LOCUS OF CONTROL AND SCHIZOPHRENIC ADJUSTMENT: A DIMENSIONAL ANALYSIS

By

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ABSTRACT

The literature indicates that: (i) locus of control is a multifactorial construct; and (ii) psychological maladjustment is associated with a generalised perception that reinforcements are not personally controlled. Little is known regarding the importance of the identified factors to psychopathology. The relationship between locus of control and adjustment is empirically well established but void of theoretical basis. The present study proposes a bridge between locus of control and Seligman's theory of learned helplessness.

Forty hospitalised psychiatric patients (diagnosed schizophrenic) and forty persons chosen randomly from a voter's roll ("normals") were administered tests of locus of control; namely, the Internal-External scale (Rotter, 1966). The Internal, Powerful Others and Chance Scale (Levenson, 1972) and the Interpersonal Trust Scale (Rotter, 1967). The Psychotic Reaction Profile (Lorr, O'Connor and Stafford, 1960), a behavioural questionnaire, was completed for each patient.

The results suggest that a multidimensional analysis does not add substantially to an understanding of the relationship between locus of control and psychological adjustment. It is however arguable that the study casts doubt on the utility of existing measures rather than the dimensions as such. Support was provided for the hypothesis linking locus of control to behavioural symptoms of learned helplessness.

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INTRODUCTION

INTRODUCTION

The concept of locus of control.

Locus of control emerged as a clinical concept in the early 1950's. The construct was originally prompted during the treatment of a patient whose behaviour and expectations, although reinforced, resisted modification. Throughout therapy, which aimed to improve social competence, the patient showed a consistent pattern in his interpretation of reinforcing events. Social successes (such as getting a job or dating) were perceived by the patient as independent of his own behaviour and explained as being a result of external agents. New behaviours taught in therapy met with frequent success but appeared not to affect expectations of future success. Little progress was made in therapy (Phares, 1976). The possible importance of the perception of locus of control as a variable influencing learning and behaviour was apparent.

Research which followed concentrated on locus of control as a personality characteristic. Scales to assess such interpersonal differences developed by Phares (1955) and later James (1957) provided an impetus for early experimentation. Rotter's Internal-External (I-E) Scale (1966), has undoubtedly been the most widely used and thoroughly investigated measure of locus of control dominating research in the area. The I-E scale itself is taken to be the operational definition of locus of control.

The definition which guided preliminary work into the development of a locus of control scale is expressed by Rotter (1966) as the following:-

> When a reinforcement is perceived by the subject as following some action of his

> but not being entirely contingent upon his action, then in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labelled this a belief in external control. If the person perceived that the event is contingent upon his own behaviour or his own relatively permanent characteristics, we have termed this a belief in internal control. (p. 3.)

The dimensionality of locus of control.

Later studies have questioned the unidimensionality assumption of the construct.

1. Investigation has shown externals to be less homogeneous as a group than internals (Hersch and Scheibe, 1967).
2. Components of the I-E measure vary across cultures, even if the total scores do not differ significantly (Parsons and Schneider, 1974; Parsons, Schneider and Hansen, 1970).
3. Factor analyses have repeatedly found the Internal-External (I-E) Scale to be multidimensional (e.g. Mirels, 1970; McDonald and Tseng, 1971; Viney, 1974).

As a result of these findings a number of studies in recent years have utilised various measures conceptualizing different structures of locus of control. The present study utilises three multidimensional analyses.

1. Two factor analytically derived subscales of the I-E

measure based upon the findings of Mirels (1970).

Although it is not possible to argue that this dichotomous model is the only consistent factor pattern to emerge, it is important to note that the results attained by Mirels (1970) has received considerable support from replications (Viney, 1974; McDonald and Tseng, 1971; Reid and Ware, 1973; Strahan and Huth, 1975; Hrycenko and Minton, 1974). The two factors are labelled "Personal Control" and Socio-political Control".

2. The tripartite separation of locus of control founded upon a phenomenological distinction (Levenson, 1972).

Levenson proposes that the belief in the control of reinforcements by powerful others and the belief in the control of chance ought not to be considered as "equivalent" external viewpoints. The belief in chance, it is argued, is a belief in the lack of structure and predictability of reinforcements whereas the belief in the control of powerful others indicates that reinforcement, even though out of the hands of the individual, follows a discernable pattern. Two separate (Powerful Others and Chance) scales measure the belief in assessing the strength of each of these attitudes. A third scale is used to measure belief in internal control (Internal scale).

3. Externality divided into "defensive" and "congruent" responding.

Some externals behave in a fashion expected more of internals (i.e. striving and active). Rotter's (1975) explanation of this phenomenon is that active externals use externality as a defense mechanism

allowing them to project blame and avoid responsibility for failure. It is suggested by Hamsher, Geller, and Rotter (1968) and Hochreich (1974; 1975) that trust may be utilised as a moderator variable to differentiate this subgroup. The argument is that, after repeatedly projecting blame on others, an individual will adopt a less trusting attitude or at least a verbally expressed distrust of others. A generalised measure of trust, Rotter's Interpersonal Trust Scale (ITS) is used for the purpose of distinguishing the external subgroups, the defensive and the congruent or "true" externals.

Locus of control and psychological adjustment.

Considerable research has confirmed a relationship between locus of control and various indices of adjustment.

Perception of control of reinforcement has been shown to correlate with self-report measures of anxiety (Butterfield, 1964; Feather, 1967; Ray and Katahn, 1968; Watson, 1967) and adjustment (Hersch and Scheibe, 1967; Platt and Eisenman, 1968; Wall, 1970; Crego, 1970; Goss and Morosko, 1970; Burnes, Brown, and Keating, 1971). Locus of control has also been found to be related to clinical diagnosis (schizophrenics being the most external:Harrow and Ferrante, 1968; Duke and Mullens, 1973) as well as behavioural assessments of psychiatric disorder (Shybut, 1968; Smith, Pryer and Distefano, 1971).

Aspects of this association between locus of control and adjustment remain problematic.

Empirically, the relationship lacks specificity. Firstly, most research has treated locus of control as a unitary

measure. As noted, a great deal of evidence implies the scale to be of multidimensional character. Further, "adjustment" is a rather broad concept which does not facilitate precise understanding. The author follows Lorr, O'Connor and Stafford (1960) in contending that a single score for adjustment, as used in some tests and behavioural rating scales, is a rather meaningless conglomerate. The present research investigates the relationship between the various components of locus of control and factor analytically derived dimensions of severe pathology.

The theoretical link between the wide ranging notion of "adjustment" and locus of control is necessarily tenuous. In an attempt to provide a possible base from which to assimilate research findings relating the perception of external control and indices of psychological maladjustment, the present study makes use of Seligman's model of learned helplessness to account for the effects of uncontrollable aversive stimulation. The impact of the experience of uncontrollability of reinforcements described by Seligman (e.g. Seligman, 1975) will be assessed in terms of this relevance to locus of control. The constructs of learned helplessness and external perception of control are undoubtedly very similar. Perceived locus of control is here taken to be a personality predisposition influencing the development of learned helplessness.

The nature of the symptoms of learned helplessness suggests a more specific formulation for the association between locus of control and adjustment. In particular, the experimental hypothesis that externality is associated with depressed levels of behaviour, rather than maladjust-

AIMS OF THE STUDY AND EXPERIMENTAL HYPOTHESIS

The areas of particular interest are:

1. The dimensionality of locus of control.

Little is known about the similarities and differences between the various conceptualisations of expectancy of control of reinforcement. Almost no attention has been paid to the question regarding the applicability of findings across the scales of perception of reinforcement. The present study investigates the inter-relationships between the dimensions and the validity of each with specific reference to their association with schizophrenic adjustment.

Hypothesis 1

Dimensions of locus of control are differentially related to indices of schizophrenic adjustment.

It might be expected that the Personal Control Factor and Internal dimension will be most closely linked to psychological health.

2. Locus of control and psychological adjustment.

It is a well corroborated finding that diagnosed schizophrenics are more external than normals and other psychiatric patients (Harrow and Ferrante, 1968; Duke and Mullens, 1973; Shybut, 1968). Further, externality has repeatedly been shown to be associated with indices of adjustment (mostly self-report) amongst non-schizophrenics.

On the basis of these findings the following general postulate is formalised.

Hypothesis II (a)

A generalised expectancy of external locus of control is associated with indices of maladjustment and the

severity of the schizophrenic disorder.

Specifically,

Group differences: Schizophrenics are more external than normals.

Clinical indices: Externality is associated with patients

(i) from closed wards.

(ii) admitted to a psychiatric institution at an early age.

(iii) having longer (total) periods of hospitalisation; or

(iv) with a greater number of admissions.

Behavioural correlates: An external locus of control correlates positively with behavioural indices of the severity of a schizophrenic disorder.

Findings have repeatedly linked locus of control and "adjustment". The breadth of the notion of adjustment necessarily limits the development of an understanding of the relationship between perception of reinforcement and psychological health. The present study postulates that a restriction upon the range of psychopathologies associated with a belief in the lack of control of personal reinforcements. The limits placed upon maladjustment rest upon Seligman's model of learned helplessness and extend only to disorders of depression/withdrawal and anxiety.

Hypothesis II (b)

An external locus of control of reinforcement is associated only with symptoms of learned helplessness, that is depression and anxiety.

Behavioural correlates: Externality correlates positively with only:

(i) the Withdrawal scale - a measure of depressed levels of activity; and

(ii) the Agitated Depression scale - a measure of manifest anxiety and depression.

Hypothesis II (b) is an alternative to the empirically based Hypothesis II (a).

REVIEW OF LITERATURE

THE DIMENSIONALITY OF LOCUS OF CONTROL

EVIDENCE FOR A SINGLE DIMENSION

The factor analysis that had been completed before Rotter's (1966) paper indicated that the total variance of the I-E scale could be attributed largely to one general factor. Franklin (1963), an unpublished study quoted in Rotter (1966), using a large high school sample (N = 1000), found a general factor accounted for 53% of the total scale variance. Additional factors contributing a small degree of variance were considered not to be sufficiently reliable to infer any subscales within the test.

A later study which modified the Rotter forced choice format into a six-point Likert rating scale also found a single dimension to account for a substantial proportion of the total scale variance (Joe and Jahn, 1973). The alteration provides a greater variability in item scores which allows for the analysis to involve the computation of product moment correlations rather than the less sensitive phi correlations. The Varimax rotation method yielded two factors each for males and females. Factor I accounted for 42,2% and 45,5% of the total variance for males and females respectively. The variance accounted for by the smaller second factor was in the region of 18% for both sexes. Joe and Jahn conclude that the emergenece of a strong first factor lends credence to the validity of the I-E scale as a broad generalised measure.

EVIDENCE FOR MORE THAN ONE DIMENSION

The heterogeneity of externals relative to internals.

It was originally assumed that a person believing in the control of forces outside of himself would be characterised as being relatively passive and not achievement orientated (Rotter, 1966). Studies reported by Rotter (1966), however, showed externals to have a wide spread of scores on college entrance (achievement) tests including some subjects with very high scores. In other words some externals acted in a manner expected of internals whilst others behaved as expected of externals. That this did not represent the absence of validity of the locus of control (LOC) construct but rather the unintentional combination of different groups as one, was suggested by the high variability of scores of externals as compared to internal subjects. Rotter (1966) refers to active internals as "defensives" inferring from the test responses a tendency to use externality as an ego defense mechanism.

Hersch and Scheibe (1967), using the Adjective Check List, found that internals, as a group, presented a fairly coherent and consistent picture of themselves as active, ambitious, and independent. Internals were significantly higher scorers on 23 adjectival self-descriptions. Externals were significantly higher on only one, "self pity".

The success of the I-E scale in predicting a wide range of behaviour.

It has been argued that the extent of the range of behaviours found to be related to the I-E scale implies the multi-dimensional nature of the measure (Viney, 1974). For

example, LOC has been found to be related to such diverse behaviours as academic performance, attribution of responsibility following failure, psychological adjustment and political activism.

Although Viney's interpretation may be correct, these usually low but significant correlations between LOC and a multitude of criteria could alternatively be understood as the expected weak associations with a single very generalisable measure as proposed by Rotter (1966; 1975).

Cross cultural evidence.

Two cross-cultural investigations have found differences in the pattern of responding to the I-E scale. (Parsons, Schneider and Hansen, 1970; and Parsons and Schneider, 1974).

Parsons, Schneider, and Hansen (1970) could find no difference in the general level of internality manifested by Danish and American students. Even though the two societies differ widely in governmental control, no differences in total locus of control were noted. The pattern of scoring however, was quite different in the two populations.

The percentage of subjects in each national group scoring in the external direction was calculated for each of the 23 items. Variations between these percentages for the groups indicate discrepancies in cultural responding. For males, percentages differed significantly on 10 of the items. For females, nine items were significantly different. Thus although total I-E scores were similar between the national groups, considerable differences in pattern of responding to individual item is apparent.

A later study by Parsons and Schneider (1974) analysed

responses of students from eight counties to Rotter's I-E scale. Translations of the questionnaire were checked and modified through the method of back translations. Significant differences were observed in the overall I-E scores. Students from Japan were more external than students from the other countries. The pattern of response analysis indicated that in some countries, the degree of externality varied widely over the 5 subscales. For instance Japanese students were, of all the groups, most external on the "Luck-Fate" and "Respect" subscales but were second most internal on the "Leadership-Success" subscale. The degree of associations among the countries' rankings on the subscales was statistically tested using Kendall's coefficient of concordance (W). The obtained rank order correlation, W, was 0,35 and not significant. Further, low order correlations ranging from 0,14 to 0,22 between the subscales were reported.

The lack of concordance among countries over the subscales as well as the low order correlations found to exist between the subscales, leads Parsons and Schneider (1974) to conclude that the I-E scale is multidimensional rather than unidimensional.

Factor analytic studies.

The factor structure of the Internal-External scale has received considerable attention, particularly after the Mirels (1970) study which identified two orthogonal factors. This contradicted the earlier findings of Franklin (1963). The powerful evidence in favour of a multidimensional

conception of locus of control is outlined in the following section.

THE DIMENSIONS OF THE PRESENT STUDY

A Two Factor Structure of the I-E scale.

Factor analytic studies.

Mirels (1970) factor analysed the 23 I-E item responses of 159 college males and 157 college females. Separate analyses yielded two independent factors for both males and females. For the male sample, Factor 1 accounted for 10,9% of the total variance and Factor II, 8,6% of the variance. The respective figures for the female sample were 12,1% and 6,7%. There was a coincidence of items loading highest on the two factors for males and females.

The content of the items loading highest on Factor I concern the respondents' perception of the importance of ability and hard work, as opposed to luck, as influences which determine personally relevant outcomes (e.g. Item 15 "In my case getting what I want has little or nothing to do with luck" vs "Many times we might just as well decide what to do by flipping a coin").

Factor II, in contrast, deals with the subject's belief regarding the control individuals have on political affairs (e.g. Item 12 - "The average citizen can have an influence in Government decisions" vs "The world is run by the few people in power and there is not much the little guy can do about it").

Mirels (1970) found that the six items which loaded highest on Factor I were identical for both sex. The same was true for four of the five items of Factor II. McDonald and Tseng (1971) repeated this result.

Of the six items which emerged in Mirels (1970) as

loading highest on Factor I for both sexes, five were also identified by McDonald and Tseng on the same criteria. Two of the four items were identified from Factor II. Inspection of items loading most highly on the factors of McDonald and Tseng indicates a very strong resemblance to the structure suggested by Mirels (1970);that is, "Personal" and "Socio-political" factors. The first factor accounted for 15%, whilst the second factor accounted for only 5% of the total scale variance for the mixed college student sample.

Reid and Ware (1973) replicated these findings in two independent experiments. In the first, the I-E scale was mailed to weight reducing clubs in Canada. The sample comprised 130 women between the ages of 20 and 55. A variance rotation was used on the first two factors with eigenvalues larger than 1,0. Factor I, called "fatalism" appeared to measure "Luck, fate, and fortune" versus "ability, hard work and personal responsibility". Factor II called "social system control" contained items concerned with the belief that people are controlled by social system forces such as the decisions of politicians.

The second experiment, attempting to increase the number of items for the social system control factor, added 8 new items; slightly reworded 9 and dropped one of the original I-E scale items. The responses of 85 Introductory Psychology students to the modified (30 item) test were factor analysed. The new test was successful in developing additional items which loaded highly on one or other of the factors. Neither the change in sample or alterations to the I-E scale appreciably affected the factor structure which

emerged.

This multidimensional structure of the I-E scale has been backed by at least four other studies.

Viney (1974) administered Rotter's I-E scale to two adolescent Australian samples. A "personal responsibility" factor and a "social responsibility" factor emerged in both the male and female samples. Taken together the two factors account for only 15% of the full scale variance for the male sample and only 19% of the female sample. The structure and amounts of variance attributable to the components is similar to Mirels (1970).

Following a principal components analysis of the correlational matrix of the 23 items of the I-E scale, Hrycenko and Minton (1974) used the variance method to rotate with an eigenvalue larger than 1,0 to orthogonal structure. Two factors emerged accounting for approximately 11% (Personal Control) and 5% (System Modifiability) of the total scale varience for college samples (both sexes). investigation of the I-E scale using a fairly small mixed sample of college students (N = 82) obtained eight factors exceeding 1,0. (Strahan and Huth, 1975). Following a variance rotation the large first two components were shown to be very similar to those found by Mirels (1970).

The dichotomous nature of LOC is further substantiated by Cherlin and Bourque's (1974) study. Two samples (one from a college population; the other randomly selected adults from a residential area) completed the I-E scale. On analysis of the I-E item responses both groups displayed similar item clustering which were labelled as "political control" and "general control." The number of factors was identified:

firstly, through an examination of the magnitude of the eigenvalues(1,0 was used as a guideline, although slightly larger and slightly smaller subjects of factors were considered); and

secondly, in terms of the meaningfulness of the various rotated structures.

Differential validity of the factors

The factors originally identified by Mirels (1970) if sufficiently independent, should be differentially related to relevant criterion variables. Research assessing such differential associations of Factor I and II is somewhat thin. Regarding the discriminant validity of the two factors, predictions have been made with respect to the following diverse parameters.

1. Drug addiction.

Berzins and Ross (1973) compared the perceived control of reinforcement of opiate addicts and a group of college students. Addicts were found to be more internal than students. This was interpreted as being a derivative of drug experiences and not the result of social learning. As predicted, when broken down into the scores based on the Mirels item clusters, differences were shown to occur primarily on the personal rather than the socio-political dimension.

2. Attribution about yielding and resisting persuaion targets.

Cialdini and Mirels (1976) had subjects attempt to influence the attitude of a confederate who either yielded to or resisted persuasion. It was hypothesised that

subjects would tend to like (that is, rate as more attractive and intelligent) another whose behaviour confirmed their perception of personal effectiveness, and dislike another who violated such expectancies. Perceived personal control was measured by Mirels's Factor I. As expected high personal control persuaders rated the yielding target as more intelligent and attractive than did matched observers. This attributional pattern was completely reversed for low personal control persuaders, who gave more favourable ratings to the resisting than to the yielding target.

This kind of interaction pattern has not been demonstrated in similar studies utilising the entire Rotter I-E scale. A review of this data by Miller and Ross (1975) notes the contradictory nature of the findings when the global locus of control measure is used. Cialdini and Mirels claim that, in the study of personality determinants of perceived causes for the results of one's own behaviour, the personal control rather than the political control factor is a more relevant dispositional variable. The exclusion of the latter might then be expected to result in a reduction of error variance.

3. Socio-political activism .

It could be expected that political participation might be related to an internal perception of control of reinforcement. Results inconsistent with this position have however been reported (Thomas, 1970; Evans and Alexander, 1970; Rotter, 1966). Abromowitz (1973) utilised a multi-dimensional analysis to re-examine the relationship between locus of control and commitment to political action. Two indices of political commitment were used: actual

engagement and desired involvement in political activities. Both measures were predicted by scores on Factor II, the political items, but not by scores on the non-political items or the full I-E scale. Correlations with Factor II were significant at the 0,01 level.

4. Age change.

Until Mirel's two factors were separated, Wilkens (1975) found no significant shift in I-E scores after a 10 year period amongst a group of undergraduate students originally tested in 1964. It then appeared that externality had increased on the socio-political factor but not on the personal control factor. This was consistent with the hypothesis that, on leaving college, the individual will be exposed to societal forces which may well increase his feelings of the influence of social and political factors.

5. Age and marital status.

Further evidence that the two factors may be discriminated by their association with other variables is provided by Boor (1974).

(a) Married college students were found to be significantly more internal on Factor I and the total I-E score than unmarried subjects.

(b) Both factors correlated negatively with age for females but only Factor II was inversely associated with age for males. Factor I was unrelated to age.

Although age and maritial status are differentially associated with Factors I and II, no rationale is given for the meaning of this discrimination.

6. Academic achievement.

Boor (1973) administered the I-E scale to 55 male and 61 female introductory psychology students. These scores were correlated with psychology year marks. The relationship of scholastic performance to Factor I and II was also investigated.

For females, the total I-E, Factor I and II scores were not related to examination results and intelligence. Amongst the male students, the full I-E scale and its subscales were all significantly correlated to examination and intelligence scores. Partialling out intelligence, however, left the examination performance significantly correlated with the total I-E and Factor II scores ($r = -0,23$ and $-0, 27$), whereas Factor I became nonsignificant ($r = -0,15$). The differences were thus small but opposite to the predicted direction. The discriminant validity of the subscale factors of the I-E scale is not supported.

Correlations between Factors I and II

It has been repeatedly claimed that the factor analytically derived measures concerned with personal control and socio-political control first identified by Mirels (1970) are orthogonal. (Mirels, 1970; Viney, 1974; McDonald and Tseng, 1971). Correlational data based upon the items loading highest on the two respective factors has not provided consistent support for this contention.

Listed below are results from five samples. In interpreting these findings it must be borne in mind that: a factor cannot be considered as equivalent to the highest loading items, and

items are selected on the basis of Mirels (1970) and factor structure tends to vary across populations.

It can thus be expected that slightly above zero correlations may be obtained.

Table 1: Correlations between Factors I and II

STUDY	SUBJECTS	CORRELATION
Boor (1974)	College students	0,36**
Abromowitz (1973)	College students	0,04
Gootnick (1974)	College students	0,29**
Wilkens (1975)	a.College students (1964)	0,44**
	b.College students	0,24

** $p < 0,01$

Levenson's Three Dimensions of Locus of Control

1. Factor analytic studies

Unlike the two dimensions identified by Mirels, which were derived from factor analytic studies, Levenson's tripartite conceptualisation of locus of control is based upon a phenomenological distinction. Levenson (1972) proposes that"... people who believe the world is unordered (chance) would behave and think differently from people who believe the world is ordered but that powerful others are in control. In the latter case a potential for control exists." (p. 261.) Further, Levenson expected cognitive and behavioural differences between the person who believes that he himself is not in control and one who feels that luck is in control. In other words the proposal is that the Internal and Chance scales are not equivalent bipolar dimensions.

Two factor analytic studies have been conducted by Levenson on the 24 items comprising her multidimensional locus of control scale. (Levenson 1973; 1974)

Levenson (1974) administered the I,P and C subscales to 329 males undergraduate students enrolled in an introductory chemistry course. Initially seven Varimax factors accounting for more than 50% of the variance were isolated with eigenvalues of more than 1,0. Considering the first three factors alone, the item clusters which emerged corresponded very closely to the subscales. The first factor, accounting for 16,8% of the total variance consisted entirely of P scale items of the I scale. The third factor accounted for 6,4% of the variance and included only C scale items. There was almost no overlap of items on the first three factors. There was only one exception

(item 20) which had equally high loadings on the first two factors.

From Levenson's other factor analytic study using the responses of psychiatric patients to the I,P and C subscales, eight factors were found to have eigenvalues larger than 1,0. (Levenson, 1973). Again the statistical structure of the scale based on the 3 largest factors was found to closely approximate the I,P and C dimensions. There was no overlap of items loading on the first three factors. In this study the largest factor consisted of C scale items (12% of the total variance). The second factor consisted solely of P scale items and third factor only I scale items (11,5% and 8,4% of total variance respectively).

These studies confirm the internal divisions of Levenson's multidimensional scale.

To examine the cross cultural feasibility of Levenson's locus of control construct, Lao (1978) factor analysed the responses of American and Chinese college students to the IPC scale. For comparison purposes the Principle Factor varimax rotation (as used by Levenson, 1973 and 1974) was applied to the data for male students from the United States and from Taiwan. The factor structure accurately identified the three dimensions from within the 24 items scale for both populations. The (summed) factors for the Chinese account for more of the total variance than the factors for the Americans (76% as opposed to 33%). One other difference in the results was that Internality (I) emerged as the first factor for the Chinese whereas powerful others (P) was the first factor for the Americans.

The external validity of the theoretical trichotomy

receives support from a study by Kleiber, Veldman and Menaker (1973) using the I-E scale. Rotter's internal-external item pairs were presented separately in a Likert-type format to 219 psychology students. The theoretical assumption that locus of control is a simple bipolar dimension was brought into question by the finding that the ratings of most item pairs although negatively correlated, were generally of a low magnitude (the median of the correlations being - 0,19). The item pairs, supposedly being polar opposites, would be expected to be strongly negatively correlated with each other.

Factor analysis of the 46 items (the 23 item pair statements of the I-E scale presented separately) produced three distinct dimensions. These were referred to as:

1. Non-belief in luck and chance
2. System modification
3. Individual responsibility for failure

Factor I includes all statements that refer to luck and chance. Factor II comprises non-luck and refer mostly to the control that social and political forces exert upon people's lives. Factor III consists predominantly of non-luck items concerned with the individual's perception of responsibility for failure.

The similarity between these three factors and Levenson's dimensions, although not mentioned by Kleiber et al (1973) is striking. Factor I and Factor III appear to be almost identical to the Chance and Internal scales respectively. There is a similarity between Factor II

(System Modifiability) and the Powerful Others scale.[1] In fact, Levenson (1975) has shown an empirical relationship to exist between the P scale and Mirel's socio-political control factor, which is more obviously close to the System Modifiability factor found in the Kleiber et al (1973) study.

Validity of Levenson's multidimensional locus of control construct

Concurrent validity of the IPC

The validity of Levenson's multidimensional locus of control scale has received some support from replications of earlier studies in which the IPC measure replaces the original I-E scale.

1. Dogmatism.

Clouser and Hjelle (1970) argue that dogmatism and externality are both associated with a susceptibility to

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[1] It should be noted that the essential difference between the System Modifiability items from the Rotter's scale and the Powerful Others items from Levenson's scale is that the latter is concerned with the influence of powerful others as it pertains to the individual himself rather than the impact an individual can exert on world affairs. Levenson's items are all stated in the first person whilst, on the whole items comprising Factor II, identified by Kleiber et al (1973) are expressed in the third person.

