

## THE RELATIONSHIP BETWEEN THE REVISED NEO-PERSONALITY INVENTORY AND THE MYERS-BRIGGS TYPE INDICATOR

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This study investigated the relationship between two of the most widely used personality measures, the Revised NEO Personality Inventory and the Myers-Briggs Type Indicator. A total of 900 participants completed the NEO PI-R and the MBTI. Correlational analysis of the personality measures showed that NEO PI-R Extraversion was correlated with MBTI Extraversion-Introversion, Openness was correlated with Sensing-Intuition, Agreeableness with Thinking-Feeling and Conscientiousness with Judging-Perceiving, replicating the findings of McCrae & Costa (1989).

Amongst the inventories used to measure personality constructs, two of the most popular are the Revised NEO-Personality Inventory (NEO PI-R) (Costa & McCrae, 1992) and the Myers-Briggs Type Indicator (MBTI) (Myers & McCaulley, 1985). The former is mostly used in the academic research area, while the latter is mostly used in the applied field of counseling and management training (Carskadon, 1979; Devito, 1985). Although the two tests differ in a number of ways, researchers have recently been focusing on the investigation of similarities between them (McCrae & Costa, 1989).

The NEO PI-R was developed by Costa and McCrae (1992) and measures five higher-order dimensions of personality, called the Five Factor Model (FFM). *Neuroticism* may be described as *the tendency to experience negative emotions, notably anxiety, depression and anger*. *Extraversion* refers to *high activity, sociability and a tendency to experience positive emotions*. *Openness to experience* represents *the tendency to involve in intellectual activities and new experi-*

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ences. *Agreeableness* refers to *friendly, considerate, and modest behavior*, while *Conscientiousness* is associated with *persistence, self-discipline, and need for achievement*. Each of these five superfactors is composed of six primary factors. Although the FFM did not derive from any single theory of personality, there is abundant evidence that its scales operationalize on a number of theoretical perspectives (McCrae & Costa, 1989). It has also received much empirical support and it is one of the most widely used tests in personality research (Furnham, 1996).

The MBTI was developed by Myers (1962) as an objective measure of Jung's theory of psychological types. The test measures four internally consistent and relatively uncorrelated personality traits, namely Extraversion-Introversion (EI), Sensing-Intuition (SN), Thinking-Feeling (TF) and Judgment-Perception (JP). *Extraversion* refers to a *person whose mental processes are directed at the external world* whereas *Introversion* refers to an *orientation towards the internal world*. *Judging* and *Perceiving* are two processes by which we perceive and then act upon information; *Perceiving* is concerned with *directly receiving information without evaluation* and *Judging* is concerned with *organizing and processing information*. Sensing and Intuition are two alternative ways of perceiving information; *Sensing* involves *receiving information directly through the senses*, whereas *Intuition* involves *discovering possibilities which might not be immediately obvious from sensory data*. Thinking and Feeling are two alternative ways of judging information; *Thinking* involves *the logical analysis of information in terms of the strict principles of cause and effect* and *Feeling* involves *identifying the emotional value that is attached to objects or events*.

Psychological type is given by a four-letter code (e.g. ESTP) and there are thus 16 personality types in total. However, this has led to criticisms of the MBTI on the basis that there is no bimodal distribution of preference scores in reality (Furnham, 1996). The MBTI has also been criticized in that there is no support for the typological theory on which it is based (Hicks, 1984; Sticker & Ross, 1964) and that it has low construct validity (Saggino, Cooper & Kline, 2001).

Based on the claim that the Jungian concepts which underlie the MBTI have been distorted, McCrae and Costa (1989) attempted to reinterpret the MBTI from the perspective of the FFM in two analyses, one considering the four MBTI scales as discrete and one considering them as continuous variables. The four MBTI indices measure aspects of four of the Big 5 dimensions of personality. More specifically, they found that EI was correlated with Extraversion, SN with Openness, TF with Agreeableness and JP with Conscientiousness. These results were replicated by McDonald, Anderson, Tsagarakis and Holland (1994). Furnham (1996) also provided evidence supporting these results, but further found Neuroticism to be correlated to both EI and TF. Furthermore, Furnham looked at the correlations between the MBTI scales and the 30 subfactors of the

FFM. The highest correlations were between EI and Gregariousness, Warmth, and Positive emotions (Extraversion), between SN and Ideas, Fantasy and Aesthetics (Openness), between TF and Tender-mindedness, Trust and Altruism (Agreeableness), between JP and Order, Deliberation and Self-discipline (Conscientiousness) and between EI and Self-consciousness, Depression and Vulnerability (Neuroticism).

