CATASTROPHE CONCEPTS IN STUDENT MOTIVATION

ALAN SAMUEL HILL.

Thesis submitted for the degree of Doctor of Philosophy.

The University of Aston in Birmingham.

November 1982.

SUMMARY

The problem posed by student study-related motivation is addressed. Students do not always appear to conform to a pattern of behaviour which might serve their own best interests, and in order to categorise the predominant overt patterns a tentative typology of student adjustive behaviour in relation to study is attempted. The basis of the typology is 'delay'.

Appropriate aspects of the relevant educational and psychological literature are reviewed in seeking to relate the categories of the typology to a theoretical model, and a pilot study indicates the probable value of certain psychological theories, notably consistency theory, approach-avoidance motivation and stress or anxiety, in gaining an initial purchase on the nature of study-related schemas developed by students.

The apparent congruity between significant adjustive behavioural features of the sample and certain features of the 'cusp' model from catastrophe theory leads to the adoption of the latter as the appropriate source for a unifying model: the main characteristics being hysteresis (delay), bimodality in delay tendency, and sudden behavioural transitions.

The design and employment of an instrument concerned with measuring delay tendency and bimodality in the sample is described and those characteristics are confirmed empirically in the sample in a manner indicating congruity with the catastrophe model. Factor analysis suggests a system of underlying motives, while sudden behavioural transitions are confirmed by means of a 'tracking diary'.

Evidence of stress in the form of self-reported anxiety in the sample is examined and an illustration is afforded of the relatively aversive nature of academic motivation among delay-avoidant students as compared with the delay-prone.

The report concludes with a brief consideration of the implications of the research findings for improved 'tuning' in both course design and academic counselling at tertiary level.

CATASTROPHE THEORY: DELAY: STUDENT MOTIVATION.

Alan Samuel Hill

Thesis submitted for the degree of Doctor of Philosophy.

November 1982.

Acknowledgements

I should like first to offer my warmest thanks to my supervisor, Dr. N.C. Graham, of the Department of Educational Enquiry at The University of Aston for his guidance and support during the lengthy period of this research. To Dr. P. Coxhead of the same department sincere thanks is due for the benefit of his advice in computer data analysis and for the suggestions which led to the method of numerical analysis of the 'Study Emphasis Time Series' reported in Chapter Five. Last but by no means least I acknowledge with gratitude the help given by the College authorites who gave permission for the research programme to be carried out on their campus, the interest shown by certain members of the College staff who willingly assisted with their experience, and the forebearance of those Third Year students who, sometimes at considerable personal inconvenience, participated as voluntary subjects in the surveys.

LIST OF CONTENTS

LIST OF TABLES

-continued-

LIST OF TABLES - continued

LIST OF FIGURES

-continued-

LIST OF FIGURES - continued

CHAPTER ONE

THE PROBLEM STATED

Introduction

> It is clear to most who work in higher education that the process of extended study, with its many points at which individuals are assessed and graded, and with its final crescendo of examinations, does create unique stresses for its participants. Students, as human beings, are going to react to stresses in numerous ways and with varying degrees of intensity....
>
> (Newsome, Thorne and Wyld, 1973, p. 86).

The typical design of courses in higher education, with its regular and frequent encounters between staff and students in lectures, seminars and tutorials, seems to presuppose a steady, or at least a more-or-less continuous involvement in the work of such courses by participating students. Hence, it would not be surprising to find that, under the stresses referred to above by Newsome et al, one fairly general form of reaction, varying in intensity over the student population, would be a series of greater or lesser perturbations in the implied pattern of continuous study. In other words, students might be expected to become involved to a greater or lesser extent in delay over study.

In fact, definite indications of student delay in study affairs are not difficult to come by. To the casual observer it may simply be that a particular student or group is frequently encountered in social areas of college, or, conversely, is very rarely encountered in a work area, such as the library. Such students are typically not often seen to be 'profitably' engaged in work and may, in some cases, be well known to be heavily involved in 'social' affairs either on the campus or elsewhere. For whatever reason, students of this type apparently spend a very considerable proportion of their time on matters that would be considered by the academic system, represented by course tutors' expectations, to be extraneous to the serious and centrally important business of preparing

for the various critical evaluations that necessarily punctuate any course of extended study at tertiary level.

However, fuller enquiry during the present study revealed a more differentiated pattern. 'Delay' appears not to be a unitary form of behaviour. It is manifested in mild or acute form and for different reasons by different people. Clearly its study might yield valuable insights into the form of students' various work patterns and into their motives revealed in terms of differences in perception of significant features of their study environment. Naturally this conceptualising of 'delay' as a significant and general feature of student adaptation to the stresses imposed by a life of extended study risks the distortion or biased interpretation of reality consequent upon the adoption of any model or paradigm (Kuhn, 1970). Notwithstanding this caveat the characterising of student adaptation to study in terms of a 'delay' model certainly appeared to afford initial purchase on the problem and to this end a pilot study was mounted. This pilot study took the form of a series of informal discussions on various aspects of study and associated problems, sounding out the impressions and attitudes of a sample of students who appeared representative of the spectrum of delay characteristics. The sample ranged from those who appeared to be obsessive workers, seldom away from their allotted tasks, to those who were very rarely encountered in a work situation and who, in some cases, were indifferent attenders at such institutional aspects of extended study programmes as lectures and seminars.

The Pilot Study

A pilot study was mounted in order to investigate the manifestations and parameters of a tendency to delay and of the associated inevitable adjustments to workrate in order to meet real or perceived requirements. The total number of Third Year students in the population selected for study was rather small by normal college standards, (N=68), and this gave rise to problems in attempting to secure a representative pilot sample for the

initial exploratory investigation. A further complication arose from the fact that one or two delay-type subjects took the opportunity afforded by the informal interviews to express criticism of the courses. This may have been a form of defence and took the form of expressions of disapproval concerning what was considered to be inappropriate features of course content or means of assessment. Yet even from this apparent irrelevance a point of considerable significance emerged, i.e. the tentative attempt to gain personal or group advantage by using the informal discussions to negotiate a more favourable position in relation to a deadline, or with respect to some element of work demanded by the college. Indeed, it soon became apparent that a particular group of students characteristically 'negotiated' their way through the college course, employing both explicit and implicit means as the occasion demanded. Without exception, students who negotiated in this way in order to gain time or to seek concessions or accommodations in terms of course requirements to their own perceived personal advantage were clearly of 'delay' type.

Unfortunately, however, some of the extreme delay-type students, whose covert characteristics would probably have been of great interest for the research, failed completely to respond to all requests for student participation. This group obviously had no intention of co-operating and studiously avoided all contact with the research programme. In fact, this was not difficult for them since the administration of survey instruments in the main empirical programme took place in normal departmental time, usually immediately following classes - having been advertised well in advance. Some of the group were notorious non-attenders, so here there appeared to be an example of avoidance behaviour further accenting already observed characteristics.

The pilot study took the form of a series of interviews over a period of approximately one term as students approached examinations at the end

of their Second Year. In fact, due to certain logistical problems, the last of the pilot interviews were held early in the Autumn Term of the Third Year, well before the major empirical surveys.

The aim of the pilot work was to establish major structural features of students' adjustment to study, paying particular attention to those dimensions on which individuals differed and which might, therefore, be used as the basis of a typology or classification. Such a typology was required to suggest a model from which operational research hypotheses might be derived.

The pilot sample was chosen by direct approach to those students whose observed behaviour, or that reported by members of staff, over a period approaching two academic years suggested that they might represent different categories in a 'delay' typology ranging from 'delay' to 'delay-avoidance'. Initially 20 Second Year students were contacted for this purpose and of these 12 finally agreed to meet at least twice during the summer term for a short discussion on the topic of 'student study habits and attitudes'. The 12 students participating were distributed widely so far as their inferred 'delay' characteristics were concerned, and the interviews, which were always arranged to suit the convenience of students, suffered virtually no absenteeism.

Emphasis was placed on the confidentiality of any information given during the discussions. These were framed in such a way as to explore students' perceptions of their own 'continuity' or 'discontinuity' in study behaviour together with any accompanying stress or anxiety, or feelings involving 'conscience' over the tendency to 'put things off'. Notes were taken by the interviewer and though students did not object to this they generally wished that their names should not be recorded in connection with such information at any point. This was, of course, readily agreed to.

The interviews were with individual students but occasionally, and fortuitously, a situation arose in classes to consider matters concerned with course organisation and the corresponding demands made upon students. Under these circumstances members of the pilot group were sometimes responsible for steering the discussion perfectly naturally towards those provisional target features of the research programme already discussed with them as individuals and without breaching confidentiality. In this way a considerable amount of additional and immediately corroborated information was gained which tended to confirm the information gained during the pilot interviews proper.

In analysing the interview data particular attention was paid to the extent to which students either explicitly or implicitly considered that the interviewer's definition of the situation was realistic, and also the extent to which the major structural characteristics, 'delay' and 'continuity-discontinuity', appeared to differ between types thought to be important for the typology.

Evidence was gained during the pilot interviews that high-delay students tended to perceive study as having relatively little intrinsic value in the main, and they obviously suffered few pangs of remorse or anxiety over their sins of omission or tardiness. In fact early in the research this finding led to a consideration of the possibility that such high-delay types might be 'at risk' in the manner described by Newsome, Thorne and Wyld (1973), a team of University counsellors. The presenting problem of 'concentration' was frequently found by these workers to incorporate significant indications of delay in getting down to the serious business of study. They point out that it is quite easy for a student to make out to himself what may seem to be a perfectly reasonable case in favour of a short period of procrastination should there be the inclination to do so. Unfortunately in some cases the habit grows and the short periods develop into longer ones. If this trend continues

inappropriate habits of work are established and a serious pattern of delay may become entrenched from which there may be no easy escape, and the student finds himself trapped in a vicious circle (Newsome et al, 1973, p.89).

Evidently in some cases the level of anxiety engendered by the threat of imminent disaster is the cause of some students consulting counsellors. The slight statistical correlation between 'Delay over Study' and 'Anxiety' (r = .2) reported in Hill (1976) was felt at this initial stage of the research perhaps to reflect this condition in a relatively small number of students - as indeed it may well do. But, as is typical in correlational studies, the coefficient conceals details of the range of differences among the individual cases comprising the sample. At this point it may suffice to report that the evidence gathered in the course of this research suggests that, except at times of actual 'confrontation', as in the presenting of a seminar paper or attendance at an examination, most high-delay type students evinced only slight anxiety in relation to study. The informal evidence appears to be that they insulated themselves from psychological harm by perceiving many of the college's expectations as artificial requirements and not truly concerned with 'real' learning experiences or significant performance. It became apparent that such perceptions formed a very effective psychological means of defence (Mechanic, 1962).

The pilot study soon revealed sub-classes within the gross category, 'delay-type', among the students in the sample. Revealed differences appeared to suggest two broad typings : those students whose delay characteristics were relatively extreme in form, and which have already been described briefly, and another group whose dispositions were at least mildly favourable towards study activity but who preferred to 'put off' the writing-up of assignments or the serious, intensive aspect of examination revision. In fact, the putting-off of intensive work until

shortly before a deadline became revealed as the norm for the sample as a whole. The real differences between these two types seemed to lie not so much in their overt behaviour as in the covert characteristics controlling the behaviour. The more extreme delay type appeared to evince priorities which de-emphasised study. These priorities seemed largely concerned with personal freedom and a more expressive mode of thought which seem to lead them to under-value institutional study arrangements and predispose them to follow their own inclinations for extended periods of time, thereby leaving until relatively late any preparation that a normal college course inevitably demands. The second and less extreme delay type, as already indicated, was more or less aligned with the values of the institution and seemed favourably disposed towards study but tended to procrastinate in the actual execution of assignments. Students in this broad sub-class appeared to be in the absolute majority in the larger sample studied intensively for purposes of the present research.

This latter finding is not at all surprising since it might readily be supposed that most people submitting themselves voluntarily to an extended course of study comprising stringent workloads and incorporating critical evaluations of performance at frequent intervals would, either consciously or unconsciously, have assessed their own tolerance of such requirements, weighing this against the social advantages in terms of public recognition which accrue to those who successfully achieve in courses of study at tertiary level. In other words, as a first assumption it might be reasonable to suppose that most persons becoming students and entering wittingly into such a mode of life would be predisposed to accommodate what might be perceived as recurrent vicissitudes, e.g. frequent examinations, in order to satisfy their need for achievement.

There is little doubt that the achievement motive was quite

significant in the functioning of most students, even those of pronounced 'delay' type. Even those exhibiting more extreme delay characteristics were found to report some disposition favouring study behaviour. (See the DTQ analyses reported in Chapter 4). All admitted that they wanted the degree, with or without reservations expressed concerning the means necessary to achieve it, but it soon appeared that the degree course represented a greater or lesser opportunity-cost to the students.

The term opportunity-cost, familiar in economics, perhaps needs clarification in terms of the present context. Briefly stated, the opportunity-cost of study activity to a student is the value of the next most valued activity which must be sacrificed at any particular point in time in order to place emphasis on study affairs. In the initial stages of conceptualisation of the research, when a suitable model for such a system of adjusting students was under consideration, it had been supposed that extreme-delay types, who adjusted to the requirements of the evaluating system very late, paid the highest price for study in terms of opportunity-cost. In other words, their preference for activities other than study was so pronounced that to study at all was conceived to represent a significant sacrifice for them. It was further supposed that the delay which characterised this type of student was occasioned by this inherent 'cost' factor, and that payment of this cost by studying would naturally be deferred until the student could no longer risk delay. The necessary 'payment', it was assumed, would commence at that point and this would be manifested by a sharp transition to the 'study', as distinct from the 'delay' mode. It was not difficult under this conceptualisation to favour the hypothesis that such high-delay students would be under considerable stress. This stress would arise through the operation of conflicting motives, viz, the motive to 'avoid' study and the motive

to 'approach' it. The former motive would be determined by their inherent disposition and the latter by the need to conform to the expectations of the evaluating system.

