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               Presser, Machine 7-57.511; Wool Presser 7-57.511;
               Shirt Presser 7-57.512; Garment Examiner 7-57.562 --
               Technical Report on the Standardization of the
               General Aptitude Test Battery.
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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.
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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

Sewer, Hand II	6-25.050
Dry Cleaner, Hand	7-57.101
Presser, Machine	7-57.511
Wool Presser	7-57.511
Shirt Presser	7-57.512
Garment Examiner	7-57.562

B-237 or S-25

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S-25

Summary

The GATB (except Part E) was administered to 33 workers employed at the Zenith Laundry, Dallas, Texas. Twenty-five of these workers were female and 8 were male. The criterion consisted of the combined ratings of three plant supervisors. The significant aptitudes for these jobs were found to be Finger Dexterity and Manual Dexterity.

Norms

GATB Norms for Zenith Laundry Workers S-25

Table I shows the minimum acceptable score for each aptitude included in the test norms for Sewer, Hand II 6-25.050, Dry Cleaner, Hand 7-57.101, Presser, Machine 7-57.511, Wool Presser 7-57.511, Shirt Presser 7-57.512 and Garment Examiner 7-57.562.

TABLE I

Minimum Acceptable Scores for B-1001

Aptitude	Tests	Minimum Acceptable Aptitude Score (Total of Converted Test Scores)
F	CB-1-O CB-1-P	70
M	CB-1-M CB-1-N	75

Effectiveness of Test Norms

The data in Table V show that 23 of the 27 good workers, or 92 percent of them made qualifying test scores. If the recommended test norms had been used for selection, 4 of the 8 poor workers, or 50 percent of them, would not have been hired.

TECHNICAL REPORT

I. Problem

The study was conducted to determine the best combination of aptitudes and minimum scores to be used as GATB norms for the occupations of Sewer, Hand II 6-25.050, Dry Cleaner, Hand 7-57.101, Presser, Machine 7-57.511, Wool Presser 7-57.511, Shirt Presser 7-57.512 and Garment Examiner 7-57.562.

II. Sample

The sample consisted of 33 employed workers, including 25 women and 8 men, at the Zenith Laundry, Dallas, Texas. These workers were employed in various jobs in the Zenith plant, and were interchanged among these jobs. Management stated that a worker could perform any of the operations of any job. The training time was 30 days for each job. The workers were selected on the basis of an interview. No tests were used for selection purposes.

Table II shows the means (M), standard deviations (σ), range, Pearson product-moment correlations corrected for broad categories with the criterion ($_c r$) and standard errors of correlation ($\sigma_c r$) of age, education, and experience for this sample.

TABLE II

Means (M), Standard Deviations (σ), Range, Product-Moment Correlations and Standard Errors of Correlation ($\sigma_c r$) for Age, Education, and Experience

N = 33

	M	σ	Range	$_c r$	$\sigma_c r$
Age (years)	37.5	10.2	21-75	-.17	.17
Education (years)	9.4	2.6	4-12	.02	.01
Experience (months)	41.2	50.2	1-210	.21	.17

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There appears to be no significant relationship between the criterion and age, education, or experience. Some of the workers are older than desirable for inclusion in a sample for test development purposes. However, it was necessary to retain these workers in the sample in order for the sample to be of sufficient size for statistical analyses.

III Job Descriptions

Sewer, Hand II   6-25.050

Job Summary

Alters and repairs all types of garments in a dry cleaning plant: lengthens or shortens sleeves, dresses, and trousers by hand and with sewing machine; alters belts, waist bands, and collars; repairs ripped or torn places in garments by hand and machine; replaces worn pockets of trousers and other garments.

Dry Cleaner, Hand 7-57.101

Job Summary

Removes spots and stains from silk, rayon, woolen, and other garments: observes, feels, and smells stains or spots to determine their source or cause; sprays necessary portion of garment with spotting gun when necessary to cause spot to appear more vividly; removes spots and stains with soap and water if those solvents are appropriate; selects other cleaning solvents appropriate to spots and stains and removes spots and stains with them using sponges and brushes.

Presser, Machine   7-57.511

Job Summary

Presses silk and rayon garments with a pressing machine, puff iron, and hand iron: positions portion of garment on buck of press and smooths out wrinkles with hands; lowers pressing head on buck by moving foot pedal and locks into position; admits steam to head and buck by pulling hand valve and moving foot pedal; removes excess steam and moisture from garment by stepping on vacuum foot

pedal; releases foot pedal to allow head to return to a raised position; shifts position of garment on buck and repeats pressing process until entire garment is pressed; presses sleeves of coats and dresses not to be creased by inserting a sleeve board into one sleeve at a time and holding this portion of garment under pressing head while applying steam by pulling hand valve, thus pressing without creasing. Smooths and shapes shoulders or any portions of garment that cannot be satisfactorily pressed on flat press by sliding these portions back and forth over a heated puff iron. Hand irons portions of garment too delicately assembled or embellished to be machine-pressed. Hangs pressed garments on a nearby rack for inspection.