Clearly, the material analysed does not allow for the emergence of a Powerful Others factor.

influence by external sources of power. They report a small positive correlation between the I-E scale and Rokeach's Dogmatism scale ($r = 0,24$; $p < 0,05$).[2] In a replicated experiment Sherman, Pelletier and Ryckman (1973) hypothesised a similar relationship between closedmindedness (dogmatism) and externality on all three of Levenson's dimensions. The data is in agreement with this prediction. The correlations between dogmatism and perceived personal control was 0,34 ($p < 0,01$). Between dogmatism and powerful others, the correlation was 0,49 ($p < 0,001$), while the association between dogmatism and chance was 0,34 ($p < 0,01$).

2. Age trends.

In an investigation of changes in locus of control, Lao (1974) found the following pattern over time: an increasing sense of personal efficiency from youth to adulthood, a stabilised sense of internal control through middle age and no decrease in internality among elderly subject. This finding was replicated by Ryckman and Malikiosi (1975) over all three of Levenson's dimensions. Both studies used a cross-sectional paradigm and suffered from sample selection biases.

3. The test-retest of locus of control.

Both Hersch and Scheibe (1967) using the I-E scale,

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2 Sherman et al (1973) transformed scores on the P and C scales so that high scores on all three scales indicate internality.

and Levenson (1972) using the IPC multidimensional measure, found on retest a small increase in internality. The reported shift although not significant was consistent for the I-E scale across a number of student samples (Hersch and Scheibe,1967) and over all three I,P and C subscales with the normative samples (Levenson,1972).

The differential validity of the IPC

The bulk of studies approaching the question of the differential validity of the subscales have tested predictions regarding associations of the Powerful Others (P) scale. It is the view of the present author that the preference for the investigation of hypotheses involving this one dimension reflects a difficulty inherent in the theoretical conceptualisation of the tripartite construct. Specifically, the Internal and Chance scales have not been adequately distinguished from each other or from Rotter's I-E single bipolar measures.

Levenson (1972) delineates the three dimensions as follows:

SCALE	INTERPRETATION
Internal	High score: indicates that the S believes he has control over his own life. Low score: indicates that the S believes he does not have much control over his own life.
Powerful Others	High score: indicates that the S believes powerful others have control over his life. Low scores: indicates that the S believes powerful others do not have much control over his life.

Chance — High score: indicates that the S believes chance forces (luck) control his life. Low score: indicates that the S believes chance forces (luck) do not control his life.

The differential validity of the Powerful Others scale

The nature of the Powerful Others scale, the perception that control of reinforcements resides in the hands of powerful others, is distinct from the other dimensions and has generated clear cut predictions beyond those possible from Rotter's single I-E measure.

1. Imprisonment.

Levenson (1976) administered her multidimensional locus of control scale to state prisoners. Earlier studies (Lefcourt and Ladwig, 1966; Le Blanc and Tolor, 1972) indicated a weak relationship between incarceration and expectancy of control. The hypothesis was that perception of a predictable and powerful authority structure would be fostered by imprisonment. This would be reflected by a positive relationship between the Powerful Others scale and:

(a) the length of time in prison; and

(b) the frequency of solitary confinement punishments.

Both predictions were empirically upheld. The two other scales showed no such relationship.

2. Attitude toward others (untrustworthyness).

It was hypothesised by Levenson and Mahler (1975) that as a result of cultural emphasis on individualism and independence, persons who felt they were controlled by powerful others would have negative views of other people.

As expected, the results indicated that the more the subjects felt they were controlled by powerful people, the more they perceived others as untrustworthy and the less they saw them as altruistic. The Internal and Chance scales were unrelated to attitudes towards others as measured by the Philosophies of Human Nature Scale.

3. Sociopolitical activity.

In a series of three studies, Levenson and Miller (1976) hypothesised, and demonstrated, high Powerful Others scores to be associated with

(a) activist liberal students (Studies I and II); and

(b) activist lesbian groups (Study III)

This was the one dimension which distinguished groups varying in political activity. In the last study it was also found that the activist lesbian group was lower in belief in personal control (i.e. lower I scores) than a "relatively inactive" women's liberation group.

4. Study habits and academic achievement.

Procuick and Breen (1974) found that both external scales correlated negatively with successful study habits and attitudes as well as academic performance. The predictions that the strength of these correlations would be lower for the Powerful Others scores than for the other scales was supported.

There are studies which have found statistically significant relationship between the Chance and Internal dimensions and proposed associations. The backing for such predictions however, tends to be less convincing and more difficult to justify.

The differential validity of the Chance scale

Garcia and Levenson (1975) provide evidence for the hypothesis that students from low income families score higher on the Chance scale than do wealthier students. The investigators claim this to be validational evidence in support of the C scale. It seems reasonable however to expect group differences to occur on each of the three dimensions with regard externality. The I and P scales were found to be unrelated to income.

Levenson (1974) predicted and showed that only a belief in chance was differentially related to involvement and information on anti-pollution activities amongst an adult sample (N = 96). Earlier research (Seeman and Evans, 1962) investigated the association between the I-E dimensions and the amount of information hospital patients had of their illness. Externals, in that experiment, scored lower on an objective test of their knowledge about their disease. This is interpreted as indicating that people who were internally orientated would attempt to control their environment through actively seeking relevant information. Levenson (1974) states, by way of "explanation" for her study: "A similar validational procedure was therefore used to see if S's who believed that chance controlled their lives had significantly less amounts of information on matters of pollution than did low C scores." (p. 379.) The equation of internality with low C scores, specifically is questionable.

The differential validity of the Internal scale

A study by Wagner, Bourgeouis, Levenson and Denton (1974),

hypothesised a positive relationship between success in using biofeedback and scores on the Internal scale. As expected, results indicated that subjects who were able to lower their galvanic skin responses had higher I scores (i.e. belief in personal control). There was no relationship between GSR and scores on the P or C scales.

The extent of the application of the Internal scale is however, not clear. Levenson (1973) for example, offers no prediction regarding the relationship between the I scale and the clinical improvement of psychiatric patients. In that experiment, the shortest hospitalisation periods were associated with low Chance scores. It is not obvious which variables might be expected to be associated with I, and not C and vice versa.

Correlations between the dimensions

Although supposedly independent the two external dimensions, the Powerful Others and Chance subscales, have been found to be moderately (and significantly) associated. Interestingly, correlations with the Internal scale have been close to zero and not significant. Negative correlations might be expected.

Below is a table of reported correlations from three studies:

Table 2: Correlations between the I, P and C subscales.

Study	Sample	I & P	I & C	P & C
Levenson (1972;1974)	Adults (normative data)	0,14	-0,17	0,59**
Levenson (1974)	Psychiatric patients	0,14	0,30	0,54**
Procuick and Breen (1975)	College students	not reported	not reported	0,68 **

** $p < 0,01$

All three samples combine male and female subjects.

Congruent and Defensive Externals

Types of externals.

As has already been noted, there is evidence which indicates that externals do not all act in a manner expected of them. For example, some externals display patterns of behaviour on skill tasks similar to the behaviour of previously identified ambitious and competitive subjects. Further, externals as a group showed a wide spread of scores on indices of academic achievement (Rotter, 1975). That these findings do not simply reflect an absence of validity of the concept is suggested by the high variability within the externals relative to the internals especially amongst male populations (Hersch and Scheibe, 1967). The interpretation offered by Rotter is that externals comprise two different, but unidentified, groups. Rotter was unable to differentiate these theoretical groups on the basis of item content of the I-E scale.

Rotter (1975) puts forward the view that the two groups correspond to the possible meanings of the external alternatives. The meaning of an external response may be taken literally to imply a fatalistic and passive attitude. Alternatively it may be argued that when an individual endorses an item which states that success is primarily a matter of luck, he is rationalising failure. When he agrees that powerful others control his life, he is blame projecting. Such responding may be considered defensive.

That externality may serve as a form of psychological defense against the experience of failure is indicated by the studies of Phares (1971) and Davis and Davis (1972).

Phares (1971) administered four cognitive tasks which student subjects were requested to rank in terms of how much they wished to succeed on each. Success and failure were experimentally controlled. Subjects were failed on these tests marked as either their first or second preference. In re-ranking the four tests "after the benefit of first hand experience", internals did not shift their evaluation. Externals however altered their order away from those on which they had failed. Davis and Davis (1972) found that externals, more frequently, blamed impersonal sources for failure than did internals. Results were the same whether failure was incurred on an "intelligence" test or on a test of "social sensitivity" in which subjects had to predict another person's attitudes. The two groups did not differ in accrediting themselves with task successes.

Interpersonal trust scores as a means of identifying congruent and defensive externals .

A study by Hamsher, Geller and Rotter (1968) focused on two generalised expectancies (viz.,locus of control and trust) of college students who rejected the findings of the Warren Commission Report into the assassination of President Kennedy. Two extreme groups, those totally accepting and those totally rejecting the Commission's findings for both males and females were identified on the basis of responses to a questionnaire about the report by comparison with previous normative studies of locus of control. The most distinctive of these four groups were the males who expressed a complete distrust of the Warren Commission. These subjects were found to be unusually external and also scored low on the Interpersonal Trust Scale.

Hamsher et al (1968) state: "These subjects admit their feelings of being manipulated by others, being at the mercy of chance factors and powerful others, and respond with marked suspiciousness toward a variety of authorities. This attitude is consistent with that of the "defensive external" initially described in Rotter (1966). More common amongst males who are actually highly competitive and achievement orientated, this reaction has been understood as a projection of responsibility for failure."(p. 214.)

The results of this investigation suggested a technique for differentiating between passive and defensive externals by the utilisation of trust as a moderator variable. This notion has been followed up in other studies (e.g. Hochreich, 1974; 1975).

The validity of the defensive/congruent distinction.

Hochreich (1974) raises the question as to whether a subgroup of externals (defensives) may more specifically account for the reported difference in attribution behaviour between internals and externals (Phares, 1971; Davis and Davis, 1972). The ITS was used to identify defensive and congruent externals.

The I-E and ITS were administered to a large number of introductory psychology students. Several months later, a total of 120 males (four groups, 30 in each) were selected and categorised on the basis of those measures - Defensive (Low Trust) Externals, True (High Trust) Externals, Low Trust Internals and High Trust Internals. The experimental task required subjects to make attribution ratings for a series of stories which varied in theme and outcome (success or failure).

The hypothesis that defensive externals attribute less responsibility to story heroes than do true externals and internals under failure (and not success) conditions was upheld. This difference was even stronger when the story involved an achievement theme. A significant I-E x ITS interaction occurred ($p < 0,01$) with defensive externals attributing less responsibility for achievement failure than each of the other three groups ($p < 0,01$ for all three comparisons). The other groups did not differ from each other.

In addition, to assess differences in self-descriptions between the groups subjects were administered the Adjective Check List (ACL). Seven of the ACL scales, those related to achievement and defensiveness, were selected for use in this study. The differences found on all seven scales (for this male sample) replicated those reported by Hersch and Scheibe (1967) for males and females combined. On four of the scales, however, I-E differences were primarily the result of I-E x ITS interactions. Specifically, the defensive externals subgroup, rather than the entire external group, were responsible for the self-description differences. Based on the adjectives checked, low trust externals are seen to score lower on a scale of personal adjustment as well as being willing to say more favourable things about themselves.

In isolating subgroups of externals, the variability associated with the behaviour of externals found in the earlier study of Hersch and Scheibe (1967) was markedly reduced. As demonstrated by Hochreich (1974) the subgroups

may be differentially associated with a number of variables. It appears that treating externals as a single homogeneous sample may thus introduce a confounding of groups. Hochreich (1975) focused on the relationship between perceived control of reinforcement and defensive blame projection. A male student sample was selected and categorised into four groups on the basis of their trust and LOC scores. The groups were defensive (low trust) externals; congruent (high trust)externals; low trust internals and high trust internals. Subjects were administered an anagrams test in which success or failure was experimentally manipulated. To create a strong achievement orientated atmosphere, the "scrambled words test" was described as "part of a test of general intelligence designed to measure analytical reasoning and verbal abilities. It was predicted that to a greater extent than the others defensive externals would attribute failure to the nature of the test rather than their own abilities. No differences were expected under the success condition. Three questionnaire items allowed subjects to attribute failure (or success) either directly or indirectly to the test. Significant locus of control x trust interaction effects were found for all of these items following failure but showed no differences between the groups after success. Results offer clear support for the validity of the defensive-congruent distinction and the utility of the ITS as a moderator variable in identifying these subgroups.

Procuick and Breen (1975) investigated the relationship of defensive externality to academic performance. The procedure used for distinguishing between internals and congruent and defensive externals differs from the other

studies reported. This study used Levenson's multidimensional locus of control (IPC) scale. Congruent externals are identified as those individuals who possess the belief that reinforcements are determined by luck, chance or fate. Defensive externals, Procuick and Breen contend, are individuals who believe that powerful others are responsible for their reinforcements but who tend to acts as internals. They argue that "this apparent inconsistency in belief and behaviour may be understood by the fact that an external belief in powerful others implies that a potential for personal control exists." (p. 550.) Subjects were categorised as internals, defensive externals or congruent externals on the basis of the scale on which they scored their highest standard score; that is, relative to the population.[3] High I scorers were labelled internals; high P scorers, defensive externals and high C scorers, congruent externals. As hypothesised by Procuick and Breen, internals were academically most successful with the defensive external being superior to congruents. In claiming that defensives may be distinguished from "true" externals by means of the IPC scale, a theoretical bridge is drawn between the closely related constructs suggested by Rotter (1966; 1968) and Levenson (1972). This is one of the few hypotheses proposed or research undertaken into the relationship that exists between those parallel fields of study.

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[3] Standard Score: $Z = \frac{X-u}{\sigma}$

THE USE OF A GLOBAL (UNIDIMENSIONAL) MEASURE OF LOCUS OF CONTROL

Despite the volume of evidence suggesting the locus of control construct to be multidimensional, a strong case can be argued in support of the use of the single (total) I-E score. The approach of some researchers (e.g. Bolon and Barling, 1978; Barling and Fincham, 1978; Reid and Ware, 1973) who dismiss the generalised measure in favour of the use of subscales on the basis of factor analytic studies is, in the view of the author, unwarranted. The suggestion that the global locus of control score is "not meaningful" being a "simple summation of the items involved in conceptually distinct factors" (Bolon and Barling, 1978) demands comment.

In the first instance, as already noted, not all factor analytic research has supported the claim that locus of control is multidimensional. Both Franklin (1963) and Joe and Jahn (1973) find evidence of the existence of one major factor contributing approximately 50% of the total scale variance.

Although the majority of factor analytic studies on the I-E scale have consistently identified more than one factor and implied a multidimensionality the following features of research in the area needs to be considered:

1. No single clear factor structure has consistently emerged.

To illustrate this point, a few of the studies in which more than one factor has emerged is presented in the table below. It is apparent that the number of

identified factors varies considerably from one experiment to another.

Table 3: A few studies indicating the multidimensionality of locus of control.

Number of factors	Study
2	Mirels (1970); Viney (1974; McDonald and Tseng (1971); Reid and Ware (1973)
3	Reide and Ware (1974); Kleiber, Veldman and Menaker (1973); Sanger and Alker (1972)
4	Collins (1974); Zuckerman and Gerbasi (1977); Zuckerman, Gerbasi and Marion (1977)
5	Duffy, Shiflett and Downey (1977); Kaemmerer and Schwebel (1976)

The matter is further complicated by the fact that research isolating the same number of factors may identify completely different structure (e.g. Sanger and Alker, 1972; Kleiber et al, 1973). Also, it may be argued that some studies finding different numbers of factors reflect essentially similar structures (e.g. Sanger and Alker, 1972 and Mirels, 1970; or Duffy et al, 1977; and Collins, 1974).

There is evidence that the factors which emerge may be dependent upon the sample used. Factors of specific relevance

to the particular sample are sometimes identified. For example, Sanger and Alker (1972) using an actively feminist sample found a "Women Control Factor", in addition to two factors similar to those identified by Mirels (1970); that is, Personal and Socio-political Control.

2. Factor analytic research has tended to be scale specific.

On the whole, Rotter's I-E scale, in either its original or modified form, has been utilised for factor analytic research. Some studies have converted the format of the I-E scale from 23 forced-choice items pairs to a 46 item Likert rating scale (e.g. Joe and Jahn, 1973; Collins, 1974).

In practice it is not the locus of control construct but the I-E scale which is being factorised. As noted by Rotter (1975) the factors which have emerged might well have been different had the scale comprised 40 rather than 25 items.

3. The dimensions identified account for only a moderate portion of the total variance.

The summed components cannot be considered as equivalent to the entire measure. In general, the size of the factors identified in studies supporting multi-dimensionality claim have been fairly small, accounting for less than 20% of the total variance. The (summed) variation attributable to the component factors is usually considerably less than half the total scale variance. (e.g. Mirels, 1970; Viney, 1974; Hrycenko and Minton, 1975).

4. Subdivision of the scale are related to each other and to the full measure.

Items: The items of the I-E scale correlate significantly with the full measure. Rotter (1966) reports item point

biserial correlations varying from 0,11 to 0,48 between each individual item and the total scale score minus that item.

Dimensions: The two (orthogonal) factors identified by Mirels (1970) have on more than one occasion been found to correlate significantly with each other. (e.g. Boor, 1974; Gootnick, 1974; Wilkens, 1975).

Two of Levenson's dimensions of locus of control, the Powerful Others and Chance scales, have repeatedly been shown to be significantly related (Levenson, 1972, 1974; Levenson, 1973; Procuick and Breen, 1975).

Conclusion

The generalised measure of locus of control is not equivalent to a conglomerate of "conceptually distinct" factors.

This being the case:

(a) subscale measures are not to be taken as a differentiated substitute for the entire measure; and

(b) the validity of the subscales requires empirical assessment and comparison to the global measure in terms of their relative productive abilities.

SUMMARY

1. There is evidence to suggest that LOC is not a unitary construct.

(a) The overwhelming majority of factor analytic investigations have identified more than one factor (Mirels, 1970; Gurin, Gurin, Lao and Beattie, 1969; McDonald and Tseng, 1971; Viney, 1974; Reid and Ware, 1973; Hrycenko and Minton,1974; Cherlin and Bourque, 1974; Sanger and Alker, 1972; Kleiber, Veldman and Menaker, 1973 and others).

(b) Externals, as a group are more heterogeneous than internals (Rotter, 1966; Hersch and Scheibe, 1967). This is taken to imply the existence of more than one type of externality (Hochreich, 1973; Hamsher, Geller and Rotter, 1969; and Levenson, 1972). Cross cultural investigations have demonstrated that whilst the total I-E scale score may not necessarily differ from country to country, the pattern of responses (subscale and item analysis) varies widely (Parsons, Schneider and Hansen, 1970; Parsons and Schneider, 1974).

2. (a) A large number of factor analytic studies of the I-E scale isolate a dichotomous structure similar to Mirels (1970), i.e. a Personal control factor and a Socio-political control factor (McDonald and Tseng, 1971; Viney, 1974; Reid and Ware, 1973; Hrycenko and Minton, 1974; Strahan and Huth, 1975; Cherlin and Bourque, 1974).

(b) With exception (e.g. Boor, 1973) available research provides limited support for the discriminant validity of the two factors (Abromowitz, 1973; Berzins and Ross, 1973; Cialdini and Mirels, 1976; Wilkens, 1975). Studies comparing

the utility of the factors and the total I-E score, indicate that error variance may be reduced when using more homogenous measures (Cialdini and Mirels, 1976; Wilkens, 1975).

(c) Reported correlations between subscales comprising items loading highest on the two respective factors have been in the low to moderate range sometimes reaching significance (Boor, 1974; Gootnick, 1974). The level of correlations implies, at minimum, a degree of independence between the factors.

3. (a) Factor analysis of responses to the IPC scale has confirmed the internal divisions of Levenson's multi-dimensional locus of control measure (Levenson, 1974; Levenson, 1973; Lao, 1978). One (external validational) study, using a modified I-E scale, isolates three factors approximating the divisions of Levenson's scale. (Kleiber, Veldman and Menaker, 1973).

(b) There is confirmatory evidence for the construct for the Powerful Others scale (Levenson, 1974; Levenson and Mahler, 1975; Levenson and Miller, 1976; Procuick and Breen, 1974). On the other hand the separate identities of the Internal and Chance dimensions has not been clarified by validational studies.

(c) Reported correlations between the Powerful Others and Chance scales are moderately high ($r \simeq 0{,}60$). The Internal scale correlates non-significantly with both external scales.

4. The existence of two distinct types of externality (defensive and congruent) initially suggested by the findings

of Hersch and Scheiber (1967) has been investigated using the Interpersonal Trust scale as a moderator variable. Defensive externals, identified as low trust externals, have been shown to differ from passive or true externals over a number of criteria (Hamsher, Geller and Rotter, 1969; Hochreich, 1974; Hochreich, 1975). Hochreich (1974) replicated the results of Hersch and Scheibe (1974) demonstrating that group differences between the self descriptions of internals and externals were largely attributable to the defensive subgroup.

5. Although research points to the multidimensionality of LOC the dismissal of the generalised (full scale) measure is unwarranted.

(a) A variety of factor structures have emerged.

(b) Factor analytic research has tended to be scale specific.

(c) The factors account for only a moderately small proportion of the total scale variance.

(d) Subdivisions of the scale are closely related to each other.

It is inaccurate to equate the full scale with a summation of the factors. The use of the entire measure in no way opposes the exploration for subscales which must enhance the predictability of related criteria.

LOCUS OF CONTROL AND PSYCHOLOGICAL ADJUSTMENT

Research and theory.

The relationship between locus of control and indices of adjustment is a vigorously researched area of investigation. Rotter (1966) hypothesises a curvilinear relationship between locus of control and adjustment. Externality, Rotter (1966) suggests, may be an adequate defense against failure but highly external scores may imply "a defensiveness related to a significant maladjustment." (p. 16.) Further an extremely external orientation would be associated with a passivity in dealing with personal difficulties. On the other hand, the highly internal subject will tend to overly place blame for failure upon himself.

The hypothesis that maladjustment is associated with extreme scores, on either end of the continuum, has not received empirical support. The vast majority of studies have pointed to a positive linear relationship between internality and measures of adjustment.

Locus of control has been shown to be correlated with self-report scales of anxiety (e.g. Butterfield, 1964; Feather, 1967; Ray and Katahn, 1968; and Platt and Eisenman, 1968; Wall, 1970; Crego, 1970; Goss and Morosko, 1970; and Burnes, Brown and Keating, 1971). Externality has also been found to be related to clinical and behavioural assessments of severity of psychiatric disorder (Shybut, 1968; Smith, Pryer and Distefano, 1971).

The theory underlying the association between locus of control and adjustment has lagged behind empirical research. In an attempt to provide a model for the understanding of

this relationship, Seligman's work on learned helplessness will be examined and related to the locus of control construct.

LEARNED HELPLESSNESS

Learned helplessness: The phenomenon and experimental paradigm.

Seligman and Maier (1967) and Overmier and Seligman (1967) used the term "learned helplessness" to describe an interference with escape-avoidance behaviours produced in dogs by prior inescapable shock. Early work investigating the parameters of the phenomenon used dogs as subjects (Overmier, 1968; Seligman, Maier and Geer, 1968).

In these studies, dogs are given inescapable electric shocks of a moderately painful intensity. The shocks are unsignalled and occur randomly in time. Twenty four hours later the animal is exposed to the test of ten signalled escape-avoidance learning trials. The test task requires the dog to jump over a barrier from one compartment of a two-way shuttle box into the other to avoid shock. Shocks could occur in either compartment. It was the response not the place which resulted in the termination of the shock. Light dimming was used as the signal to begin each trial. The signal preceded the shock by ten seconds and stayed on until the trial ended. The dog could only prevent being shocked by jumping the barrier within this 10 second interval; otherwise the subject received a shock until it had jumped the barrier or 60 seconds had elapsed at which time the trial automatically ended.

The behaviour of these animals exposed to uncontrollability, showed a typical pattern. Initially the dogs displayed frantic movements but within a short period (of about 30 seconds) become inactive and do not escape the shock. After a minute the shock terminates automatically. On subsequent

trials the dog continues to fail to escape, and seems to passively accept the shock. (Seligman and Maier, 1967).

This pattern is markedly different for dogs not previously given inescapable shocks. These dogs, by contrast, persevere with excited behaviour until its actions by chance lead it to scramble over the barrier. Thereafter the animal becomes progressively more efficient at escaping.

Most studies investigating the effects of uncontrollability have utilised a triadic experimental design. (e.g. Seligman and Maier, 1967; Overmier and Seligman, 1967; Overmier, 1968; Seligman and Groves, 1970; Maier, 1970). Three groups of subjects are used. One group receives as its pre-treatment an outcome that it can control by some response. A second group is yoked and received exactly the same physical outcome as a matched member of the first group, but there is no response the yoked subject can make that modifies these outcomes. A third group receives no pre-treatment. Later, all groups are tested on a new task. This procedure provides a direct test of the hypothesis that it is not shock itself, but learning that shock is uncontrollable, that causes helplessness.

Seligman and Maier (1967) used three groups of eight dogs. Dogs in an escape group were trained in a Pavlovian hammock to turn off shock by pressing a panel with their noses. A yoked group received shocks identical in number and duration to the shocks delivered to the escape group. A naive control received no shock in the hammock.

Twenty four hours after the hammock treatments all three groups received escape-avoidance training in the shuttle box. In contrast to the escape and naive groups, the yoked group

was significantly slower to respond. Of the eight yoked subjects, six failed completely to escape shock. Clearly the experience of uncontrollability, not the shocks, resulted in performance deficits.

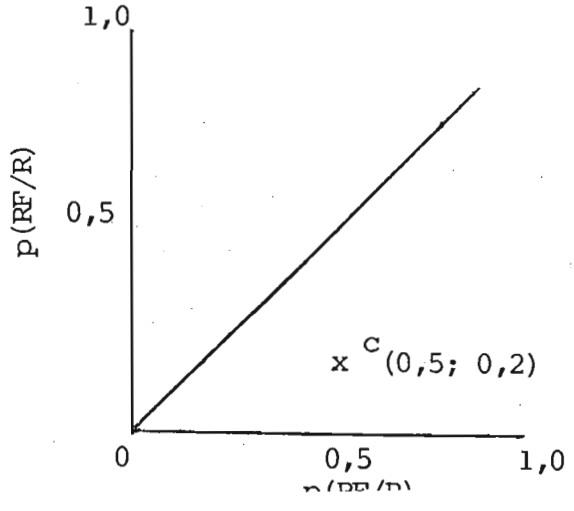
An outline of the theory.

(a) A two dimensional learning space

Instrumental learning is usually viewed in terms of the conditional probability of reinforcement following a response, p (RF/R), which can have values ranging from 0 to 1,0. At zero a response never produces a reinforcer (extinction). At 1,0, every response produces a reinforcer (continuous reinforcement). Intermediate values between 0 and 1,0 represent varying probabilities of reinforcement (partial reinforcement).

Maier and Seligman (1976) argue that rather than representing environmental contingencies as occurring along a single, dimension, instrumental learning space is more adequately described using a two-dimensional space. Orthogonal to the conditional probability of an outcome, given a response, is the conditional probability of an outcome occurring in the absence of that response p (RF/$\bar{R}$)

Below is a diagram representing a two dimensional learning space.