However, the pilot study revealed a very different state of affairs. The 'very-high-delay' type of student showed little or no signs of anxiety. Indeed, these extreme types exhibited perhaps fewer anxiety symptoms than any other group. Reference has already been made to the finding in Hill (1976) that 'Delay over Study' and 'Anxiety' (measured as a Cattell 16PF second-order factor) were found to show a slight correlation ($r = .2$). From the pilot study in the present work it would appear that this slight correlation owed little or nothing to the extreme delay type. It may in fact have been due to the success of the form of psychological defence which was found among these students, i.e. their avowed feeling that much which appeared under the heading of institutionalised study was relatively unimportant; it merely took its place amid the larger affairs of life. If these impressions gave a true reflection of the attitude of this group towards study then it would hardly be likely that they would experience anything resembling a major sacrifice over study: too little time, relatively, was devoted to it for this to be true.

And so it proved under the confirmation of the later empirical investigation. Even when a confrontation loomed there was little sign of anxiety. At this point, when other students would have completed the assignment or be revising for the examination, these high-delay types might not necessarily have got down to serious work. In the case of an essay they were quite prone to consult the appropriate member of staff and negotiate an agreement that their current understanding of the subject matter of the required work coincided with that of the tutor. By such means they sought to gain personal advantage and to minimise 'unnecessary' work. Thus, by reconciling staff and student viewpoints, 'high-delay'

students could defend against anxiety by reason of their perception of the greater degree of tolerance inherent in the study situation than that perceived by the majority of the student body. To the extent that they were successful in this exercise such students might perceive study as less dramatic in terms of such qualities as 'effort', 'pursuit of goals', 'severity', 'intentionality', 'difficulty', 'cruelty' - and so on. In fact, the evidence of anxiety reported in Hill (1976) was also found during the pilot study among certain students in the mid-range band of the overall 'delay' distribution.

Not all students in this 'intermediate-delay' band experienced anxiety in any clearly identifiable form. Those students at the more pronounced delay end of this band were similar in most respects to the very high delay types. They were certainly far less emphatic in their low estimate of many of their courses, or considerably less prone to become engaged in extraneous matters, such as College or domestic social life on an extended basis. But, like their extreme-delay counterparts, most of them suffered no particular signs of anxiety over study: they simply retained a degree of autonomy over their work-cum-social pattern of activity which was found to be quite foreign to students closer to the 'low-delay' (or 'high-approach') end of the continuum. Qualitatively their study behaviour pattern appeared to resemble the extreme delay type: they simply engaged in social activities which they deemed quite as important as study, whether these activities were connected with their college or their personal domestic (i.e. home) environment. They seemed to adjust to the requirements of the academic system quite successfully, and, in the main, without prompting from tutors, and they clearly experienced college life as a series of alternating periods of high and low study emphasis.

In general these intermediate-delay types, in spite of the clear

indications of definite periods of low engagement, or even of non-engagement with study, would not be considered slackers or idlers by staff or by other students. They should in all probability be considered perfectly normal and, typically, moderately successful, students. They fulfilled all the reasonable requirements of their courses and simply had the confidence to organise their time and effort to suit their own wider purposes.

A Tentative Typology

From the early enquiries forming the pilot study, coupled with general observation of the study behaviour of students in the target population in so far as it was revealed, a provisional typology began to emerge. It appeared that students could be ranged across a spectrum ranging insensibly from relatively high-intensity 'delay' to relatively high 'non-delay', so far as involvement with study was concerned.

The terminology involving the use of 'delay' and 'non-delay' is rather cumbersome in order to refer to the two broad groups encountered in this study, so the terms 'AP' and 'AV' will be used to indicate 'non-delay' and 'delay' behaviour respectively. The terms are derived from motivation theory, i.e. APproach and AVoidance motivation.

The typology is not necessarily intended to imply a normal distribution in the statistical sense for the population studied, though the numbers of students appropriate to the suggested regions are apparently by no means inconsistent with such a distribution. The boundaries between the various types represented by the different regions are, of course, areas of gradation rather than of sharp differentiation: the discreteness of the types being characterised by those students central to the different regions.

Qualitative Characteristics of Students Typifing the Main Regions of The Typology Emerging from the Pilot Study.

Type: AV-e (where 'e' signifies 'extreme').

Deemed most areas of study as of relatively little importance, or irrelevant, and subservient to their preferred interests, requirements or expectations; little or no anxiety manifested; no emphasised need for academic achievement; coping behaviour typically informal negotiation with staff and 'grapevine' information concerning lectures and seminars rather than by direct application to the work.

Type: AV-m (where 'm' signifies 'moderate').

Could de-emphasise study without devaluing it; little or no anxiety manifested; no emphasised need for academic achievement; delay, or 'putting-things-off' used as a normal coping behaviour; periods of high study-emphasis alternated with periods of low emphasis; study techniques more concerned with direct 'confrontation' with work than informal negotiation.

Type: AP-m

Definite orientation towards study (i.e. study tended to be emphasised preferentially over other activities at least during college terms); strong signs of anxiety as deadlines loomed; definite need for achievement of an acadmic kind; study technique more concerned with direct engagement with work than informal negotiation; delay used as a mode of psychological defence as well as a mode of coping.

Type: AP-e

Obsessive work orientation; very high need for academic achievement; clear indication of controlled anxiety, intensifying as deadlines loomed; Very high emphasis placed on study activities (virtually incessant and intensive study) through direct engagement with work rather than by means of informal negotiation; obsessive study behaviour used both for 'coping' and 'defence' (Mechanic, 1962).

An interesting point of distinction between the two 'intermediate-delay' types, i.e. AV-m and AP-m, was that the AV-m group tended to use delay for coping but seemed to experience little or no anxiety and, therefore, did not need to 'defend', whereas the AP-m group tended to use delay as a means of both coping and defence, exhibiting intermittent anxiety.

Stability-Instability Characteristics of the Regions of the Model

Type: AV-e

Study behaviour was typically characterised by dramatic transitions from low to high study emphasis (SE) immediately before a deadline, and from high to low immediately afterwards. This pattern appeared to exhibit stability at low SE and instability at high SE.

Type: AV-m

Study behaviour was marked by sharp transitions from relatively low to relatively high SE some time before deadlines, though usually exhibiting a more committed work pattern than AV-e type students. This was typically followed by a rapid return to relatively low SE. Thus this type appeared to exhibit a definite form of stable-limit oscillation, having a stable mode at both low and high SE, though with a preference for the former state.

Type: AP-m

Study behaviour was characterised by low-frequency oscillations between relatively low and relatively high SE, with superimposed high-frequency oscillations. As in the case of AV-m types there was typically a sharp transition to high SE some time before a deadline. Thus, behaviour appeared to be typically unstable.

Type: AP-e

Study behaviour characteristically a series of high-frequency oscillations in the very high SE level. As in all other types there was a dramatic transition to relatively higher SE shortly before examinations. In the case of course-work assignments these students had typically completed them long before the deadline!

Student Reactions and the Potential Value of the Research.

Traditionally a notable feature of research in areas involving psychology or its applications has been the participation of undergraduate students as subjects - their active participation being an expectation of the tutors in their department. By thus participating in the research programmes of the college staffs students would naturally anticipate substantial personal gain for a number of reasons. These would include acquaintance at first hand with important areas of theory in operational terms; insight into the nature of social experimentation, which would reap a harvest for those who, in their turn, became researchers; the certainty

that they were making, very early in their careers, personal contributions to knowledge in their chosen subject.

Evidently no comparable personal benefits would be likely to accrue to any student teacher agreeing to participate in the present research. There was no obvious way in which participation by a student could be regarded as the fulfilment of a course obligation. Nor would experience of this kind be likely to sharpen insight into, or improve performance within, the settings likely to form the working milieux of most teachers - save, that is, in a very indeterminate and tenuous sense. This latter point gains particular force from the fact that, in order to avoid undesirable bias or distortion of their responses during the various stages of the investigation, these students could not initially be taken into the confidence of the researcher concerning the purpose of the enquiry. It should be reported, of course, that an offer was freely made by the researcher to all potential subjects to discuss the nature of the work after the final data collection exercise. Needless to say, a guarantee was given concerning the confidentiality of any information divulged. It seemed hardly surprising that the initial invitation to Third Year students to participate in a survey of 'study habits and attitudes' met with only slight enthusiasm.

However, there seemed to be no reason why the long-term possible benefits of work of this kind should not be discussed with them. These benefits were conceived to be both practical and theoretical. Practically, an investigation into the overall pattern of student adjustment to the exigencies of academic study programmes might yield benefits in terms of both course design and student counselling. Theoretical benefits might include clearer insight into the rules governing observed behaviour.

The design of courses for pupils in school and students in college typically presupposes a continuous engagement by the subjects and, no doubt, teaching staffs might prefer to think that this was highly

desirable. Be that as it may, while this study has not concerned itself with the various modes of engagement with work of subjects up to the age of eighteen, it became apparent that by that stage of development 'natural' styles of adjustment had become established. The typology attempted above tries to set out the distinguishing features of the major groups in this respect. Of course, if there are quite fundamental reasons of a psychological kind why different students adjust to the requirements of study in different ways then it should be of interest, at least, to course designers to know this. They may even be able to make use of the information to design courses more congruent with the natural functional patterns of students, and to that extent perhaps make them more effective. Work of this kind, devoted to differences in study strategies, has already been begun in related areas, e.g. the work of Pask and Scott (1975) on cognitive style, and Parlett and King (1971) on 'all-or-nothing' approaches to study. But, in general, work of this kind is in its infancy.

Reference has already been made to a counselling team above (Newsome et al, 1973). While the present work was not envisaged as being directly related to counselling, the results might certainly inform the refining of advice given by academic counsellors.

It was felt that reasons such as these for the proposed research were more likely to appeal to students than the main theoretical reason for the present work, which is essentially an exercise in classification: an attempt to reduce that arbitrariness of description inherent in attempting to systematise insight into complex social systems.

Summarising students' reactions to these early negotiations it can be said that, while they were not in the main especially interested in the work itself, and could not hope to benefit in any clearly forseeable way from the findings since they would have left college long before the results were known in any case, many agreed that they would wish research to be carried out in this area. This was taken to be at least an

encouraging indication of their sympathy, but it could be anticipated that to trespass too far on their good will on these grounds alone might be an error of judgement. Subsequently a relatively large proportion of the students in the target Third Year made it clear that, subject to certain guarantees concerning the confidentiality of their responses, and assuming that the various enquiries envisaged as part of the research would not encroach to any great extent on either their study or their free time, they would be disposed to participate.

The tentative nature of the offer to participate was due principally to a greater or lesser degree of reluctance to divulge matters which many students considered in any case to be personal, but which, if known to a tutor, might be prejudicial to the outcome of one or more of their college courses. It was in connection with this latter point that one of the most significant guarantees of confidentiality could be given. Though the research was to be carried out by agreement with the college authorities, the latter had agreed that they would not concern themselves with the findings as they related to any individual student, but would be content with the general report to be prepared at a later date. Further, apart from certain obvious and understandable requirements imposed in order to safeguard both the college and the individual students in a manner which accorded with the highest ethical standards of research, the college left the design and implementation of the overall enquiry to the researcher. This meant that if the subjects cared to accept the researcher's word they could rest assured that nothing disclosed in the discussions or in the instrumental surveys would be made known to the college authorities - certainly not without students' full prior consent.

Notwithstanding their general acceptance of the assurances given there were clear signs that a substantial minority continued to harbour reservations about the way in which the enquiry seemed to trespass upon what were felt to be matters largely personal and private. These

misgivings were reflected in the final sample which was smaller than had been expected, amounting to approximately three-quarters of the entire available Third Year population for most of the empirical surveys (i.e, N = 50 to 55). There was one aspect of the final enquiry where, because of the comparatively heavy demand on students' time, a much smaller sample was expected. This was in the completion of the Study Emphasis Tracking Diary, and it could only be hoped that, despite the vicissitudes and vagaries of student participation, a useful cross-section of types referred to in the model outlined above would be represented. In the event the sample for this part of the investigation was interesting, though small (N = 12), and this will be discussed in detail in Chapter 5.

Considerable interest lay in the group of students (N $\simeq$ 15) who chose quite deliberately to distance themselves from the research. The rather superficial evidence available suggested that these non-participants were important in that they constituted in the main an independent minority who were intent on preserving autonomy in the conduct of their own affairs. By the very fact, however, that they absented themselves from all meetings concerned with the investigation, this group drew attention to themselves, and it was felt to be perfectly reasonable to scrutinise such evidence as might become available concerning their general orientation towards study activity. The sources of such evidence were discussions with other members of the college staff and the close attention to what was revealed about personality and attitude towards study in relatively brief and sometimes infrequent encounters with the students themselves.

While there is no <u>systematic</u> record of the study pattern of these students, either from the pilot study or from the later empirical surveys, it seems from the evidence available that, so far as 'study-delay' characteristics were concerned, they were fairly well distributed over the AP - AV spectrum. A number were mature day students who were considered

by staff to be fulfilling all normal course requirements but whose allegiance was necessarily divided between home and college. In the main these were probably of AP-type. Others with no such domestic commitments were heavily involved in campus affairs including student welfare or social activities and this group in the main probably exhibited AV-type behaviour. Summarising, it may be said that, while it was regretted that this overall group of students would not participate in the research, it appeared that it did not constitute a homogeneous component of the population in 'delay' terms and thus represented a range of types qualitatively embodied by others appearing in the samples.

