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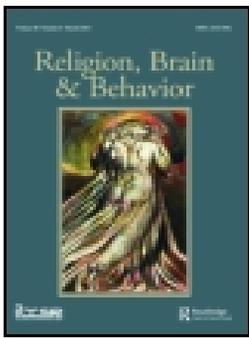
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# Introducing the Francis Psychological Type and Emotional Temperament Scales (FPTETS): a study among church leaders and church members

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## ABSTRACT

The Francis Psychological Type Scales were developed during the early 2000s to operationalize the four components of psychological type theory within survey-style research, proposing measures of introversion and extraversion, sensing and intuition, feeling and thinking, judging and perceiving. Drawing on four datasets of clergy and churchgoers ( $N = 291, 879, 1,296, 1,525$ ), the present study tests the factor structure of these established measures alongside the fifth construct of emotional temperament, distinguishing between calm emotional temperament and volatile emotional temperament. The data both support the satisfactory performance of the proposed Francis Psychological Type and Emotional Temperament Scales (FPTETS) and suggest a research program for the further development and refinement of this measure.

## KEYWORDS

Francis Psychological Type Scales; factor structure; internal consistency reliability; psychological type; emotionality; neuroticism

## Introduction

Psychology is a multifaceted field of scientific study, reflected in a variety of approaches and sub-disciplines. The present study is situated within the broad tradition of the scientific study of personality and individual differences (Corr, 2018). Scientific advances within this broad field rely on an informed dialogue between conceptual analysis and empirical investigation. Neither approach is adequately sustainable without the other. The very naming of the field itself as “personality and individual differences” poses the conceptual problem of what counts as “personality”, differentiating this construct from other individual differences. The history of personality psychology, and in particular the history of the development of personality measures, richly illustrates the diversity of approaches. For example, the sixteen-factor model advanced by Cattell et al. (1970) proposed intelligence as a personality factor, while other approaches within the individual differences tradition conceptualize intelligence as a distinct area of study. The major three dimensions model advanced by Eysenck and Eysenck (1975, 1991) proposed neurotic disorders and psychotic disorders as continuous with normal personality, while other approaches within the individual differences tradition conceptualize psychological pathologies as a distinct area of study.

One of the ongoing debates in the field of personality and individual differences has been between trait and type models. The debate has partly been between proponents of the Big Five factor model of personality, which has roots in the empirical approach pioneered by Costa and

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McCrae (1985), and psychological type theory, which has roots in the conceptual approach pioneered by Jung (1971). Over the past three decades several studies have explored the correlations between measures that operationalize these two distinctive approaches to personality assessment, with variable outcomes (Furnham, 1996, 2022; Furnham et al., 2003; Klinkosz & Iskra, 2010; MacDonald et al., 1994; McCrae & Costa, 1989; Renner et al., 2014). Less attention, however, has been given to the comparative conceptual critique of these two models of personality, with the notable exception of the work of Lloyd (2008, 2012, 2015; *in press*).

Lloyd argues that a major conceptual difference between these two models resides in the nature of the individual differences that are taken to define the area construed as personality. He maintains that the model proposed by psychological type theory construes differences in personality to be essentially non-evaluative, while the model proposed by the Big Five factors is essentially evaluative, in the sense of ascribing greater worth to one pole than to the other (as in trait theory) or greater worth to one type than to the other (as in type theory). Lloyd (*in press*) expresses the difference thus:

The Big Five model regards the factors as intrinsically positive attributes, so that a high score for (e.g.,) extraversion is admirable and a low score is a deficiency. By contrast personality type holds that each preference is one of a cognate pair, both of which have positive and negative potential. (pagination not yet available)

This fundamental difference in conceptualization may situate the two models of personality proposed by psychological type theory and the Big Five factors differently in the broad field of the scientific psychology of religion, where matters of evaluation may assume particular significance, and where the differentiation between the concept of character (involving evaluative judgements) and the concept of personality (not involving evaluative judgements) may be of importance.

Turning attention from conceptualization to operationalization, controversy in the scientific community regarding the measurement of psychological type theory has (properly) focused on the psychometric examination of the primary instrument through which the theory has been operationalized, the Myers-Briggs Type Indicator (Myers & McCaulley, 1985). The intention of the present paper is to discuss an established alternative operationalization of psychological type theory by the Francis Psychological Type Scales (FPTS) and to introduce the recent development of the instrument, the Francis Psychological Type and Emotional Temperament Scales (FPTETS). Our contention is that, specifically within the psychology of religion, there is value in employing more than one model of personality and that there is value in constructing distinctive bodies of comparative knowledge employing either the Big Five factor model or the model proposed by psychological type theory. The FPTS and FPTETS have been designed to facilitate such research.

## Introducing psychological type theory

The account of individual differences advanced by psychological type theory, however, differs significantly (and controversially) from other well-established and widely accepted models of personality in one major way. Cattell's sixteen-factor model, Eysenck's major three dimensions model, and Costa and McCrae's Big Five factor model all conceptualize individual differences as located on continua. For example, Eysenck and Eysenck (1964, 1975, 1991) consistently define a continuum from introversion, through ambiversion, to extraversion and locate individuals on that continuum through their scores recorded on the extraversion scale. Psychological type theory, however, conceptualized individual differences in terms of dichotomous typologies rather than continua. Thus, for Jung, introversion and extraversion did not define opposite ends of a continuum along which individuals could be graded, but discrete categories into which individuals could be allocated.

