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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 and a personnel evaluation form are also included. (AG)

February 1968 United States Employment Service Technical Report S-409

S-409

Development of USES Aptitude Test Battery for

Pants Presser

(any ind.) 363.782

U.S. DEPARTMENT OF LABOR

MANPOWER ADMINISTRATION

Technical Report on Development of USES Aptitude Test Battery

For . . . .

Pants Presser (any ind.) 363.782

S-409

(Developed in Cooperation with the
Missouri State Employment Service)

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February 1968

FOREWORD

The United States Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 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, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination, predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

Charles E. Odell, Director
U.S. Employment Service

GATB Study #2672

DEVELOPMENT OF USES APTITUDE TEST BATTERY

FOR

Pants Presser (any ind.) 363.782-018

S-409

This report describes research undertaken for the purpose of developing General Aptitude Test BAttery (GATB) norms for the occupation of Pants Presser (any ind.) 363.782-018. The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB Scores
P - Form Perception	80
Q - Clerical Perception	95
M - Manual Dexterity	85

RESEARCH SUMMARY

Sample:

50 (29 male and 21 female) workers employed as Pants Pressers in Missouri.

Criterion:

Supervisory ratings

Design:

Concurrent (test and criterion data were collected at approximately the same time).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations, aptitude criterion correlations and selective efficiencies.

Concurrent Validity:

Phi Coefficient = .45 (P/2 less than .005)

Effectiveness of Norms:

Only 64% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the S-409 norms, 83% would have been good workers. Thirty-six percent of the nontest-selected workers used for this study were poor workers; if the workers had been test-selected with the S-409 norms, only 17% would have been poor workers. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	64%	83%
Poor Workers	36%	17%

SAMPLE DESCRIPTION

Size:

N = 50

Occupational Status:

Employed workers

Work Setting:

Workers were employed at the H. D. Lee Corporation, Lebanon, Missouri; Prairie Manufacturing Company, East Prairie, Missouri; National Garment Company, Fayette, Missouri; Burlington Manufacturing Company, Kansas City, Missouri; Unitog Corporation, Warrensburg, Missouri.

Employer Selection Requirements:

Education: None

Previous Experience: None

Tests: None

Other: Personal interview and a check of references.

Principal Activities:

The job duties for each worker are comparable to those shown in the job description in the Appendix.

Minimum Experience:

All workers in the sample had at least one month total job experience.

TABLE 2

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations With the Criterion (r) for Age, Education and Experience.

	Mean	SD	Range	r
Age (years)	25.6	7.8	16-48	-.199
Education (years)	10.5	1.7	7-12	.316*
Experience (months)	11.7	11.5	1-48	.044

*Significant at the .05 level

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002 were administered during the period from June 1966 to July 1967.

CRITERION

The criterion data consisted of supervisory ratings of job proficiency made at approximately the same time as test data were collected. In all plants but one the ratings were made by the workers' immediate supervisor; one rating of 7 workers was provided by a second line supervisor.

Rating Scale: USES Form SP-21, "Descriptive Rating Scale" (see Appendix).

Reliability: The supervisory ratings were checked for internal consistency by computing a biserial correlation of the sum of items A-F on the rating form with a dichotomy being based upon item G of the form (see Appendix). The biserial correlation was more than twice the size of its standard error.

Criterion Distribution:

Possible Range:	7-35
Actual Range:	13-31
Mean:	23.7
Standard Deviation:	4.7

Criterion Dichotomy: The criterion distribution was dichotomized into low and high groups by placing 36% of the sample in the low group to correspond with the percentage of workers considered unsatisfactory or marginal. Workers in the high criterion group were designated as "good workers" and those in the low group as "poor workers". The criterion critical score is 22.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes P, Q, K, and M were considered for inclusion in the norms on the basis of a qualitative analysis of job duties involved and statistical analyses of test and criterion data. Tables 3, 4, and 5 show the results of the qualitative and statistical analyses.

TABLE 3

Qualitative Analysis
(Based on the job analysis, the aptitudes indicated appear to be important to the work performed.)

Aptitude	Rationale
P - Form Perception	Required in order to visually inspect trousers for wrinkles so that they may be smoothed out before pressing; required in order to fold trousers accurately.

