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Running head: KTS and EPQR-S

The relationship between the Keirsey Temperament Sorter and the
short-form Revised Eysenck Personality Questionnaire

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Abstract

The two models of personality proposed by the Keirsey Temperament Sorter (KTS) and by the short-form Revised Eysenck Personality Questionnaire (EPQR-S) propose measures of extraversion-introversion, but in other respects the two models are quite different. While the KTS proposes measures of sensing-intuition, thinking-feeling, and judging-perceiving, the EPQR-S proposes measures of neuroticism, psychoticism, and a lie scale. In order to test the comparability of the two indices of extraversion-introversion and the independence of the other constructs, a sample of 554 undergraduate students attending a university-sector college in South Wales, in the United Kingdom, completed the KTS and the EPQR-S. The data demonstrate that the Keirsey Temperament Sorter scales map in quite a complex way onto the model of personality proposed by the EPQR-S.

The relationship between the Keirsey Temperament Sorter and the
short-form Revised Eysenck Personality Questionnaire

Empirical studies in the psychology of personality develop within clear and discrete families according to a variety of different models of personality and different personality measures. It is often difficult to build bridges across these different instruments. After years of comparative neglect, the Keirsey Temperament Sorter (KTS), proposed by Keirsey and Bates (1978) and revised by Keirsey (1998), has begun to receive greater attention and more use in empirical studies in the psychology of personality. For example, in recent years the KTS has been used in a number of correlation studies with variables such as ethics (Allmon, Page, & Roberts, 2000), learning styles (Harrison & Lester, 2000), manic-depression (Lester, 2000), interpersonal conflict (Calabrese, 2000), mystical orientation (Francis & Loudon, 2000), paranormal belief (Fox & Williams, 2000), and attitude toward Christianity (Fearn, Francis, & Wilcox, 2001). There remains, however, a lack of research regarding the ways in which findings generated by this instrument map onto other models of personality. In order to address this problem the current study examines the relationship between the KTS and the Eysenckian model of personality, as represented by the short-form Revised Eysenck Personality Questionnaire (EPQR-S: Eysenck, Eysenck, & Barrett, 1985).

The KTS, available both as a paper and pencil questionnaire and electronically as an online questionnaire (see for example, Tucker & Gillespie, 1993; Kelly & Jugovic, 2001), is part of a wider family of instruments concerned to operationalise and to develop Jung's (1971) theory of psychological type. This wider family includes, for example, the Myers-Briggs Type Indicator (Myers & McCaulley, 1985) and the Francis Psychological Type Scales (Francis, 2005). This model of personality operationalised in the KTS, distinguishes between two orientations, two perceiving functions, two judging functions, and two attitudes

toward the outer world.

The two orientations are concerned with whether energy is drawn from the outside world or from the inner world. On the one hand, Extraverts (E) are orientated toward the outside world; they are energised by the events and people around them. They enjoy communicating and thrive in stimulating and exciting environments. On the other hand, Introverts (I) are orientated toward their inner world; they are energised by their inner ideas and concepts. They enjoy solitude, silence, and reflection. High scorers on the KTS EI scale are classified as extraverts and low scorers on the KTS EI scale are classified as introverts.

The two perceiving functions are concerned with the way in which people receive and process information. On the one hand, Sensing types (S) focus on the realities of a situation as perceived by the senses. They tend to focus on specific details, rather than the overall picture. On the other hand, Intuitive types (N) focus on the possibilities of a situation, perceiving meanings and relationships. They focus on the overall picture, rather than specific facts and data. High scorers on the KTS SN scale are classified as sensing types and low scorers on the KTS SN scale are classified as intuitive types.

The two judging functions are concerned with the way in which people make decisions and judgements. On the one hand, Thinking types (T) make judgements based on objective, impersonal logic. They value integrity, justice, truthfulness and, fairness. On the other hand, Feeling types (F) make judgements based on subjective, personal values. They value compassion, mercy, tactfulness and, peace. High scorers on the KTS TF scale are classified as thinking types and low scorers on the KTS TF scale are classified as feeling types.

