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# The big five versus the big four: the relationship between the Myers-Briggs Type Indicator (MBTI) and NEO-PI five factor model of personality

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Summary—This study sets out examine the relationship between two personality measures—most popularly used measure in the consultancy and training world (the Myers—Briggs Type Indicator) and one of the most heavily used measures in the academic research area on personality (the five factor NEO-PI). One hundred and sixty adults completed the NEO-PI and the MBTI. The NEO-PI Agreeableness score was correlated only with the thinking—feeling (T-F) dimension; the NEO-PI Conscientiousness score was correlated with both thinking—feeling and judging—perceiving (J-P) dimension; the NEO-PI Extraversion score was strongly correlated with the extraversion—introversion (E-I) dimensions, while the Neuroticism score from the NEO-PI was not related to any MBTI subscale score. The openness dimension was correlated with all four especially sensing—intuitive. These results were related to two other similar comparative studies. Results are discussed in terms of recent criticisms of the MBTI. Copyright © 1996 Elsevier Science Ltd.

## INTRODUCTION

The past decade has seen an unprecedented rise in the interest in personality theory and measurement (Kline, 1993). Psychometricians have been particularly concerned with the number and labelling of the fundamental dimensions of personality (Eysenck, 1992; Costa & McCrae, 1992; Zuckerman, 1992).

There is emerging consensus about the fundamental dimensions of personality and their correlates and determinants (Kline, 1993). Without doubt, the work over the last decade of Costa and McCrae (1985) has stimulated this somewhat moribund area of research. Costa and McCrae (1985) set about devising and validating a self-report instrument that measured the fundamental underlying dimensions of personality. In doing so they attempted to describe how their system overlapped with other well known and extensively used measures.

There is extensive interest in providing concurrent validity evidence for the NEO-PI measure (Piedmont, McCrae & Costa, 1992). Over the past decade there are a host of studies that have correlated established measures with the NEO-PI to establish overlap. For example:

- 1. California Personality Inventory (McCrae, Costa & Piedmont, 1992).
- 2. California Q Set (McCrae, Costa & Busch, 1986).
- 3. Cattell's 16PF (Gerberg & Tuley, 1991).
- 4. Comrey Personality Scales (Hahn & Comrey, 1994).
- 6. Eysenck Personality Inventory (McCrae & Costa, 1985).
- 7. Hollands Vocational Preference Inventory (Costa, McCrae & Holland, 1984).
- 8. Murray's Needs (Costa & McCrae, 1988).
- 9. Myers-Briggs Type Indicator (McCrae & Costa, 1989a).
- 10. Wiggins Circumflex (McCrae & Costa, 1989b).

It is difficult to summarize the findings of all these and other studies; suffice it to say that despite different theoretical origins, labels and questionnaire format, these studies showed considerable overlap between the disparate measures. It was tempting of Costa and McCrae to interpret this as concurrent evidence for their questionnaire as opposed to providing similar evidence for other questionnaire. Occasionally various dimensions or subscales from the other measures did not correlate with NEO-PI subscales or total scores. This could indicate the NEO-PI was not 'picking-up' an important trait or else that this other measure was not fundamental to personality.

The possible relationship between the MBTI and the NEO-PI has not escaped the attention of researchers. McCrae and Costa (1989a) were highly critical of the psychometric properties of the MBTI. According to McCrae and Costa (1989a), the MBTI is unusual among personality assessment devices for three reasons: it is based on a classic theory, it purports to measure types rather than traits or continuous variables, and it is widely used to explain individuals' personality characteristics not only to professionals but also to the individuals themselves and their co-workers, friends and families. But they also point out its limitations: the original Jungian concepts are distorted and even contradicted; there is no bi-modal distribution of preference scores; studies using the MBTI have not always confirmed either the theory or the measure's validity. Various criticisms of the typology theory are also cogently put by Hicks (1984). A consistent criticism of the MBTI, which is an ipsative measure, is that this response format distorts data, which causes serious psychometric shortcomings (Schriesheim, Hinkin & Podsakoff, 1991). Yet Davito (1985), has described the MBTI as "probably the most widely used instrument for nonpsychiatric populations in the area of clinical, counselling and personality testing" (p. 1030). He points out that even the

manual provides less evidence for type than for continuous trait-like measurement, which is against the spirit of the test. However, after careful evaluation he argues that the MBTI merits scrious consideration by psychologists.

