty is the double cross-validation procedure (Katzell, 1951), which includes the following steps: (a) Divide the total analysis sample into random halves, (b) separately item analyze all items in each half sample, (c) establish a relatively liberal probability standard for weighting items in each half, (d) score the questionnaires of all cases in each half using the scoring system developed in the other half, (e) compute the validities of the two scoring systems in the independent half samples, and (f) select for a final scoring system those items whose two half compound

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probability (Baker, 1952) is less than or equal to some more rigorous significance level than that used in step (c).

It should be noted, however, that this and similar strategies evolved primarily as a response to the fluctuations which typically occur in small sample research. Katzell (p. 18) recognized that "The use of a large sample (let's say 800 to 1,000 cases) assures relatively stable item weights, and it is not unusual to find that cross-validation will show relatively little shrinkage." In addition, the method is not without weakness, principally because the two estimates of r obtained are on half sample scoring keys which contain items which will not survive the final keying step. As a result, both of the half sample cross-validities are likely to be underestimates, and the larger of the two r's may be the better estimate of the final key's validity. Use of this procedure with samples having unfavorable criterion splits only serves to compound the problem.

In terms of this research, the two-step item weighting and item selection procedure was seen as capable of producing validity estimates closer to true validity than those which would result from the method outlined above. Additionally, this project's procedures did not stray completely from it. Since random halves were constructed, item analyzed, and considered in the weighting process, and validity significance levels of .05 in both halves and .001 in the total sample were required for final item selection, all of the double cross-validation elements actually related to maximizing key stability have been included. Last, but certainly not least, is the fact that this research was to be conducted within a sample estimated to be at least ten times the size of Katzell's definition of "large," and use of the total sample data was seen as the most effective strategy for reducing sampling error influences and the effects of the criterion split.

In summary, it was not felt that the double cross-validation procedure would add much in the way of operationally useful data, but scoring keys nevertheless were developed in two random half samples of the total group. Item alternatives or items with response-criterion relationships at least at the .05 level of significance were assigned weights using the 1, 0, -1 scale. The questionnaires of each half sample's cases were scored using the scoring system developed in the other half sample and the validities of the two sets of scores were computed.

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New Form Reliability

It was expected that some individuals would be given one form in a MEPS
and be accepted in time to be given the same form or its counterpart in a
Reception Station. Given that most if not all of these cases would have taken
an experimental MAP as a potential enlistee and again when actually enlisted,
the result would afford a unique opportunity, not only to estimate the test-
retest reliability of the final forms, but also to obtain at least some
measure of possible "faking" and other effects on score distributions.

It is important to note, however, that the typical conclusion in the
literature on autobiographical instrument faking is that individuals can and
will fake (i.e., pick the more favorably sounding responses more frequently)
if they are told to do so. Since they would not be given such instructions in
an operational setting, the finding has little relationship to reality and
should not be used to predict it.

Since the MAP forms were administered in this research as if they were
part of standard Army testing procedures, the resulting data can be given more
credence as a more realistic measure of the effects on scores of possible
candidate eagerness to be accepted. The primary focus of concern, however,
should be on demonstrated validity, whether or not these effects exist.

RESULTS AND DISCUSSION

Final Analysis Sample

The toal number of persons completing the two forms during the admini-
stration period was 14,897—2,073 in the MEPS and 12,824 in the Reception
Stations. The matching of completed questionnaires with military records
resulted in a substantial reduction in this sample, however, due to (a) MEPS
non-matches, who apparently did not enter the Army (N=1,001), (b) cases with
prior service (N=56), (c) duplicate cases who had gone through two experimental
form administrations (N=281), (d) Reception Station cases with Social Security
Number errors (N=68), and (e) cases with unclear enlistment status at 180 days

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(N=203). The largest non-matched group included 3,414 National Guard and Reserve members who had been given the experimental forms in the MEPS (N=123) and Reception Stations (N=3,291).

The net product of the matching process, therefore, was 9,874 cases with a discharge rate of 17.0 percent (N=1,674) for all reasons. Since 271 of the separations were for "good cause" reasons, the final analysis sample consisted of 9,603 cases, 8,200 (85.4 percent) of whom were still enlisted at the end of 180 days and 1,403 (14.6 percent) who were separated prior to 180 days for failure to adapt reasons. It is this final analysis sample which is described in Tables 1 through 4 which follow.

- Table 1 describes the ethnic group, sex, age and education distributions of the total analysis sample, as well as the separation rates for each group and the total. As can be seen, the highest attrition rates are among whites, females, the 17 year old and 23 or older age groups, and the non-high school graduate samples.

- Table 2 compares sample characteristic distributions and separation rates within and across the white and black subgroups. As can be seen, the separation rate of blacks is substantially lower than that of whites. The patterns observed in Table 1; i.e., females, 17 year old and 23 or older age groups, and non-high school graduates having higher separation rates, repeats in both groups.

- Table 3 presents the characteristics of males and females. Again separation rates for whites, the 17 year old and 23 or older age groups, and male non-high school graduate samples are higher. Females are virtually all high school graduates or above.

- Table 4 compares the high school and above and the non-high school graduate samples. Although the sample size is small, it should be noted that the separation rate of the 17 year old non-high school graduate group selected with MAP 4B is lower than the total non-high school graduate sample and the total 17 year old sample.

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Table 1
Analysis Sample and Subgroups
Enlistment Status at 180 Days

Sample	Total N	Still Enlisted N	$\%^a$	Separated- Failure to Adapt N	$\%^a$
<u>Total</u>	9,603	8,200	85.4	1,403	14.6
<u>Administration Locations</u>					
MEPS	949	790	83.2	159	16.8
Reception Stations	8,654	7,410	85.6	1,244	14.4
<u>Ethnic Group</u>					
White	7,045	5,887	83.6	1,158	16.4
Black	2,179	1,966	90.2	213	9.8
American Indian	45	38	84.4	7	15.6
Oriental-Asian-American	124	119	96.0	5	4.0
Mexican-American	81	77	95.1	4	4.9
Latin American	48	42	87.5	6	12.5
Puerto Rican	76	67	88.2	9	11.8
Cuban	5	4	80.0	1	20.0
<u>Sex</u>					
Male	7,755	6,722	86.7	1,033	13.3
Female	1,848	1,478	80.0	370	20.0
<u>Age</u>					
17	545	446	81.8	99	18.2
18	1,958	1,653	84.4	305	15.6
19	2,158	1,880	87.1	278	12.9
20	1,451	1,251	86.2	200	13.8
21	935	811	86.7	124	13.3
22	686	596	86.9	90	13.1
23 or older	1,870	1,563	83.6	307	16.4
<u>Education</u>					
More than High School	1,034	937	90.6	97	9.4
High School Graduate	7,278	6,244	85.8	1,034	14.2
GED	297	232	78.1	65	21.9
Non-High School Graduate	994	787	79.2	207	20.8

[a]Percent of line total

Table 2
Analysis Sample Blacks and Whites
Subgroup Frequencies and Enlistment Status at 180 Days

Sample	N	Total χ^a	χ^b	N	White χ^a	χ^b	N	Black χ^a	χ^b
Total	9,603	100.0	14.6	7,045	100.0	16.4	2,179	100.0	9.8
Administration Locations									
MEPS	949	9.9	16.8	713	10.1	17.7	211	9.7	15.3
Reception Stations	8,654	90.1	14.4	6,332	89.9	16.3	1,968	90.3	9.4
Sex									
Male	7,755	80.6	13.3	5,825	82.7	14.9	1,628	74.7	8.8
Female	1,848	19.2	20.0	1,220	17.3	23.9	551	25.3	12.5
Age									
17	545	5.7	18.2	461	6.5	19.5	53	2.4	13.2
18	1,958	20.4	15.6	1,487	21.1	17.6	406	18.6	9.9
19	2,158	22.5	12.9	1,579	22.4	15.1	507	23.3	6.7
20	1,451	15.1	13.8	1,056	15.0	15.1	336	15.4	9.8
21	935	9.7	13.3	700	9.9	14.3	203	9.3	9.9
22	686	7.1	13.1	493	7.0	15.0	172	7.9	8.7
23 or older	1,870	19.5	16.4	1,269	18.0	18.6	502	23.0	12.7
Education									
More than High School	1,034	10.8	9.4	722	10.2	11.4	262	12.0	4.2
High School Graduate	7,278	75.8	14.2	5,167	73.3	16.0	1,822	83.6	10.2
GED	297	3.1	21.9	256	3.6	23.4	34	1.6	11.8
Non-High School Graduate	994	10.4	20.8	900	12.8	21.2	61	2.8	21.3

[a] Percent of group total
[b] Percent separated at 180 days

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Table 3
Analysis Sample Males and Females
Subgroup Frequencies and Enlistment Status at 180 Days

