

Personality: From Theory to Practice Part I.

Merrelyn Emery February 2026.

(This is an adaptation of a very long document detailing the many applications of the test and the results. Only a fraction of those are included here to give an idea of the ways in which the test has highly practical and useful outcomes.

Overview

In 1978 Fred and Merrelyn Emery were invited to participate in a study of telephone usage for Telecom Australia. We were interested in understanding the 'whys' of phone usage rather than simply how many people chose the phone over other media, in which circumstances. This together with clues in the literature that individual or personality factors were involved in such a choice, offered an opportunity to derive and validate a test of personality based on Ackoff & Emery's 1972 open systems conceptualization of the personality of a person as an open purposeful system.

The test does away with all simplistic and closed systems notions of a person as encapsulated within their skin or as an entity that can be taken out of context. It acknowledges the reality of human affairs which is that people grow and change as they move through changing circumstances, but at the same time maintain a recognizable pattern of behavioural preferences. This notion of personality, therefore, is a very much one of *observable behavioural preferences*, the material universals of human development. It avoids all untestable hypotheses of personality as some 'essence' of individuality.

The test is based on the very simple model of the open system, a system with permeable boundaries to whatever environment. For human systems this means that not only are people and their organizations open to their physical and ecological environments and the multitude of things and processes they contain, but that they are also subject to influence from a broad social field of values and expectations which are themselves the products of human behaviour.

The test mirrors the mutual determination of open system and environment providing two dimensions each with two poles. An individual at any point in time can register a point in a 2x2 personality space.

Details of its theory, derivation, validity and reliability are given below. The test itself and this supporting detail was not published at the time, as although these data indicated that the test was more than adequate in these regards, we considered further testing to establish the consistency of its effectiveness was required.

The test has now been used in a variety of studies with diverse samples and purposes. In no case have its results deviated in any major way from hypothesized predictions. In every case so far it has shown significant influence on the phenomena under study. Its consistency of direction and power has, therefore, been repeatedly confirmed.

Two of the studies reported here are of the same occupational population, and the test faithfully reports these populations as of the same personality profile. Another is of an occupational group closely related to these two and again the test consistently records its personality profile.

The test also shows consistency in terms of being able to differentiate between reactions to positive and negative affect, a critical factor in judging human behaviour in so far as the affect system is the dominant system in determining motivation. In addition, the test delivers its promise in terms of general behavioural preferences in a range of situations, to specific technologies and slogans, learning and diffusion of that learning, and in generating attitudes and behaviour toward change.

Derivation of the test owes something to the Myers Briggs but also showed that the Myers Briggs suffers from theoretical and empirical defects. These have been removed through the design of this test. All test items were piloted to ensure reliability and validity as the results of

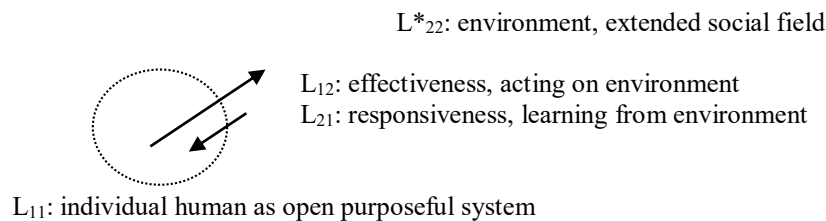
the 1980 study document. The test itself, therefore, is a short, quick and easy ‘ready reckoner’ to consistent behavioural preferences or personality.

Because of the time lag in compiling this validation document, some of the original data bases have been lost. Only two exist in full. The documentation has been recovered from reports and accompanying files where they exist. There is no full consistency, therefore, throughout the data trail. Some of the analyses I would wish to make today cannot be done for this reason. However, the consistency displayed throughout this record is high, more than enough to provide confidence that the test is actually and reliably measuring what it claims.

The Theory

This test is part of a long historical attempt by psychologists to capitalize on the brilliant insights of Jung (1923, Eng. Trans.). Eysenck worked for many decades, with some success, measuring the simple dimension of introversion-extraversion. Ackoff (with Churchman) worked toward a more rigorous and complex conceptualization of the Jungian types. Emery, after six years of empirical study of the role of alcohol in human adaptation realized that the typology which had emerged was essentially Jungian. He further observed a remarkable convergence between Churchman and Ackoff’s theoretical work on Jung’s theory of extraversion-introversion (1921) and the types that had emerged from his empirical study of alcohol users (1959). From 1964 Emery and Ackoff collaborated in further developing these empirical studies and the conceptual model was published in 1972. “To overcome the incompleteness of Jung’s theory and avoid the oversimplification of Eysenck (1947), we have started again from the beginnings made possible by our conceptualization of purposeful systems” (Ackoff and Emery, 1972, p. 119).

Emery and Trist (1965) completed the conceptualization of the open system as shown in Figure 1.



*Where L stands for lawful, meaning that each of the four components is governed by laws which can be known.

Figure 1. The Open System in Environment

By conceptualizing people as purposeful systems open to their environments, Ackoff and Emery were able to conceive of personality not as an unobservable intervening variable (which creates problems for the confirmation or refutation of its existence) but “as an observable function that describes how an individual converts a choice situation into an expected relative value for himself” (or herself). Personality has long been, and continues to be for many, some ephemeral or mystical attribute. This work and the resulting test put an end to that with a highly practical and functional definition which renders personality a powerful addition to our arsenal of reliable measures of human behaviour.

The personality of an individual in terms of the two relations that can exist between that person and their environment is given by the interplay of:

1. The extent to which the environment affects the individual (environmental responsiveness, L21).

- The extent to which the individual affects his or her environment (environmental effectiveness, L_{12}).

Because system and environment are mutually determining and therefore coevolve, this formulation follows the Lewinian equation: $B=f(P \times E)$ or behaviour is a function of person and environment.

Ackoff and Emery further conceptualized the environmental response function L_{21} in terms of intensity of stimulus and probability of response such that *objectiversion* is relatively high responsiveness to the environment and *subjectiversion* is relatively low responsiveness. Even a very environmentally insensitive person is likely to respond to a very strong stimulus. Thus this dimension can be measured as a single variable.

Clearly objectiversion is extroversion and subjectiversion is introversion on the input (stimulus) side. “An *objectivert*, then, is one who is responsive to his environment; a *subjectivert* is not. Hence the objectivert is more likely to be aware of what is going on around him and to be influenced by it. The subjectivert is more likely to be influenced by his own thoughts and feelings than by his environment. The objectivert is objectively moved and motivated, whereas the subjectivert is subjectively moved and motivated”. (Ackoff and Emery, 1972, p. 120). Objectiversion-subjectiversion corresponds to Jung’s dimension of sensing-intuiting.

Similarly, the environmental effect function was conceptualized in terms of intensity of effect and cumulative probability of choice. *Internalization* is relative indifference to intensity of effect while *externalization* is relative concern for the intensity of effect. “An externalizer is one who tends to change his environment to suit his needs. The internalizer adapts himself to his environment. If someone enters an externalizer’s environment and annoys or distracts him, he is likely to try to stop the intrusive behaviour. An internalizer in the same situation is more likely to try to ignore the intruder or move to another place. The externalizer will try to organize a group of which he is a part, to lead it; the internalizer is more likely to be a follower. If cold in a house, the externalizer will try to turn up the heat; the internalizer is more likely to add clothing.” (Ackoff and Emery, 1972, p. 122).

Internalization is therefore, introversion and externalization is extraversion on the output side. Again, these can be measured by a single variable. Externalizing-internalizing corresponds to Jung’s dimension of thinking-feeling.

The Personality Space

Combining these two dimensions creates the personality space where the location of an individual in this space is the point determined by the two measures.

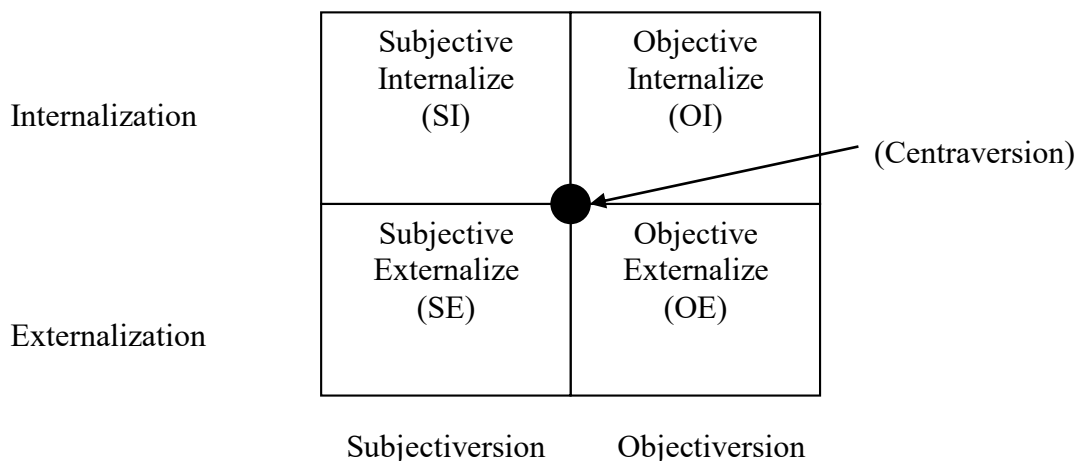


Figure 2. The Personality Space

The personality space and location of individuals within it shows why the simple dichotomy of introversion-extraversion is inadequate. The SEs and OIs are called the mixed types because they are introverted with respect to one dimension and extraverted with respect to the other. Ackoff and Emery had early data which indicated “that most people would fall into these mixed classes. This, we believe, is not accidental because we theorize that these types are more stable than pure types”. They continued (p. 123) “The pure types live almost entirely inside or outside themselves, like Koestler’s *The Yogi and the Commissar*, but both the mixed types maintain some contact with both their psychic reality and their environment, although in different ways. For reasons that we shall explore later, the pure types have more difficulty than do the mixed types in adjusting either to themselves or to their environments, particularly to others in their environment.

We hypothesize that those who are pure introverts or extroverts, when confronted with problems that require self-adjustment, tend to modify themselves out toward the edges of the personality space (the Yogi becomes more of a Yogi and the Commissar more of a Commissar). We also hypothesized that the mixed types tend to move themselves toward the center of the space, toward the point of *centraversion*, as we called it (following Neumann, 1954). Our data indicate, for example, that consumption of alcohol produces just these effects in the short run. The pure types are more likely to drink to an excess and become high or drunk and move out in the personality space with increasing dependence on alcohol. The mixed types drink moderately as a whole and tend to be self-corrective. Our data also indicate that as the pure types mature and grow older their personalities tend to move out, while the mixed types tend to move in.

A special point must be made about the concept of *centraversion*. The closer an individual approaches to this, the more s/he is responding to and seeking to modify an integrated reality of their psychic world and environment. This we believe is what constitutes psychological maturity and strength”.

The Transformation from Theory to Practice

Empirical Study and Derivation of Hypotheses

In the early stages of the 1978 [study \(REF\)](#) a literature survey and analysis of its main findings highlighted a British study about the differences between media in terms of “Social Presence” (Short et al, 1976). The key dimensions that defined the social presence of a medium were:

- Unsociable-sociable
- Insensitive-sensitive
- Cold-warm
- Impersonal-personal (Short et al, 1976, p. 66).

These dimensions were not drawn together into a conceptual framework but it is obvious that they are measuring Ackoff and Emery’s two dimensions, and the Myer Brigg’s scales, for sensing-intuiting and thinking-feeling.

Their results show the phone as a medium that is seen to be of significantly low social presence. One would expect that this would have a significant effect on the types of personality who would be attracted to use of the phone. When we unearthed the data on how the phone could be used, a more complex question emerged. Phone usage was no longer to be considered as unilaterally determined by phone technology. It was clear that different types of personalities might be attracted to phone usage **for different purposes** and might **converse differently** over the phone for the same purposes.

As a consequence we had to spell out the major ways in which phone conversations might differ for different personalities and design the interview so as to detect such differences. Drawing upon other relevant knowledge available at the time, the following table was compiled and elaborated into a set of personality dimension specific hypotheses.

Table 1. The Telephone Conversation			
Stages	Roles	Problems	Relevant Personality Aspects
Initiating	Caller / Recipient	Imbalance	Caller - thinking / feeling Recipient - sensing / intuiting
Conversing	Hearer / Speaker	Vague Referent	Hearer - sensing / intuiting Speaker - thinking / feeling
Termination	Terminator	Imbalance	Thinking / feeling

What strategies are followed in *initiating* a phone call?