K - Motor Coordination	Required in order to coordinate eye and hand movements in folding trousers and smoothing out wrinkles in trousers.
M - Manual Dexterity	Required in order to handle trousers rapidly (folding, placing on pressing buck, removing from pressing buck) so that minimum quantity production standards can be met.

TABLE 4

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations With the Criterion (r) for the Aptitudes of the GATB; N=50

Aptitudes	Mean	SD	Range	r
G - General Learning Ability	86.8	16.8	53-128	.267
V - Verbal Aptitude	87.1	15.0	63-125	.336*
N - Numerical Aptitude	88.3	20.5	40-126	.386**
S - Spatial Aptitude	91.8	17.9	55-140	.077
P - Form Perception	98.8	22.0	49-149	.326*
Q - Clerical Perception	102.3	17.4	67-136	.368**
K - Motor Coordination	97.9	21.7	62-151	.267
F - Finger Dexterity	85.6	21.5	37-137	.191
M - Manual Dexterity	99.9	21.3	59-137	.339*

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

TABLE 5

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						
Relatively High Mean					X	X	X		X
Relatively Low Standard Dev.		X							
Significant Correlation with Criterion		X	X		X	X			X
Aptitudes to be Considered for Trial Norms					P	Q	K		M

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of a comparison of the degree to which trial norms consisting of various combinations of aptitudes P, Q, K, and M at trial cutting scores were able to differentiate between the 64% of the sample considered good workers and 36% of the sample considered poor workers. Trial cutting scores at five point intervals approximately one standard deviation below the mean are tried because this will eliminate about one third of the sample with three-aptitude norms. For two-aptitude norms, minimum cutting scores slightly higher than one standard deviation below the mean will eliminate about one-third of the sample; for four-aptitude trial norms, cutting scores slightly lower than one standard deviation below the mean will eliminate about one-third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. Norms of P-80, Q-95, and M-85 provided the optimum differentiation for the occupation of Pants Presser 363.782-018. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .45 (statistically significant at the .005 level).

TABLE 6

Concurrent Validity of Test Norms P-80, Q-95 and M-85

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	8	24	32
Poor Workers	13	5	18
Total	21	29	50

Phi Coefficient (ϕ) = 45 Chi Square (X^2_v) = 8.7
Significance Level = P/2 .005

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 36 OAP's included in Section II of the Manual for the General Aptitude Test Battery. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.

SP-21
Rev. 1/66

A-P-P-E-N-D-I-X

UNITED STATES EMPLOYMENT SERVICE

DESCRIPTIVE RATING SCALE
(For Aptitude Test Development Studies)

Score_____

RATINGS SCALE FOR _____

D. O. T. Title and Code

Directions: Please read the suggestions to raters on the back of this form and then fill in the items listed below. In making your ratings, only one box should be checked for each question.

Name of Worker (print) _____

(Last) (First)

Sex: Male____ Female____

Company Job Title: _____

How often do you see this worker in a work situation?

- ☐ See him at work all the time.
- ☐ See him at work several times a day.
- ☐ See him at work several times a week.
- ☐ Seldom see him in work situation.

How long have you worked with him?

- ☐ Under one month.
- ☐ One to two months.
- ☐ Three to five months.
- ☐ Six months or more.

A. How much work can he get done? (Worker's ability to make efficient use of his time and to work at high speed.)

- ☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.
- ☐ 2. Capable of low work output. Can perform at a slow pace.
- ☐ 3. Capable of fair work output. Can perform at an acceptable but not a fast pace.
- ☐ 4. Capable of high work output. Can perform at a fast pace.
- ☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of his work? (Worker's ability to do high-grade work which meets quality standards.)

- ☐ 1. Performance is inferior and almost never meets minimum quality standards.
- ☐ 2. The grade of his work could stand improvement. Performance is usually acceptable but somewhat inferior in quality.
- ☐ 3. Performance is acceptable but usually not superior in quality.
- ☐ 4. Performance is usually superior in quality.
- ☐ 5. Performance is almost always of the highest quality.

