

12-1-1992

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## 16PF Traits and Work Performance Among Restaurant Workers

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December, 1992

Personality traits have been linked to work performance in a variety of jobs. For as many restaurants as there are in every major city, little is known about the traits that characterize the success of their personnel. Personality traits are thought to be especially relevant to restaurant work because, in the case of the wait staff, interaction with the public is a major part of the job. In the case of the kitchen staff, it is necessary to work under conditions of heat and work load stress, while at the same time make each meal turn out exactly the way it was intended on the menu. The restaurant trade is also susceptible to high turnover, suggesting that the person-job fit for most employees is less than adequate.

The purpose of the present study was to assess the traits relevant to performance among restaurant workers. Consistent with past 16PF validation efforts, the analytic objectives were (a) to present a profile of 16PF mean scores and determine whether those means differed significantly from the general population, (b) to compare a new sample of cooks against a profile of means for restaurant cooks collected on an earlier occasion (Cattell et al., 1970), and (c) to assess the correlations between trait scores and ratings of work performance.

### Method

Sixteen employees of a pizza restaurant volunteered to participate in this study. Six of the group were cooks. The other nine subjects consisted of six wait staff, one delivery driver one bus person/host, and one phone receptionist/cashier. Altogether there were 11 males and 4 females.

All participants completed the 16PF Form S. A standardized performance evaluation was used to measure the subjects' job performance on five scales: Work Output, Quality of Work, Versatility, Dependability, and Cooperation. All scales were behaviorally anchored rating scales with a range from 1 to 5. Anchors were given at scale values 1, 3, and 5. The scales were calibrated such that values of 3 and above indicated acceptable performance levels and values of 1 and 2 were unacceptable. The general manager of the restaurant completed the performance evaluations.

## Results

### Profile for Cooks from 16PF Handbook

Because the sample 42 cooks and kitchen staff from Cattell et al. (1970) was to be used as reference sample, the first set of statistical analyses were to determine which traits distinguished that group from the general population. Table 1 shows the set of 16PF trait means and one-sample  $t$  tests. Compared to the general population, that sample of cooks was warm and outgoing (A+), concrete in their thinking (B-), emotionally stable (C+), sensitive (I+), trusting (L-), practical (M-), unpretentious (N-), conservative and traditional (Q1-), group or team oriented (Q2-), and self-controlled (Q3+). On the basis of these results it was further hypothesized that the same distinguishing traits would be found among the present sample of pizza restaurant personnel, and that many of the same traits would be related to work performance for the present sample.

### Comparison of New and Old Profiles

Table 2 shows the profiles of means for the new group of cooks and the new group of servers and other restaurant personnel. One-sample  $t$  tests were used to compare each group's trait means against the general population. Independent groups  $t$  tests were also used to compare cooks against others. In light of the large number of statistical tests made, on the one hand, and the small sample size on the other hand, a critical alpha level of .05 was used to determine statistical significance.

Compared to the general population the new sample of six cooks was emotional (C-) and shy (H-). Servers were more abstract in their thinking (B+), and more sensitive (I+) than the general population. Comparisons between the two groups showed that servers were more outgoing (A+), less shy (H+), more sensitive (I+), and more extraverted overall compared to cooks.

The comparison between the new sample of cooks and the Handbook sample showed four significant differences (Table 3). Compared to the Handbook sample, the new sample was more emotional (C-), more shy (H-), more tough minded (I-), and less group oriented (Q2+). All four differences contradicted the Handbook profile.

### Correlates of Work Performance

Each of the five performance indices were considered separately, and the sum of performance ratings was also used as a criterion. In the first stage of analysis, bivariate correlations between trait scores and performance were calculated using the entire sample of 15 cases. In light of the low statistical power, a critical alpha level of .10 was used for these analyses. In the second stage of analysis, the significant traits for each criterion were combined into a unit-weighted composite predictor variable. Only primary traits were used in the composites.

People who were rated as producing more work were found to be

more intelligent (B+), sensitive (I+), and self-disciplined (Q3+). They also scored at the sensitive or emotionally expressive pole of the second order trait tough poise. The correlation coefficient between the unit-weighted combination of three primary traits was high ( $\underline{r} = .72$ ,  $\underline{p} < .01$ ). Results of the analyses with work performance appear in Table 4.