The development and clarification of psychological type theory has been progressed by a series of psychometric instruments, including the Cambridge Type Inventory (Rawling, 1992), the Gray-Wheelwright Jungian Type Survey (Gray & Wheelwright, 1946), the Jung Type Indicator (Budd, 1997), the Keirsey Temperament Sorter (KTS) proposed by Keirsey and Bates (1978) and revised by Keirsey (1998), the Myers-Briggs Type Indicator (Myers & McCaulley, 1985), the Personal

Preferences Self-Description Questionnaire (Keir, Melancon, & Thompson, 1998), the Personality Style Inventory (Ware et al., 1985), the PET Type Check (Cranton & Knoop, 1995), the Singer-Loomis Inventory of Personality (Loomis, 1982), and the Type Differentiation Indicator (Mitchell, 1991). From among this range of instruments the best-known and most-widely used is the Myers-Briggs Type Indicator (Myers & McCaulley, 1985). While these instruments have been designed to allocate individuals to discrete psychological types, underpinning such allocation are continuous scale scores. It is these underlying scale scores that have come to play a part in the growing body of conceptual and empirical research shaped by psychological type theory within the psychology of religion (Lewis, 2012, 2015, 2021a, 2021b; Village, 2011a).

From a theoretical perspective, psychological type theory has been incorporated within discussions of Christian prayer (Duncan, 1993; Keating, 1987; Martinez, 2001), church congregations (Baab, 1998), religious leadership (Osborne, 2016; Oswald & Kroeger, 1988; Ross & Francis, 2020), Christian spirituality (McGuinness, 2009; Moore, 1988), and biblical hermeneutics and homiletics (Francis & Village, 2008). These theoretical studies have provided bases on which empirical studies have built. The problem, however, with the existing pool of instruments designed to operationalize psychological type theory is that none of them was specifically designed for easy incorporation within scientific studies. It is to fill this gap that the Francis Psychological Type Scales were designed.

### ***The building blocks of psychological type theory***

The basic building blocks of psychological type theory, as originally proposed by Jung (1971) and as developed and operationalized by the Myers-Briggs Type Indicator (Myers & McCaulley, 1985), distinguish between two orientations (extraversion and introversion), two perceiving functions (sensing and intuition), two judging functions (thinking and feeling), and two attitudes toward the outer world (judging and perceiving).

The two orientations are concerned with where energy is drawn from: energy can be gathered either from the outside world or from the inner world. Extraverts (E) are orientated toward the outside world; they are energized by the events and people around them. In contrast, introverts (I) are orientated toward their inner world; they are energized by their inner ideas and concepts.

The perceiving functions are concerned with the way in which people receive and process information: this can be done through use of sensing or through use of intuition. Sensing types (S) tend to focus on specific details, rather than the overall picture. In contrast, intuitive types (N) focus on the possibilities of a situation, perceiving meanings and relationships.

The judging functions are concerned with the way in which people make decisions and judgements: this can be done through use of objective impersonal logic or subjective interpersonal values. Thinking types (T) make judgements based on objective, impersonal logic. In contrast, feeling types (F) make judgements based on subjective, personal values.

The attitudes toward the outer world are concerned with the way in which people respond to the world around them, either by imposing structure and order on that world or by remaining open and adaptable to the world around them. Judging types (J) have a planned, orderly approach to life. They enjoy routine and established patterns. In contrast, perceiving types (P) have a flexible, open-ended approach to life. They enjoy change and spontaneity.

### ***Developing the Francis Psychological Type Scales***

The Francis Psychological Type Scales (Francis, 2005) were developed initially to provide a reliable and valid instrument suitable for church-related survey work as relevant to the developing fields of congregation studies and clergy studies, as well as relevant for testing hypotheses emerging from psychological type theory regarding the connection between personality and individual differences in religiosity and among religious populations. Congregation studies required an instrument that

could be completed easily within the context of church services, either alone or alongside other brief measures. Examples of studies that have employed the Francis Psychological Type Scales to map the profile of church congregations include surveys conducted among 3,304 participants attending 140 Anglican congregations in England (Francis, Robbins, and Craig, 2011), 1,527 churchgoers from a range of different Christian denominations in Australia (Robbins & Francis, 2011), 1,474 church-going Roman Catholics in Australia (Robbins & Francis, 2012), 1,156 churchgoers from a range of Christian denominations in England (Village et al., 2012), and 263 Methodist churchgoers in England (Lewis et al., 2021). Building on such studies of regular congregations, recent studies have reported on the psychological-type profile of participants engaged in various forms of Fresh Expressions of Church (e.g., Francis, Clymo, & Robbins, 2014), in cathedral congregations (e.g., Francis, Edwards, & ap Siôn, 2021) or cathedral associations (Muskett & Village, 2015), and in samples from other religions such as Islam (Francis & Dato, 2012). Within the context of congregation studies, psychological type theory has been employed to test theories connecting personality profile and styles of congregational involvement.

Clergy studies required an instrument that could either be sent to clergy through the post or made available for online completion, generally alongside a battery of other instruments relevant to the work and experience of religious leaders. Examples of studies that have employed the Francis Psychological Type Scales to map the profile of religious professionals include surveys conducted among 1,004 Methodist ministers in Britain (Burton et al., 2010), 561 clergy serving in the Presbyterian Church (USA) (Francis, Robbins, and Wulff, 2011), 529 clergymen and 518 clergywomen ordained in the Anglican Church in the United Kingdom from 2004 to 2007 (Village, 2011b), 120 clergywomen and 436 clergymen from Protestant denominations in Australia (Robbins & Powell, 2015), and 1,480 Church of England clergy, mainly stipendiary (Watt & Voas, 2015). Within the context of clergy studies, psychological type theory has been employed to test theories connecting personality profile, church tradition, and ministry styles.

