Factorial structure and validity of the Francis Psychological Type

and Emotional Temperament Scales (FPTETS)

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**Abstract**

The aim of this study was to test the factorial structure and validity of the Francis Psychological Type and Emotional Temperament Scales (FPTETS) in a sample 209 men and women enrolled on a university ministry training course. Confirmatory Factor Analysis supported the five-factor structure of scales measuring introversion-extraversion, sensing-intuition, feeling-thinking, judging-perceiving, and emotional calm-volatility. This showed that it is possible to add the latter scales to those in the parent instrument (the Francis Psychological Type Scales) without destroying its factorial structure. Validity of the orientation and emotional temperament scales was tested among 78 of the original sample who also completed the Eysenck Personality Questionnaire Revised shortened version (EPQ-RS). There were significant correlations between extraversion scores on the two instruments and between Eysenck neuroticism and FPTETS volatile scores, suggesting these two components of the FPTETS and the two dimensions of the EPQR-S assess similar components of personality in both instruments.

*Keywords*: emotional temperament; Francis Psychological Type Scales; neuroticism; personality; psychological type

**Introduction**

The Francis Psychological Type Scales (FPTS) were developed to operationalize the model of psychological type proposed by Jung (1923) and developed into a four-component model (Myers et al., 1998). They have been widely used over the last 15 years in studies of clergy and congregations. Type models lack a component related to neuroticism, which is present in other models of personality such as Eysenck’s three-dimensional model (Eysenck & Eysenck, 1985; Eysenck et al., 1985) or the five-factor model of personality (Costa & McCrae, 1985). To remedy this, emotional temperament scales have been added to the FPTS. This study examines the factor structure of the new instrument to test if adding the scales retains the original four components. It also seeks to validate two components of the new scales against equivalent components in the Eysenck model of personality.

**Conceptualisations and operationalisations of psychological type**

Jung’s theory of psychological type is rooted in three dichotomous preferences that point to underlying psychological functioning. The first of these relates to the preference for external or internal mental processing, expressed as an orientation towards either extraversion (E) or introversion (I). The second relates to the perceiving process (P) whereby information is taken in, expressed as a preference for the functions of either sensing (S) or intuition (N). The third relates to the judging process (J) whereby decisions are made, expressed as a preference for the functions of either feeling (F) or thinking (T). Jung argued that although all orientations and functions were available to everyone, most people exhibited a preference for one or other of the pairs in each dimension, leading to the idea of a typology. This theory implies differentiation among eight function-orientations (see Ross & Francis, 2020), that is each of the four functions (sensing, intuition, thinking, and feeling) operating in each of the two orientations (introversion and extraversion). In order to operationalise this model of psychological type, psychometric instruments have been developed to assess four features of the theory in order to distinguish not only between the preferred orientation (E or I), the preferred perceiving function (S or N), and the preferred judging function (T or F), but also between the preferred process extraverted in the outside world, either the judging process (J) or the perceiving process (P). Two of the better-known instruments designed to measure these four features of psychological type theory are the Myers-Briggs Type Indicator (MBTI; Myers, McCaulley, Quenck, & Hammer, 1998) and the Keirsey Temperament Sorter (KTS; Keirsey, 1998; Keirsey & Bates, 1978).

The MBTI was designed for use with clients by trained practitioners in one-on-one or small group consultations. The MBTI is also used at extended workshops led by trained practitioners, where the aim is to allow participants to explore their personality by using the instrument as a means of developing themselves and others. The emphasis is on improving self-awareness over an extended period, often in the context of helping organisations to function more effectively. Although this model of utilizing psychological type has proved useful to many people over a number of years (Bayne, 2005), it is cumbersome in situations where type preferences need to be assessed more quickly, as in research studies using questionnaires. There have been several attempts to overcome this problem. Keirsey and Bates (Keirsey, 1998; Keirsey & Bates, 1978) developed the Keirsey Temperament Sorter (KTS), as a 70-item, self-completion instrument. They also developed the notion of ‘temperaments’ alongside type, by looking at the characteristics of people with the matched preferences of SJ, SP, NT, and NF. Although the KTS has been used in a range of studies of type and temperament (Jones & Francis, 1999; Village & Francis, 2005; Waskel & Coleman, 1991), the format of this instrument remains more appropriate for individual self-completion than for inclusion in survey-based research. Francis (2005) developed the Francis Psychological Type Scales (FPTS) specifically as an instrument designed for survey-based research in the context of studies within the fields of psychology and religion or empirical theology. The FPTS have been widely used for well over a decade in studies of clergy and lay people (for examples, see references in Francis, Laycock, & Brewster, 2017).