More recently, Moore (1987) noted the widespread use of personality tests in industry and Haley and Stumpf (1989) have pointed out, quite correctly, that the popularity of the MBTI in executive circles affords researchers tremendous opportunities for data-collection. Moore (1987) noted that most companies use the MBTI to help managers better understand how they come across to others who may see things differently. Other applications include team building, improving customer service, reconciling group differences, career planning, adapting to change, analyzing troublesome behaviour between employees and facilitating competitive strategic thinking (Bayne, 1994; Pittenger, 1993).

In an extensive review of the instrument, Carlson (1985) pointed out that the MBTI has been used somewhat unsystematically in a very wide range of areas, but generally with favourable validity assessment. The limited research on test reliability shows satisfactory internal (alpha) and test-retest reliability, but is limited by student samples and short test-retest intervals. He reviewed criterion-related studies in treatment and research settings and noted that "it is to the credit of the MBTI that the instrument successfully predicted behaviours as far apart as personal problems to imagery and group conformity" (p. 364). However, he does note that the introversion-extraversion dimension of the scale has shown most validational evidence.

This study set out to examine the relationship between the MBTI and the NEO-PI. To date, at least two studies have attempted this comparison so this may be treated as a part replication. However there are some important differences. McCrae and Costa (1989a) used a community sample, and MacDonald, Anderson, Tsagakis and Holland (1994) a student sample, but neither used a specifically working sample of adults. Secondly, neither study examined the relationship between NEO-PI subscale scores and the MBTI scores. Indeed it is in the sub-scale scores that some of the most subtle relationships may be observed.

### METHOD

## Subjects

There were a total of 160 subjects of which 91% were male. They were all middle to senior managers of an multinational communication organization. They ranged in age from their late thirties to their middle fifties.

#### Measures

Myers-Briggs Type Indicator-Form G (MBTI: Briggs & Myers, 1987). The Myers-Briggs indicator is a Jungian-based inventory that uses a paper-and-pencil self-report format. It is composed of 94 forced-choice items that constitute the four bipolar discontinuous scales which are implied in Jung's (1971) theory, Introversion-Extraversion, Sensation-Intuition, Thinking-Feeling and Judging-Perceiving. Respondents are classified into one of 16 personality types based on the largest score obtained for each bipolar scale (e.g. a person scoring higher on Introversion than Extraversion, Intuition than Sensation, Feeling than Thinking and Judging than Perceiving would be classified as an Introverted Intuitive Feeling Judging). The Myers-Briggs indicators has been the focus of extensive research and substantial evidence has accumulated suggesting the inventory has satisfactory validity and reliability (Carlson, 1985; Furnham & Stringfield, 1993).

NEO Personality Inventory Form S (NEO-PI; Costa & McCrae, 1985). The NEO Personality Inventory is a paper-and-pencil self-report measure based upon the currently popular five-factor model of trait personality (McCrae & Costa, 1985). The five factors of dimensions or personality measured by this inventory are Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness. Each domain consists of six facets which can be summed to form a total domain score. The facets of the inventory were of particular interest to the present investigation as these have not been used before when examining MBTI correlates. The inventory is composed of 240 self-descriptive statements to which respondents use a five-point scale in Likert format and anchored by strongly agree and strongly disagree to rate the extent to which each statement describes the person's self. Item responses are numerically coded and summed to obtain facet and domain scores. Even though the inventory has only been in existence for just 10 years, a considerable amount of research has been done on it and excellent support for the validity and reliability of domains has been consistently reported.

## Procedure

Subjects were required (mandated) to attend a middle management assessment centre where they completed these questionnaires amongst other exercises. A psychological consultancy ran the day long course and attendance was compulsory. Each manager was given feedback on the results of the questionnaires by a trained and certificated assessor.