While much of the empirical research in connection with congregation studies and clergy studies has employed the Francis Psychological Type Scales to generate typologies, much of the empirical research in connection with testing hypotheses emerging from psychological type theory regarding the connection between personality and individual differences in religiosity has employed the underlying continuous scale scores. The power of psychological type theory to predict individual differences (and hence its construct validity) within the empirical psychology of religion has been demonstrated across a range of areas, including the connections with: religious orientation (Francis et al., 2016; Francis, Village, and Powell, 2019; Ross & Francis, 2010; Walker, 2015), mystical orientation (Francis & Crea, 2017; Francis & Littler, 2012; Francis, Robbins, & Cargas, 2012; Hall & Hall, 2021; Ross & Francis, 2015), charismatic orientation (Francis, Littler, & Robbins, 2021; Francis, Village, & Voas, 2021a), religious experience (Francis & Village, 2017), reasons for church leaving (Francis & Robbins, 2012a), church attendance (Francis & Giordan, 2019), engagement with new expressions of church (Francis et al., 2014; Francis et al., 2020; Royle et al., 2021), religious motivation (Francis & Lankshear, 2021), attraction to Benedictine spirituality (Francis, Ineson, and Robbins, 2011), appeal of Anglo-Catholic worship (Francis, Village, & Voas, 2021b; Village et al., 2009), preferences and perspectives in Celtic Christianity (Francis et al., 2008), the adaption of positions within the theology of religions (Francis & Robbins, 2012b), preference for biblical literalism (Village, 2012), biblical hermeneutics and liturgical preaching (Francis & ap Siôn, 2016a, 2016b; Francis, Jones, and Hebden, 2019; Francis, Jones, and Martinson, 2019; Francis, McKenna, et al., 2018; Francis et al., 2009; Francis & Ross, 2022; Francis et al., 2022a, 2022b; Jones & Francis, 2019), ministry styles (Fawcett, Francis, & Robbins, 2011; Payne & Lewis, 2021), visitor expectations (Francis, Mansfield, & McKenna, 2021), learning preferences (Francis & Giordan, 2021), discipleship pathways (Francis et al., 2021), congregational bonding social capital (Robbins, Francis, & Powell, 2012a), work-related psychological wellbeing and burnout among religious leaders and teachers (Brewster et al., 2011; Francis et al., 2013; Francis & Crea, 2015; Francis & Lankshear, 2019; Francis, Gubb, et al., 2012; Francis, Ratter, et al., 2015; Robbins et al., 2012b), responses to Covid-19

(Francis & Village, 2021; Village & Francis, 2021), personal wellbeing (Crea & Francis, 2021), spiritual wellbeing (Francis, Fisher, et al., 2015), and emotional intelligence (Francis, Payne, et al., 2018; Francis, Robbins, et al., 2015).

### **Testing the Francis Psychological Type Scales**

The publications arising from research conducted with the fields of congregation studies, clergy studies, and individual differences in the psychology of religion have provided a good basis on which to test and to report on the internal consistency, reliability, factor structure, and concurrent validity of the Francis Psychological Type Scales across a range of different groups. Overall these four underlying scales (orientations, E and I; perceiving process, S and N; judging process, T and F; attitude, J and P) have generated alpha coefficients (Cronbach, 1951) well in excess of the threshold recommended by DeVellis (2003). For example, in Australia among 212 clergywomen from 14 denominations, Robbins, Francis, and Powell (2012b) reported alpha coefficients of .84 for the EI scale, .79 for the SN scale, .71 for the TF scale, and .81 for the JP scale. In England among 1,047 Anglican clergy, Village (2011b) reported alpha coefficients of .85 for the EI scale, .77 for the SN scale, .72 for the TF scale, and .81 for the JP scale.

Francis et al. (2017) tested the factor structure of the Francis Psychological Type Scales among a sample of 722 Anglican clergy in England (540 clergymen and 182 clergywomen). Confirmatory factor analysis demonstrated that 74 of the 80 items were located within the hypothesized four factor structure of the instrument with loadings of or above .38 on the hypothesized factors. Payne et al. (2021) replicated the analysis in a sample of 364 Anglican clergy in Wales and found that 78 of the 80 items were located within the hypothesized four factor structure of the instrument with loadings of or above .38 on the hypothesized factors.

In a third study, Village (2021) examined the factor structure of the Francis Psychological Type Scales employing structural equation modeling and confirmatory factor analyses among samples of 1,522 clergy and 2,474 laity from the Church of England. Although most items loaded satisfactorily on their intended dimension, a few loaded poorly, and in two cases these were also items that loaded poorly in the study reported by Francis et al. (2017). The two items were “Do you prefer to speak before thinking (E) or think before speaking” (I) from the orientations, and “Do you prefer to: keep things as they are (S) or improve things (N)” from the perceiving process. Village (2021) suggested that these two items may suffer from some social desirability bias, as listening to others first and improving things may be seen as virtues.

A fourth study (Francis & Village, 2022) replicated the analyses among two samples of adults participating in short courses relevant for Christian ministry ( $N = 185$  and  $392$ ). In both samples, 39 of the 40 items were located within the hypothesized structure of the instrument with loadings of or above .30 on the hypothesized factors, with few cross-loadings. This study also tested the concurrent validity of the FPTs alongside the 126-item Form G (Anglicized) of the MBTI (Myers & McCaulley, 1985). The two measures aligned well with the proportion of same-type categorizations matching those reported for test-retest of the MBTI (see, for example, Bents & Wierschke, 1996; Howes & Carskadon, 1979; Johnson, 1992; Levy et al., 1972; McCarley & Carskadon, 1983; Silberman et al., 1992; Tsuzuki & Matsui, 1997).

### **Introducing the Francis Psychological Type and Emotional Temperament Scales**

Although psychological type theory has its origins within a very different conceptual framework from other well-established and widely accepted models of personality developed within the individual-differences tradition, several studies have explored the connections between measures of psychological type theory (employing the continuous scale scores underpinning type categorization) and the scales proposed by other models. For example, the connection between scores recorded on the Myers-Briggs Type Indicator (Myers & McCaulley, 1985) and various editions

of the Eysenckian personality measures (Eysenck et al., 1985; Eysenck & Eysenck, 1964, 1975) have been reported by Wakefield et al. (1976), Steele and Kelly (1976), Campbell and Heller (1987), Sipps et al. (1987), Landrum (1992), Saggino and Kline (1995), Francis and Jones (2000), Furnham et al. (2001), and Francis et al. (2007). These studies tend to find that the MBTI measures of introversion and extraversion are correlated with the Eysenckian extraversion scale, and the MBTI measures of judging and perceiving are correlated with the Eysenckian psychoticism scale.

