PSYTECH
INTERNATIONAL

JTI

JUNG TYPE INDICATOR

TECHNICAL MANUAL

CONTENTS

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THEORETICAL OVERVIEW

Theories of human typology can be traced back at least as far as to the Greek physician Hippocrates (ca. 460-377 BC)

INTRODUCTION TO HUMAN TYPOLOGY

Hippocrates postulated four basic temperamental types: sanguine; choleric; melancholic and phlegmatic. This typology persisted for many centuries; for example, the philosopher Immanuel Kant (1798) based much of his psychology on this theory of four psychological types.

The importance of this early fourfold typology is that it contains within it the seeds of modern typological thinking. Although this fourfold typology is explicitly categorical (i.e., each person can only be one type), the concept of behavioural traits is nonetheless implicit in this theory, with each type being defined by reference to a number of traits which, when taken together, make up a particular personality type. For example, Kant attributes the traits of carefreeness, hopefulness, sociability, and being easily bored etc. to the Sanguine temperament. Thus, psychometric typological theories, which stress that a personality type is a higher-order construct obtained from a cluster of behavioural traits, can be seen to have been foreshadowed by these early typological theories.

Wilhelm Wundt (1903), the acknowledged founder of experimental psychology, demonstrated how a fourfold typology can arise from a two-dimensional theory. Wundt postulated two dimensions, one reflecting the strength of a person's emotions and the other the speed at which such emotions change. Given this two-dimensional system Wundt showed that four temperamental types could be defined by the behavioural traits contained within the four quadrants of this system.

The next development in personality typology was carried out by C G Jung (1921), who proposed a typological theory in which individuals could be assigned to one of eight types. (As the JTI has been developed to assess Jung's theory a full description of this typology will be saved until later in this chapter.) Moreover, as is the case with the earlier typologists, while Jung's theory describes people in terms of categories, Jung himself made it clear that he viewed personality types, such as Extraversion versus Introversion, as being dimensional rather than consisting of discrete categories.

Perhaps the most experimentally rigorous personality typology is that developed by H J Eysenck (1960, 1969), who provides a three-dimensional type description consisting of: Extraversion/Introversion; Emotional Stability/Emotional Instability, and Psychoticism (a Tough-minded/Tender-minded continuum). In line with the ideas noted above, Eysenck has shown, from an extensive body of research (based on numerous factor analytic studies), that a typology is purely a higher-order organisation of personality traits. Thus, Eysenck (1947) proposes four levels of personality description. At the lowest level are the person's specific responses to specific situations. The second level of description consists of habitual responses; those responses we typically make when similar situations occur. At the third level these habitual responses are organised into personality traits, these are the primary factors that emerge from a factor analysis of personality test items. The highest level consists of the organisation of these personality traits into a general type. In factor analytic terms these are the second-order factors which emerge when the primary factors are themselves submitted to factor analysis.

THE PIONEERING WORK OF ELIZABETH MYERS AND CATHERINE BRIGGS

After formulating his theory of personality types in 1921, Jung did little further work in this area. These ideas were then taken up by the mother and daughter team Elizabeth Myers and Catherine Briggs, who recognised the intrinsic value of Jung's personality typology. Realising that if the theory was to be of any practical value, it was necessary to develop a method for assessing a person's type, they set about developing a questionnaire measure of psychological type. This pioneering work led to the development of the Myers Briggs Type Indicator®, which is now one of the most widely referenced assessment tools.

The Jung Type Indicator (JTI) is a further development that aims to provide a modern, psychometrically sound measure of Jung's typology. Thus, while the JTI is firmly rooted in Jung's psychological theory, it has been developed using modern psychometric techniques (described in detail in Chapters 3 & 4) to ensure that the questionnaire provides a reliable and valid measure of a person's Jungian (psychological) Type.

The JTI and the MBTI ®

As well as being rooted in Jungian typological theory the JTI also incorporates some of the modifications to Jung's theory, suggested by Elisabeth Myers (1962), which have been included in the Myers-Briggs Type Indicator. Principal among these is the inclusion of the Judging/Perceiving types, which although not explicitly stated as part of Jung's typology, are nevertheless implicit in his theory of types. In addition, the JTI also adopts the method of ascertaining the dominant function used by the MBTI® (see discussion of the superior function later in this chapter). Despite these similarities between the JTI and the MBTI® there are, nonetheless, some fundamental and important differences between these two instruments in terms of their psychometric properties. This results from the JTI having been constructed using modern psychometric test theory. The most striking difference between these two instruments is that the JTI, in keeping with modern type theory (see above), construes psychological types as being best described by points on a continuum, rather than by discrete categories. Thus, unlike the MBTI®, the JTI views the two basic attitudes (Extraversion versus Introversion), the four psychological functions (Thinking versus Feeling and Sensing versus Intuiting) and the two secondary processes (Judging versus Perceiving) described by Jung as being continuous variables, rather than discrete categories. This is supported by the fact that the evidence demonstrating a discrete categorical view of psychological types is very scant. In particular, statistical analysis of MBTI® data does not reveal the bimodal distributions which would be expected if this instrument were assessing discrete categories.

Moreover, examination of the correlations between the separately scored pairs of MBTIs® attitudes, functions and secondary processes (presented in Table 1) indicates that these are effectively measuring opposite ends of the same dimension. Therefore, the JTI has been developed to assess bipolar continuous constructs, with each type being defined by those personality traits which cluster at one end of the type dimension with the type boundaries set in the middle of the scale. As Eysenck (1969) notes, this is a true typology in the modern sense of that term, as '…the widespread notion that typologies imply discontinuities, bimodal distributions, and the like, does not accurately represent the writings and views of modern typologists.'

Table 1: MBTI® Intercorrelation Matrix (n=229)

	E	I	S	N	T	F	J	P
Extraversion	1	-.94	-.19	.14	-.02	.04	-.14	.10
Introversion	-.94	1	.20	-.13	-.01	-.04	.13	-.08
Sensing	-.19	.20	1	-.89	.09	-.07	.42	.44
iNtuition	.14	-.13	-.89	1	-.15	.14	-.36	.39
Thinking	-.02	-.01	.09	-.15	1	-.80	.27	-.27
Feeling	.04	-.04	-.07	.14	-.80	1	-.27	.28
Judgement	-.14	.13	.42	-.36	.27	-.27	1	-.96
Perception	.10	-.08	-.44	.39	-.27	.28	-.96	1

JUNG'S THEORY OF THE BASIC PSYCHOLOGICAL PROCESSES

In his personality theory Jung identified two core mental activities:

- receiving, or taking in, information; which he termed Perceiving, and l
- processing that information (e.g., organising the information and coming to conclusions form it), which he termed Judging.

He further identified two alternative ways of Perceiving information, which he termed Sensing and Intuiting, and two alternative ways of Judging information, which he termed Thinking and Feeling. Moreover, Jung noted that these four mental processes can be directed either at the external world of people and things, or at the internal world of subjective experience. Thus, the existence of these four basic psychological processes, which can be used either in the internal or external world, means that people can use their mind in one of eight ways; thus, resulting in eight psycho-logical types.

THE TWO BASIC ATTITUDES

The two basic attitudes that Jung identified function as opposites, with one of these attitudes being dominant and conscious, while the other is auxiliary and unconscious.

The extraverted attitude

Extraversion is oriented towards the external, outer world. Thus, people who prefer this attitude would rather to spend time interacting with the outside world, than dealing with the inner world of subjective experiences and mental events. Thus, extraverts enjoy spending time in the company of other people and enjoy translating their ideas and interests into overt behaviour and action.

The introverted attitude

Introversion is oriented towards the inner, subjective world. Thus, people who prefer this attitude like to spend time in quiet contemplation and reflection. Thus, introverts are quiet, introspective individuals who do not feel the constant need for contact with the outer world of people and events.

THE FOUR PSYCHOLOGICAL FUNCTIONS

As described above, Jung identified four basic psychological functions, with a person's preferred function being dominant and conscious, while the non-preferred function is auxiliary and unconscious

Thinking

Thinking involves the logical analysis of information in terms of the strict principles of cause and effect. Thus, people who prefer this form of Judging approach life in a rational, analytical way; searching for logical relationships between events and ideas.

Feeling

Feeling involves identifying the emotional value that is attached to objects or events. Thus, people who prefer this form of Judging are more concerned with what they feel about a person or event, rather than, with what they can learn about it through logical, rational analysis.

Sensing

Sensing involves directly receiving information through the senses. Thus, people who prefer this form of perceiving tend to focus on the facts in a given situation, and on hard data.

Intuiting

Intuiting involves going beyond the information provided by the senses to discover possibilities which might not be immediately obvious from sensory data. Thus, people who prefer this form of perceiving have a preference for focusing on theoretical issues and hidden patterns of meaning.

DOMINANT AND AUXILIARY FUNCTIONS

Jung further noted that people's preferences for each of these functions vary, with these differences giving rise to the individual differences we observe between people. Moreover, Jung observed that the dominant function is used in the preferred world (i.e., the external world for Extraverts and the internal world for Introverts) while the auxiliary function is used in the non-preferred world (i.e., the inner world for Extraverts and the outer world for

Introverts).
In addition, Jung realised that as Thinking and Feeling are both rational functions, they tend to oppose each other, as do the non-rational functions of Sensing and Intuiting. Thus, neither member of an opposing pair of functions can have an auxiliary role for the dominant function. In this way, if a rational function is dominant then one of the non-rational functions must provide the auxiliary function and vice versa. The JTI adopts the approach developed by Elizabeth Myers (1962) for identifying which of the four functions is dominant. This consists of using an individual's secondary process of Judging or Perceiving (see next section) as an indicator of which of the four functions will be dominant and which will be auxiliary.

SECONDARY PROCESSES

As noted above one of Elizabeth Myers (1962) great insights was to recognise that the secondary processes of Judging and Perceiving could be used to identify which psychological function will be dominant for each person

Judging

Judging is concerned with organising and processing information. Thus, people who prefer this mental process for receiving information about the world like to plan ahead and organise, as they order and regulate their mental events.

