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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; Clerical 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

ONION CORER (can. & preserv.) 8-04.10

U. S. Employment Service in
Cooperation with
California State Employment Service

June 1963

GATB # 2451

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

ONION CORER (can. & preserv.) 8-04.10

B- 546

Summary

The General Aptitude Test Battery, B-1002A, was administered to a final sample of 61 female Onion Corers 8-04.10 employed at the Gentry Division of Consolidated Foods, Gilroy, California. The criterion consisted of supervisory ratings. On the basis of job analysis data, mean scores, standard deviations, 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 Onion Corer 8-04.10, B-546.

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

Effectiveness of Norms

The data in Table IV indicate that only 64 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 72 percent would have been good workers. 36 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 28 percent would have been poor workers.

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 Onion Corer 8-04.10.

II. Sample

The GATB, B-1002A, was administered during September and November 1962 to 64 women employed as Onion Corers at Consolidated Foods, Gilroy, California. Seventy-two individuals were requested to participate in this study on a voluntary basis, on paid overtime. Of these, 11 were not tested; 3 of whom had less than a 6th grade education, 2 who had less than 80 hours of training and 6 who were not available for testing. The final sample was comprised of 61 women, each of whom had completed the minimum training period of 80 hours.

In selecting applicants for employment, there are no experience or educational requirements except that each applicant be able to read, write and speak basic English. The company prefers applicants who are 5'2" or taller and they must pass a routine pre-employment physical examination.

TABLE I

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

N = 61	M	σ	Range	r
Age (years)	27.0	7.2	18-48	-.108
Education (years)	9.1	1.9	6-13	-.109
Experience (months)	30.5	21.5	1-120	.121

III. Job Description

Job Title: ONION CORER (can. & preserv.) 8-04.10

Job Summary: Feeds coring machine which removes root and stem from onions. Picks up onion from conveyor belt with one hand, and while positioning and placing onion on peg, picks up another onion from belt with other hand and repeats process.

Work Performed: Dons plastic apron to protect clothing from becoming wet from water and squirting onion juice. Presses button to start coring machine and peg chain. Working rapidly, picks up onion from conveyor belt with one hand; turns onion so that root or stem is towards worker; places onion on steel peg of peg chain (pegs move past worker at the rate of 80-85 per minute and carry onions into coring machine) and at the same time, with the other hand, picks up another onion from conveyor belt and repeats process. Places onions on steel pegs rapidly enough to process a minimum of 3,000 onions per hour.

IV. Criterion

The final criterion for this study was based on broad category ratings made by two foreladies (forelady A and forelady B). Each forelady was familiar with the on-the-job performance of only the workers she supervised; forelady A supervised 30 workers and forelady B supervised 31 workers. Initially, each forelady rated each of the workers she supervised as either "above average," "average," or "below average" on the basis of the worker's quality and quantity of production and of the training time necessary before the worker could meet the minimum production standard of 3,000 onions cored per hour. Two weeks later reratings were made by each forelady. Each set of forelady's ratings were converted to numerical scores and almost perfect reliability was obtained for the criterion based on data for the entire sample (a reliability coefficient of 1.16 was obtained; this relationship is greater than 1.0 because of statistical overcorrection for broad category criterion data). Therefore, the final criterion consisted of the sum of the numerical scores corresponding to the two ratings for each individual in the sample, resulting in a distribution of final criterion scores of 78-122, with a mean of 100.0 and a standard deviation of 17.5.

V. Experimental Battery

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

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Motor Coordination (K) - necessary to develop rapid movements marked by regular recurrence (rhythm), such as picking up onion in one hand and placing it on steel pegs and repeating same with opposite hand in an alternating sequence.

Finger Dexterity (F) - necessary to pick up onion with fingers and rapidly manipulate onion in positioning onion on moving steel pegs with root or stem pointing towards corer.

Manual Dexterity (M) - necessary to move and coordinate hands and arms quickly and accurately in positioning and pressing onions onto moving steel pegs.

On the basis of the job analysis data, V-Verbal Aptitude, N-Numerical Aptitude and Q-Clerical Perception were rated "irrelevant" for success in this occupation.

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 = 61

Aptitudes	M	σ	r
G-Intelligence	78.9	13.7	-.153
V-Verbal Aptitude	84.5	13.2	-.065
N-Numerical Aptitude	73.7	18.0	-.072
S-Spatial Aptitude	89.7	15.8	-.049
P-Form Perception	90.6	17.6	-.035
Q-Clerical Perception	91.2	14.4	-.135
K-Motor Coordination	91.9	16.1	.159
F-Finger Dexterity	100.7	19.1	.127
M-Manual Dexterity	97.9	16.0	.090

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
Irrelevant		X	X			X			
Relatively High Mean						X	X	X	X
Relatively Low Sigma	X	X				X			
Significant Correlation with Criterion									
Aptitudes to be Considered for Trial Norms							K	F	M

Trial norms consisting of various combinations of Aptitudes 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-85, F-80 and M-80 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 36 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 85, 80 and 80, respectively, and the dichotomized criterion for Onion Corer 8-04.10. 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 Onion Corer 8-04.10
(K-85, F-80, M-80)

N = 61	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	11	28	39
Poor Workers	11	11	22
Total	22	39	61

Phi Coefficient = .22
X^2 =2.928
P/2 < .05

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 85, 80 and 80, respectively, have been established as B-1002 norms for Onion Corer 8-04.10. The equivalent B-1001 norms consist of T-80, F-85 and M-85.

IX. Determination of Occupational Aptitude Pattern

The data for this study met the requirements for incorporating the occupation studied into OAP-35 which is shown in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962.