Like many other operationalisations of Jungian psychological type theory (see for example, Myers & McCaulley, 1985; Francis, 2005), the KTS makes use of a fourth index, concerned with attitude toward the outer world. The two attitudes toward the outer world are

determined by which of the two sets of functions (Perceiving or Judging) is preferred in dealings with the outer world. On the one hand, Judging types (J) seek to order, rationalise, and structure their outer world, as they actively judge external stimuli. They enjoy routine and established patterns. On the other hand, Perceiving types (P) do not seek to impose order on the outer world, but are more reflective, perceptive, and open, as they passively perceive external stimuli. They have a flexible, open-ended approach to life. High scorers on the KTS JP scale are classified as judging types and low scorers on the KTS JP scale are classified as perceiving types.

The KTS has been found to achieve satisfactory internal consistency in a study by Waskel and Coleman (1991). Using a sample of 331 university students in the USA, they found that the KTS indices achieved Cronbach alpha coefficients of 0.74 (EI), 0.89 (SN), 0.87 (TF), and 0.88 (JP). More recently, Fearn, Francis and Wilcox (2001), in a study among 367 university students in the UK, found that the KTS indices achieved Cronbach alpha coefficients of 0.68 (EI), 0.73 (SN), 0.74 (TF), and 0.82 (JP). From the studies surveyed it may be concluded that the KTS indices are generally internally consistent, in that they tend to achieve Cronbach alpha coefficients above the level deemed satisfactory by DeVellis (2003) of 0.65.

While the KTS has its roots in the theoretical work of Jung, the Eysenckian model of personality has its roots in the factor analysis of human responses, in order to identify orthogonal and discrete dimensions of personality. Eysenck's model of personality has been developed and refined over half a century. In an earlier form, represented in the Maudsley Personality Inventory (MPI: Eysenck, 1959) and the Eysenck Personality Inventory (EPI: Eysenck & Eysenck, 1964), Eysenck's model operationalised the two higher order personality factors defined as extraversion and neuroticism. More recently, Eysenck's model has operationalised three higher order personality factors defined as neuroticism,

psychoticism, and extraversion, represented in the Eysenck Personality Questionnaire (EPQ: Eysenck & Eysenck, 1975), the Revised Eysenck Personality Questionnaire (EPQR: Eysenck, Eysenck, & Barrett, 1985), and the Eysenck Personality Scales (EPS: Eysenck & Eysenck, 1991). The neuroticism scale assesses a continuum ranging from emotional stability, through emotional lability, to neurotic disorder. In Eysenck's model the high scorer on the neuroticism scale will display anxiety, depression, shyness, and low self-esteem. The psychoticism scale assesses a second continuum ranging from tendermindedness, through toughmindedness, to psychotic disorder. In Eysenck's model the high scorer on the psychoticism scale will display aggression, egocentrism, impulsiveness, and toughmindedness. The extraversion scale assesses a third continuum ranging from introversion, through ambiversion, to extraversion. In Eysenck's model the high scorer on the extraversion scale will display sociability, gregariousness, excitability, and sensation-seeking behaviour. Alongside these three scales designed to measure three major higher order factors of personality, Eysenck's instruments also include a fourth scale. This fourth scale, originally intended to detect 'faking good' and known as a lie scale, is now more generally considered to function as an index of social conformity.

