

VOCATIONAL TESTS FOR RETAIL SALESWOMEN

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The purpose of this investigation was to obtain, if possible, a vocational correlation for sales ability of the lower grade, particularly of that type found in a retail department store.

The subjects of the experiment were a group of eighteen saleswomen in one of the largest department stores of New York City, who formed a class in salesmanship. These women had all been selling for an appreciable length of time and had been chosen for instruction by their respective buyers because of the promise they showed in their work. They were employed in various departments of the store, linings, veilings, notions, art embroidery, infants' wear, dresses, waists, underwear, handkerchiefs, etc., and received salaries that (including commission) varied from \$16.00 to \$8.00 per week.

The group was tested with a list of thirteen tests, eleven of which were standard tests. Two were devised by the experimenter, and were based upon a similar test used by Munsterberg¹ upon salesmen.

The standard tests were

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|-------------------------------|--------------------|
| 1. Trabue Completion-scale A | 6 Substitution |
| 2. Number Checking | 7. Color Naming |
| 3. Opposites | 8. Hard Directions |
| 4. Mixed Relations | 9. Knox Cube |
| 5. Verb Object | 10. Cancellation |
| 11. Association-Kent-Rosanoff | |

The new tests were rearrangements tests. Two lists—one of animals, the other of cities—were presented, with however the letters of the word in each case in random order, thus, skunk-shnkuk, Bombay-yabmbo. The lists were arranged in an order of increasing difficulty and the group instructed to reconstruct the words, passing regularly down the list, but skipping any word that presented too great difficulty. They were limited to ninety seconds for each list and were informed as to whether it was animals or cities they were to look for.

¹Burt, H. E. *Journal of Applied Psychology*, Sept., 1917

REARRANGEMENT TESTS

Animals		Cities	
snkuk	skunk	yabmbo	Bombay
niol	lion	sarip	Paris
rede	deer	Indono	London
tgrei	tiger	tosbon	Boston
barze	zebra	ksnaas	Kansas
selwae	weasel	gabdda	Bagdad
bnsio	bison	beuqca	Quebec
leum	mule	tyor	Troy
seomu	mouse	latcatuc	Calcutta
shroe	horse	caghuoc	Chicago
goroanka	kangaroo	tnotrne	Trenton
delopra	leopard	karnwe	Newark
haplente	elephant	bylana	Albany
kmyeon	monkey	lbnire	Berlin
duonh	hound	revdne	Denver
ycteo	coyote	nanpaolsi	Annapolis
lqriurse	squirrel	tnosuho	Houston
kunmpchi	chipmunk	remitlabo	Baltimore
rotligala	alligator	tormlean	Montreal
laglroi	gorilla	sbucouml	Columbus
tinram	martin	satleet	Seattle
lettru	turtle	fatrdohr	Hartford
clreioicdo	crocodile	dartplnod	Portland
peatnole	antelope	rimdonhc	Richmond

The remainder of the tests, except color-naming and Knox Cube, were given as group tests and in orthodox fashion, the time limit being that of the first subject finished for all but the Trabue Completion, for which four minutes were allowed. In the association test everyone was permitted to complete the hundred associations. Color naming and Knox Cube were given to each member of the group individually. The group was tested over a period of six weeks, at ten o'clock in the morning.

Seven objective ratings of each member of the group were obtained. These were

1 *Buyer's estimate.* The buyer under whom each girl worked and who was personally well acquainted with her work was visited and asked to construct a scale of sales ability and to locate the girl upon it. The scale was made by asking the buyer to place at 1 the best salesgirl he had ever known, at 5 the poorest, at 3 one midway between the extremes, and at 2 and 4 women between 1 and 3 and 3 and 5 respectively. Then he was asked to compare the girl in question with the people on the scale and to locate her by this comparison. The group was then arranged in order of merit according to the positions of the individuals upon these scales.

