MOTIVATION AND THE LOCUS-OF-CONTROL CONCEPT : A THEORETICAL ANALYSIS AND CROSS-CULTURAL STUDY

by

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ABSTRACT

The first part of this thesis comprises a review of some of the extensive literatures on locus-of-control and task motivation. The exercise reveals that, while the locus-of-control construct has received considerable support, no satisfactory explanation of its functional characteristics as a motivational variable is available. This appears to be because locus-of-control is not a unitary construct. Previous analyses have depended almost entirely on existing measurement scales, notably Rotter's I-E Scale. In this thesis, the theoretical component is a conceptual analysis of the locus-of-control construct, and the empirical component consists of the construction and testing of a set of interlocking scales, which assess the relative importance for common events of six loci of control.

The task is specially defined as a unit of behaviour which is further analysed in terms of preparatory, decisional and operating phases. Locus-of-control is construed as the subjective relationship between effort input and performance output in a task, and this relationship is further differentiated into effort-effectiveness, task competence and range of uncertainty components. These parameters are considered in conjunction with the arousal value of the relationship between performance and satisfaction, and the inhibitory effect of effort, in a model of task behaviour which unites locus-of-control, decision-making and motivation theory.

Differences between Africans and Europeans are predicted for the structure of control beliefs, and a cross-cultural study is described which used the I-E Scale and the author's "A-C Scales". The results indicate acceptable levels of reliability and independence for the A-C Scales, and reveal cross-cultural variation in the meaning of external control. The theoretical implications are outlined. Both the model and the design of the instrument appears to make a significant impact on the theoretical and methodological problems in the area. Various practical applications are discussed.

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For
Karen
and
Lisa

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Chapter 1

THE LOCUS-OF-CONTROL MODEL

Current interest in the locus-of-control concept is usually traced to the publication of J.B. Rotter's social learning theory in 1954, though the basic ideas of that theory have a much longer history. Research on the topic began with the submission of doctoral theses to Ohio State University by E.J. Phares in 1955 and W. James in 1957, both of whom went on to make further contributions in the field. An early version of what was to become the standard measuring instrument was introduced by Rotter et al. in 1962, and in 1966 Rotter and H.M. Lefcourt were able to provide reviews of quite extensive research. These reviews were brought up to date by Joe (1971), who concluded that there was general support for the validity of the concept and the various measuring scales, but pointed to a number of specific problems requiring further research and analysis. A bibliography was also published in the same year by Throop and MacDonald (1971).

The purpose of this study is to attempt a closer analysis of the locus-of-control concept, and to propose a functional model of decision-making and action relating cognitive and motivational variables, along the lines indicated by Heckhausen and Weiner (1972). A selective review of work to date, though covering much the same ground as Rotter (1966), Lefcourt (1966) and Joe (1972), is necessary first in order to bring out points of particular relevance to the proposed model.

(i) The task situation

In this thesis, we shall refer to the context within which locus-of-control directly influences the behaviour of an individual as the task. The task, while having various external correlates

which make an objective operational definition possible, is subjectively defined by a subject. Its duration is from the apperception by the subject of motivational or situational stimuli requiring a behavioural response of a particular type, through the establishment and fixing of mental parameters affecting the nature of the responses to be made, the decisional process and initiation of behaviour, to the beginning of a specific behaviour sequence. A continuous series of tasks is embedded within the ongoing thought and action pattern of the individual. The focal stage of a task, and its most definite external manifestation, is the decision point which initiates a sequence of behaviour. Once behaviour has been initiated its progress can be regarded as essentially autonomous and controlled by low-level feedback processes. Higher-level feedback and evaluation processes will be simultaneously involved in the re-establishment of parameters in preparation for the next task. The duration of a task in objective time varies; the shorter the duration of a series of tasks, the more apparently active is the subject. A task, or series of tasks, as well as being embedded in sequences of behaviours identifiable by temporal contiguity, may also be seen as discrete steps in a series of behaviour sequences attributable to long-term goals or expectations (Raynor, 1969). Ryan (1958, 1970) has provided a theory of task motivation in which the task is seen as a "causal factor in behaviour"; however, his definition of task in terms of "intentions" or "what the individual is trying to do" appears to lack any possibility of objectification, though it may be important in that subjects tend to report their own behaviour in such terms.

Two stages in the task are discriminated in this study, and given separate treatment. The most important stage is the decisional and behaviour-initiation stage, which has received very little attention within locus-of-control theory. The precise nature of the mental parameters involved in this stage will be clarified, and those parameters will be related to one another in the form of a model. The other stage of the task which is isolated in this study is the previous stage, i.e. the process

by which these mental parameters become established and fixed in anticipation of the decision process. This stage has been the prime focus of locus-of-control theory to date, though the lack of attention to the decision process has led workers in the area into something of a conceptual cul-de-sac.

(ii) The task in locus-of-control theory

A basic notion in locus-of-control theory has been that tasks can be placed on a continuum (either objectively or subjectively defined) from "chance" to "skilled"; the former category is exemplified (at least objectively) by a prediction task using random numbers or an unbiased roullette wheel, and the latter category is exemplified (at least subjectively) by a situation in which there is a direct causal link between action and outcome, e.g. a dexterity test. Early work in the area was concentrated on the relationship between this chance-skill dimension and expectancy and performance variables (an approach having much in common with early level-of-aspiration studies). Phares (1957) reported that the reinforcement contingencies employed in task performance feedback were reflected directly in changes of expectation of success (Ps) only when the task was interpreted as a skilled one, while in chance tasks "unusual shifts" (as defined by Rotter (1954) for level-of-aspiration performance) occurred in Ps. James and Rotter (1958) and Holden and Rotter (1962), reported that the usual assumption in learning studies, that partial reinforcement is superior to 100-percent reinforcement in maintaining performance after extinction begins, applied only to chance tasks, while 100-percent reinforcement was found superior in tasks which subjects perceived as skilled. Blackman (1962) found that regular patterns in feedback tended to be attributed to the experimenter rather than to the subject's skill, and performance fell off quickly if the pattern changed. Bennion, in another unpublished dissertation to Ohio State University in 1961, showed that unexplained variability in feedback led the subject to interpret the task as a chance one, and Diggory and Ostroff (1962) showed that confidence in Ps estimates

(presumably reflecting the degree to which the task is one of skill) was higher when variability in outcomes was smaller. Rotter et al. (1961) also presented results confirming the general trend of these findings, and Rotter (1966, p. 8) summarized them as follows: "Subjects are more likely to see a sequence of reinforcement as not being chance controlled when the percentage of reinforcement significantly deviates from a 50 - 50 percentage in a right-wrong situation, when the sequence of reinforcements appear to have a pattern, when unusually long sequences of one of two alternative events occur, and when variability of performance is minimal in a task allowing for scoring along a continuum ... Investigations of differences in behaviour in skill and chance situations provide relatively clear-cut findings. When a subject perceives the task as controlled by the experimenter, chance, or random conditions, past experience is relied upon less. Consequently, it may be said that he learns less, and under such conditions, he may indeed learn the wrong things and develop a pattern of behaviour which Skinner has referred to as 'superstitious'".

Although work in locus-of-control has more recently moved away from attention to purely task-situational variables to the study of enduring dispositions to perceive tasks as chance or skilled, subjective perception of the task remains the primary mediating construct implicit in the theory. A large body of evidence has been built up indicating the importance of the chance-skill dimension in explaining task motivation and behaviour. However, it will be demonstrated that a further differentiation of the dimension can and must be undertaken for more precise predictions to be made.

(iii) Enduring predispositions in task perception

Rotter's (1954) thesis about the social determinants of behaviour relied heavily upon the concept of "generalized expectancy" which he defined (p. 166) as "generalization of the expectancies for the same or similar reinforcements to occur in a present situation as occurred in past situations for the same, or functionally related, behaviours." He enlarged on this definition in his 1966 monograph (p. 2) : "A generalized attitude, belief or expectancy

regarding the nature of the causal relationship between one's own behaviour and its consequences might ... in combination with specific expectancies act to determine choice behaviour along with the value of potential reinforcements." Rotter saw these expectancies as dependent on "the individual's history of reinforcement", and as interacting with chance-skill task expectancies; specifically, the more ambiguous a task situation was, the more would the individual rely upon his past experience to interpret the task.

This inter-subject variance in task perception was also one concern of the studies quoted earlier in connection with inter-task variance, and James' and Phares' work included the use of a short inventory designed to assess the degree to which their subjects held enduring expectancies which were likely to bias their perceptions of the experimental tasks on the chance-skill dimension. This inventory was further developed and introduced in greater detail by Rotter et al. (1962), a final version being published by Rotter (1966), and called the "I-E Scale". This designation refers to the expectancies of subjects scoring high ("External") and low ("Internal") on the scale. "Internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perception of positive and/or negative events as being unrelated to one's own behaviours in certain situations and thereby beyond personal control." (Lefcourt, 1966a, p. 207).

The I-E Scale (see Appendix A) is a forced-choice device of 23 items (plus 6 filler items) consisting of paired statements taken from earlier versions, one statement reflecting an internal and one an external belief in each case. According to Rotter (1966) the pairings minimised the effects of social desirability, and the number of items selected is on the basis of item performance; Rotter further claims that factor analysis did not indicate the presence of more than one dimension in the scale, but points out that the items represent "samples of attitudes in a wide variety of different situations" so that normal internal-consistency indices

(given in Table 5.1 in conjunction with further data collected in Africa) tend to be under-estimations. These claims will be dealt with in detail later.

While Rotter's I-E Scale has been used in by far the largest proportion of studies of locus-of-control to date (Joe, 1971; Throop and MacDonald, 1971), largely because of its suitability for under-graduate students and other readily accessible populations, a number of alternatives have appeared, and versions for children have been developed.

The 'Coleman Report' (Coleman et al., 1966) used a three-item scale of internality - externality, subjects being required to agree or disagree with statements to the effect that (a) good luck is more important than hard work for success, (b) "when I try to get ahead someone or something stops me", and (c) "people like me don't have much of a chance to be successful in life". This instrument was found to account for more of the variance in the academic achievements of 6th, 9th and 12th grade non-white pupils in U.S.A. than any other of the several variables used, and was the second best predictor for whites. Jessor et al. (1968) also successfully used a short scale, in this case a 12-item version of the I-E Scale. Dies (1968) introduced a projective measure, for which he found good correlations with the I-E Scale. Schneider (1968), upon discovering a correlation between I-E scores and preferences for skill versus chance tasks (e.g. gambling versus chess), proposed that a scale of such preference would provide a valid measure of the variable, but a study by Berzins et al. (1970) indicated that the usefulness of this substitution might be confined to student groups. Powell and Vega (1972) reviewed promising results from an Adult Locus-of-Control Scale, and Powell (1971) reviewed work with a parallel children's version known as the Children's Locus-of-Control Scale (CLOC). The best known children's scales have been those devised by Bialer (1961), Battle and Rotter (1963) (a Picture Test), and Crandall et al. (1965). The latter, known as the Intellectual Achievement Responsibility Scale or IAR, is of particular interest in that it distinguishes between responsibility for negative and positive events, and the

authors found some support for the validity of this distinction. The status of the scale is difficult to gauge, however, since no item analysis data has been published to date, and though McGhee and Crandall (1968) have provided further confirmation of the earlier results, Entwisle and Greenberger (1970) have presented results indicating lack of concurrent validity for the measure and also contradictory findings regarding the positive-negative outcome distinction. Nowicki and Strickland (1973) have criticised existing children's scales on various grounds : the Bialer scale for response bias and low reliability, the Battle and Rotter projective device as being inapplicable to large groups, and the Crandall IAR measure as being too specific to academic outcomes and also difficult for young children because of its forced-choice format. They have published a 40-item test using single statements of belief of the kind used by Rotter in the I-E Scale, requiring a Yes/No response. Internal consistency and concurrent validity statistics seem moderately good for this test.

Finally, brief mention is made at this point of a number of studies which have involved measurements of selected aspects of locus-of-control, and which will be discussed in detail later. These include studies by Schneider and Parsons (1970), Gurin et al. (1970) and Kleiber et al. (1973), all using parts of the I-E Scale; and new scales differentiating aspects of the external end of the dimension by Levenson (1972) and the present author (reported later in this thesis).

(iv) Concomitants of internality-externality

Proponents of the locus-of-control construct (Rotter, 1966; Lefcourt, 1966a, b; and others) have been at pains to point out that it is a stable expectational variable and not a motivational one, despite its recognized relevance for motivation. Many of the studies reported in the literature involve motivational concepts directly or indirectly, however, which makes it somewhat difficult to make statements about the 'pure' validity of locus-of-control. Schneider (1968) and Julian et al. (1968) provide evidence that internals prefer skilled tasks and externals chance tasks, but the latter workers provide only ambiguous evidence that internality

is equivalent to a need to control, since on their experimental task externals became frustrated by lack of control. A central point of the present thesis is that the expectational and affective components of motivation can and should be separated conceptually, and that a great deal of the current confusion in the field of motivation is due to a failure to effect such a conceptual distinction. The research on relationships between locus-of-control and other variables is summarized below under various headings.

a. Interaction of task and expectancy. A number of investigators have focussed on the interaction between internality-externality as a personality disposition ahd chance-skill as a situational task variable. In line with the studies by Schneider and Julian et al. just mentioned, Julian and Katz (1968) found that internals preferred to play for themselves in a competitive game in both skill and chance conditions, even when given the opportunity of taking advantage of their opponent's superior performance by allowing him to score for them; externals, however, preferred to play for themselves only in the chance conditions. Rotter and Mulry (1965) and Watson and Baumal (1967) have shown that internals put up better performances on skilled tasks, externals on chance tasks. The superiority of externals on chance tasks, though not as definite as the internal's superiority in skill conditions, is not easily explained in terms of Rotter's theory, and alternative explanations have been offered. Rotter and Mulry propose that externals are concerned with being lucky; in a chance (unpredictable) situation there is more scope for luck to play a part, hence they take greater care (have greater response latencies). Watson and Baumal suggest that subjects are more anxious in tasks which are inconsistent with their normal expectancies, and this suppresses performance. Petzel and Gynther (1970), however, report findings which are directly contradictory to the previous two cited, and suggest this is due either to differences in the task situations used or to the possibility of a U-shaped relationship being applicable. None of these suggestions are really satisfactory, as they stand outside the general theoretical model. A clarification of the chance-skill and internal-external dimensions

is necessary for the interactions between them to be properly understood. This is underlined by a study of Holden and Rotter (1962) which found sex differences in performance in a card prediction and betting task, set up as either chance, skill or ambiguous. Persistence was greater in the chance condition, especially for women. In the ambiguous task, large inter-subject variance was found, and men behaved as if they were in a chance situation while women behaved as if in the skill condition. These results indicate the presence of concealed interactions with unknown variables affecting the perception of the task.

b. Locus-of-control and anxiety. A large number of studies have found a relationship between locus-of-control expectations and anxiety, externals generally being more anxious (Butterfield, 1964; Rotter, 1966; Lefcourt, 1966a, b; Feather, 1967b; Watson, 1967; Ray and Katahn, 1968; Hountras and Schraf, 1970; Nelson and Phares, 1971) and some investigators have asserted that external expectations and responses on measuring scales may be due to a defensive reaction (Battle and Rotter, 1963; Phares, 1972). Ray and Katahn's factor-analytic study specifically rejected the hypothesis that there is an anxiety loading on the I-E Scale. Joe (1971) in his review, says : "the findings ... raise the question of whether belief in external control produces anxiety or whether anxiety produces a belief in external control" (p. 626). There seems to be no way of settling this issue without further differentiation of the locus-of-control dimension. Such differentiation has already taken place for the anxiety variable; the findings cited above support a positive correlation between externality and what has been termed "debilitating anxiety" (Alpert and Haber, 1960), but the correlation with "facilitating anxiety" (which could perhaps be defined, from the items intended to measure it, as a tendency for anxiety feelings to build up prior to a task but to dissipate in the task situation) tends to be zero or slightly negative.

A further indication of the complexity of the relationship is found in Houston's (1972) study showing lower physiological arousal and superior performance for externals in a situation where shock was uncontrollable, while internals did better in a learning task and

showed lower arousal when the shocks could be controlled. The apparent discrepancy between this finding and that of Brady (1958) with "executive" monkeys can perhaps be attributed to the use by the latter of avoidance control while Houston used escape control.

c. Relationship with other personality factors. Much of the research effort in locus-of-control has been directed to establishing its status as a personality variable in relation to others. Joe (1971) concludes : "The findings depict externals, in contrast to internals, as being relatively anxious, aggressive, dogmatic, and less trustful and more suspicious of others, lacking in self-confidence, and insight, having a greater tendency to use sensitizing models of defences" (p. 623). There is slight evidence that internals are more perceptually defensive, and ambiguous evidence that internals are more conservative or cautious is risk-taking or gambling situations; Harrison (1973) concludes that locus-of-control is one of the few personality variables which have any relevance for prediction of gambling behaviour. A more important finding, particularly in the context of cross-cultural application of the measures, is that internals are more conservative in the political sense (Minton, 1967; Thomas, 1970). Externals have been found to be more "tractable" and responsive to manipulative efforts, while internals are independent and resistant to pressure (Lefcourt, 1967, 1969; Baron and Ganz, 1972; Biondo, 1972). Internal children are more able to delay gratification (Bialer, 1961).

There is general consensus (Joe, 1971) that internals make more attempts to control or change their environment, "show more initiative and effort", and are generally more effective in a wide range of task situations. This extends even to greater ability to control heart rate voluntarily by responding to 'biofeedback' (Fotopoulis 1970; Ray, 1972). Something of a paradox is revealed by the finding that alcoholics and drug addicts tend to be internals (Goss and Morosko, 1970; Gozali and Sloan, 1971; Berzins and Ross, 1973). Gozali and Sloan suggest that internals become alcoholic because they believe they can control their drinking; the other two studies suggest that drugs or alcohol, by affecting moods of anxiety and depression, come to be perceived as instruments of control. Control beliefs also seem an important aspect of the variable known as "self-esteem" (Fish and

Karabenick, 1972).

In view of these findings, it is somewhat surprising that no clear relationship has been found between I-E scores and achievement motives (Feather, 1967b), though Gold (1968) reported an isolated example of a correlation in the expected direction. A number of recent writers have commented on the relationship between the theoretical constructs involved. The topic will be dealt with in detail in the next chapter.

d. Antecedents of locus-of-control expectations. Joe (1971) expressed dissatisfaction with the amount of research on causal influences in locus-of-control expectations. Rotter's assumption (1954, 1966) of a simple relationship between experience and expectancy has tended to remain at the level of conjecture, though Crandall (1963) and Crandall et al. (1964) provide support for a link between expectancy of success and reinforcement history, and show that the generalized expectancy of success, as measured by the IAR scale, is a better predictor of reinforcement effectiveness than the reinforcement history of a child. The child-rearing qualities that Crandall and her co-workers found to be related to internality in children have not been disputed; they are warmth, supportiveness, permissiveness, flexibility, approval, consistency in discipline, and expectation of early independent behaviour, as distinct from rejection, punitiveness, domination and criticism. There is a remarkable similarity between these qualities and the antecedents of achievement motivation as described by Winterbottom, (1958). Katkovsky et al. (1967) suggest that the 'cold' type of treatment teaches the child to blame external sources in order to protect himself, though Davis and Davis (1972) found in one study with women students that internals blamed themselves more for failure, indicating that the causal relationships may not be simple. Wendt (1961, quoted by Heckhausen in connection with the development of achievement motivation) proposed that the predictability of the mother's behaviour during the stage in which a child learns to walk may be related to later risk-taking behaviour. On the other hand the Katkovsky et al. (1967) study found no relationship between IAR scores and their

index of the clarity of child-rearing policy.

A few studies have reported effects at the adult level. Foulds (1971) found that experience in an encounter group increased internality, but the process involved was not specified; Harvey (1971) claimed that feelings of control increased with years spent in an administrative capacity; and Brecher (1972) reported a serendipitous finding that externality scores increased for a class of students who had just been given failing grades in an examination. This last result is also an illustration of the interdependence of locus-of-control and emotional or motivational factors.

As in the case of other difficulties with the locus-of-control construct, it is unlikely that much further progress can be made in understanding its antecedents in the absence of a better conceptual analysis of the construct.

(v) Locus-of-control as a social value

In their original reviews Rotter (1966) and Lefcourt (1966a) reported consistent evidence that locus-of-control expectations were affected by various sociological variables, notably class and minority-group membership. "Within the racial groupings, class interacts so that the double handicap of lower-class and 'lower-caste' seems to produce persons with the highest expectancies of external control. Perhaps the apathy and what is often described as lower-class lack of motivation to achieve may be explained as a result of the disbelief that effort pays off" (Lefcourt, 1966a, p. 212). Joe (1971) confirms that lower class and non-white groups in the United States are consistently more external. He suggests that, in addition to the tendency for experience to create external expectancies, there may be a cultural preference for certain items of the scales used. Support for this notion comes from the findings, cited above, that internality is associated with greater political conservatism (Minton, 1967; Thomas, 1970), and from the considerable evidence that I-E scores correlate negatively with social desirability measures (Bernhardson, 1968; Hjelle, 1971; Cone, 1971; and Joe, 1972). Rotter (1966) also admitted a residual tendency to this kind despite his efforts to remove it. Joe (1971) mentions the social desirability

contamination as one of the prime weaknesses of the I-E scale, though Cone (1971) suggested that the relationship may be due to a tendency among internals to try to impress others more.

It may very well be impossible to remove the social desirability bias in locus-of-control measures for Western populations because beliefs in personal efficacy, mastery and control are part of the external value pattern. Strodbeck (1958) and Kluckhohn and Strodbeck (1961) have discussed a concept of 'mastery over nature' involving a sense of potency or control very similar to internality, and which they regard as a "value orientation". Seeman (1959) and Dean (1961) use a concept of 'alienation', (which is seen as an undesirable state by sociologists) that is very similar to external control. Also, Smith and Inkeles (1966), Dawson (1967) and Doob (1967) have all produced scales of "modernity" which include items similar to I-E Scale items. For example, Doob's scale measures eight aspects of modernity, three of which are related to locus-of-control : future orientation, optimism and sense of control over one's destiny, and belief in determinism and scientific knowledge. Items, requiring Likert-type responses, are of the kind : "Worthwhile goals are never obtained immediately, you must work hard to reach them in the future." This has led Triandis (1971) to describe "modern man" largely in locus-of-control terms : "Open to new experiences; relatively independent of parental authority; concerned with time, planning, willing to defer gratification; he feels that man can be master over nature, and that he controls the reinforcements he receives from his environment; he believes in determinism and science; he has a wide cosmopolitan perspective, he uses broad ingroups; he competes with standards of excellence, and he is optimistic about controlling his environment" (p. 8).

This contamination of locus-of-control as an expectancy variable lends further weight to the argument that closer analysis of the construct is required for its independent status to be made clear.

(vi) Factor-analyses of the I-E Scale

Joe (1971) concluded his review of locus-of-control studies by suggesting that there is general support for the validity of the construct and its measures, but he pinpointed difficulties

with sex differences, social desirability biases, and the possible multi-dimensionality of the construct. We have already dealt with the issue of social desirability; sex differences in behaviour, despite identical I-E scores, may be attributable to multi-dimensionality and concealed interactions between sex (and other variables) and factors of locus-of-control. Rotter (1966) claimed unidimensionality for the construct, but Mirels (1970) comments on Rotter's vagueness about the method of factor analysis used and its precise results, and Rotter's reliance on a single doctoral study by R.D. Franklin for Purdue University in 1963. In that study, seven factors were chosen for rotation, but none of the loadings were higher than $\pm$ 0.30 and most were below $\pm$ 0.20. Mirels performed a further factor analysis, using the responses of 159 male and 157 female students separately; the principal components model was used, with squared multiple correlations in the diagonals (a conservative estimate of communality), and varimax rotation for two factors. The loadings of the I-E Scale items on the factors (similar for males and females) are given in Appendix B. It should be noted that a number of low loadings remain. The factors are characterized as "Mastery over one's life" and "Impact of the citizen on political institutions". Mirels suggested that further research was necessary to validate these as independent variables, but to date no further studies have appeared.

A second factor analytic study has been performed by Gurin et al. (1970), using an extended version of the scale. The extra items, constructed in the same format as the original ones, were specifically intended to explore the attitudes of black students in the United States to racial discrimination and civil rights action. Four factors were extracted (no details of the method being given), three of which contain I-E Scale items, the fourth being a "Race Ideology" factor, loading on items specific to the racial crisis. Loadings for the I-E Scale items on the first three factors are given in Appendix B. Factor I is named Control Ideology, and refers to beliefs about the operation of a "Protestant-Ethic" in American society generally; Factor II refers to the individual's

beliefs in Personal Control over his own life, and Factor III refers to beliefs that the political and social system is amenable to change (System Modifiability). The Control Ideology and Personal Control factors extracted in this study are very similar to the "Normlessness" and "Powerlessness" sub-factors of Dean's (1961) alienation scale already referred to above (section v). Gurin et al. found the behaviour of subjects who scored low (internal) on the Personal Control factor to be most similar to the behaviour of conventional internals, but that subjects high (external) on Control Ideology were most likely to engage in civil rights group action. The effect of the System Modifiability factor is not made very clear. No strong claims are made for the universality of the factor pattern, indeed the suggestion is made that it applies to Negro groups only. "Negroes may very well adopt the general cultural beliefs about internal control but find that these beliefs cannot always be applied in their own life situations" (p. 42), a conclusion previously supported by the Coleman et al. (1966) paper. Gurin's conclusions are also supported by Lao (1970), who used the same combination of items and extracted three "essentially uncorrelated" scales called Personal Control, System Blame and Discrimination Modifiability. Subjects who perceived this Personal Control as high were personally competent, had high goals, and preferred negotiation of political issues, while "System Blamers" preferred protest action. Lao also suggests that the separation of these factors applies only to blacks. A third study of the same kind by Forward and Williams (1970) comes to essentially the same conclusions.

The most recent analysis has been performed by Kleiber et al. (1973), using the Rotter items split into halves, and randomized with 40 items from a dogmatism scale. This was administered to 219 students, using a 6-point Likert scale, factor-analysed by the principal axis method, and rotations with various numbers of factors attempted. The final solution, extracting 25 per cent of the variance, yielded three factors : I, Non-belief in luck and chance (18 items), II, System Modifiability (14 items), and III, Individual Responsibility for failure (14 items). The main focus for criticism of the I-E Scale is the

method of pairing statements to yield forced-choice items. Only 7 of the original 23 pairs load on the same factor in the Kleiber study (all of these being on the first factor). In addition, correlations between originally paired statements are low (mean = -0.1717) and some are positive; the authors assert that only strong negative correlations could justify the assumption of bipolarity made by Rotter. Factor loadings and item inter-correlations are given in Appendix B. The study concludes that "a one-dimensional locus-of-control concept does not appear to be representative of the implicit dimensional constructs which students use to construe causation of events" (p. 4).

Levenson (1972, 1973a, b) has worked with three 8-item scales, which use Likert scoring but Rotter-type statements, and which are designated as I (Internality), P (Powerful others) and C (Chance). The latter two scales have been found to correlate moderately with one another, and negatively with the first; factor-analysis supports the independence of the scales. Administration of the scales to various psychiatric groups and to participants and non-participants in civil activism has also provided some evidence for the validity of this tripartite division. No evidence has been provided on the correlations with the Rotter scale, however. It seems likely that a wider choice of item types would have yielded a larger number of factors.

These studies clearly indicate that the assumption of unidimensionality of the locus-of-control construct is untenable. At the very least two aspects can be isolated : beliefs about the actual or potential operation of controlling forces in the world at large, and belief in one's own control or efficacy with respect to personal success and failure. It is unlikely, however, that the factors which have been extracted can be regarded as stable, or generally applicable, despite the superficial similarity between factors across studies. Besides the specificity of the factor solutions to the groups sampled, pointed out by Gurin and Lao, there is the well-known dependence of all factor-analytic findings on the items used. The items included in the I-E Scale are clearly not fully representative of the universe of possible beliefs about locus-of-control. The I-E

scale contains noticeably large numbers of items about luck and chance beliefs, and about political control, and this has had a strong influence on the factors extracted. As Rotter admits, the items were originally selected largely on intuitive and arbitrary technical grounds rather than on any clear conceptual analysis of the locus-of-control construct, which has in fact yet to be provided.

(vii) A conceptual analysis of locus-of-control attributions

That branch of psychology that deals generally with the human disposition to ascribe various motives, intentions, abilities, capacities and other qualities to other people, and controlling influences to situations, is known as attribution theory. It is relevant to the present discussion because it is clear that subjects, in making use of feedback or information from their own or others' past actions for the purpose of deciding on their future actions, are usually not in possession of all relevant facts and so make certain assumptions about causal or controlling influences within their life space. Furthermore, an analysis of locus-of-control has recently been offered by Bernard Weiner and his co-workers using an attribution-theory approach. The analysis pertains, as does most work in locus-of-control, to the pre-decisional phase of the task in which expectational and motivational parameters are set, but the parameters involved in the analysis are also clearly relevant to the decision phase.

That individuals do make attributions rather than direct observations about their own internal states, and make decisions on the basis of the attributions, has been demonstrated by experiments such as those of Schachter and Singer (1962) and Valins (1966). The former study showed that subjects aroused by epinephrine attributed their arousal to the drug, but used social cues to decide whether they were happy or angry in mood; the latter study found that subjects made attributions about their relative liking for different pictures, or the inherent attractiveness of the pictures, on the basis of (false) heart-rate feedback, and acted on these attributions by choosing the 'attractive' pictures for further viewing.

Heider (1958) is usually credited with the earliest contribution to attribution theory. He saw an attribution developing through five stages or levels : (i) global association between S and a particular event, (ii) responsibility for commission - "whether S did it", (iii) beliefs about the foreseeability of the outcome by S, (iv) attributions of intentionality on the part of S, and (v) judgements regarding justification for the act, i.e. whether factors were present which narrowed the range of behavioural options for S. While not directly connected with the present argument, Heider's analysis serves to demonstrate the cognitive complexity of the attribution process. Another of his theoretical postulates, that an observed outcome is attributed to a multiplicative combination of ability and motivation on the part of the doer (whether oneself or another) has long historical antecedents in psychology, and is a common feature of attribution theories and general motivation theories. Its most general practical application is that the less ability is attributed to an actor the more motivation must be attributed and vice versa. Shaw and Sulzer (1964) and Shaw and Iwanaki (1972) have found support for Heider's theory cross-culturally with their Attribution of Responsibility Questionnaire for children.

In the further development of attribution theory, two conflicting ideas emerged. Jones and Davis (1965) proposed that attributions were made primarily on the basis of discrepancies between expectations and observations, i.e. they are explanations for unique and idiosynchratic events. Kelley (1967, 1972, 1973), on the other hand, maintains that attributions are made primarily on the basis of consistency in events; for example, if most people fail on a task, this is attributed to the difficulty of the task, but if an individual often succeeds on difficult tasks, ability or motivation will be attributed to him. Kelley (1973) also proposes that people have the capacity to perform a kind of intuitive variance analysis on events : "An effect is attributed to the one of its possible causes with which, over time, it covaries" (p. 108).

Kepka and Brickman (1971) have offered, and supported with empirical evidence, an elegant solution to the divergence between these two theories. They found that "structural" qualities (i.e. relatively permanent features of people or situations), such as intelligence, ability, or task difficulty, are attributed on the basis of consistency between occasions, while "dynamic" (i.e. changeable) qualities, such as motivation, are attributed on the basis of temporal discrepancies. The thesis has been developed with particular reference to attributions of achievement motivation by Weiner and Kukla (1970), in accounting for the effects of success and failure on performance (Weiner et al., 1971), and in relation to locus-of-control (Weiner et al., 1972).

The cycle of events within what is herein called the task is, according to Weiner et al., as follows : (i) Goal directed action occurs (the goals having been set in the previous cycle); (ii) An outcome characterized either as success or failure is observed; (iii) Attributions as to the reasons for success or failure are made; (iv) changes in expectancies and/or affect occur; (v) the new value of expectancy and affect determine the next set of actions. It should be noted at this stage that the specific processes involved in the fifth stage, called in this thesis the decisional processes, are not dealt with by Weiner. The attributions made in the third stage, and round which his theory revolves, are to ability, effort, task difficulty, and luck. These four perceived causes for success and failure are made within two "causal dimensions" of locus-of-control and stability, thus :

	Internal (or Personal)	External (or Environmental)
Stable :	Ability	Task difficulty
Variable :	Effort	Luck

That is, ability and effort are characteristics of the individual which affect the outcome of a task related effort, and task difficulty and luck are environmental characteristics. Whether attributions are made to internal or external causes will reflect generalized expectancies about the locus-of-control; when internal

attributions are made, the outcome will be more reinforcing of behaviour than if external attributions are made, i.e. greater "pride" or "shame" will be felt. Both of these points are of course central assumptions of Rotter's theory (1954, 1966).

Weiner et al. treat ability and task difficulty as "structural", fixed, or stable characteristics of the person and the task respectively, while effort and luck are "dynamic" or variable characteristics respectively, in terms of the Kukla and Brickman (1971) theory. Attributions about these will tend to be made on the basis of the consistency of the outcome with past experience, effort or luck being used when there is inconsistency. However, the (perhaps minor) points can be made here that effort, though variable in the sense that it can change from one trial to the next, is usually directly observable by a subject when he is performing the task himself, and need not be inferred from outcomes. Also, task difficulty may be a relatively objective quantity in many cases where the subject has knowledge of the performance of others.

The predicted effect on future performance of the variability dimension is mediated by expectations of success (Ps); where failure is attributed to luck or effort, Ps will remain high, whereas it will fall after failure attributed to fixed characteristics. Weiner et al. (1972) found confirmation of this prediction in the fact that subjects tried harder on second trials in a task where they had failed on the first trial and the failure was attributed to bad luck or lack of effort. In another experiment reported in the same paper, support was claimed for the hypothesis that tasks of moderate difficulty are most likely to be seen as responsive to effortful behaviour, thus explaining the findings of Atkinson (1964) and Atkinson and Feather (1966) that subjects try harder on such tasks. However, such tasks may be perceived as having greater freedom of effectiveness for any source of variance. The effect of luck as an alternative attribution was not tested for in the experiment, despite the findings in the previous experiment that luck attributions caused an increase in effortful behaviour (a finding incidentally which is difficult to account for within current theories

of task motivation). We shall refer to this issue again in the next chapter, when considering Atkinson's work in detail.

The formulation of locus-of-control effects offered by Weiner et al. in terms of attribution theory is an important contribution to understanding of the construct, and is more satisfactory than previous models, for example Bachman's (1964) explanation of changes in the perception of task ability or control following success or failure in terms of dissonance theory. In particular, Weiner's explication of the relationships between effort, ability, luck, and task difficulty are in marked contrast to the vague treatments which these factors have conventionally received in locus-of-control work.

Weiner's treatment of the functions of these factors of locus-of-control in the decisional phase of the task is less than satisfactory, however; it suffers from the mistake, common in task motivation theorizing, of trying to account for both the decision process, and the pre-decisional process of fixing decision parameters, within the same model. Weiner et al. have provided an apparently sound model for the pre-decisional phase. The functional relationship between the parameters established in that phase, and behaviour in subsequent phases, is mediated by the reinforcing effects of success and failure and by success/failure expectations. They have not specified, however, the precise psychological processes involved either between the attribution of causality to internal/external factors and pride/shame feelings in relation to success/failure, or between the attribution of causes on the stable-variable dimension and change in Ps. Although the crucial inferences which have been made seem intuitively acceptable in the context of the motivational theory within which they are made (that of Atkinson), attempts to specify the relationships more precisely seem doomed to result in tautologous definitions of the variables involved. Also, Atkinson's theory, which revolves around Ps and approach/avoidance motivational contructs, is itself deficient in a variety of ways which will be outlined in the next chapter. Therefore, while accepting Weiner et al.'s account of the pre-decisional phase of the task, we are left with the problem of formulating a model of the decision stage.