Maier and Seligman (1976) offer as an illustrative example the point c (0,5 - 0,2). "Here the subject is reinforced 50% of the times that it makes R, but even if it fails to make R, it is reinforced 20% of the time."(p. 5.)

(b) Definition of controllable and uncontrollable reinforcers.

The 45^{o} line is of special importance. Whether or not the subject responds, the density of reinforcement is the same. Along this line reinforcements are uncontrollable.

Uncontrollability is defined within the instrumental learning space as being conditions in which response R stand in relation of independence to a reinforcer RF

$$p\ (RF/R) = p\ (RF/\bar{R})$$

The controllability of a reinforcement is defined within the instrumental learning space as being conditions in which a response R stands in a relation of dependence to a reinforcer RF if

$$p\ (RF/R) \neq p\ (RF/\bar{R})$$

(c) Stages of learned helplessness.

Learned helplessness has been described as involving three separate stages (Maier and Seligman, 1976; Seligman, 1975). The basic components are as follows:

Information about the contingency ⟶ Cognitive representation of the contingency (learning, expectation, belief) ⟶ Behaviour

(Seligman, 1975, p. 42.)

1. The organism receives information that the probability of an outcome is independent of performing a given response.
2. The organism learns that a contingency exists concerning the independence of responding and outcome. In addition this specific expectancy has the tendency to generalise and results in future motivational, cognitive and emotional debilitation.
3. The expectation that an outcome is independent of responding:

(a) reduces the motivation to control the outcome;

(b) interferes with learning that responding controls the outcome; and if the outcome is traumatic,

(c) produces fear for as long as the subject is uncertain of the uncontrollability of the outcome, and then produces depression. (Seligman, 1975, pp. 55-56.)

The effects of exposure to uncontrollability.

(a) Cognitive and motivational deficits.

A number of studies have attempted to demonstrate the occurrence of changes in performance following exposure to a training phase in which the subjects responses were independent of environmental outcomes.

Hiroto (1974), Hiroto and Seligman (1975) and Klein and Seligman (1976) replicated with humans performance deficits demonstrated to exist in animal experiments. The triadic paradigm was used. The "helpless" group, after experiencing uncontrollable aversive stimulation (loud white noise) displayed reduced ability to learning avoidance responses in the test task.

Other studies have used an anagram solution task. In

this task, subjects are given a series of anagrams with the same solution order. In both the escape avoidance and the anagram tasks, three dependent measures have generally been employed. Namely:

1. number of trails to escape criterion (anagram solution);
2. number of failures to escape (solve anagram); and
3. mean escape (anagram solution) latency.

The measure of number of trials to criterion was hypothesised to operationalise the cognitive deficit, and the latter two measures were hypothesised to operationalise the motivational deficit. However, as noted by Miller and Seligman (1975), because solution criteria were defined in terms of response speed, separation of motivational and cognitive components is not possible. Thus, the performance deficits, that are defined as learned helplessness may have a cognitive or motivational basis, or may result from the impairment of both processes.

(b) Emotional deficits.

Studies investigating the emotional correlates of learned helplessness generally support Seligman's hypothesis that learned helplessness involves feelings of anxiety and depression.

Miller and Seligman (1975) administered the Multiple Affect Adjective Check List before and after exposure to contingent and noncontingent reinforcement. Significant increases in feelings of depression, anxiety and hostility following noncontingent reinforcement were recorded. In similar vein Griffith (1977) found significant increases in anxiety following noncontingent success.

Two studies have investigated the emotional aspects of learned helplessness through physiological measures (Gatchell and Proctor, 1976; Krantz, Glass and Snyder, 1974). Both experiments reported that subjects exposed to learned helplessness training showed lower levels of electrodermal activity, which is thought to be evidence of a lowered motivational state.

Overall, self-report and physiological data is in line with Seligman's hypothesis of increased depression and anxiety following the induction of helplessness.

Symptoms of learned helplessness which parallel depression.

Based upon the empirical investigation of the effects of the experience of uncontrollability, six symptoms of learned helplessness emerge. Each of these organismic responses have parallels in depression. (Seligman, 1975)

1. Lowered initiation of voluntary responses - animals and men who have experienced uncontrollability show reduced initiation of voluntary responses.
2. Negative cognitive set - helpless animals and men have difficulty learning that responses produce outcomes.
3. Time course - helplessness dissipates in time when induced by a single session of uncontrollable shock; after multiple sessions helplessness persists.
4. Lowered aggression - helpless animals and men initiate fewer aggressive and competitive responses and their dominance status may diminish.
5. Loss of libido and appetite - helpless animals eat less, lose weight, and are sexually and socially deficient.
6. Physiological changes - helpless rats show norepinephrine depletion and helpless cats may be cholinergically over-active.

LEARNED HELPLESSNESS AND LOCUS OF CONTROL

Seligman's helplessness theory centres on the organismic response to the experience, and assumed perception, of response-outcome independence. Locus of control refers to an individual's generalised expectancy for control of reinforcement, i.e. response-outcome contingency.

The close resemblance of the constructs of learned helplessness and locus of control has been noted by several investigators. (e.g. Hiroto, 1974; Miller and Seligman, 1973; O'Leary, Donavan, Cysewski and Chaney, 1977).

Miller and Seligman (1973) in using both Rotter's I-E scale and Beck's Depression Inventory as measures of perception of reinforcement, implicitly equate the two notions. These investigators found that depressed undergraduate subjects failed to respond to their reinforcement experiences in skill tasks as sources of information for deriving an estimate of their future probability of success. No comparable differences emerged between internals and externals. Miller and Seligman conclude that one important aspect of depression is the perception of outcome as being noncontingent or independent of actions. Differences between the scales were not used to draw a theoretical distinction between the concepts. Rather, results were interpreted as indicating a lack of validity for the I-E measure.

Treated in this manner, locus of control and learned helplessness are practically equivalent. Both are taken to be perceptions of reinforcement.

Hiroto (1974) also investigates the relationship between locus of control and learned helplessness. The study replicates,

in man, earlier findings using dogs that motivational deficits follow from the experience of inescapable trauma (e.g. Overmier and Seligman, 1967 and Seligman and Maier, 1967). The experimental group, after uncontrollable aversive stimulation (loud noise), exhibited a greater ineptitude at learning an escape response in a new situation. Two other factors were experimentally manipulated: locus of control and the instructions which explained the task as being governed by chance or skill. All three of these factors contributed to the production of learned helplessness: the laboratory experience of uncontrollability, the cognitive set induced by chance instructions and the external personality.

In this experiment, learned helplessness is distinct from locus of control. Externality is viewed as a personality trait; learned helplessness is equated with the organismic response reflecting diminished motivation.

A study by O'Leary, Donovan, Cysewski and Chaney (1977) investigated the relationship between locus of control measures and depression within a learned helplessness framework. They found that subjects high on the I-E scale and lacking objective control over major life events involved in the 2 x 2 analysis of variance. Neither a lack of experienced control nor a belief in external control were alone associated with two measures of depression, the MMPI "D" scale and the Beck Depression Inventory.

These authors "assumed that locus of control and experienced control provide trait measures analogous with learned helplessness." (p. 165.)

The relationship between external locus of control and learned helplessness varies between investigations. The

discrepancies are the result of differences in experimental definition or conception of learned helplessness. Learned helplessness may be (i) the state assumed to exist following the experience of uncontrollable reinforcements (O'Leary et al, 1977); (ii) the cognitive expectancy of response-outcome independence (Miller and Seligman, 1973; O'Leary et al, 1977); or (iii) indexed by behavioural effects (Hiroto, 1974).

LOCUS OF CONTROL AND DEPRESSION

Two opposing hypotheses relating perception of locus of control of reinforcement to depression have been proposed. Phares (1972) argues that depressions are found in persons who possess a strong generalised expectancy that outcomes are their own responsibility but who do not expect to attain valued goals or outcomes. Empirically an inverse relationship between (external) locus of control and depression is predicted. An alternative hypothesis, based upon the resemblance of the concepts of externality and learned helplessness, suggests a positive correlation between locus of control and depression. The weight of experimental evidence is behind the second of these two proposals.

Locus of control and various associated symptoms of depression.

Self-esteem.

Two studies (Fish and Karabenick, 1971. Ryckman and Sherman, 1973) investigated the relationship between feelings of inadequacy and locus of control. Significant negative correlations are reported for both experiments.

Ryckman and Sherman (1973) report correlations of 0,29 ($p < 0,001$) and 0,20 ($p < 0,01$) for male and female college students respectively. These replicate the results of the Fish and Karabenick study in which only males were used ($r = 0,28$; $p < 0,001$).

These findings are in line with the earlier investigation of Hersch and Scheibe (1967) which showed that internals see themselves in a more favourable manner (e.g. more self confident, independent and assertive) than do externals.

Mood states.

Warehime and Woodson (1971) add weight to the implied association between internality and positive personal feelings. For both males and females the obtained correlations between LOC and a number of (positive) affect dimensions were mostly negative. An overall "mean affect scale score" was correlated with externality and found to be negative and significant ($p < 0,05$) for both sexes.

An analysis of self-reported moods elicited from medical students indicated that internals exhibited less mood disturbances than their external counterparts (Kilpatrick, Dubin and Marcotte, 1974). Internals rated themselves as "less tense, anxious, depressed, hostile, fatigued and confused" than did externals in each of the four year classes tested.

Natale (1978) showed that temporary induced mood states affected perception of personal control. By means of auto-suggestion moods of depression, elation or neutral were produced in a group of female college students. Fifteen subjects were assigned to each mood condition and locus of control scores were obtained both before and after the mood induction procedure. As predicted induced elation resulted in an increased sense of internality, depression increased externality. Neutral mood induction did not alter locus of control.

Withdrawal.

Kilpatrick et al (1974), in addition to identifying mood differences between internal and external medical students, found also that locus of control interacted significantly with year of study and self ratings of a "vigor-activity"

dimension. Internals and externals differed markedly during the second and third years of study, a period rated by subjects as the most stressful and unsettling. It is concluded that, in comparison to externals, internals maintained an attitude of vigorousness, exuberance and high energy under demanding conditions.

Locus of control and self report measures of depression.

Several studies have investigated the relationship between self-report measures of depression and locus of control. Most of these findings support the hypothesised association, derived from learned helplessness theory, between depression and the external pole of the locus of control continuum.

Below is a summary table of studies in this field.

Table 4: Correlations between locus of control and self-report measures of depression.

(a) Depression scales measuring a relatively stable trait.

Study	Scale	Subjects	Correlations
Goss & Morosko (1970)	MMPI	Alcoholics (M)	0,31 **
	D scale	(F)	0,24
Calhoun, Cheney & Dawes (1974)	Zung's Self Rating Depression Scale	Students (M)	0,58 **
		(F)	0,38 *
Procuick, Breen & Lussier (1976)	Beck's Depression Scale	Students 1st year	0,22 *
		Senior	0,10
Abromowitz (1969)	Guilford D Scale	Students	

** $p < 0,01$

* $p < 0,05$

(b) Depression scales of immediate mood-level.

Study	Scale	Subjects	Correlations
Calhoun, Cheney & Dawes (1974)	Depressive Adjective Check List	Students (M)	0,50 **
		(F)	0,09
Warehime & Woodson (1971)	Personal Feelings Scales (Mean Affect Scale Score)	Students (M)	0,19 *
		(F)	0,23 *
		Combined	0,20 **

** $p < 0,01$

* $p < 0,05$

LOCUS OF CONTROL AND ANXIETY

Internals have been found to be active, striving individuals exhibiting greater resistance to influence and who handle success and failure in a more realistic manner than externals. (Rotter, 1966). It can be expected that these behavioural characteristics, coupled with a generalised belief in the efficacy of their own efforts, ought to provide a stronger basis for personal adjustment and reduced anxiety amongst internals. By contrast externals are more vulnerable and less capable of coping with their environment. Phares (1976) notes that within social learning theory, "... anxiety is often viewed as a series of responses indicative of a high expectancy for punishment or a low expectancy of success in a valued need area.... One would expect external individuals to exhibit relatively high expectancies for punishment and therefore display greater anxiety than internals." (pp. 121-122.)

The stressful impact of the experience of uncontrollable and unpredictable stimulation has been demonstrated in both non-human and human studies.

Uncontrollability and stress responses in animals and man

Non-human studies

Mowrer and Viek (1948) administered electric shocks to 20 food deprived rats. Ten seconds after food placed in the cage was taken by the rat, a shock was delivered. Half of the rats could terminate the shock through leaping, the other half were passively yoked to the first group. That is each member of the shock uncontrollable group received shocks for the identical length of time. The variable under study was the number of inhibitions recorded by each group. An inhibition was taken to be a refusal to eat food within

ten seconds of presentation. The hypothesis that rats who could not terminate the shock would exhibit more fear related behaviour (more inhibitions) was strongly supported. The helpless group of ten rats had an overall total of 85 inhibitions ($\bar{X}$ = 8,5) compared to the shock controlling group whose total of inhibitions for the experiment was only 16 ($\bar{X}$ = 1,6).

Weiss (1971) found evidence that gastric ulceration was more common and of greater extensity among rats deprived of the ability to predict or control aversive stimuli. The shock uncontrollable (yoked) group of rats developed more ulcers than those subjects in the escape condition. Rats presented signalled (predictable) shock suffered less ulceration than rats receiving unpredictable shocks. This is in line with the view that helplessness usually produces more stress than control does.

The results of this rigorously controlled experiment contrast markedly with the findings and conclusions of the earlier "executive monkey" study of Brady, Porter, Conrad and Mason (1958) in which the actively controlling (monkey) subjects were found to develop gastric ulcers more frequently than the yoked group. Weiss notes that important differences in design distinguish these two experiments. In particular, Weiss points to a bias introduced in the Brady et al study through the non-random selection of experimental and control groups.

Human studies

In an experiment involving human subjects, Corah and Boffa (1970) found that, as measured by physiological change (change in skin conductance), stress was reduced when

subjects were able to control the termination of a negative reinforcement (white noise).

Half of the group was told that when a green light was on they should press a button to turn off the sound; when the red light was on they should not press the button which turned off the sound. The other half of the group received the further instruction that they may, if they chose, elect not to comply. Subjects in the choice condition who did press the escape button were replaced(N = 2 from a total of 20 in the choice group). Results indicate that greatest physiological arousal occurred on the no-escape trials in which the subjects were not given the option of escape (i.e. aversive stimulation was uncontrollable).

An experiment by Glass, Singer and Friedman (1969) reports on the effect of unpredictable blasts of aversive noise on task performance. Half of the subjects were given a button which they could use to terminate the noise if they wished. They were however, encouraged to use it only if they felt it necessary. Subjects in the button condition showed greater tolerance of the noise in terms of post-stimulation task persistance than did the subjects in the no button group. GSR was greater in the no-control group although the results of the statistical tests of group difference are not recorded.

Staub, Tursky and Schwartz (1971) divided 20 paid subjects into a self-control and a no-control group. Subjects were told that the experiment was designed to record physiological reactions to electric shock. The self-control subjects were given a switch which enabled them to administer the electric shocks to themselves. The experimenter increased the intensity of shocks in small steps from an imperceptible amperage up to

the subjects limit of endurance. Each subject of the no-control group was yoked to a member of the self-control group ensuring that shocks were administered in the identical temporal order. Staub et al showed that subjects who were allowed to administer shocks to themselves reported less discomfort at higher levels of shock and endured stronger shocks than did paired (passive) subjects to whom shocks were administered.

Findings consistently point to the adverse influence of unpredictable and uncontrollable aversive stimulation.

Locus of control and self report measures of anxiety

A positive correlation between debilitating anxiety and the belief in the uncontrollability of reinforcement (externality) can be predicted. Correlational data offers considerable support for this position.

Table 5: Correlations between locus of control and self-report measures of anxiety

STUDY	SCALE	CORRELATION
Butterfield (1964)	Alpert-Haber Debilitating Anxiety	0,61 **
Feather (1969)	Alpert-Haber Debilitating Anxiety	0,38 *
	Mandler Sarason Test Anxiety Questionnaire	0,38 *
		0,13
Ray & Katahn (1968)	Mandler Sarason Test Anxiety Questionnaire	0,22 **
		0,21 **
	Taylor Manifest Anxiety	0,40 **
		0,30 **
Watson (1967)	Alpert-Haber Debilitating Anxiety	0,25 **
		0,26 **
	Taylor Manifest Anxiety	0,38 **
		0,35 **
Strassberg (1973)	IPAT Anxiety Scale	0,41 **

All samples reported in the above study are students.

** $p < 0,01$

* $p < 0,05$

LOCUS OF CONTROL AND SCHIZOPHRENIA

Locus of control and ratings of severe psychopathology

Shybut (1968) constructed a "Severity of Disturbance Rating Scale" to classify psychiatric patients into moderately and severely disturbed categories. The scale incorporated ratings of present adjustment, adjustment just prior to present hospitalisation and history of adjustment. The rating of present adjustment and adjustment immediately prior to present hospitalisation were made on the basis of either presence or absence of a marked disorder of thought, affect or behaviour. The history of adjustment included ratings of marked progressive deterioration and hospitalisation record. The three areas of adjustment were rated as moderate or severe and combined into a total Severity of Disorder Index. The obtained classification included only psychotic (predominantly schizophrenic) patients in the severely disturbed group. The moderately disturbed group comprised mostly neurotic and character disorder cases. For the purpose of comparison a normal sample of hospital personnel were selected. All three groups were administered the I-E scale.

As predicted, an inverse relationship between a belief in internal control and severity of psychopathology was obtained. The severe group was significantly more external than either the normal or moderate groups.

Unlike Shybut's study, Smith, Pryer and Distefano (1971) used as the criterion of severity of impairment ward behaviour which was rated by psychiatric attendants. The MACC Behavioural Adjustment Scale was used to measure the degree of emotional impairment. The MACC is a behavioural

rating of mood, cooperation, communication,social contact as well as the "total adjustment" of the psychiatric patients.

Patients who scored at the 70th percentile or above and the 30th percentile or below on the "total adjustment" scale constituted the mildly and severely emotionallly disturbed groups respectively. Both groups of psychiatric patients (total N = 60) completed the I-E scale.

Severely emotionally impaired patients were found to be significantly more external than mildly impaired patients. These results confirm Shybut's earlier findings.

Locus of control amongst schizophrenic groups

Repeated experimentation has demonstrated schizophrenics to be more external in the perception of the locus of control of reinforcements than normals (Duke and Mullens, 1973; Distefano, Pryer and Smith, 1971; Levenson, 1973) as well as other psychiatric patients (Pryer and Steinke, 1973; Harrow and Ferrante, 1969; Levenson, 1973; Duke and Mullens, 1973; Cash and Stack, 1973).

Duke and Mullens (1973) report significant differences between the generalised expectancies of control of reinforcement of chronic schizophrenics, a psychiatric control group (mostly patients diagnosed as affective disorders) and a normal group (non-professional employees of the hospital). All three groups consisted of 20 female subjects. Only patients who had been hospitalised for two years or more were selected. As predicted, schizophrenics were more external than non-schizophrenic psychiatric patients and normals. On the basis of the differences between the psychiatric patient groups, matched for chronicity, Duke and Mullens conclude that the

external beliefs of the schizophrenics can not be interpreted as solely a function of hospitalisation.

Harrow and Ferrante (1969) administered the I-E scale to 128 newly admitted psychiatric patients of whom 40 were diagnosed schizophrenic. In comparison to all other diagnostic groups, schizophrenics scored highest. Computing the student t from the reported data provided by Harrow and Ferrante, a significant difference is obtained between the means for the schizophrenic sample ($\bar{X}$ = 10,1) and the total sample of other patients ($\bar{X}$ = 8,1). The calculated t is 2,51 (df = 126, $p < 0,05$).

Similar, but slightly more internal results, are reported by Pryer and Steinke (1973) who found schizophrenic new admissions to score higher than two other psychiatric groups combined (depressives and personality disorders). The difference between the means of the schizophrenics ($\bar{X}$ = 8,8) and nonschizophrenics ($\bar{X}$ = 7,6) is not significant. Only after dividing the schizophrenic group into paranoid and chronic undifferentiated types, did differences emerge. The Newman-Keuls analysis identified significant differences between the diagnostic categories of paranoid schizophrenia and depression, the most internal category.

Comparing four psychiatric groups with a previously reported finding using a prison sample (Lefcourt and Ladwig, 1966), Cash and Stack (1973) obtained significant differences in locus of control between the prisoners and two (psychotic) groups. The mean I-E scores were: 11,0 for schizophrenics; 10,8 for psychotic depressives and 7,9 for the prison sample.

The multidimensional IPC scale was administered to 165 newly admitted psychiatric patients. Patients were categorised

according to diagnoses of: schizophrenia (chronic undifferentiated type), paranoids, depressives and neurotics. Both schizophrenics and paranoids scored higher on the Powerful Others and Chance dimensions than did depressives and neurotics. Small nonsignificant differences were obtained on the Internal scale. This pattern of differences was repeated when comparing the scores of schizophrenics with those of a previously reported random (normal) sample.

Distefano, Pryer and Smith (1971), investigated the perception of control of reinforcements amongst psychiatric patients (the majority being psychotics) and a "normal" comparison group of hospital employees. The mean I-E score for the sample of 57 patients was 9,0 which was significantly higher than the mean of 6,3 for the 40 hospital attendants ($p < 0,01$).

That schizophrenics are more externally orientated than normals and other psychiatric groups is well substantiated. The question of which specific characteristics of the schizophrenic reaction is related to a belief in external control has however, received considerably less attention from researchers. The majority of studies have investigated group differences between schizophrenics, as a homogeneous group and normals or other psychiatric groups.

In an attempt to limit the heterogeneity of the schizophrenic population, distinctions within the diagnostic category are considered.Of possible relevance to the perception of reinforcement are:

1. The paranoid - nonparanoid distinction
2. Chronicity
3. The activity - withdrawal distinction

The paranoid - nonparanoid distinction

Persecutory delusions are a common feature of paranoid behaviour. Clinically the paranoid schizophrenic is characterised by thoughts and feelings that his mind is influenced by powerful (external) forces.

Two studies have found significant differences between paranoids and other schizophrenics. Cash and Stack (1973) found paranoids and non-paranoids to have mean I-E scores of 13,2 and 8,2 respectively. This difference is highly significant ($p < 0,001$) Pryer and Steinke (1973) found a paranoid schizophrenic sample to be more external than three other diagnostic groups (depressives,chronic undifferentiated schizophrenics and personality disorders). A comparison of group means supported the hypothesis that paranoid patients would be more external than chronic undifferentiated schizophrenics.

The results of Levenson (1973) using her multidimensional locus of control scale, do not corroborate these findings. Calculating from the data provided by Levenson, paranoids were found to score significantly higher on the Internal scale than chronic undifferentiated schizophrenics ($t = 2,4$; $= 102$; $p < 0,05$). On both the Powerful Others and Chance scales, small nonsignificant differences were evident between paranoid and other schizophrenics.

Studies correlating the Paranoid (Pa) scale of the Minnesota Multiphasic Personality Inventory with locus of control have been contradictory. (Examination of the items of the Pa and I-E scales rules out the interpretation of a positive correlation on the basis of similarity of content). Cash and Stack (1973) report a highly significant correlation

of 0,59 ($p < 0,001$) between the Pa scale and a belief in external control. The sample used was a group of 61 hospitalised patients (predominantly schizophrenic).

Investigating the association between the MMPI and locus of control, Lottman, Davis and Gustafson (1973) correlated all the clinical scales of the MMPI with the I-E scale across four psychiatric populations. Nonsignificant correlations (r = 0,17, 0,26; 0,15 and 0,12) were obtained for each of the groups (reactive schizophrenics, process schizophrenics; alcoholics, neurotics).

Chronicity

Shybut (1968) and Harrow and Ferrante (1969) suggest that locus of control is a function of the experience of hospitalisation of psychiatric patients.

Shybut (1968) compared the perception of control of reinforcement of two groups of psychiatric patients who differed in the extent of psychological disturbance. The "severely disturbed" group (mostly schizophrenics) were found to be more external than a "moderately disturbed" sample (mostly neurotics and personality disorders) of psychiatric patients. Corresponding to the difference in the severity of psychological disturbance between the groups is the length of hospitalisation. The average length of hospitalisation is significantly higher for the severe group ($\bar{X}$ = 5,5 years) than the moderate group ($\bar{X}$ = 1,3 years). Shybut proposes that prolonged hospitalisation "may reduce one's expectancies for obtaining any socially valued goals and especially long range goals and increase one's belief in external control." (p. 315.) The severity of psychological disturbance and chronicity (i.e. period hospitalised) are confounded variables.

It is thus not possible to isolate the operative variable.

That long term patients tend to be particularly external in orientation receives indirect support from Harrow and Ferrante (1969). Analysing age differences, they find that older schizophrenics, who represented a more chronic population, adopt a more external orientation than do younger patients. From the literature, it appears that in (normal) adult populations LOC is a fairly stable trait which is probably independent of chronological age. (Wilkens, 1975; Lao, 1974; Ryckman and Malikiosi, 1975).

That the period of hospitalisation is not the sole factor determining the extent of the externality of the schizophrenic population has been demonstrated by Duke and Mullens (1973). They found that chronic schizophrenics have a more external belief system than either normals or other nonschizophrenic patients. The two clinical groups were matched for length of hospitalisation. Duke and Mullens conclude that the belief in personal control may in part be, but is not wholly, a function of the experience of institutionalisation.

A study by Cash and Stack (1973) reports findings contrary to the conclusion of Shybut (1968) and Harrow and Ferrante (1969) suggesting the "externalising" impact of hospitalisation on the patients perception of his control of reinforcement. Schizophrenics were divided on the basis of their duration of hospitalisation. The mean of the chronic group for the period hospitalised was nearly ten years as opposed to that of 7 months for the acutes. The difference between the locus of control of these two groups approached significance (5% level) opposite to that which was expected from prior findings (Shybut, 1968; Harrow and

Ferrante, 1969). Chronics were found to be more internal than acutes ($p < 0,06$). In addition, correlations between Rotter's I-E scale and four measures of chronicity (time since first hospitalisation, length of current hospitalisation, total length of hospitalisation, number of admissions) were all nonsignificant and close to zero ($r = 0,03$; $0,01$; $0,07$ and $-0,01$ respectively).

The data relating locus of control to chronicity is contradictory. Most findings confound the severity of the condition and the period hospitalised. Although the hypothesis suggesting that hospitalisation results in a reduction in the sense of personal control appears feasible, there is at this stage little experimental evidence for this contention.

The activity-withdrawal distinction.

Passivity is regarded as a fundamental and necessarily present feature of the perception of external locus of control (Rotter, 1966; Hochreich, 1974; 1975). In addition, the close resemblance between the concepts of externality and learned helplessness implies a possible association between locus of control and motivational deficits.

The activity withdrawal distinction in schizophrenia, initially introduced as a rating scale by Venables (1957) may be a behavioural parameter of particular relevance to an understanding of the relationship between schizophrenia and an external perception of locus of control of reinforcement. Correlates of this dichotomy outlined by Depue (1976), indicate that withdrawn schizophrenics exhibit depressed activity levels across a wide range of behaviour.