Perceiving

Perceiving is concerned with directly receiving information without evaluation. Thus, people who prefer this mental process like to put off decision making in order to gain as much information as possible. Moreover, when they do decide to act, they will do so in an unstructured and flexible manner, without detailed prior categorising of events.

THE JUNGIAN TYPES

The two basic attitudes, when combined with the four functions, produce the eight Jungian Types. These eight types can be further differentiated in terms of the auxiliary function.

INTROVERTED-THINKING

Viewing life from a detached intellectual perspective, Introverted-Thinking types are objective clear thinking and rational. Quietly introspective and abstract thinking, some people may view them as being a little cool and reserved, or even somewhat distant, in their dealings with others. Rational, analytical and logical, they are inclined to be quiet observers of life.

EXTRAVERTED-THINKING

Logical, analytical and rational, Extraverted-Thinking types are quick to challenge ideas that are not based on sound logic. Direct and to the point in their dealings with others, they are lively energetic and talkative. They actively participate in all that is going on around them,

INTROVERTED-FEELING

Quietly thoughtful, sensitive and considerate, Introverted-Feeling types are deep introspective individuals. Keenly perceptive observers of life, they have a genuine empathic concern for others.

While they have a great capacity for warmth, they may not display this with people they do not know well. Their reliance on feeling means that they hold strong values that are central to their personal identity.

EXTRAVERTED-FEELING

Warm, friendly and sociable, Extraverted-Feeling types show a genuine interest in the people around them. Disliking conflict and discord, they will actively try to seek compromise and consensus. Thoughtful empathic and understanding, others will be quick to warm to them. Valuing genuineness in interpersonal relationships, they will be open and expressive in their dealings with others.

INTROVERTED-SENSING

Introspective, down-to-earth and realistic, Introverted-Sensing types have a quiet, matter-of-

fact interpersonal style. Focusing on practical, achievable goals, they will wish to get things done with a minimum of fuss and discussion. Deeply private individuals, they are not quick to express their inner most thoughts and feelings and, as a result, others may see them as being somewhat reserved.

EXTRAVERTED-SENSING

Outgoing sociable and lively, Extraverted-Sensing types are action orientated individuals. Pragmatic, down-to-earth and realistic, they like to achieve immediate, practical results. Goal orientated and problem focused, they have little interest in the theoretical nuances of a problem, preferring instead to focus on facts and hard data. Friendly and enthusiastic, they will be popular team members

INTROVERTED-INTUITING

Quietly observing life from an abstract intellectual perspective, Introverted-Intuiting types are deep individuals. Often engrossed in their own theoretical musings, others who are less abstract minded than them may sometimes view them as being a little cool, distant or even somewhat reserved. Deeply private individuals, they may hold back from expressing their deeply held personal views and feelings.

EXTRAVERTED-INTUITING

Lively, talkative and outgoing, Extraverted-Intuiting types are quick to enthuse others with their abstract, theoretical ideas. They greatly enjoy participating in theoretical debates and discussions, and are quick to express their personal insights and understandings. Greatly enjoying social contact, they will participate enthusiastically in all that is going on around them.

SCALE CONSTRUCTION

The JTI subscales were constructed following the principles of classical test theory (see Kline 1986 for a detailed exposition of test theory).

ITEM CONSTRUCTION

An initial item set was constructed by three psychologists who are experienced in the theory of psychological type and its assessment. Each psychologist independently generated a set of items designed to assess the core characteristics of each type. When developing these items each psychologist made extensive reference to Jung's original work on psychological type, in addition to referring to more recent published work in this area. Once an initial item pool had been generated, consensus was sought among the psychologists on the wording of each item. Minor alterations were then made to item wording until consensus was achieved, and those items on which consensus was not achieved were rejected.

ITEM TRIALING

The items were then trialled on three separate samples, two of which also completed the Myers-Briggs Type Indicator®. Items were selected for inclusion in the final instrument if they met the following criteria:

1. Each item correlated substantially (0.3 or greater) with the target MBTI scales.

2. Each item did not correlate substantially (0.2 or less) with non-target MBTI scales.

3. The items combined to form homogeneous item sets across each of the three samples (corrected item total correlations exceeding 0.3)

4. Removing any item from the item set did not reduce the scale's alpha coefficient.

5. When more than 15 items met the above criteria, those with the lowest item-total correlations were removed from the item set on an iterative basis.

THE PSYCHOMETRIC PROPERTIES OF THE JTI

This chapter presents details concerning the psychometric properties of the Jung Type Indicator and demonstrates that this instrument meets the technical requirements of a modern psychometric measure.

INTRODUCTION

Reliability

An important technical requirement for a psychometrically sound test is that the measurements obtained from that test should be reliable. This assesses the extent to which variation in test scores reflect true differences between people (on the characteristic being measured) rather than reflecting random measurement error. The reliability coefficient indicates the proportion of variance (variability) in a scale that is attributable to the underlying characteristic, rather than random measurement error. Measures of interests, attitudes and values are considered to meet acceptable levels of reliability if they have reliability coefficients above 0.7.

Reliability is generally assessed using one of three methods. The first method assesses the internal consistency, or homogeneity, of the scale items. (That is to say, the extent to which the scale items all assess the same underlying construct.) The second method assesses the extent to which parallel forms of the same test are correlated with each other, and can thus be considered to be measuring the same underlying trait or characteristic. The third method assesses the stability of scale scores over time.

Reliability: Internal Consistency

Also known as scale homogeneity, internal consistency measures of reliability assess the extent to which all of the items in a scale are measuring the same underlying construct or trait. A scale is said to be internally consistent if all the items are correlated with each other, which in turn implies that the items are all assessing the same trait or characteristic.

The most common measure of internal consistency is Cronbach's Alpha coefficient. If the items in a scale are highly correlated with each other, and with the total scale score, then coefficient alpha will be high. Thus, coefficient alpha indicates the extent to which all the items in the scale are measuring the same construct.

Reliability: Parallel Form

This assesses the extent to which two equivalent forms of the scale are correlated with each other. The Pearson correlation coefficient between the two forms is used as the parallel form reliability coefficient.

This reliability coefficient is rarely reported in the literature because of the difficulty in creating parallel forms. However, this can be a useful measure of reliability when such parallel forms exist.

Reliability: Stability

Also known as test-retest reliability, this measure of reliability assesses the extent to which a psychometric instrument produces consistent scores when used on two different occasions. The occasions may be either a few hours, days, months or even years apart. The Pearson correlation coefficient between the (same) scale scores, obtained on two different occasions, is used as the test-retest reliability coefficient.

Test-retest reliability coefficients provide a useful indicator of a scale's stability over time. If these coefficients are low (less than 0.6) then this suggests either that the behaviours/attitudes being measured are volatile and/or are situationally specific, or that scale scores are influenced by high levels of random error (i.e., they vary randomly over time). However, the fact that a scale has high internal consistency & stability coefficients only guarantees that it is measuring something consistently. It provides no guarantee that the scale is actually measuring the construct it purports to measure. Questions concerning what a test actually measures, and its relevance to particular assessment situations, are dealt with by looking at the test's validity.

Reliability is generally investigated before validity as the reliability of a scale places an upper limit on the scale's validity. In this regard it can be mathematically demonstrated that a validity coefficient for a particular scale cannot exceed that scale's reliability coefficient.

Validity

This assesses the degree to which a scale measures what it claims to measure.

Two key aspects of validity are known as criterion validity and construct validity.

Validity: Construct Validity

Construct validity assesses whether the characteristic which a scale is actually measuring is psychologically meaningful and consistent with the scale's definition.

The construct validity of a scale is assessed by demonstrating that the scale is correlated with other psychometric instruments which measure similar constructs, and is not correlated with tests which measure different constructs.

Validity: Criterion Validity

The extent to which the scale can predict a real world (measurable) criterion. The criterion validity of a test is demonstrated by showing that scale s cores are related in meaningful ways to an external criterion. Criterion validity can take the form of either predictive or concurrent validity.

Validity: Predictive Validity

Predictive validity assesses whether a test is capable of predicting a criterion that occurs at a time after the test was completed (e.g., that a selection test can predict the likelihood of someone successfully completing a training course).

Validity: Concurrent Validity Concurrent validity assesses whether the scores on a test can be used to predict a criterion which is assessed at the same time as the scale is completed (e.g., that a selection test can predict current job performance).

RELIABILITY OF THE JTI

Data on the internal consistency and stability of the JTI subscales are presented below.

Internal consistency

Table 2 indicates that the Jung Type Indicator subscales have a high level of internal consistency (reliability) across a number of different samples. Inspection of this table demonstrates that these subscales have particularly high levels of reliability (internal consistency) for such short (15 item) scales.

Stability (test-retest reliability)

The data presented in Table 3 indicate that the JTI subscales have a high level of stability (test-retest reliability) when completed by the same respondents over a week, or a three-month, period. Most significantly, these subscales demonstrate very high levels of test-retest reliability (stability) for measures of personality and/or preference.

Standard error of measurement (SEM)

Table 4 presents estimates of the standard error of measurement of the JTI subscales (presented in sten units). When interpreting any psychometric test score, it is important to take into account the fact that if a respondent were to be repeatedly tested the score, they obtained would be expected to fluctuate due to random measurement error. Indeed, their true score on the test would be expected to fall within a range of ± 1 SEm from their obtained score 68% of the time.

Table 2: Reliability (alpha coefficients) for the JTI

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
EI	.83	.88	.85	.87	.84	.85
SN	.78	.86	.84	.83	.81	.80
TF	.75	.78	.80	.81	.84	.79
JP	.82	.79	.75	.83	.82	.85

Sample 1 = Business Studies undergraduates (n=40)
Sample 2 = Technician applicants (n=107)
Sample 3 = European Business School undergraduates (n=112)

Sample 4 = Personnel
Professionals (n=158)
Sample 5 = Volunteer
Sample (n=117)
Sample 6 = Undergraduate
Psychology Students (n=222)

Table 3: Short- & Long-Term Test-Retest reliability coefficients for the JTI

	Sample 1		Sample 2	
JTI Scales	Three-month	Long-term SEm	One week	Short term SEm
EI	0.92	0.86	0.6	0.75
SN	0.88	0.80	0.66	0.89
TF	0.79	0.85	0.92	0.77
JP	0.86	0.80	0.82	0.89

Sample 1 = Training course attendees N=101 Sample 2 = Psychology undergraduates N=222

Table 4: Standard Error of Measurement

JTI Subscale	SEm
EI	0.72
SN	0.82
TF	0.87
JP	0.82

VALIDITY

The internal structure of the JTI

The intercorrelations between the JTI subscales, presented in Table 5, are all small and thus indicate that these subscales are measuring relatively independent characteristics. The highest correlation (0.27) is observed between the SN and TF subscales. It should be noted that in the MBTI® the equivalent correlations between J/P and S/N range from 0.36 to 0.44, suggesting a slightly higher degree of overlap between the scales than occurs in the JTI.