(viii) Cognition and decision-making

Decision-making theories to date, such as those of Edwards (1954, 1961) and Davidson et al. (1957), possess restricted applicability because of the narrow range of variables which they take account of; they are 'static' rather than 'dynamic' (Harrison, 1973). They have typically taken into account only sample indexes of the probability of an outcome and the value of the outcome, which are multiplicatively combined to predict behaviour probability, usually in straightforward betting tasks. This multiplicative madel has also been widely used in its simple or more elaborated forms in theories of task motivation or behaviour which are not usually regarded as decision-making theories (e.g. Hull, 1943, 1952; Tolman, 1955; Lewin, et al., 1944; Atkinson, 1964; Vroom, 1964; Herzberg, 1966; Lawler, 1966; and others). Indeed, theories designated as decision-making seem to be discriminable from task motivation theories only in their narrower area of reference and in their assumption of a specific decision process rather than longer-term bahaviour control. The assumption in this thesis that behaviour can be analysed as a series of tasks, each of which involves an assessment process for feedback from previous behaviour and a specific decisional process affecting future behaviour, seems to offer the possibility of unifying the two sets of theories.

The weight of theoretical opinion, and to some extent empirical evidence, seems to indicate that both cognitive (or expectational) and affective (or evaluative) components have to be considered, as well as the relationship (multiplicative or other) between them. In the following section a model of the cognitive component is proposed, based on locus-of-control theory. In the next chapter an affective or motivational component will be considered, together with its relationship to cognition. Some of the issues involved in the juxtaposition of cognitive and affective parameters have been reviewed recently by Heckhausen and Weiner (1972).

(ix) Clarifying the meaning of 'locus-of-control'

Locus-of-control as a generalized expectancy, and the skill-chance dimension in a task, refer essentially to the relationship

which an individual perceives, generally or in a specific task, between his behaviour and its effects or outcomes. It has become conventional in locus-of-control theory to specify these outcomes as 'reinforcements'. However, this confusion between the outcome and the reinforcement value of the outcome may be largely responsible for the apparent overlap between locus-of-control and motivation (Wolk and de Cette, 1971, 1973). The fundamental and central proposition of the present thesis is that when an individual contemplates performing a task, he considers the possible relationships between his intended actions and the events they will produce, or cause to happen. These possible relationships, however they are represented mentally, are what is conventionally referred to as locus-of-control. The sequence of events which the subject expects to occur between his doing a certain thing, and some result emerging, will be cognized either as a clear causal chain (in which case the subject is 'internal' or the task situation a 'skill' one) or as a sequence into which a variety of 'external' or 'chance' events willbe incorporated, causing the behaviour-outcome connection to be indirect and the outcome itself to be unpredictable to some degree. The cognitive representations of the expected events, including the representation of the outcome, should be regarded as entirely separable from affective or motivational processes. The dependent variable or outcome of the sequence (e.g. attaining a certain level of performance) does not have any value of its own, though it may in turn be associated with certain affective outcomes; such associations do not properly enter into a consideration of locus-of-control.

Locus-of-control expectancies, then, can be defined in terms of the expected regression of outcome on behaviour. The notion of regression implies some kind of quantification or scaling of both behaviour and outcome. The latter presents little difficulty, performance scales being a familiar or even necessary feature of the definition of a task. In some cases performance may only have two values (success or failure), but more usually several degrees of success-failure are discriminable. The most convenient example of such a performance scale is the percentage mark awarded a student in an academic task. Behaviour presents a more difficult

measurement problem, since it varies qualitatively rather than quantitatively. The suggestion offered here as a solution to this problem is that qualitatively different behaviours can be equated in terms of the effort involved in them, so that a wide variety of types of behaviour can be reduced to a single effort-investment dimension.

Thus the locus-of-control parameter affecting decisions in the task situation is a regression function of anticipated performance outcome on intended effort input. The shape of this regression function will vary from task to task, depending on the nature of the task, the generalized expectancies of the subject, and various causal attributions made in the pre-decisional phase of the task. Before going on to examine this effort-outcome parameter in greater detail, the proposition that behaviours may be equated in terms of effort will be more fully explained, since the relationship between intended behaviour and anticipated effort has received scant attention in the literature.

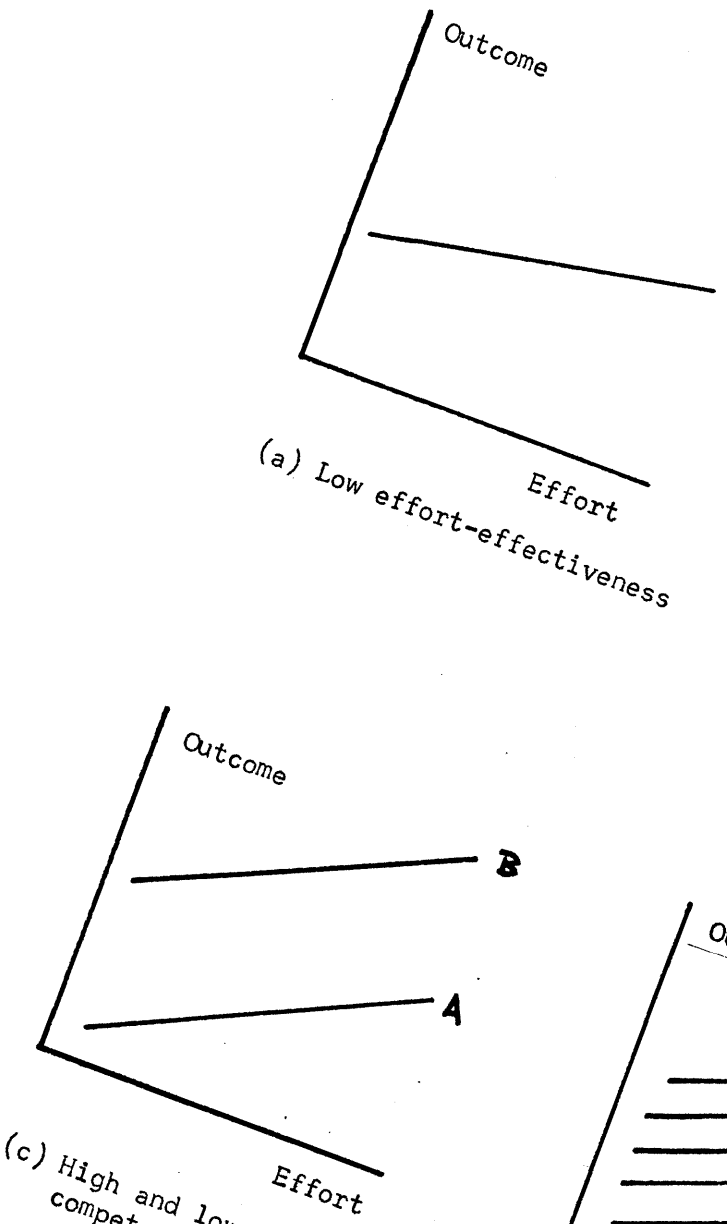
(x) The nature of effort

The term effort is widely encountered in work motivation studies and elsewhere (e.g. the Weiner et al., 1971, locus-of-control attributional analysis outlined above). Effort is rarely defined, but tends to be used in connection with behaviour which is highly motivated. It has come to be regarded as theoretically important. Smith and Cranny (1968, p. 469) sum up the situation rather well : "As Lawler and Porter (1967) have pointed out, the relationship between satisfaction and performance must be mediated by effort. It is through the worker's perceived role that satisfaction is related to effort in their model. The concept of effort rather than satisfaction as the determinant of industrial behaviour seems to us an important one, especially in view of other work which also relates intention to performance. The effort variable as conceptualised here seems quite similar to the intention variable defined by Ryan (1958) and subsequently investigated by Locke ... Rewards, or expected rewards, are also related to performance only through their relationship with effort" (p. 469). The Lawler and Porter study cited offers a clearer definition :

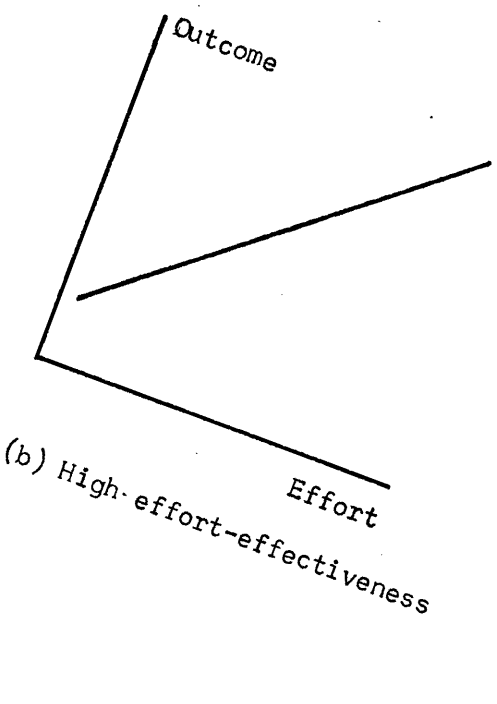
"In our model, effort refers to the amount of energy an individual expends in a given situation. In nonpsychological terms it refers to how hard the person is trying to perform the task ... Effort can be measured in various ways. For certain limited types of tasks, especially in laboratory-type settings, objective physical measurements can be obtained. In typical managerial jobs ... one must rely either on self-reports or the judgements of qualified observers." (Lawler and Porter, 1967, p. 128).

Vroom (1964, footnote, p. 193) suggests that "the relevant behavioural measures /of effort/ would include amount of time worked, frequency of task-related responses per unit time, and amplitude of task-related responses." Borg et al. have offered the most sophisticated analysis known to the present author, their variable "difficulty" being very similar to what has been termed effort in this thesis : "If we once more make a comparison with physical work, the concept of force, work and power are of special interest. Force is the physical intensity equal of kp, work is the amount of force exerted for some length, that is kpm, and finally power is the work per unit of time kpm/min (watt). Similar concepts might be used in mental work. We may momentarily exert a certain 'force' to solve a problem, we may use this force for a certain time and thus do a certain amount of mental work and we may also study the mental power, that is the mental efficiency" (p. 9). Effort as it is used in the present thesis, is the subjective homologue of work in the Borg et al. analogy, that is, the individual's perception of how much effort will be expended on a particular bit of behaviour will be a multiplicative function of the time the behaviour is expected to take and the intensity of effort which the behaviour involves during that time. The intensity will be proportional to the physical force which has to be exerted in the case of a motor task, and the amount of concentration required in a mental task. These assumptions are made in the absence of more substantial proposals, though it is asssumed that the nature of the real relationships is an empirical issue.

Figure 1.1 : Parameters of locus-of-control

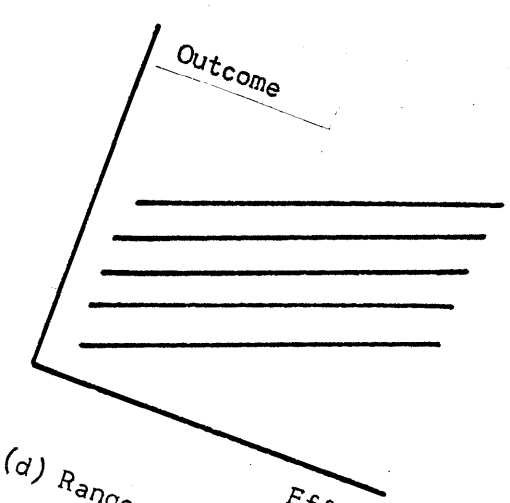


(a) Low effort-effectiveness



(b) High effort-effectiveness

(c) High and low task competence



(d) Range of uncertainty

For explanation, see text

The effort variable thus offers a solution to the problem of how to equate behaviour of different kinds, intensities, and durations in a simple fashion. Nor does it seem unreasonable to suppose that effort is used as a common factor of action in this way by subjects, so that to assess the amount of effort required to reach a certain level of performance will not be a difficult or unrealistic task for a subject. Heckhausen (1967) asserts : "The relationship between difficulty and energy output is so immediate and without mediating conscious content that it could be cited as a model example of automatic feedback" (p. 105). The question of scalar measurements of effort is an issue to which we shall return later ; for the moment it is sufficient for our purposes to assume that the amount of effort which a subject can envisage investing in a task ranges from none to a maximum value dictated by the nature of the task.

(xi) The regression of outcome on effort in a task

A regression function relating two variables (in this case, answering the question 'what level of performance y will x amount of effort result in?') varies in two ways : (i) in slope, and (ii) in height, or intersect with the dependent axis in the case of a linear function. In the present instance a third possibility emerges : (iii) the range of uncertainty involved. Figure 1.1 depicts the various possibilities in graphical form. A number of interactions between these variables are also possible. For example, interaction between (i) and (ii) above results in a curvilinear relationship which can have a number of different shapes; interactions between (i) and (iii) or (ii) and (iii) would involve the range of uncertainty varying with the amount of effort or the level of outcome respectively. Interactions between all three variables are also possible but will not be dealt with here.

Differences in the shape of the relationship between effort and outcome in an analysis of locus-of-control have the following meanings :

(i) Slope differences are equivalent to differences in what will be termed effort-effectiveness or EE. Where the slope is shallow

(the regression coefficient low) as in Figure 1.1(a), large differences in effort investment will have little effect on performance outcome, whereas a high regression coefficient results in high pay-off for increased effort (Figure 1.1(b)). It is assumed that one of the characteristics of a chance task is that the EE coefficient is low , and that in a skill task it is high. Furthermore, different individuals will ascribe different slopes to EE in the same task; those who tend to ascribe low values will tend to have high I-E Scale scores (or the equivalent) and be described as 'externals' in generalized expectancies, while 'internals' will tend to bias EE coefficients upwards.

(ii) Mean height or intercept differences are equivalent to what will be termed task competence differences or TC. This has meaning for different tasks only insofar as the performance scales are equated. The lines A and B in Figure 1.1(c) represent two individuals on the same task, in which individual A has to exert maximum effort to attain the same level of performance as subject B exerting virtually no effort; in other words the TC of B is higher than A's, though their EE coefficients are equal.

This dimension can be thought of as the ability - task-difficulty dimension. Thus, ability and task difficulty (as defined here) are seen as inversely related to one another in any specific task, for a specific subject (cf. Kelley, 1973). These terms, however, have acquired such a diversity of meanings in the literature and everyday speech that it is firmly recommended that they be dropped from the technical vocabulary. We have already seen 'difficulty' used by Borg et al. (1970) in the same sense as 'effort' is used in this thesis; in Atkinson's theory (1964) it means the inverse of 'probability of success'; and it is not unlikely that it could be confused with what is here called 'effort-effectiveness'. 'Ability' has a similar accretion of meanings in task motivation theory and other areas of psychology. Indeed, a similar case might be made for the rejection of 'effort'; however, the ambiguity does not seem as great in that case, nor is there any standard term which conveys the same idea while remaining unambiguous ('work' and

'action' being the two obvious possibilities).

(iii) The range of uncertainty dimension (RU) appears most equivalent in locus-of-control theory terms to the belief that outcomes are influenced by chance (see Figure 1.1(d)). It is not the same, however, as belief in chance, luck or fate as an active controlling influence. Rather, the existence of a high level of uncertainty in a subject facing a task will make it more likely that any beliefs he possesses in the power of external controlling forces of an active kind will affect his decisions to a high degree. In other words, if a task situation creates uncertainty in an individual, this uncertainty will be reduced or eliminated by bringing to bear a number of possible assumptions which the subject has about the world or about that task situation in particular. This reduction in uncertainty will occur during the pre-decisional phase and be mediated by the attribution processes. At the moment of decision, the range of uncertainty will be zero or very small. In this model, therefore, the moment of decision can be defined, conceptually if not operationally, as the moment at which the effort-outcome function becomes 'fixed' at a particular set of values.

There are various reasons why the RU should exist. One is that tasks are different from one another, and until the subject has become familiar with a new task and has tried out various effort levels the relationship of effort to outcome will be unclear. A second reasons is the uncertain recall of subjects for past situations, and the numerous distortions which can occur in recall. A third is suggested by Lawler and Porter's (1967) findings that the relationship of effort expended to actual outcome in a previous task is influenced by the subject's existing ability and the appropriateness of the behaviour chosen. If the subject is not aware of deficiencies in these he will find a lack of correspondence between expected and actual performance outcomes which will contribute to his uncertainty range.

There are a number of implications of the model. First, as predicted by Rotter, the behaviour of the individual in a task is most influenced by beliefs about external controlling forces when the task is ambiguous, i.e. when there is most uncertainty about the level and slope of the effort-outcome function. But as a subject gains experience in a task there is the possibility that the range of uncertainty on each trial will become smaller. This will occur if the outcomes are relatively consistent and covary with the amount of effort which the subject believes he is expending. If outcomes fluctuate, however, the range of uncertainty will remain high and decisions will continue to be influenced by external control beliefs.

Although the range of uncertainty and the influence of external beliefs on behaviour in the task is reduced by confirmation of expectancies by outcome, this will not reduce external beliefs in general; rather the contrary. For example, if a subject with an initial high uncertainty range reduces this range by adopting a low expectation for outcome because he believes he is 'unlucky', and the outcome performance does turn out to be low, the range of uncertainty will be reduced but the belief in bad luck will be reinforced by confirmation. On the other hand, if the expectancy of low performance is disconfirmed by consistent high performance outcomes, both the range of uncertainty and the belief in bad luck will be reduced. Partial disconfirmation by inconsistent outcomes will have even more complex reinforcing effects on the luck belief and other latent external control beliefs.

In addition to the consonance of these hypotheses with Rotter's theory (1954, 1966), Feather (1967a) has shown in connection with level-of-aspiration setting that performance is more responsive to emotional or personality variables in ambiguous or chance situations - the latter being defined as those in which outcomes varied from trial to trial; in skilled or predictable tasks, aspirations reflected previous performance on the task. While level-of-aspiration is not identical to 'expectation' as used above, Diggory and Morlock (1964) have pointed out the functional similarity between these constructs.

(xii) The meaning of chance, luck, fate, etc.

Writers in the locus-of-control field frequently refer to chance and luck explanations as being the distinguishing characteristic of externality, and do so without discriminating between them. As Cohen (1960) has shown, these and similar terms have similar but not identical meanings, and are used in various ways by people of differing age, education and culture. Scientifically sophisticated people in Western culture use the idea of chance to refer to the fact that certain events are unpredictable or fortuitous but that certain patterns emerge over a long series of events. Chance in that sense has no relevance for explaining or predicting a single event, but it may be used in a slightly different sense even by sophisticated people for the purpose of prediction. The most common such usage reflects a belief that the patterns which emerge in the long run are also necessarily discernable in a short series of events, so that predictions can be made on the basis of recent outcomes. This phenomenon is often referred to as the "gambler's fallacy", and is probably one of the main ways in which the range of uncertainty is reduced by people in Western culture.

This device of combining a range of uncertainty with specific expectations about the distribution of chance outcomes is given support by Cohen. Citing the works of the economist Shackle (1952; also with Carter et al., 1957) he says : "When a business man assigns a probability to the outcome of a project that he is contemplating, he means something totally different from probability as a ratio of frequencies, which according to Shackle is inapplicable to a single event... The possible outcomes of his project are considered by the business man in terms of a small number of 'dominant hypotheses' which take hold of his attention. He does not contemplate all possible outcomes, only a few essential ones which relate to special values or success or failure. These Shackle calls 'focus values'" (Cohen, 1960, p. 26).

Good or bad luck is one of the main reasons given by people for unexpected performance outcomes (Feather, 1969; Feather and Simon, 1971a, b, 1972). In this usage luck refers either to the operation of random chance variations, or to the possession by an individual of luckiness; in the task decision situation it is desirable to restrict

the word to the latter sense, i.e. to attributions by the subject to himself of a consistent tendency to gain the advantage of the randomness inherent in the world. In Kepka and Brickman's (1971) terminology, luck is a 'structural' quality attributed to a person. The concept of fate is probably also ascribed as a personal quality, but with connotations of a guiding supernatural force. Various other worldly manifestations of the supernatural might also be used to bias decisions in different ways dependent on the cultural background of the subject.

Two other general categories of external control have been mentioned by Rotter and others and could be seen as operating through reduction in the range of uncertainty in certain tasks; these are "powerful others" and "the great complexity of forces surrounding [one]" (Rotter, 1966, p. 1). They can perhaps best be regarded as the ends of a continuous ranging from direct and deliberate interference by personal acquaintances to the machinations of government and commercial bureaucracies and the general condition of society and the economy. Since no research has appeared which bears on the relationship of these forces to locus-of-control expectations in specific tasks, little can be said beyond supposing that these forces will influence only certain kinds of task behaviours and may in some instances be seen as helpful.

(xiii) Overview of the types of control expectancy

The conceptual analysis of locus-of-control expectations presented here results in the proposition that there are three different types of control dimension and that these types have been confused with one another in locus-of-control theory and measurement techniques. The effect of all three types is to influence the perceived relationship between a subject's proposed actions and the outcomes he anticipates in task situations. The first type of control, is defined in terms of the perceived effectiveness of increased effort in raising performance; the second in terms of the subject's beliefs in his general level of competence in that kind of task; and the third in terms of uncertainty he experiences in a task and his tendency to attribute specific causal values to chance, luck, fate and personal and impersonal social forces

whenever uncertainty is high. In addition, various interactions are possible, the most important being those which produce curvilinearity in the function relating effort and outcome, so that effort is believed to be more effective in particular parts of its range. Theoretically there is no dependence between these types of control; whether this independence is characteristic of actual human beliefs is an empirical issue on which there are no data at present.

No predictions about behaviour are made on the basis of these relationships alone, beyond supporting the finding of Hirsch and Scheibe (1967) that the behaviour of externals will be more variable than that of internals. One of the chief values of the model is that it makes the explication of the relationship between locus-of-control and motivation a simpler undertaking. This will form the substance of the next chapter.

Chapter 2

TASK MOTIVATION

The main object of this thesis is to propose and substantiate a model of the locus-of-control construct in relation to a person's decision to engage in a task or not. The basic model was outlined in the last chapter. In this chapter the general area of task or work motivation will be considered, with particular relation to the notions of achievement motivation and anxiety which have provided the basis for most existing theoretical analyses. A number of shortcomings of these notions and the associated analyses will be pointed out, and a new model put forward which enables the affective or evaluative component of decisional processes to be distinguished from, but related to, the cognitive or expectational component which has been dealt with in the first chapter.

The primary assumption made by most theorists in the area of task and work motivation is that when a relationship exists between performance and satisfaction, a person will expend effort in order to reach a high level of performance. At the simplest level the mechanism of reinforcement or the "Law of Effect" can be used as an explanation - 'good' performance is reinforced while 'poor' performance is not reinforced, or is punished. It has been more common, though, for theorists to make us of more complex constructs such as drive or incentive or a combination of these. Two drives which have been particularly popular as explanatory in task motivation are 'need-for-achievement' and 'anxiety', which are connected with the incentives or situational cues 'success' and 'failure' respectively. Achievement need or 'nAch' theory particularly has been used as a self-sufficient account of behaviour, and more recently Atkinson has used both nAch and anxiety in combination with one another in a single model of task behaviour.

(i) nAch theory

Achievement need theory originated in the work of Murray (1938) and has been developed in the last twenty years by D.C. McClelland and his co-workers (McClelland et al., 1953; McClelland, 1961) into one of the two most-studied areas of human motivation (the other being anxiety). Originally defined by Murray in terms of a general striving to overcome difficult obstacles (because they are there), and to do better than others, nAch could perhaps be better described in its recent usages as a preoccupation with being successful in socially acceptable ways. It is generally measured by content analysis of responses to four TAT-type pictures (McClelland et al., 1953) but a number of other methods have been tried (see Heckhausen, 1967, pp. 14-15) which have not been found to correlate well with one another (Entwisle, 1972). While most of these are of the projective type, making use of the subject's dominant preoccupation, objective tests have also been applied (e.g. Lynn, 1969; Mehrabian, 1968, 1969). Rosen(1956) proposed a distinction between nAch as conventionally measured and "achievement value orientation" as measured by questionnaire, which correlates better with sociological indices of social mobility. Morsbach (1969) using items such as "I set goals for myself which I attempt to reach" found Afrikaaner subjects in South Africa higher on this kind of measure than English speaking subjects, who were higher on TAT-nAch, the two measures being uncorrelated.

Heckhausen (1967) in a comprehensive review supporting the validity of the construct, says that high nAch subjects have a high expectation of, or "orientation to" success, are more self-confident, have an ideal-self image higher on achievement traits, possess a "Protestant Ethic" attitude to the world, are less interested in short-term goals (such as prestige or social reinforcement) than the bigger long-term goals, and are able to defer gratification and plan ahead. He denies that this preoccupation with future success is a compensation for failure frustration, and asserts that the evidence is that nAch is due to a 'success leads to success' expectation. Evidence is also reviewed that high nAch subjects become more highly physiologically activated in achievement-opportunity situations, and that these changes are accompanied by changed

subjective feelings; such subjects also react more strongly to success/failure feedback by changes in social behaviour and by systematic distortions of memory for the task.

Relationships have been found between nAch and behaviour in a variety of situations where there is an opportunity for the subject to satisfy the need in an unconstrained way (Wendt, 1955, cited by Heckhausen), and where other motives are not aroused which obscure the nAch effect (Atkinson and Reitman, 1956). Some predictive validity for the construct has been demonstrated for academic performance, risk-taking, level of aspiration behaviour, task persistence and perceptual skills (Heckhausen, 1967), and cross-culturally (Munro, 1967). The classical study of the antecedents of nAch is that of Winterbottom (1958), which has been supported by other investigators (Heckhausen, 1967; Munro, 1967). Generally, consistent and supportive encouragement of achieving behaviours in early and middle childhood, a warm relationship with a mother who reinforces such behaviour, and a not over-dominating father, seem important. The potential for satisfaction of these conditions in a society depends on complex cultural factors such as class, religion, family structure and relationships, and attitudes to children and child-rearing. The similarity of these determinants with the established antecedents of internality has been noted in the last chapter. Rosen (1959) has suggested that the essential mechanism may be the internalization of parental reactions to success, so that the high nAch subject develops a "capacity for self praise" (quoted by Katz, 1967b), while the low nAch subject "has been socialized to impose failure upon himself" (ibid.). Crandall et al. (1960) have analysed the development of achievement standards in children into two overlapping phases, the first being called 'reflective' (in which the child imitates the parental models), the second termed 'autonomous', suggesting the growing importance of cognitive processes. (The relevance of these points is also obvious for locus-of-control). But a simpler analysis in terms of reinforcement as "the transmission of differential attractiveness to antecedent stimulus situations" (Perkins, 1968) may be acceptable.

With respect to the situation in Africa, LeVine (1966) has found evidence for the validity of the construct, despite the apparent absence of the necessary child-rearing conditions (Munro, 1967, 1968). Veroff (1963) found that African students become more achievement oriented when they move into the American culture.

(ii) nAch and task motivation

Despite the support for the validity of the nAch construct by Heckhausen (1967), Atkinson (1964), Atkinson and Feather (1966), a number of serious difficulties have been raised. McClelland (1961) has based much of his support for the validity of nAch on an analysis of economic development and its correlation with nAch measured in various ways. The economist Higgins (1968), however, has attacked McClelland's thesis on three grounds : (i) the measures of economic growth used by McClelland, (ii) evidence of manipulation of definitions and findings to satisfy the hypotheses, and (iii) reasoning from poorly established correlations to causal relationships.

Klinger (1966), while conceding that the arousal conditions used by McClelland et al. (1953) may indeed increase the amount of thinking and fantasising about achievement, doubts whether the measures of nAch are valid, since relationships between the motive as measured and behaviour were found in only half of the studies he reviewed; furthermore, he argued that the theory was not really supported even by the positive findings. He suggests the relationships involved are much more complex than the theory predicts.

Entwisle (1972) has also attacked the nAch construct, largely on the basis of the reliability and validity of the measures used, and concludes that psychologists have been naively credulous in accepting claims made by proponents of nAch, as an explanatory construct.

In her critical review of nAch, Entwisle (1972) cites a paper by Solomon (1968) which comes to similar conclusions, and which suggests that a search for specific motives would be more fruitful than use of global concepts like nAch. One of the implications of this suggestion is particularly apposite to this thesis; that nAch

may stand in much the same relation to task motivation as generalized expectancies of locus-of-control do to control beliefs in a specific task situation. Thus, the degree of preoccupation with success will tend to bias the subject's evaluation of possible performance outcomes in a task. Heckhausen's (1967) examination of the nAch construct suggests various ways in which this biasing might occur: task situations may be more readily construed as tests of achievement, the performance dimension may be more readily dichotomized into 'failure' and 'success', greater differential reinforcement value may be attributed to differential levels of performance than the subject's objective reinforcement experience in that type of task would predict, and the subject may more readily become 'ego-involved', i.e. regard performance on the test as important for his long-term goals and self-image. With regard to the last effect Birney et al. (1969, pp. 150-159) have discussed in some detail the complexity of the cognitive processes involved and their antecedents in the cultural and familial background of the subject - a discussion which also has relevance for locus-of-control theory.

One major theoretical contribution to the area has been made which takes account of both task variables and nAch motivation. This theory (Atkinson, 1964, and elsewhere) however, also involves the effects of anxiety or fear-of-failure, an area which must first be briefly reviewed, in its own right.

(iii) Anxiety in task situations

A vast literature deals with the relationship between anxiety and performance in the general sense. This will not be considered here. In the last twenty years or so, however, anxiety has become important as a motivational variable affecting the decisional processes preceding task performance (Cofer and Appley, 1964; Appley, 1970). Taylor (1953) published an objective-type scale of generalized anxiety feelings (the Manifest Anxiety Scale), and Mandler and Sarason (1952) have produced their Test Anxiety Questionnaire which is designed to detect subjects with a high level of anxiety associated specifically with academic examination and test situations. Alpert and Haber (1960) distinguished between what they termed

"debilitating anxiety", which tended to manifest itself at all stages in test or evaluative situations, and which is similar to anxiety of the kind assessed by the MAS and TAQ, and "facilitating anxiety" which builds up prior to an evaluative situation, and then dissipates once the task has begun, thus providing drive-reduction reinforcement for task behaviour. Birney et al. (1969) have been working over a number of years with a projective test of anxiety, using a technique very similar to that employed for nAch. The designation tAnx will be used in this thesis to refer to task-specific anxiety, as variously measured.

The variables nAch and tAnx have generally been found independent of one another, except in the case of facillitating anxiety, which has a small positive correlation with nAch (Atkinson and Feather, 1966; Heckhausen, 1967; Birney et al., 1969). They have come to be viewed as motives to approach success and to avoid failure, or as 'hope of success' and 'fear of failure' (HS and FF), respectively (Atkinson and Litwin, 1960), and it is in this way that they are used by Atkinson in his theory of task motivation (Atkinson, 1957, 1964; Atkinson and Feather, 1966).

The validity of anxiety as a motivational construct has not been questioned to date to the same extent as the nAch construct, though this may partly reflect a lower level of interest in the variable, as well as to the unfortunate lack of cross-cultural work with the construct. Complete consensus on the meaning of the construct is still to be achieved, however, and there are inconsistencies between the results reflected using the different measures. The general picture of the high fear-of-failure subject presented by Birney et al. (1969) is as follows: he avoids engaging in tasks which are interpreted as achievement tests; when constrained he will behave 'defensively' so as to avoid the implications of failure; but when forced to perform without defences he will work hard for success in order to avoid failure (or as the authors put it, he will 'run scared'). The main research findings summarized by Birney et al. (chapter 10) should be viewed with some caution,

due to the biases in the different samples used, but are fairly consistent. FF subjects will : (i) be particularly attracted to tasks where the credit and blame for success and failure is shared by a team or otherwise externalized; (ii) show behaviour in tasks suggesting either poor future perspective or anxiety about being evaluated; (iii) perform poorly in unfamiliar complex, speeded and failure-threatening tasks, and take a long time to master such tasks; (iv) avoid aspiring to high goals, but produce 'unrealistic' levels-of-aspiration; (v) do best under success-feedback (Weiner, 1966) or no-feedback conditions; (vi) behave rigidly and maladaptively following failure; and (vii) be more motivated by the prospect of social acceptability than task success.

Thus these subjects are not only more emotionally disturbed by failure and the prospect of failure, but also demonstrate a number of features of strong externality of control, at least for negative outcomes; one is also reminded of the findings, mentioned in the first chapter, that externals are more anxious. The verbal manifestations of this externality following failure experiences, mentioned by Birney et al., include stated beliefs of the effect of chance, bad luck, having an 'off day', not having really tried, and rejection of the task as a valid measure of performance. The FF subject is distinguished from the HS subject in that he lacks an internal orientation to success and sees success and failure as being primarily defined by others. Birney et al. report a confirmation of this point using a 5-item true/false response scale which indicated that evaluation by others is more important than self-evaluation for FF subjects. Thus the task with which such a subject is formally presented is only part of a larger 'task', the primary goal of which is to avoid being negatively evaluated by others, and this primary goal can be obtained by a number of routes apart from success on the first task. The externality statements, and other behaviours such as setting unrealistic goals, may perhaps not be a reflection of generalized expectancies of external control, or beliefs that the primary task is a chance one, but could be regarded as 'operant externality'. That is, the high tAnx subject may reduce his anxiety about failure by behaving as if the task outcome is beyond his control. This is particularly

likely in view of the fact that he regards failure as socially defined, so that getting others to attribute his poor performance to external loci of control will be accompanied by a reduction in expectations of ridicule. Behaviours calculated to have this effect will dominate any achievement behaviours on the initial task, and so the subject will appear to have external expectations about that task even though he does not in fact. The problem of the exact relationship of externality or chance beliefs to performance on the initial task remains.

Birney et al. indicate some evidence that the high-FF pattern has its antecedents in maternal reactions of a neutral kind to success, and punishment for failure (the HS pattern being neutral reactions to failure and reward for success). Consistent treatment of this kind is obviously predictive of aversion for failure, but would predict internal rather than external locus-of-control expectancies. Referring to the model introduced in the first chapter of this thesis, discriminating and consistent treatment should result in high general effort-effectiveness expectancies and low generalized range-of-uncertainty expectancies, which are features of internality. The effect on task competency expectancies, will depend on how success and failure are defined for various tasks.

(iv) Atkinson's theory

Returning to the topic of nAch, J.W. Atkinson's theory of task decision-making (or "risk-taking") was presented in its original form in 1957 and in a more complete form in 1964; his book with N.T. Feather (1966) contains a number of papers giving support to the theory, and a number of others have appeared since then (e.g. Karabenick and Youssef, 1968). The theory is notable in that it takes into account both motivational variables and situational ones. The general formula predicts that the strength of the motivation to perform an act is a multiplicate function of basic motives, incentive values, and the expectancy that the attainment of the incentive will follow the act.

The basic motives considered by Atkinson are nAch (usually measured by T.A.T. technique) and tAnx (usually measured by Mandler and Sarason's TAQ); the dominant orientation of a subject as

success-seeking or failure-avoidant is assessed by subtracting the normalized measures (tAnx from nAch). Thus a major difference of interpretation of tAnx from that of Birney et al. (1969) and others is that the variable is considered as a negative or inhibitive motive. Fear of failure is defined (Atkinson, 1964) not as an exciter of avoidance responses but as an indicator that negative consequences of action are anticipated, so that achievement-striving behaviour is inhibited. This definition allows for the defensive and evasive behaviour of high-FF subjects in tasks, but makes it somewhat difficult to account for their high effortfulness in suitably constrained situations, without calling on extra postulates about changes in the expectancy and incentive aspects of the task.

The expectancy measure used in the theory is the probability of success and failure, Ps and Pf; these are complementary to one another, i.e. Ps = 1-Pf, and are used to define the task as 'easy' or 'difficult'. In many studies, the 'objective' difficulty of a task is presented to the subject as the proportion of a reference population which normally succeeds on the task. It is assumed that the subject will adopt this Ps level at least initially, though it is recognized that subjective Ps can and does change in response to hypothesised interactions with other variables; notably, the desireability of a goal is recognized as increasing subjective Ps (Atkinson, 1957; Worrell, 1956; Feather, 1965, 1966), though this 'wishful thinking' effect may be an artefact siezed upon for its convenience in 'explaining' certain of the findings.