The accuracy of this final order is somewhat doubtful, inasmuch as the varying tempers and temperaments of some fourteen buyers, their antagonism to, interest in, or indifference to the experiment and the experimenter, and their varying standards of sales-ability make for many sources of error, especially when an attempt is made to render their divers judgments into a homogeneous whole

2 *Salary* The group was ranked according to salary. This ranking is not as valuable as at first glance it may seem to be, inasmuch as length of service, age and department are as potent wage determinants as actual sales ability.

3 *Teacher's ranking for salesmanship* This ranking was made by the teacher of the salesmanship class at the end of the six weeks course, during which time the teacher had seen the group every day. It was the result of her knowledge, through actual observation, of their selling on the floor, her observation of their class performance, of an examination given by her at the close of the course, and of a detailed report submitted to her by the buyer and section manager of each woman.

4 *Ranking for General Intelligence* by the teacher

5 *Average ranking* The average of the ranks in salary, and buyer's and teacher's estimate of sales ability was calculated and the group arranged in an order of merit according to this average position.

6 *General rating* At the time of testing each woman was interviewed and her age, education, nationality, i.e., whether native or foreign born, selling experience, period of employment in her present position, weekly salary, average weekly commissions, and the department in which she worked, were ascertained. This information was placed upon a card, one for each woman, together with her rating for salesmanship and intelligence by the teacher and for salesmanship alone by the buyer. These cards were submitted to thirty-seven students of a graduate course in Advertising and Selling at Columbia University with instructions to arrange the cards in an order of merit, judging each girl for her sales ability on the basis of all the information on each card.

7. The seventh, called *Selected Group Judgment*, is a refinement of the sixth. Of the group of thirty-seven students twenty-two had had experience in either hiring or handling sales people or had actually been salesmen themselves, fifteen had had absolutely no experience whatsoever. These fifteen

were eliminated and an average ranking for each saleswoman obtained from the judgments of the smaller selected group.

The value of these seven measurements varies. By far the most valid, it would seem, are the teacher's judgments of the group, based as it is on an all round and fairly intimate knowledge of all the subjects. Its value is further confirmed by the fact that it shows a correlation of only $+ .28$ with the judgments for general intelligence, which indicates that it was something other than general intelligence itself upon which ability to sell was judged. That this other something was a quality recognized by the teacher and buyer in common and may therefore be inferred to be actual sales ability is evidenced by the fact that the coefficient of correlation between the teacher's judgment of sales ability and the buyers' was $+ .43$.

The teacher's judgment of intelligence is valid, of course, and interesting, but is not so valuable for the purposes of this experiment. The reasons for the unreliability of salary and buyers' estimates have already been discussed and need not be repeated. The average rank, composite that it is, of salary, buyers' estimates and teacher's judgment of sales ability strikes a point somewhere between the invalidity of the first two measurements and the accuracy of the last.

The last two measurements and particularly that of the selected group present a more truly composite picture than the average ranking. They are based on a complete sales history of each individual, are made by fairly competent judges, and may be considered of equal value with the teacher's judgment of salesmanship, with which indeed the sixth correlates $+ .86$ and the seventh $+ .89$. The two judgments—teacher's and group—supplement and correct each other, for what the one gains by personal knowledge is equalled in the other by the added accuracy and freedom from errors of individual judgments which group averages give.

The scores made in the thirteen tests were ranked for each test and correlated with the seven objective ratings by the Spearman formula.² Table I below presents the coefficients of correlation between performance in these tests and actual sales ability as indicated by the seven objective methods of ascertaining it.