Table 2. Strategies when initiating a phone call	
Externalizing (Thinking) types	Internalizing (Feeling) types
1. Think of some other way to handle the matter, get someone else to make the call, or at least to initiate it.	Use any excuse to phone, insist on doing it oneself ask secretary for a line, not to get the number.
2. Think through how best to get the intended message across to the target person and how to cope with probable difficulties in their comprehension. Rehearse the planned opening statements	Decide on the mood of the target person which would best facilitate comprehension of the intended message and on which projected mood in initiating the conversation would most likely induce the facilitating mood. Rehearse this projection.
3. Immediately specify as precisely as possible who is being summonsed.	Immediately seek to offset the aspect of summonsing by identifying self and only then specifying who is being called; if possible explaining why.
4. The second demand is couched as such – “I am calling...”, “I wish to speak with...”.	The second demand is muted -“I would like to talk to...” “I was hoping I would catch...” “If it is not too much trouble I would like to speak to...”
5. If person unavailable terminate as quickly as possible with “I will call back” or “Request them to ring me”.	If person unavailable, try to develop a conversation about this fact with the respondent. Terminate With “I will <u>try</u> to get back” (implying that they are obligated by calling at the wrong time) or “You might let them know that I called” (implying lack of obligation to answerer or to target person).

What strategies are likely to be used to cope with an incoming call?

Table 3. Strategies when coping with an incoming call	
Subjectivizing (Intuiting) types	Objectivizing (Sensing) types
1. Resent interruption, let someone else answer	Welcome being in social demand, try to be first to the phone.
2. Introduce self with maximum specificity to avoid being involved in unnecessary conversation.	Simply say hello.
3. Seek to establish as quickly as possible <u>what</u> the call is about; what function it is intended to serve. Impatient with long winded explanations of who is calling.	Seek to establish as full an <u>image</u> of who is calling as is possible e.g., discussing when last met and asking after their health. Quite happy to delay consideration of the <u>what</u> till this has been accomplished.

How is the initial asymmetry of the summonser – respondent coped with?

Subjectivizing (Intuiting) types	Objectivizing (Sensing) types
1.By narrowly restricting the conversation to what is legitimate to demand of their social role relation – fobbing off any attempt to extend the range of considerations.	By creating a temporary, on the phone, inter-personal relation. (a ‘phoney’ relation).

How will the speaker cope with the relative lack of ‘an open, objectively ordered and shared environment’ to shape the resulting conversation to their ends?

Externalizing (Thinking) types	Internalizing (Feeling) types
1.Keep as close as possible to the format of an exchange of written message – ‘a talking telegram’.	Keep the conversation along lines that as closely as possible follow the perceived shifts in the caller’s feelings – mirroring the changing image of the other.
2..Keep bringing the conversation back to the point if the other drifts.	Quickly drop the point if there is any feeling that the other is not with it – “are you still there”, “can you hear me”, or any sense of a change in the other’s mood.
3.Will try to bring the call to an end as soon as the point of the call has been achieved.	Will leave it to the other to terminate the call and even try to prevent this if there is any suspicion that the caller is not satisfied that the call has been successful (by rewarding callers they invite repeat calls).
4.Short, cool calls.	Long, highly participative calls.

What strategies can the **hearer** follow in order to shape the course of the conversation to their ends?

Subjectivizing (Intuiting) types	Objectivizing (Sensing) types
1. Reflecting hard on what is not being said although it could have been said, and made as much sense, but with a different message. Suspect cold-blooded manipulation.	Listening intently to how the other is coming across so that they can respond promptly to shifts in the other’s moods. Can detect also if their heart is not in their words.
2.Constantly monitor the conceptual frame in which the conversation was originally initiated or accepted.	Constantly adapt the image of the other and the image one is trying to project.
3.Leave pauses in the other’s discourse unanswered, thus asserting the independence of one’s own thought processes: or use the opportunity to re-direct the conversation.	Leave no pauses unfilled and yet fill in such a way as to encourage the other to continue with what they were on about.
Externalizing (Thinking) types	Internalizing (Feeling) types
1.Direct one’s eyes to some space upwards and to the left ; or else doodle.	Direct ones eyes to some blank space upwards and to the right ; or else peruse something.

Previous literature showed that the phone, in freeing conversation from visual contact, allowed for possibly more creative use of conversation. In addition, Schegloff’s (1968) evidence was that the phone conversation typically starts off with an inherent bias in power, favouring the caller.

As people are exposed to the phone we would expect them to become aware of these properties, although not aware of that awareness i.e., conscious of why they reacted to it in their own way. These individual reactions have been observed but not systematized. They are an

important object of study both as a double check on the purported nature of the study and as a basis for offering or redesigning the phone medium to allow people to better use it.

There are other ways of holding conversations. So there is a measure of choice. We suggest that, given the individuality of the phone medium an individual's likelihood of choosing the phone, as against other channels of person-to-person conversation will be a function of:

- (a) Sensitivity to environmental impingements
- (b) Responsiveness to the environment (likelihood of **responding** to environmental features, not just **reacting**, adjusting himself to it).

The phone offers characteristic problems and prospects for inputs and outputs. The major finding of the British study was that the media differed with respect to the notion of 'Social Presence'. As we have seen these aspects are much the same as we defined as the conceptual dimensions of person-environment adaptation-sensitivity, responsiveness

It was necessary to (a) devise measures of personality on these dimensions, and (b) measure the extent to which these personality characteristics were reflected in the way the phone was used, for what kinds of conversations.

Design of the Questionnaire and Sample

Nine blocks of data were identified as necessary to study and were ordered so that we could see what each could be expected to tell us about why people choose to use the phone for various ends. Figure 3 indicates the conceptual model that we thought the study would serve to test (block numbers attached):

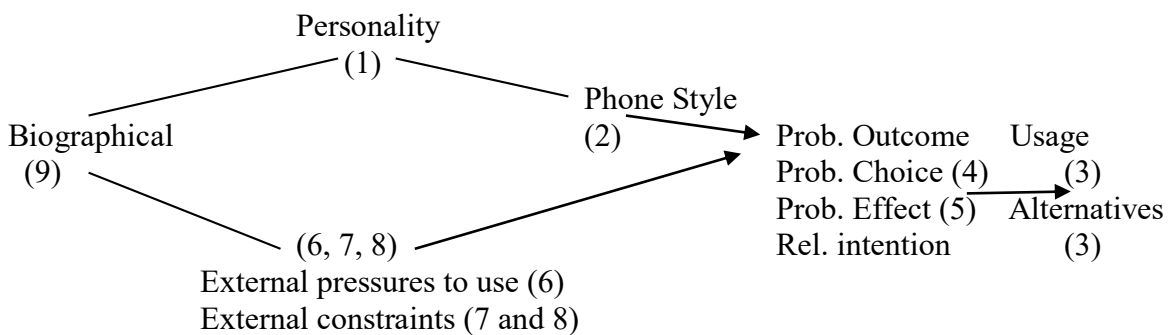


Figure 3. Conceptual Design of the Study

Therefore, the questionnaire covered all four **components** of the choice situation and provided for measures of the relevant relationships between these four components that are specified by the four **parameters** of the choice, probability of choice model, probable effectiveness, probability of outcome and relative intention (Ackoff and Emery, 1972, p34-38).

The possibility remained that some of our measures would prove inadequate. However, the design was not invalidated before being implemented by the absence of evidence on one or more dimensions. If that had occurred then valid conclusions could not have been drawn. No matter how good the measures of the included dimensions, if one dimension was unmeasurable there would be no way of knowing what the results meant in terms of choosing to use the phone, for any purpose or in any way.

It will be noted (Figure 3) that in the directive correlation (Sommerhoff, 1969) map of the overall study that the biographical data form the coenetic variable, and personality and external factors take the roles of L₁₁ and L₂₂ respectively. Apart from showing that any future state (in this case choice of phone or other media) is jointly determined by system and environment, it illustrates and alerts the researcher to the positioning of biographic (or demographic) data, externalities and personality in causal path diagrams of complex behaviours, in this and other

studies reported below. Reductionist studies isolating personality and one or two other variables will either miss or distort the influence exerted by individual personality

The usual field testing of selected items and the questionnaire were carried out. The pilot was designed to provide evidence about the relationship between the conceptualized variables. There was no concern about the demographic distribution of the conceptualized variables. The pilot sample of 64 would in any case have been totally inadequate to the task of yielding demographic estimates. To better achieve the aim of testing conceptual relations we followed experimental practice by designing a ‘balanced factorial’ sample (a Latin square design). The factors we equalized out were gender, age and class – the three variables that have been observed to explain most of human variability. In Fisher’s terms (1935) we gave the same treatment to the same number of all possible combinations of the basic variable – and observed the different effects. More significantly, from our point of view, we thus ruled out the possibility of the observed relations being simply a result of a particular historical-geographic combination of age, sex or class i.e., the correlations we find are not due to some such fact that our pilot sample was mainly ‘old males who were predominantly middle class’ or any other such biased sample. If significant correlations emerge in our ‘balanced factorial’ sample they are much more likely to indicate what is generally true of humans. It should be noted that age and class effects can be meaningfully examined within this design. The design simply prevents age, sex or class differences being confined to comparisons at one end of the spectrum.

Fred Emery had used these designs as standard procedure in the UK as they are invaluable in testing whether a questionnaire is answering the hypotheses it was designed to answer i.e., it enables us to go beyond testing individual questions to testing their conceptual interactions.

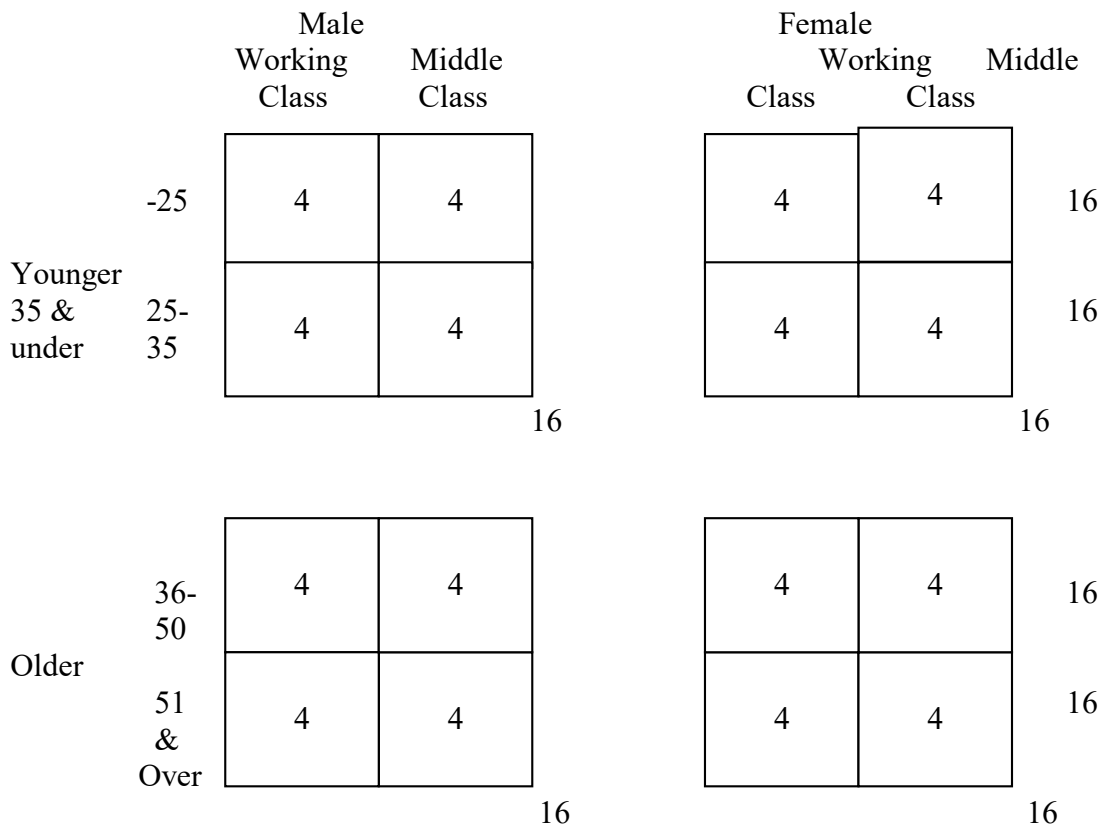


Figure 4. Balanced Factorial or Latin Square Sample Design

The model in Figure 4 can be extended to any size sample.

Method of Analysis

Wherever possible the questions were designed to produce a distribution of responses over three or more points. For some questions, like sex, this was not possible. This rule was followed so that Pearson correlations could be calculated. Packages such as SPSS now automatically adjust for point biserial correlations however.