The connection between scores recorded on the Myers-Briggs Type Indicator and various measures of the Big Five Factor model of personality have been reported by McCrae and Costa (1989), MacDonald et al. (1994), Furnham (1996), Parker and Stumpf (1998), Furnham et al. (2001), Furnham et al. (2003), and Renner et al. (2014). These studies tend to find that the MBTI measures of introversion and extraversion are correlated with the Big Five extraversion scale; that the MBTI measures of judging and perceiving are correlated with the Big Five conscientiousness scale; that the MBTI measures of sensing and intuition are correlated with the Big Five openness to experience scale.

These studies that set measures of psychological type theory alongside other well-established and widely accepted models of personality developed within the individual differences tradition consistently draw attention to the absence of a measure of emotionality within the framework of psychological type theory.

### **Research question**

It is against this background that the present study discusses and examines the introduction of a fifth measure, a measure of emotionality, alongside the four established measures within the Francis Psychological Type Scales (FPTS), leading to the Francis Psychological Type and Emotional Temperament Scales (FPTETS).

### **Conceptualizing emotional temperament**

The notion of emotional temperament operationalized within the Francis Psychological Type and Emotional Temperament Scales is rooted in the conceptualization and operationalization of Eysenck's dimensional model of personality, as published in the Eysenck Personality Inventory (Eysenck & Eysenck, 1964), the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1975), Eysenck Personality Questionnaire Revised (Eysenck et al., 1985; Eysenck & Eysenck, 1991), and the Eysenck Personality Profiler (Eysenck et al., 1992). Eysenck's dimensional model of personality emerges from two fundamental principles. The first principle is rooted in clinical practice and assumes that psychological pathologies are continuous with individual differences in normal personality. Hence two of the three major dimensions of personality with which Eysenck is concerned are characterized as neuroticism and as psychoticism. The implication of this principle is that the Eysenckian measures need to include some items that may be checked only by those who are approaching clinical pathologies. The second principle is rooted in statistical refinement and clarification of constructs and assumes that the three dimensions of personality are orthogonal. Hence the attempt is made to remove items that may overlap the constructs. The implication of this principle is that the Eysenckian measures may reshape the constructs to ensure orthogonality.

In its most complex form, as assessed by the 140 items designed to assess neuroticism in the Eysenck Personality Profiler, the Eysenckian dimension of neuroticism embraced seven traits, each of which was measured by 20 items. These traits were defined as: low self-esteem, unhappiness, anxiety, dependency, hypochondriasis, guilt, and obsessiveness. Scales of this length may be problematic in general surveys, and as a consequence the item range becomes more tuned to the individual differences recognized within the general population. Within the Eysenck Personality Questionnaire, neuroticism was assessed by 23 items, and within the Eysenck Personality Questionnaire Revised by 24 items. Further refinement of the neuroticism scale takes place in the 12-item

short-form of the Eysenck Personality Questionnaire Revised (Eysenck et al., 1985) and in the 6-item abbreviated form (Francis et al., 1992). The intention of this short form and of the abbreviated form is to identify the items that can most economically predict the variance within the longer parent instrument. It was, therefore, on the basis of the range of items included within the short form that items were shaped and tested to accommodate the format of the Francis Psychological Type and Emotional Temperament Scales.

An initial testing of the emotional temperament scale proposed by the FPTETS against the short-form Eysenck Personality Questionnaire Revised among a sample of 78 ministry training candidates reported a strong correlation between the EPQR-S neuroticism scale and the FPTETS emotional temperament scale ( $r = .78, p < .001$ ) (Village & Francis, 2022).

## Method

### Participants

The four datasets used in this study were all derived from a range of questionnaire surveys in the UK that have employed the original version of the FPTETS. They were all based on convenience samples from clergy or churchgoers since 2009. The clergy samples were from the Church of England (CoE), and the Baptist Union of Great Britain (BUGB). The samples of churchgoers (CHG1 & CHG2) were from two studies designed to examine beliefs about creation, evolution, and the environment. In total, 3,991 people completed the 50 items in the scales.

The CoE dataset was from an online survey of Church of England incumbents that was part of a wider study into church growth (Voas & Watt, 2014). Of the 1,525 respondents in this dataset who completed all the scale items, 21% were women, 27% were under the age of 50, 72% were in their 50s or 60s, and 1% were 70 or older. The BUGB dataset was from an online survey of ministers in churches affiliated to the Baptist Union of Great Britain (Garland & Village, 2021). Of the 291 respondents in this dataset who completed all the scale items, 18% were women, 31% were under the age of 50, 63% were in their 50s or 60s, and 6% were 70 or older. The CHG1 dataset was from a paper survey in 2009–2010 of churchgoers from a variety of churches, mainly in northern England (Village et al., 2012). Of the 1,296 respondents in this dataset who completed all the scale items, 56% were women, 36% were under the age of 50, 44% were in their 50s or 60s, and 20% were 70 or older. The CHG2 dataset was from a repeat study of different churchgoers in 2015–2017 (Village & Baker, 2018). Of the 879 respondents in this dataset who completed all the scale items, 56% were women, 28% were under the age of 50, 47% were in their 50s or 60s, and 25% were 70 or older.

