



# Personality, learning style and work performance

Adrian Furnham<sup>a</sup>, Chris J. Jackson<sup>b,\*</sup>, Tony Miller<sup>c</sup>

<sup>a</sup>*Department of Psychology, University College London, 26 Bedford Way, London WC1 0AP, UK*

<sup>b</sup>*Department of Psychology, University of Surrey, Guildford GU2 5XH, UK*

<sup>c</sup>*Training Department, London Victoria Insurance, London, UK*

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## Abstract

Just over two hundred telephone sales staff completed the Eysenck Personality Inventory (EPI) and Honey and Mumford's Learning Styles Questionnaire (LSQ). Extraversion was highly correlated both positively and negatively with three of the four LSQ measures. The lie scale from the EPI was also systematically correlated with the Activist and Reflector scales of the LSQ. Both the EPI and LSQ traits were modestly correlated with two criteria: ratings of Actual Performance and Development Potential. Regressions were used to determine the best predictors of the two ratings measures. Personality variables (extraversion, neuroticism) and certain learning styles (reflector, pragmatist) were statistically significant predictors of rated performance, though they accounted for less than 10% of the explained variance. The results concur with recent meta-analytical studies that show personality variables account for a small but important amount of variance in measures of work performance. > © 1999 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

There has been a recent resurgence of interest in personality testing in the work place (Furnham, 1997). This is due to two major causes: first, a general consensus in the area of personality measurement and second, the need for predictors in high job turnover areas to help select and retain good workers.

There is a growing body of evidence that personality measures are logically and statistically significantly related to successful job performance (Day & Silverman, 1989; Hogan & Hogan, 1989). Data have come from studies in various sectors as diverse as insurance claim examiners

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\* Corresponding author. Tel.: +44-1483-300800; fax: +44-1483-300803.

(Arneson, Millikin-Davies, & Hogan, 1993) to sewing machine operators (Krulowicz & Lowery, 1996). There have also been various meta-analytical reviews in this area. Hough (1992, 1998) concludes that personality measures do predict job performance but only when validity coefficients are summarized according to constructs from a personality taxonomy. It seems that when both predictor and criterion domains are considered, then specific personality constructs can predict a range of targeted performance criteria such as effort and leadership, personal discipline, counter-productive behavior, creativity, sales effectiveness, educational success, training success and combat effectiveness. In a review of European studies, Salgado (1997) reported that conscientiousness and emotional stability were valid predictors of job performance across a range of job criteria and different occupational groups. More recently Vinchur, Schippmann, Switzer, and Roth (1998) found that one personality trait (potency) predicted supervisor ratings ( $r = 0.28$ ) and objective sales figures ( $r = 0.26$ ). They conclude: "There were several classes of predictors of sales success that yielded sizeable validity coefficients. The Big Five personality dimensions Extraversion and Conscientiousness predicted sales success for both types of criteria. Potency (which includes assertiveness) appeared to be the key part of Extraversion that predicted sales performance. Achievement may be the key part of Conscientiousness that predicted objective sales success" (p. 594).

This study focuses on insurance company employees (Muchinsky, 1993) and specifically telesales employees. Hakstian, Scratchley, Macleod, Tweed, and Siddarth (1997) gave 85 telemarketing employees a battery of cognitive ability and self-report trait measures with the aim of predicting two types of outcome: hard sales figures and appraisal data. A composite of two ability and three personality scales had predictive validities of between 0.32 and 0.49 for several aggregated job-performance measures.

We investigate relationships between personality, learning style and demographic correlates of job performance measured by supervisor ratings. Previous studies have demonstrated the importance of extraversion and neuroticism in customer contact jobs (Furnham & Coveney, 1996; Salgado, 1997; Hough, 1998). Furnham and Miller (1997) found extraversion positively related to both performance ratings and periods of leave and neuroticism negatively associated with potential ratings. This study also looks at learning style predictors of job performance. Learning style instruments, of which there are many (Furnham, 1992), are used to measure people's preferred methods of learning and the efficacy of training. Research in this area of validation studies is nearly always beset by two particular problems — criteria reliability and range restriction (Hough, 1998). Both of these lead to the under-estimation of the true size of the relationship between predictor and criterion.