Several studies have investigated the relationship between the Eysenckian model of personality and another operationalisation of Jungian psychological type theory proposed by the Myers-Briggs Type Indicator (Myers & McCaulley, 1985), including Steele and Kelly (1976), Wakefield, Sasek, Brubaker and Friedman (1976), Sipps and Alexander (1987), Landrum (1992), Saggino and Kline (1996), Francis and Jones (2000), and Furnham, Jackson, Forde and Cotter (2001). However, thus far, no empirical study has investigated the relationship between the KTS and the Eysenckian model of personality. Therefore, it is the purpose of the current study to investigate how the constructs proposed by the KTS map on to the dimensional model of personality proposed by the EPQR-S. This study has been

structured in this way to facilitate dialogue between the findings of studies which have employed the two different instruments. The appropriate method for achieving this end is to examine the relationship between the two sets of scale scores, rather than to subject the total batch of scale items to factor analysis. Moreover, the relationship between the two sets of scale scores is best presented by the single correlation coefficient, since this is the information provided by the previous studies examining the relationship between the MBTI and the EPQ reported above, rather than by the correlations disattenuated for scale unreliability.

Some directional hypotheses about the relationship between the KTS and the EPQR-S may be made on the basis of existing empirical evidence regarding the relationship between the MBTI and the Eysenckian models of personality, given the findings that the MBTI and the KTS achieve large proportions of matching type designations (Tucker & Gillespie, 1993; Kelly & Jugovic, 2001) and that significant correlations are achieved between the scales of the MBTI and the KTS (Quinn, Lewis, & Fischer, 1992). Studies using the MBTI and the Eysenckian models of personality have found two strong sets of relationships emerging consistently between the scales of these two models: first, the Eysenckian scale of extraversion correlates positively with the MBTI E scale and negatively with the MBTI I scale (Steele & Kelly, 1976; Wakefield, Sasek, Brubaker, & Friedman, 1976; Sippes & Alexander, 1987; Landrum, 1992; Saggino & Kline, 1996; Francis & Jones, 2000; Furnham, Jackson, Forde, & Cotter, 2001); second, the Eysenckian scale of psychoticism correlates positively with the MBTI P scale and negatively with the MBTI J scale (Saggino & Kline, 1996; Francis & Jones, 2000; Furnham, Jackson, Forde, & Cotter, 2001). On the basis of the findings of these previous studies it is hypothesised that the Eysenckian extraversion scale will be positively correlated with the KTS EI scale and the Eysenckian psychoticism scale will be negatively correlated with the KTS JP scale.

Method

Sample

Completed questionnaires were returned from 554 first year undergraduate students attending a university-sector college in South Wales in the United Kingdom. The sample comprised 425 (77%) female students and 129 (23%) male students. The majority (437) of participants were aged between 18 and 19 years, 75 participants were aged between 20 and 25 years, 23 participants were aged between 26 and 35 years, and 18 participants were aged over 35 years.

Instruments

Personality was assessed using two different inventories: the short-form Revised Eysenck Personality Questionnaire (EPQR-S: Eysenck, Eysenck, & Barrett, 1985) and the Keirsey Temperament Sorter (KTS: Keirsey & Bates, 1978). The EPQR-S proposes three 12-item indices of extraversion, neuroticism, and psychoticism, together with a 12-item lie scale. Each item is assessed on a two-point scale: yes and no. The KTS is a forced-choice format, pencil and paper questionnaire that contains 70 items. The KTS distinguishes between the four dichotomous indices of psychological type through the use of four scales: EI, SN, TF, and JP.

Data analysis

The data were analysed by the SPSS data package (SPSS. Inc., 1988), using the frequency, correlation, partial correlation, t-test, and reliability routines.

Results

Table 1 presents the scale properties of the four indices of the EPQR-S and the four

continuous scales of the KTS in terms of the alpha coefficient (Cronbach, 1951). Regarding

-insert table 1 about here-

the internal consistency of the KTS, all four scales reported alpha coefficients of at least 0.65, the criterion for acceptable statistical reliability according DeVellis (2003). Regarding the EPQR-S, the extraversion and neuroticism scales met DeVellis' (2003) recommended criterion of 0.65. The EPQR-S lie scale was less satisfactory, achieving an alpha coefficient of 0.60, which DeVellis suggests is not desirable, although it may still be considered adequate. However, the EPQR-S psychoticism scale achieved a Cronbach alpha coefficient of just 0.48, which is unsatisfactory but consistent with the recognised weaknesses of this scale (Francis, Brown, & Philipchalk, 1992).