**Psychological type in relation to other models of personality**

One issue that has been raised in relation to psychological type is how the four dimensions relate to trait models of personality currently popular among psychologists. Type models assign individuals to dichotomous categories using the cumulative scores on each dimension obtained from the particular instrument being employed. There is considerable evidence to suggest that type scores correlate with traits in other models (Crump, Furnham, & Moutafi, 2003; Francis & Jones, 2000; Furnham, 1996; MacDonald, Anderson, Tsagarakis, & Holland, 1995; McCrae & Costa, 1989; Tobacyk, Livingston, & Robbins, 2008). In these studies, MBTI scores were usually treated as if they were scores on a trait-based model, and this may sometimes be the best way to use the data from type sorters in research contexts (Village, 2011). The Five Factor Model (FFM) model posits five dimensions: extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness (Costa & McCrae, 1997, 2008; McCrae & Costa, 2008). In a sample of 267 adults in the US that completed both the FFM and MBTI instruments there were significant correlations between the two extraversion scales, between intuition and openness, between feeling and agreeableness, and between judging and conscientiousness (McCrae & Costa, 1989). These associations are in line with theoretical predictions from the two models, and have been demonstrated to varying extents in other studies (Crump et al., 2003; Furnham, 1996; MacDonald et al., 1994; Parker & Stumpf, 1998; Renner et al., 2014; Tobacyk et al., 2008).

The Eysenck Personality Questionnaire (EPQ) was derived from work on abnormal psychology and posits three dimensions: extraversion, neuroticism, and psychoticism (Eysenck & Eysenck, 1985; Eysenck & Eysenck, 1975; Furnham, Eysenck, & Saklofske, 2008). It has been revised (Eysenck, Eysenck, & Barrett, 1985) and abbreviated (Francis, Brown, & Philipchalk, 1992). In a sample of 377 adult churchgoers there was a good correlation between extraversion as measured by the EPQ and MBTI, and moderate correlation between EPQ psychoticism and judging-perceiving scores in the MBTI (Francis & Jones, 2000). The mapping of these two instruments appears to more complex than for the FFM.

Taken together, the results cited above suggest that psychological type may be a slightly different way of conceptualising dimensions of personality that are shared with trait models. Each has their own origins and assumptions, strengths and weaknesses. The Eysenck model emerged from the field of abnormal psychology and has undergone changes since it was first developed, notably the addition of psychoticism to the original model (Eysenck & Eysenck, 1976; Eysenck et al., 1985). The Eysenck conceptualization views extremes on two of the three dimensions as indicators of pathology, whereas type models stress that preferences reflect different modes of functioning without attaching value or pathology to these preferences. The FFM has both the advantage and disadvantage of being a largely heuristic instrument, developed by the factor analysis of many words associated with personality, but with little underlying theoretical basis for the selection of the five components (De Raad, 2000). It started as a three-dimensional instrument (the NEO) and was later revised by the addition of two dimensions, agreeableness and conscientiousness (Costa & McCrae, 2008). The dimensionality has been tested and found to vary between samples (Bowler, Bowler, & Phillips, 2009; Furnham, 1996), and there is little theoretical guidance for deciding how many factors there should be (Eysenck, 1994; Vassend & Skrondal, 1995). Lloyd (2012) concluded that although there are some weaknesses with type models, the suspicion directed at them from some quarters has little justification, and often amounts to little more than prejudice.