Factor structure of the JTI items

The strongest test of the internal structure of the JTI is provided by factoring analysing (principal axis factoring with oblimin rotation) the JTI items. The scree test indicated that the data were best described by a four-factor solution, which is presented in Table 6. (Factor weights smaller than 0.3 have been excluded from this table to aid interpretation.) Inspection of this table indicates that each of the JTI items load on the appropriate factor, demonstrating the good internal structure of these items.

Equivalence between the original and revised versions of the JTI

Table 7 presents uncorrected correlations between the subscales of the original and revised versions of the JTI. All these correlations are large, and indicate that the original and revised JTI subscales are substantially equivalent to each other. Of particular note is the observation that the weakest of these correlations is between the Thinking-Feeling subscales in the original and revised versions of the JTI. This reflects the fact that a major revision was undertaken of this subscale, with the intention of removing this subscale's previously high loading on emotionality. The validity data, (presented later in this Chapter), clearly indicates that this revision was successful in that the revised TF subscale now more closely maps onto the original Jungian concept of the Thinking - Feeling psychological function.

The above correlations thus suggest that, while the original and revised forms of this instrument are not strictly interchangeable, they do nonetheless measure similar constructs. A considerable quantity of data has been collected on the original version of the JTI, which demonstrates the validity of this

measure (see Appendix I). Thus, the revised JTI can be viewed as building upon the extensive body of evidence that demonstrates the validity of the original measure.

Table 5: Intercorrelations between the JTI subscales

JTI Subscale	EI	SN	TF
EI	—		
SN	.05	—	
TF	-.26	.27	—
JP	-.04	.25	.10

Sample = total Sample (n=787)

Table 6: Factor structure of the JTI items

	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**
Item 1	.40			
Item 5	-.70			
Item 9	-.68			
Item 13	.67			
Item 17	.77			
Item 21	.30			
Item 25	.71			
Item 29	-.51			
Item 33	-.32			
Item 37	.67			
Item 41	.61			
Item 45	-.69			
Item 49	.31			
Item 53	-.64			
Item 57	-.61			
Item 2		.65		
Item 6		-.46		
Item 10		.50		
Item 14		-.51		
Item 18		-.32		
Item 22		.52		
Item 26		.51		
Item 30		.39		

	Factor 1	Factor 2	Factor 3	Factor 4
Item 34		-.52		
Item 38		-.50		
Item 42		-.31		
Item 46		.33		
Item 50		.55		
Item 54		.52		
Item 58		.47		
Item 3			.33	
Item 7			-.36	
Item 11			-.48	
Item 15			.46	
Item 19			-.52	
Item 23			.39	
Item 27			-.57	
Item 31			.54	
Item 35			.44	
Item 39			-.31	
Item 43			.54	
Item 47			-.43	
Item 51			.59	
Item 55			.50	
Item 59			-.43	
Item 4		.59		
Item 8		-.57		
Item 12		-.35		
Item 16		-.30		
Item 20		-.58		
Item 24		.31		
Item 28		.49		
Item 32		-.35		
Item 36		.47		
Item 40		.50		
Item 44		.83		
Item 48		.47		
Item 52		-.50		
Item 56		-.65		
Item 60		.82		

Sample = total sample n=778

Table 7 Correlations between the original and revised versions of the JTI

	Scale Intercorrelations
EI	.82
SN	.77
TF	.60
JP	.69

Sample = Personnel Professionals (n=40)

The relationship between the JTI and MBTI®

The correlations between the MBTI® and JTI subscales presented in Table 8, indicate that the JTI subscales are, for all practical purposes, measuring dimensions that are identical to those assessed by the MBTI®. This is clearly demonstrated by the fact that all the corrected correlations approach unity. Moreover, the size of the uncorrected correlations between the respective MBTI® and JTI subscales are in the order of those that would be expected to be found between parallel forms of the same test.

However, the strongest test of the JTI's concurrent validity is achieved by factor analysing the MBTI® and JTI subscales. Table 9 and Table 10 present the results of such factor analyses (with factor weights of less than 0.3 not being reported in order to aid the interpretation of this factor structure). These factor analyses (principal axis factoring with oblimin rotation) produced clear four factor solutions on two independent samples.

The factor analyses presented in Tables 9 and 10 demonstrate that the JTI subscales are clearly measuring four independent factors, which map closely onto the MBTI® subscales. Most importantly, each of the JTI subscales weight on only one factor, with this factor being clearly defined by the relevant MBTI® subscales.

Relationship between the JTI and the NEO

The JTI subscales were correlated with the NEO short form to assess the JTI's construct validity. These correlations are reported in Table 11.

As expected, the NEO Extraversion subscale correlated highly with the JTI Extraversion-Introversion subscale, providing strong support for the validity of this JTI subscale. Similarly, a high correlation was observed between the JTI Sensing-Intuiting subscale and the NEO Openness subscale. This is consistent with these scales' definitions, as both the NEO – O and the JTI – SN subscales measure an interest in the world of ideas and abstract thought.

The JTI Judging-Perceiving subscale correlated significantly with the NEO Conscientiousness subscale, with this being attributable to the NEO – C subscale assessing a preference for structure and order in daily activities. Moreover, the JTI Thinking-Feeling subscale correlated significantly with the NEO Agreeableness subscale, with this being attributable to the NEO – A subscale assessing an empathic concern for others; which features as a component of the Jungian concept of the Feeling type. Moreover, the fact that these latter two correlations (NEO – C with JTI – JP; NEO – A with JTI – TF) are relatively modest suggests, as would be predicted, that these two JTI subscales are measuring dimensions that are not fully accounted for by the NEO. Finally, as anticipated, none of the JTI subscales correlated highly with the NEO Neuroticism subscale, indicating that this is not a construct that is directly measured by the JTI.

A scale factor analysis was undertaken on the same data-set to examine, in more detail, the convergent and discriminant validity of the JTI. Factors were extracted using principal axis factoring and were rotated to simple structure via normalised varimax rotation. Table 12 presents factor loadings for this factor solution. (Loadings below 0.3 have been excluded from the table to aid clarity of interpretation.)

Table 8: Correlations between the JTI and MBTI® subscales

JTI Subscale	MBTI® Subscale	Corrected Correlation	Uncorrected Correlation
EI	E	1	.87
	I	-1	-.90
SN	S	.96	.75
	N	-.94	-.71
TF	T	.97	.75
	F	-.96	-.70
JP	J	.93	.76
	P	-.97	-.80

Business Studies undergraduates (n=40)

Table 9: Factor structure for the JTI and MBTI® (sample 1)

	Factor 1	Factor 2	Factor 3	Factor 4
MBTI – J	-.93			
MBTI – P	.94			
JTI – JP	.71			
MBTI – E		-.94		
MBTI – I		.93		
JTI – EI		.81		
MBTI – T			-.90	
MBTI – F			.91	
JTI – TF			.71	
MBTI – S				-.85
MBTI – N				.88
JTI – SN				.72

Sample 1 = European Business School undergraduates (n=112)

Table 10: Factor structure for the JTI and MBTI® (sample 2)

	Factor 1	Factor 2	Factor 3	Factor 4
MBTI – J	-.93			
MBTI – P	.94			
JTI – JP	.85			
MBTI – E		-.96		
MBTI – I		.97		
JTI – EI		.89		
MBTI – T			-.95	
MBTI – F			.95	
JTI – TF			.83	
MBTI – S				-.87
MBTI – N				.87
JTI – SN				.88

Sample 2 = Psychology Undergraduates (n=96)

Inspection of Table 11 demonstrates that this factor solution has good levels of convergent and discriminant validity, with all four of the JTI subscales clearly loading substantially on one four of the big-five factors. The fifth factor, Neuroticism, constitutes a factor in its own right, as would be predicted. The results of this factor analysis thus provide further evidence indicators that the JTI is measuring four distinct psychological dimensions, each covering a different area of the personality spectrum.

Relationship between the JTI and the 16PF-5

Table 13 presents correlations between the 16PF (version 5) and the JTI. As expected, the JTI Extraversion-Introversion subscale correlated highly with all the 16PF-5 extraversion factors; most notably with factors H (Social Boldness) and F (Liveliness), and to a lesser extent with factors N (Directness), Q2 (Group Orientation) and A (Warmth). This provides strong support for the validity of the JTI Extraversion-Introversion subscale. Moreover, as would be expected, the JTI subscale Sensing-Intuiting correlated substantially with the 16PF-5 factors M (Abstractness) and Q1 (Openness to Ideas), both of which assess an orientation towards the world of creative thought and ideas. Thus, this finding provides strong support for the validity of the JTI Sensing-Intuiting subscale.

While somewhat smaller, the correlations between the JTI Thinking-Feeling subscale and the 16PF-5 factors A (Warmth) and I (Intuitive), were nonetheless significant and psychologically meaningful. As would be expected these correlations indicate that Thinking types tend to have less concern about other people's feelings, than do feeling types, and are less in touch with their own feelings than are Feeling types. This finding thus provides further support for the validity of the JTI Thinking-Feeling subscale. Finally, the Judging-Perceiving subscale of the JTI was found to correlate substantially with the 16PF-5 Factor Q3 (Perfectionism), in line with expectation; as Judging types have a preference to be perfectionistic and orderly in their work and daily lives. Thus, this finding provides strong support for the validity of the JTI subscale Judging-Perceiving.