1. Motor activity: The behaviour of withdrawn schizophrenics is characterised by a reduction and delay (slowing down) of motor activity. The behaviour of active patients frequently suggests an agitation to the point of being unable to remain seated.

2. Verbal productivity: Withdrawns speak softly, sometimes inaudibly, infrequently and at a decreased rate. Actives in contrast speak often, quickly and loudly.

3. Sociability: Withdrawn patients display a reduced interpersonal contact. Active schizophrenics show a high frequency of interpersonal contacts with patients and staff.

4. Emotional lability: The affect of withdrawn patients appears flat. Actives, on the other hand, demonstrate greater lability of emotional response.

5. Anhedonia: The withdrawn schizophrenic exhibits severe anhedonia in a reduction in gratification and reduced involvement in ward activities. Active patients do not exhibit severe anhedonia. These patients usually involve themselves in the ward activities.

6. Delusions and hallucinations: Withdrawn schizophrenics show a significantly higher incidence of delusions and hallucinations than do actives.

The possibility that these forms of schizophrenia are transient phases which occur within the same patient, has been empirically refuted. Depue and Evans (1977) found that the activity withdrawal behavioural profiles were completely consistent over the time of (one) hospitalisation.

Although the relationship between expectancy of control of reinforcement and the activity withdrawal continuum remains unresearched amongst schizophrenics, theory and

related experimentation suggest this area to be of particular importance.

The study by Duke and Mullens (1973) does provide some related data. Schizophrenic patients were administered a locus of control scale as well as psychometric scale of interpersonal distance, the Comfortable Interpersonal Distance scale (Duke and Nowicki, 1972). The scale correlates highly with real life approach distances. Large interpersonal distances may be taken as an index of withdrawal. Correlation results between locus of control and interpersonal distances for various target persons indicate a range of 0,30 to 0,73 (median $r = 0,60$; $p < 0,01$). This finding supports the mediational role of perception of reinforcement in distancing decisions.

Evidence for the association between externality and withdrawal has already been noted for non-schizophrenic populations.

SUMMARY

1. The literature survey focuses upon the relationship between locus of control and learned helplessness. The conceptual similarity of the two constructs is noted. Further the empirical association between locus of control and the symptoms of learned helplessness is investigated.

2. Depression .

(a) Externality correlates with depressive responses:

i. Low self esteem

ii. Negative mood states

iii. Withdrawal

(b) Externality correlates with self-report measures of depression.

3. Anxiety

Both human and animal experimentation indicate that fear and anxiety result from the experience of uncontrollable negative reinforcements. An external orientation corresponds to self-report indices of anxiety.

4. Schizophrenia .

Schizophrenics are more external than normal and other psychiatric groups. Rating scales of severe psychopathology demonstrate an inverse relationship between belief in internal control and the severity of the disorder. Clinical distinctions of possible relevance to locus of control are reviewed.

(a) Paranoid-nonparanoid distinction. Studies comparing paranoids with other types of schizophrenic patients do not find consistent differences in perception of locus of control. Correlations between the Paranoid scale of the MMPI and Rotter's I-E have been found to vary considerably

from population to population.

(b) Chronicity. The data relating locus of control to chronicity is contradictory. Length of hospitalisation contaminates the severity of the disorder and the effect of hospitalisation. Conclusions must necessarily be equivocal.

(c) The Active-withdrawn dichotomy. The stability and wide ranging applicability of this behavioural characteristic has been demonstrated by Depue (1976). Little research has as yet emanated from this typology. On the basis of related investigations, however, this variable could prove to be important for an understanding of the relationship between perception of control of reinforcement and schizophrenia.

LOCUS OF CONTROL AND DEMOGRAPHIC VARIABLES RELEVANT TO THIS STUDY

AGE

Although some studies have investigated correlations between age and perceived control it is clear that this relationship is to be understood not by age change per se but rather in the context of the accompanying changes in the individual's capacity to influence his environment.

Using an orally administered locus of control scale, Bialer (1962) found perceived control of reinforcement to be significantly correlated with both mental and chronological age in groups of normal and retarded children. When mental age was partialled out the obtained relationship between locus of control and chronological age became negligible (partial r = 0,02). On the other hand, mental age and internality remained strongly related (r = 0,47) with chronological age partialled out.

This finding was replicated by Penk (1969) who found that a significant correlation between chronological age and internality (r = 0,27; $p < 0,01$). Althought not utilizing partialling procedures Penk's study did suggest that the variance of locus of control may be a function of verbal competence rather than age itself.

Brecher and Denmark (1969) too found a greater verbal fluency on the part of internals than of externals. This may indicate that increasing verbal fluency, which would be a concomitant of development, leads to a greater capacity to manipulate one's environment.

Lao (1974) presents evidence for the developmental

trends of locus of control by means of a cross-sectional study. Consistent with the notion that internality increases with greater independence, it was found that the belief in personal control increased from adolescence to young adulthood. Locus of control remained constant through middle age with a slight increase in externality with advanced age. The oldest groups (subjects in their sixties and seventies) were unexpectedly not significantly more external than the middle age groups (between thirty and sixty years of age).

Ryckman and Malikiosi (1975) investigate the relationship between age and locus of control amongst adults. The study was meant as a replication of Lao (1974), replacing the I-E scale with Levenson's multidimensional scale. Despite a selection bias in the sample used, the pattern was similar to that found by Lao (1974) particularly in comparing the age trend of Levenson's Internal scores with that of the I-E scores. Internality was found to increase from youth (17 - 20 years) to the middle years but showed no decline with old age.

Wilkens (1975) utilised the multidimensional locus of control approach derived from Mirels (1970) factor analysis to investigate changes in locus of control with time. Wilkens's longitudinal study followed up a sample of college students ten years after they were originally tested in 1964. A correlation of 0,31 ($p < 0,01$) was obtained between the total I-E scores for 1964 and 1974. Analysing the total I-E scale scores there was found to be a decline in internality. The drop did not reach statistical significance, (5% level). Using the two factors derived by Mirels (1970) that level of

significance was achieved. Factor II (Socio-political control) was found to decline significantly over the ten year period from 1964 to 1974.

The long term stability of the entire I-E scale and Factor I (Personal Control) scores indicate that locus of control is a psychological variable not readily modified and remaining relatively constant over time.

Lao (1976) found that a college student sample was significantly more external than their parents. It was suggested that the parent groups, in their forties and fifties, were at the height of their sense of competence and control. This finding was consistent with Lao (1974) and Ryckman and Malikiosi (1975).

Lao (1976) reports also that a series of correlations were performed to examine the relationship between I-E scores and a number of variables found to be related to locus of control in previous studies. Educational level, income, frequency of church attendance, size of geographical location, job satisfaction, evaluation of own ability and degree of involvement in community affairs, were correlated for mothers and fathers separately. Results indicated that these variables were unrelated to locus of control in these older samples. The only exception was that internality correlated significantly ($r = 0,175$; $p < 0,05$) with father's educational level.

Lao suggests that relationships with measures of generalised expectancy hold only for children and young adults and cannot be extended to older subjects. This interpretation is taken from Duke, Shaleen and Nowicki (1974)

who explain that from a social learning standpoint, younger persons would be more reliant upon generalised expectancies than older persons; hence one would expect fewer correlates of locus of control in an older population. In terms of the social learning formulation of expectancies as expressed by Rotter (1954) this would make sense.

$$E = f\ (E\ \&\ \frac{GE}{N})$$

In this formula S represents the specific situation, N represents the amount of previous experience the individual has had in that situation, E represents the expectancy, E represents a specific expectancy and GE represents a generalised expectancy. (Rotter, 1954; p. 166.) The importance of generalised expectancies (GE) in a specific situation is inversely related to the amount of prior experience (N) of that and related situation.

One might conclude that locus of control is age dependent, firstly, in the sense that it is affected by changes in personal control concomitant with age changes (e.g. Penk; Bialer, 1962). Further the extent of the generalisability of locus of control may be age dependent (Lao, 1976). There is some justification for the view that locus of control is a psychological characteristic which is relatively stable over time amongst adult populations. (Wilkens, 1975; Lao, 1974; and Ryckman and Malikiosi, 1975).

INTELLIGENCE AND EDUCATION

In his 1966 paper, Rotter reports that three unpublished studies found low or negligible correlations between indices of intelligence and I-E scale scores. In a study by Ladwig (1963), a sample of male prisoners exhibited a correlation of 0,01 between locus of control and the Revised Beta IQ. Two other studies (Strickland, 1962; and Cardi, 1962) found low non-significant correlations between perceived control of reinforcement and psychological exam results for male and female students.

An investigation by Hersch and Scheibe (1967) showed I-E scores to be unrelated to three measures of intelligence among a sample of college students in the service corp. The instruments were the Otis Quickscoring Mental Ability Test, the D48 and the Terman Concept Mastery Test. Correlations ranged from -0,07 to 0,17.

Kiehlbauch (1969) further corroborated the finding of a nonsignificant relationship between I-E and the Revised Beta measure of intelligence among reformatory inmates. Changes in locus of control scores reported by Kiehlbauch during the duration of imprisonment were not accompanied by changes in intelligence scores.

Most studies which have found a significant relationship between internality and IQ used children as subjects. (e.g. Bialer, 1962; Penk, 1969; Brecher and Denmark, 1969). Two interpretations of this association may hold. The perception of personal control may result from a bright child's ability to manipulate and control his environment. Alternatively, as Lao (1976) has proposed, the predictability of other variables from generalised expectancies may be a

function of age. Children, it would be expected, are more reliant upon generalised expectancies than older people.

A moderate correlation between intelligence and internality has been obtained for an adult sample in at least one study (Powell and Centa, 1972). Two locus of control measures, the I-E and Adult Locus of Control (ALOC) scales, and the Henman-Nelson Tests of Mental Ability were administered to a group of introductory psychology students and a group enrolled in an introductory course for bank employees. The Pearsonian correlations between the Henman-Nelson Total and I-E and ALOC were -0,34 and 0,34 ($p < 0,05$) for the groups combined. The opposite signs are accounted for by the direction of scaling. Unlike Rotter's I-E scale which totals the number of external responses, ALOC scores indicate the extent of internality, the belief of personal control. Although an exception may be found (e.g. Powell and Centa, 1972) the weight of present evidence justifies the interpretation that LOC is independent of intelligence for adult populations.

Few studies have reported the association between years of education and locus of control. Walls and Miller (1970), using a Chi square analysis of locus of control and educational level, obtained a significant relationship between years schooling and internality. ($p < 0,01$). Years education is clearly dependent upon both intellectual and social circumstances. The social class component is probably the factor responsible for this finding.

SOCIAL CLASS AND ETHNICITY

Most of the work on social antecedents supports a relationship between locus of control and social class or ethnicity. For example, most evidence indicates that blacks are more external than whites and that lower social status is associated with external beliefs.

Lefcourt and Ladwig (1966) found that white prisoners were more internal than a comparable group of black prisoners. Using subjects taken from the welfare rolls who were essentially unemployable, Scott and Phelan (1969) showed the whites of this group to be significantly more internal than either the blacks or the Mexican Indians. Zytkoskee, Strickland, and Watson (1971) obtained a significant difference between the locus of control or poor Southern black children and poor white children on Bialer's locus of control scale. Blacks were more external. There have however, been studies which have not repeated these differences. Katz (1967) and Solomon, Houlihan and Parelius (1969) did not find race differences in responses to the Intellectual Achievement Responsibility scale, which measures perceived control in academic settings of childhood.

Using Bialer's I-E measure along with a cartoon device for assessing locus of control, Battle and Rotter (1963) investigated the beliefs of black and white children from the middle or lower classes. As predicted middle class children were more internal than those from the lower classes. Lower class blacks were shown to be significantly more external than whites or middle class blacks. In another study of the effects of social class on children,

Gruen and Ottinger (1969) found that internality was associated more often with third grade children from a middle class background than those from the lower classes. Within both groups, wide differences in perception of control occurred. Gruen and Ottinger comment that neither social class was highly internal, but the middle class subjects were, relatively speaking,more internal than their counterparts.

One study in which class groupings were not reflected in measures of perceived control is reported by Gore and Rotter (1963). They failed to obtain social class differences on the I-E scale in a group of Negro college students. Despite the occasional failure to obtain differences between racial or socio-economic groups, it is notable that whenever differences are found, externality is associated with powerlessness.

In a field study conducted by Jessor, Graves, Hanson and Jessor (1968), the relationship between socio-economic status and an external fatalistic orientation was examined. Rather than relying on a single measure of socio-economic status, the investigators assessed the objective access to opportunity for three groups that comprised a community in the south-western United States. Objective access was defined by the position of a subject on eight measures including age, marital status, language spoken in the home, occupation, education, religion, generation mobility, and social participation. Each position was conceptually linked to a location in the opportunity structure. For example:

A young person has more objective access

> than an older one, since he still has a chance to achieve presently unobtained goals in the future and since youth itself is responded to socially as an asset in socio-occupational life, whereas the older person's chances are diminishing and age tends to be seen as a limitation in many areas of social life. (Jessor, Graves, Hanson, and Jessor, 1968, p. 126.)

The total of the items, then indicates the degree to which a person is in a position to secure valued ends. As expected, the ranking of three ethnic groups in terms of their mean internality scores mirrored the ranking on the basis of objective access to opportunity: the order of ranking was Anglo, Indians and Spanish. Of particular interest, is the fact that objective access and perceived control correlated strongly ($r = 0,50$; $p < 0,001$). The more objective access to opportunity one had, the more potential control of one's fate did a person acknowledge.

Locus of control and demographic variables of relevance to the present study.

SUMMARY

Age: It is concluded that:

(a) Locus of control is age dependent in the sense that is it affected by changes in experienced personal control concommitant with age changes.

(b) The utility of the generalised measure of locus of control may be age dependent and limited to the young.

(c) Locus of control is a psychological characteristic which is relatively stable over time amongst adult populations.

Intelligence and education:

(a) Most studies using adult samples have found close to zero correlations between indices of intelligence and locus of control. This is not so for research using children as subjects.

(b) One study reports internality to be related to educational level. A component of years education is opportunity, which is a function of social class.

Social class and ethnicity:

Variations in locus of control scores between ethnic and socio-economic groups can in general be related to differences in the accessability of power. Most of the evidence indicates that blacks and individuals from lower social classes are relatively more external in their beliefs.

THE PRESENT STUDY

THE PRESENT STUDY

SUBJECTS

Schizophrenic sample

Forty male patients from two State psychiatric hospitals were investigated. To achieve the required sample size, testing covered a period of three months.

Assistance was received from the hospitals' clinical psychologists regarding the suitability of patients for inclusion in terms of the set criteria. The following criteria were used as the basis of selection:

1. A diagnosis of schizophrenia. Most diagnoses made at the two hospitals do not utilise subcategories of schizophrenia.
2. An absence of any indication of drug addiction or alcoholism.
3. Absence of obvious (or stated) serious physical illness.
4. Age between 20 and 50. This was an attempt to control for maturational factors. There is evidence that scores on the I-E and IPC scales are relatively stable during adulthood. (Lao, 1974; Ryckman and Malikiosi, 1975). Further, Lorr's Psychotic Reaction Profile has been standardised and constructed from populations under the age of 50.
5. Education of Standard 7. There has not been much research investigating the association between education and locus of control or trust. There is evidence however to suggest that the I-E scale is more appropriate for subjects with at least Grade 9. (Standard 7)

education. (Nowicki and Duke, 1974).

6. Hospitalisation.

a. Present admission of a minimum of 2 weeks. The intention of the design was to avoid the inclusion of subjects in an extremely acute phase (most likely at admission) who might provide particularly unreliable data. The views and attitudes of new admissions may be unstable and markedly influenced by recent drastic situational changes.

b. Total hospitalisation of a maximum of 5 years. This criterion was designed to exclude long-term chronic subjects whose condition, in terms of behaviour and attitudes, might be expected to reflect characteristics of an extended period of institutionalisation.

The requirements for selection were checked with the staff and records before testing. Three patients requested to be excused participation and four subjects who had volunteered could not or wished not to complete the tests. Thus a total of 7 subjects withdrew from the experiment.

Normal sample

The normal group comprises a random selection from voters in the lower half of the Musgrove constituency (below Cowey Road) in the city of Durban, South Africa. Upper Musgrave is predominantly upper middle class and for that reason not considered a suitable control for a schizophrenic experimental group. The predominantly clerical or blue collar work done by the normal subjects reflects the middle and lower class composition of the group.

The same age, education and absence of obvious or stated serious physical illness criteria as applied to the

schizophrenic sample were used. Forty male volunteers were recruited.

Unlike the schizophrenic sample in which selection was guided by consultation with the hospital staff and records prior to testing, subjects from the normal sample were approached solely on the basis of being randomly selected from the roll. With respect to the experimental criteria, the suitability of subjects was unknown. In consequence, subject loss was far larger from the normal than the schizophrenic sample.

A relatively large number of subjects initially drawn were lost by:
having left the registered residence (16); or
advanced age (13).
Four subjects were lost as a result of:
not meeting the educational level criterion (2);
refusing to participate (1); and
refusing to complete the tests (1).

Although a considerable number of subjects were lost, good cooperation was received from those approached. Only two of those eligible did not complete testing (4,8%). The sample appears to have suffered very little from self-selection biases inherent in any design in which participation is voluntary.

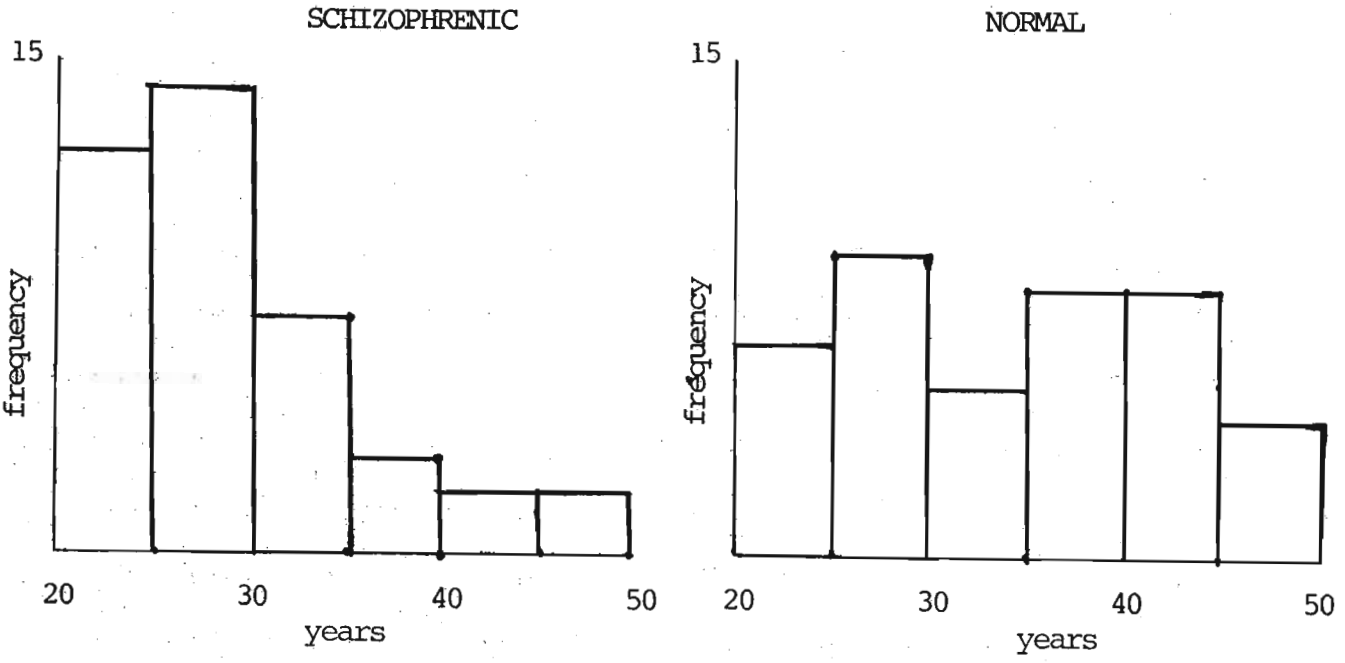
Demographic differences between the samples

1. Age

The mean age for the schizophrenic sample is 28,5 years with a standard deviation of 7,2. The mean age for the normal group is 34,1 years with a standard deviation of 8,2.

This difference is statistically significant ($t = 3,20$ / $df = 78$; $p < 0,01$). In addition the distribution of the two groups differs in that the schizophrenics are negatively skewed (being modally distributed around the two youngest age groups) compared to the more linear distribution of the normals.

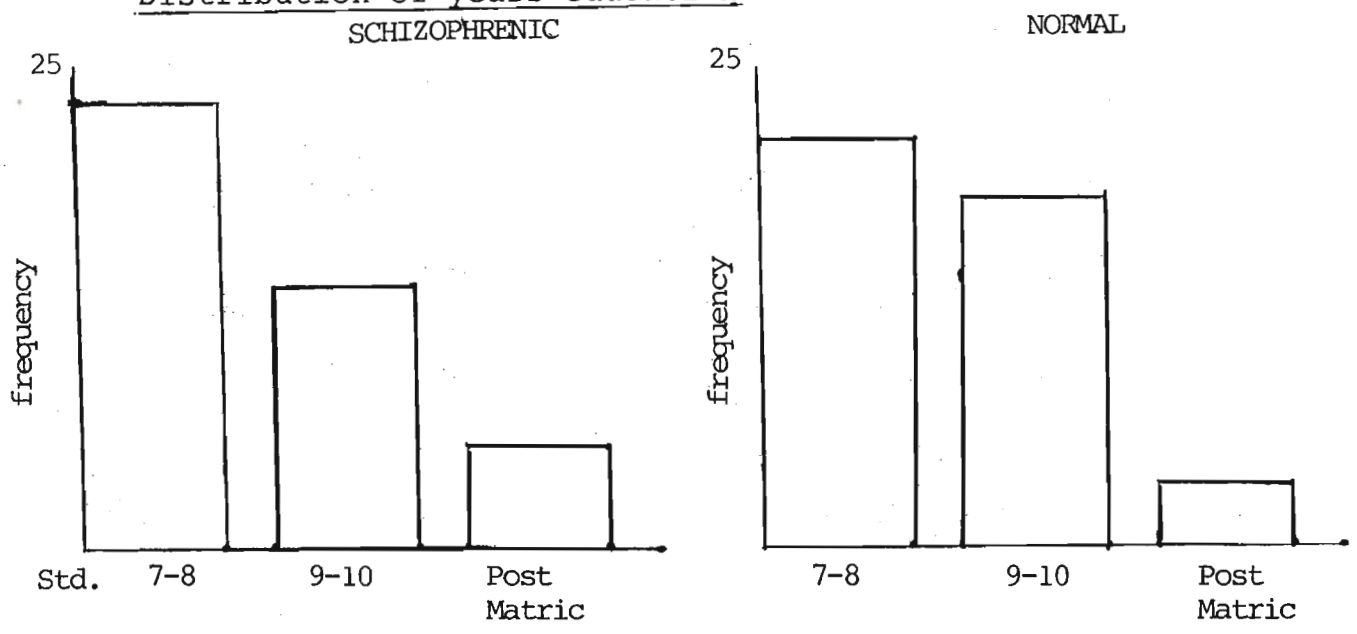
Distribution of ages of subjects in years.



2. Education

The mean number of years education is identical for the two groups ($\bar{X}$ = 10,9 years). The distributions of the two samples are similar except that more schizophrenic subjects fall into the lower education (Standard 7 and 8) and higher education (post-matric) categories. As a group, the normals are slightly more homogeneous in terms of education. This is apparent from the histogram below and is reflected in a marginally lower standard deviation (Standard deviations: normals 1,6 and schizophrenics 2,1).

Distribution of years education



3. Employment

All forty of the normal subjects were employed at the time of testing. Of the schizophrenic subjects, only four were employed up to the time of admission. The average period of unemployment (i.e. time since last job) was 2,3 years for the schizophrenic group.

The jobs of the normal group predominantly indicate a middle and lower middle class socio-economic level. From accessable information, the positions held by the schizophrenic group also reflect, with exception, a lower middle class group. A number of schizophrenic subjects had a poor work history both in terms of unemployment and a rapid succession of jobs. Five schizophrenics had never been employed.

PROCEDURE

All subjects were recruited on a voluntary basis. The nature of the testing and the study were explained in broad terms with the assurance that all information gathered would be treated as completely confidential.

Schizophrenics

Schizophrenic patients were selected on the basis of the experimental criteria. All but three patients volunteered participation.

It was emphasised that the investigation was an independent University project. The impression that the tests were accessible to, or being used by, the hospital could create a strong cognitive set and affect results.

The procedure required about one hour and was conducted in small groups of up to four subjects in a single sitting. In general, subjects were cooperative and showed application. It seems likely that the sample loss of four patients not completing the tests tapped the least motivated and most confused of the initial sample.

Normals

A computer-generated set of random numbers was used to select the group of normal subjects from the lower Musgrave area. Letters of introduction were sent to (potential) subjects informing them that their names had been randomly drawn from the voters' roll and requesting their participation in the research. Subjects were told that testing would involve completing attitude questionnaires.

It was explained that, if convenient, testing would be conducted in their homes during the week following

receipt of the letter. Subjects were invited to phone enquiries through to the experimenter.

Before testing, subjects were screened in terms of the experimental criteria. Administration of the tests required about 45 minutes. With only two exceptions (the two who refused to participate) subjects were receptive and cooperative. Subjects appeared to be well motivated, many expressing an interest in the nature of the project. After completion, the experimenter answered questions pertaining to the investigation.

Apart from the behavioural profile(Psychotic Reaction Profile) rated by the hospital staff, tests were identical for the normal and psychiatric samples.

TEST INSTRUCTIONS

Three scales were administered following completion of a brief fact-gathering questionnaire. The autobiographical information given by schizophrenic subjects was checked, where possible, against hospital records. A good reliability of information was evidenced with regard to age, marital status, education and period unemployed. Most difficult to assess was the duration of hospitalisation. Where necessary, this was estimated with hospital assistance.

The order of the scales was rotated to control for order-effect. Instructions to all scales were read aloud and clarified further if required.

1. The Internal-External Scale (Rotter, 1966).

The I-E scale requires subjects to mark their preference between pairs of statements, one internal, the other external in orientation. The scale includes six filler items.

With minor alterations, the wording below follows the instructions of Rotter (1966):

Instructions:

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered A or B. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. Find the number of the item on the answer sheet and black-in the space under the letter A or B which you choose as the statement more true.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

2. The Internal, Powerful Others and Chance Multidimensional Locus of Control Scale (Levenson, 1972).

This questionnaire asks subjects to indicate the degree of his agreement or disagreement with each of the 24 statements.

A modification of the scale for psychiatric patients, as used by Levenson (1973) is not repeated in this study. That alteration, a replacement of three items, merely flavours the test for a hospital sample rather than altering its nature. The adaptation is not essential and would endanger the comparability of the results from the two samples.

Instructions:

This is a questionnaire to determine the views of people on a number of statements. Indicate your beliefs by marking an "X" over the appropriate number on your answer sheet.