The main objection to Atkinson's formulation of expectancy of success in terms of a single value is that it is an oversimplification. It seems intuitively unlikely that subjects construe the difficulty of a task or their chances of success in that way. Furthermore, it takes no account of the range of possible outcomes that a subject may perceive in a skilled task, which seems crucial to any understanding of how people behave in such tasks.

Incentive values of success and failure are directly related to Ps and Pf in the theory, in the fashion of Lewin et al.'s (1944) theory of level-of-aspiration setting. The incentive value of success (Is) is taken as proportional to the difficulty of the task,

i.e. Is = f(1-Ps)= f(Pf), and the disincentive value of failure as proportional to the easiness of the task, i.e. If = f(Ps). Thus, this third variable in the formula is entirely dependent on the second, which is itself rather limited in applicability.

The tendency to engage in a task is given as the difference between the tendencies to approach and to avoid the task, which are in turn given by multiplication of the motive strength, outcome probability and incentive value of outcome, thus:

Approach tendency = f(nAch x Ps x Pf), which can be reduced to f(nAch x ($Ps - Ps^2$));

Avoidance tendency = f(tAnx x Pf x Pf) which similarly can be reduced to f(tAnx x ($Ps - Ps^2$)).

Since the function $Ps - Ps^2$ reaches a maximum at Ps = 0.50, it is predicted that if nAch is greater than tAnx (the case of a HS subject), the motive to engage in a task is greatest when it is of medium 'difficulty', while for the PF subject the motive to avoid the task will be greatest at moderate levels of difficulty (so the subject will seek very easy or very difficult tasks). Atkinson and Feather (1966) provide a variety of evidence that subjects high in nAch and low in tAnx do prefer to operate at intermediate levels of expectancy or risk; but subjects low in nAch and high in tAnx have not been found to prefer very easy or very difficult tasks, though their relative preference for intermediate-difficulty tasks is lower.

Heckhausen (1967) comments: "Atkinson's theory appears to be a mathematic calculus rather than a psychological model ... Nevertheless, the theory has proven extremely fruitful in stimulating research" (p. 78). Birney et al. (1969), however, make a variety of detailed criticisms, which amount to saying that the theory is too simple to carry the weight of empirical data produced by Atkinson and Feather (1966) and others. In support of Birney et al. it is apposite to repeat an observation made previously in this thesis : that motivation theorists have tended to confuse issues by attempting to deal with both the parameter-setting and decisional phases of tasks within one model; furthermore,

they have tended to refer to lengthy and complex but ill-defined sequences of behaviour as if they could be simply accounted for as single phenomena.

Another criticism of Atkinson's theory is that it is bound to a particular kind of motive, related in a narrow way to specific kinds of expectancies of success and failure. Thus, while it does not exclude the possibility of task behavour being influenced by other motives, e.g. social or cognitive, it cannot take account of them without introducing a completely separate set of constructs. This suggests a possible reason for its failure to predict the behaviour of high-anxiety subjects: the anxious subject perceives failure as socially defined and not in relation to task parameters such as Pf or to internalised standards such as If.

Karabenick (1972) suggests that part of the difficulty with Atkinson's work is due to the aggregation of data rather than examining individual subjects' responses, particularly in view of doubts about the comparability of difficulty levels across tasks. He reports two investigations of the relationship between Ps and the valence, or value, of success and failure (Vs and Vf); in neither case were these related to nAch or tAnx measures, or to the subtractive index used by Atkinson, but there was a relationship with I-E scores, the curves of V against P being steeper for internals. This contrasts with the finding of Litwin (1966) that the steepness of the curve of Vs against Ps is positively related to a function of the difference between nAch and tAnx (i.e., is higher for HS subjects), and Feather's (1967c) finding that success and failure are seen as better and worse respectively in skilled-task conditions, but are not affected by I-E scores of test-anxiety scores.

Feather (1968a) has attempted to provide for the locus-of-control variable within the Atkinson model by suggesting that an index of control designated C be added to the equation in conjunction with Ps, i.e., Vs = Ps x C and Vf = Ps x C, or more specifically, "Is = C (1 - Ps) and If = -CPs. It would also be assumed that the motives Ms (nAch) and Maf (tAnx) would be engaged as long as performance could be evaluated against standards of excellence."

This thesis, that the attractiveness of a goal is partly a function of whether success or failure is due to the subject's efforts or not, is in line with a number of findings reported by Feather. In Feather (1959b) he reported that the attractiveness of a goal for children increased with Ps, especially if success was perceived as due to skill, and/or the importance of the goal was emphasised by the experimenter. That paper also noted a tendency for different goals to be overvalued due to "wishful but uncommitted attitudes" to the task, but the possibility of failure (i.e. the cost of failure and the degree of control taken in conjunction) usually tended to make subjects try for less difficult goals once they had become committed to an actual task. Feather's 1967c findings, cited above, are also pertinent. Feather's theoretical solution to the locus-of-comtrol problem seems, however, to be a further example of a basically simple model being 'stretched' to encompass complex empirical findings.

Finally, two recent writers have put forward other explanations for the preferences for medium-difficulty tasks shown by high-nAch subjects. Weiner and Kukla (1970) suggest that such tasks are more likely to yield information about one's capabilities than very easy or very difficult tasks. They do not make it clear whether this information is for the benefit of the subject (contributing to a positive self-concept for example) or to impress others, but McClelland and Watson (1973) specify "those with high nAchievement seek moderately difficult tasks in work situations as the outcome will be most readily attributed to their effort to do well."

We must conclude, then, that Atkinson's theory fails, because of its simplicity, to account for all the phenomena within its apparent range, while successfully making predictions which can be accounted for in simpler ways, both faults being attributable to the attempt to provide one theory for two or more quite different aspects of the task situation. The theory, however, stimulated research which contributes greatly to our understanding of the parameter-setting, decisional and performance phases of tasks,

and some of this research will be further referred to in explicating the proposed model of task decision-making.

(v) Expectancy and task motivation

Reference was made in the first chapter to a number of formal theories which recognized the need for both expectancy and evaluative variables. Of these, possibly only Hull's (1943, 1952) and Lewin's (1943) are as complex as the proposals of Atkinson and Feather. Numerous other examples can be given of analyses involving the simple multiplicative relationship of expectancy and value. Bialer (1961) pointed out a propos of his locus-of-control measure that the effect of success and failure in creating reinforcing feelings of pride and shame is dependent on the subject attributing control over outcomes to himself; thus the response to feedback is due an expectational change rather than a purely hedonistic one. Breit (1969) showed that subjects respond to nAch only in skill situations. Hackman and Porter (1968) and Campbell et al. (1970) show that both expectancy and evaluation of goals have to be considered to predict work effectiveness and managerial performance, and Lawler (1966, 1968) has made the point that work performance is related to pay (and presumably other incentives) only if there is a 'perceived contingency' between them. Crandall (1963) and Crandall et al. (1964) have shown that reinforcement history is predictive of reinforcement effectiveness through mediation by generalized expectancies. Katz (1967a) has concluded that both locus-of-control and nAch are essential to prediction of behaviour in inter-racial situations, the complex interactions between testers and testees of different races being accounted for on the basis of differential expectancies of approval for behaviour. Hinrichs (1970) has reviewed a number of studies supporting the common observation that 'success leads to success' and failure to failure, which Feather (1968b) has attributed to changes in "confidence". Locke (1965) shows that liking for a task correlates with success experience.

Similarities between the antecedents, and effects, of internal control and high nAch have been noted before at various points. An overlap exists also in their theoretical assumptions. Heckhausen (1967, pp. 86-91) points out that need achievement theories assume individuals to be operating in task difficulty areas between 'too easy' and 'too difficult' where achievement can be seen to be related to behaviour, and locus-of-control theory and measurement deal with control over outcomes which are presumed to be important for the subject. Weiner and Kukla (1970) comment, "The intuitively reasonable hypothesis that high achievement motivation is associated with a faith in internal control, and low need for achievement with a belief in external causality, has received only suggestive support. It may indeed be that these individual differences are at best, weakly related. On the other hand, perhaps methodological and theoretical shortcomings have resulted in a failure to uncover the magnitude and character of the association between need for achievement and attribution of responsibility" (p. 8). They go on to suggest that the failure to find correlations between the two is due to the forced-choice format of the I-E scale items and the diversity of motives tapped by the items. Wolk and du Cette (1971), expressing the same surprise at the overall lack of correlation, suggest that "the relationship between the two constructs is much more complex than the linear relationship implied in simple correlational techniques". In a more recent paper (Wolk and du Cette, 1973) they return to the same theme and provide evidence that internality is necessary for nAch to have its predicted effects on behaviour in a variety of tasks (c.f. Breit, 1969, who found nAch effectiveness related to the degree of skill perceived in a task).

Heckhausen (1967, p. 77) also sketches out an elemental theory of the relationship of nAch and control: "The attainability of the goal depends on the degree of difficulty of the task, which is in turn determined by how it is perceived, in relation to one's personal abilities and capabilities. If attainability depends on factors that lie outside a person's possibilities of action and influence (factors such as 'chance', 'good luck and

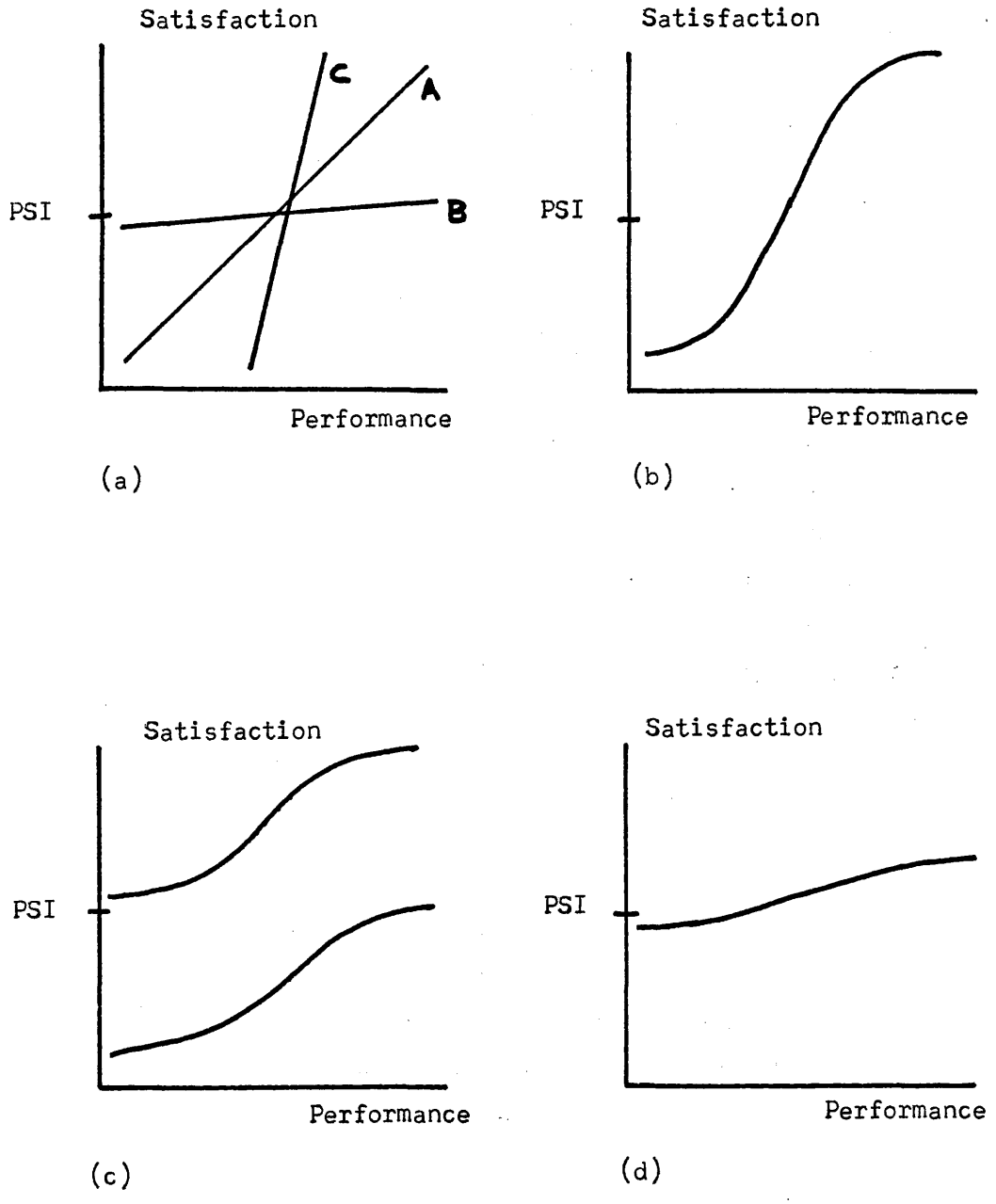
bad', 'orneriness of the subject matter', or the good will or illwill of others), then this is considered a special case". Vroom (1964) uses a model of the interdependence for behaviour of the perceived 'instrumentality' of action and the valence of the outcome. Lawler and Porter (1967) (see also Porter and Lawler, 1968) predicted that a multiplication of the expectation that efforts will lead to rewards and the values of the rewards, would predict the amount of effort attributed to the subject by others, and confirmed this.

Thus, there is increasing support for the proposition expectancy and evaluative variables have to be taken into account at the same time in order to predict behaviour. The almost universal assumption of a simple multiplication model, however, can hardly be accepted in the light of the difficulties encountered with Atkinson's theory. Furthermore, it has been shown in the first chapter that expectancy can not itself be considered as a single function, but as an interaction between three main parameters, one of which is itself the outcome of a complex attributional process. It should be clear that the selection of a single affective parameter would also meet with difficulties, since both approach and avoidance tendencies have to be simultaneously considered. It is notable that those who have proposed a simple two-factor multiplicative model of expectation and motive have considered only single motives such as nAch in their research. Any acceptable model must be capable of taking account of a variety of different kinds of motive, as Lawler and Porter (1967) have emphasised.

(vi) Performance and satisfaction

The evidence which has been reviewed in the sections above has lead to two conclusions, namely that it is necessary for both expectational and evaluative variables to be considered part of the task decision process, and that existing models of task decision are inadequate either because they fail to consider both sets of variables or because they relate them in too simple a fashion. An alternative model is sketched out below, building

Figure 2.1 : The relationship between performance and satisfaction



For explanation, see text

on the premise of the first chapter that the expectational variables in a task involve a relationship between intended effortful behaviour and anticipated outcome. The assumption is now made that outcomes are evaluated, and that the motivating force of a decision arises from the differential values of outcomes within the subject's range of attainments. Thus a complete model of task decision-making is put forward in which effortful behaviour becomes evaluated by the subject by the mediation of performance outcomes.

A number of terms have been used in the literature on task motivation to express the assumed hedonistic value of attaining different levels of performance, including 'valence' (Lewis), 'incentive value' (Atkinson) and 'expected utility' (Edwards). All of these are specific to a theory, however, and are tied to outcome-probability definitions of success and failure, which are held to be intrinsically motivating by the theory. To avoid such connotations the term satisfaction will be used in the following discussion to denote the anticipated affective value of different performance levels due to any motivational state of the individual. The satisfaction dimension will be taken to range from extreme dissatisfaction, which is aversive to the subject, through a neutral point of subjective indifference (PSI), to extreme satisfaction, which is attractive to the subject. All possible or hypothetical performance outcomes of a task can be allocated a value on this satisfaction dimension for any point in time; though the value may fluctuate in time, it assumes a specific value at the moment of decision. Further, any range of performance outcomes is associated with a range or gradient of satisfaction. When the satisfaction range is short or the gradient shallow, the different performance levels will tend to effective equivalence, and there will be little tendency for the subject to be motivated to move from a low level of performance to a high one within the range; but when the range of affective difference is great or the outcome-satisfaction gradient is steep there will be a strong tendency for the subject to become aroused motivationally over the equivalent range of performance outcomes (Berlyne's (1960)

notion of 'arousal jag' is suggestive of the idea presented here).

The outcome-satisfaction relationship can be depicted graphically (Figure 2.1(a)), or can be expressed as a mathematical function. The simplest such function is a straight line. The line A in Figure 2.1(a) represents a subject for whom satisfaction is proportional to performance over the whole range of performance; line B represents someone for whom different levels of performance on the task make very little difference to satisfaction, which is always about the PSI; and line C represents a subject for whom all levels of performance below P are maximally dissatisfying, and all levels about Q maximally satisfying, so that he would be highly motivated over that range, and only over that range.

It is assumed that performance is always defined so that the high end of the dimension is the more satisfactory. Also, if the performance-satisfaction function does not pass through PSI at some point, this means that the whole task is either attractive or aversive. If aversive, it will only be undertaken in constraint or in the absence of any more attractive alternative form of behaviour; if attractive, and also the most attractive possible task, it will be undertaken 'for the pleasure of it'. Once in such a task situation, the subject will be motivationally affected by the satisfaction gradient in the normal way, i.e. his task-related behaviour decisions will be under the control of the gradient, though his actual behaviour pattern may be disrupted by task-avoidence attempts. Thus the model is specific to the task which a subject is engaged on at a particular moment, and does not necessarily relate to his total behaviour pattern.

The satisfaction gradients in Figure 2.1(a) are unlikely to represent typical motivational states; a more plausible curve is given in Figure 2.1(b), with variants in Figures 2.1(c) and (d). The curves represent subjects for whom the very low and the very high ranges of performance on a task have low satisfaction gradients associated with them, but the middle range of performance is highly arousing. This would be the situation in which low performance is defined as 'failure' either socially or internally by the subject,

and the high range as 'success'. The precision with which the success/failure distinction is made is reflected in the gradient of the curve in the middle range. This gradient is also affected by the absolute levels of satisfaction and dissatisfaction created in the success and failure performance regions - the more attractive success is and the more repulsive failure is, the more motivating will the failure-to-success transition be. It is assumed that the levels of satisfaction and dissatisfaction associated with success and failure will reflect motivational states such as nAch (defined as hope-of-success) and tAnx (defined as fear-of-failure), but do not constitute redefinitions of these states, which are obviously more complex in nature. Furthermore, it is emphasised that nAch and tAnx are not the only determinants of satisfaction and dissatisfaction.

The position of the curve with respect to PSI is irrelevant to the basic argument, and will depend on the motivational state of the subject and the learned incentive values of various performance levels in the particular kind of task being faced. Values along the curve are likely to continuously fluctuate in response to a variety of internal and external cues of an emotional kind. Therefore prediction of the range of satisfaction associated with a range of performance at a moment of decision can only be on the basis of probability, though it is assumed that the function will have a discrete set of values at such a decision point.

The position of the curve (in particular the high-arousal portion) relative to the performance values will also vary according to the task and the subject. It seems plausible to suggest a relationship with what has been otherwise known as a 'goal' or 'level-of-aspiration', a point which will be discussed in detail later. If we take examination results as a familiar example of performance, the weak student in a particular subject (task) will have the steepest position of the curve in the region of the official pass mark, while a better candidate will adopt a much higher criterion of success.

(vii) Motivation theory and task motivation

The assumptions of the model outlined in the last section are somewhat different from those conventionally made in task motivation, which has generally utilized a drive concept of motivation (McClelland et al. 1953; Birney et al., 1969) modified by incentive (Atkinson, 1964). The concept of drive, which had its most sophisticated expression in the theories of Hull (1943, 1952) and Spence (1956) has recently come under attack (Cofer and Appley, 1964; Bolles, 1967; Bindra, 1968, 1969) and the incentive construct has received support. Appley (1970) in a review of recent developments, says, "there would appear to be ample reason to accept the notion of incentive motivation itself as different from drive (whatever it is!) and as deriving from the anticipation of (and/or commerce with) a goal object or state, However ... a clear explanation of how incentives operate has not yet been given" (p. 493). Bindra has positted the operation of positive and negative incentive-motivational "neuropsychological states" giving rise to approach or avoidance. These states are conditioned emotional responses which give strength to behaviour, and interact at higher levels with perceptual and cognitive processes to give direction. Young (1961, 1966, 1967) uses an "affective arousal" model, partly based on the support for a hedonistic principle initiated by the experimental work of Olds and Milner (1954) and in which "the role of primary affective arousal is to sustain or terminate activities according to the hedonic principle of maximising the positive and minimising the negative" (Young, 1967).

The model of task motivation used in this thesis seems to be consonant with the ideas of Bindra and Young. However, Berlyne (1967) has put forward a different theory which does not seem easily reconcilable with the model. This theory uses arousal as the primary construct, and assumes that moderate levels of arousal are positively motivating and give rise to approach, while high levels of arousal are negative and result in avoidance. This might mean, in terms of the present model, that extreme disparities between the affective values of any

two levels of performance (as reflected in steepness of the curve) will be arousing, but aversive, for the subject. Such an outcome would not be possible with the present definition of the dependent variable in terms of satisfaction, but would be possible if the variable was defined in terms of 'expected reinforcement value'. Baron (1966) applying Helson's (1964) Adaptation Level theory to social reinforcement, has given support to the notion that levels of social reinforcement which are too disparate from a subject's SRS (Social Reinforcement Standard), even in the 'positive' direction, will be aversive. The SRS is "essentially insomorphic with the objective properties of (the subject's) past history of social reinforcement." The model could in fact be amended to take account of Baron's theory in which case an inverted U-shaped relationship would obtain between the gradient of the curve and the innervation of behaviour. The choice of formulations seems arbitrarily dependent on the practical issue of whether anticipated 'satisfaction' or 'reinforcement value' is more easily measured, and in the absence of any evidence it is assumed that any possible over-reinforcement anticipated by a subject will be taken into account in predicting satisfaction.

(viii) The measurement of anticipated satisfaction

The two measures of measuring motive strengths mentioned so far, content analysis of responses to projective test stimuli and objective-type scales, seem inapplicable to the measurement of anticipated satisfaction because they are only able to yield information about general affective states in a range of approximately similar situations, and not the precise effect of specific performance levels.

A number of investigators have used more direct methods of assessing the slope of achievement satisfaction against outcomes, using specific questions. Clark et al. (1956) and Butterfield (1964) used a seven-point scale, ranging from "I would feel extremely good and very satisfied" to the opposite equivalent, to assess the value of examination performance levels, and related this to fear of failure : "The larger the discrepancy in satisfaction

a person would feel between receiving the highest grade he expects and the lowest grade he would settle for, the greater his fear of failure." Strodbeck et al. (1957) asked boys if they would be pleased or disappointed if they ended up in various occupations, and found the satisfaction slope steeper for middle-class boys. Feather (1968a) refers to this finding as a consequence of higher nAch. Morgan (1968), however, found his slope index of achievement satisfaction unrelated to TAT nAch. Jessor et al. (1968) report the use of a 'Personal Value Questionnaire' to measure the value a subject gives to achievement and recognition in academic activities, and to love and affection in social interaction, in conjunction with a 'Personal Expectations Questionnaire' to measure locus-of-control expectancies for these outcomes.

Research on the Atkinson (1957, 1964) theory has generated a number of rating scales which assume some difference in reference between 'satisfaction' and 'dissatisfaction', these being conceived of as 'valence of success' and (negative) 'valence of failure' respectively, and as being predictable from Ps. Litwin (1966) had subjects assign appropriate monetary prizes for success on a ring-toss game at different "difficulty" (Ps) levels. Brown (1963) had subjects rate their degree of 'pleasure' and 'displeasure' for success and failure on an anagram-solving task at various difficulty levels. Feather (1967c) had subjects use a points system for rewarding and penalizing success and failure on a hypothetical task. Karabenick (1972) describes an interesting procedure: "Subjects recorded their valence ratings by indicating degrees of 'satisfaction' and 'dissatisfaction' at tasks that were assigned a given difficulty (Ps) level. The Vs and Vf were rated on separate forms. Ratings were made by placing marks on vertical lines. The upper ends of the lines for Vs were labelled 'a great deal of satisfaction' and the lower ends 'no satisfaction'. Labels for the Vf scale were 'a great deal of dissatisfaction' on the top and 'no dissatisfaction' at the bottom. The point equidistant from the ends of the lines was labelled 'midpoint'. There were eleven

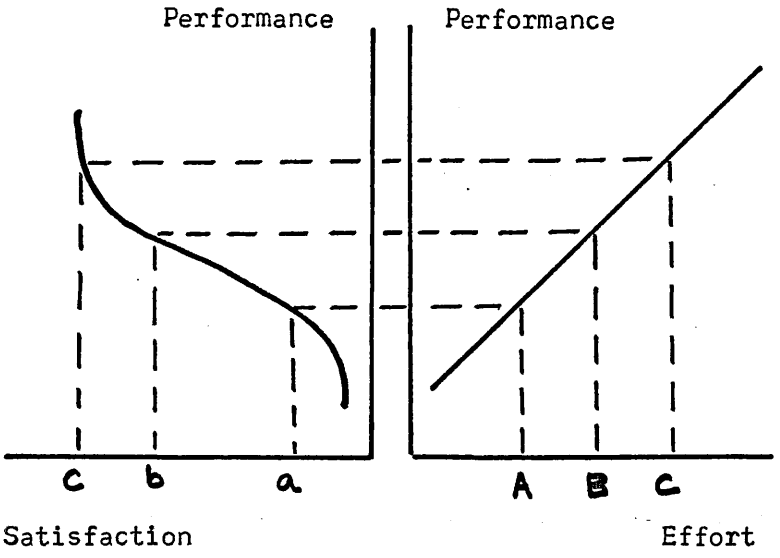
vertical lines on each rating form. Below each line were two designations: a task number and a Ps level. The Ps levels were presented in terms of 'chances out of 100' ..... Since the eleven vertical continua on each rating form were arrayed in order of difficulty, the subjects, in effect, generated a graph of the functional relationship between Vs and Ps and Vf and Pf."

The results of Karabenick's study, besides confirming Atkinson's theory and showing Vs and Vf variously related to nAch, tAnx and I-E scores, indicate some overlap between the meaning of 'low satisfaction' and 'high dissatisfaction'. Another problem of direct measurements of anticipated satisfaction is noted by Feather (1959a), who pointed out that there is a difference between the attractiveness of a goal and the attractiveness of attaining a goal - in the latter case the value of success per se has to be added on. Nevertheless, the method shows promise, if used with levels of performance replacing Ps. Karabenick's curves are slightly S-shaped, but not to the degree of Figure 2.1(b) above. Perhaps research with an open-ended format (e.g. "How would you feel if you get A+ in this test ? B+ ?" etc.) would be advisable to discover how best to construct rating scales.

(ix) Combining locus-of-control and task motivation

In the first chapter of this thesis the notion of locus-of-control was analysed in terms of a perceived relationship between various levels of effortful behaviour available to the subject and the range of performance outcomes expected to result from this behaviour. In this chapter, it has been suggested that a particular performance level or range of levels has associated with it a level or range of anticipated satisfaction, and that if any range of performance is associated with an anticipated increment in satisfaction, a subject will be motivated to shift his level of performance within that range. Thus in any single task, where the meaning of performance is identical for both control and evaluative relationships, the two can be combined so that performance becomes the mediator of a relationship

Figure 2.2 : The model of task decision/motivation



Due to the relative position of the effort-outcome and outcome-satisfaction curves, effort increment AB is associated with a greater satisfaction increment than identical effort increment BC. For further explanation, see text.

between a range of effortful behaviours and a range of satisfaction, from which it might be predicted that the range of behaviour will tend to become activated if the associated satisfaction gradient is steep enough.

The combined set of relationships can be depicted graphically, by taking the somewhat unusual step of setting the two graphs of effort-performance and performance-satisfaction against one another, using the performance axis as the interface. This is demonstrated for a hypothetical set of relationships in Figure 2.2. It can be seen that the performance-satisfaction graph of Figure 2.1(b) has been rotated anticlockwise through 90 degrees, and so now has to be read in an unconventional orientation. It should be noted that it is not suggested that effort-satisfaction is a single continuum. Each graph is to be treated separately though in relation to one another. From such a combination, a resultant curve of the regression of satisfaction on effort could be constructed. This is not attempted here, but an indication of the basic operating principle is given by the lines joining the letters A, B, C and a, b, c. The effort increment AB is equivalent to the satisfaction increment ab, but the identical effort increment BC is equivalent to the smaller satisfaction increment bc. Thus we would predict that the AB increment in effortful behaviour would be more highly motivated than the BC effort (though if a curve of performance against reinforcement-value was substituted, in accordance with Baron's (1966) theory, the prediction might be in favour of BC).

There are two differences between this solution (or its algebraic equivalent) and the more conventional multiplication of expectation and motivation. The first is that a curvilinear function (which both the effort-performance and the performance-satisfaction relationships might be in practice) cannot be represented by a single value. The second and related point is that it is necessary to know not only the slopes of the curves at any point but also the position of the curves with respect to the common performance axis. Thus, if either of the curves moves in relation to that axis or to the other curve, predictions

about the effortful behaviour level or range which would be innervated or aroused would change also. This would be the case if either the subject's feelings of general competency or his subjective 'level of aspiration' were to change.

It is not suggested that subjects mentally calculate the effort-satisfaction function over it whole range for every task. On a purely introspective basis it seems more likely to this writer that short ranges of performance outcome are serially contemplated; if the effort-satisfaction arousal value exceeds some threshold, then the behaviour necessary for the attainment of the performance will be activated and become autonomous. Other ranges of behaviour and their associated values remain latent. Pribram (1971) has made the most recent contribution to how the central nervous system activates autonomous behaviour sequences and the model offered here seems at least superficially reconcilable with Pribram's.

(x) The inhibitive effect of effort

In Chapter 1 the term effort was used to designate the amount of work associated with a particular range of behaviours, as a convenient device for summarizing the multiplicate outcome of duration and intensity, so that qualitatively different behaviours could be placed along a common scale. No affective value was attached to effort, and the effort variable was regarded as linear, i.e. equal increments on the scale are functionally equivalent at any level between zero and maximum output. While this has made the argument simpler, it is usually recognized that effort has an inhibitive or negative affective value. Vroom (1964) who deals at some length with the nature of effort in job motivation, states, "Any discussion of 'why men work' would be incomplete without some mention of the affective consequences of energy expenditure." He failed to find any experimental evidence of the "learned value of energy expenditure" but notes that this value might not be entirely negative. There is a wealth of evidence that both men and animals find enforced idleness unpleasant, and they will engage in almost any activity 'for its own sake'

if deprived of the opportunity to invest effort in reinforced behaviour (though such activities can be attributed to curiosity or exploratory motives; see Berlyne, 1960).

It must be pointed out that a difference may exist between the effects of effort which has been expended and the anticipated effects of effort, though feedback processes will ensure some correspondence between the two. Only the latter strictly concerns this thesis. However, it seems unnecessary to postulate a definitely positive value to effort at any level. What may account for the apparently intrinsic positive value of effort is that the effort-performance relationship may be inherently satisfying at every level. No matter how restricted the available range of behaviour it may be a characteristic of the C.N.S. to seek 'tasks' in which doing something will cause something to happen in even a minimal way. The organism will be activated by the most effort-effective task available, but the threshold for activation will always assume a value in the waking state which makes it possible for some behaviours to have an affective outcome. This seems consonant with the positions of Whyte (1959) and Berlyne (1960). Pribram (1971) quotes the philosopher Mace (1962), who puts forward the idea of "means-end relation reversal" as manifest in play: "The 'end', getting the ball into the hole - is set up as a means to the new end, the real end, the enjoyment of difficult activity for its own sake." (Mace, 1962, p. 11, quoted by Pribram (1971), p. 295). Thus it is the outcome not the effortful behaviour which is pleasant, though the outcome in some cases may merely be feedback from a moving muscle.

The two negative aspects of prospective effort which suggest themselves most readily are fatigue and inability to engage in attractive alternative tasks; these can perhaps be seen as correlates of the intensity and the duration of the effort, respectively. The latter may work through the attributional, parameter-setting phase of other tasks to change the effort-outcome, relationships in these tasks in an external direction, or by sensitizing the subject to the consequences of failure on the

other task. Cofer and Appley (1964, p. 139-141) review evidence on 'subjective fatigue' which makes it clear that the separation of fatigue effects from the overall motivational state of the individual is likely to be difficult. Also, they make the point that it is unlikely that amount of anticipated fatigue has a fixed relationship with inhibitive affect since the subject will be markedly influenced by his current feeling state.

Borg et al. (1970) have suggested, on the basis of ergonomic experiments, that the effect of "difficulty" (equivalent to what is called effort in this thesis) will be an accelerating function, described mathematically as a power function, the parameters of which are set with reference to the maximum tolerable difficulty level for a particular subject. That is, the inhibitive effect of difficulty rises at a rate varying between individuals to a maximum at which behaviour is totally inhibited regardless of the arousal power of the anticipated reinforcement. Applying this to our present model, it would be predicted that a subject will not necessarily activate the behaviour which is expected to yield the maximum hedonistic value, but rather the behaviour for which the difference between the arousal value of the outcome and the inhibitive effect of effort is maximised, provided that the resultant arousal value exceeds the current action threshold. But one way in which work that is daunting because of the expected effort involved may be undertaken is by breaking it down into short tasks, each of which has little cumulative effort inhibition; Baldamus (1951) has shown that short tasks feel less effortful and more pleasant to undertake. Another reason for this phenomenon may be a reduction of the range of uncertainty of effort-outcome relationship.

(xi) Goal-setting and task motivation

At this point an exhaustive re-examination of some of the research and theory reviewed earlier might be undertaken in the context of the alternative model offered here. In the absence of supporting evidence for the model beyond that already

adduced, however, such an exercise would be largely speculative. The possibilities for re-interpretation of earlier evidence are limited by the absence of information about parameters which have not been hitherto considered or assessed in experiments on task behaviour, but which are crucial to the model outlined above.

One important area of task motivation research which has been touched on already and which has particular relevance for the model beimg put forward in this thesis is the study of goals, comprising level of aspiration and goal-setting. Level-of-aspiration (LAO) was widely regarded in the era 1930-1960 as a relatively direct measure of the parameters important for task motivation generally, and continues to be used in this connection, particularly in educational research. Articles by Hoppe (1931), Gardner (1940), Lewin et al. (1944) and Muthayya (1963) trace the development of the notion. The most sophisticated theories of LOA as a 'pure' phenomenon are those of Festinger (1942) and Lewin et al. (1944), which are the precursors of Atkinson's (1957, 1964) theory of achievement motivation; they use the notions of valence (of success and failure) and Ps as parameters. In the early version of expectancy-value theory, goal decisions reflect a maximisation of 'resultant force' curves derived from success-approach and failure-avoidant tendencies. According to Festinger, the values of success and failure reflect the subject's perception of reference group norms. This idea is inherent in the present model, in which the level at which society defines the success/failure boundary is predicted to be the level at which the performance-satisfaction gradient is greatest. In connection with this, it may very well be that the observed preference for medium-difficulty tasks (Atkinson and Feather, 1966) reflect a common assumption on the part of subjects, and that the success/failure boundary is most likely to be in that region.

LOA studies concentrated mainly on the 'goal discrepancy' (GD), i.e. the discrepancy between previous performance and the subject's estimate of future performance. Frank (1935a), Gardner (1939) and others found this to be a reliable measure for subjects

across tasks and when success/failure feedback was varied, an observation which led to the assumption that GD reflected enduring personality or motivational states. LOA was identified with Ps by Diggory and Morlock (1964), though it has been generally found to rise in response to high motivation, so that it also reflects how desirable success is expected to be. However, Feather (1964) showed that LOA changes in response to the payoffs and costs imposed on the subject by the task instructions, rather than to the motivational characteristics of the primary task, a result foreshadowed by Sears' (1940) classical study of underachieving and overachieving children, and also by remarks of Frank (1935b). Furthermore, an extremely important finding (which seems to have been generally ignored in the recent literature) emerged from a factor analysis of the effects of different instructions on LOA behaviour by Weiss (1961) : two dimensions were found, a judgemental or expectation one (reflected in instructions to predict outcomes) and a motivational/evaluative one (reflecting what the subject wants to achieve).