However, somewhat surprisingly, the 16PF-5 factor G (Rule-Boundness) was not found to be correlated with the JTI Judging-Perceiving subscale. This lack of correlation between these two subscales may reflect the fact that this 16PF-5 factor assesses a narrow concern with rules, as opposed to the broader concept of Conscientiousness, that is assessed by earlier form of the 16PF.

RELATIONSHIP BETWEEN THE JTI & 15FQ (n=43)

Table 14 presents correlations between the 15FQ and the JTI. As expected, the JTI Extraversion-Introversion subscale correlated highly with all the 15FQ extraversion factors; most notably with factors FH (Social Boldness), FF (Liveliness), FA (Warmth) and FQ2 (Group Oriented). This provides strong support for the validity of the JTI Extraversion-Introversion subscale. Moreover, as would be expected, the JTI subscale Sensing-Intuiting correlated substantially with the 15FQ factors M (Imaginative) and Q1(Radical), both of which assess a creative and imaginative orientation towards the world of ideas. Thus, this finding provides strong support for the validity of the JTI Sensing-Intuiting subscale.

Table 11: Correlations between the JTI and NEO (Ffi)

Variable	EI	SN	TF	JP
NEO_N	.20	.30	.33	-.05
NEO_E	-.73	.37	.23	.06
NEO_O	-.22	.66	.05	.22
NEO_A	-.28	.06	.44	-.02
NEO_C	-.25	-.10	-.10	-.49

European Business School undergraduates (n=112)

Table 12: Factor Analysis of the JTI & NEO scale scores

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
NEO_N					-.90
NEO_E	-.79				
NEO_O		.94			
NEO_A			.84		
NEO_C				-.84	-.34
JTI2_EI	.95				
JTI2_SN		.78			.37
JTI2_TF			.82		.38
JTI2_JP				.86	

European Business School undergraduates (n=112)

Table 13: Correlations between the JTI and 16PF-5

	EI	SN	TF	JP
PF5_A	-.47	-.11	.37	.05
PF5_B	.03	.25	.06	.20
PF5_C	-.15	-.07	-.05	-.03
PF5_E	-.20	.23	-.51	.08
PF5_F	-.73	.29	.37	.38
PF5_G	.20	-.37	-.11	-.35
PF5_H	-.78	-.03	.11	.23
PF5_I	-.01	.24	.33	.01
PF5_L	.01	.02	-.10	.05
PF5_M	-.01	.64	.13	.31
PF5_N	.59	-.12	-.20	-.20
PF5_O	.25	-.21	.42	-.13
PF5_Q1	-.21	.65	.08	.34
PF5_Q2	.49	.25	-.31	-.08
PF5_Q3	.38	-.50	-.26	-.72
PF5_Q4	-.07	.15	.04	.14
PF5_IM	-.06	-.22	-.06	.02
PF5_INF	.02	.03	-.18	.08

Course Delegates (N=43)

Table 14: Correlations between the JTI and 15FQ subscales

	EI	SN	TF	JP
FA	-.62	.22	.38	.28
FC	.10	-.07	-.36	-.25
FE	-.09	.44	-.16	.22
FF	-.69	.46	.15	.33
FG	.31	-.46	-.26	-.76
FH	-.81	.22	.11	.35
FI	.21	.39	.18	.08
FL	.08	-.09	-.12	-.15
FM	-.10	.78	.16	.43
FN	.29	-.38	.01	-.38
FO	.35	-.16	.38	-.11
FQ1	-.16	.62	-.03	.48
FQ2	.61	.22	-.31	.02
FQ3	.25	-.41	-.20	-.37
FQ4	.13	-.03	.29	.05
FMD	-.10	.10	-.15	-.05
CENT	.02	.02	-.07	.07
INF	.11	.04	-.28	-.07

Course Delegates (N=43)

The Judging-Perceiving subscale of the JTI was found to correlate substantially with the 15FQ subscale FG (Conscientiousness), as would be expected, with this 15FQ factor assessing a desire for order and structure in daily activities. Thus, this finding provides further support for the validity of the Judging-Perceiving subscale of the JTI. The JTI Thinking-Feeling subscale did not correlate substantially with any of the 15FQ subscales, suggesting that this JTI subscale is assessing a construct that is distinct from those assessed by the 15FQ.

Relationship between the JTI & EPQ (n=220)

Table 15 presents the correlations between the JTI and the Eysenck Personality Questionnaire (EPQ). The most substantial correlation was observed between the JTI Extraversion Introversion scale and the EPQ Extraversion scale. This is consistent with each of these scale's definitions, and provides further support for the validity of this JTI subscale. A modest correlation was also found between the EPQ Psychoticism scale and JTI Thinking-Feeling subscale. This reflects the observation that Thinking Types tend to be rather less

caring and empathic in attitude than are Feeling Types. Thus, this result provides further support for the validity of the Thinking-Feeling JTI subscale. In addition, a small, but meaningful, relationship was observed between the JTI Judging-Perceiving subscale and the EPQ Lie scale; demonstrating that there is a small tendency for Judging Types to wish to present themselves in a more socially acceptable light. Finally, further support for the discriminant validity of JTI is provided by the low correlation found between the JTI Thinking-Feeling subscale and the EPQ Neuroticism scale. This provides further evidence that this revised JTI subscale is no longer assessing aspects of 'emotionality'.

Relationship between the JTI & OPP (n=43)

Table 16 presents Correlations between the J T I and OPP subscales. As would be expected, the OPP Gregarious – Reserved subscale correlated highly with the JTI Extraversion-Introversion subscale, providing strong support for the validity of this JTI subscale. Similarly, a high correlation was observed between the JTI Sensing-Intuiting subscale and the OPP Pragmatic – Imaginative subscale. This is consistent with these scales' definitions, as both of these subscales measure an interest in the world of ideas and abstract thought. Thus, this strong correlation between these two subscales provides further support for the validity of the JTI Sensing -Intuiting subscale.

The JTI Judging-Perceiving subscale correlated significantly with the OPP subscale Flexible-Detail-Conscious, with this being attributable to both of these subscales assessing a preference for structure and order in daily life. Thus, this strong correlation provides further support for the validity of the Judging-Perceiving subscale. The JTI Thinking-Feeling subscale was not found to be substantially correlated with any of the OPP subscales, reflecting the fact that this JTI subscale is measuring a characteristic that is not fully accounted for by the OPP.

Table 15: Correlations between the JTI and EPQ

	EI	SN	TF	JP
EPQ_E	-.73	.12	.24	-.11
EPQ_N	.25	.02	.14	.05
EPQ_P	.19	.17	-.35	.23
EPQ_L	.00	.02	.03	-.28

Undergraduate Students (n-221)

Table 16: Correlations between the JTI and OPP

	EI	SN	TF	JP
ASSERTIVE	-.29	.01	-.17	.06
FLEXIBLE	-.01	.43	.11	.45
TRUSTING	-.04	.09	.18	.02
PHLEGMATIC	-.12	.14	-.32	.17
GREGARIOUS	-.62	-.11	.15	-.03
PERSUASIVE	-.50	.34	.02	.18
CONTESTING	-.11	.04	.08	.06

	EI	SN	TF	JP
EXTERNAL	.16	-.23	.12	-.24
PRAGATIC	-.11	-.66	-.24	-.25
CONFORMING	.02	.07	.12	.02
CENTRAL	-.11	.03	.06	-.11

Course Delegates (n=95)

Relationship between the JTI & VMI (n=26)

Table 17 presents correlations (values lower that 0.3 have been excluded from this table to aid interpretation) between the JTI and the Values and Motives Inventory (VMI). As would be expected, the JTI Extraversion-Introversion subscale correlated substantially with those values that relate to a need for interpersonal contact (Independence and Affection), providing further support for the validity of the Extraversion-Introversion subscale. Moreover, further support for the validity of the JTI Sensing-Intuiting subscale was provided by the substantial correlation between this subscale and the Aesthetic values subscale of the VMI, with this correlation reflecting the fact that Intuiting types express a preference for the abstract, aesthetic and unknown, rather than for evidence and facts.

As would be predicted, the JTI Thinking-Feeling subscale was substantially correlated with the value of Affection, with this reflecting the empathic interpersonal sensitivity of Feeling types. Thus, this substantial correlation provides strong support for the validity of the JTI Thinking-Feeling subscale. Moreover, further support for the validity of the JTI Judging-Perceiving subscale was provided by the substantial correlation between this subscale and the VMI Moral values subscale, reflecting the preference that Judging Types have for order and control in their daily lives.

Relationship between the JTI & OIP (n=45)

Table 18 presents correlations (values lower that 0.3 have been excluded from this table to aid interpretation) between the JTI and the Occupational Interest Profile (OIP)

As would be expected the JTI Extraversion-Introversion subscale was found to correlate substantially with an interest in occupations that involve working with other people; including an interest in sales jobs (Persuasive). This provides further support for the validity of the JTI Extraversion-Introversion subscale. Similarly, support for the validity of the JTI Sensing-Intuiting subscale was provided by the substantial correlation between this subscale and the OIP subscale assessing interest in Artistic (aesthetic) occupations. This reflects the creative and imaginative orientation towards the world of ideas that is characteristic of Intuiting Types

The JTI Judging-Perceiving subscale was found to correlate substantially with an interest in occupations that involve following set systems and procedures (Structure). This reflects the preference that Judging Types have for order and control in their daily lives, and thus provides further support for the validity of the Judging-Perceiving subscale. Furthermore, the JTI Thinking-Feeling subscale correlated substantially with an interest in occupations that involve caring for others (Nurturing). This reflects the fact that an empathic concern for others is a core characteristic of the Feeling Type. Thus, this result provides further support for the validity of the JTI Thinking-Feeling subscale.