Sample	N	Total $\%^a$	$\%^b$	N	Male $\%^a$	$\%^b$	N	Female $\%^a$	$\%^b$
Total	9,603	100.0	14.6	7,755	100.0	13.3	1,848	100.0	20.0
Administration Locations									
MEPS	949	9.9	16.8	568	7.3	12.9	381	20.6	22.6
Reception Stations	8,654	90.1	14.4	7,187	92.7	13.4	1,467	79.4	19.4
Ethnic									
White	7,045	73.4	16.4	5,825	75.1	14.9	1,220	66.0	23.9
Black	2,179	22.7	9.8	1,628	21.0	8.8	551	29.8	12.5
Other	379	3.9	8.4	302	3.9	7.3	77	4.2	13.0
Age									
17	545	5.7	18.2	489	6.3	17.0	56	3.0	28.6
18	1,958	20.4	15.6	1,584	20.4	13.9	374	20.2	22.7
19	2,158	22.5	12.9	1,812	23.4	12.0	346	18.7	17.3
20	1,451	15.1	13.8	1,175	15.2	12.4	276	14.9	19.6
21	935	9.7	13.3	776	10.0	12.0	159	8.6	19.5
22	686	7.1	13.1	538	6.9	12.1	148	8.0	16.9
23 or older	1,870	19.5	16.4	1,381	17.8	15.1	489	26.5	20.2
Education									
More than High School	1,034	10.8	9.4	730	9.4	8.4	304	16.5	11.8
High School Graduate	7,278	75.8	14.2	5,739	74.0	12.2	1,539	83.3	21.6
GED	297	3.1	21.9	295	3.8	22.0	2	0.1	-
Non-High School Graduate	994	10.4	20.8	991	12.8	20.8	3	0.2	-

[a] Percent of group total
[b] Percent separated at 180 days

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Table 4
Analysis Sample and Education Subsamples
Subgroup Frequencies and Enlistment Status at 180 Days

Sample	N	Total $\%^a$	$\%^b$	High School Graduates and Above N	$\%^a$	$\%^b$	Non-HS Graduates N	$\%^a$	$\%^b$
Total	9,603	100.0	14.6	8,312	100.0	13.6	1,291	100.0	21.1
Administration Locations									
MEPS	949	9.9	16.8	828	9.7	16.5	121	9.4	18.2
Reception Stations	8,654	90.1	14.4	7,484	92.3	13.3	1,170	90.6	21.4
Ethnic Group									
White	7,045	73.4	16.4	5,889	70.8	15.4	1,156	89.5	21.7
Black	2,179	22.7	9.8	2,084	25.1	9.4	95	7.4	17.9
Other	379	3.9	8.4	339	4.1	8.3	40	3.1	10.0
Sex									
Male	7,755	80.6	13.3	6,469	77.8	11.8	1,286	99.6	21.1
Female	1,848	19.2	20.0	1,843	22.2	20.0	5	0.4	–
Age									
17	545	5.7	18.2	187	2.2	15.5	358	27.7	19.6
18	1,958	20.4	15.6	1,611	19.4	14.2	347	26.9	21.9
19	2,158	22.5	12.9	1,959	23.6	12.0	199	15.4	21.1
20	1,451	15.1	13.8	1,327	16.0	13.3	124	9.6	19.4
21	935	9.7	13.3	866	10.4	12.9	69	5.3	17.4
22	686	7.1	13.1	634	7.6	13.1	52	4.0	13.5
23 or older	1,870	19.5	16.4	1,728	20.8	15.4	142	11.0	28.9

[a] Percent of group total
[b] Percent separated at 180 days

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Effects of Questionnaire Length

The results of the investigation into the effects of questionnaire length on response patterns are shown in Tables 5 and 6. Comparisons of item non-response counts and their percentage of total responses are presented for four item sets: (a) items 101 through 120 in 4ABCD, which appeared as items 221 through 240 in 4CDAB; (b) items 221 through 240 in 4ABCD, which appeared as 101 through 120 in 4CDAB; (c) items 1 through 20 in 4ABCD, which appeared as 121 through 140 in 4CDAB; and (d) items 121 through 140 in 4ABCD, which appeared as 1 through 20 in 4CDAB. As can be seen, non-responses are less than one percent of the total responses for all items reviewed. While there is a tendency for non-response frequency to increase depending on item location, the increase is trivial; i.e., substantially less than one percent.

Table 5
Frequency of Non-Responses as a Function of Item Position
Map Items 1-20, 121-140

| | MAP Form ABCD | | | MAP Form CDAB | |
Item Number	Blanks N	Percent of Total Cases[a]	Item Number	Blanks N	Percent of Total Cases[b]
1	2	0.0	121	12	0.1
2	3	0.0	122	12	0.1
3	1	0.0	123	9	0.1
4	6	0.1	124	12	0.1
5	4	0.1	125	8	0.1
6	3	0.0	126	7	0.1
7	18	0.3	127	62	0.8
8	9	0.1	128	12	0.1
9	5	0.1	129	11	0.1
10	10	0.2	130	28	0.3
11	6	0.1	131	11	0.1
12	4	0.1	132	13	0.2
13	6	0.1	133	13	0.2
14	5	0.1	134	8	0.1
15	2	0.0	135	12	0.1
16	3	0.0	136	16	0.2
17	6	0.1	137	12	0.1
18	4	0.1	138	19	0.2
19	3	0.0	139	15	0.2
20	21	0.3	140	43	0.5
121	11	0.2	1	1	0.0
122	5	0.1	2	2	0.0
123	11	0.2	3	5	0.1
124	18	0.3	4	5	0.1
125	11	0.2	5	3	0.0
126	12	0.2	6	3	0.0
127	10	0.2	7	2	0.0
128	22	0.3	8	11	0.1
129	12	0.2	9	7	0.1
130	11	0.2	10	7	0.1
131	43	0.7	11	21	0.3
132	13	0.2	12	9	0.1
133	10	0.2	13	1	0.0
134	9	0.1	14	5	0.1
135	14	0.2	15	16	0.2
136	12	0.2	16	7	0.1
137	12	0.2	17	4	0.0
138	43	0.7	18	31	0.4
139	22	0.3	19	11	0.1
140	17	0.3	20	14	0.2

[a]Total taking 4ABCD, N=6,348
[b]Total taking 4CDAB, N=8,266

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Table 6
Frequency of Non-Responses as a Function of Item Position
Map Items 101-120, 221-240

| | MAP Form ABCD | | | MAP Form CDAB | |
Item Number	Blanks N	Percent of Total Cases[a]	Item Number	Blanks N	Percent of Total Cases[b]
101	18	0.3	221	19	0.2
102	14	0.2	222	19	0.2
103	9	0.1	223	18	0.2
104	4	0.1	224	12	0.1
105	7	0.1	225	22	0.3
106	20	0.3	226	25	0.3
107	32	0.5	227	35	0.4
108	3	0.0	228	10	0.1
109	9	0.1	229	23	0.3
110	12	0.2	230	19	0.2
111	6	0.1	231	15	0.2
112	14	0.2	232	31	0.4
113	18	0.3	233	56	0.7
114	23	0.4	234	44	0.5
115	17	0.3	235	33	0.4
116	16	0.3	236	28	0.3
117	10	0.2	237	12	0.1
118	12	0.2	238	18	0.2
119	11	0.2	239	16	0.2
120	8	0.1	240	9	0.1
221	9	0.1	101	13	0.2
222	9	0.1	102	12	0.1
223	16	0.3	103	15	0.2
224	21	0.3	104	11	0.1
225	17	0.3	105	11	0.1
226	20	0.3	106	16	0.2
227	19	0.3	107	10	0.1
228	18	0.3	108	18	0.2
229	22	0.3	109	31	0.4
230	27	0.4	110	57	0.7
231	20	0.3	111	14	0.2
232	17	0.3	112	25	0.3
233	13	0.2	113	6	0.1
234	16	0.3	114	6	0.1
235	10	0.2	115	13	0.2
236	10	0.2	116	14	0.2
237	21	0.3	117	22	0.3
238	9	0.1	118	12	0.1
239	13	0.2	119	16	0.2
240	12	0.2	120	11	0.1

[a]Total taking 4ABCD, N=6,348
[b]Total taking 4CDAB, N=8,266

Final Forms: Characteristics and Criterion Relationships

The most essential component of the final form development procedures was the requirement to seek equivalency of mean scores and validity within cluster. To the extent that the original assignment of items to clusters was sound, this step would act as a control for achieving the same approximate level of validity for each form. Without this control for item inter-relationships, equal mean scores might be achieved, but the validity of the final forms could be sub-stantially different and the construct measurement of the two certainly would be.

The first step of the item weighting procedures yielded a total of 213 items in which one or more alternatives were weighted. The final step of the item weighting-selection process resulted in the allocation of 179 of these items to the new MAP forms. Each form contained 101 weighted items, 23 of which were core; i.e., common to both, plus 78 unique to each. Means and standard deviations of all total and cluster scores were computed within the total sample for the total 179-item pool, as well as for each form. Also included were correlational analyses involving (a) all total and cluster scores and the criterion for the total sample, and (b) all total scores and the criterion for all subsamples of interest. The score range of Form 1 is 0 to 188 while the score range of Form 2 is 0 to 194.