Wool Presser 7-57.511

Job Summary

Presses men's and women's woolen apparel with a steam-heated pressing machine: positions portion of garment on padded buck of steam press; smooths out wrinkles with hands, lowering head of press and locking into position by stepping on pedal; presses lever on top of pressing head with hand, to admit steam, which is pulled through the garment by stepping on vacuum pedal; releases foot lock to allow head of press to return to normal position; moves garment around buck and repeats pressing operation until entire garment is pressed; presses sleeves of coats and dresses, not to be creased, by inserting sleeve board into sleeve, positions on buck and presses steam pedal   to allow steam to go upward through sleeves, thus pressing without creasing; steams shoulders of coat by inserting hand pad inside of shoulder; presses pad and garment against head of buck with one hand and presses lever on top of press for a few seconds with other hand to admit steam; changes position of pad to other portion of shoulder if necessary and presses in same manner; hangs pressed garment on nearby rack for inspector.

Shirt Presser 7-57.512

Job Summary

Finishes dress shirts, using a series of pressing machines known as a shirt unit: arranges collar of shirt on buck of collar press, clamping into position with wire holder while arranging shirt cuffs on cuff press in preparation for pressing; stretches collar and cuffs with hands to remove excessive wrinkles; lowers pressing head over collar and cuffs, locking into position for pressing; moves to adjoining machine and arranges another shirt on press for pressing bosom or back of shirt while collar and cuff press remains locked; stretches bosom of shirt over buck of press with hands, clamping collar around one end of buck, simultaneously stretching tail to remove wrinkles and clamping into position for pressing; lowers pressing head onto shirt and locks into position; moves to third press of unit and arranges back of another shirt on buck of press in preparation for pressing; stretches back of shirt over buck with hands to remove wrinkles; lowers buck of press onto shirt and locks into position; removes pressed shirts from presses as they automatically open and hangs on rack near folder to make room for other shirts on press.

Garment Examiner 7-57.562

Job Summary

Examines men's and women's cleaned and pressed wearing apparel to determine if garments have been properly processed: pushes garments with both hands along rack to own working area to inspect for inferior workmanship and any special request as listed on identification tag; examines each garment, separately, while hanging on rack to locate spots, stains, inadequate pressing, also inspecting attached identification tag to ascertain if garment needs repairs, alterations or buttons replaced; returns improperly processed garment to appropriate worker for refinishing; removes all satisfactory processed garments, and hangs men's and women's garments on separate designated racks for checker.

On the basis of the job summaries, it is believed that the following aptitudes are significant:

Form Perception (P) - for inspecting garments to detect and identify stains and spots and to make certain that garments have been properly processed.

Finger Dexterity (F) - For sewing, spotting and hand pressing operations.

Manual Dexterity (M) - For manipulation of levers and other parts of pressing and sewing machines and other processing equipment; for handling of garments in sewing, pressing and cleaning operations.

IV. Experimental Battery

All the tests in the General Aptitude Test Battery, except Part E, were administered to the sample group.

V. Criterion

The criterion was based on independent ratings by the superintendent and two xfxthx foremen of the plant. The basis for the ratings was a combination of time studies and a comparison of the workers by observing them on the job. There was complete agreement among the three raters. The criterion was in broad categories, and the qualitative ratings were converted to numerical scores for correlational purposes. In the sample of 33, there were 8 in the High group, 17 in the Middle group, and 8 in the Low group.

VI. Statistical and Qualitative Analysis

Pearson product-moment correlation coefficients, corrected for broad categories, with the criterion were obtained so that significant aptitudes could be ascertained as accurately as possible in terms of a criterion expressed in broad categories.

Table III shows means, standard deviations, correlations with the criterion, and standard errors of correlation for the aptitudes of the GATB. Table IV shows the means, standard deviations, standardized means, standardized standard deviations, correlations with the criterion, and standard errors of correlation

for the tests of the GATB.