Mark an "X" over -3 to show that you STRONGLY DISAGREE.

Mark an "X" over -2 to show that you DISAGREE SOMEWHAT.

Mark an "X" over -1 to show that you SLIGHTLY DISAGREE.

Mark an "X" over +1 to show that you SLIGHTLY AGREE.

Mark an "X" over +2 to show that you AGREE SOMEWHAT.

Mark an "X" over +3 to show that you STRONGLY AGREE.

Please ensure that you answer all questions.

3. The Interpersonal Trust Scale (Rotter, 1967).

Subjects are required to state the extent of their personal belief in the truth of each of 40 statements. The measure includes 15 filler items.

Below are the instructions, which involve minor changes from those given by Rotter (1967).

Instructions:

This is a questionnaire to determine the attitudes and beliefs of different people on a variety of statements. Please answer statements by giving as true a picture of your own beliefs as possible. Be sure to read each item carefully and show your beliefs by filling in the appropriate number on your answer sheet in the space provided.

If you strongly agree with an item, fill in the space with a "1". Mark the space with a "2" if you mildly agree with the item. That is, mark a "2" if you think the item is generally more true than untrue according to your beliefs. Fill in the space with a "3" if you feel the item is about equally true as untrue. Fill in the space with a "4" if you mildly disagree with the item. That is, mark a "4" if you feel the item is more untrue than true. If you strongly disagree with an item, fill in the space with a "5".

1. Strongly agree
2. Mildly agree

3. Agree and disagree equally
4. Mildly disagree
5. Strongly disagree

Please be sure to fill in the spaces and to erase completely any marks to be changed. Make no extra marks on the questionnaire.

Whilst the scales were being administered to subjects from the schizophrenic sample, the staff nurse in charge of the ward completed the Psychotic Reaction Profile (Lorr, O'Connor and Stafford, 1960) for each patient.

The profile consists of an 85 item behavioural check-list. Each item is marked as "True" or "Not True". Most items are phrased in unambiguous terms. On enquiring, staff nurses reported little difficultly in deciding upon their responses.

THE INSTRUMENTS USED

1. The Internal-External Scale. (Rotter, 1966)

Format:

The I-E scale is a 29 item questionnaire. Six filler items are included to disguise the purpose of the test. Each item comprises a pair of statements - one phrased in the internal direction, the other in the external direction. Subjects are instructed to mark their preference. The scale with a range of 0-23 is scored as the number of external statements chosen.

Assessing a generalised locus of control the I-E scale samples beliefs covering a wide spectrum of social events and expectations.

Examples

Item 2 A: Many of the unhappy things in people's lives are partly due to bad luck.(External)

B: People's misfortunes result from the mistakes they make. (Internal)

Item 3 A: One of the major reasons why we have wars is because people don't take enough interest in politics. (Internal)

B: There will always be wars, no matter how hard people try to prevent them. (External)

Regarding the inclusion of filler items

The use of additional buffer items has apparently been accepted with little research into how their inclusion influences the test characteristics. Kestenbaum and Hamersla (1976), in a series of three experiments, point to

the filler items being ineffectual. The exclusion of these items did not:

1. affect I-E scores;
2. impede subjects from faking good; or
3. obscure knowledge of the purpose of the test.

Regarding the forced-choice format

The forced-choice format was developed by Rotter (1966) to control for the effects of social desirability which had contaminated earlier locus of control scales. In constructing the measure, each of the statement pairs were matched on desirability. There is evidence that, providing faking good is not a strong situational demand (e.g. job interview) I-E scores are relatively free of a desirability component. (refer pp. 105-107.)

Studies by Klockars and Varnum (1975) and Kleiber, Veldman and Menaker (1973) have however questioned the suitability of the choice of corresponding statements comprising the item pairs.

Both studies required subjects to rate each separate statement of the scale (i.e. 46 statements) on a Likert type format. An assumption of the I-E scale is that item pairs are polar opposites. Consequently, it is expected that ratings of item pairs would exhibit strong negative correlations. Both studies were consistent in finding that these correlations were, whilst mostly negative, of a low order. More than half of the corresponding statements correlated less than -0,20. Klockars and Varnum (1975) and Kleiber, Veldman and Menaker (1973) report median correlations of -0,16 and -0,19 respectively.

In addition, factor analysis of the 46 statement ratings identified a structure which cut across item pairs. (Kleiber, Veldman and Menaker, 1973)

Apart from the question of the structural compatability of the items, the forced choice format has been found to be unpopular with subjects (Nowicki and Duke, 1974). A number of subjects from both samples of the present study expressed difficulty and frustration at having to decide on their preference for one or other statement.

Validity

An enormous literature has developed relating locus of control to criteria of relevance to its validity. Briefly, in support of the validity of both the theoretical construct in general, and the I-E scale, in particular, the following crucial findings are quoted.

1. Learning depends upon the perception of locus of control of reinforcement.

The general hypothesis proposed by Rotter (1966) is that when a reinforcement is seen as not being contingent upon the subject's own behaviour its occurrence or non-occurrence will not alter an expectancy as substantially as when it is seen as contingent.

Phares (1957) found that changes in expectancy for success depended upon whether subjects received chance or skill instruction (i.e. whether they were told that an ambiguous task was a matter of luck or their ability). Subjects who perceived their condition as uncontrollable exhibited fewer changes in expectancy and more "unusual shifts". An unusual shift in expectancy, sometimes called "gambler's fallacy", occurs when shifts do not confirm with one's previous experience - either an increase in expectancy

following failure or a decrease in expectancy following success.

Further, it has been demonstrated by James and Rotter (1958) that resistance to extinction of expectancies is dependent upon perception of the nature of the conditions (chance or skill). Under chance conditions, the trials to extinction were longer following partial reinforcement than after continuous reinforcement. Under skill conditions, the reverse was true.

Phares (1957) used a short Likert-type scale to measure locus of control. He found that a scale of 13 externally directed items produced low level correlations bordering on statistical significance. That is, externals made more unusual shifts in expectancy and yet made fewer and smaller shifts in expectancy than did internals. In other words, individuals with external attitudes behaved in a fashion similar to subjects who received chance instructions.

Regarding the ability of the I-E scale to replicate these findings, Rotter (1966) admits to only partial success. He does however note that investigations with the I-E scale have been consistent in direction, namely that"externals tend to produce more unusual (or gambler's fallacy) shifts." (Rotter, 1966; p. 19.)

2. Internals exhibit greater independence of judgement than externals.

Studies have demonstrated that internals are less susceptable to persuasion than externals. Crowne and Liverant (1963) designed an Asch-type conformity situation in which confederates of the experimenter were used to exert "group pressure" on the subject. Subjects were given money to bet

on the correctness of their decision. Internals were significantly less yielding. Further, when defying the majority, internals bet more money than externals.

In a similar experiment, using the I-E scale, Tolor (1971) found that when the majority of the group claimed a stationary light was moving, externals were more prone to see the light as moving.

Internals do not merely resist influence; rather they are more discriminating about which influences they accept. Ritchie and Phares (1969) found that, amongst internals, attitude change following exposure to influential arguments was independent of the status of the source. Amongst externals, the shift in opinion was a function of the prestige of the person presenting the arguments.

Another study which provides further evidence that internals are not simply stubborn or non-conformist is that of James, Woodruff and Werner (1965). They showed that more internal males than external males stopped smoking for a specified length of time after hearing the U.S. Surgeon General's report on the deleterious effects of cigarette smoking.

3. Externality is related to poor psychological adjustment.

Literature within this domain has already been reviewed. Locus of control has been shown to be correlated with self-report scales of anxiety and adjustment. In addition, externality has been found to be related to the severity of psychiatric disorder in terms of clinical diagnosis and behavioural assessments.

One area of research which has cast doubts on the validity of the I-E construct, with respect to its unitary nature, involves factor analytic studies. This too has been reviewed. Although there is considerable evidence suggesting that the I-E scale includes more than one factor, the emergent structures have not been consistent. The dimensions which have been used tend to be significantly related. As noted by Rotter (1975) the investigation of specific factors need not mean the exclusion of the general measure for study.

Reliability

Internal consistency

Rotter (1966) provides evidence for the moderately high internal consistency for the I-E scale. Results from four University and high school samples are remarkably similar. Male and female combined groups were found to have internal consistency correlations ranging from 0,69 to 0,73 using either the Spearman Brown split half, or the Kuder Richardson formula. These reliability measures reflect the homogeneity of the scale. It should be borne in mind that the I-E scale, in assessing a generalised expectancy, utilises expectancies from a wide range of situations. Compared to a homogeneous measure, lower internal reliabilities are to be expected from this form of additive scale.

Investigating the test characteristics of the I-E scale, Hersch and Scheibe (1967) used ten student groups (sample size ranging from 81 to 99) over a period of 3 years. Corrected split half measures for the various groups fell between 0,60 and 0,91.

Test-retest reliabilities

Retest reliabilities between 0,49 to 0,83 are reported by Rotter (1966) for periods of 1 and 2 months. This data includes two University samples and one group of prisoners. These figures are very close to the 0,43 - 0,84 range obtained by Hersch and Scheibe (1967) using five student samples and a two month interval. The shift in locus of control reported in this study was small and nonsignificant but consistently towards increased internality.

Kiehlbauch (1967), using reformatory samples, found retest reliability co-efficients of 0,75 after three months, 0,39 after six months and 0,26 after nine months.

For psychiatric patients, Harrow and Ferrante (1969) report a reliability co-efficient of 0,75 after a six week interval.

In a longitudinal study of changes in locus of control Wilkens (1975) found a significant correlation of 0,31 between I-E scores for subjects tested in 1964, as students, and their scores ten years later. This test of the long term stability of perception locus of control provides validity for the utilisation of the measure as a personality trait.

Social desirability

Rotter (1966) reports a low negative association between I-E scores and social desirability. He reports five experiments, using elementary psychology students, in which correlations range from -0,07 to -0,35, with a median correlation of -0,22 between locus of control and the Marlowe-Crowne Social Desirability Scale.

One study, cited by Rotter (1966), of federal prisoners, in which a higher correlation is recorded (r = -0,41), is interpreted as indicating that intrusion of the social desirability factor is possible under specific circumstances.

In the main, investigations between the Marlowe-Crowne Social Desirability Scale and the I-E scale have obtained nonsignificant or inconsistent correlations. For example, Tolor (1967) found nonsignificant correlations for two different samples - a group of teachers and a group of psychology students. (The teacher group was with a single exception, females; whilst the students were predominantly male). Correlations reported were 0,26 and -0,09. Tolor and Jalowiek (1968) used 68 male freshmen as subjects. Again a low nonsignificant correlation is reported. Feather (1967) found a significant correlation for females (r = -0,42) but not for males. Altrocchi, Palmer, Hellman and Davis (1968) found a significant correlation for males (r = -0,34) but not for females.

Cone (1971) compared I-E scale scores and the Edwards Social Desirability Scale in groups of Army mental health clinic outpatients and stockade prisoners, hospitalised alcoholics, and disadvantaged youth. Highly significant correlations were reported ranging from -0,25 to -0,70. It seems likely that the marked influence of social desirability is a function of the test conditions. Cone's sample could have been motivated by the advantage of appearing in a favourable light.

Other studies have used an alternative technique for assessing the social desirability of the individual I-E

items. Subjects are asked to rate the social desirability value of each of the 23 pairs of statements.

Hjelle (1971) found that 11 of the internal items were rated as significantly more socially desirable than the corresponding external item ($p < 0,05$) by female students. Subjects were asked to rate on a scale of 9 the social desirability value of each item. Items were presented in a randomised stimulus format of 46 statements rather than the regular (forced choice) design. In a replication of Hjelle's experiment, Kestenbaum and Hamersla (1976) found that the majority of statement pairs were biased in favour of the internally worded option. The discrepancy between social desirability ratings of the corresponding statements was shown to be consistent over three different student samples.

Joe (1972) asked college students to rate, in terms of desirability the extent of their preference for an item of the regular forced-choice pairs. Thirteen items were found to be significantly different in social desirability ratings across both samples. Eleven of these showed the internal statement more socially desirable than the corresponding external statement.

The study by Kestenbaum and Hamersla (1976) investigated the effect of the omission of the 6 filler items and the ability of subjects of "fake good" on the I-E scale. They found subjects were able to "fake good" with or without the additional items. Subjects given instructions to "make the best possible impression" tended to have more internal scores.

Experimental findings, although not entirely consistent,

appear to indicate the existence of a social desirability component which may be evoked under various testing conditions. Specifically, subjects who view the results as bearing upon their future tend to produce results more internal than could otherwise be expected.

The Internal, Powerful Others and Chance Scale (Levenson, 1972)

Format

Each of the I,P and C subscales consist of eight items in a Likert format. The possible range of scores is 0-48. The three subscales are presented as a single attitude scale of 24 items.

The items of the IPC scale differ from Rotter's I-E scale in 5 ways:

1. There are no filler items.
2. Instead of a forced choice format, a 6 point rating scale (no neutral) is used. The Rotter scale conceives internality and externality as being polar opposites on a single continuum whereas Levenson's IPC differentiates between three conceptually distinct expectancies. Note that, derived from the I-E scale, internality and externality are conceptually equivalent. Internality is simply the complement of externality (Internality = 23 - Externality).
3. On the I,P and C subscales a personal ideological distinction has been made. All the statements are phrased in the first person so as to pertain only to the subject himself. They measure the degree to which an individual feels he has control over what happens to him, not what he feels is the case for "people in general."
4. No reference is made in the items which deal with the modifiability of the specific social issues. Both the factors of personal versus ideological control and system modifiability were found by Gurin, Gurin, Lao and Beattie (1969) to be contaminating variables in the I-E scale.
5. The IPC scale has a high degree of parallelism in

content among each item triad.

e.g. Item 2. "To a great extent, my life is controlled by accidental happenings." (Chance)

Item 11. "My life is chiefly controlled by powerful others." (Powerful Others)

Item 23. "My life is determined by my own actions." (Internality)

Validity

The validity of the IPC scale has already been discussed.

The factor analytically-derived internal divisions of the IPC scale have been found to coincide with the subscale structure (Levenson, 1973; Levenson, 1974; Lao, 1978). One study (Kleiber et al, 1973) has identified from the items of the I-E scale a three dimensional structure which approximates the dimensions proposed by Levenson.

There is support for the differential validity of the P subscale. (Levenson, 1974; Levenson and Mahler, 1976; Levenson and Miller, 1976). The evidence however for the distinction between the I and C dimensions is weak. This may be the result of a conceptual confusion.

Reliability

Internal consistency

Moderately high estimates of internal consistency over all 3 scales have been obtained. (Levenson, 1972; Levenson, 1973; Levenson, and Miller, 1976).

Levenson (1972) reports Kuder Richardson reliabilities of r= 0,64 for the I subscale, 0,77 for the P subscale and 0,78 for the C subscale. Using an adult sample, corrected

split-half correlations by means of the Spearman-Brown formula were: r = 0,62 (Internal); 0,66 (Powerful Others); and 0,64 (Chance).

Levenson and Miller(1976) found similar reliabilities, Cronbach's alpha being 0,77 for the I scale, 0,71 for the P scale and 0,73 for the C scale, amongst a sample of 98 male students.

A study by Levenson (1973) also demonstrated a moderately high level of internal consistency for a sample of 165, predominantly schizophrenic, psychiatric patients as has been calculated for normal groups. Kuder Richardson reliabilities for the hospitalised sample yielded a correlation of 0,67 for the Internal, 0,82 for the Powerful Others and 0,79 for the Chance subscales.

Test-retest reliability

Levenson (1972, 1974) reports test-retest reliabilities of r: 0,64 (I subscale); 0,74 (P subscale); and 0,78 (C subscale) for an adult sample of 96 males and females after an interval of 1 week. Means for the second administration of the test were not significantly different from those of the first administration. Mean differences (test 2 - test 1) for the IPC subscales (2,31; 0,69; 0,93). These small nonsignificant changes toward internality mirror the finding of Hersch and Scheibe (1967) using the I-E scale over a 7 week period.

The test-retest correlations for a psychiatric sample showed the Powerful Others and Chance measures, but not the Internality scale to compare favourably with previously reported findings (Levenson, 1973). The test-retest reliabilities for the psychiatric patients (N: 12) were:

Internal	r = 0,08
Powerful Others	r = 0,74
Chance	r = 0,78

Social desirability

Very little information regarding the influence of social desirability on the IPC scale has been reported in the literature. Levenson (1974) does note that correlation between the Marlowe-Crowne Social Desirability Scale and each of the items were all very nearly 0,00, the highest being only 0,19. An important consideration when interpreting this finding is the implicit assumption underlying correlational techniques that the two measures are linearly related. It is quite feasible that middle-range, rather than high or low scores,are most socially favoured. Correlations in such case would be inappropriate and misleading.

The Interpersonal Trust Scale (Rotter, 1967)

Format

The Interpersonal Trust Scale consists of 25 items in a Likert format. Each item is rated from strongly agree to strongly disagree (1-5) and includes a neutral point. Being an additive scale, the possible range of scores is 25 - 125. The instrument is buffered by 15 filler items.

Thirteen of the 25 items of the test are written so that a "disagree" response indicates trust (scored 1 - 5); the other 12 so that an "agree" indicates trust (scored 5 - 1), the reverse direction. High total scores on the ITS indicate trust.

Being a measure of generalised expectancy, the scale is constructed to measure trust of a wide variety of social objects (e.g. parents, teacher, physicians, politicians,)

Two sample items are presented below:

Item 3: In dealing with strangers, one is better off to be cautious until they have provided evidence that they are trustworthy. (Usual direction)

Item 6: Parents can be relied upon to keep their promises. (Reverse direction)

Validity

Interpersonal trust is defined by Rotter (1967) as:

> an expectancy held by an individual or a group that the word, promise, verbal or written statement of another individual or group can be relied upon.(p. 651.)

The Interpersonal Trust Scale is a measure of such expectancies which it is assumed constitute a relatively stable personality characteristic.

In order to assess the construct validity of the ITS, Rotter (1967) used a sociometric rating method in college fraternities and sororities. Two sororities (N = 41 and N = 42) and two fraternities (N = 35, N = 38) in which all members had lived together for a period of at least 6 months were included in the study. In addition to asking subjects to nominate the members of the group who were highest and lowest in interpersonal trust, three trust-related ratings were obtained for each subject - gullibility, dependency and trustworthiness. As control variables humour, popularity and friendships were also rated.

The results indicate that the scale could significantly predict sociometric ratings of trust and that these predictions were significantly higher than the control variables of popularity, friendship and humour. In other words, discriminant as well as construct validity data is provided. As expected, trustworthiness was found to be closely related to sociometric trust and the ITS.

No significant relationship was found between gullibility and trust as measured by the sociometric or self rated scale. Subjects, it would appear, make a conceptual distinction between these two traits. A statistically significant negative relationship between the ITS and dependency ($r = 0,23$; $p < 0,01$) was taken to indicate that the trusting individual is less dependent on others (making decisions, seeking advice) than the individual rated low on trust.

Schlenker, Helm and Tedeschi (1973) provide further support for the construct validity of the ITS. Forty females were divided into high and low trust groups on the basis of their scores on Rotter's (1967) Interpersonal

Trust Scale. They subsequently participated in a modified Prisoner's Dilemma game against a simulated player. The game is a mixed-motive conflict situation in which the two players can either cooperate or compete. If both players cooperate, they both win a moderate amount; while if they both compete, they lose a moderate amount. If one player cooperates and the other competes, the competitor gains his largest amount while the cooperator loses his largest amount. The use of a simulated player allowed precise control over one person's cooperation and the credibility of messages sent. The simulated player kept her promises either 10% or 90% of the time. The hypothesis that subjects who scored high on the trust scale would believe and rely on the promises of the other player more than subjects scoring low on the scale received confirmation. Results demonstrate no interaction effects between the personality variable of trust and the manipulated cooperation of the other player. In other words, expectation differences between high and low trust subjects were consistent over the two levels of promise credibility.

The relationship of interpersonal trust and its relationship to overt behavioural trust and to self-disclosure were examined in a study by Cash, Stack and Luna (1975). A behavioural measure of trust was devised and defined as the speed with which subjects initiated and completed a backward fall into the hands of a readied assistant. Scores on the ITS were uncorrelated with Jourard's self-disclosure Scale. This corroborates other studies. (McDonald, Kessel and Fuller, 1972; McAllister and Kiesler, 1975) High trusters did however exhibit shorter latencies on the

behavioural scale. These findings are taken to represent evidence of the discriminant and convergent validity of the construct. It is noted that whilst it could be expected that trust is positively related to disclosure, the interpersonal trust concept, as defined by Rotter (1971), involves an expectancy regarding communicative credibility and not a desire to discuss matters with other persons.

That low trust subjects behave in a more suspicious manner than high trusters was demonstrated in a study by Wright, Maggied and Palmer (1975) using an unobtrusive, nonreactive paradigm.

Introductory psychology students, who had earlier completed the ITS, were telephoned and asked to participate in an experiment. The number of questions asked by the subject was taken as the index of suspicious behaviour. High trust subjects asked significantly fewer questions. This result was repeated for two independent University samples.

Two studies have tested groups who might be expected to differ on interpersonal trust. (Pasewark, Fitzgerald, Sawyer, and Fossey, 1973; Fitzgerald, Pasewark and Noah, 1970). Fitzgerald et al (1970) found that delinquent and non-delinquent groups were not differentiated on the ITS scores. Pasewark et al (1973) provided unexpected data on the trust scores of paranoid schizophrenics and normals. It was predicted that paranoids, theoretically characterised by distrust and suspicion, would be lower on the ITS than normals. Differences were in the opposite direction to that anticipated.

The failure of the hypothesis in both investigations

casts doubt on the construct validity of the ITS.

Reliability

Internal consistency

Data regarding the split half reliability of the Interpersonal Trust Scale is provided by Rotter (1967). The reported reliability estimates corrected by the Spearman-Brown formula are as follows:

Males	(N = 248)	r = 0,77
Females	(N = 299)	r = 0,75
Total	(N = 547)	r = 0,76

Test-retest reliability

Two estimates of test-retest reliability are available from Rotter (1967). The first involves 24 subjects (10 male and 14 female) in which the period before retest was 7 months. The obtained correlation was 0,56 ($p < 0,01$). A second assessment of the stability of ITS scores over time used a group of 42 students (34 males and 8 females). The approximate average time between tests was three months. The correlation was 0,68 ($p < 0,01$). The calculated reliabilities indicate good test consistency over relatively long periods of time.

Social desirability

In constructing the Interpersonal Trust Scale, items were, in part, assessed in terms of their relationship to social desirability. Rotter (1967) notes that one of the criteria used for inclusion of an item in the final scale was "relatively low correlation" with the Marlowe-Crowne Social Desirability Scale.

Computing the correlations between the (total) ITS

and Marlowe-Crown moderately low correlations were obtained which were all statistically significant.

Male students	(N = 248)	r = 0,21	(p < 0,01)
Female students	(N = 299)	r = 0,38	(p < 0,01)
Total	(N = 549)	r = 0,29	(p < 0,01)

The relationship to "need for social approval" may be understood as being a contaminating factor of the ITS, or alternatively, as Rotter (1968) suggests, simply indicate that trust is a socially desirable trait.

The Psychotic Reaction Profile (Lorr, O'Connor and Stafford,1960)

In developing the Psychotic Reaction Profile, descriptions of 1400 psychotic patients were recorded on a 172 item behavioural inventory. The method of homogeneous keying (that is, the use of increasing probability items) was applied to evolve four scales reducing the number of items to 85. The scales labelled Withdrawal, Thinking Disorganisation, Paranoid Belligerence and Agitated Depression are derived from factor analyses identifying these as second order dimensions.

Each item of the check list is marked as "True" or "Not True". Equivocal and vague statements have been eliminated. Staff nurses reported little difficulty in completing the questionnaire.

Interpretation of the subscales

Withdrawal.

The Withdrawal scale score distribution is relatively normal as contrasted with the strongly positively skewed distributions of the other three scales. (Lorr, O'Connor and Stafford,1960). The Withdrawal scale appears to be bipolar. One pole of the scale defines a withdrawal reaction consisting of a lack of interest or apathy, a failure to respond to others, and a reduced activity level. The opposite pole is descriptive of an excessive busyness, overactivity, and a high level of personal reactivity.

Examples:

"Usually stays by himself."

"Ignores the activities around him."

Thinking Disorganisation

The Thinking Disorganisation scale defines a broad

parameter probably central and specific to schizophrenia. Disorientation, irrelevant and incoherent speech, hallucinations, and peculiar movements are characteristic of this pattern.

Examples:

"Occasionally talks to himself."

"Smiles a lot to himself without any sensible reason."

Paranoid Belligerence

Patients scoring high on this scale are hostile, irritable, resistive, bossy and paranoid. To some clinicians, this pattern would represent a hostile acting out.

Examples:

"Tells the other patients what to do."

"Sometimes does the opposite of what he is asked to."

Agitated Depression

The anxiety and depressive elements of the scale's 5 items suggest the label "agitated depression".

Examples:

"Seems to be unhappy."

"Usually looks tired and all worn out."

Validity

Data on the validity of the Psychotic Reaction Profile with respect to the ability of the scale to distinguish open- and closed-ward patients has been provided by Lorr, O'Connor and Stafford (1960). Three scales (W, TD and AD) differentiated open-ward from closed-ward for two independent samples. The Paranoid Belligerence scale failed to discriminate on this criterion. Closed-ward patients were significantly higher on Thinking Disorganisation ($p < 0,025$ for both samples), Withdrawal ($p < 0,10$ and $p < 0,025$) and Agitated Depression ($p < 0,10$ for both samples.)

The results of Vestre (1966) provides stronger evidence for the validity of the scale. Four groups of patients were identified as:

A. closed-ward patients without ground privileges

B. closed-ward patients with privileges

C. open-ward patients

D. open-ward patients involved in pre-discharge planning.

These groups reflect an ordinal ranking of psychiatric incapacitation.

Below are the mean PRP scale scores and analysis of variance F values. The findings are as expected. The one scale (AD) on which no significant differences were found comprises only 5 items and is least reliable. The pattern of differences between the groups is consistent over all four scales.

Table 6: Means of patient groups ordinally ranked in terms of psychiatric incapacitation (Vestre, 1966).

PRP scale	Group A	Group B	Group C	Group D	Test of Null Hypothesis F
W	24,3	20,6	15,8	7,0	26,9 **
TD	7,9	6,4	1,6	0,3	44,4 **
PB	4,5	5,3	1,1	1,2	13,0 **
AD	1,9	1,6	0,9	0,8	1,00

** $p < 0,01$

The analysis of variance results are significant at the 0,01 level on the Withdrawal, Thinking Disorganisation and Paranoid Belligerence scales.

Caffey, Diamond, Frank, Grasberger, Herman, Klett and Rothstein (1964) demonstrated that the profile of schizophrenic patients who had relapsed was significantly higher ($p < 0,05$)

on all four of the PRP scales. (The increase in scale scores represents a worsening of the condition.)