A number of other studies support this duality of LOA. Grinder (1952) concluded that the meaning of LOA changes in the course of an experiment, being an expression of goal expectancy at first, but changing when performance stabilises to a 'defensive' behaviour motivated by HS and FF. Feather (1967a) found LOA to be more responsive to personality or emotional factors in ambiguous or chance tasks in which outcomes fluctuate unpredictably, than in skilled or predictable tasks in which they reflect expenctancies which appear to be closely tied to performance. Reference was made above to a number of indications of similarity of LOA responses between locus-of-control internals and high nAch subjects, and between externals and high tAnx subjects. Shifts in the meaning of LOA was used by Holt (1946) to account for his finding of generally low correlations between LOA and performance; he suggested that the more 'ego-involved' in the task the subject became the more 'defensive' he became. But as recently as 1968, Locke and Bryan showed

good correspondence between expressed goals (assessed in various ways) and examination results for college students.

To understand these contradictions it is necessary to distinguish between what the 'goal' of the subject 'really' is, and what is reported to the experimenter by LOA setting. The LOA experiment is usually a highly artificial situation, requiring prediction of performance before the attempt has been made; therefore the outcome depends on what the subject thinks the real task is - to impress the experimenter by accuracy of prediction, modesty, or ambition, or to lessen the impact of failure fears. Performance on the task itself (often a fairly meaningless one) may also be subject to similar influences. One possibility which has not been tested is that subjects (perhaps particularly externals of the type who have a high uncertainty range) may believe that their goal setting has some kind of influence on the outcome, through changing their psychological state in some way, or by 'tempting the fates'. This is particularly suggested by what Rotter (1954) termed 'unusual shifting' in LOA.

The LOA method may provide a useful way of studying locus-of-control expectancies. Using a task with the opportunity to expend varying degrees of effort, the subject could be asked, after making his effort but before the outcome is revealed, to make predictions, or he might be asked after the outcome is revealed to attribute causal relationships; or both. The effects of introducing rewards for success and/or punishment for failure, and their interaction with expectations, could also be studied.

More recent research has turned to the 'real' goals of subjects and their relationship to behaviour. In a large number of (somewhat repetitive) experiments Locke (1968) showed that setting definite high goals resulted in more productive behaviour than allowing subjects to 'do their best'. The subject's goals are normally determined by the values, knowledge and beliefs of the actor in the situation as subjectively interpreted by him, according to Locke (1970). The role of 'conscious intent'

is emphasised (this is assessed by taking verbal reports from subjects); the subject foresees the outcome of an action and this automatically triggers the action sequence. Subjects report failure if they do not attain their internal goals, and success if they do, even if no rewards or punishments are suggested by the experimenter (though asking a subject to state his goals must affect the situation). Thus action leads to satisfaction or dissatisfaction (Locke, 1970) and dissatisfaction with past performance leads to a 'desire to change' (Locke et al., 1970), so that goals have a 'direct effect' on behaviour (Locke, 1970). Aspirations provide a better explanation than expectations for motivated behaviour, since deviations from expectations do not predict the fact that success leads to harder work and to further success; deviations from aspirations cause success and failure feelings which give direction to behaviour (Locke, 1967).

Locke (1968) has also shown that knowledge-of-results and incentives for higher performance are less powerful than definite goal-setting in motivating greater striving; knowledge-of-results is seen as functional only insofar as it helps to specify the boundaries of the high goals.

Locke's use of intentionality as an explanatory construct remains the weak point in his work; inspection of the writings of Ryan (1958, 1970) to which he refers, or to others who have written on the subject (e.g. Maselli and Altrocci, 1969), fails to clarify how intention can be related to other internal states conventionally regarded as important for motivating behaviour. Weiner and Heckhausen (1972) refer to a number of writers who have used intention in the same way as Locke: Diggory (1966) talks of "intention made during the foreperiod" of the task as related to a "standard of self-evaluation" which is compared to knowledge-of-results in the post-performance period; Kanfer (1971) and Kanfer and Karoly (1971) point out that intentions alter the self-reinforcing consequences of action, by changing the performance standards which provide a basis for self-evaluation, in a task process of three phases - feedback monitoring, self-evaluation, self-reinforcement. Campbell et al. (1970) make two important

points about goals: they help to define the task by reminding the individual what he is supposed to do, but an expectancy or belief that the goal is attainable has to be developed by experience.

The treatment of goals by these workers appears to support, at least indirectly, the notion of a range of performance which is associated with a sharper increase in satisfaction than performance differentials outside the range; such a steep gradient would presumably be generated by making it clear that a failure evaluation of performance, and a success evaluation, had their common boundary in a narrowly defined range of performance. If this range of performance which is associated with a sharp satisfaction gradient is in the higher part of the performance dimension, it is likely to be expected to require high effort output to attain it; hence, setting high goals is likely to induce high effortfulness, so long as the subject has fairly high control expectations for the appropriate part of the effort-outcome function. Feedback will reduce the range of uncertainty, and feedback about improvement of performance will raise the subject's beliefs in his general competency, and his effort-effectiveness feelings if the success is consequent on high effortfulness. Thus the effects of goal setting can be regarded as one of the clearest indications of the validity of the model proposed here, and the model offers a more satisfactory account of the mechanisms involved than the intentionality construct.

(xii) Concluding remarks

In the first chapter of this thesis, it was concluded that current conceptions of locus-of-control failed to properly account for the full range of phenomena which have been observed in research on the construct and related ideas. The reasons advanced for such failure were the lack of clear conceptual analysis of the construct itself, and the absence of attempts to relate it to more general theories of motivation. A model of locus-of-control was offered as a solution to the first of these difficulties, with a promise to the reader that an integration of the model in a general model of task decision-making and action would be attempted. In the present chapter, alternative explanations

of task behaviour were reviewed, notably McClelland's theory of achievement motivation, and Atkinson's theory, which uses achievement motivation and anxiety as independent variables. These explanations were also found wanting on empirical grounds and it was suggested that the reason (particularly in the case of Atkinson's model) was the failure to make use of sufficiently sophisticated cognitive or expectational constructs rather than simple ones such as task difficulty. In the context of a clear indication that workers in the field of task motivation are increasingly recognizing the need for both cognitive/expectational and affective/evaluative components of the tasks to be considered, it was proposed that these two components be conceptually distinguished, but related to one another, by considering the main motivating variable to be the evaluation by a subject, on a single satisfaction-dissatisfaction scale, of the performance outcomes that he expects from investment of effortful behaviour. As illustrated graphically in Figure 6.2, a subject is predicted to behave in a motivated fashion if both (a) he can control his performance outcomes over a part of their possible range, and (b) this part of the range of outcomes is associated with a relatively steep gradient of satisfaction. In such conditions, the subject will become aroused, and the contemplated effortful behaviour will tend to be triggered. However, whether this triggering is effective will depend on the inhibitive effects of prospective effort-investment not being great enough to reduce the net arousal level below a current adaptation threshold. In the model, the shape of the outcome-satisfaction functions is seen as determined by enduring motives such as achievement needs, and anxiety, and social and cognitive motives, which affect the hedonistic value of different performance levels, and particularly by the subject's acceptance of certain goal levels of performance associated with a sharp satisfaction increment.

The inhibiting effect of effort is regarded as a positively accelerating or power function of effort investment. Subjects

will contemplate various possible tasks (i.e. effortful behaviour - performance outcome - satisfaction relationships) within their fields, and decisions will be taken to act whenever net arousal is great enough. The various parameters of the task are being continuously adjusted in response to internal cognitive, emotional and other cues, and to external situational feedback; however, an important feature of the model is that it does not attempt to deal with the parameter-setting phase of the task, but only with the decisional phase. Finally, the subject's waking life consists of a series of tasks, each of fairly short duration, so that repeated changes of behaviour may occur, though striving for long-term goals will be maintained intermittently so long as the expectational and affective parameters of such behaviour and its outcomes are maintained at appropriate levels.

The differences between the conception of motivation used in this model and in other tratements can be traced by and large to the fact that affective and expectational aspects have been clearly separated in this model. Although no hard-and-fast definition of this distinction is offered, the available evidence suggests that it is conceptually and operationally possible, and desireable (see Heckhausen and Weiner, 1972; also Fishbein, 1963, with respect to attitude theory). The most notable divergence from the theory of Atkinson (which seems to be the most widely acceptable to date) is in the treatment of fear-of-failure. Atkinson treats this as an inhibiting influence on motivation. But there is a wealth of indications in the journals (dating at least as far back as the work of Hurlock, 1924) that both positive and negative forms of reinforcement can have positively motivating effects. The model offered here would lead to the prediction that fear-of-failure will inhibit performance of a task with which it is associated if the subject's expectations of maximum performance outcome, even with maximum effort output, falls below the point at which performance ceases to be negatively evaluated, and if the subject has other tasks of a more rewarding kind available to him; if

no such alternatives are avilable, fear-of-failure will motivate achievement striving so long as the subject has behaviours available to him which are positively related to performance, i.e. so long as the subject believes he has some measure of control over the outcome.

Tasks do not present themselves singly. In any one situation, a number of different tasks are available. Also, any behaviour may relate to more than one performance, and to more than one motive. In some cases, the effects will be consonant or additive, and in others, competitive or subtractive. Most real-life situations will require individuals to make decisions on the basis of the aggregate affective outcomes of a number of tasks; while the model does not specify the processes involved in task combination, there seems to be no reason why conventional assumptions about how this is effected should not apply.

Finally, we have continually referred to the formulation as a 'model'. According to Brodbeck (1968), the term should be used only to refer to the transfer of a functional explanation or theory from one area to another, complete with laws and predictions. No specific source is implied for the formulation, though the method of presentation owes something to economics. But it seems premature to use the term theory, which Little (1972) has said carries "a greater load of ontological commitment". As a model it may be "academicomimetic" in Little's terms, but only insofar, it is hoped, as the cognitive aspects outweigh the affective.

Chapter 3

LOCUS-OF-CONTROL IN AFRICAN CULTURE

In the discussion of conventional locus-of-control theory in Chapter 1, the point was made that while internals tend to be fairly similar in their behaviour, external subjects are more heterogeneous. The reason for this heterogeneity suggested by the detailed model of locus-of-control proposed in this thesis is that one type, or source, of externality is the subject's possession of a large range of uncertainty about the level of performance which can be attained at various levels of effortful behaviour. Where such a large range exists, the subject will reduce it by reference to a number of possible beliefs about the operation of controlling forces in his environment. It seems likely that such beliefs will be determined or at least influenced by the generalized beliefs, about causality and person - environment relationships, prevailing in the culture. Thus, we could expect sophisticated members of Western society to make use of impersonal notions of statistical probability in reducing uncertainty, members of religiously or mystically oriented communities to refer to supernatural ideas, and members of close-knit social groups to treat interpersonal relationships as the primary determinants of important events in their lives. On the other hand, beliefs about generalized task ability and effort-effectiveness in specific tasks are more likely to be individualized and situation specific, and thus less affected by culture.

The cross-cultural method has become recognized in recent years as one of the most efficient ways of testing hypotheses about human behaviour and ensuring that techniques, instruments and theories are not too greatly culture-bound. In the area of locus-of-control African peoples seem ideally suited to be a contrast group to the predominantly American population on which

most work has been done, since the traditional causal belief system makes much use of magical and supernatural notions of an apparently external kind. Closer examination of some of the extensive anthropological literature from Africa reveals a number of inter-related aspects of this belief system which might be expected to influence locus-of-control expectations. It should be noted that the observations which are quoted may not apply to all of Africa, but from the psychologist's standpoint at least, there seems to be a number of features common to a wide range of peoples. As general discussions of the relationships pertaining between culture, thinking, and beliefs, Cole et al. (1971, pp. 3-24) and Horton (1967a, b) provide an excellent introduction to what follows.

Foster (1965, cited by Triandis, 1971) argues: "In traditional societies life is seen as a stochastic zero sum game guided by chance; that is, there is the view of limited good, andthe notion that chance or fate is the major determiner of one's share of the good." This might lead one to expect a universal fatalism and lack of attempts to control on the part of such peoples. However, Jahoda (1970), who is one of the few psychologists to take an active interest in this topic, says : "The perusal of anthropological reports is liable to convey an impression of an almost pervasive preoccupation with dangers arising from magic, witchcraft and sorcery. This would be exaggerated, as is evident from discussions dealing explicitly with the saliency of supernatural beliefs (e.g. Crawford, 1967; Marwick, 1965); ".....our Western dichotomy between 'natural' and 'supernatural' is far from being universally shared, the cosmos being conceived as unitary where every event has its meaningful place (e.g. Musgrove, 1952; Beattie, 1964)"; "Nevertheless there is ample evidence including psychiatric observations (Lambo, 1955) and other relevant studies (Johoda, 1961) that variations in one's fortunes in general, and misfortunes in particular, are apt to be attributed to outside agencies. One would therefore expect people in such societies to feel themselves less masters of their own fate than

their counterparts in western industrialised countries; and the extent to which this is the case should be related to the prevalence of supernatural beliefs" (p. 117).

There seems to be no lack of anthropological evidence that such beliefs are widespread in Africa and Jahoda (1968, 1970) has shown that they are not restricted to unsophisticated sectors of the populace but may be growing stronger (or at least being more openly expressed) among students in West Africa, and becoming integrated into new cognitive structures involving a "coexistence" between African and Western ideas and beliefs. Among the notions that Jahoda (1970)found supported by students to at least some degree were : that the day of one's birth influenced one's character; that sudden illness could be brought on by an enemy; fear of magical threats; that fortune tellers really know the future; and the existence of witchcraft as a power. All of these items mentioned seem to have some bearing on locus-of-control, and Jahoda found significant correlations between such beliefs and scores on Rotter's I-E Scale (1966) (slightly modified). Thus, "modernity of outlook was gradually becoming dissociated from adherence to supernatural beliefs" (Jahoda, 1970, p. 128), a view also reflected in his claim (Jahoda, 1962) that there is no unilinear traditional-modern scale but a mixture of these in every man.

Surprisingly, no studies appear to have been done in Africa along the lines of Michotte (1963), Piaget (1966), or Laurendeau and Pinard (1962), though Greenfield (1966) suggested that magical beliefs might influence the results of Piagetian conservation experiments, since children might attribute to an experimenter abilities to change the amount of substances while manipulating them. Social anthropologists have naturally concentrated on the social and personal aspects of supernatural beliefs, and have come to the conclusion that these tend to be expressed in personal forms such as sorcery and witchcraft, which are also indirect expressions of social tensions existing in the society. Natural events affecting an individual are regarded

as mediating between the person and someone else who has wished the outcome on him (the outcome being almost invariably bad and the responsible agent evil or malevolent, except in the case of a spirit who may be punishing one for sins of omission or commission). A man must "maintain or restore harmony with the unseen forces in his life" (Bourdillon, 1968). A general characteristic of traditional societies is that magical and social pressures are brought to bear on anyone who is unusual, even in his prosperity (Mitchell, 1965). However, this system of interpersonal magic does not rely totally on the close-knit social fabric prevailing in rural areas among traditional peasants, but may take on a particular relevance for urbanized and educated Africans, because others are believed to envy the successful.

Jahoda (1966) has provided a particularly pertinent discussion of the influence of supernatural factors on the psychology of African status aspirations. These aspirations tend to be unrealistically high because of rare cases of spectacular success due to education (often late in life), because the relatively open social system allows contact (at least within families) between the successful and the struggling, and because effort and qualifications are given more importance than personal limitations and societal barriers. Thus, in terms of our proposed model, 'getting ahead' is a 'task' with the subject having low general competency and a large range of uncertainty, but high effort effectiveness beliefs and a very steep satisfaction gradient at the point of success. In these conditions, "instrumental magic" is necessary (a) to increase personal competence (e.g. in examinations or work), (b) to influence authority and decision-making figures in favour of oneself (or to get awkward officials removed), (c) to intervene in supernatural ways in the situation, for example by giving a precognition of an examination paper, and (d) to give one general powers over one's rivals (Jahoda, 1966). But there seems to be no evidence that magic can be a substitute for effort. Thus supernatural beliefs are not a necessary part of the individual's view of the world, but a convenient cultural solution to the need for causal explanations in a highly ego-

involving task. Extrapunitive reactions to failure are a further reflection of this pattern. In success, the individual is caught in a web of familial obligations to share his good fortune; guilt arising from failure to do so is felt as a fear of magical retribution from others who envy his good fortune.

Jahoda suggests that changing child-rearing patterns and familial and social relationships may decrease reliance on supernatural attributions. Irvine (1969, 1970; Irvine and Sanders, 1971) has also given attention to early influences on the later development of cognitive abilities. He uses the notion of "primary" learning within the parental linguistic and evaluative system, as against "secondary" learning within a school system which places much more importance on personal accomplishment and competition. "We offer a rationalization that sees differential values as modal modifiers of cognition across cultures" (Irvine and Sanders, 1971) seems a remark equally pertinent to the wider fields of task motivation. "Knowledge of the environment (according to anthropologists) is based on a categorization of objects and people that is directly related to their capacity for influencing the acts and fortunes of others. Applying knowledge in this context implies participation in a system of causation whose main function is the control of kin relationships through the spirit world in which the ancestors play a crucial role. This system of causation should not be confused with child animism ... since ... fully mature adults adopt this system of causation, have learned it in childhood, argue verbally and operationally about it, and pass it on to children in a series of sayings, beliefs, and omens ... Misfortunes, because of the life force in objects and people, always have a spiritual history and a gestalt of human relationships" (Irvine, 1970, p. 26), Referring to the Mashona people of Rhodesia, he continues: "The main consequences of deviant acts rebound on self, kin, and community; while relatively little direct control can be exerted on natural phenomena or on the natural objects themselves. Indirect control is considerably greater ... In some ways this is the

antithesis of western theories of causation, where direct and observable control over the environment is held to be great and ... minimally related to the spirit world" (ibid., p. 27).

Gluckman's (1955) interpretation of the evidence is that Africans answer the question 'Why?' rather than 'How?' by reference to supernatural beliefs; for example, a man can be held to have died from malaria contracted from a mosquito, but the question of why the mosquito chose that man and not another remains to be answered. Others (e.g. Maquet, 1954; Mitchell, 1952; Bourdillon, 1968) have claimed that it is the unusual event which requires explanation in terms of magic; constancy is natural, discrepancy is attributed to the supernatural (cf. Kepka and Brickman, 1971). Maquet also suggests three reasons why supernatural explanations have become less common in western thought systems: "First, their wider knowledge of natural sequences of antecedents and consequents makes the residuum of naturally inexplicable facts more restricted ... Second, even for residual facts not scientifically explained, there is in Western culture a faith that, given time and effort, a scientific explanation will be found ... Third, for the disconcerting circumstances which may be coincidental with illness or death, the concept of chance, which does not appear frequently in Ruanda culture, is resorted to" (Maquet, 1954, p. 173). The notion of chance, according to Mitchell (1952), is a further feature of belief in science, which "recognizes the multiplicity of causative factors behind an event and therefore the possibility of the occurrence of unpredictable and unusual events" (p. 53). Bourdillon, however, warns that the idea that all events in African cosmology have an explanation can be taken too far; some events (among the Mashona of Rhodesia at least) are accounted for only as Mwari chete ('just God') or as the whim of a spirit (particularly Shave, the stranger spirit). This appears to be an anthropomorphic version of chance, consonant with the overall nature of the belief system. 'Bad luck' is not used as an expression of chance among these people but to refer to fate or fortune brought about by the malice of another (Bourdillon, 1968).

While most of these explanations tend to be offered on a post hoc basis for actual or hypothetical events (Mitchell, 1952), it is reasonable to suppose that they would occur more naturally to Africans faced with a range of uncertainty in a prospective task than notions reflecting an impersonal type of chance. Thus in the attribution phase of the task, or in stating beliefs about the reasons for events in general, Africans would be more likely to make use of the supernatural or the influence of others as expressions of externality, while people from western cultures should refer more to chance and the operation of impersonal forces in the world around them. It is with this hypothesis that the remainder of this thesis is concerned.

Finally, Sanders (1954) made the interesting observation that different languages tended to express some causal relationships in different ways, and he suggested that this might have important implications for thought processes. For example, in Spanish one says, "The bus left me" for the English "I missed the bus", which might lead one to infer a greater passivity or externality with respect to punctuality among Spanish speakers. Perhaps due to the lack of acceptance in recent years of the 'Whorfian hypothesis' from which the suggestion stems (Whorf, 1956), the hypothesis does not appear to have been tested. At least some African languages use a construction identical to the Spanish one mentioned above, and there may be other constructions of the same kind. This suggests that further study of this phenomenon in relation to locus-of-control might be worthwhile, at least as an aspect of response bias in questionnaires, though such a study is not attempted here.

Chapter 4

A CROSS-CULTURAL STUDY OF LOCUS-OF-CONTROL

Insofar as the model of task motivation presented in the first two chapters of this thesis makes an original contribution to the subject, its core is the re-analysis of the locus-of-control construct; the proposed relationship between performance outcome and satisfaction is implicit in much of the existing theory of task motivation. What is perhaps unusual about the affective component of the model is its return to a very simple basis, reminiscent of the early discussions of level-of-aspiration. Such simplicity is made possible by the fact that the expectational parameters are considered independently as a separate component. Thus any attempt to provide empirical support for the complete model has as its most important goal a substantiation of the analysis of locus-of-control into three components. The remainder of this thesis consists of a report of an empirical cross-cultural study carried out by the author in pursuit of the goal.

There are two main ways in which an empirical investigation sub-factors of locus-of-control might proceed. The first and most obvious would make use of factor-analytic techniques. A number of attempts to factor-analyse the Rotter I-E Scale have already been reported. They support the case for independent factors within locus-of-control; however, the relationship between the factors isolated by Mirels (1970), Gurin et al. (1970 and Kleiber et al. (1973) (see Chapter 1, Section vi) and the factors suggested by the present model, are not clear. This may be partly a function of the items included in the analyses. A more comprehensive pool of items might yield a more satisfactory solution from the point of view of the model. But the difficulty with factor analytic solutions is their dependence on the nature of the items chosen, and hence their dependence on the preconceptions of the investigator.

An alternative method, and the one chosen for the investigation reported below, is to establish the degree of correlation between the I-E Scale (or an alternative scale) and other scales intended to measure locus-of-control expectations of more specific kinds. The choice of such scales will, of course, again reflect the preconceptions of the investigator, but these preconceptions can be more adequately defended as specific hypotheses than is the case where a factor-analytic method is used, and thus the relationships established between such scales and a scale of generalized expectancies should carry more weight.

In the present investigation the absence of existing specific locus-of-control scales made it necessary to devise some and to establish their reliability before proceeding to correlate them with the I-E Scale. Suggestions as to the specific scales which might be constructed were taken from the literature on locus-of-control rather than directly from the theoretical analysis, but in a way which allowed the predictions of the model to be tested readily. The availability of comparable groups of African and European students was made use of to test specific hypotheses about the differences between these cultural groups suggested by the sociological evidence reviewed in Chapter 3. Details of the scales and the procedures utilized in the investigation are summarized below.

(i) The I-E Scale

In view of the obvious relevance of the locus-of-control measure for studying cognitive aspects of motivation in Africa, and the suitability and availability of African groups for testing the validity of the construct and the measures, it is surprising to find that only one study has been reported in the literature: Jahoda's (1970) study of the correlates of supernatural beliefs among Ghanaian university students. S.H. Irvine has used the Rotter I-E Scale on a small sample in Rhodesia, but the results of this have not yet been published; other unpublished data may exist elsewhere. As mentioned in the previous chapter, Jahoda found significant correlations (+0.30 to 0.41) between I-E scores and his Index of Supernatural Beliefs, the scale being the only one of several measures used which did correlate

consistently with the I.S.B. Somewhat surprisingly, he also found that the mean I-E scores for his various African groups were indistinguishable from the mean scores for American students reported by Rotter (1966). Whether this raises doubts about the validity of the construct, or the measure, or about the applicability of conventional assumptions about locus-of-control in Africa, is difficult to discern, since no further data on the performance of the I-E Scale in Jahoda's study are avilable. Parsons (Parsons et. al., 1970, and a personal communication) has provided data on West German, Italian, Japanese and Canadian students; Japanese students are much more external than the others, who are only slightly higher than a U.S. group. Again, no further data on the performance of the scale as such are given. Since any attempt to use a measuring instrument cross-culturally for the purposes of demonstrating group differences in mean scores or group differences in construct validity must assume that the scale maintains the same reliability characteristics across the groups, particular attention was paid to the internal consistency data obtained from the study reported here.

The version of the Rotter scale used involved slight adaptations to local conditions, primarily in the wording of the instructions and of a number of items, to remove American expressions and references and to simplify the English slightly so that no doubts need be entertained regarding comprehension by African students. One more substantial change was made in the wording of item No. 7 after this scale had been used in Zambia. It was found that the item correlated negatively with the total score, and this was attributed to the wording of the external half of the item including the expression "trying hard"; an apparently successful change of wording was made in the Rhodesian version. Another less important change was in the position of the filler items; in order to facilitate computer analysis of results, filler items were made to occur at regular intervals, as items 1, 6, 11, 16, 21 and 26. The presentation of results, however, uses the original numbering for items. The versions of the scales used in Zambia and Rhodesia are given in Appendix A.

(ii) The A-C Scales : a new experimental measure of locus-of-control

Inspection of the items in the I-E Scale reveals several putative sources of external control; luck, destiny, the behaviour and designs of others, accident, coincidence, obscure social forces either malevolent or benign, and other undefined sources of variance in events. These do not seem to be used in any systematic way, but are associated with an equally heterogeneous and ill-defined set of events; furthermore, the kind of event sometimes varies between the internal and external halves of the item. The reason for this randomness is that items were originally chosen on the basis of internal consistency indices and without reference to face validity. However, as in factor analysis, one only gets out of item analysis what one puts into it, and it seems clear that items were chosen for the original analysis on rather arbitrary grounds despite the theoretical background of the authors (Rotter 1954, 1966).

The validity of the I-E Scale and its alternatives has already been discussed at length (Chapter 1). Sarason and Smith (1971), commenting on these findings, suggested that the predictive utility of the scale would be improved by "situation specific I-E measures (e.g. social, academic) or ipsative measure of locus of control in various situations." There seems to be no clearly valid way of deciding what situations should be chosen, except by some kind of preliminary empirical investigation of the dominant motives or concerns of a particular population. Schneider and Parsons (1970) divided the I-E Scale items into five groups: luck or fate; politics; personal liking and respect; academic; and leadership success. These groups were represented by 7, 5, 4, 3 and 4 items respectively, thus biasing the instrument proportionately. It is not known whether these fairly represent the concerns of American students or adults. Another way of dividing situations is given by the work of Crandall (Crandall et al., 1965; McGhee and Crandall, 1968), who divided the items on the I.A.R. scale into those referring to positive and negative (or good and bad) events, and found the degree of externality affected to some extent by this division. Others have confirmed Crandall's

findings; for example, Epstein and Komorita (1971) found that failure tends to be externally attributed more than success by disadvantaged children. A further possibility is that events referred specifically to oneself will create a different reaction than those referring to people in general. Duval and Wicklund (1973) found that attribution of responsibility to the self is greater when attention is focussed on the self.

The 'A-C Scale' (See Appendix C) used in the present study was constructed by the author and used as an experimental device rather than as a scale (or set of scales) intended for normative measurements. As far as can be established, the approach taken in the construction of this scale is unique. Sixteen situations were chosen because of their apparent relevance for both African and European students in educational institutions in Africa, on the basis of a division into types of event suggested by the studies already cited and the author's understanding of student concerns. The sixteen questions could be divided in three ways, in a 4 x 2 x 2 design; four questions on each of four situations relevant to student life (Academic, Social, Political, and General); eight questions referring to positive or good outcomes, and eight to negative or bad ones; and eight questions posed with reference to the individual, with eight posed with reference to students in general. The scheme, with question numbers, is given in Table 4.1. This design enables the differential effects of the question types

Table 4.1 : A-C Scale question types and numbers

		Academic	Social	Political	General
Personal	+	1	6	11	16
	-	13	2	7	12
Impersonal	+	9	14	3	4
	-	5	10	15	8

to be found by analysis of variance.

The meanings of the labels attached to the question types should be clear by referring to the table and the scale. 'Academic' events are those directly connected with college work; 'Social' events include heterosexual activities; 'Political' events are those

in which a student might become involved on campus. (national politics being specifically excluded because of the different political experience of the groups); and 'General' events being chosen as somehow representative of concerns outside the other categories. For the remainder of the thesis 'situation' or 'event' or 'question' types will be referred to as Academic/Social/Political/General, Positive/Negative, and Personal/Impersonal.

Six different explanations are offered for each event; the subject is asked to rate each of these on a four point scale from 'no importance' to 'great importance' as causal influences on the event in question. This assumes, and suggests to the subject, the idea of multiple causality in events; although it is possible for the subject to score five of the six reasons zero, such a response is unlikely. These six explanatory factors, the order of which was systematically varied over the sixteen questions, are suggested by Rotter's (1966) paper and other studies. They are :

Action (A) : the individual's own deliberate or effortful behaviour.

Personal attributes (P) : characteristics such as intelligence, good looks, and the like, over which the individual has little or no control.

Powerful others (O) : the direct intervention of other people personally known to the individual.

Vague social forces (V) : the operation of diffuse forces in the environment and society, e.g. the state of the economy, the spirit of the times, public opinion, etc.

Supernatural forces (S) : the direct intervention in an individual's life of some guiding influence, such as God or fate.

Chance (C) : the random or unpredictable operation of causal influences.

In the replica of the inventory shown in Appendix C, the factor type is indicated by the appropriate letter in the space normally reserved for the subject's response. Item No. 16 could be regarded as the prototype of A-C questions and explanatory factors; it represents an event type characterised as General, Positive, and Personal.

Item wordings were extensively discussed with colleagues and students at the University of Zambia. Due to the difficulty of devising meaningful questions which fitted into the design of the inventory, no alternatives were developed and the normal stage of choosing the best from several alternative forms was necessarily omitted. However, the results from item analyses (reported later) indicated that none of the items used was particularly weak, and so the use of the inventory as an experimental measure seems justified. Furthermore, any shortcomings of the scales arising from this departure from established procedure are offset by the increased flexibility of the instrument, in that various interactional effects can be tested, and various transformations of the raw scores are possible, including a quasi-ipsative measure. These points will be discussed in more detail in Chapter Six.

(iii) Sampling and procedure

Student participants were drawn from three institutions: the University of Zambia in Lusaka, the Teachers' Training College in Gwelo, Rhodesia, and the Teachers' Training College in Bulawayo, Rhodesia. The first two institutions can be regarded as African, although the University of Zambia is multiracial and has a few 'European' students studying there (none of whom happened to be included in the sample); Gwelo T.T.C. is solely for indigenous Africans training to be primary and junior secondary school teachers (and is the most senior African T.T.C. in Rhodesia). Bulawayo T.T.C. takes students classified as European, Asian and Coloured for training in primary school teaching; it is the only such college in the country. The small group of non-European students (n=20) were excluded from the analysis because their responses were different in a number of respects from all others, but the group was not large enough to warrant separate analysis.

The main justification for choosing these institutions, apart from convenience, was that all have roughly equivalent entrance standards based on five 'O' level G.C.E. subjects, though many students in all of the samples were likely to have had more than the minimum qualifications. All three institutions drew students from all over the country in which they were situated, so no marked imbalance in tribal or ethnic representativeness was

likely. Although students were asked to state their group of origin on the scales, no analysis of these responses is reported since this was not intended to be a normative or descriptive study of these particular groups, but an attempt to establish the general applicability, performance characteristics, and intercorrelations of the scales in groups of some cultural diversity. The home background of the two African groups were likely to be similarly representative of the different economic strata of society in Zambia and Rhodesia.

The chief differences between the groups, apart from ethnic differences, are that the Zambian group was more likely to include students of superior ability since the University is the highest educational institution in the country, while for both Rhodesian groups a teacher-training institution is usually regarded as inferior to the University of Rhodesia (which requires 'A' levels for entry); and the second difference lies in the social, economic and political future facing the groups. Zambian students were likely to be readily employed at a high level on graduation and to be rapidly promoted as a newly independent country's elite (though there was some feeling among the students at the University of Zambia generally that they had been 'born too late' for the best opportunities). Rhodesian Africans are likely to face some difficulty in finding jobs, and are faced with economic, social and political discrimination in the immediate future. Rhodesian European students are fairly well assured of jobs, and of relative properity and social and political dominance in the immediate future; however, female students in particular complained of the uncertainties of posting by the Ministry of Education within the country, and of their salaries compared to other Europeans. It might be predicted then, that Zambians would be most internal, European Rhodesians second (and perhaps somewhat more external than U.S. college groups), and Rhodesian Africans most external on the Rotter I-E Scale.

The characteristics of each group are given below.

Zambian Africans : 65 male and 20 female first-year Humanities and Social Science students taking an elementary course in scientific thought and methodolgy; 85 male and 12 female Humanities and Physical Sciences students taking a second-year course in education preparatory to secondary school teaching; 8 male Biochemistry students in their third year, preparing for Medicine; and 11 male fourth-year Political Science students.

Totals : 172 males, 32 females. Stated ages ranged from 18 to 39 years (median 22 years, 29 not given) for males, and 17 to 27 years (median 20 years, 3 not given) for females.

Rhodesian Africans : 38 male and 10 female first-year students, 39 male and 7 female second-year students, and 30 male and 11 female third-year students. This was nearly the whole student body of Gwelo T.T.C.

Totals : 107 males and 29 females. Stated ages ranged from 18 to 26 years (median 21 years, 3 not given) for males, and 18 to 25 years (median 20 years, 2 not given) for females.

Rhodesian Europeans : 23 male and 65 female first-year students, and 19 male and 104 female second-year students. Third-year students could not be tested at a convenient time due to teaching practice arrangements.

Totals : 42 males and 169 females. Stated ages ranged from 17 to 39 years (median 20 years, 2 not given) for males, from 17 to 35 years (median 19 years, 2 not given) for females.

Groups were chosen for testing with the cooperation of lecturers of large classes who were willing to give up a session of teaching time. Both I-E and A-C Scales were administered in the same session (the total time taken varying from about 40 minutes to about twice that time). In Zambia, every alternate student completed the I-E Scale first, or the A-C Scales first. However, this caused some confusion, and so all Rhodesian groups completed the I-E Scale first.* Besides being lead through the instructions at the beginning dummy examples were written on the blackboard, and all queries were answered by the author on a group or individual basis as appropriate.

* A check on the Zambian data failed to find any order effects on the scores. However, no check on item analysis or intercorrelations was attempted, so the possibility of order effects cannot be discounted.

(iv) Hypotheses

A number of informal hypotheses have been generated in the discussion up to this point. Since the study was essentially an exploratory study using both a new conception of locus-of-control and a new measuring instrument, no formal predictions are given. Rather, three main groups of related topics have been chosen for particular attention. These are :

1. The performance charcateristics of the I-E Scale and the A-C Scales in the different racial, national and sexual categories studied, with particular reference to the comparability of these scales cross-culturally.
2. Possible group differences between response patterns on the scales, and the implications of these for the meaning of locus-of-control in African and European culture.
3. Supporting evidence for the conceptual analysis of locus-of-control offered in the first chapter. Although it has been pointed out that the A-C instrument was constructed along lines suggested by the general literature on locus-of-control rather than with a specific test of the model in view, parallels can be observed between some of the scales and the proposed factors of locus-of-control. Namely, the Action scale can be identified with the Effort-Effectiveness dimension, the Personal scale with the Task Competency dimension, and the Chance scale with the Range of Uncertainty dimension. Relationships between these scales and the I-E Scale were therefore of particular interest, in the context of the whole population studied rather than with respect to particular groups.

Chapter 5

I-E SCALE RESULTS

The responses of all subjects were punched on to cards and the data analysed by computer using programmes written for the purpose by the author. The following categories of results were printed out:

(a) Individual subject scores (not reported in this thesis, but made available to subjects).
(b) Internal consistency indices.
(c) Item analyses, and comparisons between groups on item performance.
(d) Group and subgroup mean scores and standard deviations, for intergroup comparisons.
(e) Frequency distributions in graphical form (reported but not reproduced in this thesis).

(i) Internal consistency indices

Following the practice of Rotter (1966), the main reliability indices calculated were the biserial correlation coefficient between each item and the total score minus that item, and the Kuder-Richardson reliability coefficient (Guildford, 1956). Table 5.1 summarizes these statistics for Rotter's data and all the principal groups sampled for the present study. The negative correlation for the Zambian group on item No. 7 has already been mentioned; it is clear that the minor change in wording was successful in subsequent sessions with the Rhodesian samples, though a number of other negative correlations have appeared for those samples, principally in the small African Female and European Male groups.