Work quality was correlated with one primary trait, openness to experience (Q1) and the creativity composite.

Three traits were related to Versatility: emotional stability (C+), openness to experience, (Q1+), and self-discipline (Q3+). The unit-weighted composite of these three traits was highly correlated with versatility ratings ( $\underline{r} = .67$ ,  $\underline{p} < .01$ ). Self-discipline (Q3+) was the only trait related to Dependability. Cooperation was related to two traits: C+ and Q1+. The same combination of three traits (C+, Q1+, Q3+) was highly correlated with total performance ratings ( $\underline{r} = .69$ ,  $\underline{p} < .01$ ).

#### Formula Cross-Validation

If the results of the foregoing analyses were to be put in the form of a regression equation for use in personnel selection, it is desirable to perform a check on the stability of the results when they are transferred to different samples of similar workers. The use of unit-weighted composites circumvents the problem of empirical weights capitalizing on chance characteristics of the sample. The remaining question is whether the overall  $\underline{r}$  coefficients are greatly susceptible to sampling errors and the presence of outliers in the sample. Because of the small sample size, conventional cross-validation was impossible. Therefore, the Browne cross-validation formula (Darlington, 1990) was applied to the unit-weighted  $\underline{r}$  coefficients for work output and total performance. The unit-weighted composites were treated as one-variable models.

The application of the Browne formula resulted in a "true population  $\underline{r}$ " of .78 for work output and a "true population  $\underline{r}$ " of .76 for total performance. The slight increase in  $\underline{r}$  occurs occasionally in ordinary cross-validation analysis when the hold-out sample is more homogenous than the calibration sample. In our experience, an increase in  $\underline{r}$  with the Browne formula does occur occasionally; a full explanation as to what conditions would generate this result is not available at this time.

The cross-validation  $\underline{r}$  values were used in the following formulae which convert 16PF trait scores, which are calibrated in stens, to predicted values of work output and total performance:

$$\text{Work Output} = .13(B + I + Q3) + 0.68$$

$$\text{Total Performance} = .46(C + Q1 + Q3) + 8.00$$

Predicted work output scores generated through the formula will take on values of the original 1 to 5 scale. Predicted total performance scores generated through the formula will take on values

of the original 5 to 25 scale.

### Discussion

Because of the small sample size in the present study and the discrepancies between the 16PF profile of the new sample of cook with the previous Handbook sample, we would not draw any generalizations about the distinguishing traits of restaurant cooks. Furthermore, it is not advisable to pool the mean scores for the new sample with the previous sample.

A few consistent linkages were found, however, between 16PF traits and work performance, and all findings make sense in the context of the particular work organization under study. The restaurant is loosely managed such that employees are not supervised closely. They are given general instructions about how to do their work, but each employee must work out the details of how he or she will successfully complete job tasks. Thus B+ and Q1+ traits augment success. Furthermore, the best worker is one who will keep up the work pace without close supervision; thus Q3+ is important.

The validity coefficients obtained in this study were strong, but confined to a limited type of restaurant with a particular management style. It is unclear how well the findings obtained here will generalize to other settings. Future studies could be broadened to incorporate several types of restaurants and to consider other variables such as the employee's prior restaurant experience, whether the job is full or part time, and how long the employee intends to remain in such an occupation. A useful long-term study could determine which personality factors would predict employee turnover in restaurants.

### REFERENCES

- Cattell, R. B., Eber, H. W., & Tatsuoka, M. M. (1970). Handbook for the 16PF. Champaign, IL: Institute for Personality and Ability Testing.
- Darlington, R. B. (1990). Regression and linear models. New York: Wiley.

Table 1  
Cooks Compared to the General Population<sup>a</sup>  
(N=42)

Factor	<u>m</u>	<u>SD</u>	<u>t(pop)</u>
A	6.3	1.8	2.857**
B	4.9	0.9	-4.286**
C	6.8	1.2	6.842**
E	5.0	2.4	-1.351
F	4.4	2.4	2.973
G	5.4	1.5	-0.435
H	6.0	2.8	1.63
I	6.4	2.1	2.813**
L	4.3	2.1	-3.750**
M	4.3	1.5	-5.217**
N	4.5	1.8	-3.571**
O	4.4	3.0	-2.391
Q1	3.8	1.2	-8.947**
Q2	4.1	1.2	-7.368**
Q3	6.8	1.2	6.842**
Q4	5.3	2.1	-0.625

Notes.