Tables 7 through 10 present the relationships among the core, unique, and total scores, as well as the clusters of the total item pool and those of each form. Also included are the relationships among the same major sections and AFQT scores. Tables 11 through 15 show the mean scores, standard deviations and validities of all total scores for all major subsamples. Also shown are the correlations between form scores for the total sample and major subgroups, and the means, standard deviations and score-score, score-criterion relationships of the clusters within the total sample. The data which are presented in these tables are described briefly below.

- Tables 7 through 9 show core, unique, and total scores to be highly intercorrelated. This is not unexpected, since they each include representation from all of the item clusters. The relatively low intercorrelations among cluster scores is most encouraging, since it represents an empirical confirmation of the original rational clustering procedure.

- Table 10 repeats the major section intercorrelations within the total pool and the two forms, but adds data showing the relationship between the two form scores and in turn with AFQT scores. As can be seen, the two form total scores are highly intercorrelated ($r=.89$) and only modestly related to AFQT. Finally, it is shown in this table that AFQT scores and this particular type of attrition are not related within the total sample ($r_b=.00$). A table showing failure to adapt attrition rates by AFQT score level for various subgroups is included in the Appendix to this report.

- Tables 11 through 14 show score levels and score-criterion relationships for the total item pool and Form 1 and 2 scores among all major subgroups. Ethnic group and male-female scores are highly comparable, with blacks tending to score higher than whites. Score differences are of course a reflection of criterion performance and sample characteristic differences. Blacks do have lower attrition rates so higher scores would be expected. While females have higher attrition rates, their sample does not include a non-high school graduate subgroup which would lower the MAP scores observed here. MEPS scores also tend to be higher, but the MEPS sample contains 17 year old enlistees selected with MAP 4B. Of prime importance at this point is the fact that scores on the two forms show high form-to-form relationships and a consistent pattern of validity, no matter the group. This is testimony to the comparability of the forms, as well as the stability of the scoring systems. Finally, it should be noted that the non-high school graduate sample/non-high school graduate item data presented here are for comparison purposes and are discussed more fully below.

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● Table 15 shows the total number of weighted items in each form, as
  well as the items within cluster. Form-to-form total and cluster
  mean scores are highly comparable, with Form 1's total score mean
  a point higher than that of Form 2. No practical differences exist
  between total score variances. The form-to-form cluster scores have
  obvious limitations in terms of number of items and score variance,
  but the relationships are at reasonable levels. The highest score-
  to-score relationships are understandably found in those clusters
  containing the highest number of core items.

Table 7
Map Total Item Pool
Score Intercorrelations Within the Total Sample
(N=9,603)

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Total Core	28.91	6.91	x	.69	.81	.35	.47	.59	.64	.73	.45	.42	.44	.67	.16	.26
2 Total Unique	186.56	21.89		x	.98	.48	.66	.61	.56	.66	.72	.75	.44	.62	.38	.38
3 Total Score	215.47	27.12			x	.48	.65	.64	.62	.72	.70	.71	.46	.67	.34	.38
4 Cluster 1	11.22	2.10				x	.23	.25	.27	.35	.29	.34	.16	.25	.11	.18
5 Cluster 2	30.65	5.86					x	.31	.26	.39	.35	.37	.23	.35	.18	.32
6 Cluster 3	27.08	5.33						x	.32	.49	.36	.33	.28	.41	.15	.19
7 Cluster 4	22.65	5.54							x	.40	.32	.34	.18	.35	.10	.19
8 Cluster 5	23.80	5.28								x	.40	.38	.23	.55	.15	.17
9 Cluster 6	30.28	4.75									x	.51	.29	.42	.27	.18
10 Cluster 7	31.73	5.61										x	.26	.38	.27	.21
11 Cluster 8	13.66	3.90											x	.33	.17	.19
12 Cluster 9	14.63	3.34												x	.20	.15
13 Cluster 10	7.58	1.83													x	.09
14 Cluster 11	8.23	2.00														x

Table 8
Map Form 1
Score Intercorrelations Within the Total Sample
(N=9,603)

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Total Core	28.91	6.91	x	.62	.84	.17	.48	.49	.71	.72	.41	.30	.35	.69	.10	.29
2 Total Unique	93.84	11.48		x	.94	.38	.60	.54	.50	.60	.67	.66	.36	.57	.33	.38
3 Total Score	122.75	16.64			x	.33	.61	.58	.64	.71	.64	.58	.39	.68	.27	.38
4 Cluster 1	5.57	1.18				x	.19	.15	.14	.14	.19	.21	.14	.14	.09	.13
5 Cluster 2	16.08	3.70					x	.24	.26	.33	.28	.24	.13	.33	.13	.29
6 Cluster 3	13.19	2.86						x	.28	.38	.26	.23	.22	.32	.09	.20
7 Cluster 4	15.39	3.90							x	.45	.29	.21	.14	.40	.07	.17
8 Cluster 5	14.81	3.74								x	.33	.27	.15	.52	.08	.17
9 Cluster 6	17.49	3.33									x	.40	.21	.38	.18	.14
10 Cluster 7	15.90	3.22										x	.20	.29	.21	.15
11 Cluster 8	7.07	1.91											x	.25	.07	.14
12 Cluster 9	9.82	2.56												x	.12	.18
13 Cluster 10	3.83	1.21													x	.09
14 Cluster 11	4.99	1.48														x

Table 9
Map Form 2
Score Intercorrelations Within the Total Sample
(N=9,603)

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Total Core	28.91	6.91	x	.68	.86	.34	.41	.56	.61	.73	.43	.41	.43	.67	.15	.11
2 Total Unique	92.71	11.83		x	.96	.43	.60	.57	.54	.61	.63	.68	.43	.55	.28	.20
3 Total Score	121.62	17.27			x	.43	.57	.62	.61	.71	.60	.63	.46	.64	.25	.18
4 Cluster 1	5.66	1.55				x	.13	.23	.23	.32	.23	.27	.11	.22	.04	.06
5 Cluster 2	17.60	3.96					x	.24	.17	.32	.25	.28	.21	.26	.10	.13
6 Cluster 3	13.88	3.14						x	.26	.46	.29	.27	.25	.36	.11	.00
7 Cluster 4	14.88	4.40							x	.33	.26	.32	.15	.29	.06	.10
8 Cluster 5	14.72	3.73								x	.35	.33	.23	.51	.14	.02
9 Cluster 6	15.66	2.80									x	.37	.23	.33	.15	.07
10 Cluster 7	15.83	3.43										x	.19	.30	.13	.12
11 Cluster 8	6.59	2.43											x	.32	.14	.03
12 Cluster 9	9.83	2.63												x	.14	.01
13 Cluster 10	3.76	1.19													x	.01
14 Cluster 11	4.55	1.27														x

Table 10

Major Map and AFQT Score Intercorrelations Within the Total Sample

Items	M	SD	1	2	3	4	5	6	7	8
1 Total Core	28.91	6.91	x	.69	.81	.62	.84	.68	.86	.14
2 Total Unique	186.56	21.89		x	.98	.94	.93	.94	.92	.18
3 Total Score	215.47	27.12			x	.91	.97	.93	.96	.18
4 Form 1 Unique	93.84	11.48				x	.94	.77	.77	.18
5 Form 1 Total Score	122.75	16.64					x	.81	.89	.19
6 Form 2 Unique	92.71	11.83						x	.96	.16
7 Form 2 Total Score	121.62	17.27							x	.17
8 AFQT	54.20	21.78								x

Note: AFQT Score/Criterion r_b=.00

Table 11
Map Total Item Pool
Score Validities Within the Total Sample and Major Subsamples

Sample	Attrition N	Attrition %	Total Pool Core Items M	SD	r_b	Total Pool Unique Items M	SD	r_b	Total Score M	SD	r_b
Total	9,603	14.6	28.91	6.91	.29	186.56	21.89	.32	215.47	27.12	.34
Half 1	4,802	14.6	28.81	6.93	.32	186.47	22.09	.34	215.28	27.32	.35
Half 2	4,801	14.6	29.01	6.89	.28	186.65	21.70	.31	215.65	26.91	.31
Whites	7,045	16.4	28.29	7.06	.29	185.69	22.67	.30	213.98	28.08	.32
Blacks	2,179	9.8	30.83	6.16	.29	189.41	19.21	.34	220.24	23.54	.36
Other Ethnic	379	8.4	29.28	6.22	.27	186.42	20.33	.22	215.70	24.89	.24
Males	7,755	13.3	28.22	6.93	.30	186.70	22.17	.33	215.52	27.44	.35
Females	1,848	20.0	29.26	6.72	.29	185.98	20.68	.29	215.24	25.72	.31
MEPS	949	16.8	29.59	6.31	.22	190.10	19.27	.25	219.69	23.83	.27
High School and Above	8,312	13.6	29.20	6.86	.29	187.93	21.52	.32	217.13	26.68	.33
Non-High School Graduates	1,291	21.1	27.02	6.93	.28	177.75	22.24	.27	204.77	27.49	.28
Non-HS Graduates -Non-HS Items	1,291	21.1	25.39	6.54	.30	143.56	18.23	.32	168.95	23.17	.34