### Instrument

The Francis Psychological Type and Emotional Temperament Scales assess preferences between the two orientations (extraversion and introversion), the two perceiving functions (sensing and intuition), the two judging functions (thinking and feeling), the two attitudes (judging and perceiving), and the two emotional temperaments (calm and volatile). Assessment is made by identifying ten clear characteristics associated with each preference and by pairing such characteristics in forced-choice format against the opposite preference. The ten preferences are characterized by the following descriptors.

*Extraverts (E)*: active, sociable, having many friends, like parties, energized by others, happier working in groups, socially involved, talkative, an extravert, speak before thinking.

*Introverts (I)*: reflective, private, a few deep friendships, dislike parties, drained by too many people, happier working alone, socially detached, reserved, an introvert, think before speaking.

*Sensing types (S)*: interested in facts, practical, the concrete, prefer to make, conventional, concerned about details, sensible, present realities, keep things as they are, down to earth.

*Intuitive types* (N): interested in theories, inspirational, the abstract, prefer to design, inventive, concerned for meaning, imaginative, future possibilities, improve things, up in the air.

*Thinking types* (T): justice, analytic, thinking, firm, critical, logical, truthful, skeptical, seek for truth, fair-minded.

*Feeling types* (F): harmony, sympathetic, feeling, gentle, affirming, humane, tactful, trusting, seek for peace, warm-hearted.

*Judging types* (J): happy with routine, structured, act on decisions, like to be in control, orderly, organized, punctual, like detailed planning, happier with certainty, systematic.

*Perceiver types* (P): unhappy with routine, open-ended, act on impulse, like to be adaptable, easy going, spontaneous, leisurely, dislike detailed planning, happier with uncertainty, casual.

*Volatile types* (V): emotional, discontented, feel insecure, have mood swings, get angry quickly, feel guilty about things, anxious about things, panic easily, frequently get irritated, easily bothered by things.

*Calm types* (C): unemotional, contented, feel secure, stay stable, remain placid, feel guilt free, at ease, stay calm, rarely get irritated, unbothered by things

## Analysis

The FPTETS comprise 50 items that generate 100 paired dichotomous responses (ten in each dimension). For these analyses, we 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. Each sample was subject to a confirmatory factor analysis (CFA) using the Factor Analysis procedure in SPSS 25 (IBM Corporation, 2019), with the number of factors set to the five predicated by the model. Principal Components Analysis (PCA) was used to extract factors followed by a varimax rotation (ensuring factors were orthogonal to one another). This procedure works on the assumption that variables are linearly related and have continuous, multivariate normal distributions. The data here are based on binary choices, so these assumptions did not hold. Statistical opinion is divided on whether the robustness of PCA is sufficient to allow its use on binary data (Dolan, 1994; Parry & McArdle, 1991; Rhemtulla et al., 2012). The approach here was to use PCA but to check the results against an analysis using tetrachoric correlations, which is generally recommended for some binary datasets (Lorenzo-Seva & Ferrando, 2012). The results from these two types of analysis were almost identical in terms of factor alignments, so only the PCA are reported here.

## Presentation of results

To allow reproducibility, items are shown as presented in the paper questionnaire in the Appendix (see supplemental material). In the datasets, each dichotomous response (0 = not selected, 1 = selected) was coded into a separate variable, and variables for the relevant dimensions of the model (E, S, T, J or V) are given with their derived item number. In tables we use the item number and a short text response.

## Results

### Item endorsement

The percentage frequency of endorsing the E, S, T, J, and V responses are shown in Table 1. As might be expected from the different population profiles, responses for particular items varied between datasets, but for most items there was 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”.

**Table 1.** Percentage endorsement of items across four datasets.

		N =	CoE 1525	BUGB 291	CHG1 1296	CHG2 879	Mean
Extraversion		Introversion					
i01	Active	(Reflective)	61	63	50	53	57
i12	Sociable	(Private)	46	47	42	45	43
i21	Having many friends	(A few deep friendships)	26	28	30	30	25
i32	Like parties	(Dislike Parties)	50	42	47	43	46
i41	Energised by others	(Drained by too many people)	57	52	56	55	54
i48	Happier working in groups	(Happier working alone)	58	48	41	39	41
i52	Socially involved	(Socially detached)	65	64	62	64	61
i61	Talkative	(Reserved)	54	51	45	49	51
i72	An extravert	(An introvert)	43	39	38	36	40
i81	Speak before thinking	(Think before speaking)	25	32	32	32	32
Sensing		Intuition	CoE	BUGB	CHG1	CHG2	Mean
i03	Interested in facts	(Interested in theories)	63	64	80	79	65
i14	Practical	(Inspirational)	42	42	69	68	55
i23	The concrete	(The abstract)	59	62	80	75	65
i34	Prefer to make	(Prefer to design)	33	35	64	63	51
i43	Conventional	(Inventive)	41	36	65	61	49
i54	Concerned about details	(Concerned for meaning)	16	23	38	37	25
i63	Sensible	(Imaginative)	46	52	68	66	55
i73	Present realities	(Future possibilities)	44	42	66	60	51
i84	Keep things as they are	(Improve things)	5	5	18	17	12
i94	Down to earth	(Up in the air)	84	88	89	91	86
Thinking		Feeling	CoE	BUGB	CHG1	CHG2	Mean
i06	Justice	(Harmony)	49	50	59	62	55
i15	Analytic	(Sympathetic)	47	51	41	44	40
i26	Thinking	(Feeling)	58	67	57	65	55
i35	Firm	(Gentle)	31	38	43	41	36
i45	Critical	(Affirming)	18	22	41	42	31
i55	Logical	(Humane)	44	52	54	60	48
i66	Truthful	(Tactful)	35	45	53	52	44
i76	Sceptical	(Trusting)	24	26	28	34	28
i85	Seek for truth	(Seek for peace)	69	65	70	72	65
i96	Fair-minded	(Warm-hearted)	30	35	39	40	33
Judging		Perceiving	CoE	BUGB	CHG1	CHG2	Mean
i07	Happy with routine	(Unhappy with routine)	63	68	85	82	75
i17	Structured	(Open-ended)	49	55	61	64	56
i28	To act on decisions	(To act on impulse)	72	72	78	76	70
i37	Like to be in control	(Like to be adaptable)	41	45	45	49	46
i57	Orderly	(Easy going)	42	42	58	55	48
i68	Organised	(Spontaneous)	55	62	67	67	61
i78	Punctual	(Leisurely)	72	72	75	74	72
i88	Like detailed planning	(Dislike detailed planning)	50	59	70	71	65
i92	Happier with certainty	(Happier with uncertainty)	73	70	92	92	83
i99	Systematic	(Casual)	65	64	69	70	64
Volatile		Calm	CoE	BUGB	CHG1	CHG2	Mean
i09	Emotional	(Unemotional)	64	62	73	68	71
i20	Discontented	(Contented)	22	21	11	11	16
i30	Feel insecure	(Feel secure)	17	19	15	14	21
i40	Have mood swings	(Stay stable)	22	19	28	24	29
i49	Get angry quickly	(Remain placid)	17	24	30	28	26
i59	Feel guilty about things	(Feel guilt free)	58	55	70	70	68
i70	Anxious about things	(At ease)	32	31	40	38	39
i80	Panic easily	(Stay calm)	10	12	23	21	22
i89	Frequently get irritated	(Rarely get irritated)	35	38	40	39	40
i98	Easily bothered by things	(Unbothered by things)	34	39	45	45	44