Table 1 also presents the mean scores for male and for female participants on the EPQR-S and the KTS. There are significant differences between the mean scores of male and female participants on three of the four EPQR-S scales and two of the four KTS scales.

-insert table 2 about here-

Table 2 presents the Pearson correlations between the four scales of the EPQR-S and the four scales of the KTS. Controlling for sex makes no difference to the pattern of significant relationships between the two models of personality, with the exception of the Eysenckian neuroticism scale and the KTS TF scale. The relationship between the Eysenckian neuroticism scale and the KTS TF scale is no longer significant after controlling for sex ($r = -.08$, NS).

Discussion

The correlations coefficients presented in table 2 illustrate the way in which the constructs proposed by the KTS map on to the dimensional model of personality proposed by Eysenck.

The Eysenckian extraversion scale is positively correlated with the KTS EI scale. The Eysenckian extraversion scale is also significantly, but less strongly, correlated with the KTS SN scale and the KTS JP scale. This suggests that the conceptualisation of the KTS construes the N and the P type as somewhat more extravert, and the S and the J type as somewhat more introvert.

The Eysenckian neuroticism scale is negatively correlated with the KTS EI scale. The Eysenckian neuroticism scale is also significantly, but less strongly, positively correlated with the KTS JP scale. This suggests that the conceptualisation of the KTS construes the I and the J type as somewhat more neurotic, and the E and P type as somewhat more stable. In addition, the Eysenckian neuroticism scale is correlated with the KTS TF scale when males and females are considered together, although not so after controlling for sex differences. This finding is consistent with the data presented in table 1 showing that females record higher scores than males on the Eysenckian neuroticism scale and females record lower scores than males on the KTS TF scale.

The Eysenckian psychoticism scale is negatively correlated with the KTS SN scale and the KTS JP scale. This suggests that the conceptualisation of the KTS construes the N and P type as somewhat more toughminded, and the S and J type as somewhat more tenderminded.

The Eysenckian lie scale is positively correlated with the KTS SN scale and the KTS JP scale. This suggests that the conceptualisation of the KTS construes the S and J type as somewhat more socially conforming, and the N and P type as somewhat less socially conforming.

Conclusion

This study, conducted among a sample of 554 undergraduate students, has

demonstrated a number of statistically significant relationships between the two measures of personality proposed by the KTS and the EPQR-S. In interpreting these relationships the Eysenckian constructs have been employed to illuminate and to enrich understanding of the KTS constructs.

Taking the distinction between statistical and substantive significance, two sets of relationships are of particular importance, in that they account for more than ten percent of shared variance between the two instruments. The first set of relationships concerns the location of the KTS EI scale within Eysenckian personality space. KTS EI scale is related not only to the Eysenckian scale of extraversion, but also to the Eysenckian scale of neuroticism. In Eysenckian terms, low scorers on the KTS EI scale occupy the space of neurotic introversion and high scorers on the KTS EI scale occupy the space of stable extraversion. This conclusion is important for understanding the relationship between the two systems of personality assessment and for transferring conclusions across the two systems. By insisting on the orthogonality of the two independent constructs of extraversion and neuroticism, the Eysenckian model of personality creates the theoretical and empirical possibility for individuals to occupy the spaces of stable introversion and neurotic extraversion. These possibilities are not recognised by the KTS model of personality.

The second set of relationships that account for more than ten percent of shared variance between the two instruments concerns the location of the KTS SN scale and the KTS JP scale within Eysenckian personality space. High scorers on the KTS SN and KTS JP scales occupy the space of tendermindedness (low psychoticism scores), while low scorers on the KTS SN and KTS JP scales occupy the space of toughmindedness (high psychoticism scores). The theoretical construct which links these very different aspects of personality is impulsivity. The high scorer on the Eysenckian psychoticism scale is defined as an impulsive individual by Eysenck and Eysenck (1976). Myers and McCaulley (1985) characterise the

preference for P as involving impulsivity. Close analysis of the items which comprise the KTS SN scale also reveal a connection with impulsivity. This conclusion is important for understanding how preferences for N and for P, especially when expressed in the NP combination, may also reflect some of the toughminded characteristics more generally associated with higher psychoticism scores.

