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ARI ltr, 13 Nov 1979

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PRS-SSU FAR-11b 29 Oct 43

Validation of Section Station Tests.

Study at Ft. McClellan, Alabama, Infantry Replacement Training Center,

April-May 1943.

A Preliminary Peret.

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INTRODUCTION:

This is the third in a series of studies intended to improve the efficiency of the induction station testing procedure, the two previous studies being preliminary in nature. On the basis of the information obtained from these studies, tests were improved, new tests constructed, and the problem of the criterion of soldier performance clarified. An infantry replacement training center was chosen for the present major study because it was felt that critical scores should be set in terms of the soldier performance of the group representing the mass of the Army.

This is a preliminary report to make the major results available while a detailed report is in preparation.

PURPOSE:

The major purposes of this study were: .

- 1. to develop a criterion of soldier performance, and
- 2. to validate a series of tests against this criterion.

CRITERION:

The criterion developed is a general rating scale, the ratings being referred to the concept of the average combat soldier. This "ideal average" around which to rate was chosen because, as the Army is at present organized, duty under combat conditions is the most likely ultimate assignment for the men at the lower end of the GCT distribution, the men with whom the induction station program is primarily concerned.

The rating scale is given below:

Lieutenant				Platoon 2
· Name of man being	rated Zannelos Last	L	Henry First	G. Initial
Organization	<u> </u>	••		TED
	This rocumo	nt 16 regr	UNCLASSIE	Y Vantig

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- I. Very valuable to the Army in a tactical or combat unit. He understands and learns with little effort. Shows initiative by going ahead under his own steam. Can work out the details of a job after being given the objective to be gained. Can manage a squad or detail of men. A potential non-commissioned officer.
- II. Above average in value to the Army as a soldier in a tactical unit.

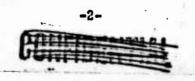
 Learns at an average rate. Is alert and responsive to commands. Adapts fairly quickly to new problems and situations. Has some initiative but not sufficient for leadership. An excellent soldier of private grade.
- III. Average value to the Army in a tactical unit. Not outstanding in any way. Learns at average rate but not so responsive to commands as II. Steady and reliable but must be told what to do before he goes ahead.
- IV. Just barely useful to the Army in a tactical unit. A slow learner generally but may be more rapid in special fields in which he had had long experience. When he once learns something he remembers it. A marginal soldier.
- V. Of some use to the Army providing there are not too many like him in a unit. Learns very slowly and responds slowly. Capable of unskilled. labor only, but once he knows his simple job, he can carry on with little supervision. Must be trained for every new job. Too dull to do any fighting except in self-defense. Can be used only in rear echelons of a theatre of operations. Most suitably used outside combat areas.
- VI. Of no usefulness to the Army. Learns very slowly, forgets readily.

 Has to be told same thing over and over again. Needs continuous supervision. Needs help in getting ready for inspections, hikes, etc. Does not use common sense in carrying out instructions. Can remember but one thing at a time. Detracts from the efficiency of a unit.

REMARKS:

The directions for using this scale were as follows:

- 1. Do not consult anyone or any record in making your rating.
- 2. In rating a man, compare him with the average soldier adequate for combat duty. Think of the man in terms of whether you would want him with you in combat and not merely in comparison with the average soldier in the group where he now is.
- 3. These ratings are not concerned with the kind of training a man has had, but with the kind of soldier he will make.
- 4. Before making any rating, read carefully the entire series of descriptions in Part I. Then place an X on the line to the left of the description that best fits the man. It is not necessary that it fit him exactly so long as it fits him better than any other description on the scale.



Availand/or special



- 5. After completing Part I, do Part II.
- 6. After completing Part II, do Part III.