Note: Items were paired choices, responses in parentheses were those for the opposite dimension of the ones used in this study. Figures are percentage responses for the item in the first column. For explanation and details of datasets, see text.

**CFA**

The CFA constrained the factors to five, thereby testing whether items loaded on the dimensions expected from the model underlying the FPTETS. Tables 2–5 show factor loadings with those

**Table 2.** Confirmatory factor analysis for Church of England clergy.

		Factor				
		1	2	3	4	5
<b>Extraversion</b>						
i01	Active	<b>.59</b>				
i12	Sociable	<b>.78</b>				
i21	Having many friends	<b>.49</b>				
i32	Like parties	<b>.57</b>				
i41	Energised by others	<b>.66</b>				
i48	Happier working in groups	<b>.39</b>				
i52	Socially involved	<b>.62</b>				
i61	Talkative	<b>.70</b>				
i72	An extravert	<b>.79</b>				
i81	Speak before thinking	.31			<b>-.33</b>	
<b>Sensing</b>						
i03	Interested in facts		<b>.52</b>			
i14	Practical		<b>.59</b>			
i23	The concrete		<b>.59</b>			
i34	Prefer to make		<b>.37</b>			
i43	Conventional		<b>.61</b>			
i54	Concerned about details		<b>.46</b>			
i63	Sensible		<b>.59</b>			
i73	Present realities		<b>.51</b>			
i84	Keep things as they are		<b>.25</b>			
i94	Down to earth		<b>.30</b>			
<b>Thinking</b>						
i06	Justice		<b>-.31</b>	.30		
i15	Analytic			<b>.64</b>		
i26	Thinking			<b>.53</b>		
i35	Firm			<b>.51</b>		
i45	Critical			<b>.50</b>		.33
i55	Logical			<b>.61</b>		
i66	Truthful			<b>.35</b>		
i76	Sceptical			<b>.34</b>		
i85	Seek for truth			<b>.36</b>		
i96	Fair-minded			<b>.53</b>		
<b>Judging</b>						
i07	Happy with routine		.39		.37	
i17	Structured				.67	
i28	To act on decisions				.50	
i37	Like to be in control			.33	.25	
i57	Orderly				.64	
i68	Organised				.70	
i78	Punctual				.50	
i88	Like detailed planning				.57	
i92	Happier with certainty		.39		.38	
i99	Systematic				.70	
<b>Volatile</b>						
i09	Emotional			-.51		.34
i20	Discontented					.54
i30	Feel insecure					.59
i40	Have mood swings					.66
i49	Get angry quickly					.58
i59	Feel guilty about things					.51
i70	Anxious about things					.69
i80	Panic easily					.56
i89	Frequently get irritated					.67
i98	Easily bothered by things					.65

Note: 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 baptist ministers.

		Factor				
		1	2	3	4	5
<b>Extraversion</b>						
i01	Active	<b>.42</b>	.35			
i12	Sociable	<b>.79</b>				
i21	Having many friends	<b>.49</b>				
i32	Like parties	<b>.69</b>				
i41	Energised by others	<b>.69</b>				
i48	Happier working in groups	<b>.56</b>				
i52	Socially involved	<b>.65</b>				
i61	Talkative	<b>.64</b>				
i72	An extravert	<b>.79</b>				
i81	Speak before thinking	.24				<b>.33</b>
<b>Sensing</b>						
i03	Interested in facts		<b>.61</b>			
i14	Practical		<b>.50</b>			
i23	The concrete		<b>.69</b>			
i34	Prefer to make		<b>.43</b>			
i43	Conventional		<b>.50</b>			
i54	Concerned about details		<b>.38</b>			
i63	Sensible	-.32	<b>.54</b>			
i73	Present realities		<b>.48</b>			
i84	Keep things as they are	<b>-.28</b>	.11			
i94	Down to earth		<b>.33</b>		.30	
<b>Thinking</b>						
i06	Justice			<b>.38</b>		
i15	Analytic			<b>.66</b>		
i26	Thinking			<b>.45</b>		
i35	Firm			<b>.67</b>		
i45	Critical			<b>.43</b>		
i55	Logical			<b>.45</b>	.32	
i66	Truthful			<b>.48</b>		
i76	Sceptical	<b>-.38</b>		.30		
i85	Seek for truth			<b>.49</b>		
i96	Fair-minded	-.39		<b>.48</b>		
<b>Judging</b>						
i07	Happy with routine		<b>.38</b>		.32	
i17	Structured				<b>.64</b>	
i28	To act on decisions				<b>.54</b>	
i37	Like to be in control			.30	.23	<b>.35</b>
i57	Orderly				<b>.64</b>	
i68	Organised				<b>.66</b>	
i78	Punctual				<b>.49</b>	
i88	Like detailed planning				<b>.62</b>	
i92	Happier with certainty		.31		<b>.52</b>	
i99	Systematic				<b>.71</b>	
<b>Volatile</b>						
i09	Emotional	.36		<b>-.40</b>		
i20	Discontented					<b>.43</b>
i30	Feel insecure					<b>.58</b>
i40	Have mood swings					<b>.60</b>
i49	Get angry quickly					<b>.57</b>
i59	Feel guilty about things					<b>.54</b>
i70	Anxious about things					<b>.66</b>
i80	Panic easily					<b>.61</b>
i89	Frequently get irritated					<b>.64</b>
i98	Easily bothered by things					<b>.67</b>