Such reversals of the normal meanings of the items suggest that there is a need for a careful examination of this wording of the I-E Scale items (or of any other substitute) before it is used, particularly in Africa. The author has come across no other re-analysis of the internal consistency of the scale, so it is impossible to know how often such differences from Rotter's data appear. It may also be that the forced-choice format contributes

Table 5.1 : I-E Scale item biserial correlations and Kuder-Richardson coefficients for each group (decimal points omitted)

ITEM	U.S.A. (ROTTER,1966)		AFRICANS ZAMBIAN		AFRICANS RHODESIAN		EUROPEANS RHODESIAN	
	Males n=200	Females n=200	Males n=172	Females n=32	Males n=90	Females n=27	Males n=41	Females n=160
2	265	250	535	140	385	818	097	362
3	214	147	317	234	050	437	292	052
4	238	344	323	024	214	-002	-013	255
5	230	131	189	340	035	434	358	303
6	345	299	028	181	-135	-443	-222	148
7	200	262	-312	-194	363	519	372	194
9	152	172	340	698	474	467	263	348
10	227	252	283	593	452	-732	435	391
11	391	215	501	-016	563	230	587	610
12	313	222	411	274	252	112	-121	341
13	252	285	504	770	445	457	609	378
15	369	209	238	309	355	516	331	612
16	295	318	556	309	506	744	276	604
17	313	407	364	066	194	408	360	352
18	258	362	235	323	339	623	419	507
20	255	307	244	206	249	195	562	195
21	108	197	187	-010	335	231	414	364
22	226	224	354	952	358	343	208	255
23	275	248	337	061	439	191	370	635
25	521	440	435	286	573	472	418	656
26	179	227	285	-055	124	027	201	352
28	331	149	374	130	682	670	484	474
29	004	211	197	-012	229	357	071	255
K-R r	700	700	642	601	711	689	671	744

to such reversals of meaning for subjects. A number of other items show distinct weaknesses in the form of correlations which, though positive, are lower than the standard error for that distribution; in most cases, however, items work satisfactorily for at least one group, which suggests that finding universally satisfactory items may be difficult.

The overall impression given by the Table is that no gross failure of the scale occurs when it is used with groups in Africa, though the Kuder-Richardson indices are generally lower than for the American sample. A more perplexing feature is the difference in the pattern or order of biserial correlations in relative size. It might be expected that in the case of reliable scale, some correspondence should be maintained between the degrees to which separate items are predictive of, or related to, the total score. Irvine and Sanders (1971) have suggested that the correlations between item difficulties of tests between different groups is a good indication of whether the means are comparable. They found much higher correlations between groups of the same race than between groups of different races, for ability tests, suggesting that the validity of the tests for cross-cultural comparisons of mean scores was in doubt. In the next section, the proportions scoring externally on each item (the equivalent of item difficulty in an ability test), will be compared in the way Irvine and Sanders suggest. However, the correlations (product-moment) between groups for item biserial correlations were also calculated and are presented in Appendix D, Section (i). Few of the correlations achieve significance and one is negative. A more useful summary of the data is given in Table 5.2 which shows the mean correlation for various types of comparisons between groups in the present study.

The highest overall mean correlations are between groups from the same country, with groups of the same race second and groups of the same sex lowest. Also, within the same-sex comparisons, difference of nationality lowers the correlation more than difference of race. However,within the same-race

Table 5.2 : Mean correlations between groups classified by sex, race and country for (a) biserial item correlations, and (b) proportions scoring externally on each item, for the I-E Scale.

For same-sex groups *	Biserial Coefficients	Proportions External
c. Same race, different countries	.334	.574
b. Same country, different races	.435	.607
e. Different races and countries	.109	.643
Overall mean	.293	.608
For same-race groups		
c. Same sex, different countries	.334	.574
a. Same country, different sexes	.323	.863
f. Different sexes and countries	.353	.513
Overall mean	.337	.853
For same-country groups		
b. Same sex, different races	.435	.607
a. Same race, different sexes	.323	.863
d. Different races and sexes	.495	.640
Overall mean	.418	.703
g. Different sexes, races and countries	.307	.674

* The groups which are added together are indicated by the letters a - g in Appendix D, Section (iii).

comparisons, sex affects the correlation slightly more than nationality, and the interaction of sex and nationality lowers the correlations less than either alone; the same interactive effect occurs between race and sex within the same-nationality comparisons, and race has a stronger effect than sex. Although there is no statistically sound way of testing the significance of such pointers, they do seem to indicate a degree of complexity in the issue as to what variable contributes the greatest influence on internal-consistency indices.

(ii) Externality proportions on individual items

The proportion of each group scoring externally on each item is reported in Appendix E, and the intercorrelations between groups (see discussion in Section (i), above) are given in Appendix D with a summary in Table 5.2. Unfortunately, no data for comparison have been published by Rotter or other investigators. The correlations between groups range from moderate to moderately high, so that it is clear that the scale does not perform nearly identically between groups, even of an apparently similar kind. In this case, same-race group intercorrelations produce the highest degree of overall similarity, with same-country groups second and same-sex comparisons lowest. Within same-sex and same-race groups, difference of country lowers the correlation more than the alternative race and sex respectively, but within the first category race and nationality interact positively. A slight interaction between sex and race occurs within the same-country category, difference of race lowering the correlation more than difference of sex.

It has been pointed out in the last section that these complex effects on the cross-cultural applicability of the scale of sex, race and nationality are not easily assessed; the absence of a European Zambian group adds to the difficulty. Some of the effect may be due to the changes in wording between Zambia and Rhodesia, and only further research can settle the issue. However, intercorrelations between Rhodesian sub-groups presented in Table 5.3 indicate still greater complexity. It can be seen from the Table that the three African Male groups show very low inter-correlations, the 3rd-year sub-group showing a particularly deviant pattern, while the European groups are more consistent. African

Table 5.3 : Correlations between subgroups of the Rhodesian samples for I-E Scale responses (proportions external).

AFRICANS

	2nd year males	3rd year males	All females
1st year males	.865	.548	.889
2nd year males		.490	.769
3rd year males			.579

EUROPEANS

	2nd year males	1st year females	2nd year females
1st year males	.758	.847	.780
2nd year males		.672	.780
1st year females			.911

Minimum coefficient for 1% significance = .515
Minimum coefficient for 5% significance = .404

females were taken as one group because of their small numbers; unfortunately a similar comparison between Zambian sub-groups was not possible because of the way the data had been stored. Significant differences in mean scores between the three Rhodesian African sub-groups are also noted in Section (iv) below, at which point the matter will be discussed further.

(iii) Group differences on individual items

Further comparisons between the responses of groups to individual items was also attempted. First, the numbers scoring internally and externally on each item were systematically compared, group by group, using a simple 2 x 2 chi-squared method (Siegel, 1956). The following pairs of groups were compared on each item:

Zambian Males and Zambian Females
Gwelo Males and Gwelo Females
Bulawayo Males and Bulawayo Females
Gwelo Males and Bulawayo Males
Gwelo Females and Bulawayo Females
Gwelo Males and Zambian Males
Gwelo Females and Zambian Females
Bulawayo Males and Zambian Males
Bulawayo Females and Zambian Females
All African Males and European Males
All African Females and European Females
All Africans and All Europeans
All African Males and All African Females
All Rhodesians and All Zambians
All Males and All Females.

Two computer runs were completed in each case, the first using raw scores and the second using scores corrected to take account of the overall differences in externality between the groups being compared. The results of these analyses are not presented in this thesis due to their great bulk and the difficulty of summarising them neatly. Furthermore, though a careful inspection of the results of each comparison was made, and a large number of significant differences

emerged, no pattern was distinguishable in the type of items on which groups differed.

This post hoc analysis was followed by another in which items were grouped together in types suggested by Schneider and Parsons (1970). The scheme, with item numbers, is as follows:

"Luck, fate" : 2, 9, 15, 18, 21, 25 and 28
"Politics" : 3, 12, 17, 22 and 29
"Personal liking and respect" : 4, 7, 20 and 26
"Academic" : 5, 10 and 23
"Leadership Success" : 6, 11, 13 and 16

For each type and for each group of subjects, the mean proportion external on these items was calculated and the closest whole-number split of the actual number in the group was calculated; chi-squared indices were then calculated as before. The results indicated that Rhodesian African Males were more external than their Zambian counterparts on the Personal ($p = 0.1\%$), Academic ($p = 5\%$) and Leadership ($p = 5\%$) types of items (but not on Politics or Luck); Rhodesians of both sexes and races added together were more external than Zambian males and females together on Personal ($p = 0.1\%$) and Leadership ($p = 5\%$) categories only; and Rhodesian African Males are more external than their European counterparts on Academic items ($p = 5\%$). The Political items, which might be expected to differentiate these groups, fail to do so.

Table 5.4 gives the mean externality proportion by item type for the principal groups in the present study together with the results reported by Schneider and Parsons. This reveals a remarkable feature: the Zambian Africans and Rhodesian Europeans are most external on the political type of item, with the Personal type second, while for Rhodesian Africans the Political type is second to the Personal type, as for U.S. and Danish subjects.

Gurin et al., (1970) used a tripartite division of items on the basis of a factor analysis (see Appendix B). Differences were tested between groups on Factor I : Control Ideology (items 6, 7, 10, 11, 16, 20, 23, 18 and 26) and Factor II : Personal Control

Table 5.4 : Mean proportions external on I-E Scale item types according to Schneider and Parsons scheme.

Group	Item type				
	Luck	Politics	Personal	Academic	Leadership
Zambian					
Males	.44	.62	.48	.38	.42
Females	.34	.64	.50	.46	.38
Rhodesian					
African Males	.47	.62	.71	.55	.58
African Females	.44	.68	.74	.58	.56
European Males	.37	.70	.67	.35	.38
European Females	.55	.72	.59	.38	.49
Schneider & Parsons					
U.S.	.38	.42	.54	.37	.25
Danish	.42	.46	.52	.40	.33
Combined	.40	.44	.53	.39	.29

(items 9, 13, 15, 25 and 28); Factor III : System Modifiability uses only two I-E Scale items (3 and 17) and so was omitted. The only significant result was for Rhodesian subjects as a whole to be more external than Zambians on Control Ideology (p = 5%).

Mirels' (1970) somewhat similar scheme (see Appendix B) involves an "ability and hard work versus luck" factor (items 5, 10, 11, 15, 16, 18, 23, 25 and 28, plus marginal items 6 and 9) and a factor focussing "on the respondents' acceptance or rejection of the idea that a citizen can exert some control over political and world affairs" (items 12, 17, 22 and 29). It should be noted that the latter differs from Schneider and Parson's "Political" grouping only in the absence of item No. 3. No significant differences were found on the first of these factors; on the second, European Females are more external than European Males (p = 5%), and Europeans (the sample of which was predominantly female) more external than Africans (p = 5%).

More sophisticated analyses of group differences such as factor analysis and multiple discriminant function analysis were not attempted, partly due to the inavailability of computer software. However, the results of the internal consistency analysis and item analysis suggest that factor or function analysis results would contain a large proportion of variance due to differences in the construct validity of the scale.

The pattern of differences in item response appears to be random to a considerable extent, though some of the factors suggested by other workers account for more variance than others. The notable absence of differences on political items (except in the case of European women on the degree to which world affairs are believed to be controllable) might indicate that these items are responded to in a qualitatively different way by different groups. This possibility is not supported, however, by the fact that the meanvariance of biserial correlation coefficients over the six groups for "Political" items, as defined by Schneider and Parsons, is lower than the mean variance for any of the other groupings of items.

Table 5.5 : I-E Scale mean scores by subgroups

	n	Mean	S.D.
Zambian males			
1st year	65	10.66	3.03
2nd year	88	10.98	4.21
3rd year	8	11.00	4.28
4th year	11	12.18	4.14
Zambian females			
1st year	20	11.50	3.04
2nd year	12	8.66	3.46
Gwelo males			
1st year	32	13.97	3.96
2nd year	35	10.97	3.61
3rd year	23	15.48	2.82
Gwelo females			
1st year	9	13.44	3.64
2nd year	7	13.29	3.51
3rd year	11	13.55	4.70
Bulawayo males			
1st year	22	10.59	3.44
2nd year	18	12.22	3.86
Bulawayo females			
1st year	63	11.89	4.01
2nd year	98	13.50	3.99

(iv) Group mean score differences

The mean I-E scores for sub-groups of the main samples are presented in Table 5.5 and for the main samples in Table 5.6; the latter Table also includes results for various combinations of groups, and the results of Jahoda's (1970) study in Ghana.

The difference between the most extreme sub-groups within the Zambian Males is not significant, but the second-year Zambian Females are significantly more external than the first years ($t = 2.35$, $p = 5\%$). First and third year students at Gwelo have mean scores higher than any the author has seen reported, including the unusually high score of 13.43 (no standard deviation given) reported by Schneider (personnal communication) for Japanese students. These two Rhodesian African Male sub-groups do not differ significantly from one another, but the lower of the two is significantly more external than the second year sub-group ($t = 3.21$, $p = 1\%$). These extraordinarily large differences between the groups, particularly between the second and third year groups,are not readily accounted for by any peculiarity of the situation known to the staff of the college. Examination of the differences in item responses (Appendix F) shows that most of the items reflect the general trend. In the case of the gap between first and second year results, the seven items with the largest differences are 3, 5, 10, 13, 18, 22 and 23. Three of these refer to academic issues, two to political ones and two to the personal-control versus luck dimension. The seven largest differences between third and second years are on items 9, 10, 15, 21, 22, 23 and 28; four of these are personal-control versus luck items, two are academic and the remaining one is political. Increased concern with control over one's academic outcomes in the first and final years of a course is not unnatural, nor perhaps is concern with general control over one's life in the final year before graduation, but the reasons for the drop in concern with political and general control matters between first and second years has no obvious cause. The small numbers of female students have similar scores in all three years.

Table 5.6 : Mean group scores on I-E Scale

Group	n	Mean	S.D.
Zambian males	172	10.94	3.75
Zambian females	32	10.44	3.40
Rhodesian African Males	90	13.18	3.97
Rhodesian African Females	27	13.44	3.79
European Males	41	11.32	3.59
European Females	160	12.88	4.06
Combined groups (using only subjects who had also completed the A-C Scale)			
African males	215	11.52	4.24
African females	57	11.84	3.88
Zambian Africans	173	10.69	4.04
Rhodesian Africans	99	13.15	3.93
Europeans	197	12.54	4.03
Total Population	489	12.02	4.09
Jahoda's Ghanaian students (all male)			
Under 25's	144	9.72	4.23
Over 25's	136	7.85	3.93

We have already referred to the low intercorrelations between these groups on item response, particularly for the third year males. Correlations between that sub-group and the Zambian and European groups are also lower than for the other two sub-groups of Rhodesian African Males. It is clear, then, that the responses of the third year group are abnormal for some reason which is not obvious.

The second year European Male group was more external than the first year, but not significantly so, whereas a similar difference for Females attains significance ($t = 2.48$, $p = 5\%$). Again, there is no ready explanation for this phenomenon; the absence of a final year group for comparison purposes is unfortunate.

Turning to the mean scores for each of the main groups taken as a whole, it is clear that the results are distinctly higher than for comparable samples of students. Zambian Males, who are more internal than any of the other groups except Zambian Females, are significantly more external than Jahoda's under-25-year-old Ghanaian male student group, with which the Zambians are most comparable ($t = 2.68$, $p = 1\%$). Jahoda (1970) did not report the exact nature of his modifications to the I-E Scale, but they were probably similar to the present author's modifications.

Neither of the differences between African Males and Female groups are significant, but European Females are significantly more external than Males ($t = 2.39$, $p = 5\%$), in line with American findings (Rotter, 1966; Joe, 1971). Combining sexes, both Rhodesian Africans and Rhodesian Europeans are more external than Zambian Africans ($t = 4.89$, $p = 1\%$; and $t = 4.39$, $p = 1\%$, respectively). Differences between Rhodesian Africans and Europeans are significant only for the Males alone ($t = 2.63$, $p = 5\%$).

In interpreting these results, the limitations to the comparability of means due to differences in response patterns between racial and national groups, reported earlier, should be borne in mind.

The shape of the distributions approached the normal fairly closely - more closely, in fact, than the scores reported by Rotter (1966, p. 26), the distributions of which are rather platykurtic.

(v) Conclusions

The above analysis of I-E Scale responses is more detailed than any that have been published, with the possible exception of the factor-analytic studies reported in Chapter 1 and Appendix B. The analysis throws considerable doubt on the comparability of scores cross-culturally, and even within apparently culturally homogeneous groups. The chief basis for this conclusion is the difference between group response patterns. The internal consistency indices, besides being much lower than those reported for American students, vary greatly between groups. Correlations between groups in the relative externality response to items are affected by race, nationality and sex, and also by unexplained differences between sub-groups within the samples. Significant differences between groups on the proportions scoring externally occur randomly, the observed patterns of differences not being those predictable from the apparent existential status of the groups. Finally, differences between group mean scores are only partly in agreement with the expectations outlined in the last chapter.

The probable reasons for such results are, (i) multi-dimensionality of the locus-of-control construct, (ii) large proportions of error variance in the I-E Scale due to the arbitrariness of statement pairing to create items, (iii) the lack of true scalar properties of the instrument, and (iv) variation between individuals and groups in the meaning of locus-of-control, particularly externality. The first two of these reasons have been previously discussed. The lack of scaleability is supported by a rough graphical check by the author, consisting of placing subjects in order of total score with a check mark indicating which items were scored externally; this revealed an apparently random pattern for the sample of subjects chosen. The fourth issue, which refers to the construct validity of locus-of-control, will be dealt with later in conjunction with the results of the A-C Scales.

A number of possible further analyses were not performed, mainly for practical reasons. A retesting would have further taxed the patience of both subjects and their instructors,

and thus severely reduced the validity of the results. Factor and discriminant function analyses, impracticable with the available computing facilities, would have been unlikely to yield stable solutions because of the unreliability of the scale itself. Therefore, it was decided that examinations of the correlations between I-E Scale and A-C Scale scores would be a more profitable exercise than further analysis of the I-E scores in isolation. This will be done in the next chapter.

Chapter 6

RESULTS FOR THE A-C SCALES

The format of the A-C Scales focusses attention on the question of the way in which subject's typically respond to objective-type personality inventories with alternatives that are similar to one another. This problem has not received much attention in the literature though Frederiksen and Messick (1959) included it in a list of response sets (see Vernon, 1963, pp. 206-7), and Cattell (1957) refers obliquely to it in a number of places. Inventories characteristically contain repetitions of items, or items expressed in highly similar ways (sometimes with the meaning reversed), so as to increase the reliability of the scale. It appears to be assumed that a consistent subject will always give the same response to such items, and that any deviation from such a pattern is the result of random error. This assumption may be justifiable in a questionnaire in which the similarly worded items are separated, so that the subject is likely to be unsure whether he is being asked the same or a subtly different question. However, when similar items occur more closely to one another, it is difficult to predict how different subjects might respond. The A-C Scales are a case in point. For example, if a 'Supernatural' and a 'Chance' explanation for the same event are perceived by the subject to mean the same thing, and these two explanations occur next to one another, a subject who has given a genuine response to the first possibility has a choice of appropriate responses to the second: he may repeat himself for reasons of consistency, or he may (if he has given a relatively strong response to the first item) give a different response, reasoning that a second strong response will give a false impression of his position on the issue. Alternatively, he may attempt to discriminate between the meanings of the two items in a way which is not normal for him. There seems to be no way of determining which of these alternatives is functional for different questions and for different subjects. The use of a rating response to items of the A-C Scales, rather than a ranking response, reduces the possible effects of this difficulty to some extent, and this is one reason why the ranking method was not used.

A further problem of objective-type items is the degree to which items are plausible, credible, or meaningful to respondents. With the A-C Scales, this problem applies to both the event which has to be accounted for and each of the suggested explanations for the event. Examination of the total responses to each of the sixteen questions showed differences between them which are relatively consistent between samples. Therefore, for certain of the analyses below the variance due to differential responses to whole questions has been removed by converting scores to deviation scores with respect to each question for each subject. These will be referred to as QD scores when they occur. QD scores amount to a quasi-ipsative measure of the various loci of control.

On the other hand, there is no way of removing variance due to the credibility of explanations for events, other than by summating individual items and assuming that the variance incredibility is reflected equally in each of the resulting scale scores, and that the differences between mean scale scores reflect an underlying belief in a particular type of explanation and not the adequacy of the items which represent that type of explanation. During the construction stage of the instrument particularly strong doubts were entertained by the author regarding the credibility of the Supernatural scale; however, the evidence which will be reviewed below indicates that this scale performed about as well as the others, and that in fact the credibility of scale items does not seem to be a major problem.

As in the case of the I-E Scale results, all analyses were performed by computer using programs devised by the author for the purpose. The following statistics were produced:

(a) Item biserial coefficients for each item with the appropriate scale score minus the item, for each group; and the biserial coefficients for each item with every scale scores, for all groups combined.

(b) Mean item responses, with standard deviations and the proportion of respondents scoring 0, 1, 2 and 3 to each item. These are not reported in the thesis, but secondary results using them are reported.

Table 6.1 : Kuder-Richardson coefficients for A-C Scales (decimal points omitted)

(i) Dichotomizing scores nearest to the median

Group :	Scale A	P	O	V	S	C
Zambian Males	62	46	60	57	76	56
Zambian Females	72	30	61	43	83	65
Rhodesian African						
Males	70	61	70	54	77	67
Females	72	67	53	66	78	62
European Males	62	58	74	68	83	70
European Females	66	68	69	63	80	69
All African Males	64	52	64	53	76	60
All African Females	74	56	53	57	79	63

(ii) Dichotomizing scores about 1.5

All African Males	61	60	62	55	71	60
All African Females	62	46	53	56	76	60
European Males	60	63	74	71	71	65
European Females	54	53	67	63	79	68

(c) Mean item responses transformed to deviation scores with respect to each individual's question responses (QD scores).

(d) Correlations between groups for the mean item QD scores.

(e) Group mean scale scores, standard deviations, and frequency distributions, using raw and QD scores.

(f) Group mean scores for each type of event, by scale, using raw and GD scores.

(g) Correlations for each group between A-C scales, and between A-C and I-E Scales, using QD scores; also partial correlations between A-C scales with respect to the I-E Scale.

(i) Internal consistency indices

Biserial correlation coefficients were calculated by first establishing the division point between the responses 0, 1, 2 and 3 which was nearest the median for each group of subjects, and dichotomizing the responses on this basis. The results are displayed in Appendix G. Inspection indicates that the internal consistency of all six scales is moderately good overall, particularly in view of the fact that this is the original version of the instrument. Few coefficients are negative, and these occur mainly in the smaller samples. No item is consistently negative, and few of them are consistently low.

These points are supported by the Kuder-Richardson reliability coefficients reported in Table 6.1. A notable point is that the most internally consistent scale by either criterion is the Supernatural scale.

Further confirmation of the internal consistency and non-overlap of the scales is given by the biserial coefficients calculated (for all samples combined) between each item and each scale total, presented in Appendix H. While not the most sophisticated index of the degree of overlap between scales, a modification of the computer program made this a simple exercise to perform. The results show that none of the items correlates more highly with another scale than with the scale

Table 6.2 : Mean correlations between groups classified by sex, race and country for responses to A-C Scale items (decimal points omitted)

	Scale					
Same-sex groups *	A	P	O	V	S	C
c. Same race, different countries	614	733	701	451	748	685
b. Same country, different races	254	682	692	782	789	819
e. Different races and countries	544	538	712	374	711	822
Overall	471	651	702	536	749	775
Same-race groups						
c. Same sex, different countries	614	733	701	451	748	685
a. Same country, different sexes	800	881	882	929	854	890
f. Different countries and sexes	541	683	698	366	663	671
Overall	652	766	760	582	755	749
Same-country groups						
b. Same sex, different races	254	682	692	782	789	819
a. Same race, different sexes	800	881	882	929	854	890
d. Different sexes and races	228	653	685	771	757	813
Overall	427	739	753	827	801	841
g. Different sexes, races and countries	555	540	737	362	675	840

* For groups summarized, see Appendix D, Section (iii)

Minimum correlation for 1% significance = 590
Minimum correlation for 5% significance = 468

with which it was associated; however it should be borne in mind that the corelation with the correct scale is slightly inflated by the fact that the total score is not corrected by subtraction of the item score. The overall positive bias of these results, despite the fact that some of the scale will later be shown to correlate negatively, is due to the use of raw scores which reflect individual response bias across all items; however, this does not weaken the case for the satisfactory purity of the scales.

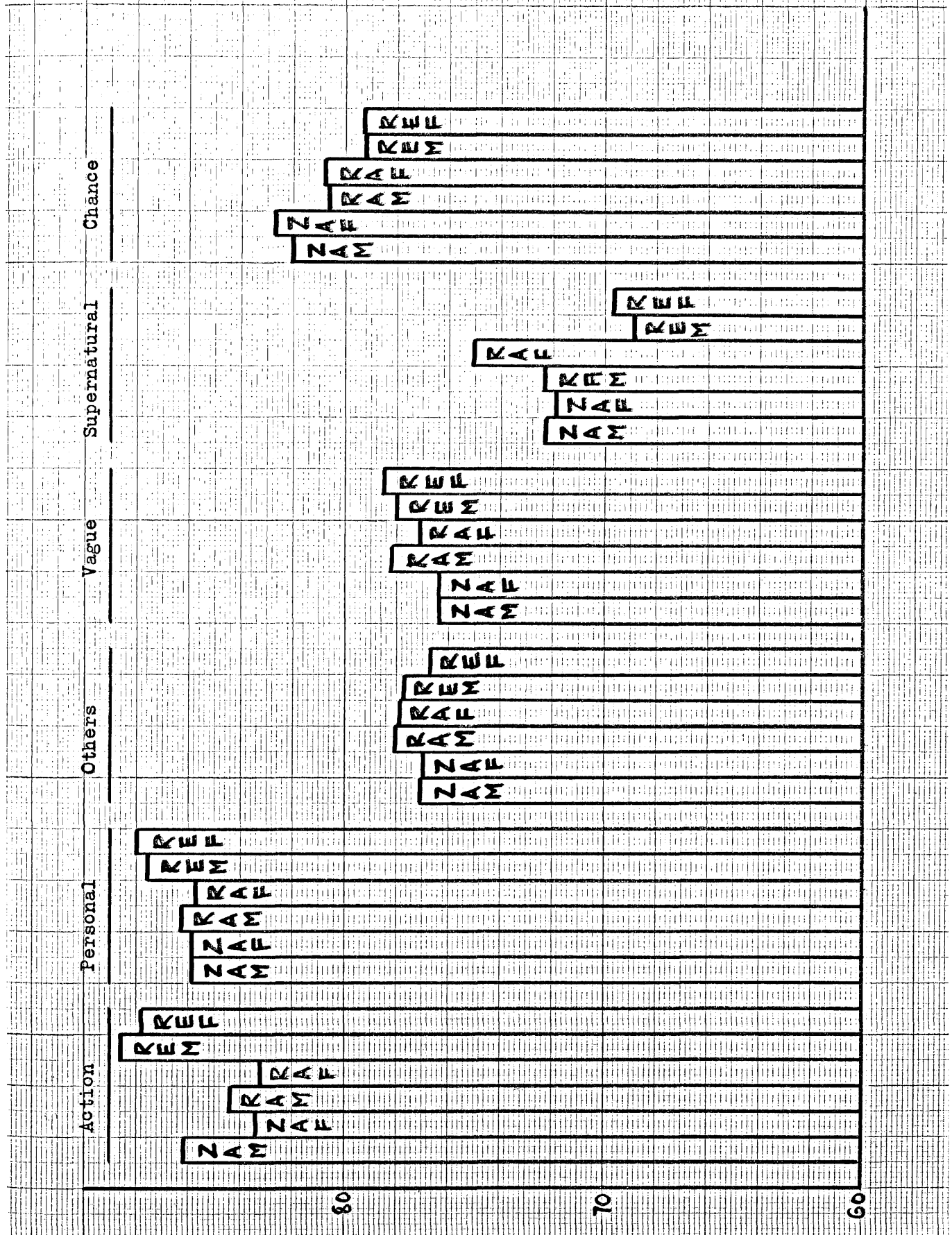
Further analyses of the results were also undertaken, using a dividing point of 1.5 for all items, rather than the point nearest the median, for dichotomizing the responses. While this affected many of the item biserial coefficients strongly, the Kuder-Richardson coefficients remained fairly satisfactory and in some cases increased (see Table 6.1). This suggests that, at least for preliminary analysis of results from the scales, the use of 1.5 as a dichotomizing point should prove satisfactory.

(ii) Mean response to items

As indicated earlier, subject's scores were computed as mean scores and QD scores, and group means calculated from these for various purposes. Group item means are not reported here as they are of comparatively little interest as such. However, intergroup correlations for mean item scores provide a useful indication of the comparability of scales across groups, as demonstrated in Sections (i) and (ii) of Chapter 5. The results of such an analysis for the six A-C Scales are reported in Appendix J, and summarised in Table 6.2. Coefficients vary widely from very low (and statistically insignificant) to very high, but appear to be generally in line with those reported for the I-E Scale in the previous chapter. For Scales A, P and O, the highest overall coefficients are yielded by same-race groups, though the differences are small for the third scale particularly. For Scales V, S and C, the greatest similarity in item responses occurs between groups from the same country.

Figure 6.1 : Group mean A-C Scale deviation scores

(Z : Zambian ; R : Rhodesian ;
A : African ; E : European ;
M : Males ; F : Females)



These effects are also reflected in the various comparisons of sub-categories. Thus we can conclude that response patterns on the A-C Scales change due to cross-racial and cross-national usage more than to cross-sexual comparisons, but no more so on the whole than does the I-E Scale response pattern.

(iii) Group mean scale scores and distributions

Group mean scores and standard deviation based on QD subjects scores are given in Appendix K, and are shown graphically in Figure 6.1. Frequency distributions based on raw subject scores were produced by computer. These are not reproduced here, but inspection of them showed that all are acceptable approximations to the normal distribution; Scales A and P yield are negatively skewed to a slight degree; and Scale S is positively skewed and cut off at the lower tail because of the generally low scores on this scale.

Differences between scale scores over all groups were found to be highly significant (using an analysis of variance method described in the next section). However, since these are raw and not standardized scores, the differences are as likely to reflect the characteristics of the scales as those of subjects; therefore, it cannot be definitely shown, for example, that subjects in general make less use of Supernatural than other types of explanations for events. The evidence is merely suggestive.

Although the responses to the scales by different groups are quite similar, the variance within groups is small and hence a number of significant within-scale differences between groups emerge. These are as follows :

Scale A (Action) : Zambian African Males are higher than both their Female counterparts ($t = 3.46$, $p = 1\%$) and Rhodesian African Males ($t = 2.99$, $p = 1\%$), who are not significantly different from the Females. European Males are the highest group, though not significantly higher than the European Females; however, both are significantly higher than Zambian Males ($t = 5.13$, $p = 1\%$, for males) and Females ($t = 4.46$, $p = 1\%$, for females). Thus, Europeans are most likely to use Action explanations, with Zambian Males intermediate between them and the other African groups.

Scale P (Personal attributes) : European Males and Females are also highest on this scale, with Rhodesian Males intermediate. The difference between the male groups is not significant, but European and Zambian Males are significantly different ($t = 2.88$, $p = 1\%$). The two African Male groups do not differ significantly. European Females are significantly higher than either of the African Female groups ($t = 2.67$, $p = 1\%$, for the smaller difference).

Scale O (Others) : This scale shows the most uniform results, the only significant differences being between Rhodesian African Males and Zambian Males ($t = 2.17$, $p = 5\%$) and between Rhodesian African Females and European Females ($t = 1.94$, $p = 5\%$).

Scale V (Vague Social Forces) : This scale also yields similar results for all groups, though both Rhodesian Male groups are higher than Zambian Males ($t = 2.80$, $p = 1\%$, for the smaller difference), and European Females are higher than Zambian Females ($t = 3.93$, $p = 1\%$) though they are not significantly higher than Rhodesian African Females.

Scale S (Supernatural) : The two noticeable features of this set of scores are the low scores of both European groups (all comparisons being significant beyond the 1% level), and the high scores of the Rhodesian African Females, who are significantly higher than their Zambian counterparts ($t = 2.09$, $p = 5\%$), and nearly significantly different from the Rhodesian African Males ($t = 1.95$).

Scale C (Chance) : European Males are significantly lower than the Zambian Males ($t = 4.19$, $p = 1\%$) and almost significantly lower than Rhodesian African Males ($t = 1.97$); also, European Females are lower than Zambian Females ($t = 4.29$, $p = 1\%$), though the difference between them and Rhodesian African Females fails to attain significance ($t = 1.57$). The Rhodesian African Males are also significantly lower than their Zambian equivalents ($t = 2.86$, $p = 1\%$), though the difference between the female groups does not attain significance ($t = 1.58$).

It should be noted that, because deviation scores are used, group means on different scales are complementary to one another. Since the European group is higher on the Action and Personal scales and to a slight degree on the Vague scale, the opposite trend has to be shared by the remaining three factors. Inspection of the distribution for raw scores (which are biassed by group response differences), however, show that while the European groups do not differ markedly in absolute response to the Action and Personal scales, their responses to the Supernatural and Chance scales retain the same relationship to those of the African groups as when deviation scores are used. We can conclude, then, that Europeans are less likely than Africans to make use of Supernatural and Chance explanations for the kinds of events used in the A-C Scales.

(iv) Explanations for different types of event

The design of the A-C Scales enables subtotals of the scale scores to be computed on the basis of different types of event. Events are classified in three ways: Academic/Social/Political/General, Personal/Impersonal, and Positive/Negative. Subtotals for each of these types, for each subject on each of the six scales, were first calculated, both from raw scores and from deviation scores. These subtotals were then used as data for further analyses, including the calculation of means and analyses of variance. Mean responses to different item types on each scale, based on deviation scores, are given for each group in Appendix L, and are represented graphically in Figure 6.2.

An initial analysis of variance was attempted using raw scores. The analysis used, given by Edwards (1968, pp. 286 - 292), enables the variance due to repeated observations on the same subject to be separated from that due to treatments and groups. In the present example, each A-C Scale was regarded as a separate treatment, and the subtotals for event types were regarded as repeated observations on the same subject. Thus, a three-way analysis of variance table, with inter-actions, was calculated for Event type, by Scale, by Group.