As a first step, correlation matrices were calculated for all relations between all items within each of the five major blocks. Causal path analysis of these matrices enabled us to identify subsets of items which appeared to be measuring the same thing. Such subsets were then scaled together to form a single measure (a so-called derived measure) if they were seen to be measuring different aspects of the same thing, or different degrees of intensity on the same measure. Where it was clear that they were just different ways of asking the same question, as in the personality test, we selected the best measure and discarded the others. In deciding what was best we were guided by distribution of responses, sensitivity of the distribution by age, sex and class and, most importantly by its correlations with items outside the subset.

The next step was preparation of the 'master matrix'. This shows the correlations between all of the surviving variables or the derived variables (each representing 2 or more of the original) from all of the boxes. This represented a reduction from the original 280 variables to 85 variables (bearing in mind though that the most of the information had been used by being drawn into multi-item scales that could reasonably be expected to provide higher reliability and discrimination than any constituent item taken alone).

Six of the variables were discarded as redundant or statistically insignificant. Eleven independent and dependent variables were left to one side at this stage as they would clearly enter into or be produced by all of the patterns that might emerge.

The matrix of the remaining 68 variables was analyzed by successive re-iterations to yield the patterns of casual relations between the intervening variables. (There is no imputation here that a correlation itself implies causality. Causality is attributed by the research according to the conceptual model (see Figure 3) and common sense. Phone usage cannot determine age but age may influence phone usage. This method is discussed in Emery F, 1976.

At the next stage each of the four patterns that emerged was re-analyzed. This involved creating for each, a matrix that contained all of the original correlations between each variable that emerged in that particular pattern and the correlations between those variables and the eight independent and dependent variables. These matrices were then re-iterated to yield the patterns reported in the next section.

Full and detailed rules for reading the resulting maps cannot be given, but they are no different and no less objective than those implicit in reading a road map.

Derivation and Validation of the Test

(This section is a minimally edited version of Emery and Emery 1980, Chapter 4.)

In 1972, Ackoff and Emery (p. 122-3) stated that "in practice measurement of the relevant variables is very difficult. We are still working on development of instruments that will simplify the process. In the meantime we have been using clinical interviews and the judgements of five independent observers applied to them to obtain estimates of the subjects' positions in the personality space. The judges have produced very consistent estimates. The results referred to in this chapter are based on data obtained in this way from approximately 100 couples, husbands and wives".

Confronted with the problematic measurement of these personality dimensions (Emery and Emery 1980, p. 4 onwards) "we went back to the Myer-Briggs Type Indicator and to work based on it. This had been studied in the mid sixties but by-passed because the evidence was confusing. Reanalysis of the evidence (plus that which has since accumulated) revealed the source of the troubles. The Myer-Brigg Type Indicator religiously stuck with all four of the dimensions Jung had postulated:

- (a) extraversion-introversion
- (b) sensing-intuiting
- (c) thinking-feeling
- (d) judgement-perception

The reanalysis showed that scales (b) and (c) were very effective in indicating types but scales (a) and (d) were defective.

The two effective scales corresponded to the two dimensions singled out by the work of Ackoff and Emery:

Sensing-intuiting “The SN index”:

Objectivert-subjectivert

Thinking-feeling “The TF index”:

Externaliser-internaliser

These two scales reflect adaptation to inputs and possible outputs respectively. The Myer-Brigg scales (a) and (d), however, are both simultaneously measuring adaptation to inputs and outputs. It is an empirical fact that most people are mixed types*¹ making sure that they keep one foot in reality ‘out there’ and the other in the reality of their internal worlds (SF’s or NT’s: equivalently, OI’s or SE’s). Little wonder the scales (a) and (d) were so confusing.

The relevance of finding how this standing divergence was reconcilable was not just relevant to theory. The most important contribution, as we found it, was that it provided us with a valid lower order of abstraction by which we could enter the common language and find questions that would help ordinary people to describe their characteristic modes of adaptation via reception of inputs and directing their outputs. It was the difference between asking a person whether they were a ‘sensy-feely type’ or an ‘objective-internaliser’; or us asking ourselves, what common garden variety of behaviours would identify such a type

Working from the middle level of abstraction we found it possible to create the items necessary for measuring our types. One interesting mistake was made by us in the first round of selecting and testing items. Following the evidence of Myer-Brigg’s and other contributions we included in the Internaliser-Externaliser scale items related to the dimension of mercy-justice. With our sample, 1978, they turned out to be quite irrelevant. The justice items used to be relevant because so many personal strategies were little more than acceptance of strategies defined for them and indoctrinated by institutions (cf. Tomkins’s fifth strategy, Vol 2. 1962). This appeared to be lacking in our sample.

In constructing the test from our selected items we departed from the usual procedures in constructing pen and paper personality tests. Usually it is assumed that people will try to hide their ‘real’ personalities and hence have to be tricked into revealing themselves, or that people are so conforming that very devious means are needed to review what they no longer know about themselves. We took the opposite tack. We felt that the self-analysis we were requesting with regard to these two dimensions did not involve any self judgements that most people would not have learnt to live with. All of the four types are to be found in any human population and it would be difficult to find any cultural pattern that had not evolved some channels for respect of all of the types. (This is not to say that within a special social segment, e.g., prison wardens, there could not be active depreciation of some personality types). Consequently we used a mere handful of items for each scale and these items were presented straightforwardly (i.e., without mixing up items from the two scales or reversing some of them) in the same way as the Oxford English dictionary presents the variations in the way a particular word has taken on meaning. In effect, we offered half a dozen different ways of describing the same description of oneself; thus allowing for differences in levels of vocabulary or the special usages in different parts of

¹ If extraverted with respect to inputs they tend to be intraverted with respect to outputs, and vice versa.

society. This does not assume that each item is exactly replicable by each of the others. The inter-correlation of items shows that each is subtly different from the others and further refinement may be possible.

This test was designed to measure a definition of personality based on theoretical conceptualization of how purposeful systems relate to their environments (Ackoff and Emery, 1972). The critical validation of this test therefore is, does it measure personality as defined by the conceptualization of Ackoff and Emery? Simply, does our test amount to an operational definition of the original concepts?

“Personality is not conceived here as an unobservable intervening variable that is invoked to explain choice, but as an observable function that describes how an individual converts a choice situation into an expected relative value for himself”. (p. 117). The two conceptual dimensions of personality are hypothesized as above, namely Subjectiversion-Objectiversion on the input side, and Externalisation-Internalisation on the output side. These are hypothesized as observable tendencies, environmental response and effect functions, not rigid commitments. They are, therefore *behavioural preferences* over a range of situations. Narrowly interpreting this can be taken to mean that an individual’s position on these two dimensions, and his or her resultant position in the personality space, must be shown to influence the probability of outcome and relative intention towards a wide range of behaviours. Thus, the first point of validation for a test purporting to operationalise the Ackoff-Emery conceptualization must lie in its ability to consistently detect the observable environmental response and effect functions in a significant range of behaviours and conditions. Moreover, the scales of the test must detect the directional tendencies hypothesized by Ackoff and Emery and, subsequently, by Emery and Emery for this particular study. Data concerning the first and second criteria of validation are given in Tables 2 and 3.*²

Reliability tests, population distributions, and ‘centroversion’ are dealt with below.

Inspection of these tables shows that the dimension Externalising-Internalising was significantly associated with 17 variables covering a wide range of behaviours and conditions, and that of Subjectivising-Objectivising significantly associated with 10.

The frequency with which these dimensions were significantly correlated with other variables is far beyond that expected by chance. That is, the two personality functions can be seen to be entering into a wide range of choice behaviours.

² For X^2 , read 'Chi squared' throughout

TABLE 2: EVIDENCE OF CONSTRUCT VALIDITY FOR THE DIMENSION SUBJECTIVISING-OBJECTIVISING (V. NO. 186)

	Subjectivising							Objectivising							Prob. Of Future Sig. Sample r's x ²	Sig. Of x ² p<	Stability of sample r's x ²	Prob. Of Future Sig. Sample r's x ²	Sig. Of x ² p<	Stability of sample r's x ²	Sig. Of x ² p<
	Melb.	Colac	Syd.	Hob.	Total	Mean r for samples	SD for sample r's	Melb.	Colac	Syd.	Hob.	Total	Mean r for samples	SD for sample r's							
211 Social Concern	0.26 ^x	0.37 ^{xx}	0.24	0.33 ^{xx}	0.35 ^{xxx}	0.30	0.06	-	-	-	-	-	-	-	22.632	0.001	0.6711	22.632	0.001	0.6711	n.s.
119 Age	-	-	-	-	-	-	-	0.50 ^{xxx}	0.04	0.12	0.30 ^x	0.16 ^x	0.24	0.205	21.716	0.001	7.662	21.716	0.001	7.662	n.s.
172 Busyness in daily life	0.32 ^x	0.26 ^x	0.24	0.39 ^{xx}	0.26 ^{xxx}	0.278	0.106	-	-	-	-	-	-	-	20.844	0.001	2.0557	20.844	0.001	2.0557	n.s.
212 Orientation to TV	-	-	-	-	-	-	-	0.27 ^x	-0.05	0.36 ^{xx}	0.34 ^{xx}	0.28 ^{xxx}	0.23	0.191	19.558	0.001	6.649	19.558	0.001	6.649	n.s.
213 Impoverished life space	-	-	-	-	-	-	-	0.14	0.28 ^x	0.35 ^{xx}	0.15	0.22 ^{xx}	0.23	0.102	14.824	0.01	1.9154	14.824	0.01	1.9154	n.s.
194 Travelling	0.17	0.24 ^x	0.02	0.30 ^x	0.20 ^{xx}	0.208	0.104	-	-	-	-	-	-	-	12.682	0.02	2.1777	12.682	0.02	2.1777	n.s.
173 Familiarity with phone	0.11	0.25 ^x	0.11	0.34 ^{xx}	0.24 ^{xxx}	0.203	0.113	-	-	-	-	-	-	-	12.341	0.02	2.3363	12.341	0.02	2.3363	n.s.
193 Social class	0.25 ^x	0.23	0.10	0.25 ^x	0.21 ^{xx}	0.21	0.072	-	-	-	-	-	-	-	11.463	0.05	0.9577	11.483	0.05	0.9577	n.s.
171 Networking	0.25 ^x	0.28 ^x	0.03	0.12	0.16 ^x	0.17	0.116	-	-	-	-	-	-	-	9.528	0.05	2.4766	9.528	0.05	2.4766	n.s.
195 Joining	-0.03	0.27 ^x	0.10	0.16	0.20 ^{xx}	0.13	0.127	-	-	-	-	-	-	-	7.088	0.05	2.9646	7.088	0.05	2.9646	n.s.

Notes: 1. Each area sample N=64. Total is sum of samples excluding Melbourne. Total N=192

2. Where N=64
 r=.25 p<.05 *
 r=.33 p<.01 **
 r=.41 p<.001 ***

3. Where N=192
 r=.14 p<.05 *
 r=.18 p<.01 **
 r=.23 p<.001 ***

4. Probability of Future Significant Sample r's X², Tippet, L.H.C. *The Methods of Statistics*. William and Norgate Ltd, London. 1941. p179

5. Stability of sample r's. X², Tippet as above, p180

TABLE 3: EVIDENCE OF CONSTRUCT VALIDITY FOR THE DIMENSION EXTERNALISING-INTERNALISING (V. NO. 185)