<sup>a</sup>Cattell et al. (1970)

\*\*p<.01,

Table 2  
Comparisons of Cooks and Servers  
Against Population and Between the Two Groups

Factor	<u>N=6 Cooks</u>			<u>N=9 Servers</u>			<u>t<sup>a</sup></u>
	<u>m</u>	<u>SD</u>	<u>t(pop)</u>	<u>m</u>	<u>SD</u>	<u>t(pop)</u>	
A	4.7	1.8	-1.04	6.9	1.7	2.30	2.24*
B	5.8	2.5	0.29	6.3	1.5	-4.05**	0.45
C	3.8	0.7	-5.39**	4.9	1.1	-1.56	1.95
E	4.7	1.8	-1.04	5.0	2.2	-0.66	0.29
F	4.5	2.0	-1.12	6.4	1.6	1.71	1.97
G	5.5	1.5	0.00	5.1	2.0	-0.50	-0.38
H	3.7	1.4	-3.00*	5.4	1.2	-0.15	2.51*
I	4.7	1.1	-1.66	7.3	1.9	2.65*	2.84*
L	5.7	2.2	0.11	6.0	2.0	0.70	0.28
M	5.5	1.4	0.00	5.7	1.9	0.25	0.17
N	5.8	1.6	0.47	5.8	2.6	0.30	-0.04
O	6.0	1.6	0.68	5.8	1.6	0.51	-0.25
Q1	5.3	2.4	-0.16	5.6	1.4	0.12	0.21
Q2	6.3	1.3	1.48	6.3	1.7	1.38	0.00
Q3	5.8	1.7	0.44	5.9	1.5	0.72	0.06
Q4	4.7	1.8	-1.04	5.1	2.0	-0.72	0.41
Impression	6.0	0.6	1.92	5.2	1.6	-0.56	-1.10
Management							
Extraversion	40	19	-1.73	59	9	1.00	2.40*



Anxiety	61	12	1.05	57	16	0.24	-0.52
Tough Poise	59	18	0.50	42	17	-1.81	-1.75
Independence	47	19	-0.95	55	14	0.07	0.93
Neuroticism	51	19	-0.46	53	14	-0.35	0.22
Leadership	48	8	-1.83	59	13	0.74	1.06
Creativity	57	18	0.25	58	16	0.43	0.11
Control--	57	15	0.31	54	14	-0.14	-0.33
Second Order							

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Notes.

<sup>a</sup>Cooks vs. Servers

\* $p < .05$ , \*\* $p < .01$

Table 3  
Comparison of 6 New Cooks vs. 42 Old Cooks<sup>a</sup>

Factor	<u>t</u> (New vs.Old)
A	-1.92
B	0.83
C	-8.16**
E	-0.38
F	0.10
G	0.14
H	-3.12*
I	-2.91*
L	1.32
M	1.82
N	1.76
O	1.85
Q1	1.43
Q2	2.89*
Q3	-1.18
Q4	-1.53

Note.

<sup>a</sup>Cattell et al. (1980)

\* $p < .01$ , \*\* $p < .001$

Table 4  
Performance Ratings and Personality Traits:  
Bivariate Correlations and Unit Weighting

<u>Work Output</u>		<u>Quality of Work</u>		<u>Versatility</u>	
Factor	<u>r</u>	Factor	<u>r</u>	Factor	<u>r</u>
B	.53**	Q1	.57**	C	.45*
I	.50*	Creativity	.50*	Q1	.45*
Q3	.50*			Q3	.66***
Tough	-.57**				
Poise					
Units <sup>a</sup>	.72***			Units	.67***
<u>Dependability</u>		<u>Cooperation</u>		<u>Total</u>	
Factor	<u>r</u>	Factor	<u>r</u>	Factor	<u>r</u>
Q3	.55**	C	.60**	C	.50*
		Q1	.49*	Q1	.53**
				Q3	.59**
				Units	.69***

Notes.

<sup>a</sup>Primary traits only

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\* $p < .01$