This study is not primarily concerned with academic performance at college but in view of the possibility of unwarrantably extrapolating impressions of study-emphasis patterns over time to judgements of students' intellectual competence it is worth recording that there was little or no evidence that the types of student designated 'AV' in this work were in any sense intellectually less able than their 'AP' counterparts. In fact, in view of their comparatively low-frequency contact with informed academic sources it might be argued that many of the former type were academically very competent in view of their level of achievement. The AV-type students appeared to conform in a marked degree to what might be termed an 'entrepreneurial' pattern of study as distinct from the contrasting 'employee' style characterising the more conformist AP-type. Certainly the relatively autonomous AV-type was apparently more easily able to cope with the risk and uncertainty of their preferred mode of study-related behaviour without undue anxiety than was the case with the AP-type.

A final point in considering student reaction to the proposed research is worth making. This concerns the intractable problem of the extent to which the results of the enquiry are actually determined by the method of

the investigation and the interaction between the researcher and the system under investigation and are not in fact representative of the norms for the population. This inevitable distortion of the results is unfortunately indeterminate but in view of the ecological validity requirement of this study such risk of distortion was to some extent minimised by the decision taken following the pilot study not to include experimental designs in the research programme.

The Nature of the Research

A consideration of the nature of the research described here must, to some extent, touch upon the subject matter of the empirical work to be described in detail in Chapters 4, 5 and 6. However, it is introduced here because the difficulties encountered in gaining student participation in all probability influenced the overall conceptualisation of the enquiry, through, for example, consideration of the reasons for reluctance on the part of subjects. These reasons - sometimes inferred from behaviour, sometimes quite explicit - and the necessity of accommodating them in order to ensure a reasonable number of subjects in the final samples would be likely to make considerable demands upon any research design, and, beyond this, may have come to form part of the researcher's implicit definition of the situation.

In view of the significance of one particular requirement, viz. that the work should concern itself with what has been called 'ecological validity' (Neisser, 1976), considerable thought was given to the mode of investigation which might be employed to fulfil this requirement. The importance of this lay not only in the kinds of evidence which would be collected, but in the very way in which the system of adjusting students would be perceived. Experimental studies seemed, on these grounds, to be inappropriate due to the unavoidable distortion of the 'natural' functioning of the samples under the artificial conditions of the experimental regimes.

Of course, there must inevitably be some sacrifice in terms of clarity

of outcome when experimental investigation is eschewed, but there are also major corresponding risks in relying on evidence from such artificially limited and controlled situations which cast doubt on the extent to which the results can be generalised to the 'real' world. Indeed the tradition of conceiving research within the experimental approach in any area cognate to the social sciences is fraught with the risk of restricted development. Neisser (1976) has indicated the shortcomings for his own specialist area. "The actual development of cognitive psychology in the last few years has been disappointingly narrow, focusing inward on the analysis of specific experimental situations rather than outward towards the world beyond the laboratory." (p. xi).

In a way which bears obliquely upon the same potential shortcomings of experimental work in psychology Jenkins (1974) highlights something of the nature of the problem encountered in the present enquiry. He points out that the early experimenters concerned to reveal the nature of 'pure' memory committed a cardinal error in the conceptualising of the problem. The details of Jenkins's critique do not concern us here, save in so far as they bear on that most important feature of experimental investigation, viz, the control of variables deemed to be 'interfering' in an enquiry. In Ebbinghaus's work such a controlled variable was the effect of prior knowledge on what was remembered. Such a pre-ordinate design may prove to have been attempting to mask highly significant independent variables. As Jenkins wryly remarks: "If one studies any field after first removing the variable that normally accounts for most of the variance, one is likely to obtain odd results that seem amiss or unusual in everyday life where that variance holds sway." (p. 2)

Because of the highly exploratory nature of the present work and because of its intention of opening up a field of study of potential interest for later investigators, risking the type of error referred to by Jenkins was considered quite unacceptable. At the design stage of this research

the variables, or variables, that normally account for most of the variance were highly speculative. Their elucidation and characterisation was an aspect of the enquiry itself.

Since the study is concerned, in part, with an attempt to gain some insight into the nature of the cognitive controls responsible for motivating students' study emphasis under normal conditions, Neisser's and Jenkins's reflections are particularly apposite here. It seemed reasonable, in conceptualising the research and in deciding the mode of investigation, to accept that these controls, or schemas, are related to the complex 'real' world of everyday student life. The term 'schema' as used here refers to: "persistent, deep-rooted and well-organised classifications of ways of perceiving, thinking and behaving." (Parry, 1967). Certain experimental investigations did suggest themselves as the work was planned, but it was felt that the outcomes of any such exercises might have been difficult to relate to results from the 'natural' settings. For this reason such possibilities were not pursued.

For the foregoing reasons the strategies employed were derived partly from the normative, and partly from the interpretive, paradigms (Cohen and Manion, 1980). Such a combination of investigative styles appears to lend itself to a perfectly acceptable compromise even to acute critics of the classical, or normative, form of investigation such as Parlett and Hamilton (1976), and readily conforms to the requirement of rigour expressed by Nisbet (1980).

The principal advantages of the interpretive, or 'social anthropology' paradigm were found in the opening stages of the work, when initial perceptions of the nature of the research were clarified and problems were redefined. The course of the pilot study followed a sequence which approximated to that outlined by Parlett and Hamilton as typical of the interpretive or social-anthropological style:-

> The course of the study cannot be charted in advance. Beginning with an extensive data base the researchers systematically reduce the breadth of their enquiry to give more attention to emerging issues. This 'progressive focusing' permits unique and unpredicted phenomena to be given due weight. (Parlett and Hamilton, 1976. p. 93).

With reference to the normative aspect of the work, since the principal instruments used were either designed specifically for present purposes, or were well-known instruments cast into a form suggested to be appropriate by the earlier interpretive stages, it seems likely that there should, at least, be no undue distortion of the structural characteristics of the system in order to fit a numerical design. For this reason the measurement should, within the definite design limits, enshrine a considerable degree of validity. The inherent weaknesses of both the interpretive and normative styles of research are clearly apparent and relate principally to the risky subjectivity of the former and the unattainable objectivity of the latter. It is hoped that consciousness of these shortcomings has in some measure avoided the excesses of both paradigms. Stenhouse expresses a very important caveat when he considers the aspirations of the more interpretively biased workers in the area of curriculum research and development as follows:-

> They aspire to 'tell it as it is' and they often write as if that is possible if they allow for some distortion due to their own values. But there is no telling it as it is. There is only a creation of meaning through the use of criteria and conceptual frameworks.(Stenhouse, 1975. pp. 116-117).

The conceptual framework of the present study, based upon a qualitative branch of mathematics, will be introduced in Chapter 3.

Summary of Chapter One

1. There is a considerable mismatch between the design of college courses, reflecting academic institutional expectations and assumptions, and actual student study behaviour.
2. The mismatch is costly in terms of personal and institutional stress, and probably in terms of inefficiency, and, therefore, constituted a problem which warranted closer detailed examination.
3. A pilot study involving unstructured interviews concerning student study habits and attitudes was conducted in order to clarify the main dimensions of the problem.
4. The pilot study led to a tentative classificatory scheme or typology related to major concepts of student adjustment to study, viz. delay/delay-avoidance, and stability or continuity/discontinuity of study emphasis; also a dimension of anxiety.
5. The tentative typology led to a consideration of the research appropriate to obtain clarification of the issues emerging as significant, and of the constraints setting limits to feasible enquiries into the system of adjusting students. These constraints were principally:

    (a) The extent of student voluntary co-operation in the proposed research programme.

    (b) The requirement of ecological validity in the results emerging from the research strategies adopted.

CHAPTER TWO

RELEVANT PERSPECTIVES ON MOTIVATION AND STUDENT STUDY BEHAVIOUR

Approach and Avoidance Motives

Chapter One drew attention to evidence suggesting that students could be grouped according to a rather crude typology which depended upon their normal disposition towards study. It was inferred that disposition in relation to study is controlled by a number of factors which fall into two contrasting categories. One group of factors tends to orient students towards study. These are the 'approach' factors and produce a high study emphasis (SE). The other group of factors produces an 'avoidance' orientation and this results in a low study emphasis.

In conceptualising contrasting resultant tendencies in student study behaviour it is natural to look for clarification in the literature on motivation, for this literature may serve two purposes:

(a) To establish the extent to which the behavioural characteristics of the student population are explicable in terms of apparently related theory.

(b) To systematise the later, more rigorous observation of the samples in terms suggested by such theory.

The term 'motive' has been translated out of its non-systematic lay usage into the arena of the social sciences where it might be supposed to have gained an exact, or operational, definition. An illustrative parallel from physics would be the concept of 'energy', which has a widely understood, if inexact, meaning in its everyday sense but a clearly defined meaning as 'a capacity for doing work' in its scientific sense. But closer examination of the use of the terms 'motive' or 'motivation' in the psychological and related literature seems to show small evidence that anything like the physicist's exactness attaches to the terms in the social sciences usage.

Peters (1958), an early reviewer of the nature of motivation, found much confusion in the employment of the concept. Lazarus (1968) has pointed out that some psychologists question the introduction of motivational concepts in psychological analysis, finding it preferable to absorb them within cognitive concepts. Thus, in the work of Kelly (1955), Bannister (1970) and Rokeach (1960), among others, motivation is treated in terms of the concepts, beliefs and expectations that individuals have about themselves and their environment. Lazarus is quite clear that this is a perfectly reasonable approach since motivation is defined as the psychological representation of goals and the routes to various desirable goals rather than as physiological needs. In fact, the only self-evident characteristic that these so-called 'motivational cognitions' have that distinguishes them from other cognitions is that they refer to goals the attainment of which is more or less important to the person.

In order to establish the nature of the controlling cognitions and their effects a brief review of the literature relating to relevant motivational concepts will be appropriate at this point.

A Cognitive View of Motivation: Adaptation and Adjustment

There has been a growing tendency over the last twenty or twenty-five years to cast motivational theorising into cognitive terms, which has stemmed in part from a dissatisfaction among psychologists with theories based simply on notions of 'drive'. For some theorists the term 'motivation' itself has become something of an embarrassment in that it appears to them to be redundant. Lazarus (1968) succeeded in suppressing the notion of motivation almost completely. Instead of motivation Lazarus tends to use the term 'adaptation', which he explains as functioning to promote "...a desirable state of affairs within the organism or between the organism and the environment." (p. 212). Heckhausen (1968) stressed the approximate functional identity between

the two terms but had reservations about the term 'adaptation' because it appeared to imply that the organism's behaviour is always subject to sufficiently forceful environmental circumstances. In later work Lazarus (1976) made a distinction between the terms 'adaptation' and 'adjustment' and appeared to imply that the latter term might be more appropriate in much psychological work. According to Lazarus the biological concept of adaptation has been borrowed and modified by the psychologist and re-named 'adjustment' in an attempt to emphasise an individual's struggle to survive and thrive in the physical and social environment. Lazarus stressed that a shortcoming of the accepted usage of the term was that it had come to signify a person's attempts to adjust to the demands of the external world, whereas true adjustment consists of two processes, viz. fitting oneself into given circumstances, and moulding the circumstances to fit one's personal needs.

The importance of considering the interaction between the human organism and the environment was considered by White (1959) in a paper which addressed itself to the problem of motivation in the absence of the 'forceful environmental circumstances' referred to by Heckhausen. White attempted the conceptualisation of some of the important features omitted by drive theory and he grouped the omissions under the term 'competence'. He stressed that the term is used in its biological rather than its everyday sense, i.e. an organism's capability to interact effectively with its environment. The motivational component of 'competance' is termed 'effectance' by White, and it would appear to be very similar, if not identical, to the term 'adjustment' as used later by Lazarus (1976). It is in this sense that the term 'adjustment' is used in the present study.

White stresses the persistence of effectance motivation in that he considers that it occupies the period of time between episodes of homeostatic crisis:

> The effectence urge represents what the neuromuscular system wants to do when it is otherwise unoccupied or is gently stimulated by the environment. Obviously there are no consummatory acts: satisfaction would appear to lie in the arousal and maintaining of activity rather than in its slow decline towards passivity.
> (White, 1959. p. 321).

Thus the organism is apparently envisaged as engaging preferentially in focused, mildy stimulating activity of an exploratory nature as a form of maintained arousal, and, according to White, is characterised by behaviour which is learned for the reward of indulging in it.

It seems likely that motivation between crises would differ as between AP and AV students. In fact, the evidence is strong that many students of relatively pronounced AP type actually did engage in study activity during periods remote from any 'confrontation' because the activities themselves brought their own peculiar reward - partly, no doubt, in terms of satisfying a need for achievement, but also, to judge from the evidence already cited, in order to allay feelings of apprehension contingent on their <u>not</u> emphasising study. AV-type students between periods of academic crisis or confrontation were much more frequently engaged in activities which might be generalised as relatively low 'study-emphasis' (SE), and this rather varied form of activity certainly did appear to be its own reward!

In fact, motivation conceptualised in terms of competence brings a powerful insight to bear on the present study which relates perhaps most significantly to the AV students. White makes the cogent point that competence would not depend upon strong drives. Paradoxically, it would be better served by play and exploration if what is required is a flexible and knowledgeable form of interaction with the environment. Strong drives lead to the learning of certain specific lessons very well, but they simply do not create maximum familiarity with the environment. This has implications for the effectiveness of possible <u>control</u> over the

environment, and it may be inferred that AV-type students are possibly involved in more effective adjustment processes than their corresponding AP colleagues.