In this research, the Honey and Mumford (1982) learning style measure (LSQ) is used. Each of the four components of the Kolb (1984) learning cycle is measured in a simple way that has led to the questionnaire developing a wide following in training and occupational psychology across the whole world, but particularly in Europe, though this in itself does not necessarily mean that it is useful or valid. The LSQ measures how people learn (i.e. their preferred learning style) and the amount they are likely to learn (high scorers on each scale are better learners than low scorers). The LSQ ensures that each participant gets a score on four scales: activist (sensation seeking, impulsive, extravert), reflector (introvert, cautious, methodological), theorist (intellectual, rational, objective) and pragmatist (expedient, realistic, practical). Researchers have also investigated the validity of the LSQ. Tepper, Tetrault, Braun, and

Romero (1993) reported that the LSQ showed convergent and discriminant validity with a problem solving questionnaire. A confirmatory factor analysis showed certain problems with the Reflector scale of the LSQ. They were also concerned about the alpha reliability of two of the sub-scales being lower than 0.70 (theorist: 0.67 and pragmatist: 0.52). Goldstein and Bokoros (1992) reported evidence that the LSQ was able to classify college students in a similar way to another learning styles inventory. Allinson and Hayes (1990) conducted three studies with 138 undergraduates in the first study, 21 masters in business administration students in the second study and 29 male managers in a manufacturing organization in the third study. Results provided evidence in favor of the construct validity of the LSQ. Using a modified LSQ, De Ciantis and Kirton (1996) reported that it provided a good match to the Kolb (1984) learning cycle theory. Furnham and Medhurst (1995) reported a high, predictable and consistent set of correlations between a student's pragmatist learning style and positive performance in university seminars.

The overlap between learning styles and personality has also been of interest (Furnham, 1992, 1996a, 1996b; Jackson & Lawty-Jones, 1996). Previous research has shown considerable amount of intercorrelation between classic personality variables such as extraversion and various learning styles such as activist. The general conclusion from these studies is that learning styles is a sub-set of personality. Jackson and Lawty-Jones (1996) propose that learning styles represent the learnt components of personality.

However none of this research has reported on the utility of the LSQ, or other similar measures, in the prediction of workers' performance and development. This is somewhat anomalous for two reasons. First, the *classic* theory of job performance (see Broyler, Thorndike, & Woodyard, 1927) links the learning process to effective performance. According to this theory, a parameter for effective performance is set by learning — if a worker has not learned the right behavior, then the worker can not perform adequately. On this basis, we would expect a reasonable correlation between the LSQ and performance. Second, *modern* management texts in professional books and journals are suggesting that the rapidly changing nature of work means that the ability to learn is increasingly crucial to effective performance and development, perhaps even at the expense of other traditional core competencies (Furnham, 1996a, 1996b; De Raad & Schouwenberg, 1996; Honey & Mumford, 1982; Jackson, 1995; Messick, 1996).

This perspective needs to be empirically tested for it to have any credence. Given the similarity between personality and learning styles (Furnham, 1992, 1996a, 1996b; Jackson & Lawty-Jones, 1996) and the probable causal link between them (Eysenck, 1996), a good test of this proposition is to compare the validity of a well-known personality measure with that of the LSQ against appraisal ratings. This study is probably the first time that learnt components of personality have been compared against performance and development criteria in the workplace; especially when compared against a traditional personality measure that provides a standard. It is therefore a classic predictive validity study.

From previous research on the LSQ, it was predicted that the activist and pragmatist learning styles would be positively correlated and theorist and reflector learning styles would be negatively correlated, with job appraisal data in the context of the job reported in this study. From previous studies, we also predicted that extraversion would be positively and neuroticism negatively, related to appraisal criteria.

This study used supervisor ratings as the dependent variable, which have been shown to be both reliable and valid (Furnham & Stringfield, 1994; Furnham, Crump, & Whelan, 1997). Although, doubts remain as to their accuracy and restriction of range, supervisor ratings make good criteria in the context of this study because supervisors are unlikely to have much understanding of workers' learning styles, thus making any link as a result of common variance extremely unlikely.

## 2. Method

### 2.1. Participants

Two hundred and three tele-sales employees took part, of which 152 were female. They were telesales agents in the insurance industry and came from various parts of the organization, but mainly the service (103) and sales (42) sector. Their average age was 30.88 years (S.D. = 9.23 years) and they had been working for the company for 5.54 years on average (S.D. = 6.08 years). The sample represents just under two-thirds of the total telesales staff and were selected randomly.