Both of these conclusions are consistent with the findings of studies which have set out to map MBTI scale scores within Eysenckian personality space. For example, Francis and Jones (2000) found the following correlations: 0.77 between EPQ extraversion and MBTI E; 0.27 between EPQ neuroticism and MBTI I; 0.25 between EPQ psychoticism and MBTI N; 0.45 between EPQ psychoticism and MBTI P.

These two conclusions help to shape three tasks for further research. First, the conclusions have been based on the findings of one pioneering study which has set out to examine the relationship between the KTS and the EPQR-S among undergraduate students in South Wales. Replication studies are needed among other populations, using other versions of the Eysenckian personality measures, in order to check the stability of these findings.

Second, the conclusions have been based on a study which employed the 1978 edition of the KTS. In 1995 a revised edition of the KTS was published, which included a number of significant changes to the original wording of the items (Keirse, 1998). Some replication studies now need to use the 1995 edition in order to check whether the revised instrument functions in precisely the same way alongside the Eysenckian dimensional model of personality as the original 1978 edition of the KTS.

Third, the development of new indices designed to operationalise the constructs of psychological type might be well advised to re-visit the notions of EI and of SN. If it is unhelpful for the construct of introversion to be associated with anxiety or neuroticism and for the construct of extraversion to be associated with emotional stability, then scale items

need to be selected which distinguish more clearly between the notions of introversion and extraversion on the one hand, and between the notions of stability and neuroticism on the other hand. If it is unhelpful for the construct of intuition to be associated with toughmindedness and for the construct of sensing to be associated with tendermindedness, then scale items need to be identified which disentangle these constructs.

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Table 1

Scale Properties

| Scale | Alpha | Male | | Female | | T | D | P< |
|---------------------------|-------|------|-----|--------|-----|-------|-------|------|
| | | Mean | SD | Mean | SD | | | |
| EPQR-S | | | | | | | | |
| Extraversion | 0.84 | 3.6 | 2.1 | 4.3 | 2.0 | -3.87 | -0.34 | .001 |
| Neuroticism | 0.68 | 3.6 | 1.9 | 3.7 | 1.7 | -0.93 | -0.09 | NS |
| Psychoticism | 0.48 | 2.0 | 1.4 | 1.6 | 1.2 | 3.36 | 0.33 | .001 |
| Lie | 0.60 | 2.0 | 1.7 | 2.4 | 1.7 | -2.51 | -0.25 | .05 |
| KTS | | | | | | | | |
| Extraversion/Introversion | 0.69 | 6.1 | 2.3 | 6.8 | 2.3 | -2.61 | -0.27 | .01 |
| Sensing/Intuition | 0.76 | 10.4 | 4.2 | 10.4 | 4.0 | 0.05 | 0.00 | NS |
| Thinking/Feeling | 0.75 | 9.4 | 4.3 | 7.0 | 3.7 | 6.10 | 0.59 | .001 |
| Judging/Perceiving | 0.84 | 12.2 | 4.6 | 12.9 | 4.4 | -1.58 | 0.16 | NS |

Table 2

Correlations between EPQR-S Scales and KTS Scales

| | Pearson Correlations | | | |
|--------|----------------------|----------|----------|---------|
| | EPQ-E | EPQ-N | EPQ-P | EPQ-L |
| KTS-EI | +0.70*** | -0.36*** | +0.03 | -0.01 |
| KTS-SN | -0.09* | +0.06 | -0.37*** | +0.09* |
| KTS-TF | -0.08 | -0.09* | -0.00 | -0.01 |
| KTS-JP | -0.16*** | +0.18*** | -0.46*** | +0.12** |

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

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