**The need to add and test a new component to the FPTS**

One aspect of personality that is present in trait models but not in type models relates to emotionality. Both the EPQ and the FFM have dimensions of neuroticism, which describe a trait related to emotionality. The underlying assumption posited by Eysenck was that those who score high on neuroticism have a low activation threshold in those parts of the brain related to the fight-or-flight response (Furnham et al., 2008). This means they tend to respond strongly to stressors, showing frequent signs of negative affect such as anxiety or fear. Other indications of neuroticism include mood swings, feelings of guilt and a tendency towards depression. This aspect of psychological functioning is not represented in classical type models, which tend to focus of the perception and processing of information, rather than on the more affective character of responses to stress. To address this lack, a ten-item scale of emotional temperament has been added to the FPTS to produce the Francis Psychological Type and Emotional Temperament Scales (FPTETS). The intention was to produce an instrument that fitted easily into the style of the FPTS while allowing the measurement of a dimension that was not an integral part of psychological type models.

The aim of this study was to examine the factor structure and validity of the new instrument using data from a sample of trainee ministers. The participants completed questionnaires at the start and finish of their training, the first included the FPTETS and the second included the shorter version of the revised Eysenck Personality Questionnaire (EPQ-RS, Eysenck et al., 1985). This allowed a test of the validity of extraversion and emotionality scores from the FPTETS by comparing them with extraversion and neuroticism scores on the EPQ-RS.

**Method**

**Participants**

Students on theology and ministry higher education programmes in the United Kingdom were invited to complete questionnaires at the start and finish of their studies (for more details, see Village, 2019). The first questionnaire included the FPTETS and was completed by 209 students. This sample was used to test the factor structure of the instrument and comprised 62% women and 38% men; 42% were under 50, 31% were in their 50s, and 27% were 60 or older. The second questionnaire included the EPQ-RS and was completed by 78 students who had previously completed the first questionnaire. This sample was used to test the validity of the FPTETS scales against the EPQ-RS and comprised 66% women and 34% men; 33% were under 50, 36% were in their 50s, and 31% were 60 or older.

**Instruments**

The Francis Psychological Type and Emotional Temperament Scales (FPTETS) were presented in paper format with items from different dimensions unseparated.[[1]](#endnote-1) The 50-item instrument included the four sets of ten forced-choice items from the original FPTS (Francis, 2005) which relate to each of the four components of the psychological type model: orientation (extraversion or introversion), perceiving process (sensing or intuition), judging process (thinking or feeling), and attitude toward the outer world (judging or perceiving). In addition, there were ten forced-choice items that were designed to assess emotional temperament (calm or volatile).

In each scale in the FPTETS, ten characteristics associated with each preference are present in opposite pairs in a forced-choice format (see Table 1 for the pairs): selecting a choice scored 1 for that preference and 0 for the opposite preference. Scores on each scale were complementary (E-I, S-N, T-F, J-P, and C-V), so the analysis used scores for only one item in each dimension to avoid unnecessary redundancy. Items scores for extraversion (E), sensing (S), thinking (T), judging (J) and volatile (V), were used as observed variables and scored zero or one.

The EPQ-RS is a 48-item instrument with forced-choice items assessing extraversion, neuroticism, psychoticism, and a lie scale (Eysenck et al., 1985). The alpha reliabilities for scales in this sample were similar to those reported elsewhere for extraversion (.88), neuroticism (.85), and the lie scale (.74). Psychoticism typically has a lower reliability, and this was also true in this study (.44).

**Data Analyses**

The analyses used responses to the E, S, T, J, and V scales, which were the mirror image of responses to the I, N, F, J, and C scales respectively. The data were subject to a confirmatory factor analysis (CFA) using the Factor Analysis procedure in SPSS 25 (Arbuckle, 2017). Our aim was to confirm the loading of items on five factors as predicted by the model, so the programme was constrained to select five factors, making this a confirmatory rather than exploratory process. Principal components analysis (PCA) was used to extract five factors followed by a varimax rotation (ensuring factors were orthogonal to one another).