In a study of the relationship between the PRP and non-psychotic behaviour, Gerber (1967) correlated the four scales of the PRP with Assertiveness, Sociability, Emotionality and Intelligence of the Patient Rating Form. As could be expected, Withdrawal was found to correlate (significantly) negatively with both Assertiveness and Sociability. Paranoid Belligerence correlated positively with Emotionality.

Evidence of the validity of the Thinking Disorganisation scale is provided by Rosenweig and Harford (1970). The findings indicated that patients rated high on Thinking Disorganisation evidenced intellectual deficits, perceptual impairment and a lower level of maturity. The validity of the Paranoid Belligerence scale is less clear from the results obtained. Patients who rated high on the Paranoid Belligerence showed less perceptual distractability and a higher lever of social maturity. (Because of low inter-rater reliability, the Withdrawal and Agitated Depression scales were not used.)

Reliability

Internal consistency

A high degree of homogeneity has been reported for the scales of the Psychotic Reaction Profile by Lorr, O'Connor and Stafford (1960). Apart from the short Agitated Depression scale, Lorr found reliabilities of at least 0,90 for the other scales. Males and female patients were rated independently by two hosptial assistants.

Somewhat weaker reliabilities were obtained in a study by Rosenzweig and Harford (1970). Although the coefficients were significant, the item reliability of the Withdrawal

scale in particular was substantially lower than that reported by Lorr, O'Connor and Stafford. Ratings were made by agreement (non-independently) between a psychologist, an occupational therapist and a male social worker.

Table 7: Internal consistencies (Kuder-Richardson) of the scales of the Psychotic Reaction Profile.

STUDY	WITHDRAWAL	THINKING DISORGANISATION	PARANOID BELLIGERENCE	AGITATED DEPRESSION
Lorr, O'Connor & Stafford (1960)	0,94	0,90	0,90	0,74
Rosenzweig & Harford (1970)	0,55	0,78	0,88	0,83

Inter-rater reliability

Divergent inter-rater reliabilities are recorded by Lorr (1960) and Vestre (1966) and Rosenzweig and Harford (1970).

Table 8: Inter-rater reliabilities of the scales of the Psychotic Reaction Profile.

STUDY	RATERS	WITHDRAWAL	THINKING DISORGAN-ISATION	PARANOID BELLIG-ERENCE	AGITATED WITH-DRAWAL
Lorr, O'Connor & Stafford (1960)	2 hospital attendants	(M) 0,90 (F) 0,92	0,88 0,81	0,85 0,78	0,65 0,58
Vestre (1966)	2 nursing attendants	0,84	0,86	0,77	0,70
Rosenzweig & Harford (1970)	Psychologist (Male) & an occupational therapist (F)	0,25	0,67	0,77	0,34

High correlations between raters are obtained by Lorr et al (1960) and Vestre (1966) on all scales. In the study of Rosenzweig and Harford (1970), satisfactory reliabilities are obtained on only two of the scales of the PRP. The low reliabilities on the Withdrawal and Agitated Depression may have resulted from the fact that the two independent raters were of different sex, different disciplines (psychology and occupational therapy), and typically observed patients in different types of activities.

It appears from a study by Gerber (1967) that the accuracy of ratings is a function of proximity to the patient. Psychiatric residents and ward nurses were found to be able to more adequately discriminate between psychotic variables than caseworkers and group workers.

RESULTS AND DISCUSSION

LOCUS OF CONTROL AND DEMOGRAPHIC VARIABLES OF THE PRESENT STUDY

Age

Table 9: Correlations between measures of locus of control and age.

	IE	FI	FII	I	P	C	ITS
Schizophrenic	-0,27	-0,09	-0,32*	-0,08	-0,18	-0,25*	0,32*
Normal	-0,22	-0,01	-0,31*	0,04	0,33*	-0,02	0,07

* $p < 0,05$

Both groups show a very similar pattern of correlations between age and the I-E scale and its factors. Consistent with most previous research involving adults, internality is seen to increase slightly with age (Lao, 1974; Ryckman and Malikiosi, 1975). Factor II in particular is associated with age. The one study which utilised a longitudinal design and analysed the influence of each separate factor however found a significant increase in externality on only the Socio-political Factor over a period of 10 years (Wilkens, 1975). The results of that experiment which compared the I-E scores of (American) students in 1964 probably reflects a change in political attitudes over a period in time. The optimism of students of the sixties was reflected in their activism and views regarding the effectiveness of involvement. The previously recorded findings would seem to be historically specific. The results of the present study indicate a change in the opposite direction. Younger subjects are more external than

older subjects on Factor II; that is, the younger subjects tend to view an individual's potential to influence political events as less consequential than older subjects. This finding, too, may be a reflection of specific social circumstances (of White English speaking South Africans) rather than being a "typical" developmental shift towards greater internality.

Correlations between age and the dimensions of Levenson's scale differ across the samples. Unexpectedly, the same positive relationship between age and internality is not obtained. For normals, low non-significant correlations are found on the Internality and Chance scales. However, a significant positive correlation ($p < 0,05$) is found between age and the belief in the control of Powerful Others, an external scale. For schizophrenics, as predicted, negative correlations are obtained for the P and C scales. The correlations with the C scale was significant ($p < 0,05$) whilst the correlation with P approaches significance.

The association between age and trust is significant for the schizophrenic group only. As a group, schizophrenics were found to be more trusting than normals. The older schizophrenics who had been hospitalised for longer periods are responsible for the greater trust indicated by the psychiatric sample.

The correlation betwen period hospitalised and interpersonal trust is 0,29 which approaches significance at the 5% level.

Education

Table 10: Correlations between measures of locus of control and education.

	IE	FI	FII	I	P	C	ITS
Schizophrenic	-0,19	-0,21	-0,15	-0,04	-0,35*	-0,26	0,20
Normal	0,02	0,07	0,14	0,05	-0,12	-0,08	-0,15

* $p < 0,05$

The normal group shows no significant association between any measure of locus of control (or trust) and education. Data for the schizophrenic sample indicates a relationship between education and internality. Apart from the Internal scale, the direction of this relationship is consistent over all locus of control scales. Prior research has reported a significant correlation between educational level and internality (Walls and Miller, 1970).

For the schizophrenic group, years education may be seen as an indicant of premorbid adjustment. Well educated schizophrenics probably have a longer history of psychological health which could account for the negative correlations between years of schooling and perception of control of reinforcements.

THE DIMENSIONALITY OF LOCUS OF CONTROL

Statistical Independence of the Dimensions

Mirels's Factor I and II.

Orthogonality of the factors.

Table 11: Correlations between Factor I and Factor II

Schizophrenic	0,22
Normal	0,43 **

** $p < 0,01$

The correlations obtained for both the schizophrenic and normal groups are within the range of previously recorded results. The Pearson co-efficient for the normal group is significant at the 0,01 level.

Although Personal Control and Socio-political Control have been identified as orthogonal factors, moderately low (rather than zero) correlations could be expected. Subscales using only the highest loading items approximate, but cannot be considered equivalent to the factors identified by Mirels (1970).

It is noteworthy that these correlations are substantially lower than the Kuder Richardson reliabilities calculated for the two groups. That is, the items within both subscales exhibit greater resemblance to each other (homogeneity) than to the the items of the other factor. This supports the contention that the factors are relatively independent.

Homogeneity of the factors.

The reliability of a test is a function of the number of

component items. Using the Spearman Brown prophecy formula, an expected reliability is calculated for Factor I and Factor II extending the subscale test lengths to that of the full I-E measure. Below is a table of the obtained and corrected reliability co-efficients.

Table 12: Kuder-Richardson Reliabilities of the I-E scale and its factors.

	IE	FI	FII
Schizophrenic	0,56	0,38	0,54
Normal	0,74	0,52	0,68

Expected reliabilities extending the subscale test length to that of the full I-E scale.

	FI	FII
Schizophrenic	0,61	0,74
Normal	0,74	0,85

The Kuder-Richardson co-efficient for the normal group falls within the narrow range of reliability values for the I-E scale reported by Rotter (1966). Somewhat lower reliabilities are obtained for the schizophrenic group. The item point biserial correlations (items against total minus item) also indicate slightly higher homogeneity of responding on the part of the normal group. (Refer Appendix 6)

Corrected for test length, the factors are shown to be more internally consistent than the global I-E measure. This provides some support for the claim that relative to the full scale the factors are a "purer" (more homogeneous) measure. The reliability of Factor I is not appreciably different from that of the full scale. Responses to the items of Factor II are shown clearly to have greater internal consistency.

Internal, Powerful Others and Chance dimensions.

Orthogonality of the factors.

Table 13: Intercorrelations between the I, P and C subscales.

	I & P	I & C	P & C
Schizophrenic	0,41**	0,48**	0,84**
Normal	-0,17	-0,20	0,40**

** p 0,01

For the normal group the correlations between the Internal, Powerful Others and Chance dimensions are as expected and similar to those previously reported by Levenson (1974).

The three correlations for the schizophrenic sample are elevated in the positive direction. The close association between the scales is not interpreted as reflecting a close similarity between the subscale constructs, but rather as the result of an intruding factor influencing all three measures. Evidence for the impact of an acquiescent response style is presented in Note 1. Moderate and significant correlations between each of the dimensions and a measure of acquiescence strongly suggests this response style to be responsible for the unexpectedly inflated correlations between the Internal, Powerful Others and Chance dimensions.

The Inter-Relationships of the Scales

Rotter's I-E scale and its factors to Levenson's dimensions of locus of control.

Table 14: Correlations between Rotter's I-E scale and its factors and Levenson's dimensions of locus of control.

		I	P	C
I-E	Schizophrenic	-0,15	0,12	0,19
	Normal	-0,50**	0,27*	0,60**
FI	Schizophrenic	0,02	0,31*	0,36*
	Normal	-0,36*	0,41*	0,63**
FII	Schizophrenic	-0,19	0,06	0,03
	Normal	-0,32*	0,07	0,40*

* $p < 0,05$

** $p < 0,01$

If, as is suggested, schizophrenic subjects do utilise an acquiescent response style when answering rating questionnaires, this would necessarily involve the introduction of an additional source of error into the scores on Levenson's dimensions.

Being independent of LOC[3], this error term is likely to weaken the statistical associations of the IPC scale. In other words, the correlations of the psychiatric group are expected to be closer to zero than those of normal groups.

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3 The independence of LOC is borne out by the statistical relationship between I-E scale measures and Acquiescence, as defined in this study (See Note 1). For schizophrenic sample, r: 0,02 (I-E); 0,20 (FI) and 0,17 (FII). For normal sample, r: 0,20 (I-E); 0,05 (FI) and 0,20 (FII). These correlations are all nonsignificant.

As predicted, correlations for the schizophrenic group are all lower but in the same direction as normals.

Of Levenson's subscales, the Chance and the Internal dimensions are most closely associated with the full I-E measure and its factors. This reflects the conceptual resemblance between the Chance and the Internal dimensions and a general measure of locus of control. The belief in the control of Powerful Others is most independent of Rotter's I-E measures. The significant correlations between Factor I (Personal Control) and the belief in the control of Powerful Others is unexpected and runs contrary to the empirical finding and experimental hypothesis of Levenson (1975). In that study, the Powerful Others scale was found to be significantly correlated with the belief in Socio-political Control.

Of the measures derived from the Rotter I-E scale, the lowest correlations are obtained between Factor II (Socio-political Control) and the three dimensions. In other words, Factor II exhibits somewhat greater independence from the locus of control measures of the IPC scale. The full I-E scale and the Personal Control factor (Factor I) appear to be more general measures of locus of control being moderately associated with each of the dimensions of Levenson's scale.

Interpersonal trust and measures of locus of control

Table 15: Correlations between interpersonal trust and measures of locus of control.

	IE	FI	FII	I	P	C
Schizophrenic	-0,40*	-0,21	-0,40*	-0,01	-0,27	-0,30
Normal	-0,33*	-0,18	-0,30	0,26	0,16	-0,20

* $p < 0,05$

These (fairly consistent) correlations indicate a moderately low negative association between external locus of control and trust for both groups. This finding has previously been recorded by Rotter (1967; 1968). Hochreich (1974; 1975) takes this inverse relationship to result from a subgroup of externals ("defensives") who are low on interpersonal trust.

Only the P scale, for the normals, reverses this association. It may be noted that the positive correlation runs contrary to the proposal of Procuick and Breen (1975) that defensive externals may be identified by high scores on the P scale. That claim implies a relationship between the belief in the control of powerful others and verbally expressed distrust.

The present study found that high P scorers tend to prefer agreement ratings (see Note 1). The effect of acquiescence, on the ITS is to shift the "true" score towards the scale's halfway point[4] which is above the mean for the normal sample. This may account for the unexpected correlation.

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[4] Half the items of the ITS are phrased so that agreement is scored low and the other half so that agreement is scored high.

LOCUS OF CONTROL AND SCHIZOPHRENIC ADJUSTMENT

Group differences

The I-E scale

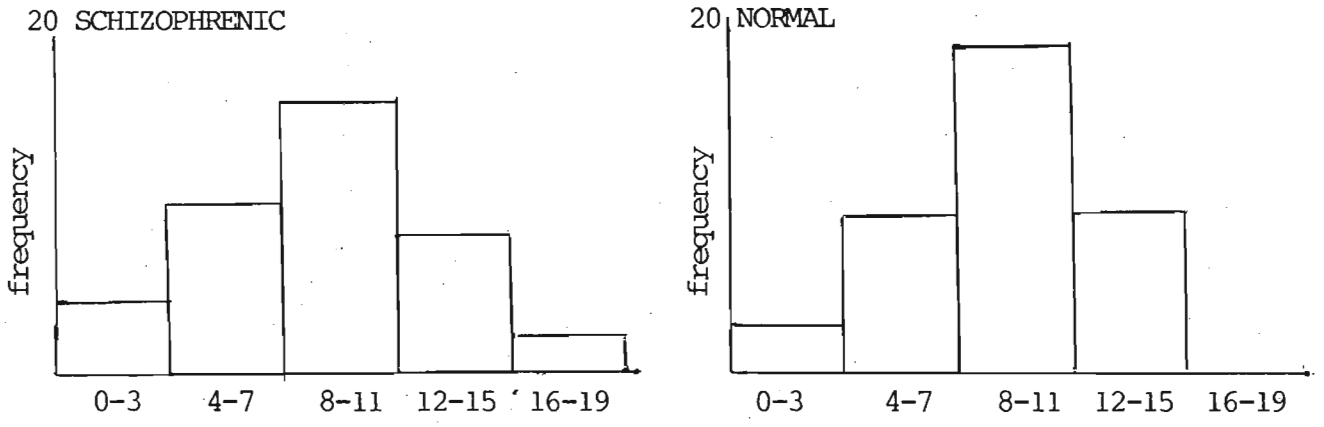
Table 16: Means and standard deviations for Internal-External scale.

	$\bar{X}$	s
Schizophrenic	8,93	3,32
Normal	8,90	3,99

The mean score on the I-E scale is almost identical for the normal and schizophrenic groups. The difference is not significant ($t = 0,04$; $df = 78$). This was contrary to the experimental hypothesis and opposes the findings of Duke and Mullens (1973), and Distefano, Pryer and Smith (1971). An important parameter distinguishing the present schizophrenic sample from that used by Duke and Mullens is the chronicity of the patients. Their sample was characterised by periods of lengthy institutionalisation and a diagnosis of chronic schizophrenia (other than paranoid type). As such the subjects are most probably process schizophrenics. The present study taps a higher functioning sample of schizophrenics because of age, education and total length of hospitalisation restriction. Reviewing the experimental results of Distefano et al (1971) the group differences appear to be accounted for not by especially high external scores for the psychiatric sample, but by unusually internal responses of the normal controls. The mean I-E score for the controls (hospital attendants) was 6,3. This is lower than the majority of other studies using normal groups (Rotter, 1966). The mean I-E score for

psychiatric patients in that experiment ($\bar{X}$ = 8,98) which closely approximates the results of the present study.

Distribution of Internal-External scores.



A slightly larger variation of scores is evident amongst the normal subjects from the distribution above. This is reflected in a marginally higher standard deviation amongst the normals (s = 3,99) compared to that of the schizophrenic group (s = 3,32). A statistical comparison of the group variances does not achieve significance (F = 0,70; df = 38 and 38). Rotter's original hypothesis proposes a curvilinear relationship between locus of control and adjustment (Rotter, 1966). In other words, it was suggested that maladjustment is associated with highly external or highly internal scores.

The schizophrenic and normal sample is not found to differ from normals in terms of either the group means or the distribution of individual scores on the I-E scale.

Factors I and II.

Although group means on the I-E scale are practically identical for the normal and schizophrenic samples, differences do emerge by breaking the total score down into Factor I and Factor II scores.

Table 17: Means of schizophrenic and normal groups on Factor I and Factor II

	FI	FII
Schizophrenic	3,22	4,03
Normal	2,10	5,08

Group differences between schizophrenic and normal groups when the I-E scale is differentiated into factors.

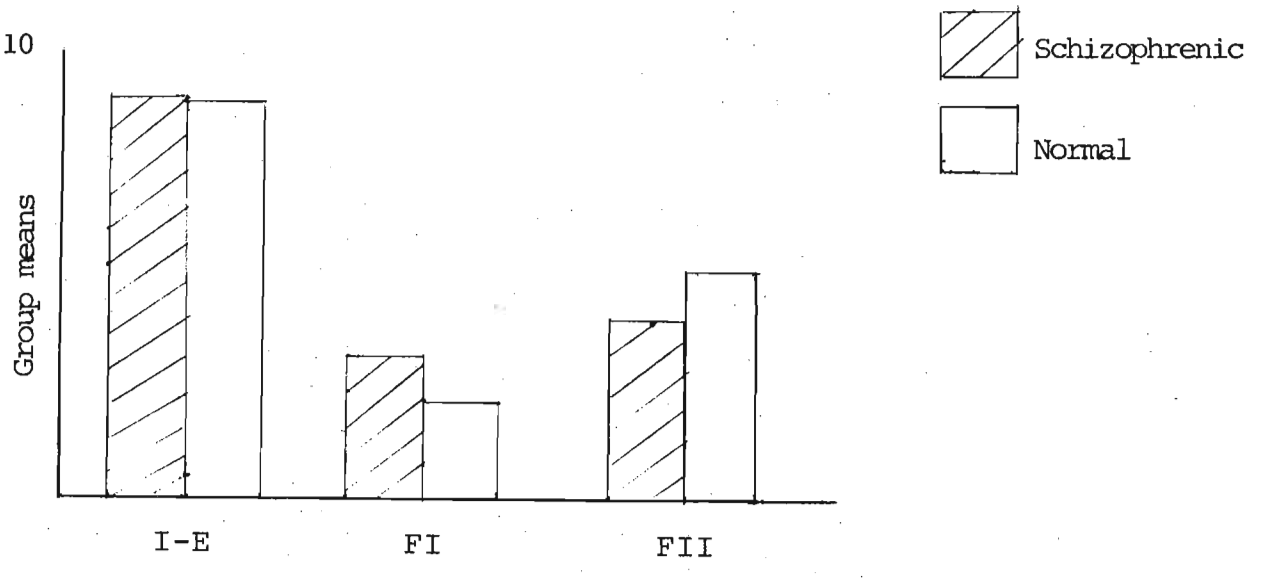


Table 18: Two way analysis of variance (repeated measures) summary table:

Source of Variation	df	Sum of squares	Mean square	F
Groups (A)	1	0,10	0,10	0,02
Subjects within groups	78	358,30	4,59	
Factors (B)	1	140,63	140,63	57,99***
Interaction (A & B)	1	46,22	46,22	19,06***
B x Subjects within groups	78	189,15	2,43	

*** $p < 0,001$

On the basis of the item content of the two factors it was expected that belief in Personal Control (Factor I) and not the belief in Political Control (Factor II) would

distinguish the groups. Analysis of group means indicates schizophrenics to be more external than normals on the Personal Control Factor. The more internal views of the schizophrenic sample on Factor II account for the similar global I-E scores for the two groups.

The IPC scale.

Table 19: Means of schizophrenic and normal groups on the Internal, Powerful Others and Chance subscales.

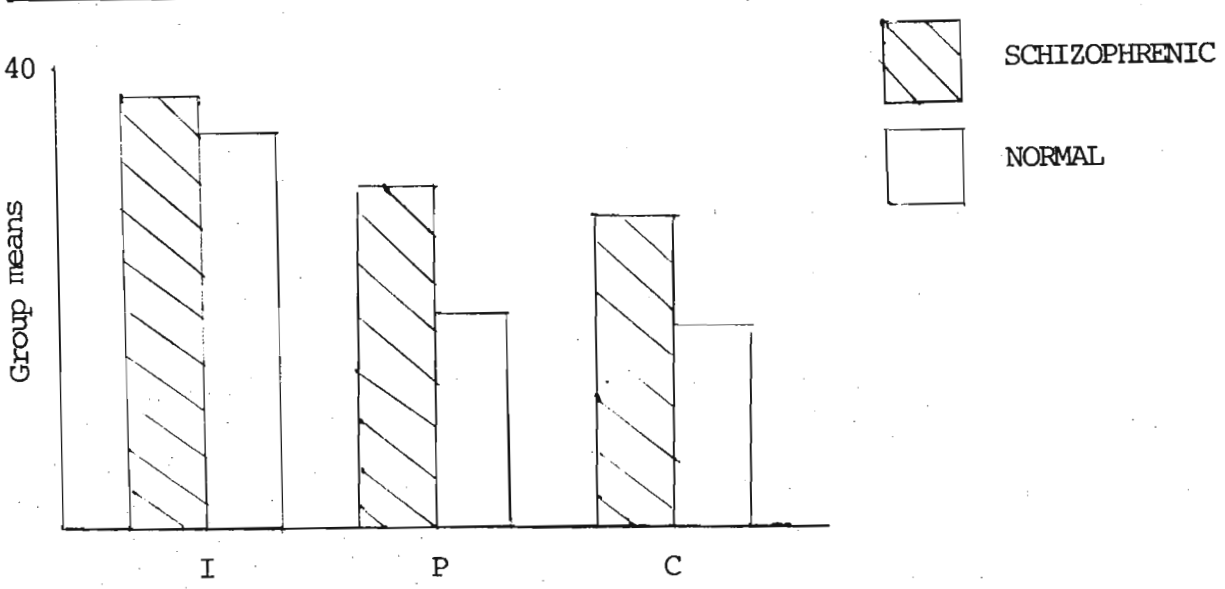
	I	P	C
Schizophrenic	37,60	29,33	26,55
Normal	34,25	18,55	17,65

Below is a statistical analysis of differences between the group means. A two way repeated-measures analysis of variance,with scores on the Internal scale converted, has been computed. Externality is indicated by high scores on the Powerful Others and Chance subscales and low scores on the Internal dimension. Internal scores are converted by reversing the poles (I converted = 48 - 1). In other words, the direction of the continuum is altered so as to coincide with the other two scales. Note that all three (external) measures are taken as the distance from the internal pole. For the P and C scales, the internal pole is 0. For the I scale, the internal pole is 48.

Table 20: Two way analysis of variance (repeated measures) summary table.

Source of variation	df	Sum of squares	Mean squares	F
Groups (A)	1	1776,70	1776,70	17,12***
Subjects within groups	78	8090,61	103,73	
Dimensions (B)	2	6522,56	3261,28	46,88***
Interaction (A & B)	2	2353,96	1176,98	16,92***
B x Subjects within Groups	156	10852,17	69,57	

Group differences between schizophrenic and normal groups, on the Internal, Powerful Others and Chance subscales.



On investigation of the interaction between the scales and groups, schizophrenics are found to be significantly higher on all three scales (t = 2,10; 4,81 and 4,15 for the IPC subscales respectively.)

The means of the IPC scale are similar although slightly higher than those recorded by Levenson (1973). In that study the means for schizophrenics were 34,9; 25,9 and 23,0 on the I,P and C measures. The interpretation offered by Levenson is in terms of the literal meaning of the intended measures.

The discrepancies between the groups may however, be understood as reflecting a difference in response styles. This is the interpretation offered here. The scores on all three dimensions appear to be elevated above what could have been reasonably forecast. Very large differences on the P and C measures and the unexpectedly high I scores suggest the possible intrusion of a factor affecting all scales in the positive direction; namely acquiescence.

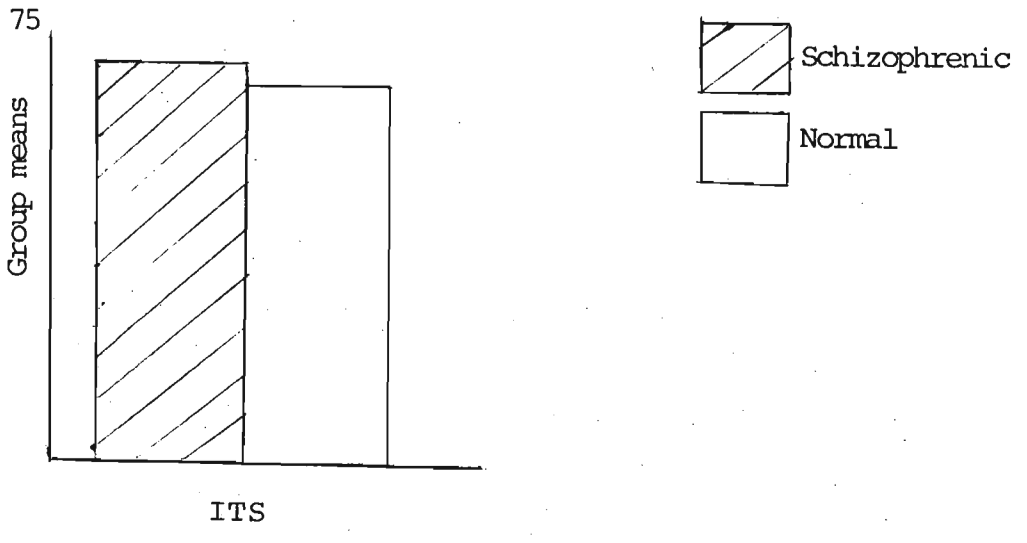
The ITS scale.

The hypothesis has been put forward that specifically the defensive (low-trust) type of externality may be related to maladjustment (Hochreich, 1975; Rotter, 1975). Further, paranoid schizophrenics, a group characterised by suspicion and distrust, could be expected to score low on the ITS.

Table 21: Means and standard deviation of the schizophrenic and normal groups on the Interpersonal Trust Scale.

	Mean	Std. dev.	t
Schizophrenic	70,40	9,59	1,75
Normal	66,70	9,29	

Group differences between schizophrenic and normal groups on the Interpersonal Trust Scale.



The difference between the groups approaches significance in the direction opposite to that predicted.

Although the results are theoretically unexpected, similar experimental findings have been reported earlier by Pasewark, Fitzgerald, Sawyer and Fossey (1973) in which paranoid schizophrenics indicated greater trust as measured by the ITS, than did normals.

Hospitalisation Variables

The statistical relationship between locus of control and four hospitalisation variables are considered.

(a) Correlational analysis of the continuous variables.

Age at first admission

Total period hospitalised

(b) Analysis of patient categories

New admissions versus readmissions

Open-ward versus closed-ward patients

a) Correlational analysis

Age at first admission

Table 22 : Correlations between measures of locus of control and age at first admission.