Variable with which correlated	Externalising							Internalising							Prob. Of Future Sig. Sample r's x ²	Sig. Of x ² p<	Stability of sample r's x ²	Sig. Of x ² p<
	Melb.	Colac	Syd.	Hob.	Total	Mean r for samples	SD for sample r's	Melb.	Colac	Syd.	Hob.	Total	Mean r for samples	SD for sample r's				
188 Takes pleasure in conversing on the phone	-	-	-	-	-	-	-	0.10 ^x	0.15	0.69 ^{xxx}	0.35 ^{xx}	0.33 ^{xxx}	0.32	0.16	26.98	0.001	3.6051	n.s.
200 Freq. of work-related calls	0.26 ^x	0.38 ^{xx}	0.26 ^x	0.21	0.28 ^{xx}	0.28	0.07	-	-	-	-	-	-	-	20.404	0.001	0.9333	n.s.
7 Freq of calls made from work place	-	0.35 ^{xx}	0.25 ^x	0.19	0.26 ^{xxx}	0.26	0.08	-	-	-	-	-	-	-	17.604	0.001	0.7491	n.s.
183 Responsiveness to positive affect over phone	-	-	-	-	-	-	-	0.0	-0.10	0.51 ^{xxx}	-0.03	0.14 ^x	0.095	0.28	16.531	0.01	14.331	0.01
175 Relative value of phone	-	-	-	-	-	-	-	0.26 ^x	0.14	0.23	0.36 ^{xx}	0.25 ^{xxx}	0.25	0.09	16.433	0.01	1.5067	n.s.
173 Positive image of phone	-	-	-	-	-	-	-	-	0.11	0.32 ^x	0.33 ^{xx}	0.27 ^{xxx}	0.26	0.13	14.457	0.01	2.0862	n.s.
189 Keeness to telephone	-	-	-	-	-	-	-	#0.09	0.15	0.43 ^{xxx}	0.10	0.22 ^{xx}	0.23	0.18	13.262	0.01	3.8513	n.s.
104 Telephone is friend for private, social life	-	-	-	-	-	-	-	0.23	0.31 ^x	0.22	-	0.26 ^{xxx}	0.25	0.05	12.041	0.01	0.2989	n.s.
176 Probability of choice of telephone	-	-	-	-	-	-	-	0.25 ^x	0.07	0.34 ^{xx}	0.15	0.19 ^{xx}	0.20	0.12	12.537	0.02	2.3315	n.s.
193 Social class	0.16	0.20	0.24	0.28 ^x	0.24 ^{xxx}	0.22	0.05	-	-	-	-	-	-	-	12.298	0.02	0.488	n.s.
197 Mentally demanding job	0.27 ^x	0.08	0.25	0.28 ^x	0.23 ^{xxx}	0.21	0.09	-	-	-	-	-	-	-	12.059	0.02	1.5555	n.s.
179 Prob of outcome of phone use	-	-	-	-	-	-	-	0.34 ^{xx}	0.04	0.20	0.19	0.15 ^x	0.19	0.12	11.792	0.02	2.7511	n.s.
201 Phone is important for protection & emergencies	-	-	-	-	-	-	-	-	0.21	0.0	0.37 ^{xx}	0.22 ^{xx}	0.19	0.19	11.041	0.02	4.2029	n.s.
105 Phone is friend for work-related life	0.07	0.11	0.35 ^{xx}	-	0.24 ^{xxx}	0.19	0.12	-	-	-	-	-	-	-	10.32	0.02	3.7068	n.s.
194 Travelling	0.07	0.21	0.12	0.30 ^x	0.23 ^{xxx}	0.19	0.095	-	-	-	-	-	-	-	10.242	0.02	1.6653	n.s.
172 Busyness in daily life	0.31 ^x	0.09	0.17	0.16	0.14 ^x	0.18	0.09	-	-	-	-	-	-	-	9.679	0.03	1.3555	n.s.
202 Phone is important for social contact & convenience	-	-	-	-	-	-	-	-	0.26 ^x	-	-	0.19 ^{xx}	-	-	-	-	-	-

#Comparable but not identical measure. Excluded from calculation of X²

The last four columns of the tables indicate also that the series of contributions across samples is not random and that the addition of data from future samples could be expected to yield an equivalent or increased chi-square for non-randomness of the series.

We may conclude that the scales at this point in the analysis represent observable descriptive functions.

The second point of the validation concerns the direction of the contribution made to each behaviour. Tables 2 and 3 again provide the evidence.

An Objectivert...”is one who is responsive to his environment; a *subjectivert* is not. Hence the objectivert is more likely to be aware of what is going on around him and to be influenced by it. The subjectivert is more likely to be influenced by his own thoughts and feelings than by his environment”. (Ackoff and Emery 1972, p. 120). The critical difference is thus that the objectivert will be more oriented towards and sensitive to others and the external sensory environment, ‘external realities’, while the subjectivert is more oriented towards introspection and the world of ideas and issues, the ‘inner psychic realities’.

Inspection of Table 2 shows that the correlated variables are indeed in the expected directions. The variables entitled Social Concern, Networking (originally called Extent to which into the Information Sector) and Joining, all express a common theme of organising one’s life around shared ideas, and issues. These three variables are found to cluster at the Subjectivert end of the scale.

In distinction, Orientation Towards TV and Impoverished Life Space cluster at the Objectivert end of the scale. Orientation towards TV is a derivative scale whose components include not only the amount of time spent watching TV but also measures which indicate that the reason for viewing is for sheer sensory pleasure rather than for possible information content.

Impoverished Life Space is also a derivative variable which includes components of low Social Concern (i.e., not being concerned with social issues), and high Orientation Towards TV (as above). The fact that Impoverished Life Space is a second order derivative variable which encompasses other discriminating variables, but in the reverse direction, provides evidence of the polarity of the Subjectivising-Objectivising scale; it is not just discriminating between an X and not X. The remaining variables are best discussed in the section on personality types rather than in terms of one dimension at a time, for the reasons given below.

The second dimension, Externalising-Internalising (Table 3) also shows evidence of the expected directedness. “An externaliser is one who tends to change his environment to suit his needs. The internaliser adapts himself to his environment...The externaliser will try to organise a group of which he is a part, to lead it; the internaliser is more likely to be a follower”. (Ackoff and Emery 1972, p. 122). Following this basic description Emery and Emery hypothesized that the telephone would be very differently perceived and used by externalisers trying to change their world and internalisers trying to adapt to theirs. More specifically, it was hypothesized that externalisers would see the phone as a valuable tool in their effort to modify the environment and would not perceive the telephone as a positive or attractive instrument for personal, social or emotional interchange (conversations). Specific hypotheses were also made about the style with which externalisers and internalisers would use the telephone (see above).

Table 3 shows that hypotheses about style of telephone use have been confirmed by variables ‘Takes Pleasure in Conversing on the phone’ and ‘Keeness to Phone’; and that these are part of a comprehensive cluster of variables which illustrate that Internalisers have a positive image of phone and see it as a medium for adaptation in terms of their personal and social life. That is, they use it for purposes of taking into

themselves the world about them. Externalisers on the other hand, are shown in this table to perceive the phone as an extremely valuable instrument (friend) for work-related (outer-directed purposes) and that they indeed use it as a medium for acting upon their environment (frequency).

Mentally Demanding Job also fits with the image of the Externaliser rather than the more passive Internaliser. This variable becomes more comprehensible in the next section.

In the interests of testing our scales as rigorously as possible, we have subjected our data to another form of analysis, one which is associated quite properly with the way the two dimensions have been conceptualized. Quite simply, if the scales of Externalising-Internalising and Subjectivising-Objectivising are correlating with a range of variables in the hypothesized directions, then all these correlates should hang cohesively together to form an overall configuration which itself confirms the hypotheses of the original framework. In other words, if our scales were to correlate with single variables but did not cohere as expected with all variables simultaneously, then our scales would be in doubt as to their ability to measure a generalized tendency.

To this end, each of the two scales were subjected to two causal path analyses using different variables in the original matrices drawn from the Master Matrix of the overall study. The matrix for the first analysis of each dimension contained only those variables which correlated with the dimension at the $p < 0.01$ level of significance. The configurations which result from these causal path should give a reasonable pure picture of the dimensions and their cohesiveness.

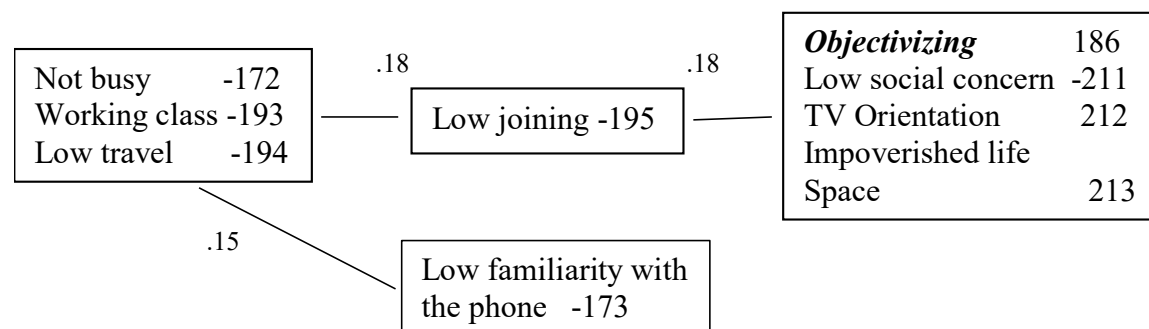


Figure 5. Objectivizing $p < 0.01$ ^{*3} ^{4}**

³ The same configurations, but with all signs reversed, gives the patten for Subjectivizing

⁴ The correlations shown here between clusters have been corrected for attenuation caused by reiteration of the matrix

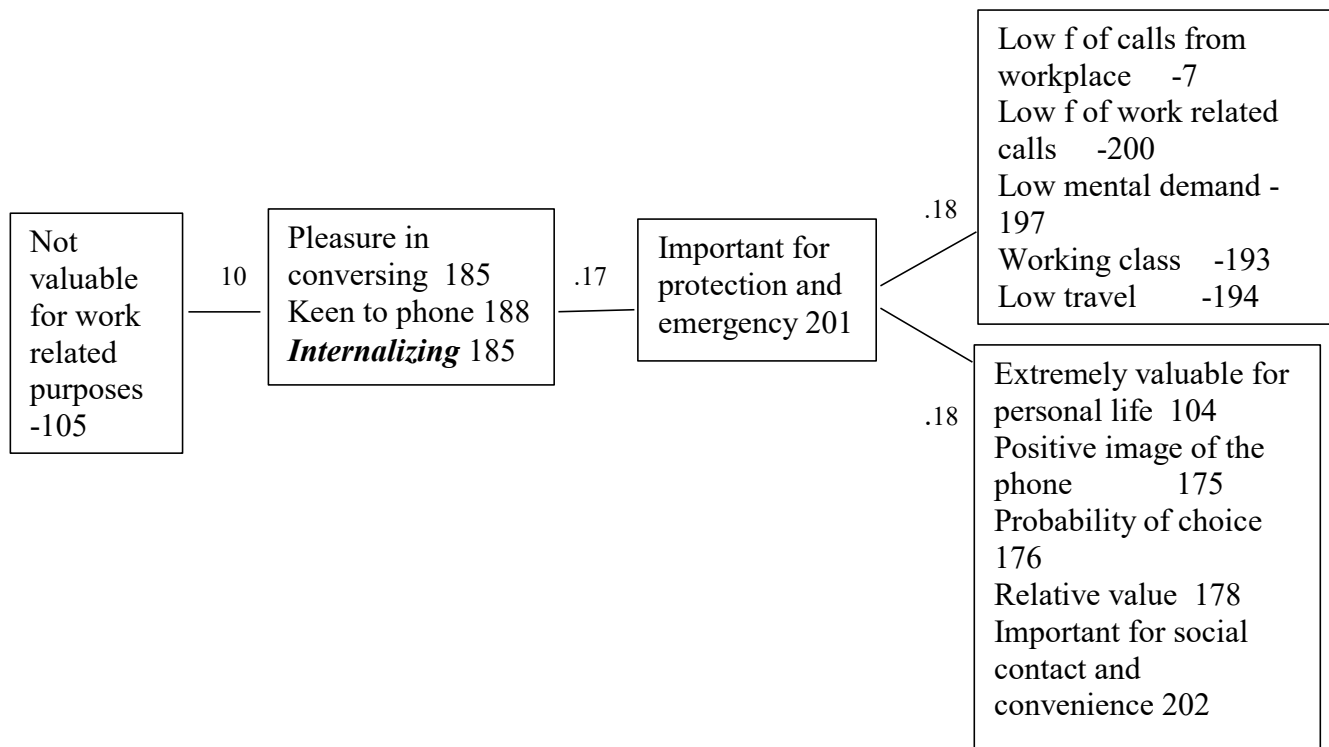


Figure 6* Internalizing p<.0.01.

* the same notes apply here as for Figure 5.

The first observation from Figures 5 and 6 is that the configurations produced by the analyses contain the component variables in exactly the directions as those specified by the first order correlation coefficients set out in Tables 1 and 2. That is that despite the reiteration of the matrices and the clustering of variables through this process, the directionality was sufficiently strong not to have been reversed in any case. This lends some weight to the argument that our two scales are in fact each measuring a generalized personality function of observable influence on behavioural choice

Further, it can be seen from inspection of the causal path diagrams that a qualitative dimension is added by the clustering of variables. For Objectivising it can be seen that the strongest clustering around that dimension is of those variables which represent a relative absence of

orientation towards introspection and ideas. (The reverse for Subjectivising). The contribution made by that cluster of variables which revolves around social class and its ramifications contributes only secondarily

Similarly for *Internalising*, the variables clustering closest about this dimension are those which were hypothesized to measure the use of the telephone for purposes of adaptation to the environment. The central relation of the cluster containing to the Internalising dimension itself and that of the importance of the telephone in order to protect oneself and for use in emergencies demonstrates nicely the way in which Internalisers interpret the world in terms of their personal selves. Again in this cluster, we find that the contributing cluster of variables which involves social class is less highly related to the central core ($r=0.14$) than is that cluster of variables which represents the value of the phone to the internaliser ($r=0.17$).