C. How accurate is he in his work? (Worker's ability to avoid making mistakes.)

- ☐ 1. Makes very many mistakes. Work needs constant checking.
- ☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.
- ☐ 3. Makes mistakes occasionally. Work needs only normal checking.
- ☐ 4. Makes few mistakes. Work seldom needs checking.
- ☐ 5. Rarely makes a mistake. Work almost never needs checking.

D. How much does he know about his job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with his work.)

- ☐ 1. Has very limited knowledge. Does not know enough to do his job adequately.
- ☐ 2. Has little knowledge. Knows enough to "get by."
- ☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.
- ☐ 4. Has broad knowledge. Knows enough to do good work.
- ☐ 5. Has complete knowledge. Knows his job thoroughly.

E. How much aptitude or facility does he have for this kind of work? (Worker's adeptness or knack for performing his job easily and well.)

☐ 1. Has great difficulty doing his job. Not at all suited to this kind of work.

☐ 2. Usually has some difficulty doing his job. Not too well suited to this kind of work.

☐ 3. Does his job without too much difficulty. Fairly well suited to this kind of work.

☐ 4. Usually does his job without difficulty. Well suited to this kind of work.

☐ 5. Does his job with great ease. Exceptionally well suited for this kind of work.

F. How large a variety of job duties can he perform efficiently? (Worker's ability to handle several different operations in his work.)

☐ 1. Cannot perform different operations adequately.

☐ 2. Can perform a limited number of different operations effeciently.

☐ 3. Can perform several different operations with reasonable efficiently.

☐ 4. Can perform many different operations efficiently.

☐ 5. Can perform an unusually large variety of different operations efficiently.

G. Considering all the factors already rated, and only these factors, how acceptable is his work? (Worker's "all-around" ability to do his job.)

☐ 1. Would be better off without him. Performance usually not acceptable.

☐ 2. Of limited value to the organization. Performance somewhat inferior.

☐ 3. A fairly proficient worker. Performance generally acceptable.

☐ 4. A valuable worker. Performance usually superior.

☐ 5. An unusually competen t worker. Performance almost always top notch.

FACT SHEET

Job Title: Pants Presser (any ind.) 363.782-018

Job Summary: Operates one or more cycled pressing machines that impresses permanent creases in pant legs and body portion of work pants, uniform pants, casual or dress slacks.

Work Performed: Removes garment from pile and spreads garment on buck of pressing machine. Folds one pant leg back so that only one leg is pressed at a time and arranges pant leg so that side and inner seams coincide as necessary. Smooths out wrinkles by hand. Depresses foot pedal to lower machine head onto positioned pant leg (machine is pre-set for desired temperature of steaming and length of time for pressing). Removes pants from buck and repeats operation for other leg.

Places body portion of pants whose legs have been pressed onto body press. Smooths out wrinkles by hand. Depresses foot pedal to lower pre-cycled machine head onto buck and pant body. Repeats as necessary to press entire periphery of body section of the garment.

Repeats operation for first leg of second pair of pants while part of body of first pair is being pressed.

Rotates first pair of pants on body press while first leg of second pair is being pressed, smooths out wrinkles and depresses pedal to lower head.

Repeats operation for second leg of second pair while first pair is in final stage of body press.

Removes completed work piece from body press and hangs pressed pants on snap-hangers of conveyor routed through baking ovens.

Pants material has been treated chemically before cutting, sewing and pressing; incorrect creases cannot be effectively corrected after pants have been pressed and definitely not after baking has been completed.

May tend only one body or one leg press depending upon method established by plant operating procedure. This depends upon weight of material being processed. NOTE: In situations where one worker operates more than one leg press or a combination of leg and body presses, the pressing functions are integrated with respect to the time cycle of the leg press operational cycle.

Buck Lower padded portion of pressing machine (comparable to an ironing board in intent).

Effectiveness of Norms: Only 64% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the S-409 norms, 83% would have been good workers. Thirty-six percent of the nontest-selected workers used for this study were poor workers. If the workers had been test-selected with the S-409 norms only 17% would have been poor workers.

Applicability of S-409 Norms: The aptitude test battery is applicable to jobs which include a majority of duties described above.

GPO 860-994

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