This hypothetical adaptive or adjustive efficiency of lower-intensity motivational states was foreshadowed in the work of Yerkes and Dodson (1908) when they demonstrated that maximum levels of motivation did not lead to the most efficient problem-solving, particularly in complex areas. Their findings suggested that for each problem there was probably an optimum motivational intensity lying between highest and lowest intensitites, with the optimum being lower for more complex tasks.

The work of Tolman (1948) featured a similar illustration of the adverse influence on adaptation of high motivation in his discussion of the concept of 'cognitive map', which relates very closely to the more frequently employed cognitive concept, 'schema'. Tolman conceived of such a map as being either narrow or broad as it relates to the range of cues picked up during the course of learning, and suggested that one of the conditions which led to a narrowing of the range of cues to which subjects were attuned was a high level of motivation. In the light of Tolman's work it is tempting to speculate that pronounced AP-type students tend to develop narrow and highly instrumental schemas which over-emphasise the competitiveness and risk of achievement tasks while restricting the range of useful and perhaps comforting cues to which individuals might be tuned. Such an undue restriction on effective adjustment might well be regarded as maladaptive.

In this connection it is certainly worth referring to a study concerned with the way in which student teachers learn their subject. Runkel and Damrin (1961) used a form of Rep Grid analysis in an exploration of the degree of complexity of the dimensions which the students used to make judgements about the nature of their work.

Since Personal Construct Theory is concerned with the extent to which people are influenced by simple or complex dimensions of judgement in construing their experiences, Repertory Grid analysis of such construing may reveal that subjects use dimensions which prove to be equivalent, and this would be considered to be a low-complexity system of judgement. Conversely the Rep-Grid testing may show that a person uses a variety of judgemental dimensions or constructs of non-equivalent type, and this would indicate high-complexity construing. Runkel and Damrin tested students at the commencement of their course, at the midway point, and finally towards the end of their training. It was found that, at first, the students utilised a wide range of dimensions in making judgements, only some of which were relevant. However, by the midway point, during the seond year of their course, anxiety had increased and their range of judgemental constructs had become much narrower, i.e. there was a general trend towards lower order complexity in construing. Finally, by the time they came to the end of the college course in the Third Year anxiety had diminished and they were once again perceiving the processes in which they were engaged as complex, but this later stage of complexity was much more appropriate in its structure to the nature of skilled professional practice in their calling. Thus, this study also suggests that, under relatively high levels of motivation associated with uncertainty and anxiety there is a tendency for people to restrict the number of constructs in terms of which they are able to interpret and judge their environment.

It may be that students vary both in their tendency to utilise a restricted range of cues and in the extremism of the judgements they make on dimensions which are common to them all. With reference to such a model it might be supposed that the study-related judgements of those students who are under considerable stress would be less complex than those of students not so stressed, leading to a correspondingly less

varied form of study-related behaviour. Where judgements are likely to be more complex, as in those students suffering less stress, it would be hypothesised that behaviour would be more varied. Furthermore those judgements actually made might well be less aversive in their affective component (Warr and Knapper, 1968).

Landfield (1954, 1955) carried out experiments which suggested that the narrowing of the perceived cue range is, in fact, likely to be due to a restricting of the range of dimensions that people employ in judging their environment. Landfield's work touches upon the present research in a further, quite cogent, way. He found that the sense of subjective disturbance or stress experienced in the presence of threatening people is due, not so much to doubt relating to the possible behaviour of the threatening person, but to a person's doubts about his own behaviour. In other words, people experience serious doubts about their own ability to cope behaviourally in such situations. This finding certainly accords well with the freely-admitted experience of a number of students of AP type who, while forcing themselves to attend, found seminars very threatening and correspondingly aversive experiences. This contrasted strongly with the reports of AV type students who, while admitting that they frequently absented themselves from seminars, appeared to suffer no particular stress or misgivings about their ability to cope when they did attend.

The tendency for the perceived cue range to be narrowed by stress is significant as a factor differentiating between AP and AV students - at least between those towards the two extremes of the typology, i.e. AP-e and AV-e. In view of the emerging evidence of considerable stress among AP students it can be inferred that their perception of the range of cues would be restricted, and problems associated with the academic workload, in terms of coping and defence, would be highly salient.

Students and Level of Development

Following the foregoing references to work relating to the influence of stress and anxiety on the processes of judgement it will be of interest to consider a recent study which has considerable bearing on the present work in that it addressed itself to the problem of post-adolescent ethical and intellectual development. It would appear to be highly probable that different levels of cognitive development would lead either to different modes of adjustment to environmental constraints and pressures or to differential influences on the intensity of expression of personality-related adjustive strategies.

Students are peculiar as a group in being selected for high intelligence, which for present purposes is perhaps most appropriately defined, in piagetian terms, as degree of adaptation to the environment. Certainly they are well adapted in the sense that they have achieved in public examinations in competition with many of their contemporaries. Traditionally they have been seen as a somewhat exclusive, elite group engaged in esoteric pursuits which were denied to most people, and the pursuits themselves were carried out largely in the segregated communities formed by colleges and universities. Further, as Biggs (1969) has reminded us, the later stages referred to by developmental theorists are concerned with the upper limits of cognitive functioning, whereas, as he says: "... it is quite obvious that most adults do not act according to formal operations most of the time: only a few do some of the time." (pp.73-74). There is, therefore, a significant degree of artificiality in being required to 'act according to formal operations' as a normal part of one's everyday functioning if one takes the whole population to which a typical developmental model would apply as a reference. Yet students <u>are</u> expected to do this and they are required to do it under a regime of assessment and criticism, albeit well-intentioned.

Evidently students have furnished evidence of their capability of maintaining such a level of operations (used in the developmental sense) in their earlier 'qualifying' years before entry to college, but as they pass through adolescence they naturally encounter conflicting pressures which certainly do not constitute a problem for the younger child. Yet one potential stress, which is peculiar to students, has received scant attention in the literature but is most certainly worth considering here. This stress is considered by Perry (1970) to be inherent in the intellectual and moral development of academics, who are naturally required to develop their insight into the nature of knowledge to a much more sophisticated level than that required by the layman. For most people, even the very intelligent, the knowledge forming part of their everyday functioning is virtually literally objective in its degree of unquestioning acceptance. However, for the potential academic this could not suffice because it is an essential aspect of his intellectual development that he learns to question the epistemological basis of his professional insight as a prerequisite to the refining of the conceptual and syntactical structures (Schwab, 1964) to which his discipline is provisionally committed. But the early stages of such development can be highly stressful because they require a shift in the frames of reference, or paradigms (Kuhn, 1970), by means of which a student has come to make sense of his world.

Before returning to the nature of student development for fuller discussion it is worth recalling that today colleges and universities are not the segregated communities that traditionally they were. To a greater extent than ever before students are subject to pressures from the world outside the academic institution. The former cloistered, inward-looking community of students has, to a considerable extent, been replaced by a generation whose wordly allegiances are strongly maintained and who conceive of study as a phase in their life which has

its proper place, and a significant one, but which should in no sense be allowed to supplant those other personal-social contacts and interests which may have been forged before entry to college.

Constant exposure to popular culture via the media on a virtually every-day basis ensures that many students are perpetually under the influence of forms of presentation which emphasise a norm of cognitive functioning well below that of Piaget's 'formal operations'. Inevitably, however, students must attempt to distance themselves from full normal participation in such mundane affairs in order frequently to concentrate their efforts in a prolonged engagement with the high-level cognitive mode of operation proper to the intellectual. Switching between these contrasted modes is likely to be quite difficult, even stressful, and inertia may be a characteristic of the 'upward' if not the 'downward' transition. Indeed, where allegiance to the popular culture is particularly strong it may be increasingly difficult for some to make the transition at all (ref. Newsome, Thorne and Wyld, 1973, already referred to in Chapter One). At best such strong allegiance might tend to minimise the effectiveness of a student's engagement in extended courses of study.

Returning to a closer consideration of the intellectual and ethical development of students during their college years it may be inferred that the transition from the earlier stage of acceptance of authority to the later stage of questioning that authority has potential for dramatic disorientation. Thus, early in his development a future student, like others in his peer-group, accepts the word of authority in the person of his teacher. It is, apparently, his task to achieve an insight into the teacher's way of perceiving and of conceiving affairs within the chosen discipline, because it is widely held that these are the 'right' or 'correct' views. The acceptance of such an orthodoxy is virtually a prerequisite for success in the earlier public examinations, such as

GCE O and A levels. Small wonder, therefore, that a 'game' in which the rules are apparently changed as play continues should prove stressful for some. Yet the study by Perry (1970) of Harvard students during their college years reveals that such a paradigm shift might form the basis of a scheme of post-adolescent development of special relevance to intellectuals.

From the results of a longitudinal survey of Harvard and Radcliffe students during a period of ten years Perry (1970) has set out a scheme which he asserts represents, in essence, the various stages through which students pass. According to this scheme development is considered to be an evolution in students' mode of interpreting their experience over this period of time, and these 'modes' are imputed to different and progressive 'forms' by means of which the students construe their experience and understanding of the nature of knowledge, value and responsibility. Perry himself provides a summary of his scheme:-

> In its full range the scheme begins with those simplistic forms in which a person construes his world in terms of absolute right-wrong, good-bad; it ends with those complex forms through which he undertakes to confirm his own commitments in a world of contingent knowledge and relative values. The intervening forms and transitions in the scheme outline the major steps through which the person ... appears to extend his power to make meaning in successive confrontations with diversity. (p.3)

In other words Perry traces development from a relatively naive 'Dualism' to a more sophisticated 'Relativism', though, of course, students will be at different 'positions' in this hypothetical system when they enter college. Without attention to detail, it may be said that the changes in the students' construing of the nature of knowledge can be grouped into nine of these 'positions', which can be summarised in three main groups, viz,'Dualism and its Modification', 'Realising of Relativism' and 'Evolving of Commitment to Relativism'. (An outline of the scheme is given in Appendix 1). Basic Dualism is a position in which knowledge is perceived as absolute and, therefore, answers in examinations are either 'right' or

'wrong'. Relativism implies the legitimacy of uncertainty and the appreciation that all knowledge is contextual and provisional. The final stages comprise 'positions' in which the student comes to realise the all-pervasive nature of Relativism and comes to live in a reconceptualised universe in which he is committed to attempt the reconciliation or tolerance of perceived inconsistencies and dissonances without any certainty of success in either undertaking. As in every other aspect of their functioning different students exhibit their own personal characteristics and it is hardly surprising to find that they pass through Perry's stages at different times: indeed, as Perry clearly indicates, some students will not pass through the developmental process at all smoothly and may 'temporise', 'retreat' or even 'withdraw'. Evidently the developmental process will be more or less stressful.

Biggs (1968), theorising quite independently of Perry, appears to agree with the substance of the latter's findings so far as the development of qualitatively different modes of thinking are concerned, but, like most other theorists, he is considering intellectual development in the wider population and not just that of the supposedly more sophisticated. In Bigg's view, so far as strictly logical considerations are concerned, formal operations probably do constitute the highest level of organisation, but he considers that there are subsequent developments - possibly taking place to some extent throughout middle age - which suggest that the peak of cognitive development is not reached at adolescence, as suggested by Piaget and others, but occurs possibly considerably later. Furthermore this peak is not simply due to more experience but to qualitative rather than quantitative differences in the way in which such experiment is 'coded' or interpreted. The basic similarity between the framework of ideas under consideration by Biggs and Perry respectively may be gauged by a more extensive quotation from the former:

> The essential feature of this new system is that it causes the formal operational system, developed at adolescence, to come to terms with the demands of an alogical reality. This latter consists of a world of events that occur with changing probabilities; and more important still, of people who vary considerably in their predictability. The university might be regarded as an institution whose function it is to point out the relativity of formal systems of thinking, and thus to soften the uncompromising concepts of the undergraduate ... (Biggs, 1968. p.77).

There is a strong sense in which the present study concerns itself with differences between students of broadly similar intellectual (logical) capacity in terms of their encoding or interpretation of the nature of extended study programmes, with all the implications that this might have as a complex control over behaviour. It seems quite reasonable to assume that their particular stage of development, considered in terms of some such scheme as Perry's, would be a factor influencing this interpretation and, therefore, should be considered as an aspect of their individual study motivation, in the complex cognitive sense associated with the work of Lazarus (1968) already referred to.

Broad indications of the nature of these complex cognitive controls over study-related behaviour, i.e, study motives, emerged throughout the investigation reported here. There were, for example, early indications that students who were relatively highly motivated to achieve in study programmes might find the experience of an apparent change in 'the rules of the game' during their courses especially aversive when compared to those without such high apparent motivation. This stress in the face of a pressure towards a relativist position might be expected in such positively motivated, or AP-type students, since it would seem to impose an additional obstacle en route to achievement. In fact, the early belief on the part of the researcher that those students who typically strongly emphasised study probably perceived the process in more favourable terms than those who typically tended towards low study emphasis was quickly eroded by the evidence gathered. Strong confirmation of the error of this

initial assumption was afforded on a number of different occasions, as, for example, when several members of this 'high-SE' group openly admitted that to leave college would be a relief in the sense that they could read for interest in their subject areas and not merely for the purpose of meeting yet another deadline! It should be mentioned that the student making the strongest assertions in this respect recorded the highest score on the Delay Tendency Questionnaire (DTQ) in the entire sample (see Chapter Four), i.e, she had the greatest self-reported tendency to avoid delay, or the highest dispositional tendency to emphasise study of all the students in the sample.