At this point where we have identified the nature of the dimension and validated their essential consistencies, it is important to note that the most direct measures of the relationship between telephone usage, both in terms of frequency of calls, and only work-related calls, and style of usage, are related only to the Externalising-Internalising dimension; not to the Subjectivising-Objectivising dimension of the personality space.

Analysis of the two dimensions was subsequently performed on variables with correlations at $p<.01$ plus those with correlations at $p<.05$ level of significance. The subsequent configurations are not reported here as they show the same consistency of results.

Keeping in mind that the total study included many other personality ‘type’ variables that did not, from the combined data file, have significant first order correlation with the two personality scales, we decided that it may be of relevance for our understanding of our two dimensions to perform a causal path analysis of a matrix which included these personality ‘type’ variables and the scales undergoing validation. Each of the two scales was separately entered into the same matrix. After the second re-iteration of each of these analyses, it was found that the two scales were clustering with different sets of variables with no overlap. Each of the matrices effectively split in half, illustrating, amongst other things, that the two dimensions are distinct and separate entities which confirms the low first-order correlation between them, $r=.07$.

The following Figures 7 and 8 illustrate the results of this analysis.

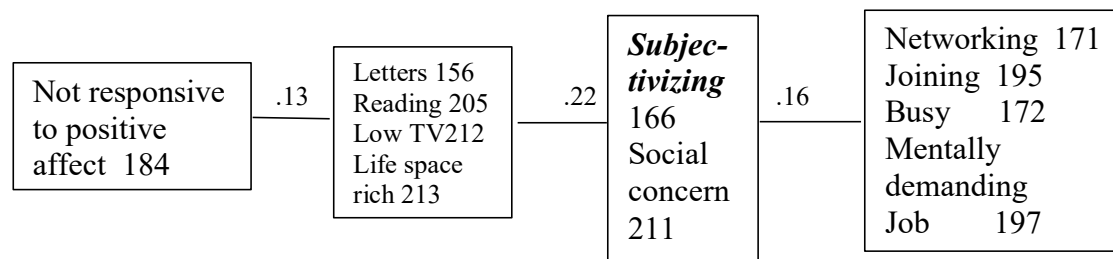
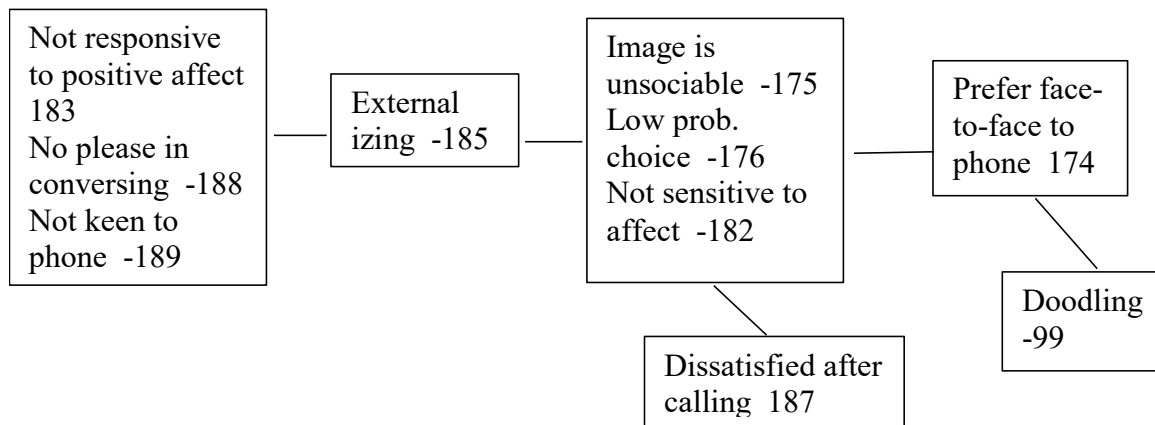


Figure 7. Subjectivizing; Dynamics



Correlations not shown

Figure 8. Externalizing; Dynamics

Figures 7 and 8 show patterns that are consistent with those above based on $p < .01$ correlations but which allow more interpretation of the dynamics of the dimensions. The typical Subjectivert is shown to have rich life-space characterized by leisure activities of reading, writing personal letters and low involvement with television. These activities are seen to be closely tied to being socially concerned.

The cluster of variables representing joining and networking with others around shared ideas is also directly related to Subjectivising and social concern, and produces a coherent picture of the person whose response set is towards the world of ideas rather than people or the sensory environment.

It will be noted that the variable Mentally Demanding Job has moved in this analysis from the Externalising dimension to that of Subjectivising where it clusters with the networking variables. Subjectivisers are seen also not to be responsive to negative affect which would cause others to see them as insensitive to people

The typical Externaliser is shown here also to take a very dim view of the telephone as a medium of communication, and we can see from the clustering of the variables of low sensitivity to affect communicated over the phone, and the image of telephone as cold, etc., that they do not perceive it as their preferred mode of communication, although as we know from the overall analysis that they are heavy users of the telephone for work-related purposes.

It can be inferred from the cluster of 183, 188 and 189 that Externalisers use the phone strictly for purposes of affecting their environment and are not interested in pleasant conversations or whether the person at the other end is happy; and from variable 187 and the line through variable 174 to 99 that while it is used for this purpose, it is considered to be less effective than face-to-face conversation.

We specifically predicted that Externalisers would doodle while talking on the phone, and we can further hypothesize now from this configuration that it is the conflict or tension which is set up by the Externalisers preference for the more effective mode of face-to-face conversation which leads to the doodling and other less extreme fiddling behaviour while on the phone.

Personality Types

There is a third level of conceptualization against which we may validate our test. Ackoff and Emery went further in their theoretical work than hypothesizing in terms of single dimensions. They have spelt out in *On Purposeful Systems*, the characteristics of four types of adaptation as derived from an individual's position in the total personality space defined by the two dimensions.

So far, we have dealt with the dimensions as separate entities, but of course this is an artificial evaluation as, in reality, they can only exist in combination: no open system can be described solely in terms of inputs or outputs. The association of variables such as Mentally Demanding Job with both Subjectivising and Externalising is a result of such artificiality.

The four types of adaptation are the logical possibilities of combinations of the two dimensions. We have explored these types using the same methodology as was used for the single dimensions. We have, therefore, pictures of the two "mixed" types, the Objective-Internalisers and the Subjective-Externalisers, and the two "pure" types, the Objective-Externalisers and the Subjective-Internalisers. The "pure" types are oriented to either psychic or external reality in both input and output.

At this stage, we encountered a methodological problem in obtaining the pictures. The natural pattern in the data occurred for mixed types, as would be expected from the fact, as Ackoff and Emery hypothesized, that the great majority of the population falls into these two classes. This made it quite difficult to produce a stable picture of the rarer pure types, as the matrix showed a definite tendency to revert to a mixed solution. The other difficulty involved the fact that the two dimensions are statistically independent and can be combined only through the linkages of some common variables.

Solutions have been obtained. The patterns obtained for the pure types are less reliable indicators of these types than are those for the mixed types for the first reason given above. They are only a first approximation.

These are the pictures so obtained of an individual or system reacting or responding to an external change by modifying itself.

The most detailed descriptions of these four types of adaptation given by Ackoff and Emery are in the context of families as systems. Although our picture is from an aggregate of individuals, the pictures should show a high degree of consistency regardless of the focus of the description.

Objective-Internaliser

“A family that, as a unit, is objective internalising is likely to be sensitive to the needs of its members, and its members are likely to adapt to each other’s needs. There will be collective sacrifices for the benefit of those who require most assistance. There will be little activity of the family as a whole. Activity of members will tend to be independent. Privacy will be valued and provided to each of the family members. The unit is likely to be entertained by others more than it entertains others. It will not engage in a great deal of social activity. What social activity it has is likely to be confined to a relatively small group of friends. There will be a lot of reading, watching TV, and general exposure to media, because the family will be interested in what is going on around it, but will not intervene in external events and try to direct them”. (p. 130).

Let us take these points one by one:

- *‘Sensitive and Responsive to Others’*
- Our O-I’s are both sensitive and responsive to affect transmitted over the phone.

- *‘Little Activity’*
- This is shown by those clusters about variables 7 and 171.

- *‘Entertainment and Social Activity’*
- Our clusters show low joining activity and high orientation towards TV. However, our data indicates also low degree of reading which is in contradiction to Ackoff and Emery’s hypothesized O-I. Reading and watching TV do not appear to serve the same purpose.

In addition to these points, which show a high degree of consistency, our O-I’s show some other features which fit quite credibly with the basic pattern. Apart from telephone usage which has been discussed above, we have:

- *Variable 201*
- ‘the phone is important for protection and emergencies’.

This is a clear example of adapting oneself and one’s own small world to the larger environment.

- *Variable 187*
- ‘feeling satisfied after having called’ -

is another example. Because these people do not frequently use the phone for work-related purposes they must be using it for more personal reasons and as the pictures show, also because they like using the phone.

This implies that before the call a state of personal dissatisfaction existed in the caller which they believed could be remedied by a personal call which had no other purpose than to make contact with some other human being. In other words, the resulting conversation with its affective

components was sufficient to restore the personal balance between the caller and the outside environment; nothing has strictly changed in this outer environment, only in the psychic reality of the caller.

The light that these results throw on previous studies of telephone use in the literature will be discussed more generally below.

The Subjective-Externaliser- See Figures 11 and 12.

“A family that is subjective externalising will be less sensitive to its members’ needs, and its members will be more inclined to manipulate each other. The members are likely to be more independent of each other; yet they will engage in more collective activity. It is a family that does things together. It will have more social activity, and is likely to entertain more than it is entertained. Its social activities are likely to involve a relatively large number of different people many of whom are acquaintances. There is likely to be a good deal of organised recreational activity of an active sort, such as swimming, boating and picnicking.” (Ackoff and Emery 1972, p. 130).

From Figures 11 and 12 our S-E’s are seen to be insensitive and non-responsive to affect, at least over the phone. As was discussed above, they do use the telephone to manipulate others and thereby affect their environment. They are also shown to be joiners and networkers and enjoy a rich active life. Frequency of calls adds to the picture of these people as initiators of activity, not simply receptors.

It is possible from this description to infer that the reason that the S-E’s prefer face-to-face contact to using the phone is just because they are not highly skilled in picking up the subtleties of affect in others and, therefore, need every possible clue they can get. Or, as we will consider later, they need the controls that can be exerted face-to-face.

Pure Types

Our pictures here are less satisfactory than for mixed types for the reasons outlined above. However, some features do emerge. It will be noted that there are considerably fewer variables than for the comparable figures for mixed types. The cluster of variables around Social Class are not relevant to the Pure Types at the $p < .01$ level.

The Subjective Internaliser - see Figures 13 and 14.

“A family that is subjective internalising will have many characteristics in common with a monastery or nunnery. The home will be a castle with a moat around it. The unit will be withdrawn from its environment and will be an escape from it. Its members will have little interaction; each will want privacy and will respect such a desire on the part of the others. It will have few visitors and its members will visit others infrequently”.

Generally, our picture does not describe as extremely the isolation, introversion and privacy seeking hypothesized by Ackoff and Emery. For example, there is some joining behaviour and the S-I is keen to phone, has some positive image of the telephone and feels satisfied after calling. They do, however, also see the phone as a defence against the outside world which is perceived as dangerous and threatening.

On the other hand, we do have a fairly clear picture derived from social concern and low degree of networking, of the person who is ideas oriented but lacking in action about these ideas. This is the dreamer, the artist, the philosopher, the Yogi, described by Koestler, 1945, p. 10.

“He believes that nothing can be improved by exterior organisation and everything by the individual effort from within”.

As this is a more fundamental characteristic of the introvert than is telephone style and usage, we may have some confidence that we do have an operational definition of this pure type.

The Objective Externaliser - See Figures 15 and 16.

“A family that is objective externalising will have many characteristics in common with an army unit that occupies a barracks. There will be little privacy and little desire for it. There will be a lot of conversation, interaction and group activities. It will be an effusive and overbearing unit, frequently spilling out into its environment and bringing its environment into it. It will have gang-like properties. It will take up causes and be active in community affairs”.