### 2.2. Measures

#### 2.2.1. Dependent variables

Each employee was given an annual rating by their direct manager. The ratings were labelled performance and development and the outcome was recorded for each. Each employee is awarded a mark on each of the following scales (see Table 1)

The measure on the *P* scale was 2.87 (S.D. = 0.41) and on the *D* scale 1.64 (S.D. = 0.82). Because of common errors of skew with these sorts of ratings, two other combined measures were computed, which were  $P + D$  and  $P \times D$ . Both arithmetic and multiplicative functions can help ease problems of range restriction by providing a better distribution of the dependent variable. Also by combining the ratings, it is possible to get a more global criterion measure.

#### 2.2.2. Independent variables

Each person completed two personality tests:

##### 1. Eysenck Personality Inventory (EPI; Eysenck & Eysenck, 1964)

This measures extraversion and neuroticism. The scores are said to provide a purer

Table 1

Grade Performance ( <i>P</i> )		Development ( <i>D</i> )
1	Unacceptable level of performance	Potential for continuing development in current role
2	Currently falls short of the success criteria	Potential for a move within or outside the function at current level
3	Meets the success criteria	Potential to progress to the next level
4	Consistently exceeds the success criteria	Potential to progress beyond the next level

measure of extraversion than subsequent measures (Eysenck & Eysenck, 1991). There is considerable evidence of its reliability and validity.

## 2. Learning Style Questionnaire (LSQ; Honey & Mumford, 1982)

This measure provides four scores on four learning styles: activists (flexible, open-minded, optimistic), reflectors (careful, thorough, thoughtful), theorists (logical, rational, objective) and pragmatists (practical, realistic, businesslike).

## 3. Demographic Variables

Sex, age and experience in the company were also measured.

## 4. Hand and Ear Preference

Given evidence that cerebral laterality seems to be related to sales, the ear and hand using preference was recorded by asking respondents on which ear they habitually wore the ear piece of their telephonic head set; and which hand they habitually wrote with. Previously, Furnham, Richardson, & Miller (1997) found telesales staff who had left earpieces out-sold those who wore right or stereo headsets.

## 3. Procedure

Participants were tested whilst on training courses. The tests were obligatory and fed back to all participants as part of their course.

## 4. Results

### 1. Relationship between the measures

Table 2 shows the relationship between personality variables and learning styles from this and three other studies. Given that three different instruments were used to measure personality in these four diverse groups, the results are remarkably consistent. Activists tend

Table 2

Correlations between the EPI and LSQ. Decimal points not included to aid interpretation. 1, Furnham (1992). EPQ.  $N = 60$ . 2, Jackson and Lawty-Jones (1996). EPQ.  $N = 166$ . 3, This study. EPI.  $N = 203$ . 4, Furnham (1996a, 1996b). NEO-PI-R.  $N = 176$ . \*\* =  $p < 0.01$ , \* =  $p < 0.05$

	Activist				Reflector				Theorist				Pragmatist			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Extraversion	52**	59**	64**	0.28**	-51*	-23**	-47**	-10	-06	-10	-34**	-04	37*	17*	07	14
Neuroticism	00	05	09	03	11	-05	03	15*	19*	04	07	05	-15	-08	02	-10
Psychoticism	38*	36**			-18	-29**			-32**	-30**		-10	-13			
Lie	-19*	-29**	-36**		-21*	21**	30**		06	23**	22**		00	08	01	

to be extraverted, tough-minded and relatively honest in their questionnaire response style. Reflectors are introverted and theorists have low psychoticism scores. Pragmatists tend to be extroverted.

2. Correlation between all variables

Table 3 shows the full intercorrelation matrix. Four things are clearly apparent from the Table. First, predictably, the four supervisor rating measures are highly intercorrelated. Second, the three demographic measures are unrelated to performance, but they are to personality and learning style (particularly age). Third, hand/ear preference seems unrelated to any of the other variables. Finally, the personality and learning style measures are closely and logically correlated.

3. Regressions of all variables on to all dependent measures

Table 4 shows the four regressions, three of which were significant. The only clear, consistent and significant predictor across the various regressions was ‘reflector’, which was negatively related with the rating variables.

4. Regression of self-report measures on to all dependent measures

Because the demographic and ear/hand preference seemed unrelated to the supervisor ratings, another set of regressions were computed using only EPI and LSQ scores. As shown in Table 5, all the regressions were significant, accounting for about 8% of the explained variance. The most consistent findings were from the LSQ: being a theorist was positively related, while being a reflector was negatively related to the different ratings.