Figure 6.2 : Group mean A-C Scale deviation scores, by types of event

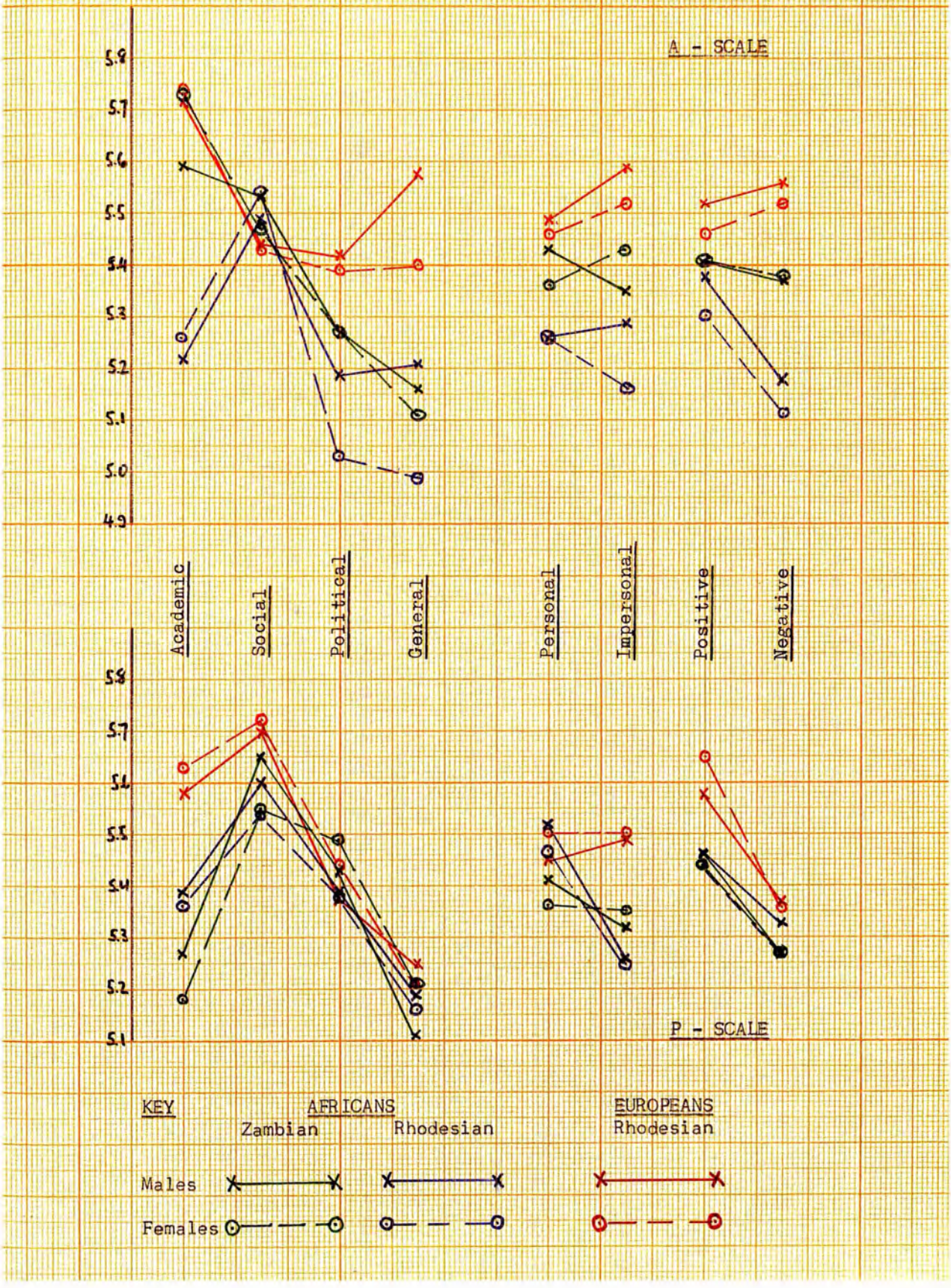


Figure 6.2 (continued) : Group mean A-C Scale deviation scores, by types of event
(for key see p. 121)

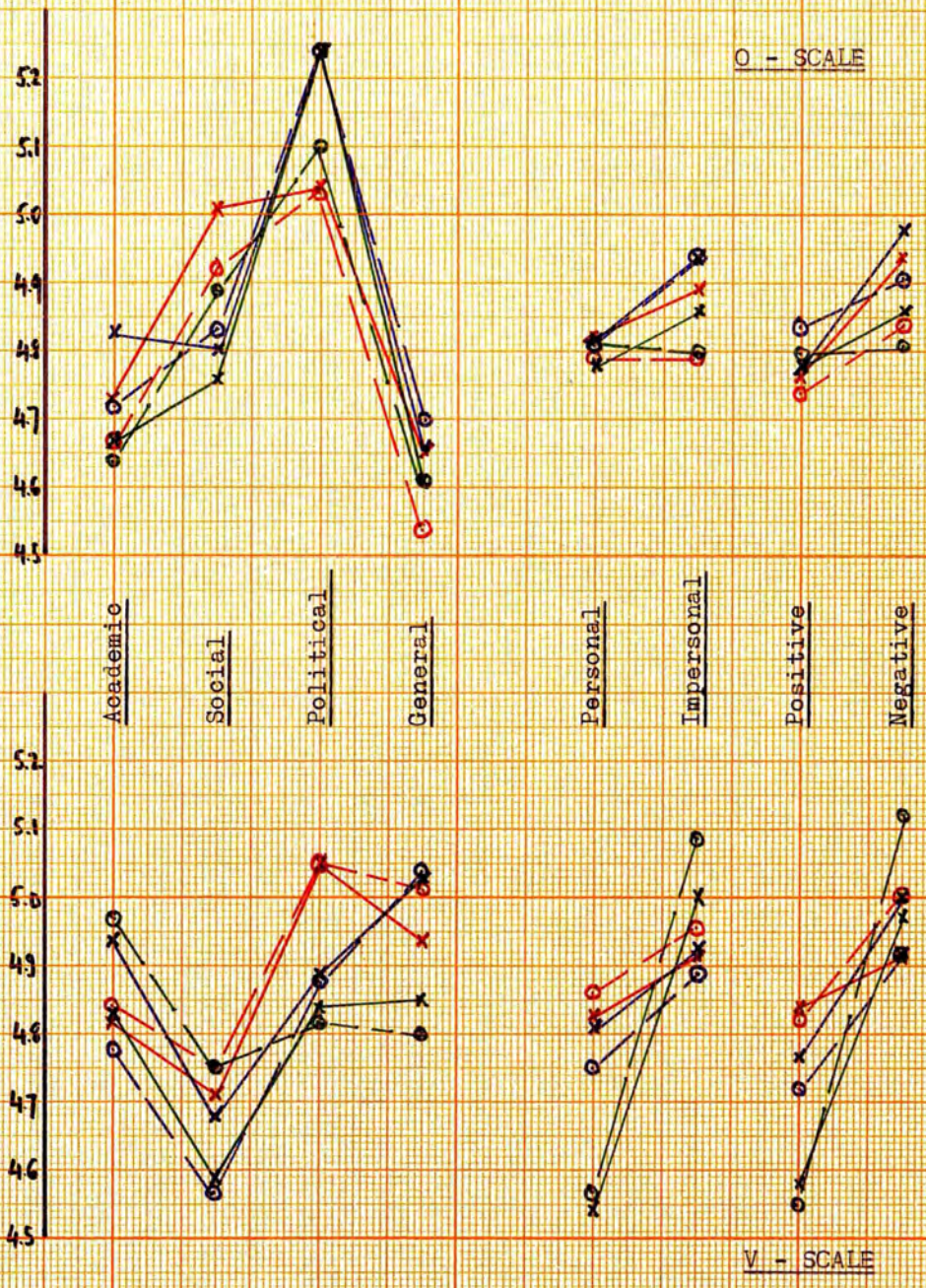
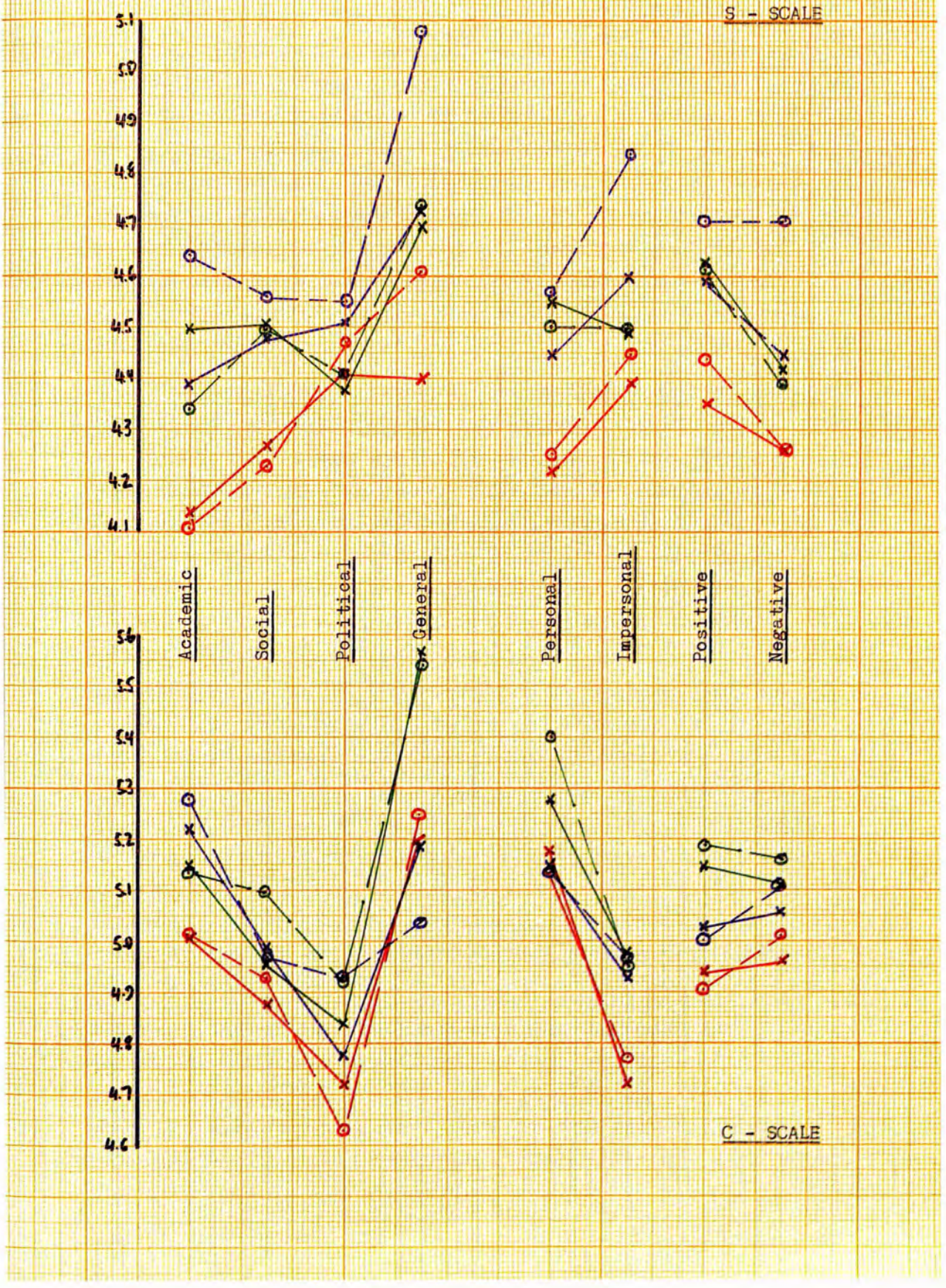


Figure 6.2 (continued) : Group mean A-C Scale deviation scores, by types of event
(for key see p. 121)



In order to satisfy the requirement of independent cells, each subject contributed only one set of observations, i.e. only the observations on one of the scales, or one-sixth of his available data. Since, for the sake of simplicity of computation, equal numbers of subjects were included in each cell, the numbers of subjects per treatment was restricted to the largest integer quotient of six possible in the smallest group being included in the analysis. This severely restricted the analyses which included the small African female groups, so they were considered as one group. A sample of subjects was then selected as random from each group up to the maximum size possible and 'allocated' to one of the 'treatment' (i.e. scale) cells at random.

A variety of comparisons of groups was then undertaken. Three effects emerged in all analyses as highly significant: treatment (scale), stage (event type), and the treatment by stage (scale by event type) interaction. We have already dealt with intergroup differences between scale responses in the last section; the group effects do not emerge as significant in the overall analysis of variance despite the significant differences between means, considered two at a time, observed earlier. The significant differences between event types indicate that the use of deviation scores in other analyses is justified, since subjects tend to find the different kinds of question differentially plausible and respond accordingly. The interaction between scales and event types (for deviation scores, thus removing the main effect due to event type) are represented as means in Appendix M. However, since no prior standardization of items was done, these interactions merely indicate that subjects responded differentially to items as well as to event types, and do not indicate any common preferences in explaining different event types.

Inspection of Figure 6.2 indicates that the reason for the failure to find significant group effects and interactions in the analysis of variance with raw scores, is (apart from the small cell sizes which had to be used) the fact that differences between groups on scale-by-event interactions occur only on some scales and for some classifications of events. For the

Academic/Social/Political/General classification of events, groups have noticeably different response patterns only on the Action and Supernatural scales (the Vague Social Forces scale showing a partial interaction). For the Personal/Impersonal distinction, interactions appear on the Action, Personal, Others, and Supernatural scales, while for Positive/Negative distinction only the Action and Chance Scales show group differences. A two-way version of the previously described analysis of variance (Edwards, 1968, pp. 271 - 280) was used to test these effects. Since only one scale was considered at a time, the cell size equalled the number in the smallest group of subjects. Proceeding as before, the effects mentioned in the above were found significant to at least the 5% level.

(v) Correlations between A-C Scale scores

Product-moment correlations between the six A-C Scales were computed using deviation scores (to remove response bias), and are reported in Appendix L. Partial correlations taking into account the common correlations with the I-E Scale scores (reported in the next section) were also calculated and reported in Appendix L. Figure 6.3 shows graphically the pattern of partial correlations.

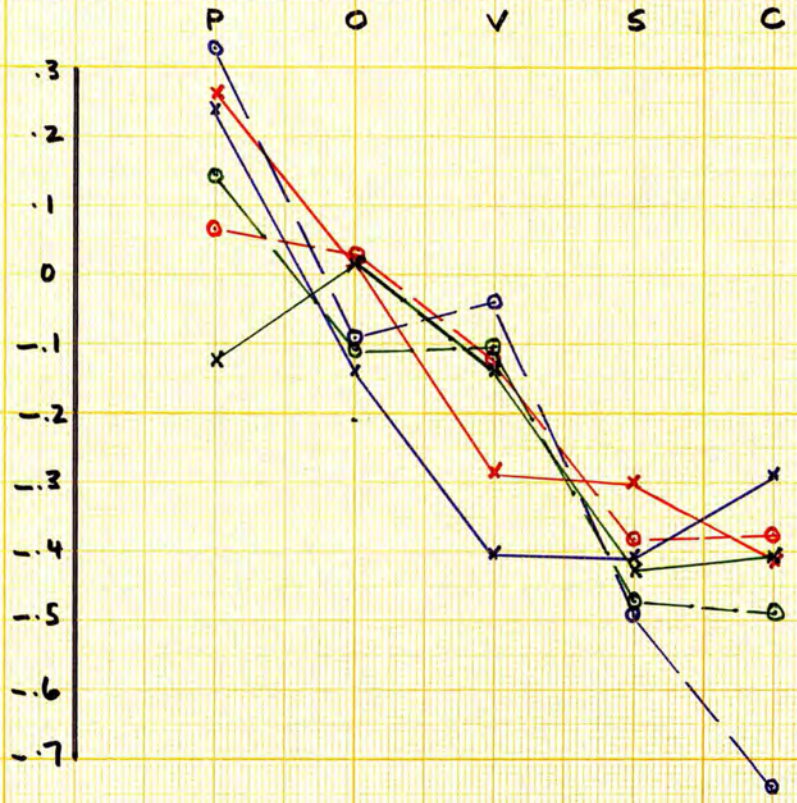
The results of the analysis of the Action, Personal, Supernatural and Chance scales are of particular interest. It can be seen that the Action and Personal Scales correlate positively with one another for all groups, though the size of the correlation varies from slightly negative to moderately high. This implies that causal influences residing in the self, whether classified as active or passive, tend to be regarded as similar. The correlations of the Action scale with the C-Scale are essentially zero, and with the V-Scale negative, though the range is from very low to moderate in the latter case. Correlations with both Supernatural and Chance scales are roughly equally negative to a moderate degree, and fairly consistent between groups. Thus the A and P scales together form one end of a continuum, with the S and C scales at the other end, the V scale being more similar to the latter group.

The Personal scale, on the other hand, except for a moderate and consistent negative correlation with the C scale, shows a more varied pattern between groups, suggesting that further analysis of the meaning of fixed personal attributes for different people might yield useful information about the effect of this factor in decision making and causal attributions. The Action and Personal patterns show no racial or sexual effects of note.

The Supernatural scale correlates negatively with Action (more so for Africans) and to a lesser degree with the Personal scale (females in each category correlating more strongly); the Chance scale also correlates negatively with the Action (females more strongly) and with the Personal scales. The correlations between the Supernatural and Chance factors, however, vary from moderately positive (for the two African female groups) to moderately negative for the European Males. The mean correlation for females is positive, and negative for males; Europeans are more negative than Africans as a whole, though the largest groups (African males and European females) have essentially zero correlations. These results, which have no readily available explanation, also suggest the need for further research on the relationship between supernatural and chance explanations for different types of subject.

Correlations between the Others and Vague Social Forces scales are essentially zero for females but slightly negative for males. The V scale also correlates negatively with the Action and Personal factors for males, but is essentially uncorrelated for females. However, it also correlates negatively with the Supernatural scale (particularly for the female groups). Correlations with Chance are negative for the O-scale, and range from moderately negative to moderately positive for Vague Social Forces (females being more negative). These results suggest that the O and V scales reflect factors other than a basic internal - external factor, and that responses to such factors are influenced by the sex of the respondent.

Figure 6.3 : A-C Scale intercorrelations
(for key, see Figure 6.2, p. 121)



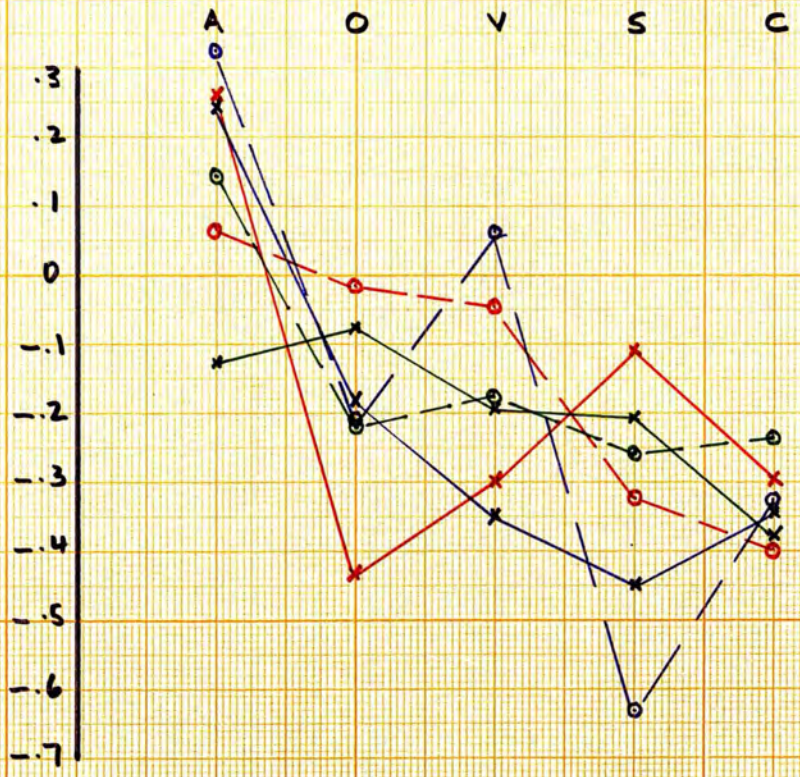
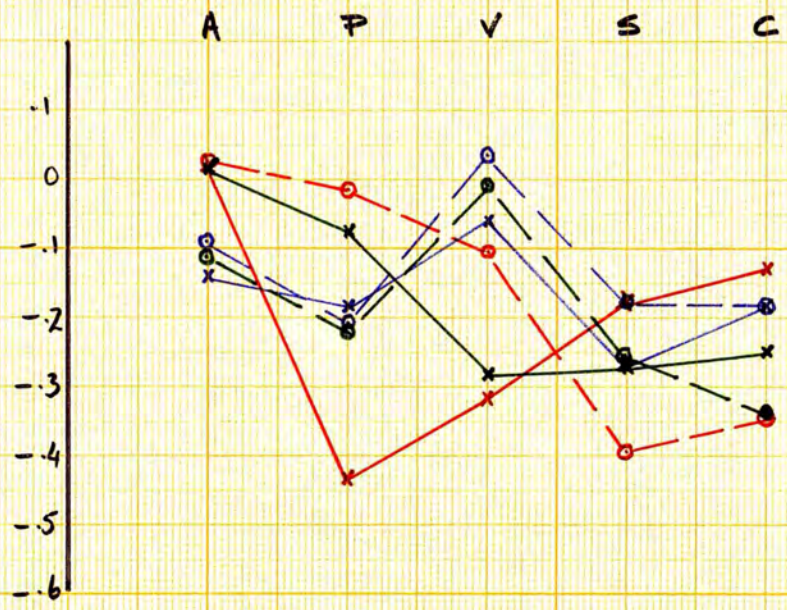


Figure 6.3 (continued) : A-C Scale intercorrelations
(for key, see Figure 6.2, p. 121)



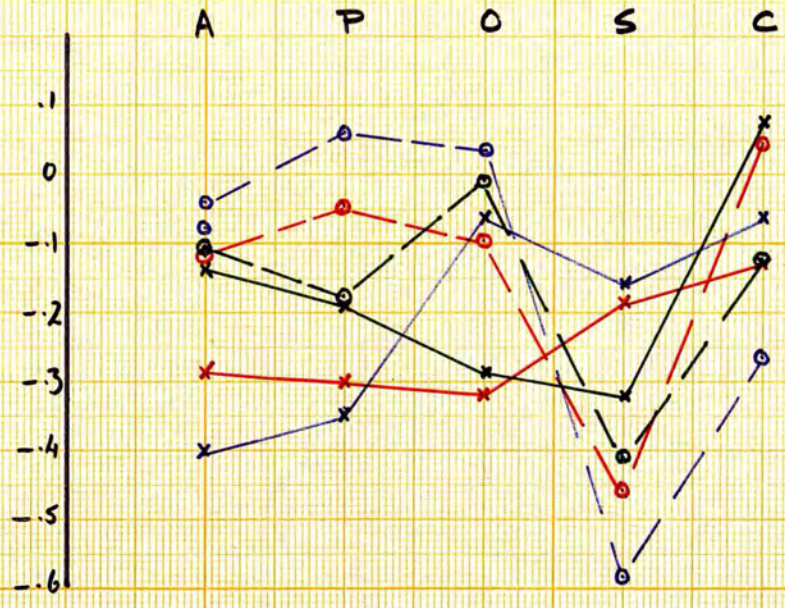
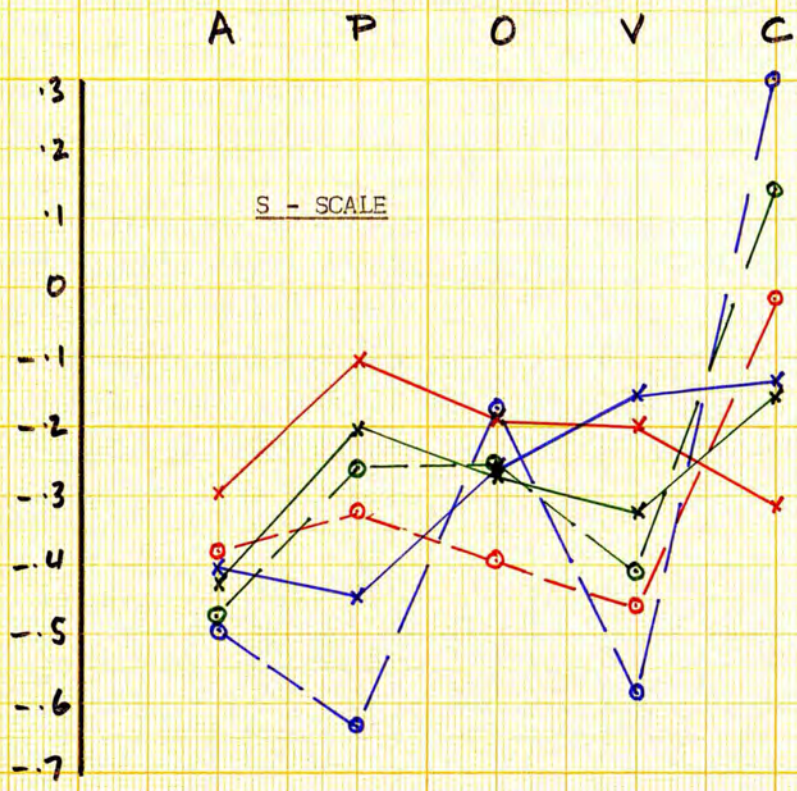
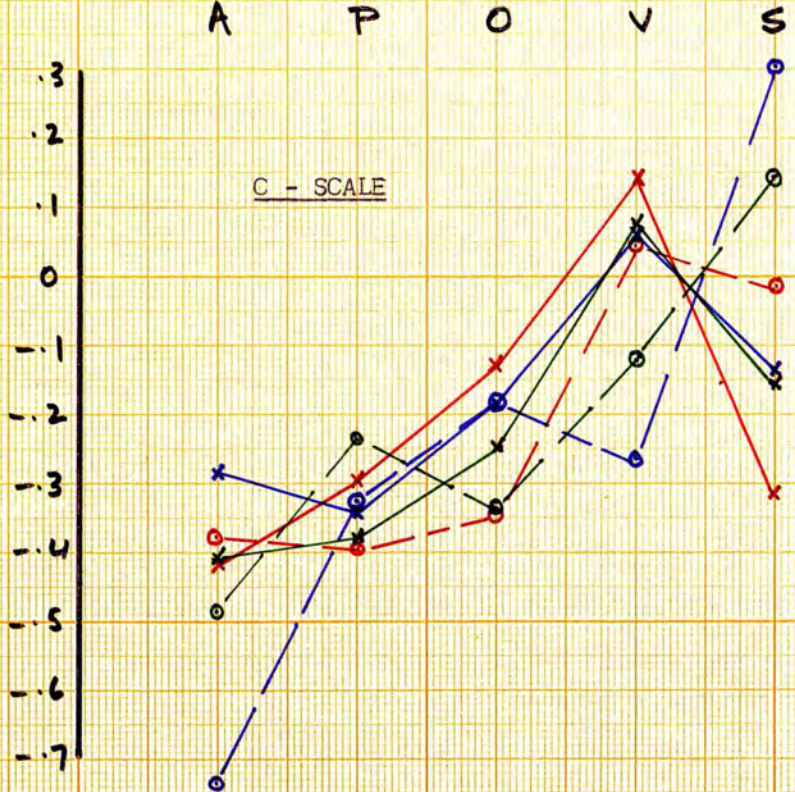


Figure 6.3 (continued) : A-C Scale intercorrelations
(for key see Figure 6.2, p. 121)





The overall pattern of correlations between A-C Scales is somewhat complex, but is consonant with the observation, made at various points earlier in this thesis, that the meaning of internality if fairly clear and does not vary much between groups, while externality has more diverse meaning, more likely to be affected by cultural and other factors such as sex. The results do not however, yield unequivocal evidence about the relationships between aspects of externality, in particular the specific hypothesis that the O, V and S factors are used as alternative explanations for events by different individuals, though the generally negative correlations between these factors suggest that it is a tenable hypothesis.

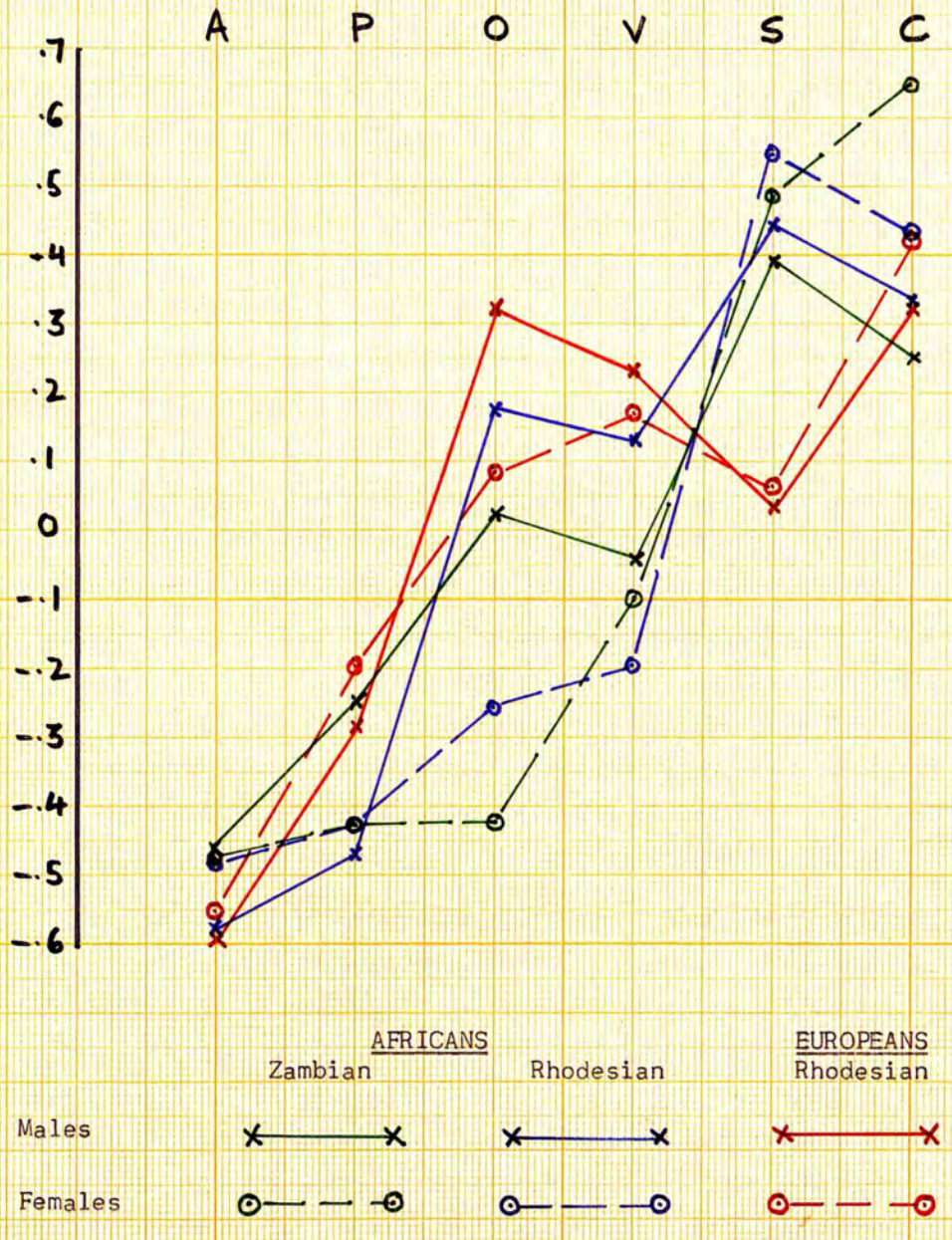
Table 6.3 : Correlations between I-E Scale scores and A-C Scale scores (deviation scores) (decimal points omitted).

	A-C Scale					
Group	A	P	O	V	S	C
Zambian Africans						
Males (n = 141)	-459	-247	023	-040	390	252
Females (n = 32)	-475	-425	-426	-100	487	651
Rhodesian Africans						
Males (n = 74)	-574	-467	175	135	444	336
Females (n = 25)	-480	-425	-256	-197	549	436
Rhodesian Europeans						
Males (n = 41)	-592	-283	328	235	034	321
Females (n = 156)	-550	-197	083	170	062	422

(vi) Correlations between the I-E Scale and A-C Scales

Product-moment correlations between subjects' scores on the modified Rotter I-E Scale and normalized scores on the A-C Scales are presented both numerically in Table 6.3 and graphically in Figure 6.4, since these results are of particular interest to the investigation and to the hypotheses about the nature of

Figure 6.4 : Correlations between I-E Scale scores and A-C Scale scores



locus-of-control given in the first chapter of this thesis. The numbers in the groups are slightly lower in some cases than for the I-E Scale and A-C Scales alone, as some subjects failed to complete both properly.

The first striking feature of the graph is the high degree of similarity between all groups in the correlations with the Action scale, and the second is the considerable agreement on the correlations with the Chance scale. The first confirms again the proposition that the locus-of-control construct is unitary at the internal end; the comparatively small range of correlations with the Personal scale (previously shown to correlate with the Action scale) is further substantiation of the point. The consistent correlations with Chance demonstrates that, for the I-E Scale at least, this variable is a significant anchoring point for the external end of the I-E Scale. However, for most of the African subjects, the highest external correlations are with the Supernatural factor, as expected from our earlier discussion of African culture; only the Zambian Females deviate from this pattern by showing a higher correlation with Chance, though their correlation with the S scale is also high. On the other hand, the Europeans show very low and insignificant correlations with the Supernatural Scale (a fact which cannot be attributed to reduced variance associated with their lower Supernatural scale scores; Appendix K shows that the S-scale variances are in fact the highest for all groups).

Correlations with the Others and Vague Social Forces scales are more varied, and range from moderately negative to moderately positive, half of them being below statistically significant levels. This lends further support to the need for a more searching analysis of the meaning of these scales. One can observe, however, that for both of these scales males, and Europeans, are more external; furthermore, males are more external on the O-Scale than the V-Scale while the opposite is true for females. One possible interpretation of this finding might be that females, and Africans, feel more in control of specifically social causal influences on their lives than males generally, and Europeans in particular, do.

(vii) Summary and discussion

The instrument used in the investigations reported above was designed to answer a number of questions, only some of which are pertinent to the present thesis. In particular, it was designed to expedite the investigation of various possible interactions between variables affecting subjects' attributions of causality for events in their lives. Thus, items were chosen not primarily with the internal reliability or validity of the complete scales in view, but in such a way as to fit into a balanced scheme of the kind associated with analysis of variance. Rather than providing a large number of possible items to be reduced by reference to their empirical scalar characteristics, as is usually done, certain decisions were taken as to the particular type of item which would be of most value for testing certain hypotheses about locus-of-control attributions. These were then assembled as a set of inter-ralated scales on the basis of face validity (the judgements being made almost entirely by the author with the help of colleagues). Furthermore, no pre-testing of the instrument was undertaken, and the exercise reported in this thesis comprises both a check on the functional characteristics of the scales and an empirical cross-cultural investigation with them.

Consequently, it is interesting to note that a measure of success can be claimed for both aspects of the investigation. First, evidence has been presented indicating that the internal consistency data on all six scales can be regarded as satisfactory, and not unlike comparable statistics for Rotter's I-E Scale. Item biserial correlations (using either the responses dichotomised about the nearest point to the median for the item, or about an arbitrary fixed point for all items) are high enough to justify considering the scales as measuring fairly unitary variables, and this conclusion is supported by the Kuder-Richardson indices. Furthermore, none of the items correlated more highly with another scale total than its own. Unfortunately, it was not practicable to obtain test-retest data, nor are there in existence any marker tests other than the I-E Scale which could lend further support

to these claims, nor were more sophisticated multivariate analyses of the factorial contents of the scales possible. However, it seems justifiable to proceed on the basis that full-scale scores are satisfactory measures of various beliefs about causal effects in common events.

On the other hand, evidence is adduced which shows that cross-cultural comparisons using these scales is subject to the same kinds of influence as in the case of cruss-cultural application of the I-E Scale. For the first three scales (Action, Personal, Others) inter-group correlations on mean item responses were highest for same-race groups, while for the remaining three scales correlations were highest between groups from the same country, thus indicating that comparisons between mean scores are more valid between groups of the same race and country. It seems likely, however, that it will be difficult to find scales which are not subject to this effect to some degree, and the size of correlations indicate that cross-cultural comparisons are not wholly innappropriate.

The mean group score comparisons for the six scales fail to support the predictions made earlier, to the effect that African and European groups would show little difference on the Action and Personal scales, but would do so on the other scales, African favouring Other and Supernatural explanations, and that Europeans would make more use of Vague Social Forces and Chance explanations. The results indicate that Europeans differ significantly from Africans on the first two scales, being higher in both cases. On the Other and Vague Forces scales, however, inter-group differences are slight and mostly insignificant. Partial support is given the hypotheses by the fact that Europeans score significantly lower on the Supernatural scale; on the other hand, the expectation that Europeans would make more use of the Chance explanation is directly contradicted, as their scores are significantly lower than those of the African groups.

Evidence is also produced that the groups differ in the relative importance given to explanatory factors for various types of events, particularly with the Action and Supernatural scales. The exact nature of these differences is of little importance for the present thesis, particularly as results for sub-scales

cannot be regarded as very reliable. However, it is important to point out that such a result indicates the sensitivity of the scales to the type of event which is being explained, and this should be taken into account both in interpreting the present results and in future attempts to construct scales of the same kind. Such an effect has been shown to be a prominent feature of the I-E Scale (see Chapter 1, Section vi). In the case of the I-E Scale, the effect is relatively uncontrolled, since the different types of event are confused and unequally represented. The design of the A-C Scale offers the possibility of a greater degree of control and accurate measurement of such interactions.