In order to increase the reliability and validity of the ratings, three independent ratings were obtained for each man studied: one from his corporal, one from his sergeant, and one from the officer-in-charge of his platoon. The independence of the three ratings was assured by the presence of the Personnel Research Subsection officer while the rating blanks were being entered. A meeting with the raters was arranged, and the purpose and importance of the study was explained as follows:

Explanation Given to Lieutenants, Sergeants and Corporals Who Rated the Soldiers in the Ft. McClellan Study

You men no doubt remember the lists of the relatively unsatisfactory soldiers you prepared a few days ago. Arrangements have already been made to examine the least satisfactory of these men. What you don't know is how important these lists were and how important are the ratings I am going to ask you to make tonight. The General Staff has made up its mind about certain things and has ordered them accomplished through the study being made here. Since the induction of the next 2,000,000 men will be affected by the results of this study, it is highly important that you do what I am asking with the utmost care, exactly as you are instructed.

We have no way of knowing which soldiers are satisfactory and which unsatisfactory other than by asking you who deal with them every day to spot them for us. That is the purpose of these ratings. Each one of you will be asked to rate a few selected men. These men you rate may all be unsatisfactory or all satisfactory. Some of the men you rated you may have sent in on the lists you prepared. Simply rate them again.

It should be mentioned that the Army careers of the men whom you are rating tonight will very probably not be affected. But men like those you indicate as unsatisfactory will not be inducted if we can find any way to prevent it.

What I am now giving you are the general directions for doing this rating and a sample rating form. After we have gone over these I will give you the names of the men you are to rate.

Rating scales with names of ratees inserted were then distributed and the ratings obtained immediately, with no discussion being permitted. A total of eleven meetings were held in obtaining these ratings. With some exceptions, the attitude of the raters was good and gave evidence of appreciation of the need for care in making the ratings.





POPULATION:

The following groups were rated on the scale described above:

- 1. 100 randomly chosen GCT Grade V white men in regular training.
- 2. 100 randomly chosen GCT Grade IV white men in regular training.
- 3. 100 randomly chosen GCT Grade V colored men in regular training.
- 4. 100 randomly chosen GCT Frade IV colored men in regular training.
- 5.* English-speaking white men in the special training unit, problems other than that of slow learning excluded.
- 6. Colored men in the special training unit, problems other than slow learning excluded.

All men rated had been in training at least four weeks at the time the ratings were obtained.

The plan of the study placed most reliance on the random IV-V groups in obtaining the correlations between soldier performance and the tests. In addition, however, it was desired to locate for testing a group of soldiers who could be considered highly unsatisfactory to insure against the possibility that the randomly selected IV-V groups might not have sufficient range or include a sufficient number of such men for adequate comparisons. This was accomplished by the following method:

1. A form of the pattern below was developed:

Description A: Just barely useful to the Army in a tactical unit. A slow learner generally, but may be more rapid in special fields in which he has had long experience. When he once learns something, he remembers it. A marginal soldier.

If description "A" fits a man, place an A after his name in the column headed "A, B, or C."

Description 3: Of some use to the Army providing there are not too many like him in a unit. Learns very slowly and responds slowly. Capable of unskilled labor only, but once he knows his simple job, he can carry on with little supervision. Must be trained for every new job. Too dull to do any fighting except in self-defense. Can be used only in rear echelons of a theatre of operations. Most suitably used outside combat areas.

If description "B" fits a man, place a B after his name in the column headed "A, B, or C."

These groups were selected for special training in part on the basis of tests and hence can be used only as a check on the findings. Results for them are not reported here.





<u>DESCRIPTION C:</u> Of no usefulness to the Army. Isarns very slowly, forgets readily. Has to be told the same thing over and over again. Needs continuous supervision. Needs help in getting re dy for inspection, hikes, etc. Does not use common sense in carrying out instructions. Can remember but one thing at a time. Detracts from the efficiency of a unit.

If description "C" fits a men, place a C after his name in the column headed "A, B, or C".