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Table 12
Map Form 1
Score Validities Within the Total Sample and Major Subsamples

Sample	Attrition N	%	Form 1 Core Items M	SD	r_b	Form 1 Unique Items M	SD	r_b	Form 1 Total Score M	SD	r_b
Total	9,603	14.6	28.91	6.91	.29	93.84	11.48	.29	122.75	16.64	.32
Half 1	4,802	14.6	28.81	6.93	.32	93.86	11.56	.31	122.67	16.75	.35
Half 2	4,801	14.6	29.01	6.89	.28	93.83	11.40	.29	122.84	16.54	.31
Whites	7,045	16.4	28.29	7.06	.29	93.41	11.85	.30	121.70	17.20	.32
Blacks	2,179	9.8	30.83	6.16	.29	95.31	10.17	.31	126.14	14.34	.34
Other Ethnic	379	8.4	29.28	6.22	.27	93.55	10.89	.22	122.83	15.40	.26
Males	7,755	13.3	28.22	6.95	.30	93.73	11.66	.32	122.55	16.85	.35
Females	1,848	20.0	29.26	6.72	.29	94.34	10.64	.30	123.60	15.72	.31
MEPS	949	16.8	29.59	6.31	.22	95.97	9.95	.22	125.56	14.49	.24
High School and Above	8,312	13.6	29.20	6.86	.29	94.53	11.31	.30	123.73	16.40	.33
Non-High School Graduates	1,291	21.1	27.02	6.93	.28	89.43	11.58	.25	116.45	16.82	.28
Non-HS Graduates Non-HS Items	1,291	21.1	25.39	6.54	.30	72.54	9.51	.30	99.56	14.75	.32

Table 13
Map Form 2
Score Validities Within the Total Sample and Major Subsamples

Sample	Attrition		Form 2 Core Items			Form 2 Unique Items			Form 2 Total Score		
	N	%	M	SD	r_b	M	SD	r_b	M	SD	r_b
Total	9,603	14.6	28.91	6.91	.29	92.71	11.83	.29	121.62	17.27	.32
Half 1	4,802	14.6	28.81	6.93	.32	92.61	11.90	.31	121.42	17.35	.34
Half 2	4,801	14.6	29.01	6.89	.28	92.82	11.76	.28	121.83	17.19	.29
Whites	7,045	16.4	28.29	7.06	.29	92.28	12.18	.29	120.57	17.81	.30
Blacks	2,179	9.8	30.83	6.16	.29	94.10	10.64	.34	124.93	15.20	.36
Other Ethnic	379	8.4	29.28	6.22	.27	92.87	11.06	.20	122.16	15.76	.24
Males	7,755	13.3	28.22	6.95	.30	92.97	11.91	.30	121.79	17.42	.33
Females	1,848	20.0	29.26	6.72	.29	91.65	11.43	.26	120.91	16.62	.29
High School and Above	8,312	13.6	29.20	6.86	.29	93.40	11.66	.30	122.60	17.04	.32
Total MEPS	949	16.8	29.59	6.31	.22	94.13	10.78	.25	123.72	15.54	.27
Non-High School Graduates	1,291	21.1	27.02	6.93	.28	88.32	11.98	.24	115.33	17.43	.28
Non-HS Graduates Non-HS Items	1,291	21.1	25.39	6.54	.30	71.02	9.97	.30	98.04	15.48	.31

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Table 14
Map Forms 1 and 2
Score Relationships and Validities Within the Total Sample and Major Subsamples

Sample	N	Attrition %	Form 1 Total Score			Form 2 Total Score			Form 1-2 Score
			M	SD	r_b	M	SD	r_b	r_{xx}
Total	9,603	14.6	122.75	16.64	.32	121.62	17.27	.32	.89
Half 1	4,802	14.6	122.67	16.75	.35	121.42	17.35	.34	.89
Half 2	4,801	14.6	122.84	16.54	.31	121.83	17.19	.29	.89
Whites	7,045	16.4	121.70	17.20	.32	120.57	17.81	.30	.90
Blacks	2,179	9.8	126.14	14.34	.34	124.93	15.20	.36	.86
Other Ethnic	379	8.4	122.83	15.40	.26	122.16	15.76	.24	.86
Males	7,755	13.3	122.55	16.85	.35	121.79	17.42	.33	.89
Females	1,848	20.0	123.60	15.72	.31	120.19	16.62	.29	.89
MEPS	949	16.8	125.56	14.49	.24	123.72	15.54	.27	.87
High School and Above	8,312	13.6	123.73	16.40	.33	122.60	17.04	.32	.89
Non-High School Graduates	1,291	21.1	116.45	16.82	.28	115.33	17.43	.28	.85
Non-HS Graduates Non-HS Items	1,291	21.1	99.56	14.75	.32	98.04	15.48	.31	.90

Table 15
Map Form 1 and 2 Total Items and Item Clusters –
Score Relationships and Validities Within the Total Sample
(N=9,603)

Item Cluster	Items Each Form Core	Items Each Form Unique	Form 1 M	Form 1 SD	Form 1 r_b	Form 2 M	Form 2 SD	Form 2 r_b	Form 1-2 Score r_{xx}
Total Core	23	0	28.91	6.91	.29	28.91	6.91	.29	1.00
Total Unique	78	0	93.84	11.48	.29	92.71	11.83	.29	.77
Total Score	23	78	122.75	16.64	.32	121.62	17.27	.32	.89
1 Early Experiences-Influences	0	5	5.57	1.18	.12	5.66	1.55	.12	.16
2 Academic History-Orientation	3	11	16.08	3.70	.17	17.60	3.96	.15	.64
3 Work History-Orientation	2	9	13.19	2.86	.21	13.88	3.14	.20	.58
4 Physical Activity-Orientation	6	7	15.39	3.90	.26	14.88	4.40	.26	.80
5 General Self Esteem	4	7	14.81	3.74	.18	14.72	3.73	.17	.80
6 General Self Description	1	11	17.49	3.33	.18	15.66	2.80	.18	.51
7 Social Orientation-Skills	0	14	15.90	3.22	.15	15.83	3.43	.17	.42
8 Enlistment Influences-Motivation	2	4	7.07	1.91	.18	6.59	2.43	.18	.61
9 Service Perceptions-Orientation	4	4	9.82	2.56	.23	9.83	2.63	.21	.80
10 General Perceptions-Values	0	3	3.83	1.21	.09	3.76	1.19	.11	.16
11 Unassigned	1	3	4.99	1.48	.14	4.55	1.27	.11	.36

Non-High School Graduate Item Subsets

The procedures to develop a subset of items within each form for use with non-high school graduates resulted in the identification of 144 items weighted in the total sample which could serve the non-high school graduate use purpose. Each subset in each form consists of 82 weighted items, 20 of which are core—common to both forms—plus 62 unique in each. Score range of the Form 1 subset is 0 to 152; score range of the Form 2 subset is 0 to 157. Tables 16 through 19 which follow present score characteristics and score-criterion relationships for these non-high school graduate item subsets within the non-high school graduate sample. It should be noted that separate analyses were not conducted for the various populations within the non-high school graduate sample because of the small sample sizes involved.

- Tables 16 through 18 present the relationships among all of the subsets' major part (core, unique, total score) and cluster scores. As observed with the larger item sets, the major sections are highly intercorrelated, since they represent a cross section of the clusters. The cluster scores themselves show generally modest to low relationships, indicating their relative independence. Within this sample, AFQT scores show a low but positive relationship to this type of attrition.

- Table 19 shows the total number of weighted items in each form, as well as the items within the cluster. Form-to-form total scores (r=.90) and their validities are highly comparable, with the mean score of the Form 1 subset about one and one-half points higher than that of Form 2. Cluster scores are encouragingly equivalent given the smaller number of items involved. Again, score-criterion relationships are quite satisfactory. As to the number of items in each cluster (cf. Table 15), the greatest differences between the total sample and the non-high school graduate item pools are found in the Academic History-Orientation and Social Orientation-Skills clusters.