## RESULTS

Table 1 shows the zero-order correlations. Partial correlations were also calculated partialling out sex and age but they made very little difference. The pattern in the results is fairly clear. Agreeableness seemed to be significantly related to the MBTI Thinking-Feeling dimension. Conscientiousness was related both to Thinking-Feeling and Judging-Perceiving; Extraversion was not unsurprisingly, strongly correlated with the Introversion-Extraversion dimension; Neuroticism was negatively related to Introversion-Extraversion and Thinking-Feeling; while Openness was significantly related in predictable ways, to all of the four MBTI scores.

Usually, but not always, the subscale scores followed a pattern; that is, the subscales correlations were about the same size and direction with each of the various MBTI dimensions in turn. However, some of the subscales of Agreeableness showed curious and contradictory patterns. Thus trust and modesty subscales correlate significantly and in opposite directions with Introversion and Extraversion.

Table 2 shows the relationship between the results of three similar studies for comparative processes. Overall, the patterns are quite comparable, with the correlations being more likely to be significant in the study compared with Costa and McCrae (1988)

Predictably, the two scales' Introversion-Extraversion scores were the most highly intercorrelated. Agreeableness too had a clear and fairly strong relationship with the Thinking-Feeling MBTI subscale. Neuroticism seemed weakly related to the

Table I. Correlations between the 10 ratings and the five-factors sub-scale and total scale scores (N = 160). Occasional anomalies in significant levels are owing to missing data