PLEASE PRI	HP				
NAME Lost First			Poor Coor- dination		None of These
		•••••		 	
•					
•					•
•					
•.			•		

It will be noted that the above form permits obtaining the same information about the soldier as the rating scale. Two major differences are evident, however. The first is that only the lowest three rating steps were used. Since it was desired to locate only unsatisfactory soldiers the three highest steps were unnecessary. Use of but three of the steps also had the practical advantage of keeping the number of names to be entered within reasonable limits. In addition, use of this form does not force the rater to judge a soldier about whom he is uncertain or lacks information.

- 2. The form was accompanied by these directions:
 - a. Do not consult anyone or any record in making your rating.
- b. In rating a man compare him with the average soldier adequate for combat duty. The group you are rating may have few or many men who fit the descriptions on the other side of the page. If you do not list any men for the descriptions B and C, it will mean that you would be willing to have all your men with you in combat.
- c. These ratings are not concerned with the kind of training a man has had but with the kind of soldier he will make.
- d. Before listing any men, read carefully the descriptions at the top of the other side of this page.
- e. Consider each man of your group to see if he fits any of the three descriptions at the top of the reverse side of this page. If he does, list his name, placing an A, B, or C in the appropriate column to indicate which of the descriptions fits him.





- f. It is not necessary that the description fit him exactly so long as it fits him better than the other descriptions at the top of page 2.
- g. If a man is better then any of the descriptions given, his name will not appear on the list.
- h. After listing the names and A. B. or C. place an X in any of the other columns that apply. More than one column may be checked; one must be.
 - (1) If a man has poor coordination, place an X after his name in the column headed "poor coordination".
 - (2) If a man is physically unable to do the work, place an X after his name in the column headed "physical problem".
 - (3) If a man has a poor attitude toward Army training, is emotionally unstable, or has personal problems which affect his work, place an X after his name in the column headed "emotional problem".
 - (4) If a man is a plain slow learner, place an X after his name in the column headed "slow learner".
 - (5) If none of the above apply to the man, place an X after his name in the column headed "none of these".
- 1. Check each man's name on the platoon roster to be sure you consider every men in your group.

Rater	
Rank	
Org	••

3. The letter carrying the forms was as follows:

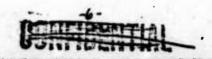
HEADQUARTERS
INFANTRY REPLACEMENT TRAINING CENTER
Fort McClellen, Alabama

April 24, 1943.

MEMORANDUM: See Distribution Below

SUBJECT: Construction of Rating Blank of Soldier Performance.

1. Representatives of the Adjutant General's Department from Washington are here at the IRTC conducting an experiment to improve induction station





procedures so as to keep out of the Army men who are so ill-adapted for military training as to be a burden to the Army. This Headquarters desires complete cooperation in carrying out instructions relative to this project.

- 2. The platoon leader (officer), platoon sergeant and each squad corporal in certain battalions will be asked to make out a brief rating sheet on a few of the poorest soldiers in their respective units. The platoon leader will assemble his cadremen and proceed as follows:
 - a. Explain briefly the purpose of the meeting.

b. Distribute platoon or squad rosters previously prepared.

- c. Read and explain directions for using the soldier performance rating scale.
- 3. Without discussion of any individual soldier and with each rater working independently, the following will be accomplished:

a. Rating:

- (1) Platoon leaders will consider each man in the platoon to determine whether he fits one of the three descriptions of the rating scale.
- (2) Platoon sergeants will likewise consider each man in the platoon.

(3) Each corporal will consider only the men in his own squad.

- b. It is imperative that no discussion occur while the lists are being prepared. The platoon leader will see that men are seated so that each may work independently.
- c. The lists and the reaters will be collected by the platoon leader immediately after being completed and will be checked by him to see that the rating sheets are correctly made out and signed.
- d. Regimental Adjutants will turn in completed rating sheets from their units on or before 1115, Thursday, April 29, 1943.
 - let Fattalion 12th Battalion
 2nd Battalion 14th Battalion
 4th Battalion 18th Battalion (Except Co. "B")
 7th Battalion (except Co. "D") 21st Battalion
 8th Battalion 22nd Battalion
 9th Battalion 23rd Battalion (Except S.T.U.)
 10th Battalion 24th Battalion