 The responses to all items were dichotomous (1 = selected, 0 = other item in pair selected). Statistical opinion is divided on how far such data can be analysed with the CFA procedures applied to normally distributed data, but most experts advise the use of methods that do not require the assumptions applying in normal PCA (Dolan, 1994; Lorenzo-Seva & Ferrando, 2012; Parry & McArdle, 1991; Rhemtulla, Brosseau-Liard, & Savalei, 2012). For this reason, the categorical PCA procedure in SPSS (CATPCA) was also used to extract factors, and the results are presented alongside those from a standard PCA.

**Results**

**Item endorsement**

The percentage frequency of endorsing the E, S, T, J, and V responses are shown in table 1. Cronbach’s internal consistency reliabilities for the scales (alpha) were E-I: .80, S-N: .66, T-F: .65, J-P: .76, and C-V: .80. For most items there was a fairly even split between the two possible responses. A few items had more consistent uneven splitting, notably ‘Keep things as they are’ (i84, sensing) which was much less popular than the intuitive alternative ‘Improve things’, ‘Punctual’ (i78, judging) which was much more popular than ‘Leisurely’, ‘Happier with certainty’ (i92, judging) which was more popular than ‘Happier with uncertainty’, and ‘Emotional’ (i09, volatile), which was more popular than ‘Unemotional’. In this sample, some of these items may have carried some value bias, such as the idea that those entering ministry should be agents of change rather than maintainers of the status quo.

- insert table 1 about here -

**CFA**

The CFA constrained the factors to five, thereby testing whether items loaded on the dimensions expected from the model underlying the FPTETS. Table 2 shows factor loadings for normal PCA with those less than .30 removed to improve readability. Table 3 shows the same results but treating responses as binary categories. The two sets of results were similar, with the same relative factor loadings for items, showing the robustness of normal PCA to violations in the underlying nature of the data. Analysis of items was therefore confined to the PCA results in table 2.

- insert tables 2 and 3 about here -

The factor analyses showed that only four of the 50 items had factor loadings below .30 for their expected scale. There were a few additional items that also loaded more heavily on a different dimension to that expected:

 *Extraversion:* One item, ‘Speak before thinking’ (i81), loaded poorly on its expected scale and loaded to the same extent on judging.

*Sensing:* One item, ‘Concerned for details’ (i54), loaded poorly on its expected scale and loaded most heavily on the volatile scale.

*Thinking:* One item, ‘Truthful’ (i06), loaded poorly on its expected scale and loaded most heavily negatively on sensing.

*Judging:*Two items loaded reasonably well on this scale, but more heavily on other scales: ‘Act on decisions’ (i28) negatively on extraversion, and ‘Like to be in control’ (i37) which was slightly more heavily loaded on thinking.

*Emotionality:*One item, *‘*Emotional*’* (i09), loaded poorly on its expected scale and loaded positively with extraversion and negatively with thinking.

These results suggest that there may be scope for adjusting some of these items to ensure a better fit to the underlying dimensionality of the instrument. Despite this, the Cronbach alpha reliabilities of all five scales were reasonable to good: extraversion .80, sensing .65, thinking .65, judging .76, volatile .80.

**Validity of the FPTETS Extraversion and Volatile scales**

Table 4 shows bivariate correlations between the Eysenck and FPTETS scale scores for 78 participants that fully competed both instruments during the study. As expected, the two largest positive correlations were between the two measures of extraversion (*r* = .72, *df* = 77, *p* < .001) and between the neuroticism and volatile scales (*r* = .78, *df* = 77, *p* < .001). There were also significant negative correlations between the sensing scale scores and the Eysenck psychoticism and extraversion scale scores, suggesting that sensing may be associated with stable introversion.