	ш	_	S	Z	L	压。	ſ	۵.	E	SN	TF	JP
Al Trust	0.20**	-0.21**	0.04	-0.04	-0.30**	0.24***	0.00	0.09	0.20*	0.07	-0.29***	00:0
A2 Straight forwardness	0.09	0.12	0.07	0.00	-0.21**	0.11	0.00	0.04	0.11	0.05	-0.18*	0.00
A3 Altruism	0.27***	-0.29***	-0.01	0.02	-0.32***	0.28***	0.11	-0.10	0.28***	0.04	-0.35***	0.11
A4 Compliance	-0.10	80.0	0.03	-0.03	-0.24**	0.19**	0.13	60.0	-0.09	0.00	-0.24**	0.13
A5 Modesty	-0.22**	0.24**	90.0	-0.06	0.20**	0.22**	80.0	-0.14	-0.23**	90.0	0.23**	60:0
A6 Tender-mindedness	0.03	-0.04	-0.08	0.07	-0.44***	0.43***	-0.08	0.17*	0.03	-0.06	-0.44***	-0.09
Agreeable	0.00	-0.01	0.03	-0.03	-0.47***	0.40***	90.0	00.0	00.0	0.04	-0.47***	90:0
C1 Competence	000	80 0 -	0.06	0.04	0.13	0.24**	**00	-012	0.05	-0.06	0.18*	0.21**
C2 Order	0.11	-0.09	0.32***	-0.36***	0.13	-0.15*	****0	-0.46***	0.11	0.29	0.16*	0.59***
C3 Dutifulness	0.03	0.03	0.13	-0.15*	0.03	0.10	0.27**	0.21**	-0.04	0.12	0.07	0.28***
C4 Achievement striving	0.04	-0.09	0.05	0.08	0.21**	-0.28***	0.26***	-0.21**	90.0	0.03	0.24**	0.27
C5 Self discipline	80.0	-0.11	0.21	0.23**	0.16*	-0.21**	0.33***	-0.27***	0.10	0.18*	0.17*	0.35***
C6 Deliberation	60.0-	0.09	0.15*	0.20**	0.16*	-0.23**	0.49***	-0.42**	-0.10	0.11	*61.0	0.49***
Conscientiousness	0.03	0.06	0.20**	-0.24**	**61.0	0.28***	0.50***	().4/***	0.04	.10*	0.23**	0.52***
El Warmth	0.63***	-0.61***	-0.17*	0.15*	-0.27***	0.26	0.00	0.01	0.63***	-0.11	-0.25***	0.00
E2 Gregariousness	***89.0	-0.67***	-0.12	0.12	-0.19**	0.17**	0.03	-0.10	***89.0	0.07	-0.14	0.04
E3 Assertiveness	0.44***	0.45***	0.07	80.0	0.10	0.12	60.0	0.12	0.45***	0.02	0.15*	80.0
E4 Activity	0.23***	-0.25***	-0.02	-0.03	0.14	-0.19**	0.19**	0.12	0.24***	0.01	0.18*	0.19**
E5 Excitement seeking	0.42***	-0.43***	-0.24**	0.23**	0.00	0.0	0.26***	0.17*	0.43***	0.21	0.03	-0.24**
E6 Positive emotions	0.47***	··· 0.44***	-0.H	0.10	*91.0	0.11	0.01	0.02	0.46***	0.07	-0.15*	0.00
Extraversion	0.69***	-0.69***	-0.18*	*91.0	0.00	0.05	-0.03	0.02	0.70***	0.11	-0.04	0.02
NI Anxiety	- 0.21**	0.21**	90.0	90.0	-0.13	*91.0	0.14	-0.13	0.21**	90.0	0.15*	0.14
N2 Anger-hostility	90.0	800	000	00.0	0.03	-0.05	0.07	0.00	90.0	0.03	400	0.00
N3 Depression	-0.31***	0.30***	0.05	0.05	-0.16*	**81.0	0.0	0.02	0.30***	0.10	0.18**	00.0
N4 Self-consciousness	-().44***	0.43	0.03	03	-0.13	0.15*	0.05	00.0	0.43***	0.02	**81.0-	0.0
N5 Impulsiveness	0.17*	-0.15*	-0.14	0.20**	-0.17*	0.15*	-0.26***	0.24**	0.17*	-0.17*	0.18**	0.27***
N6 Vulnerability	0.24**	0.27**	0.04	0.03	-0.14	0.19***	0.07	-0.11	0.25***	0.02	-0.17*	90:0
Neuroticism	0.24**	0.26***	0.02	0.03	-0.16*	481.0	10.0	-0.00	-0.25***	-0.05	0.19**	0.00
Ol Fantacy	11.0	-013	***070-	****0	-0.7***	**70	***90 0	0.32***	0.13	-() 44***	****	****
02 Aesthetics	10	-011	***05 0-	0.33***	***0	**50	10.0-	0.04	0.11	***08 0-	****	-0.02
03 Feelings	**100	*61.0-	-0.14	0.10	+010-	**61.0	0.04	0.02	0.50**	-0.12	**61.0	0.02
04 Actions	0.26***	-0.27**	-0.31***	0.28***	-0.16*	0.17*	0.25***	**81.0	0.27	-0.26**	0.14	-0.23**
05 Ideas	0.04	-0.05	-0.46***	0.45***	00.00	0.07	-0.16*	**61.0	0.04	-0.43***	0.04	-0.18*
06 Values	0.08	-0.09	0.19**	0.22**	-0.06	0.02	-0.26***	0.19**	60.0	-0.19	0.04	-0.25***
Onemers	(1 ) 1 * *	*****	*****	******	***	4466	4	4447				

NEO-PI Extraversion Neuroticism Openness Agreeableness Conscientious MBTI B -0.24\*\* 0.58\*\*\* 0.69\*\*\* 0.21\*\* Extraversion E -0.18-0.30\*-0.080.000.11 0.03 0.26\*\*\* 0.58\*\*\* 0.46\*\*\* 0.22\*\* Introversion I 0.140.30\* -0.010.01 0.06 0.01 Sensation S -0.16-0.02-0.08-0.18\*0.60\*\*\* 0.52\*\*\* 0.20\*\* -0.110.03 0.03Intuition N 0.03 0.02 0.71\*\*\* 0.49\*\*\* 0.29\* 0.24\*\* 0.21 0.16\* 0.03 0.03 0.52\*\*\* Thinking T -0.29\*0.16\* 0.02 0.09 -0.34\* 0.22\*\* 0.40\*\*\* 0.02 -0.28\*\*\*-0.28\*\*\* Feeling F 0.36\* 0.18\*0.05 0.05 0.35\* 0.22\*\* 0.52\*\*\* 0.40\*\*\* 0.02 0.24\*\* 0.50\*\*\* -0.25 0.01 0.06 -0.03-0.07 0.000.56\*\*\* Judging J 0.06 Perceiving P 0.30\* -0.000.03 0.02 0.03 0.24\*\* 0.00 0.62\*\*\* -0.41\*\*\* 0.00C R C R  $\mathbf{C}$ CCR R R 0.22\*\* 0.08 ΕI 0.16\*\* 0.25 0.74 0.70\*\*\* 0.03 -0.030.00 0.04 SN 0.050.10 0.11 0.72\*\*\* 0.48\*\*\* 0.04-0.04 -0.15\* -0.06-0.16TE 0.19\*\* 0.24\*\*\* -0.15\*-- 0.23\*\* 0.190.06 0.040.02 0.444 0.47 0.17\*\* -0.49\*\*\* 0.52\*\*\* 0.15\* JP 0.11 0.00 0.02 0.30\*\*\* -0.06-0.06

