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The Big Five Facets and the MBTI: The Relationship between the 30 NEO-PI(R) Facets and the Four Myers-Briggs Type Indicator (MBTI) Scores

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Abstract

This study looked at the relationship between two very well-established personality tests at the facet level. Over 9000 adults completed the MBTI and the NEO-PI-R, which measures six facets each of the Big Five personality traits. Correlational analysis suggested very little relationship between test scores, despite issues of shared method variance. At the domain level, results suggested the highest correlations for Neuroticism was TF, for Extraversion EI, for Openness JP and for both Agreeableness and Conscientiousness TF. There were many inconsistencies in the pattern of correlations at the facet level. The study also did not confirm the relationship between the SN scale and Openness which has been found before. Regressions of the Big Five onto the four MBTI scores suggested that all five traits were related to the TF and JP types. Results are discussed in terms of previous studies in this area. Limitations are acknowledged.

Keywords

Personality, MBTI, NEO-PI-R, Big Five

1. Introduction

Probably the most well know personality test among I/O practitioners and business coaches and trainers of many backgrounds is the Myers-Briggs Type Indicator-Form G (MBTI: DeVito, 1985; Lloyd, 2012; Moyle & Hackston, 2018; Myers & Myers, 1990; Randall et al., 2017). It has been claimed that about fifty million people have taken the MBTI since the 1960s and that two million continue to do so every year, but accurate and up-to-date data is very difficult to

obtain. Certainly it is probably the most well-known test in the world, as so many people have been asked to complete it.

Equally, the most well-known and used personality test by researchers is the Big Five NEO-PI® (Costa & McCrae, 1992; Furnham, 2021). There is a *plethora* of data on the psychometric properties of the NEO-PI-R and a corresponding *paucity* on the MBTI which has long gone out of fashion with personality researchers.

This study looks at the relationship between these two tests in a large adult sample and using facet scores. No previous studies have examined the relationship using a facet level analysis which offers an opportunity to look more closely at the nature of the relations between the two measures. Furthermore, the data are collected from a large group of working adults. The results should allow people who have taken one test to "translate" their scores to the other, thus possibly getting greater insight into the mechanisms and processes by which personality traits operate.

1.1. The MBTI

The MBTI is loosely based on Jungian theory and is a four-dimensional model which allows people to be described by four letters representing their particular "type". Types are regarded as categories of membership that are distinct and discontinuous. Typological theory suggests a discontinuity between similar behaviours, while trait theory does not. Myers and McCaulley (1985) developed the original MBTI. The manual suggests that Extraverts relate more easily to the outer world of people and things while Introverts' main interests are in the inner world of concepts and ideas. Sensing and Intuition are ways of perceiving: Sensing through the five senses and "known facts" while Intuition is more "unconscious" looking for possibilities and relationships. The two ways of Judging are summed up by the opposites of Thinking, which stresses logic and impersonal processes, and Feeling, based more on personal values and judgements. The final dimension is a combination of Perception and Judgement, with Judging types showing preferences for a planned, decided, orderly way of life while the Perceiving type prefers a flexible, spontaneous way of life.

Assessments and critiques of the MBTI have been published for over 40 years (Arnau et al., 2003; Carlyn, 1977; Carlson, 1985; Case & Phillipson, 2004; Choi, 2021; Dawes, 2004; Furnham 2020, 2022; Murray, 1990; Pittenger, 1993; 2005; Querk, 2000; Stein & Swan, 2019; Thompson & Borrello, 1986; Yang et al., 2016). The test has been used to describe different groups (Goetz et al., 2020).

One critique of the MBTI is that it is less reliable than other tests and which may account for many disparity in findings. According to McCrae and Costa (1988), 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 of 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.

1.2. Relationship to Other Personality Tests

Various studies over many years have looked at the location of the MBTI in the personality factor space. Saggino and Kline (1996) looked at correlations between the MBTI and Cattell's 16PF, and Eysenck's Personality Questionnaire (EPQ). Their factor analysis of the MBTI yielded five, not four, factors, and they suggested that the EI dimension is clear but the TF dimension is "not sufficiently pure" because it loads on to different factors. There are studies which have related the MBTI to other tests, like the Fundamental Interpersonal Relations Orientation-Behavior, as well as intelligence tests. Some recent work has investigated the relationship between dark-side (personality disorder) traits and the MBTI (Furnham & Crump, 2014). More recently Furnham and McClelland (2022) have looked at the relationship between the MBTI and the CPI (California Personality Inventory).

