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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerican Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CONTAINER MAKER-FILLER-PACKER OPERATOR (misc. food prep.) 7-68.920

B-519 or S-242

U. S. Employment Service
in Cooperation with
New York State Employment Service

April 1963

GATB # 2405

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

CONTAINER MAKER-FILLER-PACKER OPERATOR (misc. food prep.) 7-68.920

B-519

Summary

The General Aptitude Test Battery, B-1002A, was administered to a final sample of 53 women employed as Container Maker-Filler-Packer Operator 7-68.920 at the Thomas J. Lipton Company plant in Albion, New York. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, job analysis data, correlations with the criterion, and their combined selective efficiency, Aptitudes K-Motor Coordination, F-Finger Dexterity and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Container Maker-Filler-Packer Operator 7-68.920 B-519

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
T	CB-1- G CB-1- K	85	K	Part 8	90
F	CB-1- O CB-1- P	80	F	Part 11 Part 12	75
M	CB-1- M CB-1- N	75	M	Part 9 Part 10	75

Effectiveness of Norms

The data in Table IV indicate that 12 of the 17 poor workers, or 71 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 71 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 28 of the 33 workers who made qualifying test scores, or 85 percent, were good workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Container Maker-Filler-Packer Operator 7-68.920.

II. Sample

On June 22, 1960 the GATB, B-1002A, was administered to a final sample of 53 women out of a total of 58 women employed by the Thomas J. Lipton Company of Albion, New York as Container Maker-Filler-Packer Operators 7-68.920. The women were selected for employment by interview without testing with an aim to hiring only stable persons willing to do repetitive factory work. Although no specific age, education or experience requirements exist, the process tends to result in a somewhat older group. The minimum training period is approximately two months. All of the individuals in the sample are considered experienced workers.

TABLE I

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion - Rating II (r) for Age, Education and Experience

N = 53	M	σ	Range	r
Age (years)	45.4	8.2	31-60	-.147
Education (years)	9.2	1.7	7-12	.265
Experience (months)	83.5	53.3	8-185	.452**

**Significant at the .01 level

The significant correlation in Table I indicates that (1) experienced workers performed better on the job, or (2) raters were biased in giving higher ratings to these workers.

III. Job Description

Job Title: Container Maker-Filler-Packer Operator (misc. food prep.)
7-68.920

Job Summary: Tends an automatic machine which forms, fills and weighs individual foil packets containing dehydrated soup mix, and which fills and seals retail display boxes with packets.

Work Performed. Checks machine readiness by observing that sealing-mechanism temperature guage is up to minimum; that foil roll is in position; that magazine is loaded with display boxes; that glue pots have been filled; and that soup mix knobs are open. Starts machine operation and checks first few packets for open seals, punctures, etc., adjusting foil-cutoff-photoelectric-switch knob if necessary; checks for punch fold to be in center of foil, adjusting arbor-tilting knob if necessary; spot-checks weight of packets which have been accepted and rejected by automatic scale by observing weight on Shadowgraph scale, adjusting feed-control knobs if necessary; and spotchecks supplies and calls for replenishment. In the event of a machine jam, shuts off machine, removes damaged packets, makes necessary adjustments or calls mechanic. Cleans machine and work area.

IV. Experimental Battery

All the tests of the GATB, B-1002A, were administered to the sample group.

V. Criterion

The criterion consisted of supervisory ratings by the rank-comparison method. One day after testing the General Foreman rated all 53 workers, Foreman A rated the 26 workers on his shift, and Foreman W rated the 27 workers on his shift. Each of the three arrays of ranks was converted to linear scores. Therefore, each worker had two scores, one corresponding to the General Foreman's rating and one corresponding to the immediate Foreman's rating. The following correlations were obtained for these ratings:

Rating I	Experience	Foreman A	Foreman W
General Foreman	.654**	.816**	.676**
Foreman A	.619**		
Foreman W	.396*		
Mean of General Foreman and Foreman A or Foreman W	.611**		

*Significant at the .05 level
**Significant at the .01 level

Twelve weeks after the first rank-comparison ratings, reratings were made by the three foremen using the same method. The following correlations were obtained for these reratings:

Rating II	Experience	Foreman A	Foreman W
General Foreman	.500**	.826**	.804**
Foreman A	.249		
Foreman W	.367		
Mean of General Foreman and Foreman A or Foreman W	.452**		

*Significant at the .05 level
**Significant at the .01 level

The linear scores corresponding to the average of the second set of ratings (reratings) made by the three raters was selected as the final criterion for the study because, as indicated by the statistics above, these scores have greater inter-rater reliability, and less relationship with the experience data for the sample.

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis:

The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation:

Form Perception (P) - required to determine position of foil rolls, magazines, pouchfold and side and/or top seals.

Clerical Perception (Q) - required to correctly read scale, maintain records of time test and reports of production, and to adjust dials.

Finger Dexterity (F) and Manual Dexterity (M) - required to manipulate dials, adjust foil roll, load magazines, operate and shut down machines, and check weights quickly and accurately.

On the basis of the job analysis data, V-Verbal Aptitude was rated "irrelevant" for successfully performing the duties of this job.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 53

Aptitudes	M	σ	r
G-Intelligence	88.2	12.7	.017
V-Verbal Aptitude	92.9	13.7	.083
N-Numerical Aptitude	87.9	14.5	-.016
S-Spatial Aptitude	85.3	15.4	-.080
P-Form Perception	89.1	16.1	.092
Q-Clerical Perception	92.9	14.1	.213
K-Motor Coordination	97.2	15.4	.321*
F-Finger Dexterity	97.2	19.4	.130
M-Manual Dexterity	102.8	20.2	.078

*Significant at the .05 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important					X	X		X	X
Irrelevant		X							
Relatively High Mean							X	X	X
Relatively Low Sigma	X	X	X			X			
Significant Correlation with Criterion						X			
Aptitudes to be Considered for Trial Norms						Q	K	F	M

Trial norms consisting of various combinations of Aptitudes Q,K,F and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of K-90, F-75 and M-75 had the best selective efficiency.

VII. Validity of Norms (Concurrent)

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 32 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes K, F and M with critical scores of 90, 75 and 75, respectively, and the dichotomized criterion for Container Maker-Filler-Packer Operator 7-68.920. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Container Maker-Filler-Packer Operator 7-68.920. (K-90, F-75, M-75)

N = 53	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	8	28	36
Poor Workers	12	5	17
Total	20	33	53

Phi Coefficient = .47
χ^2 = 11.512
P/2 < .0005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes K, F and M with minimum scores of 90, 75 and 75, respectively, have been established as B-1002 norms for Container Maker-Filler-Packer Operator 7-68.920. The equivalent B-1001 norms consist of T-85, F-80 and M-75.

IX. Determination of Occupational Aptitude Pattern

The specific norms established for this study did not meet the requirements for allocation to any of the existing 35 OAP's (revised 10/61). The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.