Table 3  
Correlations between all the variables. Decimal points not included to aid interpretation. \* =  $p < 0.05$ , \*\* =  $p < 0.01$ , \*\*\* =  $p < 0.001$

	<i>P</i>	<i>D</i>	PD	PTD	<i>S</i>	<i>A</i>	<i>E</i>	EP	HP	Ex	Ne	Li	Act	Pe	Th
Performance ( <i>P</i> )															
Development ( <i>D</i> )	29***														
<i>P</i> + <i>D</i> (PD)	64***	92***													
<i>P</i> × <i>D</i> (PTD)	49***	97***	97***												
Sex ( <i>S</i> )	03	10	0.08	0.07											
Age ( <i>A</i> )	03	12	11	12	−03										
Experience ( <i>E</i> )	−01	14*	12	12	05	60***									
Ear preference (EP)	00	03	02	02	03	08	−02								
Hand preference (HP)	00	15*	12	12	00	−01	−02	−04							
Extraversion (Ex)	07	−17**	−17**	−17**	−06	−39***	−39***	06	01						
Neuroticism (Ne)	04	09	08	−06	−08	−01	12	−06	−10						
Lie (Li)	08	00	03	02	−11	26***	18**	03	04	−31***	−32***				
Activist (Act)	−03	−07	−07	−07	−11	−25***	−30***	16*	03	64***	09	−36***			
Reflector (Re)	−04	−02	−03	−03	00	18**	10	−07	−07	−46***	02	30***	−45***		
Theorist (Th)	04	14*	13	14*	05	23***	20**	06	07	−34***	07	22***	−27***	48***	
Pragmatist (Pr)	14*	−04	−09	−06	00	−06	−05	11	−01	12	−06	00	21**	−13*	05

Table 4

Regression of demographic, laterality and personality factors on to the rating factors. \* =  $p < 0.05$ 

	<i>P</i>		<i>D</i>		<i>P + D</i>		<i>P × D</i>	
	Beta	<i>t</i>	Beta	<i>t</i>	Beta	<i>t</i>	Beta	<i>t</i>
Sex	0.06	0.79	0.08	1.07	0.08	1.17	0.07	0.90
Age	0.03	0.34	0.08	0.82	0.07	0.79	0.07	0.79
Experience	−0.11	−1.18	0.02	0.26	−0.02	−0.26	0.00	−0.10
Extraversion	0.17	1.03	−0.32	−1.97*	−0.19	−1.15	−0.27	−1.60
Neuroticism	0.50	2.30*	−0.14	−0.67	0.08	0.39	−0.04	−0.22
<i>E × N</i>	−0.51	−2.12*	0.27	1.11	0.00	0.97	0.15	0.60
Lie	0.14	1.71	−0.02	−0.32	0.04	0.43	0.00	0.08
Ear preference	−0.03	−0.50	0.02	0.26	0.00	0.00	0.00	0.08
Hand preference	−0.04	−0.54	0.15	2.14*	0.10	1.47	0.16	1.62
Activist	0.04	0.45	−0.15	0.29	0.04	0.41	0.02	0.25
Reflector	−0.20	−2.23*	0.12	−1.72	−0.21	−2.29*	−0.20	−2.21*
Theorist	0.10	1.27	−0.03	1.50	0.14	1.72	0.15	1.82*
Pragmatist	−0.19	−2.58*	0.27	−0.49	−0.10	−1.44	−0.06	−0.83
<i>F</i> level	1.36		1.79*		1.65*		1.60*	
<i>R</i> square	0.09		0.11		0.10		0.10	

## 5. Discussion

The results of this study provided confirmatory evidence of the relationship between fundamental personality traits and learning styles. Extraverts tend to be activists; introverts reflectors. Neuroticism is not clearly related to learning style. The lie score is modestly negatively correlated with activist and positively correlated with reflector and theorist. The

Table 5

Regression of personality and learning style on to the four dependent variables. \*\* =  $p < 0.01$ , \* =  $p < 0.05$ 