Table 16
Map Form 1 - Non-High School Graduate Items
Score Intercorrelations Within the Non-High School Graduate Sample
(N=1,291)

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Total Core	25.39	6.54	x	.60	.85	-.13	.13	.56	.75	.74	.41	.29	.36	.71	.17	.30
2 Total Unique	72.54	9.51		x	.93	.35	.40	.52	.52	.63	.72	.63	.38	.61	.35	.32
3 Total Score	99.56	14.75			x	.29	.33	.60	.68	.75	.65	.54	.40	.73	.31	.35
4 Cluster 1	3.99	1.10				x	.09	.13	.10	.13	.20	.19	.16	.12	.10	.04
5 Cluster 2	6.88	1.66					x	.12	.10	.17	.18	.17	.08	.12	.06	.06
6 Cluster 3	10.36	2.53						x	.33	.44	.25	.16	.21	.40	.10	.19
7 Cluster 4	14.36	3.54							x	.49	.34	.22	.17	.44	.14	.17
8 Cluster 5	14.83	3.78								x	.32	.28	.16	.55	.14	.20
9 Cluster 6	17.11	3.41									x	.42	.23	.40	.24	.12
10 Cluster 7	9.19	2.37										x	.20	.30	.21	.12
11 Cluster 8	6.23	1.81											x	.25	.13	.10
12 Cluster 9	9.72	2.64												x	.19	.22
13 Cluster 10	2.55	.85													x	.11
14 Cluster 11	4.07	1.53														x

Table 17
Map Form 2 - Non-High School Graduate Items
Score Intercorrelations Within the Non-High School Graduate Sample
(N=1,291)

Items	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 Total Core	25.39	6.54	x	.66	.87	.34	.20	.62	.67	.73	.44	.36	.41	.65	.16	.05
2 Total Unique	71.02	9.97		x	.94	.44	.46	.61	.55	.62	.69	.62	.42	.59	.28	.11
3 Total Score	98.04	15.48			x	.44	.40	.67	.65	.72	.64	.56	.45	.67	.25	.09
4 Cluster 1	4.26	1.30				x	.15	.20	.25	.34	.26	.21	.06	.21	.09	.03
5 Cluster 2	6.91	2.10					x	.15	.17	.21	.17	.16	.09	.17	.07	.06
6 Cluster 3	11.70	2.97						x	.32	.50	.37	.28	.24	.40	.12	-.02
7 Cluster 4	13.53	4.22							x	.39	.27	.23	.20	.31	.08	-.02
8 Cluster 5	12.98	3.52								x	.34	.30	.19	.46	.16	-.00
9 Cluster 6	15.40	2.93									x	.40	.24	.35	.15	.01
10 Cluster 7	9.86	2.38										x	.20	.34	.13	-.01
11 Cluster 8	5.64	2.21											x	.31	.07	.03
12 Cluster 9	9.72	2.69												x	.16	.01
13 Cluster 10	2.06	1.04													x	-.04
14 Cluster 11	3.90	1.32														x

Table 18
Major Non-High School Graduate Map and AFQT Score Intercorrelations
Within the Non-High School Graduate Sample
(N=1,291)

Variable	M	SD	1	2	3	4	5	6	7	8
1 Total Non-HS Core	25.39	6.54	x	.67	.82	.60	.85	.66	.87	.08
2 Total Unique	145.44	18.37		x	.98	.93	.92	.94	.91	.11
3 Total Score	170.82	23.28			x	..90	.96	.93	.96	.11
4 Form 1 Unique	72.54	9.51				x	.93	.75	.75	.06
5 Form 1 Total Score	99.56	14.95					x	.80	.90	.06
6 Form 2 Unique	71.02	9.97						x	.94	.11
7 Form 2 Total Score	98.04	15.48							x	.12
8 AFQT	63.93	11.84								x

Note: AFQT Score/Criterion r_b=.10

Table 19
Map Forms 1 and 2 Total Non-High School Graduate Items and Item Clusters – Score Relationships and Validities Within the Non-High School Graduate Sample
(N=1,291)

Item Cluster	Items Each Form		Form 1			Form 2			Form 1-2 Score r_{xx}
	Core	Unique	M	SD	r_b	M	SD	r_b	
Total Core	20	0	25.39	6.54	.30	25.39	6.54	.30	1.00
Total Unique	0	62	72.54	9.51	.30	71.02	9.97	.30	.75
Total Score	20	62	99.56	14.95	.32	98.04	15.48	.31	.90
1 Early Experiences-Influences	0	4	3.99	1.10	.04	4.26	1.30	.13	.21
2 Academic History-Orientation	0	7	6.88	1.66	.10	6.91	2.10	.11	.16
3 Work History-Orientation	2	7	10.36	2.53	.17	11.70	2.97	.20	.60
4 Physical Activity-Orientation	6	6	14.36	3.54	.27	13.53	4.22	.24	.79
5 General Self Esteem	4	7	14.83	3.78	.21	12.98	3.52	.20	.80
6 General Self Description	1	11	17.11	3.41	.21	15.40	2.93	.24	.56
7 Social Orientation-Skills	0	9	9.19	2.37	.20	9.86	2.38	.13	.37
8 Enlistment Influences-Motivation	2	3	6.23	1.81	.24	5.64	2.21	.17	.61
9 Service Perceptions-Orientation	4	4	9.72	2.64	.24	9.72	2.69	.21	.81
10 General Perceptions-Values	0	2	2.55	.85	.14	2.06	1.04	.08	.13
11 Unassigned	1	3	4.07	1.53	.06	3.90	1.32	.00	.31

Cross-Validation

The development of random half scoring keys with a .05 level of significance required for weighting produced 194 weighted items in the half 1 scoring key and 185 weighted items in the half 2 scoring key. The score range of the Half 1 key is 0 to 347; the score range of the Half 2 key is 0 to 337.

Table 20 below presents the means, standard deviations, and score validities and cross-validities of the two keys within the total sample and the half samples. Cross-validities are those in parentheses. As to an interpretation of the meaning of the cross-validities, it should be noted first that the number of items keyed in each of the half samples is only slightly higher than the number keyed in the total sample's total item pool (194 and 185 versus 179). Given this closeness in the number of keyed items, and if as Katzell suggests, the higher cross-validity may be the better estimate, then the Half 2 cross-validity of .31 may be compared to the total item pool's validity of .34. The Half 1 key's cross-validity could be viewed as a lower-bound, but highly unlikely possibility. Finally, since Form 1 and 2 scores correlate so highly with total item pool scores (.97 and .96), extending total pool conclusions concerning the possible magnitude of validity shrinkage to Form 1 and 2 scores would appear reasonable.

Table 20
Validities and Cross-validities of Random Half Scoring Keys

| Sample | N | Half 1 Scoring Key | | | Half 2 Scoring Key | | |
		M	SD	rb	M	SD	rb
Total	9,603	210.89	28.07	.31	207.05	24.86	.34
Half 1	4,803	210.48	28.48	.37	206.95	24.81	(.31)
Half 2	4,801	211.30	27.65	(.26)	207.16	24.91	.37

New Form Reliability

Form 1 and 2 test-retest reliabilities are shown in Tables 21 through 24 for the 267 persons who took the MAP first in a MEPS and second in a Reception Station. Despite the group's small size, data also are presented for the 77 non-high school graduates in this sample who did the same.

o Tables 21 and 22 present total score reliability estimates for Form 1 (r=.82) and Form 2 (r=.83), as well as all major sections and clusters in each form. Possible faking effects; i.e.; higher means and lower standard deviations on initial test, are present, with a total mean score difference of approximately two and one-half points. These shifts also may be due in part to actual changes in perceptions of some elements such as physical activity-orientation once military training's physical demands have been experienced. There nevertheless is a shift in scores. As to the cluster score data, they are affected by more limited score variability and the number of core items each cluster contains, but they are presented here so that the reader may compare patterns.

o Tables 23 and 24 present total score reliability estimates for the non-high school graduate item subset (Form 1 r=.71, Form 2 r=.74) within the non-high school graduate test-retest subsample. These data are provided, however, with a caveat that the sample is not of sufficient size to permit conclusive statements about degree of score shift. The pattern, however, is the same as that observed in the larger total sample.

The applicant-recruit score differences of course must be considered when planning for the operational use of the new MAP Forms (i.e., the effect of various cut scores should be determined on applicant, rather than recruit score distributions). The validity of MAP scores with these conditions operant, however, has been established in a predictive form with the MEPS total sample, even with some restriction in the range of scores.

Table 21
Map Form 1
Test/Retest Score Reliabilities Within the Test/Retest Sample
(N=267)

Score	Test (MEPS)		Retest (Recept Stations)		Test-Retest r_{xx}
	M	SD	M	SD	
Core	29.00	6.78	28.03	7.04	.79
Unique	95.38	10.34	93.96	10.77	.78
Total Score	124.39	15.51	121.99	16.13	.82
1 Early Experiences-Influences	5.58	1.12	5.53	1.15	.60
2 Academic History-Orientation	16.30	3.66	16.26	3.92	.80
3 Work History-Orientation	13.27	2.74	13.22	2.87	.60
4 Physical Activity-Orientation	15.40	3.89	14.69	3.95	.80
5 General Self Esteem	14.82	3.67	14.31	3.94	.73
6 General Self Description	18.29	2.90	17.69	3.06	.56
7 Social Orientation-Skills	16.09	3.14	16.20	3.15	.63
8 Enlistment Influences-Motivation	7.09	1.72	6.96	1.99	.58
9 Service Perceptions-Orientation	10.06	2.51	9.70	2.58	.61
10 General Perceptions-Values	3.97	1.14	3.90	1.17	.34
11 Unassigned	4.89	1.57	4.91	1.56	.76

NOTE: Test-Retest interval in days M=29.83, SD=23.07

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Table 22
Map Form 2
Test/Retest Score Reliabilities Within the Test/Retest Sample ·
(N=267)