- insert table 4 about here -

**Discussion**

The aim of this study was to test the factorial structure of the Francis Psychological Type and Emotional Temperament Scales (FPSETS) and the validity of two components related to extraversion and emotional volatility. This extends work of the factorial structure of the Francis Psychological Type Scales (FPTS) to include an additional factor related to emotional temperament. The structure of the four components of the FPTS were similar to those identified in previous studies (Francis et al., 2017; Village, 2021). This study has shown that the inclusion of an emotional temperament scale within the framework of the original FPTS seems to work well and allows the assessment of a construct that is related to neuroticism within the revised Eysenck model. One item in the emotional temperament scale worked poorly, because participants linked ‘emotionality’ with items associated with either extraversion or feeling (the opposite of thinking). This item may need to be revised slightly, perhaps to indicate the sort of ‘over emotionality’ that is associated with emotional instability. The correlation of the two measures of extraversion was as predicted, and in line with other studies that suggest this aspect of personality is similar across several different models (Francis & Jones, 2000; McCrae & Costa, 1989; Tobacyk et al., 2008). Even with the weaker item included, the emotional temperament scale appeared to be a useful and reliable measure of emotional stability versus instability.

 The items in the four original dimensions of the FPTS generally loaded as expected on the correct dimension, confirming previous analyses (Francis et al., 2017; Village, 2021). The items that loaded least well were in some cases those did the same in previous analyses, suggesting the scales could be improved by removing or adjusting the wording of some items. This is unlikely to make a significant difference to the way individuals score on each dimension, or their final type categories, but better items might help to define the constructs more tightly.

 This study of FPTETS suffered from some weaknesses that need to be addressed in future studies. The sample size was relatively small, and the sample was of training ministers. Previous use of the FPTS has tended to be with clergy and laity, and it would be useful to test the instrument on a wider range of participants. The cross validity with the Eysenck instrument was separated in time by up to three years, to reduce the size of questionnaires. Although these aspects of personality are, by definition, thought to be stable over time in adults, it would be better where possible to deliver the two instruments simultaneously.

**Ethical Approval**

Approval for the project was given by the Faculty Research Committee at York St John University, reference ET/17/06/10/AV.

All participants were required to give their informed consent before participating in the project and completing questionnaires.

**Disclosure statement**

No potential conflict of interest was reported by the author(s).