Table 17: Correlations between the JTI and VMI

VMI (scale)	JTI-EI	JTI-SN	JTI2-TF	JTI-JP
Traditional				-.41
Moral	-.25	-.33		-.58
Independent	.62	.42		
Ethical				
Altruistic	.35	-.34		
Affiliative	-.45	-.34	.44	
Affection	-.61		.61	-.39
Achievement	-.49			-.48
Financial	-.40			
Safety			.30	-.49
Aesthetic	.38	.66		.31

Undergraduates (n=23)

Table 18: Correlations between the JTI and OIP

	JTI2-EI	JTI2-SN	JTI2-TF	JTI2-JP
Variety				
Stability		-.34	-.41	
Structure		.30		-.81
People	-.83		.36	
Control	-.36	-.40		-.33
Persuasive	-.56			
Scientific				
Practical				
Administrative		-.37		
Nurturing			.54	
Artistic		.70	.34	
Logical			-.34	

European Business School Students (n=45)

BIAS

Sex differences

Table 19 presents data on sex differences on the JTI subscales. Inspection of this table indicates that, for the current sample, the only subscale which shows significant mean differences between men and women is Thinking-Feeling. This table further indicates that, in comparison to the men in the present sample, women demonstrate a small mean preference for Feeling over Thinking. This sex difference has also been reported for the MBTI (both Form G and Step 1). Thus, this observed sex difference may reflect a real difference between men and women, rather than reflecting test bias

Table 20 presents alpha coefficients for each of the JTI subscales by sex. Inspection of this table indicates that each of the subscales has comparable levels of internal consistency for men and women.

Age differences

Table 21 presents correlations between age and each of the JTI subscales. All these correlations are close to zero, indicating that age is not associated with JTI scores.

Race differences

Table 22 presents data on race differences on the JTI subscales, based on samples of undergraduates from white and ethnic minority backgrounds. Inspection of this table indicates that there are no significant mean differences between these samples.

The effect of race on the reliability of the JTI subscales

In order to adequately demonstrate that a test is not biased against certain racial groups it is insufficient simply to show that there are no significant mean differences between the scores obtained by different racial groups. Rather, it is necessary to demonstrate that the test is as valid and reliable when used on the specified subgroup as it is when used on the population on which it was initially developed. To this end Table 23 presents the alpha coefficient for each of the JTI subscales, on a sample of ethnic minority under-graduates. Inspection of this table indicates that all these alpha coefficients are high, demonstrating that the JTI subscales continue to be reliable when completed by ethnic minorities.

Table 19: JTI subscale means and standard deviations for men and women

	Mean Women	Mean Men	p value	SD Women	SD Men
EI	26.2	28.2	.102	10.6	9.9
SN	34.1	34.5	.801	9.1	9.3
TF	40.0	36.1	.005	7.1	7.8
JP	29.1	29.4	.854	8.2	9.2

Sample = personnel and training professionals (men = 63 women =63)

Table 20: Alpha coefficients for JTI subscales by sex

	Men	Women
EI	.88	.86
SN	.81	.80
TF	.83	.79
JP	.83	.84

Sample = combined sample

Table 21: Correlations between the JTI subscales and age

JTI Subscale	AGE
EI	-.06
SN	-.00
TF	.02
JP	.14

(men = 274 women =421)

Sample = personnel & training professionals (n = 158)

Table 22: JTI subscale means and standard deviations, for white and ethnic groups

JTI Subscale	Mean White	Mean Ethnic	p value	n White	n Ethnic	SD White	SD Ethnic
EI	24.01	21.18	.133	71	51	10.75	9.43
SN	37.06	34.94	.120	71	51	7.31	7.43
TF	41.68	39.73	.144	71	51	7.65	6.56
JP	26.62	25.06	.394	71	51	10.59	8.94

Sample = undergraduates (n = 122)

Table 23: Coefficient alpha for each of the JTI subscales on an ethnic minority sample

	Alpha Coefficient
EI	.85
SN	.76
TF	.77
JP	.83

Sample = undergraduates (n=62) from ethnic minority groups

The effect of race on the construct validity of the JTI

Table 24 presents correlations between the 15FQ and the JTI subscales for a sample of undergraduates from ethnic minority backgrounds. As would be predicted, the JTI Extraversion-Introversion subscale correlates highly with all the 15FQ extraversion factors; most notably with factors FH (Social Boldness), FF (Liveliness), FA (Warmth) and FQ2 (Group Oriented). This provides strong support for the validity of the JTI Extraversion-Introversion subscale when completed by ethnic minority groups. Moreover, as would be expected, the JTI subscale Sensing-Intuiting correlated substantially with the 15FQ factors M (Imaginative) and I (Intuitive), both of which assess a creative, imaginative intuitive orientation towards the world of ideas. Thus, this finding provides strong support for the validity of the JTI subscale Sensing-Intuiting when completed by ethnic minority groups. The Judging-Perceiving subscale of the JTI was found to correlate substantially with the 15FQ subscale FG (Conscientiousness), as would be expected, with this 15FQ factor assessing a desire for order and structure in daily activities. Similarly, there was a modest correlation between this JTI subscale and the 15FQ factor Q3 (Disciplined), reflecting the fact that both of these subscales assess a preference for order, discipline and self-control in daily life. Thus, this finding provides further support for the validity of the Judging-Perceiving subscale of the JTI when completed by ethnic minority groups. The JTI Thinking-Feeling subscale did not correlate substantially with any of the 15FQ subscales, suggesting that this JTI subscale is assessing a construct that is distinct from those assessed by the 15FQ.

Finally, it is noteworthy that the pattern of correlations obtained between the JTI subscales and the 15FQ factors, on the present sample of undergraduates from ethnic minority backgrounds, was broadly similar to the pattern of correlations obtained on a sample of white European course delegates (reported in Table 14). This supports the construct validity of the JTI when completed by ethnic minority groups.

Table 25 presents correlations between the JTI and the OPP subscales on a sample of undergraduates from ethnic minority backgrounds.

As would be expected, the OPP Gregarious – Reserved subscale correlated highly with the J T I Extraversion-Introversion subscale, providing strong support for the validity of this JTI subscale when completed by an ethnic minority sample. Similarly, a high correlation was observed between the JTI Sensing-Intuiting subscale and the OPP Pragmatic – Imaginative subscale. This is consistent with these scales' definitions, as both of these subscales measure an interest in the world of ideas and abstract thought. Thus, this strong correlation between these two subscales provides support for the validity of the JTI Sensing -Intuiting subscale when completed by ethnic minority groups.

Table 24: Correlations between the JTI and 15FQ subscales on an ethnic minority sample

JTI Subscale	EI	SN	TF	JP
FA	-.53	-.18	.06	.26
FC	.34	-.20	-.14	-.46
FE	-.38	.10	-.21	-.00
FF	-.66	.10	.02	.06
FG	.07	-.46	-.19	-.63
FH	-.71	.22	.14	-.13
FI	.04	.45	.36	.30
FL	.31	-.24	-.16	.14
FM	.08	.64	.34	.43
FN	.36	-.18	-.02	-.24
FO	.28	.05	.01	.17
FQ1	.01	.17	-.05	.26
FQ2	.58	.11	-.13	.08
FQ3	-.07	-.25	-.12	-.46
FQ4	.14	-.05	.08	.20
FMD	-.20	.05	.10	-.30
CENT	-.14	.03	-.19	.21
INF	-.12	-.08	.08	.04

Sample = undergraduates (n = 62) from ethnic minority groups

Table 25: Correlations between the JTI and OPP on an ethnic minority sample

	EI	SN	TF	JP
ASSERTIVE	-.34	.09	-.23	-.21
FLEXIBLE	.09	.16	.13	.54
TRUSTING	-.28	.21	.33	-.03
PHLEGMATIC	-.24	-.15	.07	-.28
GREGARIOUS	-.57	-.24	.21	-.26
PERSUASIVE	-.46	.25	-.00	.09
CONTESTING	-.05	.11	-.07	.13
EXTERNAL	.23	.16	.15	.28
PRAGATIC	.00	-.66	-.36	-.24
CONFORMING	-.07	.08	.13	-.30
CENTRAL	.08	-.03	.06	.13

Sample = undergraduates (n=62) from ethnic minority groups

The JTI Judging-Perceiving subscale correlated significantly with the OPP subscale Flexible – Detail- Conscious, with this being attributable to both of these subscales assessing a person's preference for structure and order in their daily lives. Thus, this strong correlation provides support for the validity of the JTI Judging-Perceiving subscale when completed by ethnic minority groups. Finally, it is noteworthy that the JTI Thinking-Feeling subscale was not found to be substantially correlated with any of the OPP subscales.

This clearly reflects the fact that this JTI subscale is measuring a characteristic that is not assessed by the OPP.

Finally, it is noteworthy that the pattern of correlations obtained between the JTI and OPP subscales, on the present sample of undergraduates drawn from ethnic minority backgrounds, was broadly similar to the pattern of correlations obtained on a sample of white European course delegates (reported in Table 16). This further supports the construct validity of the JTI when completed by ethnic minority groups.

RESOURCE MATERIALS ON PSYCHOLOGICAL TYPE

BOOKS

Please Understand Me, An Essay on Temperament Styles by David Keirsey and Marilyn Bates. Prometheus Nemesis Book Company, P.O. Box 2748, Del Mar, CA 92014
One of the more widely known books describing the MBTI®.

Portraits of Temperament, David Keirsey. Prometheus Nemesis Book Company, P.O. Box 2748, Del Mar, CA 92014

Gifts Differing, Isabel Briggs-Myers (with Peter Myers). Consulting Psychologists Press, 1980 ISBN 0-89106-011-1 (pb) 0-89106-015-4 (hb).

Manual: A Guide to the Development and Use of the Myers Briggs Type Indicator, by Isabel Briggs-Myers and Mary H. McCaulley. Consulting Psychologists Press, 1985.

LifeTypes, by Sandra Hirsh and Jean Kummerow, ISBN 0-446-38823-8 USA and ISBN 0-446-38824-6 Canada. Warner Books, Inc., 1989.

Facing Your Type, George J. Schemel and James A. Borbely. Published by Typofile Press, Church Road, Box 223, Wernersville, PA 19565.

Type Talk. Otto Kroeger and Janet M. Thuesen. Bantam Doubleday Dell Publishing Group, Inc. (Tilden Press also mentioned.) ISBN 0-385-29828-59.
An easy-to-read book that gives profiles for all sixteen personality types.

Type Talk at Work. Otto Kroeger and Janet M. Thuesen. ISBN 0-385-30174-X.