The O-E is as described by Koestler, the Commissar, the opposite to the Yogi: he who lives entirely from Without. To the O-E, words and ideas mean little, he is for changing the world by revolutionary action without reflection. Our pictures give some feelings for this. The O-E here is a busy man of action, unconcerned about social issues. There is little interest in reading or writing personal letters. His use of the telephone is confined to its instrumental value as a media of affecting the environment and there is no pleasure in conversation per se. Nor does he value the telephone as a defence against the world. He is, however, a heavy telephone user for work related purposes.

We find that the O-E shares with the S-E, a preference for face-to-face contact, rather than the telephone, perhaps because the former offers more control. The coincidence of lack of interest in activities which generate ideas and the busy networker is some assurance that the concept is basically sound.

Validation Summary

Our data at the level of the type gives a very close fit to the ideal conceptions of Ackoff and Emery. This applies particularly to the mixed types, less so for the pure. As this is the most critical level of fit for purposes of validation, being the level of the living person rather than of abstract dimensions, it would appear that a reasonably successful operational definition of personality has been achieved.

A Note on the Role of Social Class

It will have been noted in the above analyses that social class has been a relevant independent variable, particularly for the mixed types. This raises some questions. Ackoff and Emery indicated the prospect of “a personality genetics” whereby certain sorts of parents create certain sorts of children who then go on to seek certain sorts of partners. Their hypothesis was more specifically that pressures would be put on children, especially those born into imbalanced families, to conform to personalities which brought the family as a unit further towards centroverson and hence stability.

The only critical test of this hypothesis would have to involve studies of families over time. However, our data indicates very clearly and consistently that personality is associated with traditional measures of social class. The implication of this is that certain sorts of people reproduce themselves. The extent to which these human reproductions are born and/or raised cannot be judged here, nevertheless, the data

indicates that there is a much greater chance of middle class people measuring as Subjective Externalisers and working class people scoring as Objective Internalisers. There can be little doubt that this, as a general phenomenon, is related to educational level and the opportunities for mobilizing potentialities for subjectivising and externalising. The fact that social class in this study is closely associated with gaining a mentally demanding job, doing a lot of travelling, etc., illustrates the role of occupation and occupational status in Australia.

We also have the fact that while social class was highly correlated with the mixed personality types, it fell out of the causal path analyses for pure types. This may, in fact, indicate that both S-E and O-I families are for some reason producing in Australia pure types rather than copies of themselves. This would not occur as the general rule which indicates reproduction in one's own image, but would lead us into a more detailed study of the effect of culture and family dynamics on the creation of certain distributions of personality types.

We shall come to this. In the meantime, it is sufficient to note that for this study social class is acting as a determinant of personality and is responsible to a significant extent for some of the clusters which have emerged.

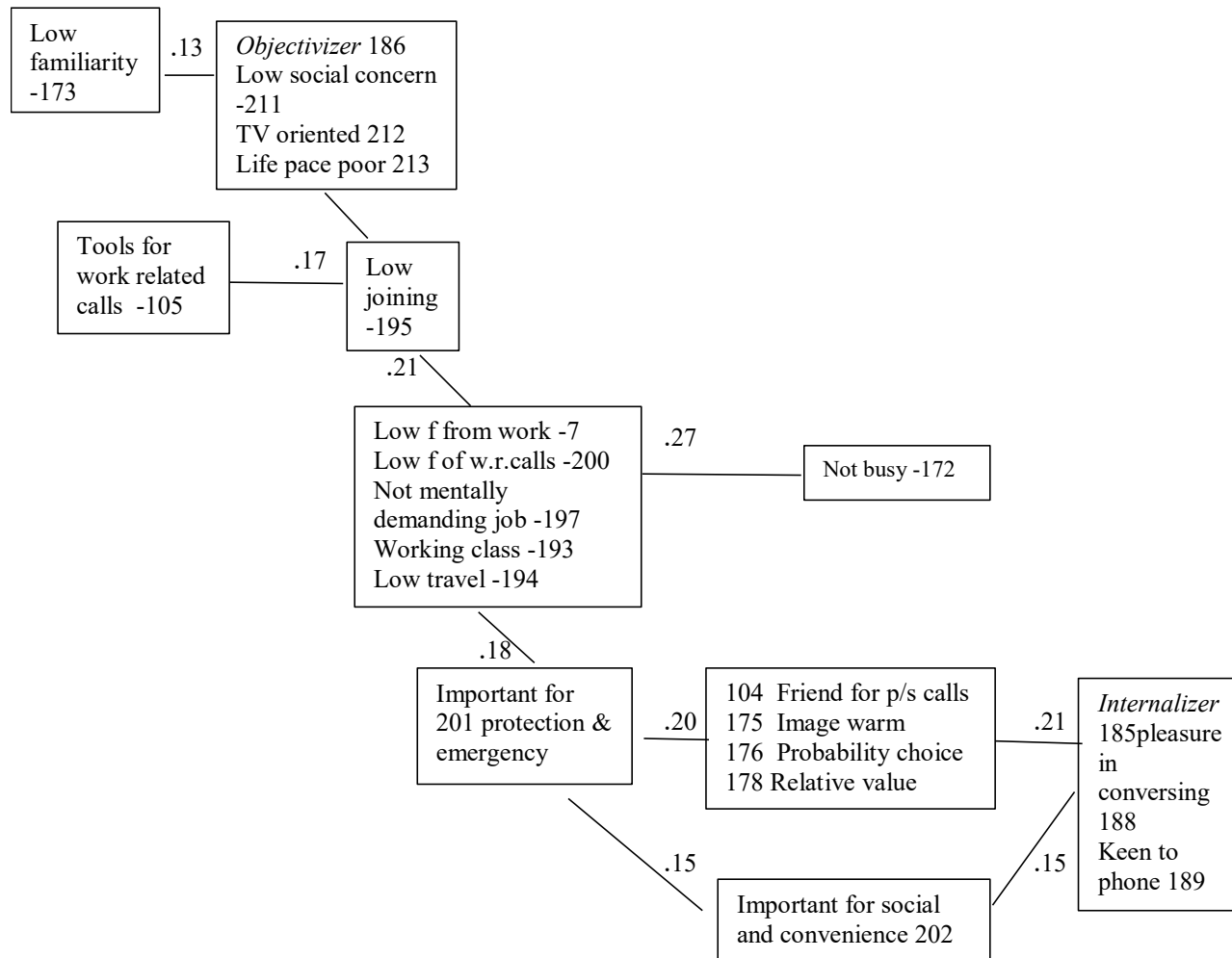


Figure 9. Objective Internalizing

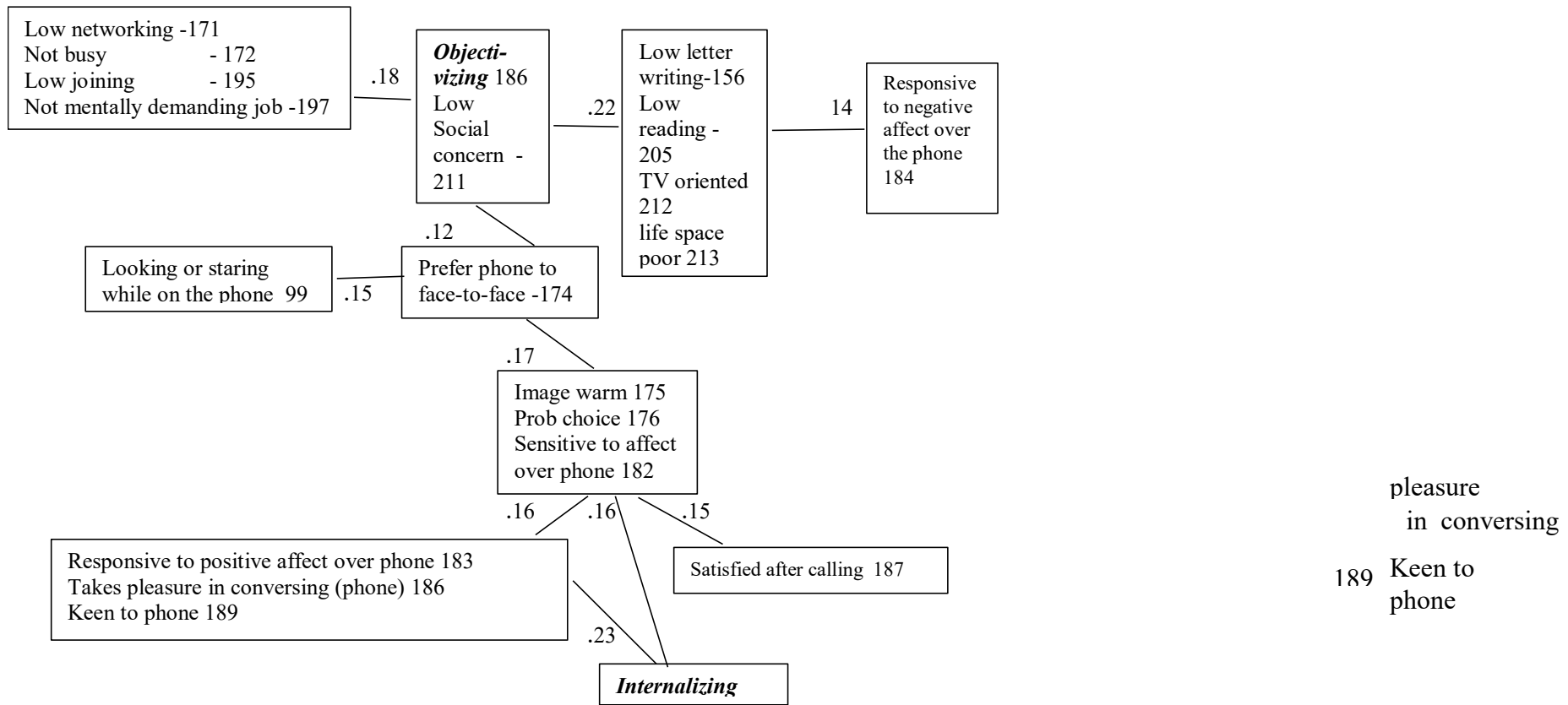
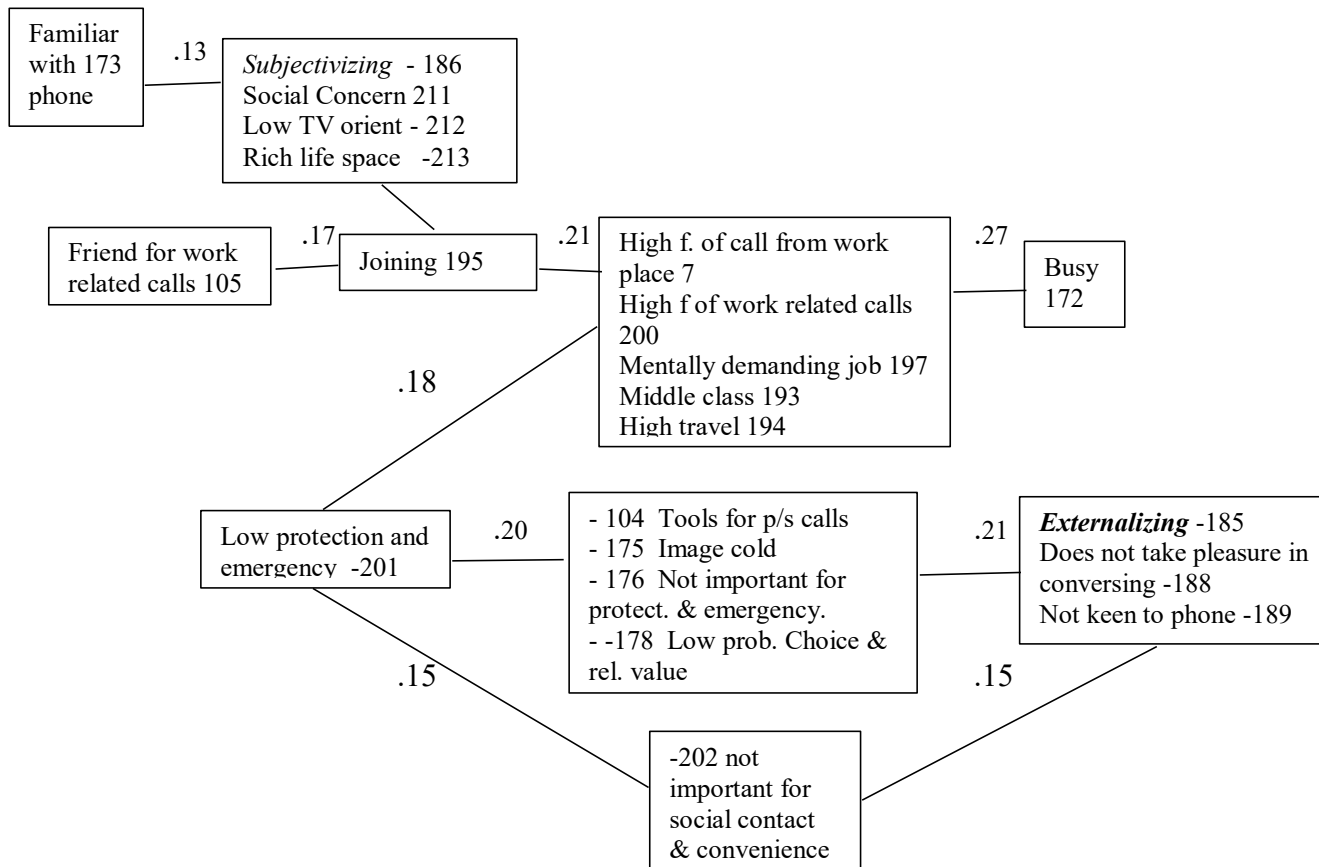