Note: For explanation, see Table 2.

**Table 4.** Confirmatory factor analysis for Churchgoers 1.

		Factor				
		1	2	3	4	5
<b>Extraversion</b>						
i01	Active	<b>.43</b>	.32			
i12	Sociable	<b>.76</b>				
i21	Having many friends	<b>.47</b>				
i32	Like parties	<b>.53</b>				
i41	Energised by others	<b>.54</b>				
i48	Happier working in groups	<b>.47</b>				
i52	Socially involved	<b>.68</b>				
i61	Talkative	<b>.70</b>				
i72	An extravert	<b>.73</b>				
i81	Speak before thinking	.22				<b>.35</b>
<b>Sensing</b>						
i03	Interested in facts		<b>.53</b>			
i14	Practical		<b>.61</b>			
i23	The concrete		<b>.65</b>			
i34	Prefer to make		<b>.53</b>			
i43	Conventional		<b>.52</b>			
i54	Concerned about details		.21		<b>.25</b>	
i63	Sensible		<b>.54</b>		.31	
i73	Present realities		<b>.46</b>			
i84	Keep things as they are	<b>-.23</b>	.22			
i94	Down to earth		<b>.45</b>			
<b>Thinking</b>						
i06	Justice			<b>.42</b>		
i15	Analytic			<b>.59</b>		
i26	Thinking			<b>.39</b>		
i35	Firm			<b>.61</b>		
i45	Critical			<b>.46</b>		
i55	Logical			<b>.52</b>		
i66	Truthful			<b>.38</b>		
i76	Sceptical			<b>.37</b>		
i85	Seek for truth			<b>.50</b>		
i96	Fair-minded	<b>-.35</b>		<b>.46</b>		
<b>Judging</b>						
i07	Happy with routine		<b>.35</b>		.33	
i17	Structured				<b>.60</b>	
i28	To act on decisions				<b>.48</b>	
i37	Like to be in control			<b>.37</b>	.30	
i57	Orderly				<b>.64</b>	
i68	Organised				<b>.71</b>	
i78	Punctual				<b>.34</b>	
i88	Like detailed planning				<b>.52</b>	
i92	Happier with certainty				<b>.37</b>	
i99	Systematic				<b>.67</b>	
<b>Volatile</b>						
i09	Emotional			<b>-.36</b>		<b>.36</b>
i20	Discontented					<b>.40</b>
i30	Feel insecure					<b>.55</b>
i40	Have mood swings					<b>.67</b>
i49	Get angry quickly					<b>.64</b>
i59	Feel guilty about things					<b>.44</b>
i70	Anxious about things					<b>.65</b>
i80	Panic easily					<b>.66</b>
i89	Frequently get irritated					<b>.63</b>
i98	Easily bothered by things					<b>.62</b>

Note: For explanation, see Table 2.

**Table 5.** Confirmatory factor analysis for Churchgoers 2.

		Factor				
		1	2	3	4	5
<b>Extraversion</b>						
i01	Active	<b>.44</b>				
i12	Sociable	<b>.76</b>				
i21	Having many friends	<b>.48</b>				
i32	Like parties	<b>.50</b>				
i41	Energised by others	<b>.52</b>				
i48	Happier working in groups	<b>.45</b>				
i52	Socially involved	<b>.67</b>				
i61	Talkative	<b>.66</b>				
i72	An extravert	<b>.72</b>				
i81	Speak before thinking	.24				<b>.34</b>
<b>Sensing</b>						
i03	Interested in facts		<b>.62</b>			
i14	Practical		<b>.62</b>			
i23	The concrete		<b>.67</b>			
i34	Prefer to make		<b>.54</b>			
i43	Conventional		<b>.53</b>			
i54	Concerned about details		<b>.40</b>			
i63	Sensible		<b>.52</b>		.34	
i73	Present realities		<b>.50</b>			
i84	Keep things as they are	<b>-.20</b>	.19			
i94	Down to earth		<b>.45</b>			
<b>Thinking</b>						
i06	Justice			<b>.44</b>		
i15	Analytic			<b>.59</b>		
i26	Thinking			<b>.42</b>		
i35	Firm			<b>.56</b>		
i45	Critical			<b>.44</b>		
i55	Logical			<b>.50</b>		
i66	Truthful			<b>.37</b>		
i76	Sceptical			<b>.39</b>		
i85	Seek for truth			<b>.46</b>		
i96	Fair-minded			<b>.47</b>		
<b>Judging</b>						
i07	Happy with routine		.30		<b>.42</b>	
i17	Structured				<b>.64</b>	
i28	To act on decisions				<b>.54</b>	
i37	Like to be in control			<b>.33</b>	.29	
i57	Orderly				<b>.63</b>	
i68	Organised				<b>.67</b>	
i78	Punctual				<b>.47</b>	
i88	Like detailed planning				<b>.54</b>	
i92	Happier with certainty		<b>.41</b>		.30	
i99	Systematic				<b>.66</b>	
<b>Volatile</b>						
i09	Emotional			<b>-.39</b>		.31
i20	Discontented					<b>.44</b>
i30	Feel insecure					<b>.51</b>
i40	Have mood swings					<b>.62</b>
i49	Get angry quickly			.31		<b>.58</b>
i59	Feel guilty about things					<b>.48</b>
i70	Anxious about things					<b>.68</b>
i80	Panic easily					<b>.64</b>
i89	Frequently get irritated					<b>.66</b>
i98	Easily bothered by things					<b>.68</b>