The aim of this study was to replicate the findings of McCrae and Costa (1989) ( $N = 468$ ) and of McDonald et al. (1994) ( $N = 209$ ), on a large adult population ( $N = 900$ ), showing similar correlations between the MBTI and the NEO PI-R, and also to replicate the findings of Furnham (1996) ( $N = 160$ ) and find similar patterns of correlations amongst the NEO PI-R subscales and the MBTI scales. Therefore, the hypotheses were that Extraversion would be correlated with EI (H1), Openness with SN (H2), Agreeableness with TF (H3) and Conscientiousness with JP (H4).

## METHOD

### PARTICIPANTS

A total of 900 participants were recruited in this study. Of these 717 were male and 183 were female. Their age ranged from 23 to 64, with a mean of 42. They were all British adults, tested by a business psychology consulting company as part of an assessment exercise.

### MATERIALS

*The Revised NEO Personality Inventory (NEO PI-R)* (Costa & McCrae, 1992). This is a 240-item untimed questionnaire, measuring 30 primary and five supertraits. Each item of the test is answered on a five-point Likert scale, the answers ranging from *strongly disagree* to *strongly agree*. A considerable amount of research has been done on the NEO-PI demonstrating high levels of both reliability and validity (Furnham, 1996).

*Myers-Briggs Type Indicator (MBTI)* (Myers & McCaulley, 1985). This is a 94-item untimed questionnaire (administration time is 15-25 minutes), determining preferences on four bipolar scales: Extraversion-Introversion, Sensing-Intuition, Thinking-Feeling and Judging-Perceiving. Respondents are classified into one of 16 personality types, based on the highest score they receive on each of the four scales. Research on the MBTI has demonstrated that the inventory has a satisfactory level of both reliability and validity (Furnham & Stringfield, 1993).

### PROCEDURE

Participants were tested by Kaisen Consulting, a British-based management

consulting firm run predominantly by chartered psychologists, as part of an individual assessment or career development center process.

## RESULTS

### (A) PERSONALITY MEASURES: NEO PI-R AND MBTI

**Correlations** Partial correlations between the Big 5 personality factors and the Myers-Briggs Type Indicator, controlling for gender and age, are presented in Table 1. The highest correlations between the two personality tests were as follows. Neuroticism was most highly correlated with MBTI Extraversion ( $r = -.30$ ,  $p = .001$ ) and Introversion ( $r = .31$ ,  $p < .001$ ). Costa and McCrae's Extraversion was most highly correlated with Myers-Briggs Extraversion ( $r = .71$ ,  $p < .001$ ) and Introversion ( $r = -.72$ ,  $p < .001$ ). Openness was most highly correlated with Sensing ( $r = -.66$ ,  $p < .001$ ) and Intuition ( $r = .64$ ,  $p < .001$ ). Agreeableness was most highly correlated with Thinking ( $r = -.41$ ,  $p < .001$ ) and Feeling ( $r = .28$ ,  $p < .001$ ). Conscientiousness was most highly correlated with Judgment ( $r = .46$ ,  $p < .001$ ) and Perception ( $r = -.46$ ,  $p < .001$ ). These results are in agreement with McCrae and Costa's (1989), McDonald et al's. (1994) and Furnham's (1996) findings, which are also presented in Table 1 for comparison purposes.