	<i>P</i>		<i>D</i>		<i>P + D</i>		<i>P × D</i>	
	Beta	<i>t</i>	Beta	<i>t</i>	Beta	<i>t</i>	Beta	<i>t</i>
Extraversion	0.20	1.20	−0.34	−2.10*	−0.20	−1.20	−0.27	−1.68
Neuroticism	0.50	2.29*	−0.13	−0.59	0.10	0.45	−0.03	−0.16
<i>E × N</i>	−0.51	−2.15*	0.21	0.90	−0.04	−14	0.10	0.42
Lie	0.12	1.51	−0.02	−0.29	0.03	0.03	0.00	0.09
Activist	0.04	0.38	0.03	0.33	0.04	0.42	0.03	0.28
Reflector	−0.18	−2.20*	−0.19	−2.22*	−0.23	−2.61**	−0.23	−2.57**
Theorist	0.09	1.11	0.17	2.10*	0.17	2.15*	0.18	2.28*
Pragmatist	−0.19	−2.15*	−0.05	0.67	−0.11	−1.59	−0.07	−0.99
<i>F</i> level	1.93*			2.07*		2.21*		2.14*
<i>R</i> square	07		08		08		0.08	

average size of the significant correlations suggest the overlap between personality and learning style to be about 10%.

Perhaps the most interesting findings were the regressions, which looked at the best predictors of the supervisor ratings. Surprisingly, the sex, age and years of experience in the company appeared to have no effect on supervisor ratings. Neither did hand or ear preference, although there was some indication that left-handed sales staff received high developmental ratings. The personality and learning style variables were significant predictors. Extraversion was not a significant predictor of performance, although introversion was a significant predictor of potential. Equally surprisingly, neuroticism was a significant predictor of performance, as was the interaction of extraversion and neuroticism. The interaction between extraversion and neuroticism in this study provides an interesting measure similar to Gray's impulsivity dimension in which high impulsivity represents high extraversion and high neuroticism and low impulsivity represents low extraversion and low neuroticism (Gray, 1990). This significant interaction term suggests that combinations of personality scales can be significant predictors even in the presence of the original scales and that impulsivity can be an important predictor of performance ratings. None of the personality traits were significant predictors of the two combined rating variables suggesting that there are advantages to collecting criterion measures over several scales instead of just one overall scale.

The four learning style measures were more consistent predictors of the four dependent measures. Contrary to prediction, the activist learning style was not significantly related to the various ratings. However, the reflector style was quite consistently and negatively related to rated success, while the theorist learning style was significantly related to three of the four dependent measures.

According to Honey and Mumford (1982), reflector learners are careful, thoughtful, thorough and methodical. But they do have a tendency to hold back from direct participation, are indecisive, risk averse and unassertive. It is no wonder that these characteristics are consistently *negatively* related to performance among telesales personnel. It appears, therefore, to be a good select-out, or negative predictor.

Theorist learners, according to Honey and Mumford (1982) are logical, rational, disciplined and objective and good at asking probing questions. Yet they do tend to have a low tolerance for uncertainty, disorder and ambiguity and are full of 'shoulds, oughts and musts'. Again, the finding that theorists are positively related to rated performance and development is unsurprising, given that telesales staff have to obtain and log, specific information regarding particular policies.

The utility of the LSQ in comparison to the EPI is quite surprising since learning styles appears to be a sub-set of personality (Furnham, 1992, 1996a, 1996b; Jackson & Lawty-Jones, 1996). The most likely explanation of why the LSQ is therefore more predictive of supervisor ratings than the EPI is therefore that *learnt* components of personality are better predictors than personality as a whole. Since learnt components of personality are also likely to be changeable and flexible over time, this may be at least one reason why personality measures tend to have relatively low predictive validity within the work-place.

Finally, it needs to be noted that the percentage of variance explained by personality and learning styles together was only about 8%. This is not a large amount and indicates that the majority of variance was unrelated to individual differences in personality and learning style.



Unreliability and restriction of range of the criteria would however cause the underestimation of the true size of the relationship between predictors and criteria. At the same time, it should be noted that chance relationships within the data can mean that regression models overestimate the true size of the relationship. Further data collection could reduce this overestimation by testing the regression model with a second sample or by splitting a larger sample than we report in this study into two.

In conclusion therefore, this study reports that a measure of learning is superior to the prediction of job appraisal ratings than personality. Such a result reinforces the link between learning and performance in classic theory and provides some evidence in favour of learning as being a new core competency that could easily be overlooked in traditional job analysis. The increasing rate of change in the world of work suggests that learning will increasingly become more and more important in worker performance and development.

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