The gross responses of subjects to different explanations for various event types may be regarded as a relatively crude index of the status of these explanations in the subjects' cognitive structures, since they are most likely to be affected by superficial characteristics of the questions and by social-desirability response sets peculiar to the cultural group. As is usually assumed in mental testing, a more fundamental guide to the way in which subjects structure the world is likely to be given by the correlations between measurements of different kinds. In the present instance, two sets of such correlations are relevant: those between the A-C Scales, and those between the A-C Scales and the I-E Scale.

Within the A-C Scales the pattern of correlations shows the Action and Personal factors to be positively correlated with each other to various degrees from low to moderate, and negatively correlated with both Supernatural and Chance scales, which have a range of intercorrelations with each other ranging from moderately positive to moderately negative. No racial, national or sexual trends in these results can be discerned. Turning to the correlations of these scales with the I-E Scale, fairly clear patterns emerge. Both the Action and Personal Scales, in that order, are negatively correlated. The range of correlations is fairly small, particularly for the Action scale, and no discernable differances emerge between race or sex groups. This confirms two general hypotheses, the first

(emerging from a review of work on locus-of-control) being to the effect that the internal end of the construct is quite definitely fixed and refers primarily to the individual's effort-effectiveness, and the second (emerging from our discussion of African culture) to the effect that cultural differences should not have much influence on responses to the Action and Personal factors, since they arise from individual experiences rather than cultural interpretations. These results also seem to indicate that a distinction can be drawn between the latent meaning of the Action and Personal variables in terms of their relationship to generalized locus-of-control, and the readiness with which they are used as explanations, in which cultural differences emerge.

The results for the Personal scale in relation to both the Action and the I-E Scale requires special mention. In the conceptual analysis of locus-of-control advanced in the first chapter, it was hypothesized that a factor called Task Competency would emerge independently of Effort-Effectiveness in an analysis of locus-of-control. The Action scale can be identified with Effort-Effectiveness. Similarly, the Personal scale can be seen to have properties in common with the Task Competency construct, though they are not identical (and the scale was not deliberately constructed with this in mind). Both Effort-Effectiveness and Task Competency are expected to correlate with locus-of-control expectancies, and the parallel between those constructs and the A and P Scales is given credence by the fact that these scales both correlate negatively with the I-E Scale (which measures externality). However, the A and P scales also correlate positively with one another, which would not be the case if they measured independent factors. Various explanations of this can be offered, the most obvious of which is that the A-C Scales are not pure enough for subjects to distinguish them as independent effort-effectiveness and competency constructs. It may be that these constructs would be difficult to distinguish from one another in any situation where attributions of causality for events in general are required, even were the questions more specifically designed with the distinction in view. To put it another way, only where a particular subject is accounting for a specific

event will a distinction be made between the effects on performance outcome of effort and ability. The data collected with the A-C Scales cannot, therefore, provide more than suggestive evidence as to the independence to the Effort-Effectiveness and Generalized Competency constructs.

Turning to the correlation between the I-E Scale and the Chance Scale, it can be seen that a moderate positive relationship prevails. This is to be expected in view of the proportion of items in the I-E Scale which refer to chance and luck. It also confirms the accepted meaning of externality as a belief in chance and luck. However, the even higher correlations with the Supernatural scale for Africans indicates that the I-E measure has different meanings across cultural groups. The difference between the Europeans and Africans in this respect is predictable from a general knowledge of the cultural belief systems, Africans generally giving more emphasis to personalized forms of causality in natural events.

The relationship between the Chance factor and the I-E scores do not provide any firm support for the analysis of locus-of-control proposed earlier, but can be regarded as suggestive. The third variable in the analysis is the Range of Uncertainty, which can be identified with a belief in chance in one sense, namely that events are unpredictable. The fact that the correlations of the Chance and I-E Scales are similar for all groups is consonant with a Range of Uncertainty about events, which is more likely to be a function of personal experience than of cultural factors. But in respect of other meanings of chance which are of particular relevance to the thesis, e.g. the notions that one can possess luck, or that one can rely on the alternation between chance outcomes even in the short run, the data are irrelevant. The possession of luck was not included as an aspect of the Personal Attributes scale (though it might be instructive to do so); however, the consistent moderate negative correlations between the P and C scales may be significant in this regard.

The results from the Others and Vague Social Forces scales are more difficult to interpret. The ranges of correlations with the I-E Scale are relatively large, particularly for the

O-Scale, and unexpected sex and race differences emerge. The correlations between these scales, and with the other A-C Scales, shed little light on the matter, and it is suggested that further investigation to clarify their status and to determine whether factors other than an internality - externality factor, or the components of internality - externality proposed in this thesis, are involved. However, the generally negative correlations holding between these two scales and the Supernatural and Chance scales could possibly be interpreted as supporting the notion that they tend to be used by subjects as alternative explanations for events, as suggested in the first chapter; but the lack of the expected cultural differences in the way the O and V Scales are used could be regarded as contrary to such an interpretation.

The conclusion which can be drawn from the foregoing results and discussion is that the A-C Scale can be regarded as a useful instrument for the cross-cultural investigation of the locus-of-control construct, and the results from it provide some support for the formal and informal hypotheses generated in earlier chapters. Such a conclusion, however, anticipates a more thorough review of the argument so far, This will be attempted in the final chapter.

Chapter 7

REVIEW AND CONCLUSION

This thesis is about the meaning of locus-of-control. There are two reasons for being dissatisfied with present conception of this variable. The first is that, despite a growing body of evidence that locus-of-control as a construct is related to motivational constructs, and is empirically inseparable from motivational variables, no unifying model of locus-of-control and motivation has yet been proposed which takes full account of all the ideas and findings which have appeared in the literature. The second reason for dissatisfaction is that, despite considerable evidence of complex relationships between measures of locus-of-control and other personality variables, and evidence that the construct as it is used is not unilinear, no stable measure of locus-of-control has emerged which does justice to these facts. It seems obvious that the two approaches to the field are inter-dependent, however; it is unlikely that a satisfactory theory can emerge without more concise data about how locus-of-control is related to personality and behaviour, while the development of satisfactory measures awaits a better understanding of what it is that is being measured. In this thesis a remedy is provided for both sources of dissatisfaction. First, a new analysis of locus-of-control is proposed which itself generates a number of interesting predictions, and which can be incorporated in a general theory of task motivation or decision making. Second, a new measure of locus-of-control is put forward and subjected to some empirical testing in a population whose cultural diversity includes features of particular relevance for locus-of-control. This measure involves six interlocking scales, which, though not directly dependent on the theoretical analysis, enable some suggestive parallels to be drawn between the two types of analysis of locus-of-control.

(i) Locus-of-control and motivation theories

There seems to be little evidence to contradict the growing certainty that locus-of-control is a valid construct. A cursory inspection of issues of Psychological Abstracts shows a stream of investigation being reported each month which makes use of locus-of-control measures and ideas. Most of these are successful in the sense that statistically significant correlations in the expected directions are found between measures such as Rotter's I-E Scale and a large variety of behavioural and personality indices. This very success, however, might be seen as disquieting, since it may reveal a looseness of definition (conceptual or operational) which will eventually prove fatal. More immediately, it can be pointed out that most measures of locus-of-control, and the theoretical background from which they spring, refer to generalized expectancies of control. While the evidence does seem to support such a general applicability of the theory to diverse situations, mention was made in the first chapter of a number of studies where somewhat unexpected results have had to be accounted for by using ad hoc notions outside the basic theory. Often these ad hoc explanations involve motivational or emotional constructs. For example it has been found that expectations tend to be affected by what the subject wants, and by needs to avoid anxiety, and measures of locus-of-control have been found to correlate with socially determined needs such as social desirability. Other investigators (e.g. Gurin, 1970; Lao, 1970) have also proposed that the existential status of a subject (his race or sex) influences the structure of locus-of-control beliefs and not just their strength.

On the other hand, our discussion of some of the work on task motivation, notably that on achievement need and anxiety, has revealed to an even greater extent an overlap with cognitive and expectational variables. At the more elementary levels, such as McClelland's original work on nAch, such variables were not explicitly considered. However, it can be seen that they were implicit. The way in which nAch is measured, using TAT techniques, involves a consideration of both the affective value of achievement goals for the subject and also the environmental and personal factors

which determine their attainability. Specifically, nAch theory assumes that desirable goals are attainable through the individual's striving or effortful behaviour. The doubtful validity of nAch measures, which has been pointed out by a number of critics in the last few years, can be attributed to the failure of these assumptions of internal control to hold true (in addition to the questionable reliability of the measuring scales). A recent paper (Wolk and de Cette, 1973) has shown that nAch only produces its expected results when subjects are also internally controlled.

Atkinson's (1957, 1964) more sophisticated version of need achievement theory takes explicit account of an expectational factor. This factor is the subjective probability that success (or failure) will occur in a particular task, expressed as a decimal fraction. The higher the expectation of success, the more will the subject feel motivated by need for achievement (or hope of success), and the lower the success expectation the more inhibited is the subject by anxiety or fear-of-failure. However, the particular value of the goal is also considered as a function of success/failure expectations, by assuming that 'difficult' goals have greater incentive value, and 'easy' goals create a greater fear-of-failure since to fail on an easy task is more shameful. The theory has received a great deal of attention, but fails to predict or explain all the phenomena within its range without recourse to special arguments.

It is proposed in this thesis that the main reason for this failure is the over-simplification of the expectational dimension involved in the use of probability of success. Only in a pure gambling situation is a subject likely to compute his chances of success as a probability coefficient or ratio (and a casual knowledge of gamblers is sufficient to suggest that they very rarely believe that outcomes are purely a matter of chance). For any situation in which a subject feels he can influence the outcome in any way, chances of success are likely to be perceived as some function of the strategy used, the effort invested, and the propitiousness of the circumstances surrounding the attempt. Thus

any theory of motivation which attempts to use expectancy as a variable must be able to take account of such determinants. Locus-of-control theory does attempt such an account, but is difficult to relate the locus-of-control dimension to the other variables which are also necessary to include in a theory of motivation. Feather's (1968a) suggestion, that a further locus-of-control index be added as a fourth element in the Atkinson formula, compounds the inherent weaknesses in Atkinson's model, while failing to encompass the complexity of expectations.

The case for a comprehensive theory of task motivation, incorporating the kinds of concepts and data accumulated by both locus-of-control and affective-motivational studies, has been finding increasing support in recent years. This support has come from a variety of workers, but more particularly from those involved in industrial and organizational psychology, who have also produced a substantial proportion of the empirical support for existing models. The formulation put forward in this thesis attempts to take account of the need for a practically useful model for applied purposes while not becoming tied to any particular field of application. The example of a student faced with the comparatively complex set of demands of study, course performance and examinations has served as a guide in the author's thinking and in the thesis. Also, the locus-of-control measure introduced in the thesis is specifically oriented to the college environment.

(ii) Tasks, decisions and motivated behaviour

The formulation of a model of task motivation depends on the acceptance of a number of assumptions and definitions. The first of these refers to the nature of the task itself. The development of locus-of-control theory and its establishment as a personality variable has drawn attention away from original and fundamental ideas about it. The distinction drawn in early work between 'chance' and 'skill' tasks, and the need to break down complex behaviours into such specific tasks, has not been sufficiently exploited. In this thesis, the task is treated as the fundamental unit of ongoing behaviour. At the level of analysis considered appropriate for most treatments of locus-of-control, that is the

level at which individuals are capable of some degree of conscious insight into the parameters affecting their behaviour, the task is defined as the period from the apperception by a subject of motivational or situational stimuli requiring a particular type of behavioural response, through a phase of establishing mental parameters which determine the nature of the response, to a decision involving the initiation of the behaviour. Once the behaviour has been initiated it is largely autonomous (and beyond the concern of this analysis), but information is fed back to the system which results in the apperception of a new situation, requiring fresh parameters and a further decision (which may result in a continuation of the behaviour or the initiation of new behaviour).

Two aspects of this definition of the task must be emphasised. The first is that the task can be decomposed into stages or phases. Leaving aside the final behavioural phase, the other two phases are of particular relevance for the argument. The preparatory or pre-decisional phase has received most attention in locus-of-control and motivation theory to date. During this phase various parameters, including expectancy and evaluative parameters to be discussed later, become established. In the following decisional phase, the value of these parameters result in a decision being taken to trigger a particular sequence of behaviour or not. The processes involved in these two phases are distinctly different from one another, a point which has generally not been recognized. Current theories of motivation tend not to distinguish between the two stages, and to assume that behaviour is being continuously adjusted in response to the continuously varying values of the relevant motivational parameters. This seems to have contributed to the difficulties encountered by existing theories, particularly the difficulty of giving a clear account of the interaction of expectational parameters such as locus-of-control and affective-motivational ones such as nAch and anxiety. To put it another way, conventional motivation theories assume that the brain acts like an analogue computer. The proposition advanced here is that the process is more like that of a digital computer equipped with a program of discrete steps, or decisions. This formulation appears more in keeping

with the nature of the cognitive processes involved in expectancy calculation. However, an analogue model may represent the affective component more adequately. It seems to the author that the complete model of task motivation offered in the thesis would in fact be most adequately simulated on a hybrid analogue-digital system.

Returning to the nature of the task, a second feature is its cyclical arrangement. Behaviour is divided into a sequence of tasks, in each of which the phases are repeated, generating fresh parameters and decisions on each occasion. Tasks also overlap, in that the preparatory phase of one is concurrent with the execution phase of the previous one. The periodicity of this sequential process is a matter of conjecture. It may be, as in a computer, that the cycle time is a fixed characteristic of the individual. It seems more likely, however, that it varies according to internal stimuli and external demands, shorter cycle times being manifest in intensive, complex behaviour with many changes of direction. This periodicity may provide part of the data for the subjective time-assessment system insofar as intervening activity influences the perception of lapsed time.

It must be pointed out, though, that the issue of periodicity cannot be isolated from the level at which the task is defined. In this connection it is pertinent to relate the idea of the task to the concept of the Plan put forward by Miller, Gallanter and Pribram (1960) in their book Plans and the Structure of Behaviour. They define the Plan as a program guiding a particular type of behaviour. It in turn comprises TOTE ("test-operate-test-exit") units which bear the same relation the Plan as an instruction does to a complete computer program. The TOTE unit consists of a test mechanism, wherein existing states of the organism or the world are compared with a level determined by the Plan, and an execution mechanism, sometimes linked to a behaviour process and sometimes to another mental process. If the test mechanism finds "incongruity", i.e. a disparity state, the execution mechanism is operated, and the state retested for as many cycles as are necessary for the disparity to disappear,

whereupon the next TOTE loop is activated. The TOTE unit is seen as the fundamental element of behaviour, replacing the reflex. Sub-Plans are also nested hierarchically within Plans to various depths and in various interactive arrangements. A discrete piece of behaviour can then be characterised as part of an overall Plan or any sub-Plan or sub-sub-Plan within it. Various examples are given by Miller et al. to demonstrate the applicability of the model to a wide range of human behaviour and thought.

The parallels between the concept of task presented here, and the Miller et al. model, can be formulated in various ways. On one level, a parallel can be drawn between the hierarchical nesting of sub-Plans within Plans, and the way in which subjects have short-term tasks which are components of long-term tasks. On a lower level, the parameter-setting, decisional, and behavioural phases of the task have a similarity to the test and operate phases of the TOTE unit. A possible compromise would be to regard the task as a sub-Plan. Thus the term Plan would be reserved for the longer-term or macro-level organization of activity, and the term task restricted to lower levels of organization, functional in the shorter term. In this conception, the task would operate as the intermediate level of organization between the Plan and the TOTE unit of behaviour. Such a formulation is not fundamental to the basic thesis, however.

Analysis of the decision process within the task relies on distinction, referred to at various points in the foregoing discussion, between cognitive or expectational parameters and affective or evaluative ones. It is accepted that such a distinction may be quite artificial in the sense that the actual neurological processes are inextricably intertwined. However, as a conceptual distinction within a model of task decision-making it seems intuitively acceptable and supported implicitly and explicitly by a number of writers. Of particular note at this point is the observation by Miller et al. (1960) that the test phase of their TOTE unit would involve both an evaluative and comparative function. Most theories of decision-making to date have made use of a simplified version of such a distinction (conventionally using probability and utility

in a multiplicative relationship). By expanding the model an attempt has been made in this thesis to being together not only locus-of-control and general motivation theories, but decision theory and motivation theory as well. The cognitive-expectational part of the model is given most attention, and is concerned with redefining locus-of-control.

(iii) A definition of locus-of-control

The simplest expression of the meaning of locus-of-control in a particular task is the subjective relationship between what the subject contemplates putting into a task in the way of effortful behaviour and what he expects to get out in the way of changes in the environment. The term effort is used as the highest common denominator of all kinds of behaviour extending over varying periods at different levels of intensity, and the term performance has been used as the most relevant aspect of task outcome for the individual. Both terms are used in a non-evaluative sense.

The concept of locus-of-control as it has been used in the literature, and as it has been operationalized in measuring instruments such as Rotter's I-E Scale, is a dysjunctive concept. One of its components is a belief in the general efficacy of such behavioural tendencies as trying hard, working hard, taking an active part, being prepared, taking advantage of opportunities, and so on. In this thesis it is called Effort-Effectiveness. It can be represented mathematically or graphically as the regression coefficient of performance output on effort input. Such a coefficient is an objective parameter with respect to a completed task or set of tasks, and it is assumed that in the case of prospective decisions the subjective coefficient will be determined by the stored memories or traces of the objective parameter values from past tasks of a similar kind. It seems unlikely, however, that the value is stored as a single coefficient. It is more likely that an individual remembers what happened in the past when certain levels of effort were invested in specific tasks. When faced with a fresh task he will summarise this stored information in some way as required by the particular task be faces. He can also summarize the information

when faced with the task of responding to a belief scale like the I-E Scale; however, most such scales require the summarization to be carried out over a wide range of tasks, providing a very general impression which can only be used to predict behaviour on an average, and not a specific, task. The Rotter I-E Scale and similar measures also suffer from the drawback of including the Effort-Effectiveness factor along with other factors in one measure. Factor-analytic studies of the I-E Scale item inter-correlations have not revealed an Effort-Effectiveness factor so named, but those that have been extracted could be interpreted in this way. Mirels' (1970) "mastery over one's life", Gurin et al.'s (1970) "Personal Control", and Kleiber et al.'s "Individual responsibility for failure", all include items phrased in terms of Effort-Effectiveness as defined here (though other factors extracted by these investigators also contain a minority of such items, and the Effort-Effectiveness factor extracted in each case is not 'pure').

The Action scale of the A-C Scales instrument described in this thesis can be interpreted as a measure of Effort-Effectiveness. It assesses the relative importance of what an individual does as a causal factor in a number of events of relevance to the average student. Even this scale, however, can only yield a crude estimate of Effort-Effectiveness, since it requires subjects to do little more than indicate whether personal action or effort has an important effect on outcomes compared to other possible sources of influence; it does not measure the exact relationship between effort and outcome in terms of a gradient or regression coefficient. In use, the Action Scale was found to elicit the strongest responses from both African and European respondents, particularly Europeans. While belief strengths are difficult to separate from characteristics of the scale items which predispose subjects to respond to them, the finding indicates that the action or effort factor is regarded as important as a causal influence on events. Much more significant is the fact that the Action scale correlates more highly than any other of the six scales with the I-E Scale and can thus be regarded as an important component of a definition of internal control, for both Africans and Europeans. Further evidence indicates that

African and European groups differ with respect to the relative importance given to Action or Effort-Effectiveness in various kinds of events. This does not reduce the validity of the construct, but indicates that people do distinguish between events, or tasks, in judging the efficacy of effort, and also that cultural factors influence the way that subjects perceive the effect of effort. On a practical level, the finding provides a warning that the construction of any scale of Effort-Effectiveness must involve a consideration of the scale loadings of event types used as the basis for items, especially if the scale is to be used for cross-cultural comparisons. The format of the A-C Scales instrument suggests one way in which such control may be exercised.

Returning to our mathematical model of the relationship between effort and outcome as the definition of locus-of-control, a second feature of the regression equation now has to be considered. This is the constant in such an equation. Mathematically the constant expresses the value of the dependent variable when the independent variable has a value of zero (in the case of a linear equation, which for simplicity we are considering). Applying this to the effort-performance relationship, the constant would express the fact that in some tasks a subject could attain a certain level of performance with zero effort. Since this does not make sense in practice, we can substitute for zero effort the notion of the minimum degree of effort which it is possible to expend and still be considered to be doing something relevant in the task. The value of the constant will be different depending on the subject and the task; which is to say that some people have an advantage over others in certain tasks in that they can reach a higher level of performance with minimal effort investment. It is further assumed that they will maintain this advantage at higher levels of effort, so long as Effort-Effectiveness is held constant. In conventional teams, such an advantage is attributed to the relationship between basic ability of the subject in that type of task, and the difficulty of the task itself. However, since terms such as easy, difficult and ability have taken on various meanings, we have used the term Task Competence in this thesis to refer to the idea that ability may be a factor in locus-of-control.

The ability-task difficulty dimension has not been explicitly recognized so far in locus-of-control theory. However, it is obviously implicit in the notion that people differ (or believe that they differ) in the amount of control they have over their outcomes. Also, it is recognized in some of the measuring instruments which have been used, for example, Crandall et al.'s IAR Scale, which contains items asking children to attribute success on certain tasks to trying hard versus being good at that type of task, or to the easiness of the task. Thus, it tends to be regarded as an external factor. In the investigation reported in this thesis, we appear to have found that it is definitely correlated with internal control.

The Personal scale of the A-C Scales provides a kind of equivalent of the Task Competency variable. It differs, as does the Action scale from Effort-Effectiveness, in being non-specific, in this case with respect to both task and ability type. Individual items of the scale test the subject's evaluation of fixed personal characteristics, including ability, as factors in the causation of different types of event. The findings indicate that this is an important factor for all groups tested (somewhat more so for Europeans). Furthermore, this scale correlates with the internal end of the I-E Scale, a particularly interesting finding in view of the almost complete lack of reference to ability in the I-E Scale items, though there are references to the inherent difficulty of certain tasks. It indicates that ability is a factor which is taken into consideration when assessing the degree of control one has in a situation. Such a result could never have emerged from a factor analysis of the I-E Scale or any other instrument which did not specifically include a number of items referring to ability or differential task difficulty for people. It is also consonant with the finding by Fish and Karabenick (1972) mentioned before, that internality and high self-esteem are correlated.

In the mathematical formula for a regression equation, there is no necessary correlation between the coefficient and the

constant, and the direct application of the regression model would therefore predict independence between the Effort-Effectiveness and Task Competency variables. The findings for the Action and Personal scales indicate a small positive correlation between them, even when the effect of the common relationship with the I-E Scale is partialled out. This may be partly a feature of the particular scales involved, but the fact that the relationship varies slightly between groups indicates that subjects assume Effort-Effectiveness and Task Competency go together. They would therefore emerge as oblique factors in a factor-analytic study.

(iv) The Range of Uncertainty

A third variable in the relationship between effort and outcome is the certainty with which the performance outcome can be predicted for any level of effort investment. The level of confidence may vary in practice, depending on the level of effort involved, but to simplify matters we have considered it as constant and designated it the Range of Uncertainty. As in the cases of the other two variables, the Range of Uncertainty can describe either the objective fluctuation in outcomes of a number of completed tasks, or the subject's recollection of these fluctuations, or his expectation for a single prospective task; a degree of correspondence is assumed to exist between these for similar tasks. Objective variance in the outcomes of completed tasks may be attributed to undetected fluctuations in ability or skill, or to unintended variation in effort input from trial to trial, or to a variety of other sources. Attributions of controlling influences to various possible sources will partly reflect the subject's ability to keep track of the interactions between detectable or measurable known sources of variance. No matter how intelligent a person is, it is likely that such intuitive variance analyses will leave a lot of unexplained variance or uncertainty as to what caused outcome events in the past to occur in the way they did, and therefore some uncertainty as to what will happen in apparently identical circumstances in the future. One dimension, then, along which we would expect subjects

to vary is the degree to which uncertainty in outcome is recognized to be a feature of situations. Where this is recognized as an important feature, subjects may accept that differences in outcome between one trial and other for a particular person (or between different people in similar circumstances) are inexplicable or due to an inherent randomness in the universe.

The Chance scale of the A-C Scales assesses a subject's tendency to use randomness as an account of events. The findings indicate that Africans (particularly Zambians) are more likely to use this type of explanation for events than Europeans. This was unexpected, since an examination of some of the anthropologists' writings led us to think that Europeans would feel more comfortable with explanations in terms of chance or randomness than Africans, whose supernatural beliefs are often seen as an attempt to remove any uncertainty about causal relationships in the world around them. The correlations between the Chance Scale and the I-E Scale, however, are roughly identical; furthermore, for African groups the average correlation of the I-E Scale with the Chance Scale is not as high as the correlation with the Supernatural scale. This leads us to conclude that while the meaning of internality is almost identical for both racial groups, the meaning of externality is more heavily loaded for Africans with implications of active controlling forces of a supernatural variety.

Another meaning of the term Chance was discussed earlier, but no attempt has been made to measure it. This is the notion, often called 'the gambler's fallacy' or 'negative recency' (see Cohen, 1972), pp. 76-8 for the distinction), that the laws of chance for large numbers of events also hold for small numbers; that is, if a run of events of a particular kind have occurred, an individual may come to believe that the chances of some alternative outcome are then greater. There is no obvious way of testing the importance of such beliefs with the A-C Scales, since the items refer to events in general and not to a particular series of events. Aspects of this belief may, however, be reflected in the Chance and Supernatural scale scores.

Another variable very commonly confused with chance is luck, or more particularly the notion that some people are lucky or can acquire luck in special situations. In this thesis, such beliefs have been categorized as supernatural since they involve the notion of some active influence on events rather than the acceptance of randomness in events; but to avoid the ambiguity, no references to luck were included in the Supernatural scale, and the importance of luck requires further investigation as a control factor.

Accepting that people can tolerate uncertainty as to the causal influences pertaining to past or future events in general, the important proposal has been made in this thesis that it is a necessary condition of making a decision to act that such uncertainty be reduced to zero or near zero, and that in fact the point of decision may be defined in terms of the time at which uncertainty reaches a zero or minimal value. It would be difficult to verify this hypothesis empirically due to the rapidity of change of the locus-of-control parameters, the very short interval between decision points, and the fact that the decision point and its parameters are notoriously elusive of introspective methods of assessment. Nevertheless, it is a useful assumption to make, since it solves the problem of how people can make decisions in states of apparent uncertainty. Following from our earlier discussion of the concept of the task it can be seen that the reduction in uncertainty need only occur at the decisional point of a particular task, and the same or higher levels of uncertainty may still be present in the initial phase of the following task. Thus, the subject accepts for an instant a particular hypothesis about what level of performance outcome will result from a particular piece of intended behaviour. This enables the behaviour to be triggered (or not, depending on its satisfaction value), and also enables the hypothesis to be tested. If it is confirmed by the actual outcome it will be strengthened and the general level of uncertainty reduced; or the opposite may occur, and fresh hypotheses will be entertained on subsequent trials. It is assumed, of course, that the brain possesses a capacity to store the information gained by these tests and to develop smaller ranges of uncertainty on future encounters with

that particular type of task. This hypothesis about the psychological implications of certainty and uncertainty is directly opposed to conventional views. Cohen (1972, pp. 90), for example, suggests that "a readiness to tolerate uncertainty was a selective factor in human evolution" and that humans enjoy making decisions in uncertainty. This may be so but not necessarily because uncertainty exists at the moment of decision. The theory developed in this thesis is that decisions are a function of both expectational and evaluative parameters operating in conjunction, whether the decision is associated with gambling or 'risk-taking' or not. Perhaps the significance of an initial high uncertainty level is that it allows for complex patterns of attributions about causal relationships to come into play, adding interest to the task, and providing the possibility of obtaining satisfactions from making correct predictions in a complex and difficult task.

Two ways of reducing uncertainty have already been touched on, namely chance (as an actual source of control) and supernatural influences. The Supernatural scale of the A-C Scales was constructed in such a way as to appear maximally acceptable to both Europeans and Africans; that is, references to culturally specific forms of supernatural or religious beliefs were avoided. Despite the fact that the items still seem more attached to European forms of belief, Africans responded to this scale significantly more strongly than Europeans, in terms of both scores and correlations with the I-E Scale. As in the case of the Action scale, the groups also differed in the pattern of relative responses given to different types of events, demonstrating a need for this interaction to be taken into account when constructing further scales to measure the importance of Supernatural responses. The correlation between the Chance and Supernatural scales vary by racial and sexual groups, indicating the presence of complex interactional effects on the meanings of the scales across groups.

The two other sources to which control over events can be attributed and which have been investigated by the construction of A-C Scales are (i) the direct intervention of powerful Others closely associated with the subject, such as friends, enemies, acquaintances (and members of one's family, though reference to these were not included in the scale), and (ii) indirect influence on events

from the diverse social, economic, political and physical conditions in the world. It was predicted that Africans would give precedence to the former, since their cultural beliefs about the world are traditionally biased in the direction of explaining natural events by reference to interpersonal relationships, whilst modern European thought systems tend to the opposite, that is they explain even interpersonal relationships in terms taken directly from the physical sciences. The results do not support this hypothesis, since the O and V scales were responded to roughly equally by all groups. The pattern of correlations between these scales and with the I-E Scale is varied and complex and difficult to interpret, so there is a need to explore these two variables further. The A-C Scales as an instrument could be used to throw light on the issues, but other methods might also be utilized. In connection with attributions of control to specific others and to environmental forces more generally, it would be interesting to discover whether a conceptual distinction, made in the field of mental health, between 'predisposing' and 'precipitating' types of causation (see for example, Rapaport, 1961) have intuitive relevance for the ordinary person.

(v) Methodological problems

In claiming partial support for the theoretical model of locus-of-control presented in the thesis, an important methodological point must be made. All of the A-C Scales and the I-E Scale were found to elicit different patterns of responses from the different groups of subject. In particular, disparities emerged between cultural groups, but sex also made a difference. The relative influence of race, nationality and sex varied between scales, making any clear inferences as to the direction of these influences difficult to draw. This means that the correlations between the scales and the conclusions that have been made as to the differential 'meaning' of what the scales measure, must be regarded with caution. Only a set of relationships in some form of hyperspace can properly be adduced. That is, the meaning of say, supernatural influences for a particular group, can only be stated with reference to the

meaning of locus-of-control and other constructs as they apply to the same group, and not in any absolute way.

It seems unlikely that scales can be devised which will prove entirely satisfactory across cultures. The unsuccessful pursuit of the goal of culture-free ability texts is witness to this point. Psychology has been slow to follow the lead of the physical sciences in accepting multi-method approaches to single problems. In chemistry, for example, the analysis of a single compound proceeds through a number of tests from which various properties of the substance can be deduced, to arrive at a conclusion. The level of complexity involved is not very different from the level of complexity of the set of beliefs about causal influences that have been discussed in this thesis. The appropriate mathematical models are readily available.

The importance of getting to know more about the structure of beliefs about causal influences extends beyond the goal of being able to predict task decisions of individuals in experimental task situations, to the more general goal of coming to understand the cognitive map by which the behaviour of groups is guided. This is particularly vital in the context of plural societies such as Rhodesia, and in any situation where communication between groups has to be efficient enough to avoid conflicts developing. The A-C Scales were developed with this large goal in mind, though they are capable of supplying only a small part of the necessary data.

The problems of assessment and prediction become vastly more complex and difficult if the whole task-motivation model is considered, and it is for this reason that the empirical data collection was confined to the expectational parameters. The complete model, however, generates a number of hypotheses about task behaviour which are in conflict with the predictions of existing theories. The most notable feature of the analysis of the affective-evaluative parameters of task motivation is the return to a simpler model involving a relationship between performance outcome and a satisfaction-dissatisfaction dimension.

This is made possible by the greater complexity of expectational parameters which are taken into consideration, in contrast to the proposals of Atkinson and others, who rely on simple expectational parameters and relatively complex affective ones. It may be that the net result of the two approaches is the same, but it seems to this author that it will be easier to disentangle the cognitive parameters than the affective ones.

The importance of established findings about affective parameters such as achievement need and anxiety is not dismissed. Rather, these variables have been treated in the same way as locus-of-control; that is, they are regarded as generalized variables which influence the specific evaluative parameters in particular tasks. Thus, need for achievement is held to influence the shape of the outcome-satisfaction relationship at its positive end, and anxiety is held to influence the negative end. A significant difference between this model and Atkinson's is that achievement need and anxiety can act together as motivators of activity, provided the locus-of-control parameters are in appropriate relationship to the affective parameters. Specifically, it is essential to know over what range of performance outcome the subject believes he has control, and whether this is the same range as that for which the sharpest satisfaction gradients apply. To the degree that this is so, the subject will be aroused to action. This arousal will be effective whenever it is not overcome by greater amounts of inhibition created by the prospect of high levels of effort expenditure, and so long as the net arousal is sufficient to exceed whatever threshold has been set by current levels of stimulation and activity.

(vi) Applications of the theory

The applicability of the theory depends on two things. First, on how far the notion of the task can be extended into the varied forms of behaviour organization characteristic of the human being. We have not pursued this matter here in any detail, since it partly depends on establishing empirically at what point the notion of the task becomes so general as to be useless as a predictive device. Secondly, the applicability of the theory depends on limitations of the measuring techniques which are

available, for both the cognitive and the affective parameters. It is hoped that the proposals which have been made in this regard will provide a basis for further investigation, and in particular it is hoped that the basic conception of the A-C Scales instrument will provide a more useful starting point for further analysis of the structure of locus-of-control than existing scales are capable of doing.

Provided that the conceptual and methodological problems can be solved, the most obvious field of application of the model is industrial and organizational psychology. A considerable variety of prescriptions have been offered in recent years for increasing work efficiency and worker satisfaction (e.g. Argyris, 1964; Herzberg, 1966; Likert, 1959; McGregor, 1966; Porter and Lawner, 1968; Vroom, 1964; and others). Despite their variety, these prescriptions have one feature in common, which is the increased emphasis on the importance of the individual and his idiosynchratic set of motives and attitudes in the work situation. The analysis of task motivation provided in this thesis gives the locus-of-control parameters central importance. Thus it can be argued that the essential features of any system for increasing work efficiency and satisfaction are concerned with manipulating the worker's environment so as to increase his feelings of control. The performance dimension in the work situation is fixed in terms of what is useful or productive. Satisfiers, such as money, security, etc. are supposedly related to this performance dimension, though as Porter and Lawler have pointed out, they frequently are not so in fact. Thus the performance types and level which is satisfying may not be the one which is productive. On the other hand, the way that the organization and working conditions are structured may fail to give the individual control, using behaviours available to him, over the range of performance which he finds satisfying. This may be because effort does not appear to be effective, performance goals or task difficulty are too high in relation to ability, or the worker feels very uncertain about the relation between effort and performance. In these conditions the worker is likely to find other effort-outcome relationships which are more satisfying, though less productive.

A further problem is that people are satisfied by other things than money, security, etc. Again, if the work situation is structured so that these other satisfiers are not available or not related to performance, the worker will be dissatisfied, or inefficient, or both. Thus the worker must be able, by using effortful behaviours available to him and which are productive, to main control over these outcomes which he finds satisfying. It seems clear that if this goal is to be attained a simple knowledge of how the individual structures the world in terms of a unidimensional locus-of-control construct will not suffice.

Beyond the relatively simple problems of the work situation, far more complex ones remain to be tackled at a political level. Viewed even in the light of existing ideas of industrial organization, no past or present system of political, economic or social organization of peoples could be regarded as satisfactory. If people are to feel that they have control over their own lives, and if a primary aim of political organization is to give them this control, then a much more profound knowledge is necessary of the structure of control beliefs and how they come to be developed.

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APPENDIX A : Rotter's I-E Scale (original,* Zambian and Rhodesian versions).

(i) Instructions to the respondent

Original version:

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.