1.3. MBTI and NEO-PI-R

Over nearly 30 years researchers have tried to locate the dimensions of all new tests in the Five Factor space because of the dominance of the FFM. McCrae and Costa (1988) found the four MBTI indices measure aspects of four of the Big 5 dimensions of personality. They found that EI was correlated with Extraversion, SN with Openness, TF with Agreeableness and JP with Conscientiousness. They had various critiques, such as Jung's descriptions of the types include traits that we know empirically do not covary. They argued that the MBTI includes a scale (the JP scale) that is not part of Jung's theory. The measurement identifies people in terms of dominant function and hence dichotomises preference scores, yet when plotted out are not bi-modally distributed. Empirical evidence shows that there are interactions, as well as main effects, for the types which follow the descriptions of the types, is lacking. Similarly, the questionnaire fails to measure Neuroticism.

MacDonald et al. (1994) tested 161 female and 48 male Canadian university students and found the MBTI EI was correlated with NEO-PI Extraversion, MBTI SN with NEO-PI Openness, MBTI TF with NEO-PI Agreeableness, and MBTI JP with NEO-PI Conscientiousness. Furnham (1996) also provided evidence supporting these results, but further found Neuroticism to be correlated with both EI and TF. Furnham looked at the correlations between the MBTI scales and the 30 subfactors of the Five-Factor Model. The highest correlations were between EI and Gregariousness, Warmth, and Positive emotions (Extraversion), between SN and Ideas, Fantasy and Aesthetics (Openness), between TF and Tendermindedness, Trust and Altruism (Agreeableness), between JP and Order, Deliberation and Self-discipline.

Furnham et al. (2003) got 900 participants to complete the NEO PI-R and the MBTI questionnaire. 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 and Costa (1988).

Klinkosz and Iskra (2010) tested a Polish sample of 300 psychology students. Correlations for scores on the MBTI scales with NEO-4 domains ranged from .72 to .02 for Extraversion, from −.60 to −.16 for Openness to Experience, from −.56 to −.04 for Agreeableness, and from .55 to −.07 for Conscientiousness. They argued that two domains assessed with the NEO–4 correspond to preferences measured by the Myers-Briggs Type Indicator. Renner at al. (2014) tested 435 adult Austrians (255 female), using the NEO-FFI and confirmatory factor analysis. The found MBTI Extraversion correlated with Extraversion, MBTI Judging-Perceiving with Conscientiousness, MBTI Thinking-Feeling with Agreeableness, and MBTI Intuition-Sensing with Openness to Experience.

There is therefore both consistency and inconsistency in the results from the above studies. This matter may be resolved by a closer examination at the facet level which the NEO-PI-R affords.

1.4. This Study

This study advances our knowledge in this area in three ways. First, rather than using a relatively small convenient student sample this study uses a sample of nearly 10,000 adults, which should ensure more generalisable results. Second, we use the NEO-PI-R which is a much longer Big Five measure with six facet scores per trait. This offers a much more detailed and nuanced analysis of the precise relationship between the Big Five traits and the four MBTI scores. Third, in this study we compute not only correlations but multiple regressions to example how the Big Five together impact on the four Jungian dimensions. We expect to part replicate and extend previous findings.

2. Method

2.1. Participants

There were 7538 males and 1949 females who took part in this study. Their average age on test taking was 36.43 years (SD = 5.03). All were employed: 38.2% were senior managers, 20% were middle managers and 11.6% were junior managers. The remainder were support staff or experts. They came from a wide range of organisations in the private and public sector.

2.2. Tests

1) **Myers-Briggs Type Indicator (MBTI)** (Myers & McCaulley, 1985). This is a Jungian-based inventory that is composed of 94 forced-choice items that yield scores on each of the eight factors, as well as the famous four dimensions: 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. The test provides linear scores on each dimension which are usually discussed in terms of types based on cut-off scores. The MBTI is notorious for its scoring procedure that eliminates/ignores data by converting an interval scale to a binary ordinal scale. The Myers-Briggs Type Indicator has been the focus of extensive research and substantial evidence has accumulated suggesting the inventory has satisfactory concurrent and predictive validity and reliability.