Figure 10. Dynamics. Objective internalizing.



p<.01

Figure 11. Subjective Externalized

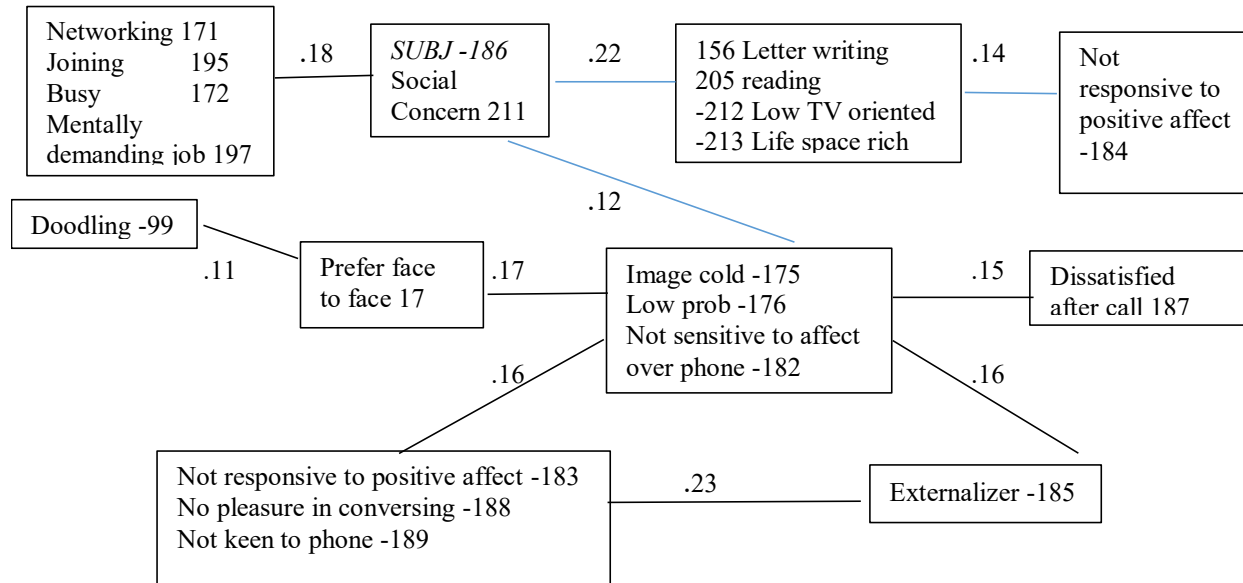
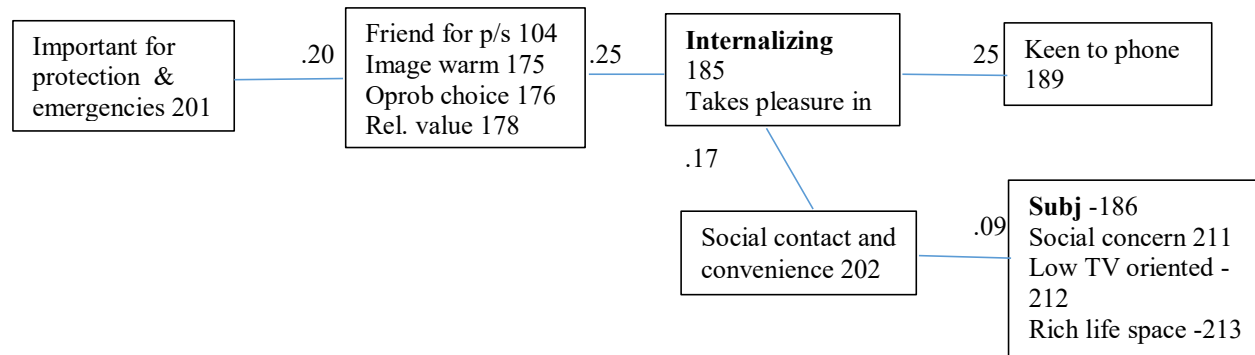


Figure 12. Subjective Externalizer Dynamics



Internalizer p<.01

Figure 13. Pure Types, Subjective

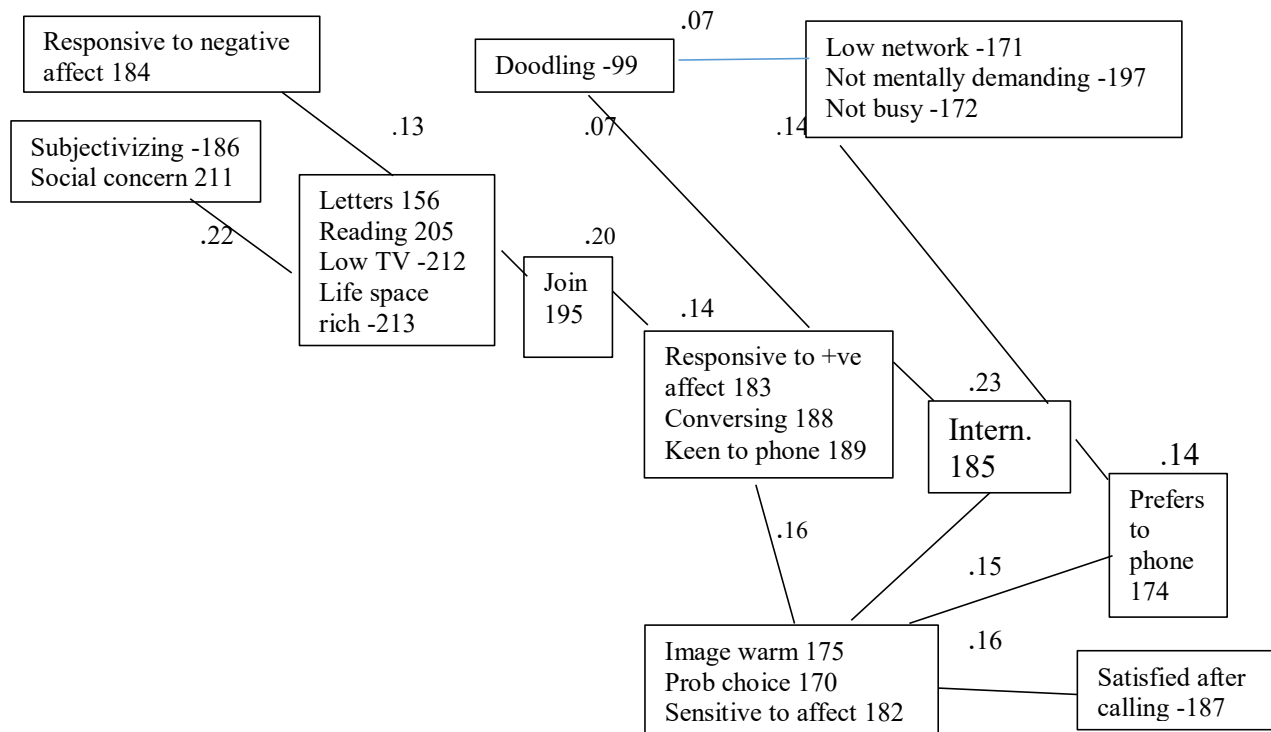


Figure 14. S-I Dynamics

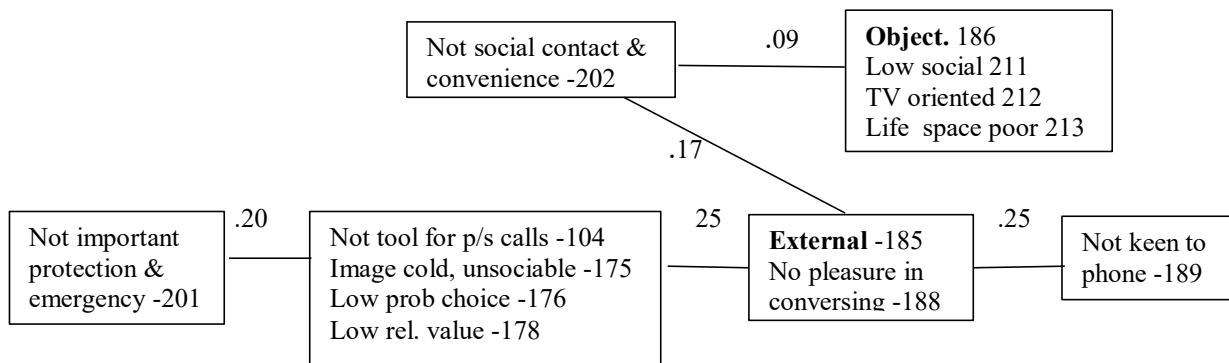


Figure 15. Objectivizing Externalizer $p < .01$

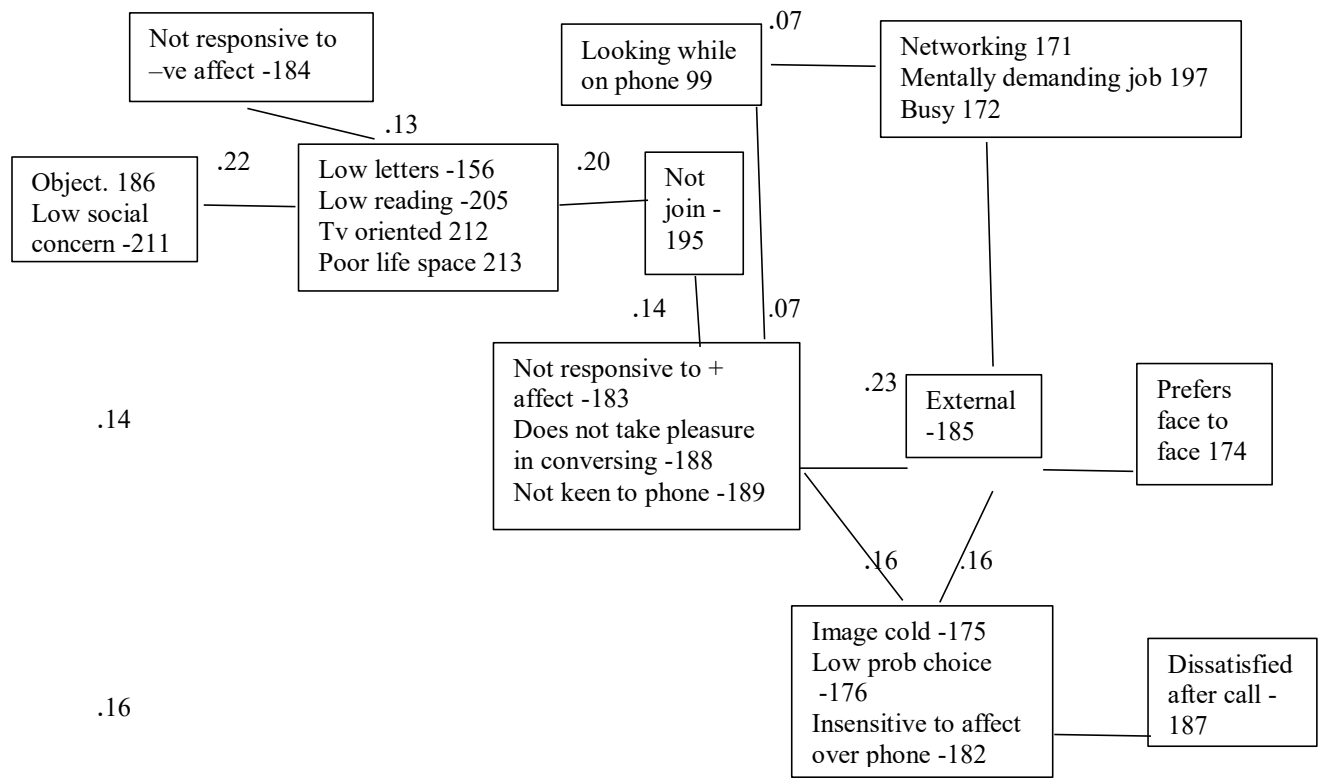


Figure 16. O-E Dynamics

Reliability

Tables 4(a) and 4(b) present several forms of reliability indices.