TABLE 1  
PARTIAL CORRELATIONS BETWEEN MBTI FACTORS AND NEO PI-R SUBFACTORS AND SUPERFACTORS

	E	I	S	N	T	F	J	P
N1:Anxiety	-.27***	.27***	.17***	-.16***	-.10**	.09**	.17***	-.18***
N2:Angry-hostility	-.08*	.10**	.08*	-.07*	.05	-.02	.04	-.04
N3:Depression	-.34***	.33***	.15***	-.15***	-.13***	.13***	.04	-.03
N4:Self-conscious.	-.44***	.45***	.22***	-.22***	-.09**	.06	.17***	-.19***
N5:Impulsiveness	.12***	-.13***	-.10**	.10**	-.10**	.12**	-.18***	.21***
N6:Vulnerability	-.29***	.29***	.13***	-.10**	-.21***	.17***	.07	-.09**
<b>Neuroticism</b>	<b>-.30***</b>	<b>.31***</b>	<b>.15***</b>	<b>-.14***</b>	<b>-.13***</b>	<b>.12***</b>	<b>.07</b>	<b>-.07</b>
<i>N. (McCrae &amp; Costa,1989)</i>								
<i>Males</i>		.16**		-.06		.06		.11
<i>N. (McCrae &amp; Costa,1989)</i>								
<i>Females</i>		.17*		.01		.28***		.04
<i>N. (MacDonald et al.,1994)</i>								
<i>Males</i>	-.18	.14	-.16	.21	-.29*	.36*	-.25	.30*
<i>N. (MacDonald et al.,1994)</i>								
<i>Females</i>	-.20*	.23*	.10	-.02	-.18*	.18	.09	-.03
<i>N. (Furnham, 1996)</i>	-.24**	.26***	-.02	.03	-.16*	.18*	.01	-.00
E1:Warmth	.58***	-.58***	-.18***	.16***	-.19***	.14***	-.08*	.09*
E2:Gregariousness	.67***	-.65***	-.10**	.11**	-.04	.01	-.06	.07*
E3:Assertiveness	.47***	-.50***	-.19***	.17***	-.18***	-.13***	-.03	.07*
E4:Activity	.41***	-.43***	-.22***	.21***	.11**	-.10**	-.05	.08*
E5:Excitement seek.	.34***	-.33***	-.20***	.21***	.04	-.02	-.20***	.20***
E6:Positive emotions	.50***	-.53***	-.31***	.27***	-.13***	.11**	-.14***	.15***
<b>Extraversion</b>	<b>.71***</b>	<b>-.72***</b>	<b>-.28***</b>	<b>.27***</b>	<b>.00</b>	<b>-.00</b>	<b>-.13***</b>	<b>.16***</b>
<i>E. (McCrae &amp; Costa,1989)</i>								
<i>Males</i>		-.74***		.10		.19**		.15*