Score	Test (MEPS)		Retest (Recept Stations)		Test-Retest r_{xx}
	M	SD	M	SD	
Core	29.00	6.78	28.03	7.04	.79
Unique	93.21	10.90	91.69	11.33	.79
Total Score	122.22	16.28	119.72	16.76	.83
1 Early Experiences-Influences	5.61	1.59	5.73	1.55	.65
2 Academic History-Orientation	17.36	4.04	17.29	4.08	.81
3 Work History-Orientation	14.03	3.16	13.70	3.10	.68
4 Physical Activity-Orientation	14.66	4.40	14.00	4.39	.82
5 General Self Esteem	14.66	3.43	14.50	3.68	.72
6 General Self Description	15.86	2.53	15.51	2.75	.52
7 Social Orientation-Skills	15.85	3.38	16.09	3.49	.68
8 Enlistment Influences-Motivation	6.94	2.22	6.41	2.45	.61
9 Service Perceptions-Orientation	10.16	2.44	9.81	2.73	.52
10 General Perceptions-Values	3.96	1.11	3.72	1.10	.29
11 Unassigned	4.43	1.35	4.31	1.40 ·	.76

NOTE: Test-Retest interval in days M=29.83, SD=23.07

Table 23

Map Form 1 Non-High School Graduate Test/Retest Score Reliabilities
Within the Non-High School Graduate Test/Retest Sample
(N=77)

Score	Test (MEPS)		Retest (Recept Stations)		Test-Retest r_{xx}
	M	SD	M	SD	
Core	26.33	5.88	24.69	6.20	.69
Unique	74.27	8.82	73.29	8.58	.65
Total Score	102.16	13.11	99.52	13.22	.71
1 Early Experiences-Influences	3.97	1.16	4.14	1.14	.74
2 Academic History-Orientation	7.33	1.85	6.95	1.68	.41
3 Work History-Orientation	10.62	2.64	10.42	2.68	.55
4 Physical Activity-Orientation	14.51	3.49	13.78	3.74	.77
5 General Self Esteem	14.58	3.65	14.36	3.62	.58
6 General Self Description	18.08	2.84	17.74	3.08	.51
7 Social Orientation-Skills	9.36	2.45	9.75	2.52	.58
8 Enlistment Influences-Motivation	6.55	1.46	6.25	1.93	.40
9 Service Perceptions-Orientation	10.22	2.26	9.39	2.32	.46
10 General Perceptions-Values	2.62	.76	2.52	.72	.17
11 Unassigned	4.12	1.61	3.97	1.64	.71

NOTE: Test-Retest interval in days M=30.12 SD=16.62

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Table 24
Map Form 2 Non-High School Graduate Test/Retest Score Reliabilities Within the Non-High School Graduate Test/Retest Sample
(N=77)

Score	Test (MEPS)		Retest (Recept Stations		Test-Retest r_xx
	M	SD	M	SD	
Core	6.33	5.88	4.69	6.20	.69
Unique	72.65	8.73	70.58	9.35	.69
Total Score	100.55	13.30	96.82	14.44	.74
1 Early Experiences-Influences	4.26	1.32	4.44	1.35	.52
2 Academic History-Orientation	7.04	2.59	6.64	2.16	.53
3 Work History-Orientation	11.70	3.07	11.40	2.81	.61
4 Physical Activity-Orientation	13.87	4.08	12.82	4.79	.78
5 General Self Esteem	12.33	3.12	12.48	3.24	.62
6 General Self Description	16.13	2.65	15.39	2.54	.32
7 Social Orientation-Skills	10.04	2.19	10.27	1.91	.45
8 Enlistment Influences-Motivation	6.31	2.00	5.46	2.15	.65
9 Service Perceptions-Orientation	10.52	2.27	9.96	2.34	.31
10 General Perceptions-Values	2.03	.97	1.95	1.00	.16
11 Unassigned	4.07	1.32	3.90	1.43	.60

NOTE: Test-Retest interval in days M=30.12, SD=16.62

Utility

To provide a more concrete illustration of the relationship between MAP scores and attrition, frequency distributions of attrition were computed by MAP form score, including non-high school graduate item subset scores. The outcomes then were collapsed into seven score levels with their respective still enlisted-separated distributions. Tables 25 through 28 present the results of these analyses in bar chart form and, as can be seen, the percent still enlisted at each level is exceeding that of each level below it. Between level differences, particularly toward the top half of the score range, are not dramatic, but that is not atypical with a criterion split of 85-15. What is critical is the fact that there is a sizeable group of enlistees toward the bottom of the MAP score distribution with an attrition rate two or more times as large as that of the total sample. Screening at this level can reduce attrition while minimizing the frequency of false negative cases (those whose scores would tend to indicate a high probability of discharge, but who in fact would stay enlisted if selected).

The data presented in Tables 29 through 31 are more directly operational. Using the same frequency data described above, determinations were made of the implications of various attrition reduction goals within the total, the high school and above, and the non-high school graduate samples. As shown in Table 29, for example, achieving a goal of reducing attrition by approximately 10 percent would require a Form 1 cutting score of 91, which also would result in a loss of between 2 and 3 percent of the stayers. Similarly, a cutting score of 102 would reduce attrition by approximately 25 percent, while losing approximately 10 percent of the stayers. Attrition reduction goals will of course depend on enlistment volume and may be adjusted upward or downward as desired.

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Table 25
Map Form 1 — Still Enlisted Rates by Total Score Level

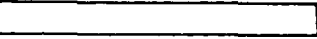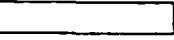| Score Range	Within Score Range		Number-Percent in Range Still Enlisted At 180 Days	
	N	%		
148 - 163	435	4.5	419	96.3
140 - 147	1,070	11.2	1,012	94.6
131 - 139	1,842	19.2	1,652	89.7
118 - 130	2,945	30.7	2,552	86.7
106 - 117	1,842	19.2	1,515	82.2
93 - 105	1,009	10.5	765	75.8
26 - 92	460	4.8	285	62.0
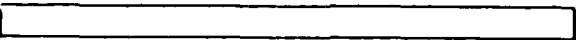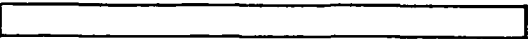
Note: Total sample base rate (i.e., percent still enlisted at 180 days) is 85.4 percent. Total sample N=9,603, r_b =.32.

Table 26
Map Form 2 - Still Enlisted Rates by Total Score Level

Score Range	Within Score Range		Number-Percent in Score Range Still Enlisted At 180 Days	
	N	%		
149 - 167	430	4.5	409	95.1
139 - 148	1,173	12.2	1,094	93.3
129 - 138	1,916	20.0	1,718	89.7
117 - 128	2,638	27.5	2,298	87.1
105 - 116	1,911	19.9	1,574	82.4
92 - 104	1,067	11.1	821	76.9
31 - 91	468	4.9	268	61.1

Note: Total sample base rate (i.e.,percent still enlisted at 180 days) is 85.4 percent. Total sample N=9,603, r_b =.32.

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Table 27
Map Form 1
Non-High School Graduate Still Enlisted Rates
by Non-High School Graduate Score Level

Score Range	Within Score Range		Number-Percent in Score Range Still Enlisted At 180 Days	
	N	%		
122 – 133	59	4.6	54	91.5
114 – 121	151	11.7	133	88.1
107 – 113	253	19.6	218	86.2
96 – 106	368	28.5	295	80.2
86 – 95	257	19.9	189	73.5
74 – 85	141	10.9	98	69.5
27 – 73	62	4.8	32	51.6

Note: Total sample base rate (i.e., percent still enlisted at 180 Days) is 78.9 percent. Total sample N=1,291, r_b=.32.

Table 28
Map Form 2
Non-High School Graduate Still Enlisted Rates
by Non-High School Graduate Score Level

Score Range	Within Score Range		Number-Percent in Score Range Still Enlisted At 180 Days	
	N	%		
122 - 135	61	4.7	53	86.9
114 - 121	142	11.0	123	86.6
93 - 105	236	18.3	202	85.6
106 - 113	420	32.5	344	81.9
83 - 92	235	18.2	179	76.2
71 - 82	140	10.8	89	63.4
26 - 70	57	4.4	29	50.9

Note: Total sample base rate (i.e., percent still enlisted at 180 days) is 78.9 percent. Total sample N=1,291, r_b=.31.