One theoretical position was conceived to be of especial importance in the present research. Evidence emerging during the pilot study suggested that the presence or absence of cognitive dissonance in relation to study might well serve to distinguish between AP and AV students, and this evidence is now considered.

Cognitive Dissonance and Study-Related Schemas.

As is widely recognised motives can be conflicting. Students enter college with the evident intention of obtaining a qualification - in the case of the students referred to here, the B.Ed degree. Yet to achieve this goal they must survive many hazards in the form of coursework assignments and examinations. According to Lazarus and the other workers referred to above conflict of this kind must be regarded as due to conflicting cognitions.

In its original form cognitive dissonance theory held that people tend to strive to maintain consistency or consonance among any cognitions that they perceive to be related to each other in any way (Festinger, 1957; Festinger & Carlsmith, 1959). The theory led to a spate of empirical research, the results of which were somewhat ambiguous. As Nel, Helmreich and Aronson comment in a review of these conflicting results: "... the most

accurate general conclusion one can draw from all these findings is that the cognitive world is a far more complicated place than Festinger and Carlsmith believed in the good old days of 1959". (In Warren and Jahoda, 1973. p.224).

Naturally, researchers in this area were stimulated to modify the earlier version of the theory in order to accommodate the seemingly aberrant empirical findings, and probably the most significant and, so far as the present work is concerned, the most cogent modification was made by Aronson (1973). The significance of the modification proposed by Aronson lay in its emphasis on the centrality of the self-concept, and this led to the notion that a dissonant relationship is one that involves an inconsistency between the individual's self-concept and a cognition about his behaviour.

In the light of the Aronson modification of cognitive dissonance theory it will be of interest to set out some of the details of related findings emerging from the pilot study. There was, in fact, definite evidence of dissonance as a subjective experience in certain students when referring to their own study behaviour. This was a finding of some interest in view of that fact that a failure to obtain definite evidence of such experience of dissonance was sometimes considered to be the greatest defect in earlier versions of the theory. Initially one of the most surprising features of the cognitions reported by students was that among both AP and AV types were students who were very similar in reporting their aversion for various aspects of the prescribed study programme. This aversion in itself might constitute a reason for some delay in serious engagement with study in advance of a deadline. The two groups did differ, however, in their reports of the extent to which study, or rather the potential rewards of study, were of fundamental importance to them. In other words, study-related behaviour seemed to differ as between the two groups in its possible significance for the self-concept.

The evidence suggested that AP-type students could never escape a certain degree of stress arising from the extent to which necessary study requirements constituted a psychological burden. The risks and tasks inherent in maintaining an acceptable self-concept in the face of an academic programme was a recurrent aversive experience for the majority of them. The following extracts from pilot study protocols, as far as possible reported verbatim, illustrate this:

(a) "It's worrying if you let it go on for too long" (i.e, if one delays for what seems an unreasonably long period).

(b) "You seem to worry whatever happens. If you don't seem to have anything 'real' to worry about you feel you've probably missed the point somewhere. So you worry about that!"

(c) (Concerning the writing of essays). "Probably the main reason I don't start writing until late is that if I finished well before the deadline I might find somebody had done it a completely different way. I mean, with a different slant, different references - and so on. And that would be another worry, so I'd probably have to think it all through again. In any case, if I'd written it early I would amost certainly feel dissatisfied with it and have to keep checking it and tinkering with it. I'd have no time to myself! Some of us feel it's better to take any reasonable amount of time you want for yourself - I mean, free time - and then get down to the real work. By that time it's too late to worry about improving it: there just wouldn't be time. And you seem to do better work anyway. You don't pay attention to distractions then."

It is worth noting that the term 'worry' as used by one of the students above may not be quite synonymous with anxiety though anxiety seemed to be clearly implied. It seems to refer to a state akin to tension: an uncertainty, or state of uneasiness. The experience was interpreted by students as one in which they were typically not actually fearful, but could not actually relax. The state did appear to correspond to a form of stress in a more or less acute form.

Perhaps the most fruitful conceptualisation of the psychological states and behaviour patterns manifested by students in relating to their study programmes is in terms of 'adaptation', which was referred to early in Chapter One. This concept, as defined by Mechanic (1962), embodies two distinct functions. An extended quotation from Mechanic will illustrate

this:

> When we speak of an adaptive device we refer to any thought or behaviour that is relevant to one's situation, or to his feelings about the situation. When the behaviour has consequences relevant to the situational demands, we shall refer to it as coping behaviour. In other words, coping behaviours are relevant to defining, attacking amd meeting the task. When the behaviour is aimed at handling feeling states evoked by the situation and the coping process, it will be called defence; thus defence refers to the maintenance of the integration of personality and the control of feeling states. (p. 51)

Clearly the protocol in (a) above embodies a good example of what Mechanic would classify as adaptive defence.

The controlling, or 'motivating' cognitions. C_1 and C_2, in the case of the students referred to above is inferred to be:

C_1 I might produce a good essay and get a high grade by getting down to work. (Equivalent to appreciating the means of maintaining or achieving a high self-concept).

C_2 I need as much free time to myself as possible. (Equivalent to risking a diminished self-concept through low achievement).

These dissonant cognitions appear to be resolved thus:

> Free time is essential for the quality of my work. It leads to undistracted, concentrated effort when the need arises.

If the inferred cognitions can be accepted as dominant here, and the evidence is quite strong, then Aronson's modification of cognitive dissonance theory appears to have been supported.

Considering now the AV-type students, dissonance theory would predict that in order to reduce the discomfort (i.e, subjective experience) of conflicting cognitions they would tend to minimise the subjective importance of study. Enquiry among the most persistently delay-inclined members of the group revealed that they did, in fact, tend to minimise the importance of study, but, surprisingly, there were no obvious dissonant cognitions to be resolved: no apparent 'motivating' cognitions as far as study was concerned.

Two examples of inferred cognitions representative of the AV-type students will be given since there were some differences in their disclosed

perceptions of the business of serious study:

Example 1

C_1 I consider my social (i.e, non-study-related) affairs to be of great importance and these are my private concern and responsibility. (NB Stress laid on independence and autonomy).

C_2 The demands of (prescribed) study interfere with my preferred activities and encroach upon my freedom.

The resultant cognition here, which was made quite explicit by a number of AV-students, appears to be represented by the statement:

> "Most areas of prescribed study are seen as relatively unimportant in comparison with private interests and preferred social affairs."

Example 2

This represents a different set of cognitions which can be summarised in the following statements:

C_1 I don't tend to do a great deal of work.

C_2 I regard myself as quite successful since I have been quite successful academically so far.

The resultant cognition, which was implicit only in this case would appear to be:

> Dedicated or intensive study is not essential to the achievement of acceptable success as far as I am concerned.

In Example 1 the self-concept appears to be enhanced not so much by study-related matters and their association with publicly-recognised modes of achievement as by a sense of independence and personal control or autonomy. The explicit, "most areas of study are seen as relatively unimportant", could hardly be regarded as the expression of a cognition which reconciles dissonant elements. It is in the nature of a logical resultant of the main, controlling, cognitions. The same may be said of Example 2. The implicit, "dedicated or intensive study is not essential to achievement," is a cognition consonant with, or even deducible from, the main 'controlling' explicit cognitions. There is no resultant motivational cognition stemming from a need to reduce dissonance so far

as can be detected from a consideration of the verbal and other, attitudinal, indications of the students' schemas in relation to study.

This was early evidence of what were felt to be highly significant differences in the motivational controls over study-related behaviour between students of apparently distinct behavioural types. The significance of these differences is that there are features of students' study schemas which are counter-intuitive so far as the impressions of many tutors were concerned. Thus, the traditional 'good' student is one who diligently attends classes or tutorials, gives evidence of wide, relevant and carefully considered reading, and submits assignments in good time. However, there may be quite erroneous notions among college staffs of the cost of such approved behaviour to the students themselves, and, indeed, the early impressions of the subjective nature of the engagement with study among the AP students suggested that their behaviour was largely controlled by instrumental purposes or goals and was not, in the main, associated with pleasurable emotions.

Even at the stage of the gaining of these initial impressions the AP-e group referred to in Chapter One was clearly distinguishable from the more typical AP-m group. Symptoms of high stress were clear in all cases within the AP-e group, though they tended to differ between individuals, and these impressions were powerfully confirmed later in the study. In one case a student developed what amounted to paranoia concerning the examiners' requirements. She was haunted by the requirement that they must 'draw a line' (i.e, a pass-fail borderline) somewhere. At all costs she must find herself 'above the line'; hence her ceaseless engagement in the study process. Another member of the same group had virtually exhausted herself with unremitting effort a few weeks before the final examinations and needed academic counselling and emphatic reassurances from various members of the teaching staff with whom she was most closely involved before she was able to face the last stages of the course and the

final assessment programme. For this student, whose study behaviour would have been considered irreproachable by all traditional standards, the unrelenting processes of study, largely self-imposed, had become a virtually insupportable burden at a critical time in the programme and she came very near indeed to disaster. The extent of this burden was explicitly voiced by yet another member of the AP-e group whose relations with staff were good and who admitted to considerable interest in the subjects studied. She looked forward to leaving college at the end of the course:"I shall be glad to read for interest's sake and not just to meet yet another deadline." A veritable cri-de-coeur!

During the research no attempt was made to investigate in any systematic way the forms of stress actually encountered by students during their course which might be attributable to the study programme. The detailed nature of such stress was not seen as a particularly significant feature of the work. The fact that a distinction could be made between the reported indications of motivational cognitions of AP and AV behavioural types was considered to be the main feature of interest which would be investigated more rigorously in the later empirical work. However, it is of some interest to consider the findings of an earlier investigation by Mechanic (1962), who also studied the perceptions and cognitions of students approaching a critically important confrontation.

The similarity between the two studies must not be pressed too far. Mechanic's work concerned itself with a group ($N \simeq 20$; the actual number changed slightly during the investigation) of Ph.D students in an American university who were preparing for a qualifying examination in order to proceed to a later stage in their doctoral studies. In contrast, the research reported here was focused on a considerably larger group ($N > 50$ in most samples), comprising undergraduate students in an English teachers' college. Yet, of course, the fundamental features of the two systems had much in common and it is likely that Mechanic's findings would furnish at

least some worthwhile insight into the stresses encountered by the student teachers. An outline of this work now follows for purposes of comparison.

Stress and Adaptation

The first and most obvious difference between the small population of research students studied by Mechanic and the Third Year teaching students forming the target population of the present investigation, quite apart from their different statuses as research students and undergraduates respectively, is that concerning the apparent universality of stress in the higher-degree students. In this respect the latter students probably more closely resembled AP-type rather than AV-type students in the classifcation adopted here. Mechanic found that there were several very significant sources of stress:

(a) The process of social comparison in which other students were sometimes perceived as better prepared.

(b) Social interaction, involving students and possibly staff, which led to the spread of rumour on the 'grapevine' concerning, for example, the content and severity of approaching examinations.

(c) The presence of highly competent students - involving a form of social comparison, as in (a) above.

(d) The presence of highly anxious students. These tended to arouse anxiety in others.

(e) Mood fluctuation. This is a temporal aspect of stress which appears to be exacerbated as a crisis, such as an examination, looms.

Of these sources of stress the process of social comparison was probably the most fundamental since the other stress sources were either related to it or derived from it.

Mention has already been made of the two aspects of adaptation: coping and defence. Coping in the College sample took several forms; a reduction in the leisure time of the AP group, as in Mechanic's population; discussions with staff for purposes of clarification or negotiation; and intensification of study behaviour.

Defence was governed by that fact that a person's behaviour represents a more or less consistent pattern of response, i.e, defence is personality-related. In this sense both studies agree with Aronson's modification of cognitive dissonance theory (Aronson, 1973), in finding that a person seeks to maintain cognitive integration by controlling the information that he perceives and rendering it congruent with his views and needs as these relate to his self-concept. The extent to which study behaviour was organised round central attitudes concerned with the relationship of the self to a perceived external world, or 'effective environment', will be discussed in Chapter Six. It is sufficient at this point to note Mechanic's cogent point that it is the effective environment to which beliefs, expectancies and threats relate and to which responses are made. "In constructing this 'schema' a person is reinforced and supported by a group of whose communication structure he forms a part" (Mechanic, 1962, p. 118).

The essence of adaptive defence revealed in the pilot work of the present study was a series of comforting or reassuring cognitions and attributions. Thus students tended to emphasise the non-objective aspects of examinations. In the earlier American study the evidence suggested that students tended to make attributions concerning success and failure in such a way as to defend the self-concept in a way which has since been investigated in the work of Weiner (1974).

These construings were not without risk of self-deception as a final quotation from Mechanic (1962) makes clear:

> Between reassuring cognitions and the reality limits of the situation the student treads a thin line. Rationalisations that are too obvious are not effective, for they cannot readily be upheld in the light of contradictory and non-confirmatory evidence that the student must constantly encounter. For this reason social support becomes important, as is the student's attempt to qualify his attitudes significantly so that they appear realistic and also do not interfere with adequate preparation for the examination. (p. 57)

Bearing in mind the similarity between the population studied by Mechanic and the students of AP type in the present research, the strong indication is that, for the AP students, their study affairs are probably fraught with considerable stress of a kind not characteristic of AV students. This stress constitutes an additional burden over and above the necessary academic work-load.

The 'Effective Environment'

Cognitive theorists are, in a general sense, intent on developing models which relate human behaviour to the complexity of human mental processes. They do not conceive of stimuli as directly linked to relatively simple thought-chains which issue directly and inevitably in predictable action. Stimuli are considered as forms of 'information' which are related to each other to form 'beliefs' and it is these beliefs that invest the salient features of the environment with meaning. Behaviour is considered to be the outcome of the beliefs.