Type Watch. Otto Kroeger and Janet M. Thuesen.

The Leadership Equation. Lee Barr and Norma Barr. Eaking Press, Austin, Texas. 1989.

Using the Myers-Briggs Type Indicator in Organizations. Sandra Krebs Hirsh. Consulting Psychological Press, Inc., Palo Alto, CA. 1985.

People Types and Tiger Stripes. Gordon Lawrence. Available from Centre for Application of Psychological Type, Gainesville, Florida. ISBN 0-935652-08-6.
This book is written primarily to help teachers counsel students, but it applicable for other related uses.

Working Together. Olaf Isachsen and Linda Berens. New World Management Press, Coronado, CA. 1988.

Psychological Types, C.G. Jung, H.G. Baynes (translator). Bollingen Series, Princeton U.P., 1971 ISBN 0-691-01813-8 (pb) 0-691-09770-4 (hb).

An Introduction To Theories of Personality, B.R. Hergenhahn. Prentice-Hall, New Jersey, 1990.

An Empirical Investigation of the Jungian Typology, by Leon Gorlow, Norman R. Simonson, and Herbert Krauss. In Theories of Personality, Primary Sources and Research, editors: Gardner Lindzey, Calvin S. Hall, Martin Manosevitz, Robert E. Krieger Publishing Company, Florida, 1988.

The Measurement of Learning Style A Critique of Four Assessment Tools Timothy J. Sewall, University of Wisconsin, 1986.

Dichotomies of the Mind: A System Science Model of the Mind and Personality, Walter Lowen (with Lawrence Miike). John Wiley, 1982 ISBN 0-471-08331-3.

Introduction to Type: by Isabel Briggs Myers, published by Centre for Applications of Psychological Type, Gainesville, Florida 32601.

PERIODICAL LITERATURE

The Type Reporter. Susan Scanlon, Editor. For Subscription information, mail to: 524 North Paxton Street, Alexandria, VA 22304.

Journal of Psychological Type. The official research journal of the Association for Psychological Type, 9140 Ward Parkway, Kansas City, MO 64114.

I APPENDIX

ADMINISTRATION AND SCORING INSTRUCTIONS FOR THE JTI

Administration

The Jung Type Indicator (JTI) is administered in a self-scoring (paper & pencil) questionnaire.

Scoring

The JTI is self-scoring. Scoring instructions are provided inside the questionnaire booklet, by tearing off the top (flimsy) sheet.

ADMINISTRATION INSTRUCTIONS FOR THE JTI

Begin by

- Introducing yourself and explaining your role
- Explaining the purpose of the session
- Emphasising confidentiality
- Describing when and how feedback will be given – Answering any questions

Continue by reading aloud the following instructions **exactly** as given below. Say:

> "*From now on, please do not talk among yourselves, but ask me if anything is not clear. You will be completing the Jung Type Indicator. While you are completing the questionnaire I shall be checking to make sure you are not making any accidental mistakes when filling in your answers on the questionnaire. I will not be checking your answers.*"

WARNING: It is most important that questionnaires do not go astray. They should be counted out at the beginning of the assessment and any questions that have not been completed should be returned. Remember to collect all the top (flimsy) sheets that contain the JTI questions.

The respondents can however keep the profile chart and capsule type descriptions.

Distribute the questionnaires

Then ask:

> "*Has everyone got two sharp pencils and a questionnaire.*"

Rectify any omissions, then say:

> "*Please open the questionnaire and print your first name and family name, in the spaces provided. Please also indicate your title, age, sex and educational level in the spaces provided. Do not forget to write down the highest educational qualification you have obtained (e.g., BTech Engineering) and your occupation (students should state their field of study).*"

Allow time for completion of the biographical information and then say:

> "*Please follow the instructions as I read them to you. This is a questionnaire concerning your interests, preferences and attitudes about a range of things. There is no time limit, however most people take about 10 minutes to complete the questionnaire. Answer each question by filling in the box that best describes you.*"

Indicate the example response on the answer sheet. Now say:

> "*When answering the questions please remember the following:*
>
> *Do not spend too much time pondering over the answer to each question. The information given in a question may not be as full as you might wish, but please answer the question as best as you can.*
>
> *Please try to avoid the middle (in between) answer wherever possible.*
>
> *Try to be as truthful as you can. Don't give an answer just because it seems to be the right thing to say.*
>
> *Make sure you answer every question, even those which do not seem to apply directly to you.*
>
> *Do not erase an answer. If you wish to change an answer, put an X through the incorrect response and fill in the correct response.*
>
> *Please note that the questions and answers run across the page (indicate this to respondents by holding up a questionnaire and pointing) and not down the page.*"

Indicate how the questions and answers run across the page.

Then say very clearly:

> "*Is everyone clear about how to complete this questionnaire*"

Deal with any questions, appropriately, and then say:

> "*Please begin*"

Answer only questions relating to procedure at this stage, but enter in the Administrator's Test Record any other problems which occur. Walk around the room at appropriate intervals to check for any potential problems that may occur.

When everyone has completed the questionnaire then say:

> "*Thank you for completing the Jung Type Indicator*"

Procced to scoring instructions

SCORING INSTRUCTIONS FOR THE JTI

The JTI is administered in a self-scoring booklet. The test administrator should ensure that the questionnaire has been correctly been completed before scoring the JTI. Respondents can score their own JTI by following the simple scoring instructions inside the test booklet.

The instructions for scoring the JTI, the scoring key and Profile chart are exposed by tearing the questionnaire along the perforation. The total raw score for each JTI subscale is obtained by adding the numbers in each column that have been marked. (**Note**: the subscales are scored by column and each subscale score should be within the range of 0 to 60. column). Each of the four raw subscale total scores should then be entered into the appropriate box at the bottom of each column. These raw total scores are converted into profile scores by referring to the Score Conversion table (which is indicated by a bold arrow).

The four profile subscale scores are then marked on the JTI Profile Chart. (Note: do not enter raw subscale scores on the JTI Profile). The four letter JTI code can be identified by referring to the JTI profile. Profile scores 1-4 are classified as E, S, T and J, while profile scores 7-10 are classified as I, N F and P. Middle values (5 and 6) are treated as borderline preferences. When borderline preferences are indicated, additional JTI codes can be generated by using both ends of each subscale.

II APPENDIX

PSYCHOMETRIC DATA FOR THE ORIGINAL VERSION OF THE JTI

RELIABILITY

Internal consistency

Internal consistency reliabilities (Cronbach's Alpha) were computed on samples 1 & 5. The coefficients are computed over both the combined males & females for each relevant sample. Table 26 below provides these coefficients separately for each sample and for the entire set of respondents. In addition, the mean 'corrected' item-total correlations for each scale are also reported for each of these samples. These parameters index the mean association between the constituent items within a scale and the scale score itself, each individual item-scale score coefficient is corrected for the inflation of the coefficient due to the items' inclusion in the scale score.

Table 26 also provides information concerning the total number of items which make up each scale of the JTI. Table 26 shows that all the JTI dimensions have reliability coefficients above .7indicating that the test meets a high standard of reliability. The reliability of these scales compares favourably with the reliability coefficients reported in the user manual for the Myers-Briggs Type Indicator.

Stability

Table 27 displays temporal consistency data for the JTI scales. Both short-term (2 weeks) and long-term (3 months) reliability coefficients are reported based on a sample of 80 and 83 respectively. As can be seen the JTI is highly reliable in terms of temporal stability over the periods reported.

The reliability of the JTI over the time periods indicated is extremely high and compares very favourably with test-retest coefficients reported for other tests.

Table 26: JTI scale internal consistencies and mean ITC for various samples

Scale	№ of Items	Sample 1 (N=618)		Sample 5 (N= 456)		Total Sample (N=5577)	
		Alpha	ITC	Alpha	ITC	Alpha	ITC
EI	10	0.82	0.31	0.78	0.27	0.80	0.29
SN	15	0.70	0.24	0.72	0.20	0.74	0.21
TF	15	0.72	0.15	0.76	0.18	0.75	0.16
JP	15	0.73	0.15	0.74	0.16	0.74	0.16

Table 27: Short- & Long-Term Test-Retest Coefficients for the JTI

JTI Scale	Short-term Test-retest	Long Term Test-retest	Short-term SEm	Long-term SEm
EI	0.91	0.86	0.6	0.75
SN	0.89	0.80	0.66	0.89
TF	0.79	0.85	0.92	0.77
JP	0.83	0.80	0.82	0.89

VALIDITY

As was said in the introduction once we have ascertained the reliability of a test, we must address its validity. It is important to know that the constructs we are measuring are valid, that it is indeed measuring the characteristic it purports to measure. This section of the manual provides considerable evidence to demonstrate that the dimensions of the JTI are consistent with similar measures.

The internal structure of the JTI

Table 28 is based on the total JTI standardisation sample described earlier and indicates that the correlations between the JTI dimensions are fairly modest in size. This demonstrates that the four dimensions measured by the test assess different personality characteristics. For purposes of comparison the inter-correlation matrix for the MBTI is presented in Table 28 opposite. This is based on a sample of 229 UK undergraduates. It can be observed that the separately scored pairs of MBTI attitudes and functions are effectively opposite ends of the same scale, providing support for JTI single dimensions.

The relationship between the JTI and the MBTI

A sample of 131 undergraduate volunteers completed both the JTI and the MBTI as part of a test validation exercise. Table 29 opposite displays the significant correlations between the various JTI dimensions and the MBTI.

As can be seen from the above table the JTI dimensions correlate highly with their MBTI counterparts. All of the correlations are above 0.65 showing that there is an excellent match between the corresponding constructs of the two tests.

Corrections for unreliability associated with each of the two instruments, would result in the following correlations assuming no measurement error.

Table 30 opposite demonstrates that there is most congruence between JTI and MBTI Extraversion-Introversion, with all other matched pair registering corrected values of .80 or better.