Your answers to the items on this inventory are to be recorded on a separate answer sheet which is loosely inserted in the booklet. REMOVE THIS ANSWER SHEET NOW. Print your name and any other information requested by the examiner on the answer sheet, then finish reading these directions. Do not open the booklet until you are told to do so.

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 number 1 or 2 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.

Zambian and Rhodesian version:

This questionnaire is to find out how people feel about some important aspects of life. Each of the twenty-nine items consists of two statements, marked a and b; you should read both of the statements for each item and decide which one you believe

* By kind permission of Professor Rotter.

is more true. Don't pick the one you think other people would like you to pick, or the one you wish were more true; we want to know what you believe. This is not a test of any kind, so there are no right and wrong answers. Sometimes you may believe both statements, and sometimes neither of them; you should still decide on the one you believe more. Please read the statements fully and decide carefully, but don't spend too much time on any one item. Give one answer to every item by making a circle round the a or the b (if you change your mind make the new decision clear). Also, try to decide each item on it's own - don't think about what you decide for the others. This questionnaire is private and confidential and no-one apart from the research worker will know about your personal responses.

(ii) Items : The original items are given first, followed by the Zambian version (marked Z) and for Rhodesian version (marked R) whenever these differ from the original. As indicated in the text (Chapter 4) the filler items (nos. 1, 8, 14, 19, 24 and 27 in the original version), were placed at regular intervals in the Zambian version (becoming nos. 1, 6, 11, 16, 21 and 26). External responses are capitalized.

1a. Children get into trouble because their parents punish them too much.

b. The trouble with most children nowadays is that their parents are too easy with them.

.... parents are too good to them. (Z & R).

2A. Many of the unhappy things in people's lives are partly due to bad luck.

b. People's misfortunes result from the mistakes they make.

.... from being careless or foolish. (R)

3a. One of the major reasons why we have wars is because people don't take enough interest in politics.

.... people leave too many decisions to politicians. (R)

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

4a. In the long run, people get the respect they deserve in this world.

B. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

.... is often not recognized ..... (Z)

Unfortunately, some people's merits are not recognized no matter how hard they try. (R)

5a. The idea that teachers are unfair to students is nonsense.
.... schools and colleges .... (R)

B. Most students don't realize the extent to which their grades are influenced by accidental happenings.
.... results are affected by accidental factors. (R)

6A. Without the right breaks one cannot be an effective leader.
One cannot be an effective leader unless other people cooperate. (Z)
One cannot only be an effective leader if other people are ready to be led. (R)

b. Capable people who fail to become leaders have not taken advantage of their opportunities.
Intelligent people .... (R)

7A. No matter how hard you try some people just don't like you.
No matter what you do there will be some people who just don't like you. (R)

b. People who can't get others to like them don't understand how to get along with others.
.... how to live with others. (Z)
.... don't know how to treat them properly. (R)

8a. Heredity plays the major part in determining one's personality.
Most of one's personality comes from parents and ancestors. (Z & R)

b. It is one's experiances in life which determine what they're like.
The way one is brought up determines what one is like. (Z & R)

9A. I have often found that what is going to happen will happen.
.... what happens was bound to happen anyway. (Z)
.... what happens in one's life was bound .... (R)

b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
.... as deciding on a course of action. (Z)
Trusting to luck .... (R)

10a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.

.... unfair exam. (Z)

.... unfair exam questions. (R)

B. Many times exam questions tend to be so unrelated to course work that studying is really useless.

Often exam questions are so unrelated to lectures .... (Z)

Often exam questions are so unrelated to courses that studying makes little difference to the results. (R)

11a. Becoming a success is a matter of hard work, luck has nothing or little to do with it.

.... successful .... (Z)

B. Getting a good job depends mainly on being in the right place at the right time.

.... or on who one's friends are. (Z)

12a. The average citizen can have an influence in government decisions.

The ordinary person .... political decisions. (R)

B. This world is run by the few people in power, and there is not much the little guy can do about it.

.... ordinary man...(Z & R)

13a. When I make plans, I am almost certain that I can make them work.

B. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyway.

14a. There are some people who are just no good.

b. There is some good in everybody.

15a. In my case getting what I want has little or nothing to do with luck.

.... achieving my goals ....

B. Many times we might just as well decide what to do by flipping a coin. (tossing, Z & R)

16A. Who gets to be boss often depends on who was luck enough to be in the right place first.

.... to get the best opportunities. (R)

b. Getting people to do the right thing depends on ability, luck has nothing or little to do with it.

Getting to the top .... (R)

17A. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control.

b. By taking an active part in political and social affairs the people can control world events.
If everyone took .... we could .... (R)

18A. Most people don't realize the extent to which their lives are controlled by accidental happenings.

b. There is really no such thing as "luck".

19a. One should always be willing to admit mistakes.

b. It is usually better to cover up one's mistakes.

20A. It is hard to know whether or not a person really likes you.

b. How many friends you have depends upon how nice a person you are.

21A. In the long run the bad things that happen to us are balanced by the good ones.

b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22a. With enough effort we can wipe out political corruption. (could, R)

B. It is difficult for people to have much control over the things politicians do in office.

23A. Sometimes I can't understand how teachers arrive at the grades they give. (marks, R)

b. There is a direct connection between how hard I study and the grades I get. (results, R)

24a. A good leader expects people to decide for themselves what they should do.

b. A good leader makes it clear to every body what their jobs are.

25A. Many times I feel that I have little influence over the things that happen to me. (often, Z & R)

b. It is impossible for me to believe that chance or luck plays an important role in my life.
I just don't believe that chance or luck plays a large part in my life. (Z & R)

26a. People are lonely because they don't try to be friendly.

B. There's not much use in trying too hard to please people, if they like you, they like you.

.... they either like you or they don't. (Z & R)

27a. There is too much emphasis on athletics in high school (secondary school, Z & R)

b. Team sports are an excellent way to build character. Team games .... cooperativeness. (Z & R)

28a. What happens to me is my own doing (responsibility, Z & R)

B. Sometimes I feel that I don't have enough control over the direction my life is taking.

.... way my life is going. (Z)

.... much control .... (R)

29A. Most of the time I can't understand why politicians behave as they do.

.... the way they do. (Z)

Most of the time people don't know the reasons for political decisions. (R)

b. In the long run the people are responsible for bad government on a national as well as a local level.

.... on the national and local levels. (Z & R)

APPENDIX B : Factor analyses of Rotter's I-E Scale

Factor loadings, with decimal points omitted, of original scale items; for further details, see text, Chapter 1, Section vi. (r_{ab} = correlation between originally paired half-items)

	MIRELS (1970)				GURIN et al. (1970)						KLEIBER et al. (1973)				
	Males		Females		Males			Females			Males & Females				
	I	II	I	II	I	II	III	I	II	III		I	II	III	r_{ab}
2.	-09	02	-20	09	07	19	07	08	20	04	a	-54			
											b			38	-19
3.	-11	11	04	28	05	12	18	16	04	31	a			25	
											b		-29		-04
4.	35	04	04	02	18	06	15	09	02	03	a			36	
											b		-31		-30
5.	38	17	37	05	22	07	10	01	18	02	a			43	
											b	-49			01
6.	-27	-09	-41	-23	37	07	07	18	30	04	a	-44			
											b			62	-03
7.	-17	08	-13	-25	27	09	04	10	17	17	a			-14	
											b			55	-06
9.	-28	-09	-30	-14	08	35	08	10	17	17	a	-37			
											b	46			-15
10.	33	22	36	07	26	19	02	25	12	02	a			37	
											b		-32		-26
11.	57	16	60	13	38	11	01	26	38	01	a	56			
											b	-40			-18
12.	12	68	01	49	15	34	15	41	14	15	a		58		
											b		-63		-47
13.	28	29	37	23	11	47	00	10	27	15	a			38	
											b	-55			-16
15.	60	13	47	18	17	25	01	20	32	07	a	58			
											b	-50			-22
16.	-40	-19	-59	03	43	08	03	38	26	01	a	-56			
											b	61			-35
17.	-04	-70	-23	-45	12	22	29	36	13	24	a		-50		
											b		57		-26
18.	-48	-27	-43	-10	21	14	06	05	48	03	a	-59			
											b	54			-24
20.	-18	-02	-29	-11	23	13	19	20	06	08	a	-21			
											b			44	-03
21.	-03	-21	-03	-01	Not reported						a			46	
											b			52	14
22.	10	64	07	60	10	39	21	41	07	24	a		55		
											b		-62		-20
23.	-40	-10	-53	04	32	14	09	28	21	06	a		-34		
											b		30		-21
25.	-61	-10	-58	-03	30	28	02	04	45	07	a	-61			
											b	55			-32
26.	11	08	-04	47	25	25	12	25	09	05	a			43	
											b		-38		-13
28.	37	03	42	-11	18	30	01	10	30	03	a			23	
											b	-51			-34
29.	-18	-44	-01	-36	Not reported						a		-16		
											b		33		04

APPENDIX C : The A-C Scales

Most of the events in our lives have more than one cause. It is often difficult to know exactly why things happen as they do, but most people have opinions about the reasons for the events that are important to them. This questionnaire is to find out how important you think different kinds of reasons are for events concering yourself or your fellow students.

Sixteen situations are described on the following pages. Underneath each description is a list of six possible things which might affect the situation. You should read the item carefully, and then decide how important each reason for the event is, in your opinion. Then indicate how you feel by putting a number opposite the reason :

If you think the reason is of NO IMPORTANCE, put	0
If you think the reason is of SLIGHT IMPORTANCE, put	1
If you think the reason is of MODERATE IMPORTANCE, put	2
If you think the reason is of GREAT IMPORTANCE, put	3

You can keep this sheet in front of you to refer to, but the rule is, the more important the reason, the higher the number.

You must put a number for every reason, even if you are not sure. You can use any number as many times as you wish; try to respond to each reason on its own, don't pay attention to the other answers. If you want to change your mind, MAKE IT CLEAR.

This is not a test, and so there are no right or wrong answers; we can only find out about your own opinions. So pay no attention to what others are doing. This questionnaire is completely confidential, and nobody but the psychologist will see your paper.

First, complete the following details :

NAME _____ SEX male/female _____ AGE _____

National/ethnic/racial group of origin _____

Year of Study _____ or Occupation _____

NOW TURN OVER AND DO THE ITEMS. Answer carefully, but don't spend too long on any item. If you have any difficulty, raise your hand.

1. If you got a better result than usual in an exam it would be because :

You were guided by some inner voice	S
The other students were below standard	V
Luckily the questions were on your strong points	C
You were particularly good at the subject of the exam	P
You had worked harder than usual	A
The examiner had got to know you in class and liked you	O

2. If you tried to make friends with a student of your own sex, but found yourself rejected, it would probably be because :

You had not approached him or her in the right way	A
There are a lot of unfriendly people around these days	V
There was something about you he or she found disagreeable	P
Some mysterious power kept you apart	S
Someone who didn't like you had influenced him or her	O
People sometimes do things which cannot be explained	C

3. The things which get some students elected to office in student organisations are :

A natural ability to win people's confidence	P
Some people are destined to become leaders	S
Help from influential friends	O
It's a matter of chance which person gets elected	C
A particular type of leader is produced by each set of circumstances	V
Making an effort to find out from other students what their opinions are	A

4. The reasons why some individuals win a lot of prizes in magazine and advertising competitions are :

Taking a lot of trouble over the entries	A
Judges have a bias in favour of certain classes of people	O
Higher natural ability	P
Most of the entries are so poor it's easy to win	V
They enter so many they are bound to win by the law of averages	C
Some people are favoured by fortune	S

5. Some people have difficulty with a course at college because :

The system doesn't prepare students properly for that kind of course	V
A plan has been set for their lives and the subject doesn't fit into it	S
They were unlucky in their choice of subjects	C
They don't spend enough time working at it	A
People have less natural ability in some subjects	P
The instructor doesn't help those with difficulties enough	O

6. The reasons why you are particularly liked by certain people are :

Most people have a need to be friendly these days	V
You have a likeable personality	P
You try to behave in the way you know they approve of	A
These people are especially nice	O
Your common fate draws you together	S
These are the people who chanced to meet you	C

7. If you tried to get other students to adopt a course of action, but failed to persuade them, it would be because :

Some influential students were against you	O
You went about it the wrong way	A
There are evil influences at work on people	S
Students are not usually easy to persuade	V
You haven't the gift of persuasiveness	P
It turned out they were interested in other things at the time	C

8. The reasons people have misfortunes are :

Life is so complicated it's difficulty to avoid misfortunes	V
It's the law of averages that one has misfortunes sometimes	S
Misfortunes are sent to test people	C
Someone else has messed things up for them	O
They are not intelligent enough to see trouble ahead	P
They don't look ahead and plan for the future	A

9. Some people have brilliant careers because :

They were in the right place at the right time	C
They are brighter than average	P
The economic system made opportunities available to them	V
The gods favour certain individuals	S
They work hard	A
They get help from others	O

10. Some people lead lonely lives because :

Other people reject them	O
They don't try to cultivate friends	A
They are very shy personalities	P
They don't chance to meet people they can make friends with	C
Others are so busy with their own affairs it's easy to get left out	V
It's a kind of curse that some people have to suffer under	S

11. If you found that some people took notice of your views on a political issue it would be because :

You are naturally able to express ideas well	P
Something gives you the power to see what's going to happen without you realising it	S
These would be people who agreed with your views in general	O
You take the trouble to keep up-to-date with developments	A
By coincidence you had adopted the same viewpoint as them	C
Particular issues become of great interest from time to time	V

12. If you fell sick on the day of an important exam it would be because :

Someone else was careless about spreading germs	O
You were fated not to sit the exam	S
You didn't look after yourself properly	A
It is difficult to avoid sickness when you live and work with so many	V
Just bad luck you got sick at the wrong time	C
You often fall ill when something worries you	P

13. If you failed to get your degree or diploma in the end it would be because :

You just haven't got the necessary ability	P
A certain proportion fails and anyone can be one of these	C
There are so many factors affecting the results, it's impossible to prepare oneself properly	V
You wasted too much time at college	A
It was bound to happen to you and there was no way of stopping it	S
Certain members of staff will not have done their job properly	O

14. The reason some people are so attractive to the opposite sex is :

They just happen to meet the people who find them attractive _C_

There are changing fashions in what is considered attractive _V_

They have some special quality that others lack _P_

They have been chosen to be more fortunate in this respect _S_

Their friends help to put them in contact with the right partners _O_

They take a lot of care over the things that are admired by the opposite sex _A_

15. The reasons many people feel they have no control over political events are :

Their leaders do not make enough effort on their behalf _O_

They lack the inborn capacity to learn how the political system works _P_

They do not try hard enough to gain the control they want _A_

Political and historical events are destined to take their course regardless of men _S_

Since everyone tries to push his point of view political events are confused and difficult to control _V_

Politics are like a lottery - sometimes you win but usually you lose _C_

16. When you find that things are going well for you, this is usually because :

There is an unseen power which help you sometimes _S_

Life has its ups and downs and this is one of the good times _C_

The complicated machinery of life is running more smoothly _V_

Your personality and abilities have given you an advantage in overcoming difficulties _P_

The people that affect your life are being more helpful than usual _O_

You have arranged your affairs well _A_

APPENDIX D : Intergroup correlations for I-E Scale item indices

(i) Biserial coefficients for U.S. and African groups *

	USF	ZAM	ZAF	RAM	RAF	REM	REF
USM	448	337	011	288	083	154	515
USF		166	-064	065	-023	005	250
ZAM			168	655	498	283	448
ZAF				210	012	167	-066
RAM					379	562	728
RAF						263.	308
REM							423

(ii) Proportions external for African groups *
(no data available for U.S. groups)

	ZAF	RAM	RAF	REM	REF
ZAM	886	511	565	734	644
ZAF		461	637	704	552
RAM			863	657	494
RAF				785	558
REM					840

(iii) Key to summary analyses in Tables 5.2 and 6.2
(correlations with same letter averaged)

	ZAF	RAM	RAF	REM	REF
ZAM	a	c	f	e	g
ZAF		f	c	g	e
RAM			a	b	d
RAF				d	b
REM					a

* US : American Z : Zambian R : Rhodesian
A : African E : European
M : Males F : Females

APPENDIX E : Proportions of each main group external on each item of I-E Scale.

	AFRICANS				EUROPEANS	
	ZAMBIAN		RHODESIAN		RHODESIANS	
	Males	Females	Males	Females	Males	Females
Item						
2	326	156	544	519	317	538
3	919	844	589	593	854	819
4	401	344	822	741	707	669
5	529	500	744	778	537	500
6	727	719	789	667	537	700
7	512	469	867	889	829	831
9	390	281	311	259	220	469
10	192	344	433	333	220	363
11	273	156	656	519	244	319
12	616	563	722	704	634	581
13	442	560	478	667	561	669
15	262	125	200	148	171	244
16	233	125	389	370	195	256
17	651	688	611	741	707	719
18	709	594	744	704	732	813
20	494	531	556	667	659	469
21	459	406	411	444	463	806
22	547	656	578	741	781	813
23	413	531	467	630	293	269
25	436	344	522	519	512	675
26	535	625	600	667	488	394
28	483	469	556	519	146	300
29	390	469	589	630	512	669
n	172	32	90	27	41	160

Decimal points omitted.

APPENDIX F : I-E Scale Item proportions external for Rhodesian African subgroups.

Item	First Year	Difference 1st - 2nd	Second Year	Difference 3rd - 2nd	Third Year
2	625	139	486	036	522
3	688	259	429	267	696
4	875	104	771	055	826
5	875	161	714	-105	609
6	813	-044	857	-205	652
7	875	-011	886	-060	826
9	281	138	143	466	609
10	500	329	171	568	739
11	594	-035	629	154	783
12	656	-001	657	256	913
13	594	280	314	251	565
15	188	102	686	305	391
16	375	032	343	135	478
17	625	111	514	225	739
18	844	158	686	010	696
20	625	139	486	076	562
21	406	120	286	323	609
22	625	196	429	310	739
23	594	423	171	568	739
25	531	102	429	223	652
26	594	080	514	225	739
28	563	134	429	310	739
29	625	111	514	138	652

Decimal points omitted.

APPENDIX G : Biserial correlations of A-C Scale items with scale scores minus the item. (Decimal points omitted.)

Item	AFRICANS				EUROPEAN	
	ZAMBIAN		RHODESIAN		RHODESIANS	
	Male (n=142)	Female (n=32)	Male (n=96)	Female (n=25)	Male (n=42)	Female (n=166)
SCALE A : Action						
1	217	267	263	647	025	189
2	358	525	373	418	-035	314
3	384	370	347	019	315	205
4	123	638	284	014	503	338
5	398	427	372	511	408	330
6	371	240	324	439	418	085
7	358	555	476	756	361	386
8	265	324	207	356	-053	403
9	390	732	421	196	499	385
10	246	216	353	511	171	370
11	464	114	343	164	440	515
12	269	230	426	356	387	276
13	099	370	485	383	193	376
14	442	351	442	306	320	384
15	058	303	309	158	226	360
16	335	370	385	489	315	393
SCALE P : Personal attributes						
1	081	581	103	253	025	247
2	182	425	352	707	224	261
3	402	-077	510	178	371	478
4	213	000	349	238	454	346
5	040	290	194	-124	013	269
6	184	398	322	172	277	361
7	262	140	328	641	660	318
8	275	-275	170	429	212	187
9	445	-344	303	284	402	494
10	035	-214	280	359	254	303
11	337	449	181	452	648	622
12	-044	089	184	-150	-123	177
13	086	423	434	578	462	399
14	211	-052	192	487	076	444
15	188	-144	289	-007	-130	371
16	104	-102	448	430	295	386

APPENDIX G (continued) : A-C Scale item biserials

Item	AFRICANS ZAMBIAN Male (n=142)	AFRICANS ZAMBIAN Female (n=32)	AFRICANS RHODESIAN Male (n=96)	AFRICANS RHODESIAN Female (n=25)	EUROPEAN RHODESIANS Male (n=42)	EUROPEAN RHODESIANS Female (n=166)
SCALE O : Powerful others						
1	094	298	367	-011	433	305
2	252	195	448	247	393	538
3	323	200	257	341	548	486
4	401	358	239	159	743	464
5	203	166	353	343	469	280
6	075	-063	267	295	534	209
7	206	558	360	382	640	376
8	362	665	497	119	393	403
9	380	282	394	039	348	394
10	314	169	352	358	098	458
11	527	530	325	242	188	158
12	391	287	342	048	273	313
13	490	111	300	330	436	281
14	356	290	545	-093	155	331
15	-037	198	341	469	355	442
16	319	134	418	021	519	419
SCALE V : Vague social forces						
1	303	-204	-002	-013	096	217
2	319	293	253	127	561	334
3	146	387	254	081	414	183
4	249	069	-065	-013	234	181
5	064	037	271	299	238	413
6	235	206	452	554	538	411
7	282	294	375	429	369	176
8	230	093	126	165	425	503
9	256	-065	250	239	043	449
10	222	060	336	601	482	350
11	181	-159	164	493	265	282
12	390	387	131	509	435	263
13	455	297	238	192	347	152
14	240	206	302	328	649	302
15	291	386	260	447	245	249
16	274	159	387	310	094	326

APPENDIX G (continued) : A-C Scale item biserials

Item	AFRICANS ZAMBIAN Male (n=142)	AFRICANS ZAMBIAN Female (n=32)	AFRICANS RHODESIAN Male (n=96)	AFRICANS RHODESIAN Female (n=25)	EUROPEAN RHODESIANS Male (n=42)	EUROPEAN RHODESIANS Female (n=166)
SCALE S : Supernatural						
1	369	184	391	022	660	492
2	374	605	487	297	761	535
3	488	716	367	373	550	283
4	288	631	270	444	516	470
5	259	543	271	799	433	535
6	183	524	280	376	496	543
7	342	333	358	165	578	473
8	404	280	443	293	652	475
9	543	492	667	523	000	781
10	654	670	507	383	729	504
11	398	459	348	631	586	458
12	505	599	565	782	499	652
13	574	492	548	686	582	460
14	479	677	622	236	860	514
15	621	386	432	585	469	592
16	567	670	643	314	499	614
SCALE C : Chance						
1	278	-039	528	285	105	327
2	229	390	168	126	516	377
3	224	550	327	384	584	308
4	181	119	187	-258	152	250
5	312	246	217	159	668	427
6	220	432	349	213	165	331
7	271	103	415	235	421	141
8	336	302	394	285	332	528
9	262	-019	232	199	409	502
10	128	443	422	463	260	418
11	361	376	185	396	409	446
12	105	554	375	415	103	296
13	355	317	240	285	386	238
14	195	408	481	359	619	364
15	165	172	284	199	486	475
16	436	419	490	493	089	335

APPENDIX H : Biserial correlations of A-C Scale items with each scale total for all Africans and Europeans (n = 502) (decimal points omitted).

Item	A	P	Scale Totals O	V	S	C
A-Scale items with each scale						
1	464	070	-025	055	-044	-164
2	529	277	124	192	046	104
3	475	094	107	090	-114	-002
4	399	175	076	237	-054	-086
5	549	216	019	050	-041	-059
6	374	253	279	097	197	282
7	606	354	202	182	003	087
8	453	348	184	171	-101	-036
9	624	268	-042	000	-063	-030
10	483	272	098	106	017	144
11	573	301	211	276	-001	118
12	499	206	212	221	057	-008
13	406	125	066	-050	-064	-058
14	521	303	314	264	088	174
15	480	247	246	145	045	174
16	541	303	098	142	-163	-025
P-Scale items with each scale						
1	093	384	065	208	-007	-023
2	178	437	261	126	110	170
3	311	595	224	218	137	101
4	228	484	136	252	057	098
5	097	422	186	257	036	190
6	218	492	141	038	074	096
7	289	555	163	168	125	155
8	314	438	231	112	-024	-004
9	299	495	148	251	-045	023
10	262	399	238	214	096	232
11	311	554	232	220	261	294
12	-025	267	220	077	139	230
13	195	479	231	242	061	147
14	288	505	212	232	140	121
15	186	420	175	157	243	196
16	347	555	188	157	-105	-146

APPENDIX H (continued) : A-C Scale item cross-biserials.

Item	A	P	Scale Totals O	V	S	C
O-Scale items with each scale						
1	061	175	443	121	195	157
2	170	284	558	205	219	237
3	055	213	609	187	217	448
4	-059	105	572	175	277	234
5	090	175	442	247	052	-013
6	244	190	340	219	229	237
7	133	265	543	208	235	255
8	089	116	589	179	059	180
9	186	258	541	299	070	253
10	170	303	506	290	141	219
11	193	229	510	278	100	173
12	251	171	494	292	122	190
13	074	193	572	160	239	121
14	150	279	538	321	139	237
15	169	248	523	300	199	209
16	255	181	525	180	128	292
V-Scale items with each scale						
1	075	180	134	361	-105	079
2	061	134	249	499	153	194
3	212	141	079	421	-045	090
4	136	176	214	322	159	217
5	200	249	291	362	183	303
6	220	106	239	508	107	177
7	060	130	229	433	214	310
8	038	196	182	513	279	388
9	165	209	249	498	058	186
10	095	136	203	523	138	288
11	163	145	161	428	-028	032
12	130	197	132	473	-019	015
13	007	251	236	462	256	287
14	202	262	263	561	088	266
15	104	152	164	447	158	230
16	125	197	227	514	073	228

APPENDIX H (continued) : A-C Scale item cross-biserials.

Item	A	P	Scale Totals O	V	S	C
S-Scale items with each scale						
1	041	061	165	135	576	208
2	-033	051	128	068	635	284
3	118	208	149	259	513	230
4	-003	177	154	071	580	389
5	-034	134	244	216	635	369
6	114	224	244	120	538	355
7	060	198	284	165	576	226
8	043	104	175	243	572	191
9	-151	-008	197	007	767	308
10	-168	009	184	143	729	325
11	087	172	258	187	609	310
12	-062	099	168	076	746	385
13	-198	071	305	071	704	321
14	-084	041	204	162	688	324
15	-057	073	073	167	596	202
16	022	123	241	167	712	246
C-Scale items with each scale						
1	103	241	198	269	027	426
2	007	101	074	241	232	461
3	-120	027	195	217	363	570
4	076	133	144	144	147	435
5	038	189	280	233	264	554
6	010	151	300	300	283	422
7	192	219	243	245	057	443
8	059	110	131	298	312	602
9	032	199	403	252	287	556
10	067	111	193	213	304	488
11	077	087	234	219	137	557
12	036	111	151	152	116	501
13	-080	098	245	167	364	515
14	-001	080	229	262	314	611
15	-001	111	331	323	350	602
16	142	165	095	202	274	561

APPENDIX J : Correlations between groups for mean item responses on A-C Scales. (Decimal points omitted.)

GROUPS *	A	P	O	V	S	C
ZAM-ZAF	808	818	848	934	799	922
ZAM-RAM	549	674	815	488	872	796
ZAM-RAF	679	796	817	317	702	554
ZAM-REM	338	689	673	317	669	799
ZAM-REF	462	666	717	378	675	796
ZAF-RAM	403	570	578	583	718	788
ZAF-RAF	679	792	587	414	624	573
ZAF-REM	648	414	756	346	674	884
ZAF-REF	750	386	751	430	753	844
RAM-RAF	719	882	863	897	817	787
RAM-REM	120	728	772	720	823	871
RAM-REF	240	634	765	821	808	869
RAF-REM	215	671	604	720	706	756
RAF-REF	388	635	612	843	754	766
REM-REF	873	943	934	956	946	962

* Legend : Z : Zambian R : Rhodesian
A : African E : European
M : Males F : Females

APPENDIX K : Group mean A-C Scale scores (corrected for variance due to subject and response biases by conversion to QD* scores).

SCALE	MEAN Zambian	S.D. Males	MEAN Zambian	S.D. Females
Action	86.22	4.29	83.31	4.23
Personal	85.85	3.30	85.72	2.60
Others	77.13	3.16	76.91	3.44
Vague	76.40	3.14	76.36	2.74
Supernatural	72.33	4.81	71.96	4.34
Chance	82.06	3.78	82.74	4.21

Rhodesians

	African	Males	African	Females
Action	84.41	4.54	83.28	4.82
Personal	86.23	4.28	85.71	4.05
Others	78.12	3.46	77.94	2.76
Vague	78.25	3.58	77.10	4.13
Supernatural	72.35	5.55	75.15	6.42
Chance	80.63	3.60	80.82	4.64

	European	Males	European	Females
Action	88.61	4.21	87.85	3.82
Personal	87.55	3.33	88.00	2.99
Others	77.70	3.82	76.73	3.39
Vague	78.07	3.43	78.52	3.12
Supernatural	68.85	4.22	69.64	5.03
Chance	79.23	3.81	79.26	3.79

* For explanation see Chapter 6, introductory section.

Each mean represents 16 item scores, calculated with a mean of 5 and S.D. of 1 for each question for each subject.

APPENDIX L : Intercorrelations between A-C Scale deviation scores for each group, with and without correction for correlation with I-E Scale. (decimal points omitted.)

Top sector : uncorrected correlations

Bottom sector : partial correlations w.r.t. I-E Scale

Zambian African Males

Scale	A	P	O	V	S	C
Action	-	088	004	-100	-526	-462
Personal	-123	-	-077	-173	-277	-413
Others	017	-074	-	-283	-240	-233
Vague	-133	-189	-282	-	-310	066
Supernatural	-424	-202	-271	-320	-	-040
Chance	-403	-374	-247	079	-155	-

Zambian African Females

Scale	A	P	O	V	S	C
Action	-	317	084	-037	-593	-643
Personal	145	-	003	-115	-411	-439
Others	-110	-218	-	035	-406	-508
Vague	-101	-175	-009	-	-403	-157
Supernatural	-471	-258	-251	-408	-	413
Chance	-486	-236	-336	-122	145	-

Rhodesian African Males

Scale	A	P	O	V	S	C
Action	-	448	-210	-402	-551	-411
Personal	249	-	-237	-369	-488	-441
Others	-136	-179	-	-034	-151	-109
Vague	-400	-349	-059	-	-076	099
Supernatural	-404	-447	-259	-153	-	025
Chance	-283	-341	-181	-058	-134	-

APPENDIX L (continued) : Corrected and uncorrected A-C Scale intercorrelations. (decimal points omitted)

Top sector : uncorrected correlations
Bottom sector: partial correlations w.r.t. I-E Scale

Rhodesian African Females

Scale	A	P	O	V	S	C
Action	-	465	047	061	-529	-790
Personal	329	-	-073	139	-711	-451
Others	-090	-208	-	085	-280	-268
Vague	-039	062	036	-	-584	-317
Supernatural	-494	-631	-173	-581	-	471
Chance	-736	-326	-180	-262	308	-

Rhodesian European Males

Scale	A	P	O	V	S	C
Action	-	371	-187	-362	-366	-505
Personal	263	-	-483	-343	-113	-359
Others	010	-431	-	-213	-161	-005
Vague	-284	-297	-316	-	-182	212
Supernatural	-297	-108	-182	-196	-	-284
Chance	-413	-295	-123	148	-312	-

Rhodesian European Females

Scale	A	P	O	V	S	C
Action	-	165	-027	-190	-351	-517
Personal	069	-	-028	-079	-328	-437
Others	023	-017	-	-091	-385	-277
Vague	-117	-047	-107	-	-440	113
Supernatural	-380	-323	-392	-458	-	015
Chance	-376	-398	-345	046	-012	-

APPENDIX M : Group mean deviation scores by event type for each A-C Scale.

GROUP (for key see Appendix D)	EVENT TYPE			
	Academic	Social	Political	General
SCALE A :				
ZAM	5.59	5.53	5.27	5.16
ZAF	5.73	5.47	5.27	5.11
RAM	5.22	5.49	5.19	5.21
RAF	5.26	5.54	5.03	4.99
REM	5.72	5.44	5.42	5.58
REF	5.74	5.43	5.39	5.40
Mean	5.54	5.48	5.26	5.24
SCALE P :				
ZAM	5.27	5.65	5.43	5.11
ZAF	5.18	5.55	5.49	5.21
RAM	5.39	5.60	5.39	5.19
RAF	5.36	5.54	5.38	5.16
REM	5.58	5.70	5.38	5.25
REF	5.63	5.72	5.44	5.21
Mean	5.40	5.63	5.42	5.19
SCALE O :				
ZAM	4.67	4.76	5.24	4.61
ZAF	4.64	4.89	5.10	4.61
RAM	4.83	4.80	5.24	4.66
RAF	4.72	4.83	5.24	4.70
REM	4.73	5.01	5.04	4.65
REF	4.67	4.92	5.03	4.54
Mean	4.88	4.87	5.15	4.63
SCALE V :				
ZAM	4.83	4.59	4.84	4.85
ZAF	4.97	4.75	4.82	4.80
RAM	4.94	4.68	4.89	5.03
RAF	4.78	4.57	4.88	5.04
REM	4.82	4.71	5.05	4.94
REF	4.84	4.75	5.05	5.01
Mean	4.86	4.68	4.92	4.95

APPENDIX M (continued) : Group mean deviation scores by event type for each A-C Scale.

GROUP	EVENT TYPE			
	Academic	Social	Political	General
SCALE S :				
ZAM	4.50	4.51	4.38	4.70
ZAF	4.34	4.50	4.41	4.74
RAM	4.39	4.48	4.51	4.73
RAF	4.64	4.56	4.55	5.08
REM	4.14	4.27	4.41	4.40
REF	4.11	4.23	4.47	4.61
Mean	4.35	4.43	4.46	4.71
SCALE C :				
ZAM	5.15	4.96	4.84	5.57
ZAF	5.14	5.10	4.92	5.54
RAM	5.22	4.99	4.78	5.19
RAF	5.28	4.97	4.93	5.04
REM	5.01	4.88	4.72	5.20
REF	5.02	4.93	4.63	5.25
Mean	5.14	4.97	4.80	5.30
	Personal	Impersonal	Positive	Negative
SCALE A :				
ZAM	5.43	5.35	5.41	5.37
ZAF	5.36	5.43	5.41	5.38
RAM	5.26	5.29	5.38	5.18
RAF	5.26	5.16	5.30	5.11
REM	5.49	5.59	5.52	5.56
REF	5.46	5.52	5.46	5.52
Mean	5.38	5.39	5.41	5.35
SCALE P :				
ZAM	5.41	5.32	5.46	5.27
ZAF	5.36	5.35	5.44	5.27
RAM	5.52	5.26	5.46	5.33
RAF	5.47	5.25	5.44	5.27
REM	5.45	5.49	5.58	5.37
REF	5.50	5.50	5.65	5.36
Mean	5.45	5.36	5.51	5.31

APPENDIX M (continued) : Group mean deviation scores by event type for each A-C Scale.

GROUP	EVENT TYPE			
	Personal	Impersonal	Positive	Negative
SCALE O :				
ZAM	4.78	4.86	4.78	4.86
ZAF	4.81	4.80	4.80	4.81
RAM	4.82	4.94	4.78	4.98
RAF	4.81	4.94	4.84	4.91
REM	4.82	4.89	4.77	4.94
REF	4.79	4.79	4.74	4.84
Mean	4.81	4.87	4.79	4.89
SCALE V :				
ZAM	4.54	5.00	4.58	4.97
ZAF	4.57	5.09	4.55	5.12
RAM	4.81	4.93	4.77	5.00
RAF	4.75	4.89	4.72	4.92
REM	4.83	4.92	4.84	4.92
REF	4.86	4.96	4.82	5.00
Mean	4.73	4.97	4.71	4.99
SCALE S :				
ZAM	4.55	4.49	4.63	4.42
ZAF	4.50	4.50	4.61	4.39
RAM	4.45	4.60	4.59	4.45
RAF	4.57	4.84	4.71	4.71
REM	4.22	4.39	4.35	4.26
REF	4.25	4.45	4.44	4.27
Mean	4.42	4.55	4.56	4.42
SCALE C :				
ZAM	5.28	4.98	5.15	5.11
ZAF	5.40	4.95	5.19	5.16
RAM	5.15	4.93	5.03	5.06
RAF	5.14	4.97	5.00	5.11
REM	5.18	4.72	4.94	4.96
REF	5.14	4.77	4.90	5.01
Mean	5.22	4.89	5.04	5.07