Table 1 Continued

	E	I	S	N	T	F	J	P
<i>E. (McCrae &amp; Costa, 1989)</i>								
<i>Females</i>		-.69***		.22**		.10		.20**
<i>E. (MacDonald et al., 1994)</i>								
<i>Males</i>	.58***	-.58***	-.08	.02	.05	-.05	-.06	.03
<i>E. (MacDonald et al., 1994)</i>								
<i>Females</i>	.68***	-.68***	-.13	.06	-.08	.06	-.16*	.13
<i>E. (Furnham, 1996)</i>	.69***	-.69***	-.18*	.16*	-.09	.05	-.03	.02
O1: Fantasy	.18***	-.21***	-.53***	.52**	-.18***	.17***	-.28***	.30***
O2: Aesthetics	.15***	-.18***	-.45***	.44***	-.19***	.17***	-.08*	.08*
O3: Feelings	.33***	-.35***	-.32***	.29***	-.24***	.20***	-.12***	.14***
O4: Actions	.33***	-.35***	-.46***	.42***	.05	-.06	-.23***	.25***
O5: Ideas	.07*	-.09**	-.56***	.56***	-.04	-.00	-.13***	.14***
O6: Values	.13***	-.14***	-.31***	.31***	-.03	.03	-.21***	.22***
<i>Openness</i>	.28***	-.32***	-.66***	.64***	-.17***	.13***	-.25***	.26***
<i>O. (McCrae &amp; Costa, 1989)</i>								
<i>Males</i>		.03		.72***		.02		.30***
<i>O. (McCrae &amp; Costa, 1989)</i>								
<i>Females</i>		-.03		.69***		-.02		.26***
<i>O. (MacDonald et al., 1994)</i>								
<i>Males</i>	-.30*	.30*	-.60***	.71***	-.34*	.35*	-.07	.07
<i>O. (MacDonald et al., 1994)</i>								
<i>Females</i>	.14	-.13	-.70***	.65***	-.07	.15*	-.35***	.33***
<i>O. (Furnham, 1996)</i>	.21**	-.22**	-.52***	.49***	-.26**	.22**	-.24*	.24***
A1: Trust	.22***	-.21***	-.17***	.20***	-.27***	.18***	-.04	.06
A2: Straightforward.	-.12***	.14***	.05	-.05	-.24***	.14***	.06	-.08*
A3: Altruism	.21***	-.20***	-.00	-.02	-.27***	.16***	.03	-.03
A4: Compliance	-.10**	.10**	.06	-.05	-.26***	.17***	.10**	-.10**
A5: Modesty	-.21***	.21***	.15***	-.16***	-.14***	.09**	.04	-.07*
A6: Tender-mind.	.01	-.03	.10**	-.10**	-.42***	.37***	-.01	.02
<i>Agreeableness</i>	-.02	.02	.01	-.00	-.41***	.28***	.05	-.06
<i>A. (McCrae &amp; Costa, 1989)</i>								
<i>Males</i>		-.03		.04		.44***		-.06
<i>A. (McCrae &amp; Costa, 1989)</i>								
<i>Females</i>		-.08		.03		.46***		.05
<i>A. (MacDonald et al., 1994)</i>								
<i>Males</i>	-.08	-.01	-.11	.29*	-.60***	.52***	-.00	-.00
<i>A. (MacDonald et al., 1994)</i>								
<i>Females</i>	.01	-.01	-.09	.08	-.41***	.39***	.03	-.05
<i>A. (Furnham, 1996)</i>	.00	-.01	.03	-.03	-.47***	.40***	.06	.00
C1: Competence	.18***	-.18***	-.05	.04	.15***	-.16***	.20***	-.18***
C2: Order	.08*	-.08*	.19**	-.20***	.13***	-.19***	.50***	-.52***
C3: Dutifulness	.07*	-.07*	.09**	-.11**	.09**	-.15***	.24***	-.25***
C4: Achievement-striv.	.25***	-.28***	-.12***	.08*	.23***	-.21***	.19***	-.17***
C5: Self discipline	.16***	-.15***	.05	-.08*	.20***	-.23***	.32***	-.31***
C6: Deliberation	-.13***	.14***	.20***	-.22***	.13***	-.20***	.44***	-.46***
<i>Conscientiousness</i>	.13**	-.13***	.10**	-.13***	.22***	-.27***	.46***	-.46***
<i>C. (McCrae &amp; Costa, 1989)</i>								
<i>Males</i>		.08		-.15*		-.15*		-.49***
<i>C. (McCrae &amp; Costa, 1989)</i>								
<i>Females</i>		.08		-.10		-.22**		-.46***
<i>C. (MacDonald et al., 1994)</i>								
<i>Males</i>	-.11	-.01	.03	-.03	.01	-.02	.56***	-.62***
<i>C. (MacDonald et al., 1994)</i>								
<i>Females</i>	-.02	-.00	.11	-.18*	-.07	-.04	.49***	-.50***
<i>C. (Furnham, 1996)</i>	.03	-.06	.20**	-.24***	.19**	.28***	.50***	-.41***

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Partial correlations between the subfactors of the Big 5 and the MBTI dimensions, controlling for gender and age, are also presented in Table 1. EI was most highly correlated with Gregariousness ( $r = .67, p < .001$ ), Warmth ( $r = .68, p < .001$ ) and Positive emotions ( $r = .50, p < .001$ ). SN was most highly correlated with Ideas ( $r = -.56, p < .001$ ), Fantasy ( $r = -.53, p < .001$ ) and Aesthetics ( $r = -.45, p < .001$ ). TF was most highly correlated with Tender-mindedness ( $r = -.42, p < .001$ ), Altruism ( $r = -.27, p < .001$ ) and Trust ( $r = -.27, p < .001$ ). JP was most highly correlated with Order ( $r = .50, p < .001$ ), Deliberation ( $r = .44, p < .001$ ) and Self-discipline ( $r = .32, p < .001$ ). The highest correlations between the Neuroticism sub-factors and the MBTI dimensions were with Self-consciousness ( $r = -.44, p < .001$ ), Depression ( $r = -.34, p < .001$ ) and Vulnerability ( $r = -.29, p < .001$ ), all of which are subfactors of EI.

