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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 also included. (AG)

TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

GARMENT LOOPER (knit goods) 6-14.410

B-460 S-1

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

September 1962

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

GARMENT LOOPER (knit goods) 6-14.410

B-460 *or S-190*

Summary

The General Aptitude Test Battery, B-1002A, was administered to 53 women employed as Garment Loopers at the Bernard Altman Company, San Antonio, Texas. The criterion was supervisory ratings expressed in broad categories. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes K-Motor Coordination, F-Finger Dexterity and M-Manual Dexterity were selected for inclusion in the test norms.

GATB Norms for Garment Looper 6-14.410 B-460 *or S-190*

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the norms for Garment Looper 6-14.410.

TABLE I

Minimum Acceptable Score on B-1001 and B-1002 for B-460 *or S-190*

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
T	CB-1-G CB-1-K	90	K	Part 8	95
F	CB-1-O CB-1-P	110	F	Part 11 Part 12	105
M	CB-1-M CB-1-N	100	M	Part 9 Part 10	95

Effectiveness of Norms

The data in Table V indicate that 13 of the 22 poor workers, or 59 percent of them, did not achieve the minimum score established as cutting scores on the recommended test norms. This shows that 59 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 24 of the 33 workers who made qualifying test scores, or 73 percent, were good workers.

I. Problem

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 Garment Looper, 6-14.410.

II. Sample

The General Aptitude Test Battery B-1002A was administered on May 25, 1960, to 53 women employed as Garment Loopers at the Bernard Altmann Company, San Antonio, Texas. One woman was eliminated from the sample because her glasses were broken and the test administrator was not made aware of this until the end of the testing session. Therefore, the final sample consisted of 52 female Garment Loopers.

Table II shows the means, standard deviations, ranges, and Pearson product-moment correlations (corrected for broad categories) with the criterion for age, education, and experience.

TABLE II

Means (M), Standard Deviations (σ) Ranges, and Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion (c^r) for Age, Education, and Experience.

N = 52

	M	σ	Range	c^r
Age (years)	26.7	5.4	19-39	.162
Education (years)	8.5	2.4	2-12	-.182
Experience (months)	4.2	3.1	1-11	.396**

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

There are no significant correlations between age or education and the criterion. The correlation between experience and the criterion is significant at the .01 level. This indicates that (1) raters were biased in favor of workers with more experience or (2) workers with more experience performed better on the job.

III. Job Description

Job Title: Garment Looper (Knit goods) 6-14.410

Job Summary: Operates a looping machine and joins together pieces of knit sweaters. Places cone of yarn on spindle and threads yarn through tension guides and through eye of needle. Picks up one piece of sweater (may be sleeve or neck piece) and sets loops on rotating dial looping points. Picks up piece to be joined and sets loops on looping points to correspond with loops of first piece. Depresses pedal to start motion of rotating dial. As dial slowly rotates, sets remainder of loops to correspond with loops already set on dial looping points (dial carries the looped material through the automatic joining and trimming mechanism). Starts and stops machine as necessary. Changes or replenishes yarn.

IV. Experimental Battery

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

V. Criterion

The criterion data collected consisted of supervisory ratings which were based on productivity and given by Plant Superintendent, Production Manager, time and Cost Study Man, and Foreman, and grouped in broad catagories. The final criterion score was based on the combined judgments of all the raters. The distribution of the final criterion scores ranged from 41-63, with a mean scores of 50.2 and a standard deviation of 8.7.

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 match piece to be joined and to sets loops on looping points to correspond with loops of the first piece.

Motor Coordination (K) - Required to place cone of yarn on spindle, and threads yarn through tension guides and through eye of needle.

Finger Dexterity (F) - Required to thread machine and hang loops in the looping points.

Manual Dexterity (M) - Required in handling cone of yarn pieces of sweaters.

On the basis of the job analysis data, the following aptitudes are considered obviously unimportant for performing the duties of this job and are considered "irrelevant" aptitudes: Aptitudes V, N, and Q.

B. Quantitative Analysis:

Table III shows the means, standard deviations, and Pearson product-moment correlations (corrected for broad categories) with the criterion for the aptitudes of the GATB. The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations (Corrected for Broad Categories) with the Criterion (c^r) for the Aptitudes of the GATB.

N = 52

Aptitudes	M	σ	c^r
G-Intelligence	80.5	9.7	.224
V-Verbal Aptitude	81.2	10.0	.008
N-Numerical Aptitude	79.9	13.8	.173
S-Spatial Aptitude	87.6	13.6	.228
P-Form Perception	90.7	17.8	.254
Q-Clerical Perception	94.5	12.6	.002
K-Motor Coordination	107.5	13.6	.325*
F-Finger Dexterity	111.3	14.3	.502**
M-Manual Dexterity	115.0	16.4	.319*

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

For a sample of 52 cases, correlations of .354 and .273 are significant at the .01 level and the .05 level of confidence, respectively. Aptitude F correlates significantly with the criterion at the .01 level. Aptitudes K and M correlate significantly with the criterion at the .05 level.

C. Selection of Test Norms

TABLE 17

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	X			X			
Relatively High Mean							X	X	X
Relatively Low Sigma	X	X		X		X			
Significant Correlation with Criterion							X	X	X
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 tetrachoric correlation technique. A comparison of the results showed that B-1002 norms consisting of K-95, F-105 and M-95 had the best selective efficiency.

VII. Validity of Norms

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-third of the sample in the low criterion group. A criterion critical score of 41 was used and resulted in 22 of the workers, or 42 percent of the sample, being placed in the low criterion group.

Table V shows the relationship between test norms consisting of Aptitudes K, F, and M with critical scores of 95, 105, and 95 respectively, and the dichotomized criterion for Garment Looper 6-14.410. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V

Validity of Test Norms for Garment Looper

(K-95, F-105, M-95)

N = 52

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	6	24	30
Poor Workers	13	9	22
Total	19	33	52

$r_{tet} = .60$ $\quad \chi^2$ 6.763

$\sigma_{r_{tet}} = .22$ $\quad$ P/2 $<$ .005

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 95,105, and 95 respectively, have been established as B-1002 norms for the occupation of Garment Looper 6-14.410. The equivalent B -1001 norms consist of T-90, F-110, and M-100.

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 occupational aptitude patterns. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.