	IE	FI	FII	I	P	C	ITS
Age at Ist admission	-0,36*	-0,14	-0,37*	-0,05	-0,28	-0,33*	0,29

* $p < 0,05$

As expected a belief in external control is related to early admission to a psychatric instituion. Five of the six measures of locus of control, three of which reach significance, support this hypothesis.

As an index of adjustment, it could be predicted that early admission to a psychiatric hospital is related to an external perception of locus of control of reinforcement. Further, it can be assumed that later hospitalisation, which is linked to good premorbid adjustment, is more likely to be associated with a history of greater personal competence and control of reinforcement outcomes. This experience, in terms of social learning theory, would predispose such individuals towards a more internal orientation.

Total period hospitalised

Table 23 : Correlations between measures of locus of control and total period hospitalised.

	IE	FI	FII	I	P	C	ITS
Total period Hospitalised	-0,21	-0,04	-0,19	-0,09	-0,13	-0,17	0,35 *

*p < 0,05

Taking the period hospitalised (chronicity) as an indicant of the extent of the psychiatric disorder it is expected that positive correlations with LOC measures will be obtained. The results are interesting in that, although correlations between LOC and the total period of hospitalisation do not achieve significance it appears that the trend, indicates an increase in internality with hospitalisation.

For two reasons the obtained co-efficients must be guardedly interpreted. Firstly, hospital records were not always complete for the purpose of determining precisely the total period hospitalised, especially for patients who have been transferred or were previously at another psychiatric hospital. The period was gauged by reconciling, as best as possible, the patients' own estimate with existing records, using staff assistance where necessary. Errors could be expected to weaken correlations. Secondly, although the chronicity (period hospitalised) variable, being an index of adjustment, may be expected to influence the correlations with perception of control, institutionalisation may itself affect patients' beliefs about the locus of control of reinforcements.

Analysis of patient categories

New (Ist admissions) versus readmitted patients.

Table 24 : Means for new and readmitted patients

	New patients (N = 26)	Readmissions (N = 14)	t
I-E	9,89	8,65	1,02
FI	3,89	3,03	1,42
FII	4,11	4,00	0,15
I	36,33	37,97	-0,53
P	30,56	28,97	0,36
C	29,67	25,65	0,92
ITS	64,89	71,39	1,89

Repeated hospitalisation is associated with a more internally oriented perception of locus of control for the psychiatric sample. This difference occurs in each of the six measures of LOC, but does not reach significance. This is in line with the nonsignificant correlational trend between total period hospitalised and internality. It is noticeable that first admissions are rather more external on Personal Control (Factor I) although the correlation between duration hospitalised and Factor I is close to zero ($r = 0,04$). This suggests that patients who have been admitted more than once perceive greater personal control than first admissions not as a result of institutionalisation. The first experience of a psychiatric disturbance leading to hospitalisation appears to be the factor which most adversely affects the belief in one's ability to manipulate reinforcements.

Levenson (1973) compared patients admitted for the first

time with those previously hospitalised. Differences indicate that readmissions more than new patients, feel that other people or chance forces had more control. Cash and Stack (1973) using the I-E scale, on the other hand, obtained a close to zero correlation with the number of admissions (r = 0,04). The findings of these researchers are in accord with results of the present study in which the first admission, in particular, is seen to have an important impact upon the belief in personal control.

Interestingly, an analysis of Interpersonal Trust scores show a marked difference in the generalised expectancies between patients hospitalised more than once and those hospitalised for the first time. The mean ITS score for new admissions is 64,89 (slightly more distrusting than the normals) whilst the mean score for readmissions is 72,00. This difference between new and readmitted patients, unlike the locus of control discrepancy, appears to be a function of the duration of institutionalisation (r = 0,30; p 0,06).

Open-ward versus Closed-ward patients.

Table 25 : Means of open-ward and closed-ward patients.

	Open (N = 9)	Closed (N = 31)	t
I-E	8,54	9,64	1,03
FI	3,19	3,29	0,17
FII	3,69	4,64	1,47
I	38,65	35,64	-1,14
P	28,38	31,07	0,70
C	25,88	27,79	0,49
ITS	70,85	69,57	-0,40

Open ward patients are more internal than are the closed ward patients across each of the six measures of locus of control. None of these differences achieve significance ($p = 0,05$). Patients assigned to the closed wards are in general, more severely disturbed than those in open wards. Group differences are in the expected direction.

The Behavioural Profile (PRP)

Table 26 :Correlations between the locus of control measures and Lorr's Psychotic Reaction Profile scales.

	IE	FI	FII	I	P	C	ITS
W	0,31*	0,16	0,23	0,03	0,22	0,26	-0,20
PB	-0,36*	-0,37*	-0,22	0,04	-0,10	-0,19	0,24
AD	0,47**	0,27	0,43**	-0,10	0,15	0,18	-0,36*
TD	-0,27	-0,32*	-0,27	-0,02	-0,11	-0,15	0,03

* $p < 0,05$

** $p < 0,01$

Based upon the broad hypothesis that locus of control is related to the severity of maladjustment, positive correlations can be predicted between externality measures and each of Lorr's four behaviour scales.

These predictions hold however only for the Withdrawal and Agitated Depression scales. Apart from the correlation between Withdrawal and the belief in Internal Control which was very close to zero all other co-efficients favour the general hypothesis.

In sharp contrast the relationship between Paranoid Belligerence and scale of locus of control is opposite in direction to that expected in terms of the hypothesis associating externality to adjustment. The discrepancy may be accommodated by the experimental hypothesis conceptually linking external perception of control and the construct of learned helplessness. The symptoms of helplessness include depression and anxiety. This hypothesis predicts only positive correlations with those scales measuring depression and anxiety (Agitated Depression) and low levels of

behaviour (Withdrawal). Paranoid Belligerence, a measure of aggression and activity level , correlates positively with internality.

These results provide some support for the contention that the perception of locus of control of reinforcements may be an important influence on activity level rather than adjustment per se.

An inspection of the strength of association between Lorr's Psychotic Reaction Profile scales and the various dimensions of locus of control indicates that subscales fail to be clearly differentiated by these behavioural measures of schizophrenic adjustment. That is, these measures do not provide evidence for the discriminant validity of the subscales of locus of control.

Regarding the associations with the Levenson's multi-dimensional IPC scale there is a marked similarity between the corresponding correlations involving the Powerful Others and Chance subscales, the magnitude of the correlations with the Chance Dimensions being marginally larger (but still not reaching the 0,05 level of significance). Correlations involving the Internal Scale are close to zero.

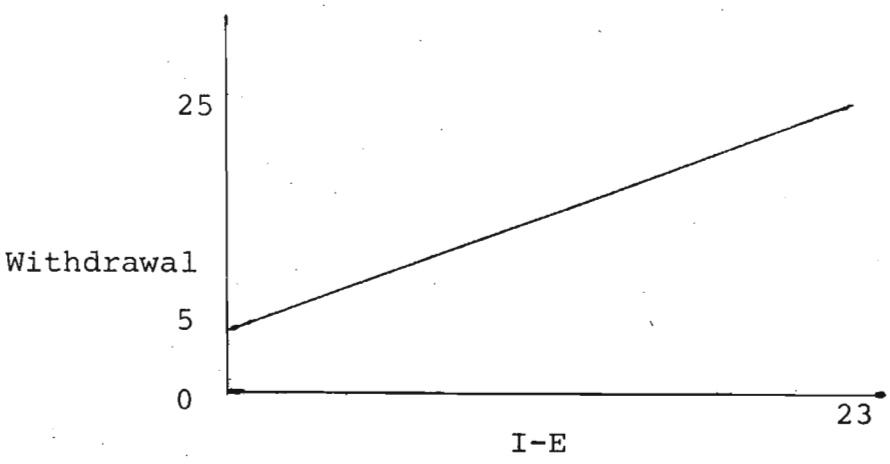
These Pearson co-efficients indicate a lower degree of association between the Psychotic Reaction Profile and Levenson's dimensions than with Rotter's I-E scale or its factors. This discrepancy may be accounted for by the intrusion of an acquiescent response style in influencing scores on the IPC scale.

With respect to the I-E scale (both the global score and factors), correlations with measures of schizophrenic behaviours are in general, close to statistical significance

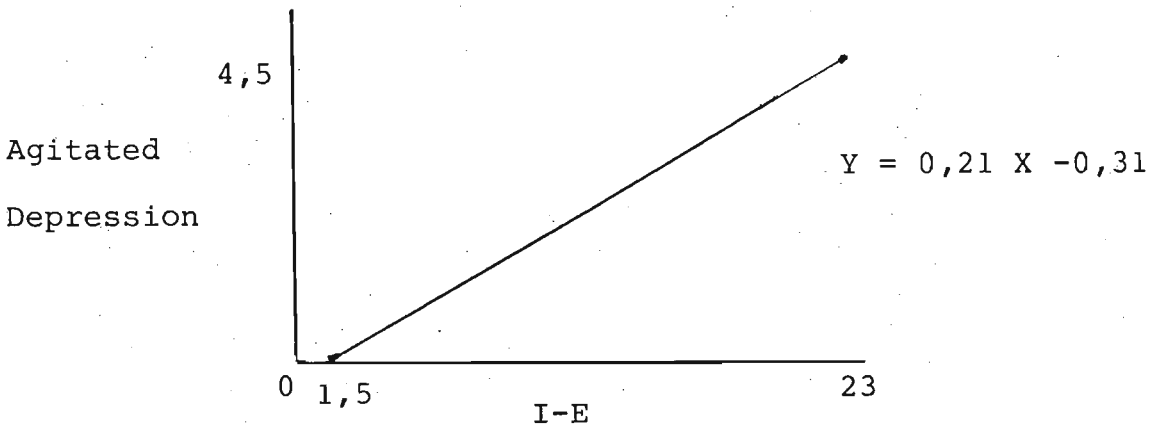
($p < 0,05$). The differences which do exist between Factor I and Factor II are inconsistent. There is certainly no support for the proferred hypothesis that only Factor I will be associated with indices of adjustment. Overall, it is apparent that the correlations are largest when utilising the full scale score.

Linear regressions of the Withdrawal, Agitated Depression and Paranoid Belligerence scales from the I-E measure.

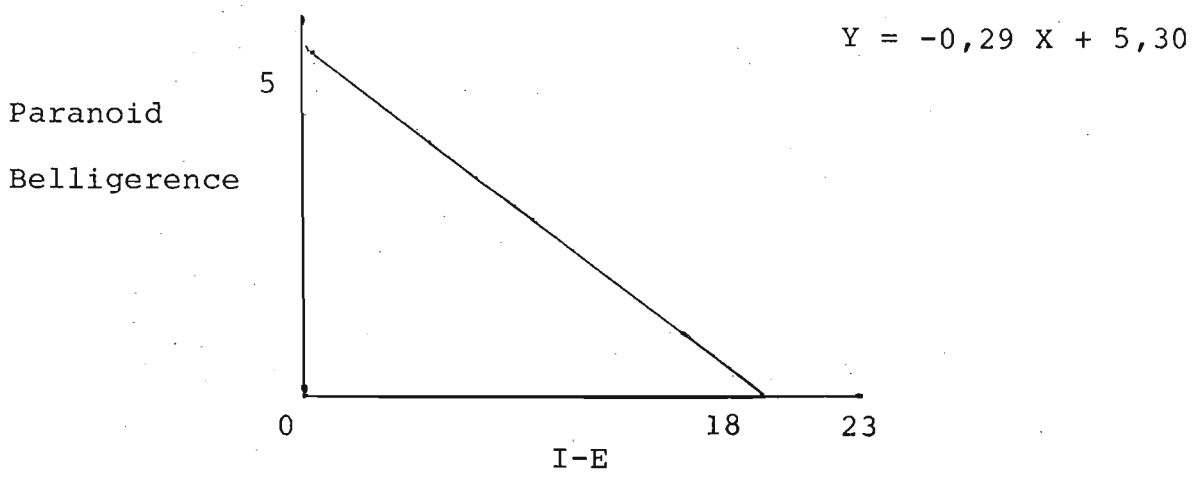
The linear regressions below present a visual expression of the relationship between locus of control and the scales of the Psychotic Reaction Profile. Graphically the relationship between I-E scores and the Withdrawal and Agitated Depression scales is seen to be in the positive direction and is as expected, in terms of the broad hypothesis associating indices of maladjustment and externality.



$Y = 0,86 X + 4,99$



The line of best prediction of Paranoid Belligerence form I-E scores is in the reverse direction. (The linear regression of the Thinking Disorganisation scale is not significant at the 5% level and for that reason not included.)



Outline of results.

The outline of results concerns itself with the two primary areas of interest of the study.

1. The dimensionality of locus of control.
2. Locus of control and schizophrenic adjustment.

1. The dimensionality of locus of control.

Findings from the following aspects of the present research are of relevance to the question of the dimensionality of locus of control:

(a) The statistical independence of the dimensions.

(b) The relative homogeneity of the dimensions.

(c) The discriminant validity of the dimensions with respect to other scales of locus of control.

(d) The discriminant validity of the dimensions with respect to schizophrenic adjustment.

i. Group diffferences

ii. Correlations with hospitalisation variables

iii. Correlations with the Psychotic Reaction Profile scales

(a) i. The correlations between Factor I and Factor II are moderately low for both the schizophrenic and normal groups and fall within the range of previously reported results (Wilkens, 1975; Gootnick, 1974; Boor, 1974). For the normal group, the correlation between the two factors reaches significance. Items comprising these scales are those with the highest loadings and as such cannot be considered factorally pure. A low, not zero, association was thus expected.

ii. The correlations between the Internal, Powerful

Others and Chance dimensions are for the normal group, similar to those previously reported. (Levenson, 1974). Low nonsignificant negative correlations were obtained between the Internal and both the Powerful Others and Chance subscales. A moderate positive (significant) correlation was obtained between the two external dimensions. For the schizophrenic group, these three correlations were considerably increased in the positive direction. This is interpreted as the influence of the intrustion of a systematic style of responding and acquiencence.

(b) i. The utilisation of factors requires that, at minimum, they be "purer" (more homogeneous) than the full measure. Correcting the internal consistancy of the factors of Rotter's I-E scale for test length, the Kuder Richardson co-efficients for both Factor I and II become superior to that of the complete scale. Relatively, Factor II is shown to be more homogeneous than the complete scale for both groups. The corrected internal reliability of Factor I is marginally higher only for the schizophrenic group.

(c) The interrelationships between the subscales exhibit the following three characteristics:

i. Correlations between the factors of Rotter's I-E scale and Levenson's IPC scale do <u>not</u> offer clear support for the differential validity of any subscale measure. The association between scores from the two scales are all in the expected direction and may be attributable to a generalised expectancy of locus of control common to each specific dimension.

ii. In considering measures derived from the I-E scale it is

evident that the correlations between Levenson's three dimensions and Factor II are in general lower than those involving either Factor I or the global I-E score. Overall, the correlations between Levenson's three dimensions of locus of control and Factor II are low with just two of the six correlations (Factor II x IPC x 2 groups) achieving significance at the 0,05 level. This suggests a partial independence of this particular factor, Socio-political Control,from the generalised expectancy of locus of control of reinforcement.

3. The correlations between the dimensions of the IPC scale and the I-E scale factors are weaker (closer to zero) for the psychiatric than the normal group. Correlations are however, in the expected directions for both samples. It is evident that the degree of association between the Powerful Others subscale and the measures derived from Rotter's I-E scale are in general lower than those involving either the Internal or Chance dimensions. (The correlations between the Powerful Others scale and Factor I are not in accord with this pattern.) The Chance and Internal subscales do not differ substantially. This supports the contention suggested by the literature survey that these two dimensions are not readily distinguishable from each other on a conceptual level.

(d) Although there has been very little investigation of the relationship between indices of adjustment and dimensions of locus of control it was intuitively expected that the dimensions are differentially related to locus of control. In particular it was felt that Factor I and not Factor II would be related to adjustment. Also it was expected

that the Powerful Others subscale would reflect a lower order set of associations with indicants of psychopathology.

2. Locus of control and schizophrenic adjustment.

(a) Group differences.

Relative to the normals, the I-E scores of the schizophrenic group are composed of a high (i.e. external) Factor I component and an unexpectedly low (i.e. internal) Factor II component. Schizophrenics are thus more external in the perception of Personal Control. That the belief in personal control rather than the belief in socio-political control would be related to adjustment was expected. The differences between the groups on Factor II is contrary to the general hypothesis that maladjustment is associated with an external perception of locus of control of reinforcement. The internal scores of the schizophrenics, relative to the normals on Factor II accounts for the similarity in total I-E score between the groups.

The differences obtained between the psychiatric and the comparison groups on the Internal, Powerful Others and Chance dimensions were as expected for the external dimensions, but contrary to prediction for the Internal subscale. The suggested interpretation is not in terms of the psychological differences purportedly assessed by the scales. It appears that for the psychiatric sample, the Internal scale does not accurately measure the belief in Internal Control and also that all three scales are inflated by an acquiescent response tendency.

(b) Locus of control and hospitalisation characteristics.

The hospitalisation variables of the study - age at first admission, single or multiple hospitalisations, total period hospitalised and closed or open-ward status - may be taken as indices of psychological adjustment. In terms of the general hypothesis it was expected that the severity of psychological disturbance would be associated with a perception of external locus of control. As predicted age at first admission was found to be negatively correlated with externality. The expected direction of this relationship was obtained for 5 of the 6 LOC measures. The Pearson co-efficient reached significance for the I-E, Factor II and Chance scales (p 0,05). Comparing closed- and open-ward patients, the expected (but nonsignificant) differences were obtained for each measure of LOC.

The association between chronicity (i.e. extensive hospitalisation) and locus of control is consistent in direction. Longer total hospitalisation and multiple admissions are associated with an increased internality. This association may reflect the patients' feelings of a loss of control following the traumatic experience of an acute psychotic attack (and subsequent first admission to a psychiatric hospital).

(c) Locus of control and behavioural scales of schizophrenic adjustment.

i. External locus of control was found to correlate positively with the Agitated Depression and Withdrawal scales of Lorr's Psychotic Reaction Profile. The direction of this relationship was consistent for all locus of control scales apart from the (close to zero) correlation between the Internal

and Withdrawal scales. The co-efficients of the correlations between the full I-E scale and Withdrawal (r = 0,31) was significant at the 0,05 level. The Pearson product moment between the I-E scale and Agitated Depression (r = 0,46) was significant at the 0,01 level.

ii. An external locus of control was found to correlate negatively with the Paranoid Belligerence scale (r = 0,36 with I-E; p 0,05) and the Thinking Disorganisation scale (r = -0,27 with I-E; not significant). The direction of this relationship was consistent for all LOC scales apart from the (close to zero) positive correlation between the Internal and Thinking Disorganisation scale.

OVERVIEW

1. The generalised expectancy rather than specific expectancies of locus of control accounts for the statistical relationships with indices of adjustment.

(a) The generalised expectancy of locus of control (the total I-E score) is found to be the best predictor of indices of adjustment. Specific subscale measures tend to follow the direction of correlations involving the full I-E score but are generally of a lower order.

(b) No one dimension of locus of control is of specific relevance to the indices of schizophrenic adjustment used in this study. That is, there is no particular subscale which is(consistently) most closely associated with aspects of psychopathology. It would appear that the positive correlations of the subscales is attributable to a generalised measure of externality, a factor common to each. This is demonstrated by the significant positive inter-relationships between the subscales.

(c) The proposition forwarded by Hochreich (1975) linking specifically defensive (low trust)externality to psychological maladjustment is refuted. The psychiatric sample is significantly more trusting than the normal comparison group and previously recorded norms (Rotter, 1967). Further, high trust covaries with certain indices of psychiatric incapacitation; mainly total period hospitalised and the behaviour patterns described as withdrawal and agitated depression. This opposes the notion that "defensive externals" are responsible for the hypothesised relationship with maladjustment (Hochreich, 1975). Maladjustment is clearly a concept which is multifaceted, and is not consistently associated with high external and low

trust scores.

The generalised (global) expectancy of locus of control which is assumed to be common to the specific subscales, appears to account for:

i. Intercorrelations between the subscales of locus of control; and

ii. Correlations between the subscales of locus of control and indices of adjustment.

2. There is limited support for the partial independence of Factor II from the I-E scale and the Powerful Others dimension from the IPC scale.

As noted each of the subscales (except for the Internal subscale) follow the same pattern of correlation: that is, the direction is consistent.

The slightly lower correlations between the degree of incapacitation and Factor II, as compared to Factor I or the full I-E scale, however, implies a partial independence of this factor, the belief in Socio-political Control. Support for the discriminant validity of Factor II comes also from the finding that the subscale is more homogeneous - has a higher internal consistency when adjusted to control for test length than the full scale. This holds for both research groups. The internal consistency of Factor I exhibits only a marginal superiority over the full scale for the schizophrenic sample and is only equivalent to that of full scale for the normal group.

The composite (aggregate) score of the I-E global total were very similar for the two groups. Factor I scores differ in the hypothesised fashion, schizophrenics being more external. It was anticipated that there would be no

difference between the groups on Socio-political Control. Normals however, were more externally orientated. As norms have not been provided in earlier studies it is not possible to claim either that the scores of the schizophrenic were unusually internal or those of the normal group particularly external. It can be conjectured that the latter is the case. For the schizophrenics to be especially internal on a dimension which shows only a slight degree of independence from the generalised expectancy of locus of control runs counter to the weight of the data from this study and previous research associating an external orientation with poor psychological adjustment. The interpretation of the discrepancy between the groups on Factors I and II is unclear. The difference does however illustrate the independence of these two item clusters of the I-E scale.

Likewise the Powerful Others dimension of the IPC scale has a slightly lower set of correlations than either the Chance subscale or the measures derived from the I-E scale. This, together with the finding of the superior co-efficients of internal consistencies (scale and item reliability values) as compared to the Internal or Chance scale, is taken to suggest a limited independence from the other measures of externality. It was noted in the review of literature that differential associations have been obtained for the P scale whereas little discriminant validity is available to support the intended conceptual nature of the Internal and Chance scales.

3. <u>There is some doubt regarding the psychometric characteristics of the Internal, Powerful Others and Chance scale</u>.

(a) The format of the test.

Levenson's multidimensional locus of control scale involves a rating by the subject of the degree of his agreement or disagreement with a set of statements. The test is scored by giving a high score for agreement with a statement and a low score for disagreement with a statement. Thus the format is such as to permit systematic influence by a directional response style.

There is data indicating that acquiescence influences scores on the IPC scale for the schizophrenic group in particular. In essence, the findings which suggest such an interpretation are:

i. All three dimensions for the psychiatric sample and the Powerful Others scores for the non-psychiatric sample correlate significantly with an index of acquiescence.

ii. The homogeneity - both internal reliabilities and items/total minus item correlation - of the Internal, Powerful Others, and Chance measures is elevated for the schizophrenics above the expected. These co-efficients are larger for the schizophrenic than the normal sample. This reverses the finding regarding the internal consistency of the I-E scale, a similar test in a non-rating format.

iii. Compared to results from the non-psychiatric and previously reported population norms (Levenson, 1972) scores for the mental patients are inflated on each of the three dimensions. Higher scores on the two external scales (Powerful Others and Chance scales) were predicted whereas lower scores on the Internal scale were hypothesised. Previous findings have also failed to obtain the expected difference on the Internal scale between schizophrenic and

normal groups (Levenson, 1973).

iv. Consistently throughout the study, correlations with the IPC subscale scores are of a lower order but in the same direction as those with the I-E scores (e.g. with hospitalisation and behavioural variables of adjustment). This is interpreted as being due to an additional random error component, acquiesence.

(b) Validity of the Internal scale,

In a literature survey it was suggested that a conceptual indistinctness between the Internal and Chance dimensions has made discriminant validity studies difficult if not impossible. Neither of these measures emerges as clearly distinguishable from the generalised expectancy measured by Rotter's I-E scale.

The Internal scale repeatedly correlates very close to zero with adjustment measures found otherwise across the subscales, to be related to externality (e.g. with Age at first admission, -0,05; with Period hospitalised, -0,09; with Withdrawal, 0,03; with Paranoid Belligerence, 0,04; with Agitated Depression, -0,10 and with Thinking Disorder, 0,02). Two unexpected findings highlight the suspect characteristics of this scale. Firstly, the Internal subscale correlates positively with both external dimensions of Levenson's multidimensional scale (Powerful Others and Chance). Secondly, as a group, schizophrenics scores higher on the Internal scale than did normals. This runs counter to the rest of the research findings.

The lack of success on the part of the Internal scale to predict various criteria of adjustment may be attributed to

the scales unsatisfactory reliability. Levenson (1973) reported an extremely low restest co-efficient (r = 0,08) over a period of only 1 week for a sample of psychiatric patients. This lack of stability over time would account for the current findings.

4. The experience of living in a mental hospital does not externalise patients' perceptions of control of reinforcement.

It might be expected that for patients within the regulated environment of a psychiatric institution, the belief in personal control would diminish. Long-term patients could in time come to view their predicament as quite hopeless and, as a result, adopt a passively acceptant (externally controlled) perception of reinforcements.

Findings however do not support the suggestion that hospitalisation leads to a more external orientation. Comparison of of new and readmitted patient groups as well as correlations between the total period hospitalised and locus of control indicate a slight (although insignificant) increase in internality to be associated with the factor of chronicity. Long-term patients may be seen as more "maladjusted" than new patients. The severity of the disorder, being associated with an external orientation, would act to weaken the "true" (uncontaminated) relationship between locus of control and hospitalisation. If anything the strength of the relationship is weaker than would be the case were "maladjustment" under experimental control.

The results suggesting that internality increases as a function of time institutionalised is backed by an experiment using reformatory inmates (Kiehlbauch, 1967). Kiehlbauch

found that following initially high (external) scores on the I-E scale, the perception of reinforcement of prisoners shifted towards internality. Comparing the subjects who had recently entered the reformatory (within 1 month of committment) and those who had been imprisoned for 12-13 months, a significant trend from greater to lesser externality was evident.

It may be that, following initial uncertainty of first admission, patients gain in personal confidence and competence to successfully manage reinforcements within the hospital setting.

5. An external perception of locus of control of reinforcement is not associated with all clinical indices of psychopathology. The hypothesis connecting learned helplessness and externality is supported and there is evidence linking an activity level continuum to the internal-external dimension.

External locus of control is found not to be related to all forms of maladjustment. This was expected in terms of the hypothesis linking learned helplessness to the generalised expectancy of external control of reinforcement. The hypothesis limits predicted (adjustment) correlates of locus of control to behaviours associated with the experience of uncontrollability.

Correlational analysis indicates that of the scales of the Psychotic Reaction Profile, only Withdrawal and Agitated Depression are related to externality. Interestingly Paranoid Belligerence was found to be related to expectancies of internal control. Patients rated high on paranoid belligerence exhibit hostile and aggressive behaviour. Withdrawal and

agitated depression, on the one hand, and paranoid belligerence on the other, may be viewed as opposite poles of a behavioural depression dimension.