Table 28: JTI Intercorrelation Matrix (N=5575)

	EI	SN	TF	JP
EI	1.00	-.02	.05	-.21
SN	-.02	1.00	.33	.46
TF	-.05	.33	1.00	.20
JP	-.21	.46	.20	1.00

Table 29: Uncorrected correlations with the MBTI®

MBTI scales	EI	SN	TF	JP
Extraversion	.82	-.03	.08	-.23
Introversion	-.80	.03	-.13	.19
Sensing	-.22	.65	.09	.45
iNtuiting	.14	-.66	-.16	-.42
Thinking	-.02	.18	.66	.21
Feeling	.10	-.15	-.65	-.10
Judging	-.30	.35	.18	.70
Perceiving	.27	-.38	-.18	-.69

Table 30: JTI Corrected correlations with the MBTI®

MBTI scales	EI	SN	TF	JP
Extraversion	1.0			
Introversion	1.0			
Sensing		.81		
iNtuiting		-.83		
Thinking			.83	
Feeling			-.81	
Judging				.88
Perceiving				-.86

Relationship between the JTI and the NEO

As part of an occupational assessment training course 108 personnel professions completed both the JTI and the NEO Short form.

The strongest relationship was observed between JTI Extraversion- Introversion and its NEO equivalent (-. 72). This would tend to suggest that to all intents and purposes these are virtually interchangeable. Assuming no measurement error the corrected correlation would increase to .90, suggesting over 80% common variance. The JTI Sensing-Intuiting scale correlates most highly with NEO Openness to change and Experience, whereas both the JTI Thinking-Feeling and Judging-Perceiving do not register as strong relationships with the NEO. Those that are observed are meaningful, however. Thinking-Feeling correlates with Neuroticism, Openness, Agreeableness and inversely with Conscientiousness, suggesting that Feeling types tend to be more emotional, open to experience and ideas, empathic and less concerned with structures. Finally, JTI Judging-Perceiving relates primarily with Openness and marginally (inversely) with Conscientiousness, suggesting that high scorers on the Perceiving end of the J-P continuum are more open to ideas and less conscientious.

Relationship between the JTI and the 16PF

Table 32 presents the correlations between JTI and 16PF based on a sample of 210 delegates primarily in the Personnel and Training disciplines attending courses organised by Psytech International. The results demonstrate some interesting, and meaningful correlations between the JTI dimensions and the scales of the 16PF.

The JTI Extraversion/Introversion dimension shows strong correlations with the extraversion factors of the 16PF – reserved/ outgoing, restrained/spontaneous, timid/ venturesome and group-oriented/self-sufficient. The Sensation/ Intuition dimension of the JTI shows logical correlations with such 16PF factors as conservative/ experimenting, submissive/dominant and toughminded/ tender-minded.

Judgement/Perception on the JTI strongly correlates with the 16PF factor of expedient/ conscientious, a correlation you would expect given the respective definitions of these two dimensions. The Thinking/Feeling dimension of the JTI correlates primarily with 16PF anxiety factors which might be expected given the emotional sensitivity of the Feeling type.

Table 31: Correlations between JTI and NEO

	EI	SN	TF	JP
N	.29	.02	.42	-.04
E	-.72	.11	.09	.20
O	-.32	.53	.34	.37
A	-.14	.24	.31	.17
C	-.03	-.29	-.36	-.29

N Neuroticism
E Extraversion
O Openness to Experience
A Agreeableness
C Conscientiousness

Table 32: Correlations Between the JTI & 16PF (N=210)

16PF Scales	EI	SN	TF	JP
A Warm	.45			
C Stable	.35		.31	
E Dominant	.38			-.32
F Impulsive	.53			
G Conscientious	-.30			.65
H Venturesome	.73			
I Tenderminded		-.36		
L Suspicious			-.33	
M Imaginative				
N Diplomatic	-.47			.32
O Apprehensive			-.48	
Q1 Experimenting		-.43		
Q2 Self-reliant	-.54			
Q3 Self-disciplined				
Q4 Tense-driven			-.37	
FG Fake Good			.50	

Relationship between the JTI and the 16PF-5

A sample of 84 delegates on a Psytech training course completed both the JTI and the16PF version 5 as part of the course requirement. The results yield extremely strong relationships between JTI and 16PF-5 in a number of areas, namely, E-I, SN and J-P, with less significant, but nonetheless meaningful relationships between TF and relevant 16PF factors.

The JTI E-I scale registers among the most prominent correlations with 16PF-5. Those high on the E-I continuum, tend to be Reserved, Serious, Shy, Private and Self-reliant. The JTI S-N scale correlates most highly with

Abstractedness on 16PF-5 but also notable correlations are observed with Sensitivity, Openness to Change, and Expediency. The JTIT-F scale fails to register the very high correlations with 16PF-5, although this is fairly consistent with other findings e.g., 16PF vs. MBTI and 15FQ and JTI. Those that are elevated, suggest that those high on the T-F scale tend to be Warm, Sensitive and Abstract but are also inclined to register a degree of anxiety in terms of Emotionality and Apprehension. Finally, JTI scale J-P correlates primarily with 16PF Factor G:Expediency (-.67) but also with Openness (Q1), Abstractedness (M) and Tolerance of Disorder (Q3). Perhaps a little surprising is the fairly elevated correlation with H: Social Boldness.

Relationship between the JTI & 15FQ

Table 34 presents the correlations between JTI and 15FQ based of 5575 individuals which constitutes the entire standardisation sample of JTI described in section 4.2.

The results highlight a number of meaningful correlations between the personality dimensions of the 15FQ and the JTI scales. It will be seen that the JTI EI scale correlates quite strongly with the extraversion dimensions of the 15FQ such as Outgoing, Socially Bold etc. The SN scale correlates with those 15FQ dimensions – Intuitive, Conceptual & Radical – that one would expect given the nature of the SN dimension. The JP scale, with its emphasis on organisation and planning, correlates most strongly with just those dimensions on the 15FQ – Detail conscious, Radical & Disciplined that one would expect. Thinking-Feeling (TF) tends to correlate most strongly with the 15FQ anxiety dimensions such as Calm-stable, Self-doubting etc., again this is what one would expect given the emotional sensitivity of those people on the feeling end of this dimension.

Table 33: Correlations between JTI and 16PF-5

16PF-5 Factors	EI	SN	TF	JP
A Warmth	-.52		.43	.31
B Reasoning				
C Emotional Stability				
E Dominance			-.33	
F Liveliness	-.71			
G Rule-Consciousness		-.46		-.67
H Social-Boldness	-.72			.40
I Sensitivity		.53	.52	.31
L Vigilance		-.35		
M Abstractedness		.75	.42	.45
N Privateness	.55			
O Apprehension			.45	-.30
Q1 Openness to Change		.50		.47
Q2 Self-reliance	.68			
Q3 Perfectionism		-.31		-.53
Q4 Tension				
IM Impression Mgt				

Table 34: Correlations between JTI and 15FQ (N=5575)

15FQ Scale	EI	SN	TF	JP
Outgoing	-.81			
Calm-stable	-.27	-.46		
Assertive	-.37	-.28		
Enthusiastic	-.68	.26	.38	
Detail conscious	-.24	-.58		
Socially Bold	-.80			
Intuitive	.41	.59		
Suspicious				
Conceptual	.72	.23	.26	
Restrained	.35	-.27	.24	-.43

Relationship between the JTI and OPP

A sample of 158 volunteers completed both the OPP and the JTI as part of a test validation exercise. These comprised primarily personnel and training delegates attending Psytech courses but also a group of undergraduate Business Study students who completed both tests as a part course on Personnel Selection.

The table opposite suggests good overlap with OPP dimension and JTI with simple correlations with each of the JTI scales and a single OPP dimension ranging from .57 to .73. The most notable relationships exist between Gregarious and EI (-.64), Pragmatic and SN (-.61), Phlegmatic and TF (-.57) and Flexible with JP (.73). In addition to being linked to anxiety, TF is also related to empathy and imagination. With the levels of overlap reported here, the OPP could provide fairly accurate estimates of type.

Relationship between the JTI and occupational interest profile

A total sample of 1971 completed both JTI and OIP as part of selection and assessment procedures with a diverse number of organisations.

As can be seen from Table 36 opposite Extraversion on the JTI correlated quite strongly with the OIP needs for variety, change and people exactly those needs which one would predict for Extraverts. Extraverts showed an interest in Persuasive roles involving the communication of information as well as in those activities centred on other people. Intuitives, as indicated on the SN scale, showed the need for Variety and Change which would be expected given the questioning, exploring nature of those people placed at the N end of this dimension. Intuitives were also highly interested in Artistic pursuits, again this is in line with the definition of Intuitives. Feeling types tended to be low scorers on Stability, a measure of emotional resilience & self-confidence, while scoring highly on need for Change, which would indicate some lack of emotional self-control.

There was also a fairly high correlation between Feeling types and Artistic interests, an expression of the sensitive emotionality of Feeling types. Finally, Perceptive types with their emphasis on spontaneity and flexibility tend to score highly on the OIP needs for Variety and Change.

As would be expected of the spontaneous Perceptives they showed a dislike of Administrative tasks such as clerical and financial work.

Table 35: Correlations Between OPP & JTI (N=158)

OPP Scale	EI	SN	TF	JP
Assertive	-.31		-.37	
Flexible		.42		.73
Trusting				
Phlegmatic	-.32	-.57		
Gregarious	-.64			
Persuasive -	-.54			
Contesting				
Pessimistic	.37			-.27
Pragmatic		-.61	-.32	-.29
Distortion				

Table 36: Correlations between JTI and OIP (n=1971)

OIP Scale	EI	SN	TF	JP
Variety	-.21	.16		.22
Change	-.23		-.30	
Structure	.15	.22	.24	.35
People	-.57			
Control	-.24			
Persuasive	-.38	.17		
Scientific	.13			
Practical			.13	
Administrative				-.15
Nurturing	-.25		.15	
Artistic	-.18	.40	.24	.13
Logical	.10		-.10	

OIP-Pers Persuasive Interests
OIP-Nur Caring Interests
OIP-Sci Scientific Interests
OIP-Art Creative Interests
OIP-Prac Practical Interests
OIP-Log Logical Interests
OIP-Admin Administrative Interests

Relationship between the JTI and EPQR and I7

A sample of 221 volunteers completed both the JTI and the EPQR and I7 as part of a test validation exercise. Table 37, below, provides details of the most significant correlations found. The JTI Extraversion dimension correlates highly with the corresponding Eysenck scale, it also correlates with the I7 scales of impulsivity and venturesome, as would be expected. The JTI TF dimension correlates well with the I7 scale of empathy and with the EPQ Neuroticism scale. Both of these correlations are in line with the definition of the TF dimensions. The JTI JP dimension correlates with I7 Venturesome and Impulsivity, reflecting the opposite ends of planning & spontaneity of the JP dimension.