Table 4(a) presents item and test standard deviation and derived Alpha Coefficients of inter-item consistency.

Table 4(b) presents item-test correlations and the resulting Spearman-Brown measure of internal consistency.

It will be noted that the Spearman-Brown reliabilities are generally higher than the alpha coefficients. This is not a surprising result as the Kuder-Richardson formulas consistently under-estimate reliability relative to other measures. (Anastasi, 1976, p. 118; Guilford, 1965, p. 461). Both indices illustrate that while these indices are satisfactory, there could be some improvement in internal consistency.

To test another aspect of reliability, we have also calculated whether the item-test correlations do, in fact, represent a non-random series across independent administrations of the scales. Table 4(c) shows that for each item we may conclude that the across-sample series of contributions are non-random

Using the Spearman-Brown formula, we have calculated that to raise the internal consistency index to 0.80, we need to increase the number of items on each scale to six and five respectively (Table 4(d)). This should render the scales sufficiently reliable for diagnostic clinical usage. Additional items would, of course, be necessary to raise this index to 0.90, but given the validity data as above, this is probably unnecessary and undesirable. Given that the level of validation must necessarily take precedence over the reliability testing, we would attempt to increase the reliability indices to the extent of risking a lower order of construct validity.

Separately, validation and reliability testing indicate a reasonably successful test construction. Further evidence of achieving a satisfactory joint outcome can be adduced from Guilford, p. 481, quoting from Tucker, 1946. Tucker demonstrated mathematically that, in a set of well-constructed items, item-test correlations will range between 0.30 and 0.80, so that item inter-correlations will range between 0.10 and 0.60. Perusal of Tables 4(b) and 4(c) will show that our figures meet these specifications.

Table 4(a): Evidence of Reliability – Coefficient Alpha*

Name of Sample	Standard Deviations of Items				S.D. of Dimension Ext-Int. V. No. 185	Coefficient L	Standard Deviations of Items				S.D. of Dimension Subj-Obj V. No. 186	Coefficient L
	83	84	85	86			87	88	89	90		
Sample	1.335	1.198	1.345	1.420	3.693	0.646	1.344	1.333	1.281	1.194	3.549	0.629
	1.418	1.540	1.391	1.373	3.440	0.409	1.608	1.422	1.540	1.404	4.031	0.60
Melbourne	1.218	1.599	1.458	1.332	3.840	0.615	1.464	1.603	1.530	1.501	4.217	0.636
Colac	1.418	1.603	1.405	1.425	3.80	0.541	1.589	1.625	1.292	1.285	3.765	0.535
Hobart												
Sydney												

* Coefficient Alpha. Generalised form of Kuder-Richardson Reliability Coefficient. Anastasi, Anne. London. 1976. Pp. 116-118.

Psychological Testing, 4th Ed. Collier Macmillan Publishers.

Table 4(b): Evidence of Reliability – Item-Test Correlations*

Name of Sample	Item-Test Correlations				r_{it} 185. Ext-Int	Item-Test Correlations				r_{it} 186. Subj-Obj
	83	84	85	86		87	88	89	90	
Sample	0.56	0.63	0.61	0.60	0.692	0.58	0.73	0.78	0.61	0.77
	0.57	0.69	0.70	0.63	0.743	0.65	0.75	0.60	0.58	0.74
Colac	0.61	0.80	0.63	0.67	0.772	0.70	0.79	0.79	0.48	0.784
Sydney	0.58	0.71	0.65	0.63	0.737	0.65	0.76	0.73	0.54	0.765
Hobart										
Total File										

* Spearman-Brown. Guilford J.P. Fundamental Statistics in Psychology + Education. 4th Ed. McGraw-Hill Inc. 1965. pp. 463.

Table 4(c): Stability of Item-Test Correlations Across 3 Samples*
(Test-Retest)

<u>V. No. 185</u>	<u>Ext-Int</u>	<u>Mean r</u>	<u>S.D.</u>	<u>r²</u>	<u>n.</u>
Items	83	0.58	0.026	0.0854	n.s.
	84	0.71	0.086	0.9089	n.s.
	85	0.65	0.047	0.2745	n.s.
	86	0.63	0.035	0.1525	n.s.
<u>V. No. 186</u>	<u>Subj-Obj</u>				
Items	87	0.64	0.06	0.4453	n.s.
	88	0.76	0.031	0.1159	n.s.
	89	0.72	0.107	0.3969	n.s.
	90	0.56	0.068	0.5673	n.s.

* Tippett, as above p. 180. Comparable data not available for Melbourne sample.

Table 4(d): Additional Test Items Required to Bring Reliability to 0.80*

	<u>Present R from Total File</u>	<u>Required R</u>	<u>n.</u>
V. No. 185 Ext-Int	0.737	0.80	1.427
V. No. 186 Subj-Obj	0.765	0.80	1.229

* Spearman-Brown. Guilford, as above p. 465. n = number of times test must be lengthened.

The Distribution: Age and Sex

The distribution of scores is as follows in Figure 17. In each of the following analyses, individuals whose scores fell on an internal line have been counted into the appropriate “mixed type” quadrant. The sample contained three male centraverts who have not been included in most tabulations and whose exclusion brings the number of males from 96 to 93. These centraverts were aged 16-20 years, 31-35 years and 61-65 years.

		SUBJECTIVERT (S)				OBJECTIVERT (O)				
		<u>Age</u>				<u>Age</u>				
		<u>16-25</u>	<u>26-35</u>	<u>36-55</u>	<u>56+</u>	<u>16-25</u>	<u>26-35</u>	<u>36-55</u>	<u>56+</u>	
INTERNALIZER (I)	Male N	4	2	3	2	Male N	7	2	3	7
	Female					Female				
	N	6	2	7	4	N	8	11	14	11
		N=30				N=63				
EXTERNALIZER (E)	Male N	8	15	17	3	Male N	4	4	8	4
	Female					Female				
	N	8	6	6	0	N	2	5	3	3
		N=63				N=33				

Figure 17. Distribution of Personality by Age and Sex

A plot of all individual scores showed that the test is measuring adequately across all positions from the point of centroversion to the extremes of the quadrants. The distribution is not random. ($X^2=21.04$, d.f. =1, $p<.001$).

From work done in UK and the USA, Ackoff and Emery estimated that approximately 80% of the population would be mixed types, i.e. O-I's and S-E's. Our Australian sample shows mixed types accounting for only 65.6% of the population. As we do not have strictly comparable figures for other countries based on this test, we cannot be too precise but there are certainly grounds for speculation that there are factors in Australian culture which lead to an unexpectedly high proportion of pure types, particularly O-E's who account for 17.2% of the sample.

	S	O
I	N 16-35 years = 14 36+ years = 16	N 16-35 years = 28 36+ years = 35
E	N 16-35 years = 37 36+ years = 26	N 16-35 years = 15 36+ years = 18

Figure 18. Distribution of Personality by Age

There are no significant age differences between S and O and between E and I. There are also no significant differences in the distribution of ages between pure and mixed types. However, Ackoff and Emery put forward a more specific hypothesis regarding the influence of age in the concept of Centroversion and we shall deal with that below after examining sex differences.

	S	O
I	M=11 F=19 (30)	M=19 F=44 (63)
E	M=43 F=20 (63)	M=20 F=13 (33)

$$X^2=21.04. \text{ d.f. } =1. \text{ p}<001$$

Figure 19. Distribution of Personality Quadrants by Sex

The distribution shown in Figure 19 is again non-random. For the mixed types, females are 69.8% of the O-I population and males are 68.3% of the S-E population. For the pure types, females are 63.3% of the S-I population and males are 60.6% of the O-E population.

Figure 20. Distribution of Personality Dimensions by Sex

	S	O		I	E
Male	54	39	Male	30	63
Female	39	57	Female	63	33
$\chi^2=5.75, \text{ d.f.}=1, \text{ p}<.02$			$\chi^2=21.04, \text{ d.f.}=1, \text{ p}<.001$		

Figure 20 gives the distributions for the dimensions separately and as can be seen from the X^2 's, the I-E dimension has relatively more influence over the sex distribution than does the S-O scale.

As noted above, our Australian sample had more pure types than expected. It can be seen from these distributions also that our sample contains more O-E's than expected as this is known to be a heavily masculine predisposition.

Centroversion – The Centre of the Personality Space

Ackoff and Emery (1972, p. 123) put the concept in these terms:

“The closer an individual approaches to this (centroversion) the more he is responding to and seeking to modify an integrated reality of his psychic world and his environment. This we believe is what constitutes psychological maturity and strength”.

More specifically, they went on to state that pure and mixed types would move differently over time; the pure types modifying themselves out towards the edges of the personality space and the mixed types moving towards centroversion.

While ideally this hypothesis should be tested longitudinally our data did allow one test. To this end each individual's position was plotted in the personality space and the distance between this position and the point of centroversion was measured in millimeters to the nearest mm. These distances then allowed us within the confines of our static data to test the hypothesis for age and sex and interactivity. Table 5(a) contains the mean distance from centroversion for age and sex groups and the standard deviations for these mean scores.

The asterisks on the right hand side of the table indicate the cases where the means were in the expected direction. In only two cases were they not. Both these cases concerned O-I's. It is possible that this is an example of a strong cultural phenomenon overlaying this basically genotypical nature of the score. The current and increasing concern for nurturance and traditional feminine-value based relations, both interpersonal and person-environment, may have been internalised sufficiently to arrest moves of O-I's towards centroversion. The sensitivity group culture which has been booming in Australia for some years may also well be filling a necessary cultural gap imposed by environment and historical pressures. If this cultural gap or limitation has been a feature of Australian culture, then we would expect that it would be O-I's who have been most sensitive to it, and most likely to internalise it.

Table 5(a) Distance from Centroversion (in millimetres)

Sex and Type		Age Groups			Rate of change($m_1 - m_2$) (m_1)
		1-4	5-12		
Female SI	x	153.38	159.55	*	0.04
	s	52.45	70.70		
Female OE	x	114.57	150.33	*	0.238
	s	58.91	30.64		
Female OI	x	106.53	116.08		0.082
	s	61.99	48.31		
Female SE	x	120.5	93.0	*	0.228
	s	52.64	31.75		
Female SI + OE	x	136.33	156.29	*	t = 3.758
	s	57.50	58.63		
Female OI + SE	x	112.45	111.61	*	
	s	57.76	46.05		
Male SI	x	107.67	109.2	*	0.014
	s	42.55	74.30		
Male OE	x	124.13	169.83	*	0.269
	s	45.34	44.83		
Male OI	x	102.11	126.1		0.10
	s	53.68	69.14		
Male SE	x	151.57	115.25	*	0.24
	s	67.53	44.89		
Male SI + OE	x	117.07	152.0	*	t = 7.0608
	s	43.29	59.77		
Male OI + SE	x	137.66	122.89	*	t = 5.315
	s	67.01	51.81		

Overall the centroversion hypothesis is confirmed. Table 5(b) shows that all pure types are further from centroversion than all mixed types, and that this differs with aged in the expected direction.

Table 5(b). Means and SD's of Distance from Centroversion for Pure and Mixed Types

	Age		
	Gp 1-4	Gp 5-12	
Male + Female Pure	127.03	154.15	For one-tailed test t = 10.7966, p<.01
Male + Female Mixed	58.18	58.34	t = 7.5284, p<.01
	124.86	115.18	
	63.28	49.42	

We can now place some confidence in the fact that S-I's and O-E's will experience greater difficulty in integrating self and environment over time and conversely, that O-I's and S-E's will tend towards self-corrective and integrative behaviour over a chronological period.

Australian Culture

Table 6 gives the difference between the Australian distributions observed in this study and those expected from studies in UK and USA. This test was not available in that early work but some of the differences are large. Australia appears to have more than expected SIs and Oes, ie. the pure types, and too few OIs, particularly female. There is an opportunity here for further research into the nature of Australian culture and predispositions.

Table 6. Cultural Differences

		S		O	
		UK/US	AUST.	UK/US	AUST.
Female	I	10	19.8	65	45.8
	E	20	20.8	5	13.5
Male	I	5	11.8	25	20.4
	E	55	46.2	15	21.5

NB: These are percentages of each sex.