By command of Brigadier General PHILOON:

/s/ W. L. Roach /t/ W. L. ROACH, Lt. Col., A.G.D., Adjutant

25th Battalion

DISTRIBUTION: "A" (195)
Plus 4 per each Co. in Par. 3e

11th Battalion





4. The lists obtained by the procedure outlined above contained the names of approximately 1300 white and 275 colored soldiers. These lists were consolidated and men chosen for testing whose names appeared on three lists as fitting description "B" (Step V in the long rating scale), and who was checked a slow learner by two of the raters or whose name appeared at least twice as fitting description "C" (Step VI in the long rating scale), both raters checking the man as a slow learner. 155 whites and 77 colored met this criterion and were tested. For analysis, the white group was reduced to 113 and the colored to 71 by eliminating all those scoring above GCT Grade IV. This was done to eliminate any bias GCT might have on the results in the comparisons between this group and the marginally satisfactory group described below.

Some may well have been overlooked as the corporals, sergeants and lieutenants made up these lists. In other words, while this list might not contain the names of all unsatisfactory soldiers, it is quite likely that those who are listed are definitely unsatisfactory. The lists, not being obtained under immediate supervision, are subject to collaboration on the part of the corporal, sergeant and lieutenant rating the same men. It is not felt that this occurred on a large scale.

From these lists were also selected white and colored marginally satisfactory soldiers. Ken who were listed as fitting description "A" (Step IV on the long rating scale) by at least one rater, with no rating below this, and whose GCT Grade was IV or V were chosen for testing.

TESTS:

Sixteen different tests were used in this study. Not all could be given to all men. The ones with which this preliminary report is concerned are those now in use in the induction stations and the newly constructed tests which showed the greatest promise during the analysis of the data. The tests were administered to groups ranging in size from ten to eighty. In all, sixty groups were tested.

Non-Verbal Tests Now in Use

Group Tests

Individual Tests

Visual Classification-la (VC-la)

Block Counting (DST-10)
Wells Concrete Directions (CD)

New Tests Showing Promise

Group Crientation 1 (GO-1)
Group Target 1 (GT-1)

Individual Examination 1 (IE-1)
Individual Target 1 (IT-1)

Block Counting is the test now employed in the induction stations as an individual test. In the present study it was used as a group test.



The major results of this study pertinent to the induction station program may be considered under the four headings: (1) reliability of the criterion, (2) comparison of test scores of selected groups, (3) the correlations between the rating scale and the tests, and (4) reliability of the tests.

1. Reliability of the soldier performance rating scale. With three ratings this is .77 for the white and .73 for the colored group of randomly selected GOT Grade IV - V men. As rating scales go, this is excellent reliability. This is particularly the case in this instance, since so many raters are involved. In the white group there were more raters than men rated; at least 240 raters rated the 200 men in the random IV - V white group.* It appears that the rating scale concerns a concept about which there is marked agreement among whose who are directly concerned with the actual training of soldiers.

Table I gives the means and standard deviations on the rating scale for the various groups. There are four points of special interest in this table:

- a. Within each race, the scale discriminates between men in regular and special training. This is an encouraging eign of the validity of the rating scale.
- b. The colored groups are consistently rated as better** soldiers than the whites. No corclusions regarding race differences can be drawn from this finding. A variety of factors makes it difficult to obtain adequate ratings of the colored men. The fact that the finding holds for the special training groups is particular evidence for this interpretation. Colored men in special training at Fort McClellan were selected on the basis of lower standards than white.

^{*} The number of raters involved is so large because of the number of battalions from which it was necessary to choose men to obtain 100 Grade V men. The white IV - V group was selected from 5 battalions. Since there were a minimum of three raters for each platoon and 80 platoons to a battalion, at least 240 raters are involved for the 200 men rated. Additional corporals were involved so the actual number of raters was even greater.