Table 2. Comparisons with other studies

A: McDonald et al. (1994), Males N = 48; B: This study, Males N = 160; C: McCrae & Costa (1989a), Males N = 267.

MBTI Introversion-Extraversion scale and to a lesser extent with the Thinking-Feeling scale. But it was Openness and to a lesser extent, Conscientiousness, that overlapped most consistently, with MBTI scores, and frequently in opposite directions. Thus Openness was associated with Intuition and Conscientiousness with Sensation; Openness with Feeling and Conscientiousness with Thinking; Openness with Perceiving and Conscientiousness with Judging.

## DISCUSSION

The results of this study show clear overlap between the two now widely used measures. Agreeableness is closed linked to the Thinking-Feeling dimensions for the MBTI; Conscientiousness with the Judging-Perceiving dimensions; Extraversion naturally with the Introversion-Extraversion dimensions and Openness with the Sensing-Intuitive dimension. Only Neuroticism appeared to be correlated with a variety of MBTI dimensions and somewhat inconsistently. Indeed, it has been pointed out that the dimension most conspicuously missing from the MBTI is Neuroticism.

As McCrae and Costa (1989a, p. 33) found, there was an impressive evidence of convergence of the two measures which they believe "probably accounts for the many meaningful associations between MBTI scales and external criteria such as occupational preferences, creativity and educational performance". Thus they note that Openness to Experience and Intuition are correlated because both are predictors of creativity, while Conscientiousness and Judging are related because both are measures of orderliness and self-discipline.

McCrae and Costa (1989a) are rather critical of the MBTI. Apart from the scoring method, the relationship to Jung's theory and the typological rather than the trait approach, they are critical of the MBTI omitting Neuroticism which all serious theorists and psychometricians believe is a fundamental dimension of personality. They also note that MBTI does not give comprehensive information on all the scales, which the subscale of the NEO-PI is able to do. They believe this is very important for understanding individuals who score in the middle range. They conclude: "If the MBTI is used, evidence to date suggests that it may be better to abandon the Jungian framework and reinterpret the MBTI in terms of the five-factor model" (p. 37). MacDonald et al. (1994, p. 343) however, are less eager to jettison Jungian theory and vocabulary in favour of the five-factor terminology based on the overlap between the measures. They believe "the findings of the present study should be interpreted as reflecting only on empirical relationship between these constructs".

It is however, abundantly clear that the psychometric properties, particularly the all-important construct and predictive validity criteria of the NEO-PI are superior to that of the MBTI. In addition, the subscale scores derived from the five super factors means it is probably more useful in the applied field by being able to look in greater detail at any one factor.

There remains now sufficient replicated evidence of the overlap between the MBTI and the NEO-PI among diverse populations whilst each measure may benefit from examining the extant empirical literature of the other, they would both benefit considerably by examining the behavioural and cognitive correlates of the various dimensions of both scales that overlap. In particular, the MBTI researchers might benefit from seeing the links between the scores on the test and such things as work-related behaviour (Furnham, 1994), while some of the clinical applications of the MBTI over the past 50 years may help NEO-PI researchers interested in developing further applied hypotheses in the area.

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