Evidently in these terms cognitions are mediating processes between stimuli (perceptual information) and some form of behavioural adjustment to the 'effective environment'. The significance of the term 'effective environment' can be understood from a brief extract from Baldwin (1969):

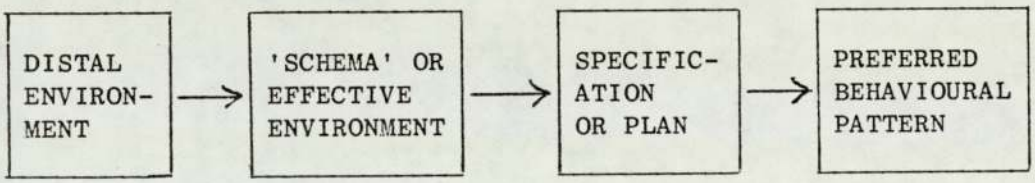
> A cognitive theory of behaviour assumes that the first stage in the chain of events initiated by the stimulus and resulting in the behavioural act is the construction of a cognitive representation of the distal environment. The latter events in the chain are instigated, modified and guided by this cognitive representation. The cognitive representation thus acts as the effective environment which arouses motives and emotions and guides overt behaviour towards its target or goal. (p. 326)

The effective environment can be recognised as what Neisser (1976) would refer to as part of a 'motivational schema' controlling action, and the process overall of motivation, as Weiner (1972) notes, can be conceived of as comprising two major stages. There is, firstly, some cognitive representation of the received stimulus, which he terms the 'schema' proper, and secondly there is some specification or plan, indicating the

way in which cognition influences the final behavioural response. This is the sense in which the cognitive theory takes into account a subject's individual interpretation of his own experiences, i.e, the interpretation mediates between the 'real' environment comprising the various salient events figuring in the distal field, and the actual adjustive behaviour as it is expressed in a person's preferred behavioural pattern or behavioural programme. As Evans (1975) expresses it: "The crux of cognition is that it implies that the organism has to interpret its inner states before they can be truly seen as determinants of behaviour." (p. 97). It is, of course, the 'preferred behavioural pattern' that is manifested by an adjusting population and an attempt will now be made to model the extreme forms of this pattern.

Behavioural Pattern and Adjustment

The wider system to which Weiner's (1972) two-stage process of motivation refers can be represented by a four component model:-



It is worth clarifying the meanings of the terms used in the model.

DISTAL ENVIRONMENT. The significant perceptual and conceptual features of the environment external to the person.

SCHEMA or EFFECTIVE ENVIRONMENT. The cognitive representation of the distal environment, i.e, the one in respect of which the subjects' episodic and dispositional judgements are made (Warr and Knapper, 1968). (See Chapter Six p. 159 for a discussion of episodic and dispositional judgements).

SPECIFICATION or PLAN. The process which determines how the cognition influences the final behavioural response. No direct investigation of this process has been attempted in the present study, but it may be that it could be envisaged as developing from initial processes of the kind proposed as feasible by Miller, Galanter and Pribram (1960). Their scheme might be supposed to operate in the early stages of learning any adjustive process and the outcome would form a permanent feature of the subjects' behavioural repertoire in similar situations.

PREFERRED BEHAVIOURAL PATTERN. It might seem that this could be very variable within any one individual's repertoire. It is, however, unlikely that in practice any individual will continue to explore the potential diversity and range of behaviour since, by definition, adjustive behaviour is that which leads to successful adaptation to the environment, and this will become increasingly a characteristic pattern over time. In other words, individuals will tend to conform to their own preferred behavioural pattern to the extent that this achieves goals which they value positively and which does not involve them in particularly aversive experiences. Under stress, this pattern is likely to become further shorn of significant variability and conform more nearly to ideal forms due to the narrowing of the range of cues to which a subject responds under such circumstances.

In the present study the term 'schema' refers not merely to the cognitive representation of the received stimulus, in the restricted sense employed by Weiner (above), but includes the three later stages of the four-component model already referred to. In this sense the present usage conforms more closely with the use of the term in the work of Piaget, whose work was regarded by its author as centrally concerned with the processes of adaptation of an organism to its environment. The piagetian schema, of course, includes any behavioural component as an integral quality of the particular stage of cognitive development.

It is suggested that the preferred behavioural study patterns of the students in the college sample studied in the present research can be modelled by assuming that they are the resultant of two contrasted dispositions, viz, 'approach-to-study', and 'avoidance-of-study! The term 'disposition' is used in the technical sense of normal behaviour, as contrasted with 'episodic' behaviour, following the usage of the terms to distinguish between the two forms of 'impression' or 'judgement' by Warr and Knapper (1968) already referred to above.. Clearly such modelling may be conceived of as the modelling of a form of approach-avoidance motivation.

Summary of Chapter Two

1. Attention was drawn to the possibility of grouping students according to their normal disposition towards study. Disposition is conceived to be controlled by factors which fall into two categories: 'approach' factors underlying high study emphasis (SE), and 'avoidance' factors underlying low SE.
2. A review of the relevant literature relating to cognitive theories of motivation was undertaken and this led to the concepts of student adaptation and adjustment to the demands of a life of extended study.
3. Stress is an influence on perception and behaviour which results in a narrowing of the range of perceived cues and a corresponding inability to adjust to a wider range of potentially relevant information. It was concluded that AP-type students are prone to such stress and to the corresponding relatively maladaptive perceptions and behaviour.
4. A discussion of students' level of development indicated a further source of stress and aversive or 'avoidance' motivation. This arises from the 'artificial' requirement of academic regimes that students function for prolonged periods in areas of uncertainty and at high levels of abstraction.
5. Evidence derived from the pilot study and relating to cognitive dissonance was shown to indicate clear motivational differences between AP and AV student types. A review of a study by Mechanic (1962) of Ph.D students under stress revealed similar forms of 'coping' and 'defence' as were apparent in students of AP type.

6. The concept of 'schema' was found to be useful in linking differential perceptions and interpretations of the effective environment with the different 'preferred behavioural patterns' which are characteristic of students of different study disposition, and, therefore, of different adjustive strategies.

CHAPTER THREE

THE PROPOSED MODEL

Classification and Dynamic Systems

At this point it may be useful to give a summary of the principal features of student study-related behaviour derived from the evidence reported in Chapter One, together with the inferred nature of the controls over behaviour suggested by a survey of the cognate literature which was discussed in Chapter Two. This recapitulation is intended as a reminder of the major characteristic features of the system of adjusting students, for purposes of the present study, before a model is suggested which can accommodate the detail required within a definite structure and set of coherent relationsips. While admitting that some of these features are closely interrelated, it appears that the leading characteristics of the system which are of prime interest here are:-

(a) Differential delay characteristics among the students.

(b) A tendency to adjust dramatically to the perceived requirements of the evaluating system by some students - especially noticeable immediately before a deadline.

(c) Indications in some students of stress, due apparently to their perception of the inherently harassing nature of evaluated study.

(d) Apparent differences between students in their tendency to conform behaviourally either to 'external' requirements, or to their own 'internal' preferences respectively.

(e) Evidence of cognitive dissonance in some subjects (i.e, conflict between their actual study-related behaviour and their preferred self-image).

(f) Differences in negotiating style:-

  (i) For purposes of clarification in order to avoid risk (i.e, requiring further 'external' direction).
  (ii) For purposes of extending, or at least exploring, the limits of tolerance in the course and examination requirements in order to preserve a preferred personal identity and autonomy.

The problems of modelling such a dynamic system of adjustment are, needless to say, formidable. The system appears to exhibit both

continuous (progressively changing) and discontinuous (abruptly changing) adjustment to the apparent requirements of the evaluating system. Since the major behavioural characteristics were relatively high, or relatively low, study emphasis (SE) it could be hypothesised, as shown in Chapter Two, that the controls over such observed and self-reported behaviour were two groups of contrasting and complex motives which formed significant features of students' study-related schemas. These motives respectively favour 'approach' (i.e. relatively high degree of engagement with study), or 'avoidance' (i.e, relatively low degree of engagement with study).

In attempting to model a dynamic system such as that outlined here it is natural to consider other systems which are comparable in the sense that they exhibit some equivalence in their significant features. These features, upon which the typology referred to earlier was based, are:-

(a) Degree of continuity-discontinuity in adjustment.

(b) Degree of delay in affecting such adjustment.

(c) Degree of lability, as indicated by frequency of oscillation between high and low level modes of behaviour.

In fact, such comparable systems are not hard to find, and just a few examples will illustrate the diversity of systems which conform, at least approximately, to the same observable pattern:

The Developing Zygote

During development of the zygote more or less imperceptible intracellular structural and physiological changes occur over a relatively lengthy period of time (continuous phase). This is followed by sudden and dramatic morphological change over a relatively short period at cell-division, or mitosis (discontinuous phase).

The Beating Heart

During diastole changes in blood pressure and volume are relatively slight over a relatively long period, whereas during the succeeding systole there is a sudden and violent change in both pressure and internal volume as the ventricle dramatically contracts.

Prison Disturbances

Discontent and tension increase steadily over a more or less lengthy period until a 'trigger' or 'flash' point is reached. At this point there is a sudden rapid (i.e, discontinuous) escalation to violence. (Zeeman, Hall, Harrison, Marriage and Shapland, 1976).

A Quarrel

The build-up to a quarrel is usually gradual until a critical point is reached. At this point there is, typically, a sudden and quite irrational escalation to full-scale heat and acrimony.

It is worth noting that in all the above examples the return to the earlier phase is equally discontinuous and dramatic.

This clearly recognisable pattern occurring over a wide-ranging diversity of systems naturally excites great interest and, in the context of the present study, suggests that there may be morphological similarities between different behavioural systems and their controlling factors which may not be readily apparent, but which may fruitfully be suggested by a model which generalises such structural relationships. Of course, the principal problem confronting a researcher here lies in achieving a conceptualisation which systematically reduces the arbitrariness of choice among the competing descriptions available for such systems of overt behaviour and covert controls. A fundamental classification is a prerequisite, but here a further problem emerges concerned with the need to classify dynamic behavioural features.

In fact, the above illustrative examples have all been modelled using the concepts of a newly-developed branch of mathematics, viz, Catastrophe Theory, and it will be appropriate to outline the defining features of this theory since it appears from the literature to lend itself to the description and modelling of phenomena in diverse areas of enquiry, including the behavioural sciences. Such successful modelling as that referred to above naturally gives rise to the

speculation that, at a sufficiently abstract level, certain characteristic features of systems which are superficially quite different might in essence be the same. If this were true it should be possible to indicate the deep isomorphisms between those systems already successfully modelled and a system under investigation. These isomorphisms are, of course, the major defining features of the general model itself as they are differentially represented in the various modelled systems.

In most systems within the social sciences the task of proper characterisation is potentially confounded by the enormous amount of associated 'noise'. Because of this noise, or random fluctuation in associated variables, the major structural features of the system may only indistinctly be discerned, and without guidance it is difficult to make a selection among possible structural features competing for significance. It is in precisely such a context that a model is most valuable. Skemp (1979) makes this point admirably:

> The abstract quality of a theoretical model reduces noise and allows us to concentrate on what is relevant for the task in hand. Some problems are often more easily dealt with by being understood as particular cases of powerful and more general theories. (p. 182)

This expresses precisely the sense in which the catastrophe model is considered to be of value in the present research, since it was hypothesised that, in structural terms, the enormously complex system represented by the normal patterns of behaviour of a student population adjusting to the requirements of an extended course of study punctuated by a series of critical evaluations, exhibits some of the characteristics of an elementary catastrophe.

In the system under investigation here the two major behavioural spectra on which students can vary differentially have already been identified, i.e, 'Delay/Non-Delay' and 'Continuous Adjustment/ Discontinuous Adjustment'. In this context, as already implied in the

examples of modelled systems cited earlier, the term 'continuous' means that any changes in Study Emphasis (SE) are normally smooth in contrast to the 'discontinuous' mode of SE change.

Before attempting to model the system of adjusting students, however, it will be appropriate to give a brief explanatory account of the nature of Catastrophe Theory as it relates to the present context.

A Brief Introduction to Catastrophe Theory

The twentieth century has witnessed dramatic changes in our conception of the nature of the universe. The mechanistic dogma of the nineteenth century first faltered and finally crumbled under the accumulating evidence that the universe is a queerer place than was formerly imagined: perhaps, as J.B.S. Haldane has said, 'queerer than we can imagine." (See Woodcock and Davis, 1980, p.11). Finding such phenomena as the nature of light and of atomic structure impossible even to describe, let alone explain, in terms of the type of representational models so familiar to the mechanists of the late nineteenth century, physicists turned to mathematical expressions of the nature and properties of such phenomena. The result has been a progressive replacement of what were considered to be earlier inadequate geometrical definitions by such abstractions as, for example,'relativistic change in mass, length and time', and the casting of relationships in terms of 'wave equations'. Geometrical reductionism appeared to have failed as an explanatory principle and henceforth descriptions and definitions were to be couched in terms which lent themselves to the new non-geometrical mathematical orthodoxy.