^{**} The lower the mean the better the rating.

Table I

Comparison of Mean Soldier Performance Ratings Made by Lieutenants, Sergeants and Corporals on Selected Groups of White and Colored Enlisted Men

	Lieutenant			5	Sergeant			Cornoral		
	N	14	SD	N	<u>M</u>	SD	N	M	SD	
White Random IV - V	200	3.67	1.25	200	3.60	1.35	200	3.68	1.31	
White STU	81	4.74	0.87	82	4.82	0.99	82	4.50	1.02	
Colored Random IV - V	235	3.18	1.17	235	3.05	1.24	243	2.85	1.19	
Colored STU	104	4.02	1.06	104	3.72	1.21	104	3.62	1.09	

- c. Considering the great number of raters involved there is a remarkable similarity of means and standard deviations for the ratings of the white group. Those for the colored group fluctuate more, additional evidence that the ratings are not as good for them.
- d. The means for the white group fall at the point on the scale that is very reasonable for a group of random $IV = V^*s$. They are between the steps on the scale describing the marginally satisfactory and the average soldier.

The reasons for the difference in the edequacy of the ratings for the white and colored groups cannot be stated with certainty. The tendency for raters to judge individuals in terms of the means for the group of which they are a part is one possible factor involved. Since the total white group contains more men of higher GCT levels, this would be a tendency for raters to compare the white IV - V's against a more rigorous standard. Hence, mean ratings for the white IV - V group would be lower than for the IV - V colored. This interpretation is supported by the fact that the whites score higher on all tests than do the colored.

Whatever the reasons there is no justification for assuming that Grade .

IV - V colored men are better soldiers than IV - V white men. So far as the special training units are concerned, there is reason to believe that the colored men in these units are poorer soldiers than the white men in similar units. At Ft. McClellan the standards for admission to special units was lower for colored than for white.

For the reasons given above, most reliance will be placed on the analysis for the white groups.

2. <u>Comparison of selected groups:</u> Table II gives the comparison between the marginally satisfactory and unsatisfactory groups. This is a critical comparison since the two groups do not differ greatly in terms of soldier performance. It is evident that the new tests discriminate the groups better than the old. VC-lA is a possible exception to this statement. IE-1 and GT-1 appear to be the better tests while Wells CD appears completely without value.

It is likewise evident that the colored groups score lower on all tests than do the white. Further the tests do not discriminate within the colored group nearly as well as they do within the white group.

To check the possibility that the tests might discriminate more extreme groups within the colored race, Table III was prepared. In this table the unsatisfactory group is the same as that included in Table II. The high satisfactory group was selected from the random IV - V colored group. Men rated at least average (StepIII) on the soldier performance scale were chosen for comparison with the unsatisfactory group. It is clear that the tests do discriminate these groups. All but one of the new tests (GT-1) discriminate better than the tests now in use.

TABLE II

Comparison of Mean Scores of Marginally Satisfactory and Unsatisfactory White and Colored Soldiers on the Present Induction Station Tests and on the Experimental Tests.

	WHITE COLORED													
Present Tests		LOW SATIS. UNSATISFACTORY		CR	LO	W SATI	S.	UNS	atist.	CTORY	CR			
	N	М	SD	n	М	SD		N	и	SD	1	N	SD	
VC_la	75	41.3	6.0	118	34.7	10.3	5.6	53	32.5	10.8	76	23,6	10.1	2,1
DST-10	75	12.5	3.1	118	10.7	3.5	3.8	53	8,7	4.2	76	8.2	4,3	0.7
Wells C-I	43	40.3	9.4	85	43.7	10.1	-1.9	**	-	-	-	-		
moveril Mental Tests														
ot_1	75	20.0	4.7	118	15.0	5.9	6.5	53	15,6	5,9	76	12,1	6.3	3.2
00-1.	72	10,7	2.8	113	8.5	3.5	4,5	40	7.8	3.4	77	6.1	3.3	0.8
IT-1	72	43.5	9.2	109	35.5	12.6	4.9	49	34.6	11.9	53	23.9	11.7	2.4
IE-1	70	49.0	14.2	102	32.9	14.7	6.7	29	36.9	13.4	34	26.8	8.9	3.4

^{*} Negative CR indicates that the more satisfactory group exhibited a lower mean score.