## DISCUSSION

The aim of this study was to investigate the relationship between two well-established personality tests, the NEO PI-R and the MBTI. It was hypothesized that, in line with previous research (McCrae & Costa, 1989; McDonald et al., 1994), Extraversion would correlate with EI (H1), Openness with SN (H2), Agreeableness with TF (H3) and Conscientiousness with JP (H4). The results clearly supported all of these hypotheses. Neuroticism was also found to be correlated with EI, a finding which has been reported previously by Furnham (1996), although this correlation was smaller in magnitude compared to the other correlations.

These results demonstrate an overlap between the two personality measures, which can be better understood by looking at the correlations between the subfactors of the Big 5 and the MBTI factors. The greatest overlap, as measured by the size of the correlations, is between Extraversion and MBTI Extraversion-Introversion, which is not surprising, as there is clearly considerable theoretical overlap between these factors (McCrae & Costa, 1989). More specifically, the subfactors which most highly correlated with EI were Gregariousness, Warmth, and Positive emotions. The same subfactors were reported by Furnham (1996) as having the highest correlations with EI.

Openness to experience was negatively correlated with Sensing and positively correlated with Intuition. Sensing involves directly receiving information through the senses while Intuition involves going beyond the information provided by the senses in order to discover possibilities that may not be immediately obvious. When looking at the subfactors of Openness, which correlated most highly with SN, the reason that these factors overlap is more apparent. The highest correlations were between SN and Ideas, Fantasy and Aesthetics, which measure whether a person is insightful, inventive, curious, original, imaginative,

complicated and versatile - among other things - which logically would be characteristics of an Intuitive person. It should also be noted that the same subfactors were found to have the highest correlations with SN in Furnham's study (1996).

Agreeableness was negatively correlated with Thinking and positively correlated with Feeling. Thinking people approach life in a rational, analytical way, searching for logical relationships and analyzing information by the strict principles of cause and effect, whereas Feeling people are more concerned with what they feel about a person or an event rather than what they can learn about him, her or it through logical analysis. The Agreeableness subfactors which most highly correlated with TF were Tender-mindedness, Trust and Altruism, replicating Furnham's (1996) findings. These are characteristics of people who are - among other things - sympathetic, warm, soft-hearted, kind, forgiving, trusting, peaceable and tolerant. It is therefore not surprising that Agreeable people tend to be Feeling.

Conscientiousness was positively correlated with Judging and negatively correlated with Perceiving. *Judging is the process of coming to a conclusion about something* whereas *Perceiving is the process of becoming aware of something*. Again, the overlap between these factors is better understood by looking at the correlations between the subfactors and JP. The Conscientiousness subfactors which most highly correlated with JP were Order, Deliberation and Self-discipline, in accordance with Furnham (1996). These are characteristics of people who are organized, thorough, methodical, industrious, and who are not hasty or impulsive. It is therefore expected that Conscientious people would not simply take in information (Perceiving), but would process that information in order to reach a conclusion (Judging).

Neuroticism was negatively correlated with MBTI Extraversion and positively correlated with Introversion, although this correlation was not very high in comparison to the other correlations. The Neuroticism subfactors which were most highly correlated with EI were Self-consciousness, Depression and Anxiety. These results are very similar to those of Furnham (1996), who found Self-consciousness, Depression and Vulnerability to have the highest correlations with Neuroticism. These subfactors represent people who are - among other things - shy, inhibited, anxious, moody, fearful and who lack confidence. These characteristics in logic relate more to people whose mental processes are directed towards the inner world, that is, Introverts. The correlations between the Big 5 subfactors and the MBTI factors clearly follow the pattern reported by Furnham in 1996.

This study is a replication of the studies of McCrae and Costa (1989), McDonald et al. (1994) and Furnham (1996), attesting to the significant overlap between the NEO PI-R and the MBTI by using a large sample. This does not necessarily mean that the MBTI should be reinterpreted in terms of the FFM. The

most important implication of this finding is that research that has been conducted on the areas of overlap on the two tests separately can be joined to provide a more comprehensive picture of the construct of personality. Future research should, therefore, focus on comparing and contrasting the findings of studies on either the NEO PI-R or the MBTI and some common factor (e.g., vocational interests, intelligence, academic achievement) thus providing more conclusive reports on the effect of personality on the factors under investigation.

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