But not all mathematicians and scientists have been complacent over the new approach. Rene Thom found resignation rather than comprehension in the move towards greater and greater orders of abstraction. "Thom believes that the provision of some kind of picture, at least to the

mind's eye, is of primary importance. To him, our qualitative grasp of form and geometric order goes deeper than our quantitative grasp of number and magnitude." (Woodcock and Davis, 1980. p.13). Certainly it has been possible to delineate the shapes of some processes using traditional mathematics where the functions are smooth, i.e, where changes are continuous. Such smoothly-changing functions represent the relationships common in the subject-matter of the calculus. Major problems arise, however, when relationships cannot be represented by smooth functions and such phenomena have not, until recently, been susceptible to mathematical modelling. Examples of such discontinuous processes have already been referred to above. These processes all involve the notions of definite threshholds and relatively sharp change in form or level of activity, and it is not surprising to find that the mathematics of continuous change are not capable of defining or explaining them.

Thom has, in effect, proposed that a return to geometry be made in order to enable us to understand such processes and their defining characteristics more fully. According to Thom catastrophe theory is a conceptual tool well suited to this purpose. It originates in topology, which is itself a modern descendant and derivative of geometry, and it is the topological provenance of the theory which determines that it shall be qualitative rather than inherently quantitative. The potential application of catastrophe theory derives from its systematic and generalised reflection of the way in which the form of processes and objects change, and the resulting models are quite independent of the qualitative features of the parameters which are being related. These qualitative elements must be derived from analysis of empirical data for any particular system or process suspected of exhibiting the properties of an elementary catastrophe. However, these limitations of the theory, stemming from its inherently qualitative nature, are

outweighed by the possibility of classifying a multifarious and disparate range of phenomena under the same defining structural and functional characteristics. Further, the classification might lead to fruitful hypotheses concerning less obvious characteristics of a system should it be found to exhibit clearly some of the features of an elementary catastrophe.

Classification of observed phenomena is a first step in the scientific ordering and systematising of any province of investigation and there can be little doubt that understanding of the processes of student adaptation and adjustment to study is in its very early and primitive stages. Such modelling as that suggested here may, therefore, serve to provide an initial and tentative ordering of data in relation to a general theory that has only become feasible since the creation of an appropriately rigorous, yet flexible, mathematics.

Of course, it is not the purpose of the present chapter to furnish an exhaustive introduction to Catastrophe Theory. What is required is an outline of those aspects of the theory which have a direct bearing on the present work. A much fuller exposition of the theory can be found in such sources as the collected papers of Professor E.C.Zeeman on catastrophe theory (Zeeman, 1977a), who acknowledges the difficulty of the proofs of the theory as set out by Thom (1972) but insists that the fundamental ideas are easily accessible to non-mathematicians as valuable conceptual tools in a number of areas of investigation.

Stated briefly, Thom discovered that there is a very limited number of forms which can be taken by graphs which illustrate the relationship between a number of control variables and their results. This classification of graphs has considerable significance for science. It shows that however complex the apparent influences acting on a system, provided that the system obeys a principle tending to minimise or maximise some significant function, then all the discontinuities we

observe in the system can be modelled by seven basic graphs. (See Table 3.1.). Thus, in manufacturing industry energy usage tends to be minimised; in economics this applies to cost; most people are thought to minimise effort for a given reward (at least, in the sense that they behave economically); students might, intuitively, be supposed to minimise risk of failure. Conversely, these examples could be referred to a corresponding principle which, in every case, could be seen to result in the greatest possible gain for an individual or group under the particular circumstances.

Table 3.1.

The Seven Fundamental Catastrophe Graphs or Models. (After Woodcock and Davis, 1978).

NUMBER OF CONTROL FACTORS	ONE BEHAVIOUR AXIS	TWO BEHAVIOUR AXES
1	FOLD	-
2	CUSP	-
3	SWALLOWTAIL	HYPERBOLIC UMBILIC ELLIPTIC UMBILIC
4	BUTTERFLY	PARABOLIC UMBILIC

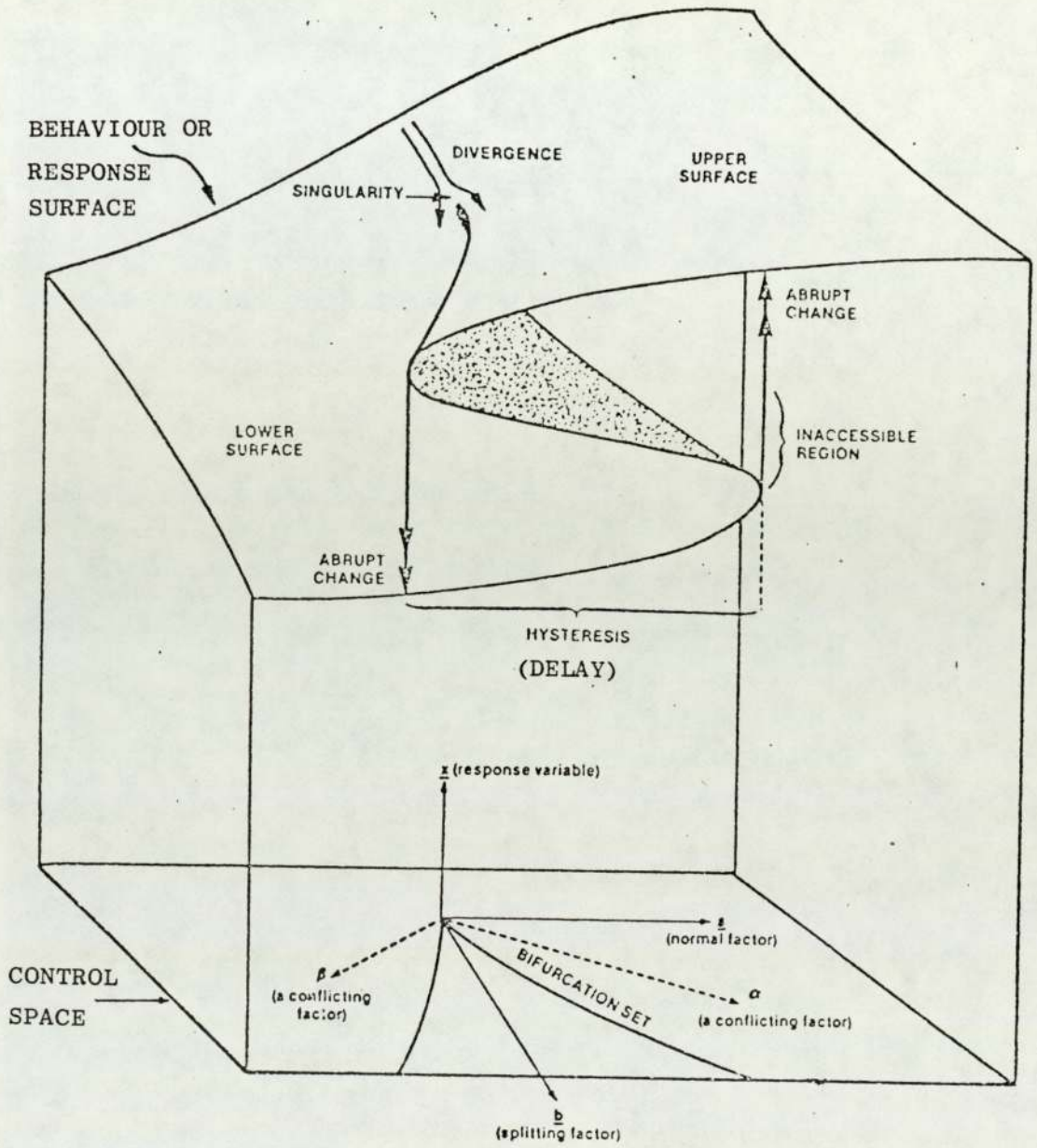
Since the validity of the modelling of these discontinuities in such parsimonious terms has been guaranteed by the mathematicians it is left to empirical scientists to investigate various systems in order to establish their suitability for modelling in terms of catastrophe theory. Some of the potentially fruitful areas of enquiry have already been suggested by Zeeman and his co-workers (Zeeman, Hall, Harrison, Marriage and Shapland, 1976; Isnard and Zeeman. 1976), and others, such as Tall (1977) and Flay (1978), have shown similar enthusiasm for the systematic approach to modelling in the social sciences afforded by this means. Virtually all of this work has been conceived in terms of the

'cusp' model and since it has also been used as the hypothesis-generating model in the present research it will be appropriate to give an account of its characteristics.

The Cusp Model

It can been seen from Table 3.1. that the cusp catastrophe model is a graph relating a single behavioural dimension to two control factors. Since there are three dimensions the graph is in the form of a surface rather than the line of the more familiar two-dimensional graph. The most familiar representation of this relationship is probably that shown in Fig. 3.1. where the controls are represented as axes orthogonal to each other in the two-dimensional 'control space' of the model and which function as 'dynamics' holding the behavioural surface in a configuration marked by a pleat or overfold for certain values.

The dynamics, so-called, are those psychological 'attractors' concerned with the minimising or maximising principle referred to earlier. In the present case, in the earlier stage of conceptualising the model of the system, it was hypothesised that these dynamics were 'approach' and 'avoidance'motives as these related in the broad sense to study activity, and it was evidently a matter of importance to gain some insight into the nature of these motives and the part they played in study schemas. In fact, Fig. 3.1, which is adapted from Flay (1978), shows that the two control factors can be disposed either as two conflicting 'normal' factors, or as a normal and a 'splitting' factor. As explained below the diagram in Fig. 3.1, rotation of the control factors does not change the properties of the behaviour surface. Briefly, it should be explained that a 'splitting factor' is a control factor that tends to bifurcate, or divide, a population with respect to some behavioural characteristic into high and low components as the magnitude of the factor increases.



The properties of some psychological phenomena are the same as those of the cusp catastrophe. Here the behaviour or response surface and its projection onto the control space and bifurcation set of the cusp catastrophe are shown. The two control factors can be represented as the normal and splitting factors, a and b respectively, or as two conflicting factors, α and β . Such a rotation of the control factors does not change the properties of the behaviour surface because the 'local results from catastrophe theory hold true for a wide class of coordinate transformations." (Saari, 1977, p.158). (After Flay, 1978).

Fig. 3.1. The 3-Dimensional Cusp Catastrophe Model.

It may be that the different configurations of the control factors are appropriate to different aspects or periods of the process of adjustment. Certainly it does seem to be true, as Flay (1978) indicates, that "the properties of some psychological phenomena are the same as those of the cusp catastrophe." (p.337).

The five characteristic properties delineated and related by the model are:-

Bimodality - The behaviour is bimodal for certain values of the control factors. This indicates that for a particular range of control values behaviour may be either on the upper, or on the lower, surface, but the probability that it will be of intermediate intensity is very low. This can be seen from the probability function, or 'likelihood function' illustrated in Fig 3.3.

Sudden Transitions - For certain smooth changes in the control factors the corresponding changes in behaviour are abrupt or catastrophic between one mode and another.

Hysteresis - Catastrophic changes from one mode of behaviour to another take place at different values of the control factors, depending on the direction of change. This is the feature of the model concerned with delay in behavioural response to the inferred controls, whether the latter are internal or external.

Inaccessibility - For certain values of the control factors there is a region of behavioural inaccessibility, in the sense that behaviour of this possible type is the least probable for these particular control values.

Divergence - The fold or pleat in the behaviour surface of the model results in the possibility of a very small difference in initial control and behaviour values leading smoothly to very different modes of behaviour.

In discussing stress and adaptation in Chapter Two reference was made to a study comparable to the present research by Mechanic (1962) in which the investigator 'tracked' a group of Ph.D students. Mechanic identified several significant sources of stress in the target population, one of which was mood fluctuation, and he noted that this problem was exacerbated during a crisis such as the approach to an examination. It is worth noting in this connection that Zeeman (1977a) considers that the effect of the environment upon mood has features that strongly indicate the validity of catastrophe nodelling. He cites the persistence

of mood, the sudden changes and the delays associated with the changes, the occurrence of different moods under similar circumstances and the inaccessibility of intermediate moods between extremes under some conditions. All these properties are characteristic of the cusp model.

MacLean (1970) discusses the origin of the emotions which underlie these moods and he concludes that they are probably generated in the limbic brain. He admits that it is difficult to record information from the limbic system but suggests that because there are direct connections with the frontal lobes the latter might evince artifacts which would echo limbic catastrophes. Zeeman supports these observations with the physiological indicators of autonomic nervous activity which provide comparable artifacts such as the facial expression of a dog which can indicate different levels of both fear and rage.

In this study the characteristics of the cusp model which are investigated in the samples are bimodality, sudden transitions and hysteresis. Zeeman (1976) suggests that if two or three of the five characteristic properties of the cusp model are found in a system then that system may be considered as a possibility for modelling by means of catastrophe theory, and in seeking such characteristics in a particular system the present work cannot lay claim to any special originality since there are numerous recent studies of phenomena more or less closely related to the present area of enquiry for which catastrophe models have been proposed. Examples are: Pavlovian conditioning (Frey and Sears, 1978); cognitive development (Saari, 1977); perception of ambiguous figures (Poston and Stewart, 1978; Shafer, 1976); resolution of psychological crisis (Lewis, 1977, 1978); intrapersonal conflict (Cowan, 1977, 1978); teaching practice problems (Preece, 1978, 1979).

Following Zeeman's suggestion that an indication of the suitability for catastrophe modelling of a system may be gained by detecting only a

proportion of the total number of defining characteristics, in the present work, as mentioned above, only bimodality, sudden transitions and hysteresis (or delay) are investigated in the student population. To show how these features are related by the cusp model a theoretical example which parallels the form of adjustment observed in the actual population will be described. This example, in fact, appropriately models an approach-avoidance conflict as it might be represented among different students adjusting to the requirements of a life of extended study, and it will introduce the essential dynamic element into the modelling. The example was referred to in Hill (1976).