^{**}Wells C-D was not administered to the colored soldiers.

Comparison of Mean Scores of High Satisfactory and Unsatisfactory Colored Soldiers on the Present Induction Station Tests and on the Experimental Tests.

PRESENT	HIGH	SATISTAC	TORY	פוניט	amispacto	PY	CR
Tests	ñ	M	SIGHA	N	· м	SIGMA	
VC-la	152	36.3	8,6	76	28.6	10.1	.5.7
DST-10	151	11.3	2.9	76	8.2	4.3	5.6
Wells C-D	*		-	-	-	-	
experi_ Mental Tests							
GT_1	151	14.2	5,3	76	12.1	6.3	2.5
GO_1	150	9.9	2.9	77	6.1	3.3	8.5
IT-1	80	42.2	9.0	53	28.9	11.7	7.0
IE-1	79	39.7	13.3	34	26.9	8.9	6.0

^{*} Wells C-D was not given to colored troops

3. Correlations of tests and criterion. The correlation method yields the best means of comparing the relative value of the tests. These correlations are presented in Table IV. For reasons already mentioned, most reliance is placed on the results for the white group. Results for the colored group are presented but not heavily weighed in evaluating the tests. The poorest tests are those now in use. The Wells Concrete Directions, in particular, is of practically no value. The IE-1 is the best single test. VC-1A shows up less well in the correlational analysis then it did in comparison of means. This is owing to the pronounced skew in NC-1A distribution. This skewness makes for unreliability of the validity coefficient. Taking both analyses into account VC-1A is inferior to the new tests.

The bi-serial correlation of soldier performance with the tests now in use in induction stations (Q-1, VC-1A, DST-1O, and Wells C-D) and acceptance at rejection at induction stations on the basis of prevailing critical scores is only .23 for the white group. Any one of the new tests yields correlations with soldier performance that are considerably higher than this.

4. Reliability of the tests: Table V gives the reliability coefficients of the tests. These reliabilities, while not as high as might be desired, are satisfactory in terms of the time required to take the tests. Lengthening the tests to increase their reliability would not yield a sufficient increase in validity to warrant the additional time required to take them.

conclusions:

- 1. The four new tests are definitely superior to those now employed in induction stations as predictors of soldier performance.
- 2. The Wells Concrete Directions is of little value in selecting better soldiers.
- 3. The criterion is more adequate for the white than the colored group. Hence more reliance should be placed on the findings for the former group.
- 4. It is uncertain whether differences between white and colored on the tests are owing to cultural, race, or selective factors.
- 5. Increasing the reliability of the tests by addition of more items would not yield sufficient increase in validity to warrant the additional expenditure of time in test administration.

Table IV

Comparisons of the Correlations of the Present Induction Station Tests and the Experimental Test with Soldier Performance Ratings for Randomly Selected White and Colored Soldiers in GCT Grades IV and V

White IV - V	Colored IV - V
.26	.32
.34	.21
.17	₩
.46	31 🗸
.40	.24
.44	.32
.51	.31
	.26 .34 .17 .46 .40

^{*} Wells C-D was not given to colored group.

Table V

Reliabilities of Present Induction Station Tests and of Experimental Tests Based on 200 Randomly Selected White Soldiers in GCT Grades IV and V

		r	
Present Tests	Š.		
VC-1A		.89	
DST-10		.73	
Wells C-D			
Experimental '	Tests .		
GT-1		.85	
GO-1		.70	
IT-1		.88	
· IE-1	1904	.78	

^{*} The reliability could not be estimated because the Kuder-Richerdson Formula is not applicable to weighted scores.