Relationship between the JTI and Kline's PPQ

Table 38 below gives the correlations between the JTI and Kline's PPQ obtained from a sample of 193 volunteers. It can be seen that the JTI EI scale correlates most highly with the PPQ Extraversion dimension. The SN dimension correlates fairly highly with the PPQ

Unconventionality scale, reflecting the Intuitives desire to go beyond the obvious. SN also correlates with the PPQ Tenderminded and Conscientiousness scales, which reflects the sensitive and adaptable nature of the Intuitive type. JTI Thinking/ Feeling correlates highly with the PPQ Tenderminded scale which is to be expected given the emotional sensitivity of the Feeling type. The JTI JP scale, as one would expect, correlates most highly with the PPQ Conscientiousness and Unconventionality scales. This is consistent with the definition given for the conscientious, conventional Judgmental type.

Table 37: Correlations between JTI, EPQR and I7 (N=221)

EPQR Scale	EI	SN	TF	JP
Psych		.30		.45
Extra	-.70			.27
Neurot			.51	
Lie				
Impul	-.23			.29
Vent	-.27		-.30	.33
Emp			.56	

EPQR-Psych Psychoticism
EPQR-Extra Extraversion
EPQR-Neurot Neuroticism
EPQR-Lie Social-Desirability
I7-Impul Impulsivity
I7-Vent Venturesomeness
I7-Emp Empathy-Sensitivity

The relationship between JTI and survey of interpersonal values

A sample of 160 volunteers completed both the JTI and the Gordon's Survey of Interpersonal Values as part of a test validation exercise. As can be seen from the table below a number of interesting correlations were found. The JTI E-I dimension correlates quite well with the SIV Leadership scale, suggesting that leadership is particularly valued by extroverts. E-I also correlates with SIV Recognition and Support reflecting the extroverts desire for social recognition and the support of other people. The JTI S-N dimension correlates most strongly with the SIV Conformity scale which is an indication of the solidity and conventionality of JTI Sensation types. S-N also correlates with SIV Benevolence and Independence reflecting the Intuitive's basic friendliness along with their desire for freedom from restrictions. Thinking/Feeling on the JTI correlates with the SIV Leadership and Support. The logical, rational Thinking types tended to value leadership qualities more than the emotional, sharing Feelings types. The relationship with support is a reflection of the need on the part of Feeling types for the support and encouragement of other people.
The Judgmental/Perceptive scale displayed a high relationship with the SIV Conformity scale. This would be expected given the desire of the Judgmental type to live an ordered life, conforming to social values and expectations. JP also correlates highly with SIV Independence, reflecting the independent nature of the Perceptive type, who likes to be free to act in a spontaneous, unplanned way.

Table 38: Correlations between JTI & Kline's PPQ (N=193)

PPQ Scales	EI	SN	TF	JP
Insecure	.29		.23	
Tender		.21	.48	
Extra	-.21			
Conscient		-.27		-.41
Unconv		.43		.38

PPQ Insecure Insecurity
PPQ Tend Tendermindedness
PPQ Extrav Extraversion
PPQ Conscient Conscientiousness
PPQ Unconv Unconventionality

Table 39: Correlations Between JTI & Gordon's SIV (N=160)

SIV Scales	EI	SN	TF	JP
Support			.30	
Confor		-.36		-.67
Recogn	-.20			
Indepen		.27		.38
Benevo		.27	.28	
Leader	-.29	-.33		

SIV-Support Support
SIV-Confor Conformity
SIV-Recogn Recognition
SIV-Indepen Independence
SIV-Benevol Benevolence

FACTOR STRUCTURE OF THE JTI

Table 40 displays the results of carrying out a factor analysis on data obtained from a sample of 131 undergraduate subjects who completed both the JTI and the MBTI. Principal Components extraction with Normalised Varimax Rotation was carried out on all the variables. Loadings below 0.4 have been excluded for the purpose of clarity.

As can be observed from Table 40 below, both the JTI and the MBTI have extremely clean factor structures with each of the four Jungian types emerging as separate factors.

This is clear evidence that the four scales measured by the JTI, and by the MBTI, are independent of each other and that each scale is measuring a separate psychological entity.

The results of this factor analysis suggest that there is every reason to believe that the JTI does measure four distinct psychological dimensions, each covering a different area of the personality spectrum.

Normalized Factor Loadings
(Normalized Varimax Rotation)

Table 40: Factor Structure of the JTI and MBTI

	I	II	III	IV
MBTI E		-.970		
MBTI I		.962		
MBTI S	.906			
MBTI N	-.921			
MBTI T			.912	
MBTI F			-.897	
MBTI J				.938
MBTI P				-.930
JTI EI		-.887		
JTI SN	.809			
JTI TF			.841	
JTI JP				.732

III APPENDIX

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SUPPLEMENT

SUPPLEMENT TO RELIABILITY AND VALIDITY EVIDENCE ASSOCIATED FOR JTI RELEASE 2

Equivalence between the original & revised versions of the JTI

The substantial correlations presented in Table 1 indicate that the two forms of the JTI are substantially equivalent (all above 0.6). Of particular note is the observation that the weakest of these correlations is between the Thinking -Feeling subscales in the original, and revised versions, of the JTI. This reflects the fact that a major revision was undertaken of the original TF sub-scale, with the intention of removing this sub-scale's previously high loading on emotionality. The validity data, which is presented later in the manual, clearly indicates that this revision was successful in that the revised TF sub-scales now more closely maps onto the original Jungian concept of the Thinking - Feeling mental function.

A considerable quantity of validity evidence was collected for the original version of the Jung Type Indicator. This demonstrated that the scales of the JTI were measuring the characteristics that they set out to measure. The above correlations, would suggest that while the forms are not interchangeable, version 2 of the JTI builds upon this body of evidence and should demonstrate as similar, if not better construct validity as further data is collected.

Table 1: Correlations between versions 1 & 2 of the JTI (n=40)

	Scale Intercorrelations
EI	.82
SN	.77
TF	.60
JP	.69

Reliability of the (revised)

The data presented in Table 2: Reliability (alpha coefficients) for the JTI (revised) sub-scales indicate that the Jung Type Indicator sub-scales have a high level of reliability across a number of distinct samples. Most significantly, these sub-scales demonstrate extremely high levels of reliability for such short (15 item) scales.

The Standard Error of Measurement (SEm) for JTI subscales is presented in Table 3 below. This value provides the 68% confidence interval for JTI sten scores which are used on the profile chart. That is for example, an individual obtaining a sten score of 8 on the EI scale, would be expected to score within the range of 7.25 to 8.75 on 68% of occasions. This demonstrates that the JTI scales provide fairly robust measurements.

Structure of the (revised)

The inter-correlations between the JTI sub-scales, presented in Table 4, are all small, and thus indicate that these sub-scales are measuring relatively independent characteristics. The highest correlation, between SN and JP compares favourably with the correlation obtained between equivalent scales on the MBTI (0.42 and 0.39).

Table 2: Reliability (alpha coefficients) for the JTI (revised) sub-scales)

	Sample 1	Sample 2	Sample 3	Sample 4
EI	.83	.88	.85	.82
SN	.78	.86	.84	.84
TF	.75	.75	.80	.78
JP	.82	.79	.75	.76

1 Business Studies undergraduates (n=40)
2 Technician applicants (n=107)
3 European Business School undergraduates (n=112)
4 Personnel Professionals (N=40)

Table 3: Standard Error of Measurement for JTI sub-scales in sten units

	SEM
EI	.75
SN	.77
TF	.94
JP	.96

Table 4: Inter-correlations between the JTI sub-scales

	EI	SN	TF
EI	–		
SN	.15	–	
TF	-.14	.21	–
JP	.01	.30	.12

Equivalence with the MBTI

The correlations presented in Table 4 indicate that the JTI sub-scales are, for all practical purposes, measuring dimensions that are identical to those assessed by the MBTI. This is clearly demonstrated by the fact that all the correlations (corrected for attenuation due to measurement error) approach unity. Moreover, the size of the uncorrected correlations between the MBTI and JTI sub-scales are in the order of those that would be expected to be found between parallel forms.

The strongest test of the JTI's equivalence to MBTI is achieved by factor analysing the MBTI and JTI sub-scales. The factor analysis (principal axis factoring with varimax rotation) of these sub-scales produced a clear four factor solution. Table 6 presents the results of this factor analysis (with factor weights of less than .3 not being reported in order to aid the interpretation of this factor structure). These results demonstrate that the JTI sub-scales are clearly measuring four independent factors, which map closely onto the MBTI sub-scales. Most importantly, each of the JTI sub-scales weight on only one factor, with this factor being clearly defined by the relevant MBTI subscales.

Table 5: Correlations between the JTI and MBTI sub-scales

JTI Sub-scale	MBTI Sub-scale	Corrected correlation	Uncorrected correlation
EI	Extraversion	1	.87
	Introversion	-1	-.90
SN	Sensing	.96	.75
	Intuition	-.94	-.71
TF	Thinking	.97	.75
	Feeling	-.96	-.70
JP	Judging	.93	.76
	Perceiving	-.97	-.80

Business Studies undergraduates (n=40)

Table 6: Factor structure for the (revised) JTI and MBTI

	Factor 1	Factor 2	Factor 3	Factor 4
MBTI	-.93			
MBTI	.94			
JTI - JP	.71			
MBTI - E		-.94		
MBTI - I		.93		
JTI - EI		.81		
MBTI - T			-.90	
MBTI - F			.91	
JTI - TF			.71	
MBTI - S				-.85
MBTI - N				.88
JTI - SN				.72

European Business School undergraduates (n=112)