2) **NEO Personality Inventory Revised (NEO-PI-R)** (Costa & McCrae, 1992). This questionnaire is a 240-item measure designed to assess the Five Factor Model (FFM) domains (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness), as well as six primary traits/facets for every domain. The test takes approximately 35 min to complete. Research has provided evidence for the validity and the reliability of this instrument.

2.3. Procedure

Participants were tested by a British based psychological consultancy over a period from 10 to 16 years, where participants attended assessment centres and their data was logged. Total scores were logged which prevented the possibility of examining the internal reliability of the scales, which is generally seen as satisfactory. Participants were given feedback on their test performance and agreed to take part in research, and anonymised data was used in the analysis with their permission. Data files were given to the author for analysis with all tests scored.

3. Results

Table 1 shows the results of domain and facet correlations. The highest correlation for EI was Extraversion (r = .20), but also Neuroticism (r = −.08) and Openness (r = .09). SN was only correlated with Agreeableness (r = .05), while TF was correlated significantly with Agreeableness (r = −.35) as well as Openness (r = −.14) and Conscientiousness (r = .20). Finally, JP was correlated most highly with Openness (r = −.16).

Table 1 also shows the correlations with the facets. What is particularly interesting is where some facets correlate fairly highly, but others not at all, with the MBTI trait. A good example were the facet correlations with TF, two Extraversion facets were strongly negative and three positive, while three were negative and three not significant with Openness.

We then proceeded to do a number of regressions to further understand the relationship between these two measures. We regressed the MBTI onto the Big Five, and vice versa. Table 2 shows the results of four regressions with the four MBTI scales as criterion variables and the Big Five as predictors. All were significant, with the variance accounted for varying between 1% and 21%. The regression for EI was predictably the clearest, with Extraversion being the strongest correlate. The SN variable suggested that Sensing people were high on Agreea-

bleness and low on Openness and Conscientiousness. Surprisingly all five factors related to the TF dimension, suggesting that Conscientiousness was positively, and all other big five traits negatively, correlated with the Thinking dimension. The final regression suggested that Judging people were low on Openness and high on Conscientiousness and Extraversion.

Table 1. Correlations between the big five domain and facet scores and the MBTI scores.

	Mean	SD	EI	SN	TF	JP
Mean			22.84	22.19	27.41	23.36
SD			14.87	14.61	15.79	14.54
Neuroticism	63.96	19.92	−.08***	.00	−.16***	00
Anxiety	12.05	5.22	−.09***	−.02	−.15***	.03
Angry Hostility	9.96	4.58	−.04***	−.01	.00	.00
Depression	9.33	4.74	−.08***	.00	−.16***	.01
Self-Consciousness	11.63	4.29	−.12***	.01	−.14***	.04***
Impulsiveness	14.61	4.42	.05***	.02	−.12***	−.08***
Vulnerability	6.44	3.53	−.08***	02	−.19***	.03
Extraversion	128.14	18.63	.20***	−.03	.01	−.07***
Warmth	23.78	4.02	.14***	.01	−.19***	−.04
Gregariousness	20.09	4.72	.17***	−.03	.04	−.05***
Assertiveness	20.95	4.49	.14***	−.01	.19***	−.00
Activity	21.79	4.11	.12***	−.03	.14***	−.04
Excitement Seeking	18.91	4.51	.13***	−.04	.06***	−.11***
Positive Emotion	22.66	4.62	.15***	−.02	−.13***	−.08***
Openness	120.92	18.66	.09***	−.03	−.14***	−.16***
Fantasy	16.90	4.86	.05***	.00	−.18***	−.14***
Aesthetics	17.56	5.96	.04	−.04	−.16***	−.08***
Feelings	21.92	4.23	.08***	.02	−.23***	−.09***
Actions	20.04	4.19	.10***	−.01	.01	−.15***
Ideas	20.76	5.26	.06***	−.03	.03	−.07***
Values	23.75	3.42	.04	.01	−.02	−.13***
Agreeableness	120.06	15.74	.02	.05***	−.35***	.03
Trust	22.13	4.12	.07***	.03	−.21***	−.00
Straightforwardness	18.83	4.47	−.02	.06***	−.20***	.06***
Altruism	23.90	3.48	.09***	.01	−.25***	.02
Compliance	18.11	4.03	−.01	.03	−.21***	.04
Modesty	17.53	4.62	−.05***	.03	−.18***	.00
Tender Mindedness	19.56	3.45	.03	.03	−.36***	.00