The means and standard deviations of the aptitudes and the standardized means
and standard deviations of the tests are comparable to the general population
norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), Product-Moment
Correlations (corrected for broad categories) with the Criterion,
($_c r$), and Standard Errors of Correlations ($\sigma_{c} r$) for the
Aptitudes of the GATB

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N = 33

	Aptitudes	M	σ	$_c r$	$\sigma_{c} r$
G	Intelligence	79.6	18.5	.17	.17
V	Verbal Aptitude	80.5	16.8	.10	.17
N	Numerical Aptitude	76.7	20.6	.21	.17
S	Spatial Aptitude	84.4	14.5	.08	.17
P	Form Perception	74.4	19.8	.16	.17
Q	Clerical Perception	71.0	20.9	.26	.16
A	Aiming	71.7	23.8	.28	.16
T	Motor Speed	66.3	23.4	.26	.16
F	Finger Dexterity	90.0	19.6	.40	.15
M	Manual Dexterity	96.5	19.7	.49	.13

TABLE IV

Means (M), Standard Deviations (σ), Standardized
Means (M'), Standardized Standard Deviations (σ'), Product-Moment
Correlations (corrected for broad categories) With the
Criterion ($_cr$), and Standard Errors of Corre-
lation (σ_cr) For the Tests of the General Aptitude Test
Battery

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N = 33

Test	M	σ	M'	σ'	$_cr$	σ_cr
A Tool Matching	13.6	6.0	74	21	.18	.17
B Name Comparison	42.1	20.9	71	21	.26	.16
C H-Markings	36.8	7.3	80	20	.28	.16
D Computation	17.7	8.2	77	21	.18	.17
F Two-Dimensional Space	14.2	6.4	79	16	.16	.17
G Speed	108.8	24.4	74	24	.22	.17
H Three-Dimensional Space	12.7	4.9	86	14	.07	.17
I Arithmetic Reason	5.6	3.2	82	18	.24	.16
J Vocabulary	11.9	7.8	80	17	.10	.17
K Mark Making	55.1	12.3	69	25	.27	.16
L Form Matching	18.6	6.8	80	17	.19	.17
M Place	87.3	7.8	98	18	.40	.15
N Turn	98.7	10.3	94	24	.49	.13
O Assemble	26.0	4.4	93	19	.40	.15
P Disassemble	26.5	3.9	87	21	.26	.16

The statistical results were interpreted in the light of significant aptitude
requirements as indicated in the job descriptions. The statistical analysis

indicates that of the aptitudes measured by the GATB, M (Manual Dexterity) and

F (Finger Dexterity) appeared significant based on high means, standard deviations.

significant correlations with the criterion and the job analysis data. Although

Aptitude P is indicated by the job analysis data as significant for some of the

duties, there is no statistical evidence of the significance of Aptitude P.

The correlations of .40 for Aptitude F and a .49 for Aptitude M are significant at the 5% level of confidence and 1% level respectively. None of the other correlation coefficients in Table III are significant.

Test norms were established by setting minimum scores approximately one standard deviation unit below the means of Aptitudes F and M. This resulted in norms consisting of Aptitudes F and M with minimum scores of 70 and 75 respectively. The relationship between these norms and the criterion was determined by means of the tetrachoric correlation and Chi Square techniques. For the application of these techniques the criterion was dichotomized with the high and middle groups designated as "good workers" and the low group as "poor workers." Table V shows the relationship between the test norms and the criterion.

TABLE V

Relationship Between Test Norms Consisting of Aptitudes F and M With Critical Scores of 70 and 75 Respectively and the Criterion For Zenith Laundry Workers
N = 33

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	2	23	25
Poor Workers	4	4	8
Total	6	27	33

$$r_{tet} = .76 \qquad x^2 = 4.64$$
$$\sigma r_{tet} = .35 \qquad p/2 = < .025$$

The data in Table V show that the relationship between the test norms and the criterion ratings is significant. The tetrachoric correlation of .76 with a standard error of .35 shows that the norms have good predictive value for the criterion. A Chi Square value of 4.64 which yields a p/2 value of less than .025 indicate that

there are less than 25 chances in 1,000 that this relationship occurred by chance.

VII. <u>Conclusions</u>

1. On the basis of mean scores, correlations with the criterion, and job analysis data, it is recommended that Aptitudes F and M with minimum scores of 70 and 75 respectively be used as test norms for the occupations of Sewer, Hand II 6-25.050, Dry Cleaner, Hand 7-57.101, Presser Machine 7-57.511, Wool Presser 7-57.511, Shirt Presser 7-57.512 and Garment Examiner 7-57.562.

2. It is further recommended that check studies on additional and preferably larger samples of workers in the occupations listed above be conducted to verify the applicability of the recommended test norms.