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Table 1

*Endorsement of items*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Extraversion α = .80 | % |  |  | Introversion α = .80 | % |
| i01 | Active | 49 |  | i02 | Reflective | 51 |
| i12 | Sociable | 46 |  | i11 | Private | 54 |
| i21 | Having many friends | 21 |  | i22 | A few deep friendships | 79 |
| i32 | Like parties | 52 |  | i31 | Dislike Parties | 48 |
| i41 | Energised by others | 59 |  | i42 | Drained by too many people | 41 |
| i48 | Happier working in groups | 44 |  | i47 | Happier working alone | 56 |
| i52 | Socially involved | 63 |  | i51 | Socially detached | 37 |
| i61 | Talkative | 54 |  | i62 | Reserved | 46 |
| i72 | An extravert | 42 |  | i71 | An introvert | 58 |
| i81 | Speak before thinking | 33 |  | i82 | Think before speaking | 68 |
|  | Sensing α = .68 | % |  |  | Intuition α = .68 | % |
| i03 | Interested in facts | 61 |  | i04 | Interested in theories | 39 |
| i14 | Practical | 58 |  | i13 | Inspirational | 42 |
| i23 | The concrete | 67 |  | i24 | The abstract | 33 |
| i34 | Prefer to make | 59 |  | i33 | Prefer to design | 41 |
| i43 | Conventional | 51 |  | i44 | Inventive | 49 |
| i54 | Concerned about details | 18 |  | i53 | Concerned for meaning | 82 |
| i63 | Sensible | 55 |  | i64 | Imaginative | 45 |
| i73 | Present realities | 52 |  | i74 | Future possibilities | 48 |
| i84 | Keep things as they are | 8 |  | i83 | Improve things | 92 |
| i94 | Down to earth | 85 |  | i93 | Up in the air | 15 |
|  | Thinking α = .65 | % |  |  | Feeling α = .65 | % |
| i06 | Justice | 63 |  | i05 | Harmony | 38 |
| i15 | Analytic | 35 |  | i16 | Sympathetic | 65 |
| i26 | Thinking | 44 |  | i25 | Feeling | 56 |
| i35 | Firm | 41 |  | i36 | Gentle | 59 |
| i45 | Critical | 32 |  | i46 | Affirming | 68 |
| i55 | Logical | 44 |  | i56 | Humane | 57 |
| i66 | Truthful | 44 |  | i65 | Tactful | 56 |
| i76 | Sceptical | 25 |  | i75 | Trusting | 75 |
| i85 | Seek for truth | 64 |  | i86 | Seek for peace | 36 |
| i96 | Fair-minded | 29 |  | i95 | Warm-hearted | 71 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Judging α = .76 | % |  |  | Perceiving α = .76 | % |
| i07 | Happy with routine | 70 |  | i08 | Unhappy with routine | 30 |
| i17 | Structured | 59 |  | i18 | Open-ended | 41 |
| i28 | To act on decisions | 66 |  | i27 | To act on impulse | 34 |
| i37 | Like to be in control | 51 |  | i38 | Like to be adaptable | 49 |
| i57 | Orderly | 44 |  | i58 | Easy going | 56 |
| i68 | Organised | 62 |  | i67 | Spontaneous | 39 |
| i78 | Punctual | 80 |  | i77 | Leisurely | 20 |
| i88 | Like detailed planning | 73 |  | i87 | Dislike detailed planning | 27 |
| i92 | Happier with certainty | 85 |  | i91 | Happier with uncertainty | 15 |
| i99 | Systematic | 71 |  | i100 | Casual | 30 |
|  | Volatile α = .80 | % |  |  | Calm α = .80 | % |
| i09 | Emotional | 80 |  | i10 | Unemotional | 20 |
| i20 | Discontented | 14 |  | i19 | Contented | 86 |
| i30 | Feel insecure | 22 |  | i29 | Feel secure | 78 |
| i40 | Have mood swings | 36 |  | i39 | Stay stable | 64 |
| i49 | Get angry quickly | 27 |  | i50 | Remain placid | 73 |
| i59 | Feel guilty about things | 79 |  | i60 | Feel guilt free | 21 |
| i70 | Anxious about things | 42 |  | i69 | At ease | 58 |
| i80 | Panic easily | 25 |  | i79 | Stay calm | 75 |
| i89 | Frequently get irritated | 43 |  | i90 | Rarely get irritated | 57 |
| i98 | Easily bothered by things | 48 |  | i97 | Unbothered by things | 52 |

Note: Items were paired choices. Figures are percentage selecting each item in a pair

 *N* = 209; α = Cronbach’s alpha.