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Table 29
Map Forms 1 and 2 – Stay/Leave Expectancies
For the Total Sample at Various Cut Score Levels

Score Range	Total N	% of Total Sample	Stay N	% of Total Stay	Leave N	% of Total Leave
Total (Total Sample)	9,603	100.0	8,200[a]	100.0	1,403[b]	100.0
Form 1						
91 or higher	9,239	96.2	7,976	97.3	1,263	90.0
96 or higher	8,991	93.6	7,805	95.2	1,186	84.5
100 or higher	8,737	91.0	7,624	93.0	1,113	79.3
102 or higher	8,571	89.3	7,506	91.5	1,065	75.9
Form 2						
88 or higher	9,285	96.7	8,021	97.8	1,264	90.1
94 or higher	9,024	94.0	7,837	95.6	1,187	84.6
98 or higher	8,959	93.3	7,632	93.1	1,127	80.3
102 or higher	8,391	87.4	7,340	89.5	1,051	74.9

[a] 85.4 percent of total   [b] 14.6 percent of total

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Table 30

Map Forms 1 and 2 — Stay/Leave Expectancies

For the High School and Above Sample at Various Cut Score Levels

Score Range	Total N	% of Total Sample	Stay N	% of Total Stay	Leave N	% of Total Leave
Total (Total HS And Above)	8,312	100.0	7,181[a]	100.0	1,131[b]	100.0
Form 1						
92 or higher	8,001	96.3	6,985	97.3	1,016	89.8
97 or higher	7,793	93.8	6,836	95.2	957	84.6
101 or higher	7,590	91.3	6,690	93.2	900	79.6
103 or higher	7,430	89.4	6,574	91.5	856	75.7
Form 2						
91 or higher	7,999	96.2	6,986	97.3	1,013	89.6
96 or higher	7,780	93.6	6,827	95.1	953	84.3
100 or higher	7,518	90.4	6,616	92.1	902	79.8
103 or higher	7,293	87.7	6,447	89.8	846	74.8

[a] 86.4 percent of total   [b] 13.6 percent of total

Table 31
Map Forms 1 and 2 – Stay/Leave Expectancies for
the Non-High School Graduate Sample at Various Non-High School Graduate Cut Score Levels

Score Range	Total N	% of Total Sample	Stay N	% of Total Stay	Leave N	% of Total Leave
Total Non-High School Graduates	1,291	100.0	1,019[a]	100.0	272[b]	100.0
Form 1						
72 or higher	1,240	96.0	994	97.5	246	90.4
79 or higher	1,178	91.2	959	94.1	219	80.5
84 or higher	1,117	86.5	914	89.7	203	74.6
87 or higher	1,064	82.4	872	85.6	192	70.6
92 or higher	946	73.3	782	76.7	164	60.3
Form 2						
69 or higher	1,243	96.3	997	97.8	246	90.4
77 or higher	1,172	90.8	957	93.9	215	79.0
80 or higher	1,135	87.9	934	91.7	201	73.9
84 or higher	1,076	83.3	888	87.1	188	69.1
89 or higher	932	72.2	769	75.5	163	59.9

[a] 78.9 percent of total   [b] 21.1 percent of total

Summary

This fifth phase of the Army's investigations into the utility of autobiographical questionnaires in predicting early service attrition has produced two new and more comprehensive Military Applicant Profile (MAP) forms for use with males and females of all education levels. The products also include forms within forms—two approximately equivalent subsets of items weighted on the basis of total sample data, but applicable to non-high school graduate subsamples. The same forms may therefore be used with all candidates for data collection purposes, but with different keys applied according to candidate education levels.

It should be emphasized again that the validities observed are in the face of a generally unfavorable criterion split of 85 percent still enlisted and 15 percent separated. It also should be noted that the validities reported here are in spite of a likely restriction in range of Form 1 and 2 scores. The extent of that restriction can be determined and adjustments for it made as soon as the Army can develop larger and more representative MEPS samples than those available in this study. As to the cross-validities of the final scoring systems, validity shrinkage is expected to be minimal given the rigor of the development process and the pattern of validity observed across multiple subgroups.

The choice of cutting scores on the new forms is, of course, a policy decision which will depend on the expected number and quality of applicants, projected staffing levels, and data from experimental research such as the findings of this Research Note. It is recommended that the total sample used in this research continue to be tracked to determine score relationships with such elements as longer term attrition, progression, and re-enlistment rates.

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APPENDIX

o Standard Operating Procedures

o Attrition by AFQT Score Level

Administration of the Military Applicant Profile
MAP Forms 4AB/CD and 4 CD/AB
at Selected MEPS, February, 1982 Until Completion

I BACKGROUND

The Military Applicant Profile (MAP) is a multiple choice questionnaire

asking about the individual's family, school, and work background, as well

as his or her experiences, interests, attitudes and ideas.

Development of MAP was undertaken in an effort to reduce attrition

among Army recruits for failure to adapt to military requirements during

the early months of their enlistment. Earlier forms of MAP have demonstrated

validity in distinguishing between enlistees who were separated for failure to

adjust in the first six months and those who succeeded and remained in the

Army. As a result, one form of the MAP was made operational in all AFEES as

of July, 1979 for 17 year old non-graduates.

Today alternate forms of MAP are urgently needed in order to extend

its use and to lessen the likelihood of test compromise. The current

administration at MEPS and Reception Stations under this SOP and the

subsequent follow-up of those tested is aimed at trying out new items and

re-evaluating old ones with the ultimate goal of producing new and effective

alternate forms.

II REQUIREMENTS

Forms 4 AB/CD and 4 CD/AB of the MAP are to be administered at designated

MEPS starting 1 February, 1982, and continuing until the specified quotas are

filled.

1

The MAP is to be given to all non-prior service, Active Army candidates, both male and female of all racial and ethnic groups processing during this period. In the event that male quotas are attained before female, testing of males may be stopped. However, female testing must continue until their quotas are filled. Only one of the two forms will be used at each MEPS. The form to be used at each MEPS is shown below, along with quotas assigned and quantities of the questionnaire and separate answer sheet provided. Both forms (4 AB/CD and 4 CD/AB) contain the same 240 questions; only the sequence in which they are presented is different.

The separate answer sheets are not interchangeable; to prevent confusion or error both booklets and answer sheets are color coded. (4 AB/CD in blue; 4 CD/AB in green).

Specific instructions for administering the MAP are contained in the Manual for Administering MAP Forms 4 AB/CD and 4 CD/AB which accompanies this SOP. One point however is so essential that it is repeated here: Entering and coding examinees' Social Security number must be carefully checked by the administrator or proctors before releasing examinees. Failure to provide accurate SSN's would prevent subsequent tracking of these cases and would severely curtail the usefulness of this study.

MAP ADMINISTRATION LOCATIONS-FORMS-QUANTITIES

MEPS	Form	Quantity	MEPS	Form	Quantity
Albuquerque	Blue	50	Atlanta	Green	50
Denver	Green	100	Beckley, W.Va.	Blue	50
El Paso	Blue	50	Boston	Green	50
Houston	Green	75	Buffalo	Blue	50
Oklahoma City	Green	75	Charlotte	Green	50
Phoenix	Blue	100	Harrisburg	Blue	50
Portland, Me.	Green	50	Jacksonville	Green	50
San Antonio	Blue	75	Manchester, N.H.	Blue	50
San Diego	Green	100	Miami	Blue	50
Chicago	Blue	300	Newark	Blue	50
Cleveland	Green	300	New Haven	Green	50
Nashville	Blue	75	New York	Blue	50
Detroit	Green	300	Pittsburgh	Green	50
Kansas City	Blue	75	Portland, Ore.	Green	75
Louisville	Green	150	Richmond	Green	50
Milwaukee	Blue	100	San Juan	Blue	50
Minneapolis	Green	100	Springfield, Mass	Green	50
Montgomery	Blue	150	Syracuse	Blue	50
St Louis	Green	100	Wilkes-Barre	Green	50
Albany, N.Y.	Blue	50			

Reception Stations	Form	Quantity	Reception Stations	Form	Quantity
Fort Dix	Blue	3,000	Fort Sill	Green	2,000
Fort Jackson	Green	4,000	Fort Leonard Wood	Green	3,000
Fort Knox	Blue	2,500	Fort Bliss	Green	1,000
Fort McClellan	Blue	2,000			

III SECURITY

Both forms of the MAP (4 AB/CD and 4 CD/AB) although not marked for Official Use Only (FOUO) are to be handled as though they were so stamped, and are to be stored and protected as carefully as other test materials labeled FOUO.

IV FURTHER INFORMATION and MATERIALS

If there are any questions relating to this project, clarification or requirements, etc., or if more testing materials are needed, MEPS may contact:

> Attention: Mr. Frank W. Erwin
> Richardson, Bellows, Henry & Co.
> 1140 Connecticut Ave., N.W.
> Washington, D.C. 20036
>
> Telephone: 202-659-3755

V RETURN OF DATA

Completed answer sheets (after they have been checked) should be securely wrapped and forwarded to Richardson, Bellows, Henry & Co. address as above, weekly for the duration of the study.

When quotas for both males and females have been filled, all questionnaire booklets and unused answer sheets should likewise be returned to Richardson, Bellows, Henry & Co.

SECTION I—PREPARATION FOR TESTING

1. ## Testing Method

    Forms 4 AB/CD and 4 CD/AB of the Military Applicant Profile (MAP) are to be given in accordance with the principles of test administration set forth in chapter III, "Test Administration", in AR 611-5, Army Personnel Tests. In addition to these general principles, the specific directions for administering MAP 4 AB/CD and MAP 4 CD/AB are to be followed without deviation. No omissions or changes in the wording of the instructions to examinees are permitted. Questions asked by examinees are to be answered as much as possible by repeating the appropriate portion of the directions.

2. ## Time Requirements

    No strict time limits are established. Most examinees can answer the 240 questions within two (2) hours. A few may take longer.