Note: For explanation, see Table 2.

less than .30 removed to improve readability. In all four datasets the five dimensions emerged more or less as expected. There were a few items that regularly loaded on a different dimension than expected:

*Extraversion:* One item, “Speak before thinking” (i81), factored on other dimensions in all four datasets, once negatively on Judging and three times negatively on Volatile.

*Sensing:* One item, “Keep things as they are” (i84), loaded as expected in the CoE dataset, but loaded negatively with Extraversion in the remaining three datasets. One item, “Concerned for details” (i54), loaded heavily on Judging in the CHG1 dataset.

*Thinking:* There was only one instance of incorrect loading in this dimension: “Justice” (i06) loaded negatively on Judging, but the difference from the correct loading was minimal (-.31 versus -.30).

*Judging:* One item, “Like to be in control” (i37) loaded with Volatile in three datasets and with Thinking in the fourth.

*Volatile:* One item, “Emotional” (i09) loaded negatively with Thinking in all four datasets.

The factor analyses showed that all five scales worked well in all four datasets. However, four items consistently loaded onto the wrong scale and these may be reducing the reliability of the measures:

- “Speak before thinking” in the Extraversion scale, paired with “Think before speaking” in the Introversion scale;
- “Keep things as they are” in the Sensing scale, paired with “Improve things” in the Intuition scale;
- “Like to be in control” in the Judging scale, paired with “Like to be adaptable” in the Perceiving scale;
- “Emotional” in the Volatile scale, paired with “Unemotional” in the Calm scale.

Reliability analysis on the full 10-item scales showed good to very good internal reliability for all scales in all four datasets (Table 2). Removing the above items from their scales in the four datasets increased mean Cronbach’s alpha in each of the four affected scales: Extraversion (.81), Sensing (.72), Judging (.77), and Volatile (.80). The gains were always small, but the dropped items were always the only ones that would increase the reliability if they were removed. (Table 6)

**Table 6.** Cronbach alpha reliabilities for FPTETS in each dataset.

	E	S	T	J	V
CoE	.83	.72	.68	.79	.79
BUGB	.83	.72	.70	.79	.78
CG1	.77	.69	.69	.72	.79
CG2	.77	.73	.68	.76	.78
Mean	.80	.71	.69	.76	.79

## Discussion

The Francis Psychological Type Scales (FPTS) were originally developed during the early 2000s to operationalize the four components of psychological type theory within survey-style research, proposing measures of introversion and extraversion, sensing and intuition, feeling and thinking, judging and perceiving. The availability of these scales has led to a burgeoning of empirical studies drawing on psychological type theory within the field of the psychology of religion and empirical theology. Integrating the findings of empirical studies grounded in psychological type theory alongside parallel streams of research within the individual-differences tradition employing either the Eysenckian three-dimensional model of personality or the Big Five Factor model of personality

is impoverished by the absence of a measure of emotionality or neuroticism. The Francis Psychological Type and Emotional Temperament Scale (FPTETS) have been designed to address this problem.

By drawing on four distinct datasets of clergy and churchgoers ( $N = 291, 979, 1,296, 1,525$ ), the present study has supported the factor structure of this new instrument. Confirmatory factor analysis using Principal Component Analysis followed by varimax rotation, with the number of factors set to the five factors predicted by the model, largely retrieved the hypothesized structure. Internal consistency reliability also provided satisfactory outcomes for the five paired scales, in terms of the alpha coefficients. On these grounds the present scales can be commended for further use.

The CFA suggested poor loadings on expected factors for three pairs of items from the Francis Psychological Type Scales: one from the measures of the orientations (extraversion and introversion), one from the measures of the perceiving process (sensing and intuition), and one from the measures of the attitudes toward the outer world (judging and perceiving). Poor loading was also apparent for one pair of items from the emotional temperament scale. Future research is needed to test replacements for these four pairs of items in order to improve the psychometric properties of the Francis Psychological Type and Emotional Temperament Scales.

It is not our intention here to try to integrate Emotional Temperament into a type-based theory, although this may be a useful long-term goal. Village (2011a) noted that those who prefer trait models often criticize type models because of its underlying theory, even though some trait models are largely heuristic and have little theoretical basis in neurological functioning. The FPTETS have been conceived and developed primarily as pragmatic research tools within the fields of empirical theology and congregational studies. Although the original four-dimensional instrument built on the Jungian theory of dichotomized preferences in each dimension, there are sound pragmatic and statistical reasons for using continuous scale scores in some research analyses (Village, 2011a). The Emotional Temperament scales emerged from Eysenckian theory that conceives neuroticism as an underlying continuum rather than binary state, so there is less justification for dichotomizing this component than there is for dichotomizing the other four components. Dichotomization has value within the Jungian framework, particularly when using the instrument within practical and applied contexts where simplicity is a virtue, or when profiling congregations or particular groups of individuals. Presenting type or temperament preferences enables results to be more easily compared with other instruments and more readily understood by users and practitioners within the field of psychological type theory. Nonetheless, we would recommend treating all five dimensions of the FPTETS as continuous scores in analyses where dichotomization might lead to the unnecessary loss of information.

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

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