The findings of Natale (1978) may also be taken to suggest a similar continuum underlying the association of the internal-external dimension. In that study mood states were induced. As a procedural check, criteria of reported subjective mood and motoric activation were used to validate the technique of inducing depressed, neutral or elated moods. The mood state of depression increased externality whereas elation increased internality.

Conceptually equating the perception of learned helplessness and the external end of the locus of control dimension, a positive correlation was expected between measures of external control and depressed levels of behaviour. That internality would be associated with higher activity levels was however not predicted.

Some weaknesses of the study

1. The choice of a comparison group.

The random nature of the normal group used in this study makes the present sample preferable to certain alternatives utilised in other research. For example, hospital personnel was used by Duke and Mullens (1973) and Shybut (1969) to constitute the normal samples.

The psychiatric sample is distinguishable from normal groups in terms of psychological adjustment and also the experience of hospitalisation. Non-psychiatric hospital patients could possibly be a better control group in a future study. Even so, some doubt would still persist regarding the equivalence of these two types of hospitalisation. A repeated measure design over time for the schizophrenic group would also not adequately separate these two factors.

The possible intrusion of the experience of hospitalisation is considered in discussion and interpretation of the present results even though the groups are not matched on this factor. The indication of the present study is that hospitalised patients gain a feeling of personal control over time. This would probably mean that the association between indices of psychological disturbance and externality would be strengthened if the variable of chronicity was controlled.

2. Hospital diagnosis.

Attention could be paid to the more rigorous identification of the patient category for the purposes of research. Hospital diagnosis should not be relied upon for the sake of accuracy of understanding and replicability of findings.

It is however the case that the emphasis of the present study was not the characteristics of a particular psychiatric category but rather to gain some insight into the relationship between locus of control and the broad concept of adjustment. From the literature it appears that "severely maladjusted" groups most clearly point to the relevance of perception of reinforcement as a component of psychological disorder. A schizophrenic sample was chosen as such a group.

3. Scales.

The use of scales contaminated by a response style error considerably restricts the interpretation of the results. This influence only became evident upon inspection of the data and statistical analysis. The rating scales appear to be markedly affected. Existing literature using these particular measures with mentally disturbed patients do not provide warning of this limitation.

It seems that forced choice items are the best format for psychiatric samples. At minimum, ratings should be phrased in such a way that response styles do not systematically affect scores in one direction. To further investigate the question of the importance of existing dimensions to psychopathology the development of new measures may be necessary.

CONCLUSION

CONCLUSION

The question of the relevance of the dimensions of locus of control to psychological adjustment is not resolved by the present study. Results indicate the generalised measure (the full I-E scale) to currently be the best single predictive measure of most of the study's indices of psychopathology. This is not to say that the factors are unimportant. For example, it was found that psychiatric patients were more external on Factor I than normals whereas there was no difference on the total I-E scores of the two groups.

A review of the literature indicates considerable interest in the dimensional analysis of locus of control. The present study points to psychometric weaknesses of existing dimensional measures, especially when using psychologically disturbed subjects. The I,P and C subscales are found to be open to significant influence by an acquiescent response style. The strength of correlations involving these dimensions is necessarily reduced by the presence of this additional error variable. Further, the Internal dimension was found, in the case of the psychiatric sample, to be unrelated to all variables considered in the study. This may be a function of the instability of the measure over time. Levenson (1973) reports a reliability of only 0,08 after 1 week. The factors of I-E scale derived from Mirels's analysis (1970) although partially independent of the generalised (global) I-E score, suffer from weak internal reliabilities. This is inevitable using a very small number of forced-choice test items. The ITS was found not to distinguish between the groups in the expected direction. This suggests the validity of the

instrument to be suspect and supports the conclusion of similar studies (Pasewark, Fitzgerald, Sawyer and Fossey, 1973; Fitzgerald, Pasewark and Noah, 1970).

The psychometric qualities of the I-E scale are undoubtedly superior to those of the existing dimensions. In addition, the generalised I-E score is conceptually more adequately defined than its statistically derived factors. The emphasis of dimensional research during the 1970's has concentrated upon factor analysing the I-E scale and establishing the discriminant validity of existing subscale measures. The construction of more satisfactory measures has been neglected. There are exceptions (e.g. Reid and Ware, 1974) which have attempted to develop and extend existing factor measures. The tools of most dimensional research however remain crude.

It is concluded that, at this point in time, Rotter's full I-E scale score should not be dismissed out of hand in favour of dimensional components. Undoubtedly, the predictive potential of dimensions is considerable but further attention should be given to the development of new (longer) scales.

Regarding the relationship of locus of control to psychological adjustment, the present study suggests that a connection exists between externality and behavioural depression. Both the Withdrawal and Agitated Depression scales were shown to correlate with an external perception of control of reinforcement. The highly external scores of schizophrenic subjects reported in the literature may be largely the result of the withdrawn subjects included and not a characteristic of the entire patient group.

Seligman's model of learned helplessness could prove useful as a basis for understanding the relationship between the internal-external dimension and psychopathology. Further, in providing a possible theoretical framework for the locus of control construct, stimulation and direction could be given to future research. Conversely the locus of control could assist the development of learned helplessness theory in humans. Learning helplessness involves, in the first instance, the experience of uncontrollability and in the second, the perception of uncontrollability. The overwhelming majority of research of learned helplessness has centred upon cognitive motivation and emotional deficits following the (experimentally manipulated) experience of random aversive reinforcements. Less attention has been given to the role of perception of uncontrollable reinforcements as it relates to such performance deficits. The internal-external dimension could serve a valuable function in this regard.

NOTE 1

Acquiescent Response Style: An intruding factor.

Levenson's multidimensional LOC measure is scored on the basis of the strength of the subject's agreement with each of the 24 statements, comprising the scale (-3 = strong disagreement through to +3 = strong agreement). As a necessary consequence of this format design, the subscale totals of subjects displaying a (directional) response style will systematically introduce an error into the measures. That is, scores will be inflated for subjects displaying acquiescent response tendencies and reduced for those displaying negativist response tendencies.

The following unexpected findings were obtained and are interpreted as the result of the intrusion of an acquiesent response style amongst the schizophrenic group.

1. Two indices of the reliability of the subscales for the psychiatric samples reflect a greater degree of internal consistency than expected.

(a) The Kuder Richardson reliability co-efficients are larger than expected being considerably higher than those of the normal group.

Table 27 : Internal consistencies (Kuder Richardson co-efficients) for the IPC subscales.

	I	P	C
Schizophrenic	0,67	0,79	0,80
Normal	0,51	0,71	0,61

(b) Item analysis indicates a higher correlation between items and subscale totals (excluding that item) for the schizophrenics (refer to Appendix).

Table 28: Median correlations between items and total minus item for the IPC subscales.

	I	P	C
Schizophrenic	0,42	0,59	0,52
Normal	0,28	0,52	0,35

2. Relative to the normals the correlations between the dimensions of the IPC scale were all elevated for the schizophrenic sample. Results of the normals were in line with previous statistical analysis: namely, a moderate (significant) correlation was obtained between the P and C subscales with close to zero (nonsignificant) associations between the I subscale and the two external dimensions. The correlations of the schizophrenics were all higher than those of the normal group. Both correlations involving the I subscale achieve significance ($p < 0,01$).

3. The scores of the schizophrenics were higher than expected across all three dimensions of the IPC scale. The differences between the normal and psychiatric samples were in the hypothesised direction for both the Chance and Powerful Others dimensions. The finding that schizophrenics also believe themselves to be more internally controlled (that is, score higher on the I subscale) is contrary to the literature and other results of the present study.

To test the possible existence of a directional response style, an index of the tendency to acquiesce was derived from another (independent) Likert-type rating questionnaire, the Interpersonal Trust Scale. The ITS utilises a 5 point rating scale including a neutral (1 = strongly agree to

5 = strongly disagree).

Thirteen of the items of the ITS are phrased such that disagreement reflects a trusting attitude ("usual direction") and the other twelve such that agreement reflects distrust. ("reverse direction"). Scores on the reverse direction items are converted to be equivalent to the usual direction items with high scores indicating trust.

For the purpose of this analysis, acquiescence is defined as the difference between the two halves states in opposing directions. That is,

Acquiescence = Reverse direction items - Usual direction items

(The final item stated in the usual direction is omitted to numerically equate the two sets of items.)

Note that the tendency to agree elevates the (converted) reverse direction item totals and depresses the usual direction item totals. Acquiescence as defined by this formula, is necessarily affected by differences between the half scales.

Both the schizophrenic and normal samples were found to have positive mean acquiescent scores ($\bar{X}$ = 17,1 for schizophrenics and 11,2 for normals) indicating the preference of subjects to, on the whole, agree with expressed opinions on the ITS. These scores are significantly greater than zero (t = 12,3 and 9,7; df ; 39; $p < 0,01$). As predicted, the Acquiescent scores of the psychiatric group is significantly larger than the normals (t = 3,31; df = 78; $p < 0,01$).

The most clear-cut evidence of the impact of an acquiescent response style on Levenson's multidimensional LOC scale is obtained from correlations between Acquiescence and three subscales.

Table 29: Correlations between Acquiescence and IPC subscales.

	I	P	C
Schizophrenic	0,35*	0,63**	0,52**
Normal	-0,08	0,42**	0,11

* $p < 0,05$

** $p < 0,01$

Amongst the schizophrenic sample, all three scales are significantly correlated with Acquiescence. For the normals, the belief in the control of Powerful Others is associated with the greater utilisation of agreeing responses. The finding for normals suggests specifically that persons with a stronger belief in the control of powerful others tend to be more acquiescent. On the other hand, the significant correlations across all three probably reflects the influence of an acquiescent response style for the psychiatric sample.

It is concluded that the format rather than the content of the IPC scale accounts for a substantial part of the variance between the groups.

APPENDICES

CORRELATIONS OF TEST VARIABLES: SCHIZOPHRENIC

	Age	Education	I-E	FI	FII	I	P	C	ITS	Acq.	Age at Ist admission	Period Hospitalised	W	PB	AD	TD
1	-	0,31	-0,27	-0,09	-0,32	-0,08	-0,17	-0,25	0,32	-0,11	0,79	0,62	-0,05	-0,15	-0,03	0,37
2	0,31	-	-0,19	-0,21	-0,15	-0,04	0,35	-0,26	0,20	-0,30	0,38	-0,03	-0,14	0,18	0,11	-0,07
3	-0,27	-0,19	-	0,61	0,84	-0,15	0,11	0,19	-0,40	0,02	-0,36	-0,22	0,31	-0,36	0,47	-0,27
4	-0,09	-0,21	0,61	-	0,22	0,02	0,31	0,36	-0,21	0,20	-0,14	0,04	0,16	-0,37	0,27	-0,32
5	-0,32	-0,15	0,84	0,22	-	-0,19	-0,06	0,03	-0,40	-0,17	-0,37	-0,19	0,23	-0,22	0,43	-0,27
6	-0,08	-0,04	-0,15	0,02	-0,19	-	0,41	0,48	-0,01	0,35	-0,05	-0,09	0,03	0,04	-0,10	-0,02
7	-0,17	0,35	0,11	0,31	-0,06	0,41	-	0,84	-0,27	0,63	-0,28	-0,13	0,22	-0,10	0,15	-0,11
8	-0,25	-0,26	0,19	0,36	0,03	0,48	0,84	-	-0,30	0,52	-0,33	-0,17	0,26	-0,19	0,18	-0,15
9	0,32	0,20	-0,40	-0,21	-0,40	-0,01	-0,27	-0,30	-	0,05	0,29	0,30	-0,20	0,24	-0,36	0,04
0	-0,11	-0,30	0,02	0,20	-0,17	0,35	0,63	0,52	0,05	-	-0,17	-0,13	0,01	-0,07	-0,10	-0,02
1	0,79	0,38	-0,36	-0,14	-0,37	-0,05	-0,28	-0,33	0,29	-0,17	-	0,25	0,08	0,03	-0,13	0,22
2	0,62	-0,03	-0,22	0,04	-0,19	-0,09	-0,13	-0,17	0,30	-0,13	0,25	-	0,01	-0,12	0,00	0,38
3	-0,05	-0,14	0,31	0,16	0,23	0,03	0,22	0,26	-0,20	0,01	0,08	0,01	-	-0,09	0,77	0,02
4	-0,15	0,18	-0,36	-0,37	-0,22	0,04	-0,10	-0,19	0,24	-0,07	0,03	-0,12	-0,09	-	-0,26	0,00
5	-0,03	0,11	0,47	0,27	0,43	-0,10	0,15	0,18	-0,36	-0,10	-0,13	0,00	0,77	-0,26	-	-0,01
6	0,37	-0,07	-0,27	-0,32	-0,27	-0,02	-0,11	0,15	0,04	-0,02	0,22	0,38	0,02	0,00	-0,01	-

Degrees of freedom = 38

A correlation of 0,31 is significant at the 0,05 level.

A correlation of 0,40 is significant at the 0,01 level.

Acq. = Acquiescence

CORRELATIONS OF TEST VARIABLES: NORMAL

	Age	Education	I-E	FI	FII	I	P	C	ITS	Acq.
1	-	-0,30	-0,22	-0,01	-0,31	0,04	0,33	-0,02	0,07	0,41
2	-0,30	-	0,02	0,07	0,14	0,05	-0,13	0,08	-0,15	0,11
3	-0,22	0,02	-	0,79	0,83	-0,50	0,27	0,60	-0,33	-0,20
4	-0,01	0,07	0,79	-	0,43	-0,36	0,41	0,63	-0,18	-0,05
5	-0,31	0,14	0,83	0,43	-	-0,31	0,07	0,40	-0,31	-0,20
6	0,04	0,05	-0,50	-0,36	-0,31	-	-0,17	-0,20	0,26	-0,08
7	0,33	-0,13	0,27	0,41	0,07	-0,17	-	0,40	0,16	0,43
8	-0,02	0,08	0,60	0,63	0,40	-0,20	0,40	-	-0,20	0,11
9	0,07	-0,15	-0,33	-0,18	-0,31	0,26	0,16	-0,20	-	0,14
10	0,41	0,11	-0,20	-0,05	-0,20	-0,08	0,43	0,11	0,14	-

Degrees of freedom = 38

A correlation of 0,31 is significant at the 0,05 level.

A correlation of 0,40 is significant at the 0,01 level.

Acq. = Acquiescence.

Demographic characteristics of Schizophrenics

Subject	Age	Years Education	Marital status	Period unemployed (yrs)
1	28	16	Single	0
2	25	12	Single	1
3	32	12	Single	4
4	34	12	Single	5
5	37	15	Single	10
6	42	9	Divorced	7
7	36	9	Single	7
8	41	15	Divorced	4
9	23	9	Single	4
10	27	9	Married	0
11	27	12	Single	1
12	20	9	Single	- *
13	29	11	Divorced	0
14	20	10	Single	3
15	20	12	Single	0
16	33	9	Single	0
17	30	10	Single	2
18	29	9	Divorced	6
17	26	9	Married	4
20	21	11	Single	-
21	25	9	Single	2
22	27	10	Single	3
23	27	9	Single	1
24	21	11	Single	0
25	22	10	Single	1
26	20	9	Single	-
27	45	16	Married	3
28	47	10	Married	10
29	29	12	Single	0
30	25	10	Single	-

Demographic characteristics of Schizophrenics (cont'd)

Subject	Age	Years Education	Marital status	Period unemployed (yrs)
31	25	10	Single	1
32	21	9	Single	0
33	31	12	Single	1
34	20	10	Single	-
35	34	11	Single	3
36	22	15	Single	1
37	33	12	Married	2
38	24	9	Single	3
39	38	10	Single	4
40	25	11	Married	0

* never employed

Demographic variables of Normals

Subject	Age	Years Education	Marital status	Current Occupation
1	41	10	Married	Clerk
2	35	9	Married	Fitter & turner
3	24	12	Married	Clerk
4	37	10	Married	Motor technician
5	41	11	Married	Foreman
6	25	11	Married	Surveyor
7	41	12	Married	Auditor (SAR)
8	39	9	Single	Driver
9	20	10	Single	Clerk
10	43	11	Married	Boiler Maker
11	44	10	Married	Salesman
12	42	9	Married	Art Advertiser
13	23	10	Single	Lithograph
14	33	9	Married	Insurance Official
15	25	12	Married	Accountant
16	29	10	Divorced	Television Technician
17	38	11	Married	Bank Teller
18	42	10	Married	Foreman
19	40	12	Married	Manager
20	24	11	Single	Electrician
21	36	10	Married	Machine operator
22	28	10	Single	Trainee Accountant
23	34	11	Married	Data Controller
24	30	13	Married	Accountant
25	37	12	Married	Horologist
26	26	11	Married	Clerk
27	29	10	Married	Motor technician
28	24	10	Single	Driver
29	22	11	Single	Clerk
30	33	11	Married	Clerk

Demographic variables of Normals (cont'd)

Subject	Age	Years Education	Marital status	Current Occupation
31	35	10	Married	Electrician
32	26	15	Married	Accountant
33	25	17	Single	Chartered Accountant
34	32	12	Married	Salesman
35	47	10	Married	Customs Officer
36	48	9	Married	Park Assistant
37	38	10	Married	Clerk
38	50	12	Married	Manager
39	29	12	Married	Salesman
40	47	10	Widower	Porter (SAR)

Hospitalisation variables of schizophrenics

Subject Number	Total Period hospitalised (years)	Age at Ist admission	Patient status	Closed/ open ward patients
1	0	28	First	Open
2	0	25	First	Open
3	4	21	Readmitted	Open
4	3	30	Readmitted	Open
5	4	27	Readmitted	Open
6	5	30	Readmitted	Open
7	4	27	Readmitted	Open
8	5	28	Readmitted	Open
9	2	18	Readmitted	Open
10	0	27	First	Open
11	1	19	Readmitted	Open
12	1	17	Readmitted	Open
13	1	25	Readmitted	Open
14	0	20	First	Closed
15	0	20	First	Closed
16	3	23	Readmitted	Closed
17	4	20	Readmitted	Closed
18	3	24	Readmitted	Closed
19	2	19	Readmitted	Closed
20	0	21	First	Closed
21	3	18	Readmitted	Closed
22	1	25	Readmitted	Closed
23	1	23	Readmitted	Closed
24	1	17	Readmitted	Closed
25	2	18	Readmitted	Closed
26	2	17	Readmitted	Open
27	2	32	Readmitted	Open
28	5	28	Readmitted	Open
29	3	23	Readmitted	Open
30	2	19	Readmitted	Open

Hospitalisation variables of schizophrenics (cont'd)

Subject Number	Total Period hospitalised (years)	Age at Ist admission	Patient status	Closed/ open ward patients
31	3	21	Readmitted	Open
32	4	17	First	Open
33	3	24	Readmitted	Open
34	2	17	Readmitted	Open
35	2	18	Readmitted	Open
36	2	19	Readmitted	Open
37	1	26	First	Open
38	0	23	First	Open
39	4	29	Readmitted	Closed
40	2	22	Readmitted	Closed

Scale scores: Schizophrenics

Subject	IE	FI	FII	I	P	C	ITS
1	11	4	6	31	15	27	70
2	10	5	5	32	23	19	73
3	12	3	7	35	28	24	64
4	4	1	2	48	0	0	81
5	12	4	5	28	49	25	71
6	3	0	1	30	31	17	63
7	5	4	2	46	44	45	84
8	6	1	3	41	18	23	89
9	14	6	6	47	36	24	72
10	19	5	2	46	42	42	65
11	11	2	6	45	46	48	68
12	7	2	3	47	43	39	82
13	3	1	2	33	30	15	73
14	13	2	7	34	23	15	68
15	1	0	0	28	38	29	66
16	10	5	4	29	15	20	80
17	11	4	6	35	33	32	68
18	11	3	4	12	18	7	84
19	9	3	5	39	37	35	69
20	14	6	5	43	38	39	49
21	10	3	6	37	29	33	58
22	8	4	3	48	42	36	70
23	9	3	5	43	38	30	60
24	11	3	5	47	42	47	70
25	12	4	5	27	26	20	81
26	9	2	5	46	32	20	74
27	6	2	2	42	14	6	83
28	7	3	1	38	26	21	79
29	6	4	2	33	27	26	65
30	14	3	9	30	16	15	42

Scale scores: Schizophrenics (cont'd)

Subject	IE	FI	FII	I	P	C	ITS
31	9	5	3	47	40	39	66
32	8	5	3	38	32	30	71
33	8	2	4	28	5	16	79
34	8	3	3	44	36	42	67
35	13	6	4	32	40	33	66
36	4	2	1	43	10	11	73
37	8	5	2	47	45	41	64
38	14	3	7	28	19	25	58
39	9	4	5	42	37	31	70
40	7	0	5	35	19	15	81

Scale scores: Normals

Subject	IE	FI	FII	I	P	C	ITS
1	10	2	6	36	17	7	66
2	5	0	4	45	6	15	73
3	10	1	6	24	20	19	63
4	11	4	6	32	10	21	70
5	13	3	7	39	25	27	66
6	14	4	7	27	8	24	59
7	10	1	6	30	24	24	77
8	6	2	3	37	31	22	73
9	11	1	7	37	15	22	55
10	5	3	1	32	16	25	68
11	11	4	6	34	29	21	65
12	11	2	6	23	24	12	68
13	12	2	8	26	13	15	63
14	1	0	1	40	11	9	75
15	1	0	1	45	11	2	68
16	12	2	7	35	21	23	76
17	5	1	3	36	19	22	52
18	9	2	4	26	16	8	66
19	13	4	7	34	16	21	61
20	10	1	7	27	19	12	67
21	9	2	5	23	24	11	64
22	5	1	2	40	14	11	85
23	8	1	7	41	17	7	79
24	16	5	8	33	20	22	39
25	2	0	2	35	10	9	76
26	14	3	8	35	14	26	56
27	8	2	6	44	23	16	74
28	14	4	6	32	9	23	60
29	11	4	4	29	25	25	74
30	17	6	7	25	27	26	57

Scale scores: Normals

Subject	IE	FI	FII	I	P	C	ITS
31	8	1	5	40	12	12	45
32	4	1	2	38	9	8	73
33	8	2	7	39	17	22	64
34	6	1	5	36	19	19	67
35	7	2	5	40	19	19	86
36	3	0	2	36	19	14	67
37	7	0	5	35	24	20	69
38	6	1	4	33	12	16	43
39	13	4	8	35	29	25	64
40	10	5	2	36	47	24	75

Behavioural rating of schizophrenics: The Psychotic Reaction Profile.

Subject	Withdrawal	Paranoid Belligerence	Agitated Depression	Thinking Disorganization
1	22	3	3	0
2	11	0	2	1
3	24	0	5	1
4	2	10	0	3
5	34	6	5	0
6	4	1	0	8
7	21	5	2	1
8	25	4	1	2
9	4	1	1	0
10	21	1	3	0
11	17	0	4	2
12	2	3	0	1
13	3	8	0	0
14	23	6	1	2
15	10	9	0	0
16	5	2	0	0
17	1	0	0	0
18	0	2	0	0
19	0	2	0	0
20	6	1	0	0
21	18	0	4	3
22	22	0	3	2
23	11	6	2	0
24	6	10	0	3
25	23	6	3	3
26	19	2	2	0
27	1	1	0	0
28	15	0	1	8
29	8	0	2	4
30	21	1	4	1

APPENDIX 5 Cont'd.

Behavioural rating of schizophrenics: The Psychotic Reaction Profile.

Subject	Withdrawal	Paranoid Belligerence	Agitated Depression	Thinking Disorganization
31	24	0	2	0
32	14	4	2	0
33	1	0	1	0
34	21	0	0	0
35	21	0	4	0
36	8	7	1	2
37	12	1	1	0
38	18	1	3	1
39	1	4	0	0
40	6	2	0	0

APPENDIX 6

Item Analysis

1. The I-E Scale

Item Point Biserial Correlations

Item number	Schizophrenics	Normals
1	0,23	0,45
2	0,27	0,26
3	0,13	0,36
4	0,08	0,13
5	0,14	0,27
6	0,22	0,41
7	0,07	0,16
8	-0,20	0,21
9	0,10	0,42
10	0,25	0,38
11	0,33	0,35
12	0,34	0,38
13	-0,02	0,12
14	0,43	0,32
15	0,09	0,51
16	0,04	0,40
17	0,04	0,23
18	0,40	0,57
19	0,03	0,15
20	0,30	0,39
21	0,07	0,19
22	0,35	-0,02
23	0,19	0,13
Median	0,14	0,32
Kuder-Richardson	0,56	0,74

APPENDIX 6 Cont'd.

2. Factor I

Item Point Biserial Correlations

Item number	Schizophrenics	Normals
1	-0,06	-0,10
2	0,09	0,12
3	0,32	0,32
4	0,13	0,27
5	0,16	0,21
6	0,08	0,34
7	0,16	0,17
8	0,47	0,44
9	0,06	0,05
Median	0,13	0,21
Kuder-Richardson	0,38	0,52

3. Factor II

Item Point Biserial Correlations

Item number	Schizophrenics	Normals
1	0,33	0,42
2	0,27	0,35
3	0,18	0,36
4	0,29	0,31
5	0,40	0,57
6	0,04	0,39
7	0,38	0,68
8	0,15	0,01
9	0,15	0,25
Median	0,27	0,36
Kuder-Richardson	0,52	0,68

4. Internal

Pearson product correlations between item and total minus item

Item number	Schizophrenics	Normals
1	0,38	0,44
2	0,57	0,17
3	0,16	0,06
4	0,27	0,00
5	0,47	0,23
6	0,48	0,36
7	0,46	0,47
8	0,21	0,33
Median	0,42	0,28
Kuder-Richardson	0,67	0,51

5. Powerful Others

Pearson product correlations between item and total minus item

Item number	Schizophrenics	Normals
1	0,53	0,55
2	0,66	0,30
3	0,58	0,48
4	0,34	0,34
5	0,63	0,55
6	0,32	0,49
7	0,35	0,03
8	0,59	0,56
Median	0,56	0,49
Kuder-Richardson	0,79	0,71

6. Chance

Pearson product correlations between item and total minus item

Item number	Schizophrenics	Normals
1	0,28	0,29
2	0,50	0,05
3	0,77	0,37
4	0,33	0,38
5	0,61	0,21
6	0,53	0,45
7	0,57	0,41
8	0,53	0,32
Median	0,52	0,35
Kuder-Richardson	0,80	0,61

7. Interpersonal Trust Scale

Pearson Product correlations between item and total minus item.

Item number	Schizophrenics	Normals
1	0,53	0,26
2	0,25	-0,13
3	0,24	0,23
4	0,35	0,18
5	0,13	0,32
6	-0,01	0,12
7	0,17	0,18
8	0,17	-0,04
9	0,46	0,42
10	0,29	0,21
11	0,39	0,45
12	0,24	0,59
13	0,35	0,41
14	0,33	0,24
15	0,26	0,28
16	0,10	0,30
17	0,46	0,04
18	0,02	0,30
19	0,08	0,07
20	0,04	0,31
21	0,22	0,05
22	0,28	0,20
23	0,08	0,28
24	0,18	0,14
25	0,15	0,24
Median	0,24	0,24
Kuder-Richardson	0,63	0,66

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