    All Examinees should be permitted to complete the questionnaire.

3. ## Material Requirements

    (a) Each of the two forms requires its own separate answer sheet. These are not interchangeable. Each MEPS will administer only one of the two forms, as shown in the Table in the SOP.

    (b) For the examiner

    (1) A copy of this manual.

    (2) Extra copies of appropriate Questionnaire Booklet (MAP 4 AB/CD or MAP 4 CD/AB).

(3) Extra copies of Answer Sheet (MAP 4 AB/CD or MAP CD/AB as appropriate).

(4) Extra pencils, Number 2 or softer, with erasers.

(c) <u>For the examinee</u>

(1) One MAP 4 AB/CD or MAP CD/AB Questionnaire Booklet.

(2) One MAP 4 AB/CD or MAP CD/AB Answer Sheet, as appropriate.

(3) One pencil, Number 2 or softer, with eraser.

ADMINISTERING THE MAP 4 AB/CD or MAP 4 CD/AB

1. Reading the Directions

In this Manual the directions in large type are to be read aloud to the examinees. Read all directions slowly and distinctly, making sure the examinees can follow as you read. Other directions, including those in parentheses, are for the examiner only and are not read aloud.

2. Initial Instructions

When all examinees are seated, the examiner should say:

EACH OF YOU WILL BE GIVEN A QUESTIONNAIRE BOOKLET, A SEPARATE ANSWER SHEET AND A PENCIL. DO NOT OPEN YOUR BOOKLET OR MAKE ANY STRAY MARKS ON YOUR ANSWER SHEET UNTIL YOU ARE TOLD TO DO SO. BE SURE TO LISTEN CAREFULLY TO ALL DIRECTIONS. IF THEY ARE NOT PERFECTLY CLEAR, RAISE YOUR HAND. (Hand out materials).

3. Supplying Identification Information

Say to examinees:

OPEN YOUR ANSWER SHEET. ON THE LEFT HAND PAGE IN THE VERY TOP CENTER, FIND WHERE THE WORDS "NAME (LAST, FIRST, MIDDLE INITIAL)" ARE PRINTED. IN THE BLANK BOXES DIRECTLY BELOW THESE WORDS ENTER YOUR LAST NAME, OR AS MUCH OF IT AS WILL FIT, ONE LETTER TO A BOX. THEN SKIP ONE BOX AND DO THE SAME FOR YOUR FIRST NAME. THEN, IF THERE IS STILL ROOM, SKIP ONE BOX AND ENTER YOUR MIDDLE INITIAL. DO THIS NOW.

Pause.

NOW LOOK AT THE COLUMNS OF LETTERS IN TINY CIRCLES BELOW YOUR NAME.
YOU ARE GOING TO BLACKEN ONE CIRCLE IN EACH COLUMN-THE ONE THAT HAS
THE SAME LETTER AS IN YOUR NAME ABOVE. AN EXAMPLE HALF WAY DOWN ON
THE LEFT OF THE PAGE SHOWS YOU HOW THIS IS DONE. UNDER THE NAME
BLAKE, THE FIRST COLUMN HAS THE B BLACKENED, THE SECOND HAS THE L
BLACKENED, AND SO ON. TO TAKE CARE OF THE SPACE BETWEEN NAMES. THE
EMPTY CIRCLE ABOVE THE LETTER A IS BLACKENED. IS THIS CLEAR?

> Pause. Proctors should provide help if needed.

NOW GO BACK TO YOUR OWN NAME, AND BLACKEN THE PROPER LETTER-
CIRCLES-BELOW YOUR NAME.

> Allow time for this.

NOW LOOK AT THE BLOCK TO THE RIGHT OF YOUR NAME LABELED "SOCIAL SECURITY
NO". IN THE BOXES DIRECTLY BELOW, ENTER YOUR SOCIAL SECURITY NUMBER,
ONE NUMBER TO EACH BOX. DO THIS NOW. (PAUSE) NOW JUST AS YOU DID WITH
YOUR NAME, BLACKEN THE CIRCLE IN EACH COLUMN WHICH HAS THE SAME NUMBER
AS YOU WROTE ABOVE IN YOUR SOCIAL SECURITY NUMBER. DO THIS VERY
CAREFULLY. IT IS MOST IMPORTANT.

> Pause.

HAS EVERYONE FINISHED THIS? ARE THERE ANY QUESTIONS?

> Proctors should check to see that examinees are coding their
> SSN properly; and give help as needed. Then say:

IN THE MIDDLE OF THE PAGE, BELOW YOUR NAME BLOCK FIND THE WORDS
NAME OF THIS LOCATION. ENTER_____

(Examiner give name of post or station)

4

(66)

ON THE NEXT LINE <u>TODAY'S DATE</u>, ENTER _____ .

(Examiner supply correct date.)

BELOW THE DATE ARE THREE ITEMS: A, B, AND C. COMPLETE THESE BY
BLACKENING THE APPROPRIATE CIRCLE FOR EACH.

Pause

HAS EVERYONE FINISHED? (Wait if necessary) BEFORE YOU TURN TO
YOUR QUESTIONNAIRE BOOKLET LISTEN CAREFULLY TO THESE DIRECTIONS:

1. READ EACH QUESTION AND <u>ALL</u> THE POSSIBLE ANSWERS BEFORE
   YOU PICK YOURS.

2. PICK ONLY <u>ONE</u> ANSWER TO EACH QUESTION.

3. ANSWER <u>EVERY</u> QUESTION AS ACCURATELY AS POSSIBLE.

4. USE ONLY THE SOFT PENCIL GIVEN YOU. IF IT BREAKS RAISE
   YOUR HAND FOR ANOTHER ONE. DO NOT USE A BALL POINT PEN.

5. MAKE HEAVY DARK MARKS THAT FILL THE CIRCLE.

6. ERASE CLEARLY ANY ANSWER YOU WISH TO CHANGE.

7. MAKE NO STRAY MARKS OUTSIDE THE ANSWER CIRCLES.

(Pause) ARE THERE ANY QUESTIONS? (Pause) THEN OPEN YOUR
QUESTIONNAIRE BOOKLET AND BEGIN WITH QUESTION NUMBER ONE, AND
NUMBER ONE ON THE RIGHT HAND PAGE OF THIS ANSWER SHEET.

During the test proctors should check to see that all examinees
are marking their answers as instructed.

If feasible, examinees may be permitted to use the latrine
during the testing session, one by one, but not in groups.

5

(67)

As examinees finish, each should turn in his or her Answer Sheet and Questionnaire Booklet individually to a proctor. The proctor should examine each Answer Sheet, while the examinee waits, in order to insure that

(1) all questions have been answered, and

(2) most important that Answer Sheet I.D. especially the Social Security Numbers have been properly entered and coded. The Social Security Number's blackened circles must match the number written above them.

Each examinee may be permitted to leave if feasible when he or she has finished and after the Answer Sheet has been checked by a proctor. Again, however, every examinee should be allowed to complete the Questionnaire.

ARI Phase V-AFQT Score-Attrition by Level

Sample		V 1-9	IV 10-30	AFQT Levels IIIb 31-49	IIIa 50-64	II 65-92	I 93-100
Total	Number of Cases	1	1,719	2,170	2,259	3,017	275
	Percent of Total	–	18.2	23.0	23.9	32.0	2.9
	Attrition Rate	–	13.8	14.5	17.4	14.1	8.4
Whites	Number of Cases	0	911	1,285	1,803	2,659	267
	Percent of Total	–	13.2	18.6	26.0	38.4	3.9
	Attrition Rate	–	17.1	18.3	18.9	14.9	8.6
Blacks	Number of Cases	1	707	771	369	291	5
	Percent of Total	–	33.0	36.0	17.2	13.6	0.2
	Attrition Rate	–	9.8	9.5	13.3	6.5	0.0
Other Ethnic	Number of Cases	0	101	114	87	67	3
	Percent of Total	–	27.2	30.6	23.4	18.0	0.8
	Attrition Rate	–	11.9	6.1	5.7	11.9	0.0
Males	Number of Cases	1	1,711	1,558	1,754	2,399	230
	Percent of Total	–	22.4	20.4	22.9	31.3	0.3
	Attrition Rate	–	13.6	12.3	15.8	12.9	8.3
Females	Number of Cases	0	8	612	505	618	45
	Percent of Total	–	0.4	34.2	28.2	34.6	2.5
	Attrition Rate	–	50.0	20.3	23.2	18.6	8.9
Non-HS	Number of Cases	0	1	18	724	526	16
	Percent of Total	–	–	0.1	56.3	40.9	0.1
	Attrition Rate	–	–	44.4	21.8	19.6	6.3
HS & Above	Number of Cases	1	1,718	2,152	1,535	2,491	259
	Percent of Total	–	21.1	26.4	18.8	30.5	3.2
	Attrition Rate	–	13.7	14.3	15.4	12.9	8.5
MEPS	Number of Cases	0	92	218	251	334	30
	Percent of Total	–	9.9	23.6	27.1	36.1	3.2
	Attrition Rate	–	10.9	19.7	17.5	17.7	6.7