Table 2

*Confirmatory factor analysis for trainee ministers: normal PCA*

|  |  |  |
| --- | --- | --- |
|  |  | Factor |
|  |  | 1 | 2 | 3 | 4 | 5 |
|  | **Extraversion** |  |  |  |  |  |
| i01 | Active | **.54** |  |  |  |  |
| i12 | Sociable | **.74** |  |  |  |  |
| i21 | Having many friends | **.30** |  |  |  |  |
| i32 | Like parties | **.52** |  |  |  |  |
| i41 | Energised by others | **.60** |  |  |  |  |
| i48 | Happier working in groups | **.46** |  |  |  |  |
| i52 | Socially involved | **.65** |  |  |  |  |
| i61 | Talkative | **.75** |  |  |  |  |
| i72 | An extravert | **.76** |  |  |  |  |
| i81 | Speak before thinking | **.29** |  |  | -.29 |  |
|  | **Sensing** |  |  |  |  |  |
| i03 | Interested in facts |  | **.45** |  |  |  |
| i14 | Practical |  | **.62** |  |  |  |
| i23 | The concrete |  | **.63** |  |  |  |
| i34 | Prefer to make |  | **.37** |  |  |  |
| i43 | Conventional |  | **.49** |  |  |  |
| i54 | Concerned about details |  | .22 |  |  | **.45** |
| i63 | Sensible |  | **.58** |  |  |  |
| i73 | Present realities |  | **.43** |  |  |  |
| i84 | Keep things as they are |  | **.20** |  |  |  |
| i94 | Down to earth |  | **.44** |  |  |  |
|  | **Thinking** |  |  |  |  |  |
| i06 | Justice |  |  | **.34** |  |  |
| i15 | Analytic |  |  | **.66** |  |  |
| i26 | Thinking |  |  | **.31** |  |  |
| i35 | Firm |  |  | **.68** |  |  |
| i45 | Critical |  |  | **.45** |  | .35 |
| i55 | Logical |  |  | **.57** |  |  |
| i66 | Truthful |  | **-.37** | .28 |  |  |
| i76 | Sceptical |  |  | **.28** |  |  |
| i85 | Seek for truth |  |  | **.48** |  |  |
| i96 | Fair-minded |  |  | **.32** |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Judging** |  |  |  |  |  |
| i07 | Happy with routine |  |  |  | **.50** |  |
| i17 | Structured |  |  |  | **.61** |  |
| i28 | To act on decisions | **-.39** |  |  | .35 |  |
| i37 | Like to be in control |  |  | **.42** | .41 |  |
| i57 | Orderly |  |  |  | **.66** |  |
| i68 | Organised |  |  |  | **.68** |  |
| i78 | Punctual |  |  |  | **.40** |  |
| i88 | Like detailed planning |  |  |  | **.53** |  |
| i92 | Happier with certainty |  | .35 |  | **.38** |  |
| i99 | Systematic |  |  | .33 | **.56** |  |
|  | **Volatile** |  |  |  |  |  |
| i09 | Emotional | .**44** |  | -.38 |  | .25 |
| i20 | Discontented |  |  |  |  | **.54** |
| i30 | Feel insecure |  |  |  |  | **.63** |
| i40 | Have mood swings |  |  |  |  | **.75** |
| i49 | Get angry quickly |  |  |  |  | **.55** |
| i59 | Feel guilty about things |  |  |  |  | **.31** |
| i70 | Anxious about things |  |  |  |  | **.70** |
| i80 | Panic easily |  |  |  |  | **.68** |
| i89 | Frequently get irritated |  |  |  |  | **.63** |
| i98 | Easily bothered by things |  |  |  |  | **.58** |

Note: PCA extraction constrained to five factors, with varimax rotation. Numbers in bold indicated highest loading for each item. Loading of less than .30 are omitted for readability, apart from those expected within a particular scale.