Continued

Conscientiousness	134.31	17.39	.04	−.04	.20***	.14***
Competence	24.36	3.24	.07***	−.03	.15***	.05***
Order	19.00	4.50	.01	−.04	.13***	.16***
Dutifulness	25.00	3.52	02	−.04	.09***	.09***
Achievement Striving	23.34	4.01	.08***	−.02	.22***	.05***
Self-Discipline	23.97	4.08	.06***	−.04	.16***	.07***
Deliberation	18.66	4.41	−.04	−.03	.14***	.15***

***$p < .001$. Note correlations over r > .025 are significant at .01.

Table 2. Regressions with the four MBTI scores as criterion and NEO Big Five as predictors.

(a) MBTI_EI

	B	*SE*	*Beta*	*t*
Neuroticism	−.01	.01	−.01	−.80
Extraversion	.16	.01	.20	14.60***
Openness	.00	.01	.00	.23
Agreeableness	.02	.01	.02	2.08*
Conscientiousness	−.01	.01	−.01	−.78
Adjusted R^2			.04	
F			63.27	
p			.001	

(b) MBTI_SN

	B	*SE*	*Beta*	*t*
Neuroticism	−.02	.01	−.02	−1.67
Extraversion	−.01	.01	−.01	−.60
Openness	−.03	.01	−.04	−2.85**
Agreeableness	.05	.01	.06	4.64***
Conscientiousness	−.05	.01	−.06	−4.51***
Adjusted R^2			.01	
F			9.99	
p			.001	

(c) MBTI_TF

	B	*SE*	*Beta*	*t*
Neuroticism	−.12	.01	−.15	−12.54***
Extraversion	−.04	.01	−.05	− 3.86***
Openness	−.08	.01	−.10	−8.48***
Agreeableness	−.39	.01	−.39	−36.73***
Conscientiousness	.17	.01	.19	15.75**
Adjusted R^2			.21	
F			395.30	
p			.000	

(d) MBTI_JP

	B	*SE*	*Beta*	*t*
Neuroticism	.04	.01	.06	4.38***
Extraversion	−.02	.01	−.03	−2.26*
Openness	−.11	.01	−.14	−10.88***
Agreeableness	.03	.01	.03	2.59*
Conscientiousness	.13	.01	.16	12.34***
Adjusted R^2			.05	
F			71.77	
p			.001	

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

We also performed rotated and unrotated factor analyses. The varimax rotated analysis revealed four factors: One (Eigenvalue 1.86; Variance 20.7%; NEO-C .84; NEO-N −.79); Two (Eigenvalue 1.53; Variance 16.9%; NEO-O −.76; NEO-E .76; MBTI-E .52): Three (Eigenvalue 1.28; Variance 14.3%; NEO-A .84; MBTI TF −.76) and Four (Eigenvalue 1.12; Variance 12.43%; MBTI-SN .74; MBTI-JP .68). Again, this appeared to show how unrelated the tests were.

4. Discussion

This study confirmed and extended the scattered literature on the relationship between two of the most well-known and celebrated personality tests, but two different groups of professionals: academics and practitioners (Moyle & Hackston, 2018). Many may be surprised at the low correlations between the two tests suggesting little empirical as well as conceptual overlap. Although there is abundant evidence documenting the criterion validity (concurrent and predictive) for measures of the Big Five, specifically the one used here (NEO-PI-R) there is scant evidence for the MBTI (Furnham 2021). Thus, these results illustrate the need to question further what the MBTI measures and any evidence of concurrent validity.

Results showed that whereas one scale, Sensing-Intuition, was not represented in Big Five factor space, Thinking-Feeling, and to a lesser extent Judging-Perceiving, seemed related to a number of personality trait facets.

Because of the growth in psychological tests, and to a lesser extent theories, there has been an interest in the relationship between scores from tests supposedly measuring the same construct (Furnham, 2008; Pace & Brannick, 2010). In this study both tests had a measure on introversion-extraversion, though the other factors were quite differently described and named.