The correlations of the tests with the buyers' estimates and with salary indicate for the most part a chance relationship and are consequently not significant. Some such results were to have been expected from the unreliability of both methods

² Used throughout in the experiment

TABLE I.³

Tests	Buyer	Salesmanship	Teacher Intelligence	Salary	Average	General Rating	Selected group
Completion	—	40	81	.01	.12	.43	.51
No Checking	29	43	15	—	.13	.37	41
Opposites	26	.65	52	.30	.55	.59	62
Mixed Relations	—	50	69	.05	32	.55	66
Rearrang. Animals	05	45	58	23	.31	.53	52
Rearrang. Cities	—	38	35	07	17	.30	42
Verb Object	20	21	55	03	.29	.51	.47
Substitution	—	15	20	—	.13	.13	.35
Color naming	07	.31	30	11	.21	.39	31
Directions	—	41	64	—	14	.25	09
Knox Cube	13	12	61	.06	.06	.27	.43
Cancellations	49	41	01	—	.33	.28	42
Association—Individ	53	01	—	57	.16	.30	—
			32		.48		33

³ The probable errors for these Coefficients are as follows.

Probable errors for Formula $r = 1 - \frac{6 \sum D^2}{n(n^2 - 1)}$ when n is 18

r	P. E.	r	P. E.
.00	.166	.50	.125
.10	.165	.60	.107
.20	.159	.70	.085
.30	.151	.80	.059
.40	.139	.90	.031

TABLE 2
TEAM CORRELATIONS

Sales Ability		Intelligence	
1 Teacher	2 Selected Group	3 Av of Teacher and Selected Group	
Opposites . . . 65	Opposites . . . 62	Opposites . . .	62
Relations . . . 50	Relations . . . 66	Relations . . .	
Rearrang Animals 45	Rearrang Animals 52	Rearrang Animals . . 58	
No Checking . . 43	Completion . . 51	Completion . . 81	
Cancellation . . 41	Verb-Obj . . 47	Directions . . . 64	
Directions . . 41			
.76			

of estimation Individuality of association alone shows a relatively high positive correlation with these two, $+.53$ with the buyers' judgment and $+.57$ with salary.

The other measurements, in which we seem justified in placing a greater degree of confidence, show coefficients whose general character is much higher and positive. The average ranking of course produces a coefficient that is not so low as salary and buyer coefficients and not so high as that obtained from the teacher's estimate. It is an interesting and pertinent fact worthy of note here, that, whereas the group judgment is fairly high throughout, in almost every case correlation with the new order obtained from the selected group raised the coefficients to a marked degree.

If from the tests we select those which gave the six highest correlations for the teacher's judgment of sales ability, those which gave the five highest for intelligence and also those which gave the five highest for selected group judgment, average the rankings of each of these groups and correlate these averages with their respective measurements we obtain a group which correlates $+.76$ with sales ability as judged by the teacher and a slightly different group which correlates $+.69$ with sales ability as judged by the selected group.

Three tests of these two groups are identical for both groups, —mixed relations, opposites, and rearrangement of animals. When the average ranks of these three tests were ranked and correlated with the ranks obtained from an average of the teacher's judgment for sales ability and that of the selected group a coefficient of $.62$ was obtained. The team for intelligence gives a coefficient of $.75$. See Table 2.

TABLE 3

JUDGMENT CORRELATIONS

	Salary	Teacher		Average	General Rating	Sel Group
		Sales	Intell			
Buyer ..	24	43	— 01	76	67	47
Salary		20	02	63	28	19
Teacher S. .			28	73	86	89
Teacher I . .				34	68	77
Average					88	74
General Rating						97

The evidence throughout the experiment seems to indicate that the type of sales ability called for in a retail department store is a fairly measureable function in terms of mental tests, with which it shows a definite tendency to correlate positively. Vocational selection may very well be made upon the evi-

dence of performance in such tests, and our results point to three in particular,—mixed relations, opposites and rearrangement of animals—which may be used with an accuracy of $+.62$ in such selection. Of course the group used in this experiment is too small for the absolute values obtained in correlation to have any binding significance, but the direction, at least, in which these values point, is unmistakable and indicates that the field of retail salesmanship is one open to much profitable investigation by the vocational psychologist