Table 3

*Confirmatory factor analysis for trainee ministers: Categorical PCA*

|  |  |  |
| --- | --- | --- |
|  |  | Factor |
|  |  | 1 | 2 | 3 | 4 | 5 |
|  | **Extraversion** |  |  |  |  |  |
| i01 | Active | **.54** |  |  |  |  |
| i12 | Sociable | **.74** |  |  |  |  |
| i21 | Having many friends | **.29** |  |  |  |  |
| i32 | Like parties | **.53** |  |  |  |  |
| i41 | Energised by others | **.60** |  |  |  |  |
| i48 | Happier working in groups | **.47** |  |  |  |  |
| i52 | Socially involved | **.65** |  |  |  |  |
| i61 | Talkative | **.75** |  |  |  |  |
| i72 | An extravert | **.76** |  |  |  |  |
| i81 | Speak before thinking | .25 |  |  | **-.29** | **.29** |
|  | **Sensing** |  |  |  |  |  |
| i03 | Interested in facts |  | **.44** |  |  |  |
| i14 | Practical |  | **.64** |  |  |  |
| i23 | The concrete |  | **.64** |  |  |  |
| i34 | Prefer to make |  | **.40** |  |  |  |
| i43 | Conventional |  | **.48** |  |  |  |
| i54 | Concerned about details |  | .25 |  |  | **.44** |
| i63 | Sensible |  | **.60** |  |  |  |
| i73 | Present realities |  | **.42** |  |  |  |
| i84 | Keep things as they are |  | **.20** |  |  |  |
| i94 | Down to earth |  | **.48** |  |  |  |
|  | **Thinking** |  |  |  |  |  |
| i06 | Justice |  |  | **.35** |  |  |
| i15 | Analytic |  |  | **.66** |  |  |
| i26 | Thinking |  |  | **.32** |  |  |
| i35 | Firm |  |  | **.67** |  |  |
| i45 | Critical |  |  | **.45** |  | .34 |
| i55 | Logical |  |  | **.57** |  |  |
| i66 | Truthful |  | **-.32** | .28 |  |  |
| i76 | Sceptical |  |  | **.26** |  |  |
| i85 | Seek for truth |  |  | **.48** |  |  |
| i96 | Fair-minded |  |  | **.34** |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Judging** |  |  |  |  |  |
| i07 | Happy with routine |  |  |  | **.51** |  |
| i17 | Structured |  |  |  | **.59** |  |
| i28 | To act on decisions | -.35 |  |  | **.38** |  |
| i37 | Like to be in control |  |  | **.42** | .41 |  |
| i57 | Orderly |  |  |  | **.65** |  |
| i68 | Organised |  |  |  | **.69** |  |
| i78 | Punctual |  |  |  | **.43** |  |
| i88 | Like detailed planning |  |  |  | **.53** |  |
| i92 | Happier with certainty |  | .32 |  | **.38** |  |
| i99 | Systematic |  |  | .34 | **.56** |  |
|  | **Volatile** |  |  |  |  |  |
| i09 | Emotional | **.42** |  | -.37 |  | .24 |
| i20 | Discontented |  |  |  |  | **.53** |
| i30 | Feel insecure |  |  |  |  | **.64** |
| i40 | Have mood swings |  |  |  |  | **.75** |
| i49 | Get angry quickly |  |  |  |  | **.54** |
| i59 | Feel guilty about things |  |  |  |  | **.32** |
| i70 | Anxious about things |  |  |  |  | **.70** |
| i80 | Panic easily |  |  |  |  | **.68** |
| i89 | Frequently get irritated |  |  |  |  | **.62** |
| i98 | Easily bothered by things |  |  |  |  | **.58** |

Note: Categorical PCA extraction constrained to five factors, with varimax rotation Numbers in bold indicated highest loading for each item. Loading of less than .30 are omitted for readability, apart from those expected within a particular scale.

Table 4

*Correlation matrix for components of the Francis Psychological Type and Emotional Temperament Scales (FPTETS) and the Eysenck Personality Questionnaire Revised Shorter version (EPQ-RS)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | E-Psy |  | E-Neu |  | E-Lie |  | E-Ext |  | F-Vol |  | F-Jud |  | F-Thk |  | F-Sen |  | F-Ext |
| FPTETS - Extraversion | .22 |  | -.17 |  |  .03 |  | .72\*\*\* |  | -.06 |  | -.24\* |  | -.14 |  | -.26\* |  |  |
| FPTETS - Sensing | -.37\*\*\* |  | .13 |  | -.02 |  | -.47\*\*\* |  | .05 |  | .29\* |  | -.01 |  |  |  |  |
| FPTETS - Thinking | .13 |  | -.08 |  | -.08 |  | -.08 |  | -.06 |  | .27\* |  |  |  |  |  |  |
| FPTETS - Judging | -.16 |  | .22 |  | -.11 |  | -.25\* |  | .25\* |  |  |  |  |  |  |  |  |
| FPTETS - Volatile | -.05 |  | .79\*\*\* |  | .23\* |  | -.12 |  |  |  |  |  |  |  |  |  |  |
| EPQ-RS - Extraversion | .34\*\* |  | -.20 |  | .00 |  |  |  |  |  |  |  |  |  |  |  |  |
| EPQ-RS - Lie | .09 |  | .24\* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EPQ-RS - Neuroticism | -.19 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| EPQ-RS - Psychoticism |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Note: *N* = 78; \* *p* < .05; \*\* *p* < .01; \*\*\* *p* < .001

1. In the dataset, variables were grouped into the relevant dimensions of the model (E, S T, J or V) but retained the item number from their order in the questionnaire. Tables report the item number and a short text response. [↑](#endnote-ref-1)