This issue is known as *Jingle-Jangle fallacy* which refers to the specious idea that two different things are the same because they bear the same name (*jingle fallacy*) or that two identical or very similar concepts are different because they have different labels (*jangle fallacy*). For the psychometrician, the jangle fallacy

describes the inference that two tests of whatever sort with *different names* or *labels* measure essentially quite *different constructs*/*ideas*. On the other hand, a jingle fallacy is based on the assumption that two measures that have the same name measure the same construct. In this sense the extraversion scores on the two tests supports the jingle fallacy: they are measuring different things

It should be pointed out that neo-psychoanalytic Jungian and trait theorists, like Eysenck, have very different explanations for the trait of extraversion. Eysenck's (1967) theory of cortical arousal postulates that extraverts are under-stimulated and therefore tend to seek arousal-inducing behaviours to increase their arousal level, whereas introverts are cortically over-stimulated, and tend to avoid situations or behaviours that may induce an increase in arousal level. He saw activity, sociability and ambition as central to extraversion. Extraverts trade off accuracy for speed, always seeking new stimulations. The Jungians on the other hand argue that extraverts draw energy from an external world of interaction and doing, while introverts draw energy from an internal world of thought and reflection. They tend to reflect, and then to act. Interestingly, at the domain level the correlation between the two extraversion scores was only r = .20 and none of the facets had a higher score. Similarly in the regression Agreeableness was also significant. Thus, it seems that the underlying concept of the process or mechanism for the same trait effects the questionnaire items and hence the overall score.

The Big Five factor which was most strongly and consistently associated with an MBTI trait was Agreeableness with TF Feeling. This confirms the previous findings. The MBTI literature suggests that those with high Feeling scores have a proclivity to harmony, intimacy, sympathy and devotion. They often try too hard to meet other's needs, enjoy serving people, try never to offend others, and is a sensitive emotional self-monitor.

What is dramatic about **Table 1** is that of the 140 correlations with the MBTI and the Big Five Domains and Facets only two were r > .25. Similarly, in one regression, only one percent of the variance was accounted for. This suggests whatever the SN dimension is measuring it is not central to the Big Five scheme. The MBTI literature suggests that this dimension refers to how people process or take in information. It is concerned with learning about the world. Sensors prefer to take in information in concrete, tangible ways, relying mainly on their five senses. Those who intuit look for patterns in relationships and prefer to focus on the more abstract big picture. Previous studies have shown the SN scale is related to Big Five Openness which seems logical but in this study we found the relationship is very weak. Those interested in learning style and preference would recognise this description as an approach to learning or intellectual style (Furnham, 1992, 2012a, 2012b). This suggests the MBTI is measuring factors outside those usually thought of as personality variables.

One of the features of the MBTI and those who use the test is the message of "gifts differing" and the "acceptability" of every profile. This contrasts with the

Big Five literature which suggests that those with high scores on Neuroticism are prone to a number of problems like depression, anxiety and psycho-somatic illness. The question is, then, what are the MBTI types most associated with Neuroticism? The correlational results suggest that Neurotics are Introverted Sensors, while the regressions suggest while it is also being associated with Perceivers.

A great deal of the data in health and organisational psychology suggests that two of the Big Five factors, namely Conscientiousness and Neuroticism, are associated with adaptation and work success (Furnham, 2018a). The MBTI profile suggests that Thinking and Judging types would be most happy and successful. Indeed, there is data to suggest that the ENTJ profile is most commonly found among successful executives (Furnham & Stringfield, 1993).

One question practitioners often get asked is, which is the best or better personality test? (Celli & Lepri, 2018) This is of course a simple, rather naïve, question but one requires a long and complex answer usually starting with questions for what purpose the test is to be used (counselling, selection, self-awareness). It has been demonstrated that academics and practitioners have different perceptions and needs in test selection and usage (Furnham, 2018b). This may explain why the MBTI is so popular with practitioners and long ignored by academics interested more in the theoretical foundations and psychometric properties of tests, particularly construct and predictive validity. Thus, if asked which test is the most valid and validated the answer would be the NEO-PI-R, while which is the most marketed to and used by practitioners (e.g. trainers) the answer would be the MBTI. The results of this study may help those interested try to understand the results of one test in the terminology of the other.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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