Evidence presented earlier in this report clearly suggests a delay factor differentiating between students who tend to respond readily to social pressure and normally exhibit relatively high SE, and those who do not readily conform to such pressure and normally exhibit relatively low SE. It is interesting to consider the hypothetical change in distribution over time of a population comprising students of these two types. At some point relatively remote from a critical deadline we may distinguish between two theoretical maxima: a maximum comprising students whose normal policy is relatively low SE (AV type), and a maximum comprising students whose normal policy is relatively high SE (AP type). Figure 3.2. illustrates the hypothetical distribution of students at three successive times, t_1, t_2, and t_3, as they approach a critical deadline, say an examination. This diagram is a translation into terms of the present study of the descriptions used by Isnard and Zeeman (1976), and the two 'rules' referred to in connection with Fig. 3.2, viz. Maxwell's Rule and the Delay Rule, are as described by those workers. Behaviour which follows Maxwell's Rule will lend support to a policy where there is an overall maximum, while behaviour which follows the Delay Rule will lend support to a local maximum.

Note: X_0 in the Figure indicates an indeterminate policy.

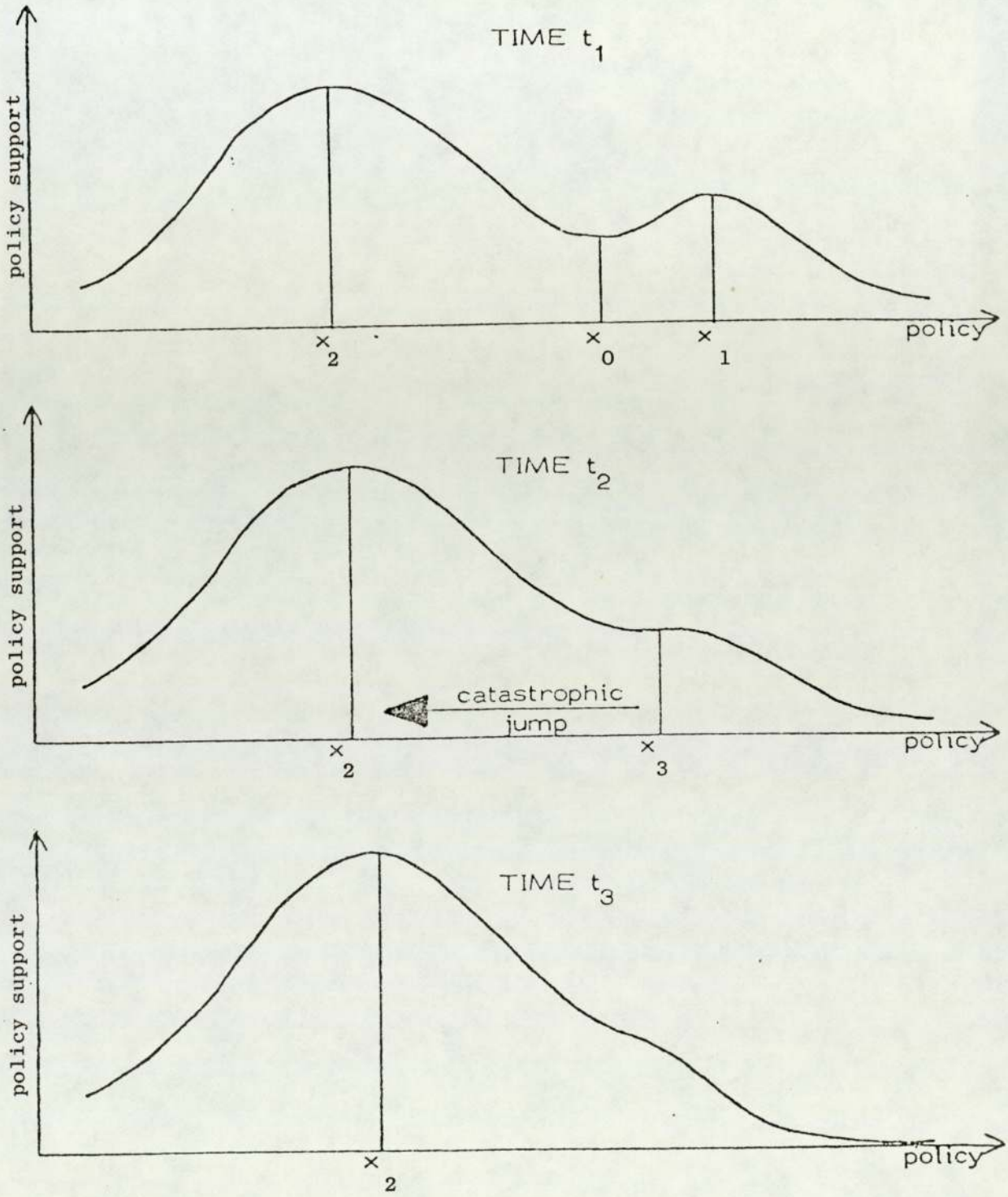


Fig. 3.2. 'Local' and 'Distant' Majorities and a 'Catastrophic' Change of Policy. (Modified after Isnard and Zeeman, 1976). For explanation see text.

In the instantaneous distribution portrayed at t_1 in Fig. 3.2, the dispositional judgement of the AV-type student will lead him to consider study as less urgent than it would seem to the dispositional judgement of the AP-type at this time. Hence the low-SE policy at X_1 will comprise a greater number of dispositional 'avoidance' than of dispositional 'approach' students. Under the Delay Rule the former group of students will tend at first to support the more congenial, psychologically more accessible, 'local' maximum, which, for them, will be low SE. The Delay Rule is, according to Isnard and Zeeman, the one which normally operates because a group tends to cling to the psychological protection of its local maximum and will delay making a catastrophic change until forced to do so. At t_1 the majority of dispositional AP-type students would, theoretically, already be supporting the policy of high SE at X_2.

The delay by many dispositional 'avoidance', or AV-type, students in engaging with serious study continues until the low SE peak, slightly displaced to X_3 under the influence of an increasing awareness of the absolute majority support for the high SE policy at X_2, just disappears. At this point in the time sequence, i.e, at t_2, there is no <u>local</u> majority support among like-minded delayers at X_3, and it is hypothesised that, according to Maxwell's Rule, there will be a sudden (discontinuous) change of policy. This dramatic change of policy among hard-line delay-type students constitutes the catastrophe, in which behaviour changes discontinuously via a sudden transition (See Fig. 3.1.) to high SE.

The graph setting out the distribution at time t_3 shows the position immediately preceding the critical deadline. The two psychologically distinct types of student, i.e, 'approach' and 'avoidance' respectively, are now <u>behaviourally</u> indistinguishable. The former group conform to their dispositional study policy, though no doubt the

intensity of the salient control is increased, whereas the latter group conform to a prevailing social pressure, and their drastically changed behaviour is likely to be of relatively brief duration - an episode, in fact. This episodic judgement immediately preceding the deadline is likely to result in a maximising of conformity throughout the total population to the prevailing social pressure, though for a period of time before this the same social pressure is likely to have formed a 'splitting factor' (see Fig. 3.1.) bifurcating the study behaviour of the delay-prone. This latter state of affairs is shown clearly by the distribution at t_1 in Fig. 3.2, where delay-prone, or AV-type students would be found in both maxima.

Bearing in mind the observed rapid return of the AV-types to low SE following the crisis, or deadline, it seems that an actual change of attitude is unlikely to underlie such changes of policy. As already indicated, the policy changes are far more likely to be the result of episodic judgements related to increasingly salient social pressure, leaving the normal attitudes or dispositions, unchanged.

The Likelihood, or Probability, Function

Following the reasoning set out above in connection with Fig.3.1. it can be hypothesised that in the period leading up to a critical deadline it should be possible to detect four study-related preferred behaviour patterns and their associated tendencies or motives, and this can be set out both in tabular and in graphical form:-

Table 3.2.

Canonical Types of Motive and the Associated Behaviour

MOTIVES	MOST LIKELY BEHAVIOUR
Neutrality (i.e, neither approach nor avoidance)	Indifference with respect to study
Avoidance only	Relatively low SE
Approach only	Relatively high SE
Both approach and avoidance (i.e, bimodality).	High or low SE (Indifference is least likely).

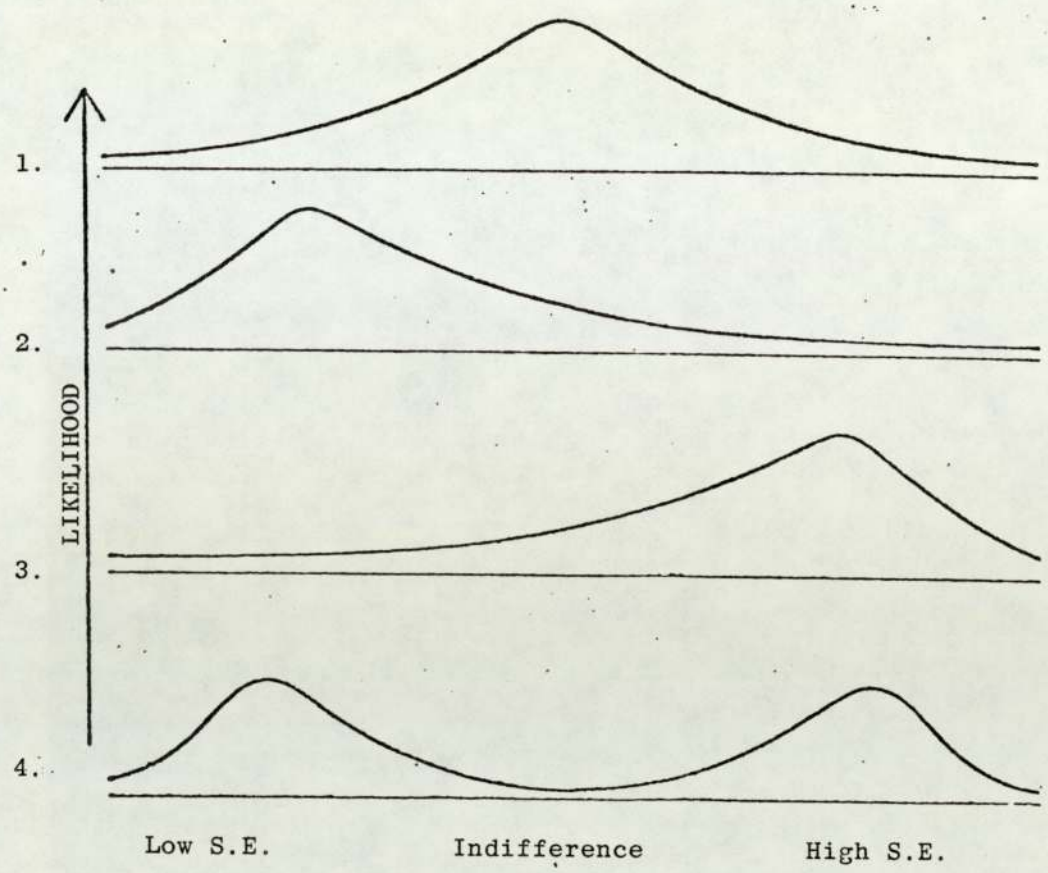
The Likelihood Function determines the study behaviour of students under the conflicting influence of 'approach' and 'avoidance' motives, and, in fact, what catastrophe theory tells us is that if the probability distributions take the form of those set out in Fig.3.3. then the three-dimensional graph relating the two causes (motives) and their effects (behaviour) will take the form of the cusp catastrophe surface shown in Fig. 3.1. The fundamental stability of the model is also of interest in the context of the present study since it would reflect, should the modelling be appropriate, a corresponding stability in the controls or motives hypothesised to function in the target population. As Postle (1980) points out:

> The elementary catastrophes have the important property of being structurally stable, that is, approximately, that the shape of the surfaces, and the behaviour they model, remain stable even when small perturbations, or noise, are introduced. (p. 26)

This comment indicates the robustness of the catastrophe theory models.

The use of the Likelihood Function to relate individual types of student to the cusp model follows Zeeman (1976), and it attempts to isolate the influence of two major controls over behaviour, though it needs to be remembered that the canonical forms of the probability distributions set out in Table 3.2. and Fig. 3.3. are the defining, or limiting, forms and will be exemplified by relatively few individuals in the population. Most individuals will take intermediate positions. e.g, they will tend to be characterised by intensities of the control parameters somewhere within the limits of the model. However, if the system of adjusting students can be appropriately modelled by the cusp graph, it may be possible to detect individuals corresponding approximately to the canonical forms shown among others of more intermediate form.

The extent to which this hypothesis was substantiated, and the



Motives	Most likely behaviour
1. Neither 'approach nor 'avoidance'.	Indifference with respect to study.
2. 'Avoidance' only	Relatively low study emphasis.
3. 'Approach' only	Relatively high study emphasis.
4. Both 'approach' and 'avoidance'.	High or low study emphasis. (Indifference is least likely).

The Likelihood Function determines the study behaviour of students under the conflicting influences of "approach" and "avoidance" motives. What catastrophe theory tells us is that if the probability (likelihood) distributions look like those given here then the 3-D graph relating the 2 causes (motives) and their effects (behaviour) will look like the cusp-catastrophe surface shown in the diagram of the 3-D model.

Fig. 3.3. The Likelihood Function.

specific interpretation of the nature of bimodality for purposes of the present research will be indicated in Chapter Four.

The Cusp Model and a Definition of 'Delay-over-Study'

The earlier part of this report has made it clear that investigation into the nature of delay in relation to study is an important aspect of the work. For this reason catastrophe theory would be required to furnish an appropriate theoretical definition of delay from which an operational definition might be derived.

Inspection of the 3-dimensional catastrophe model represented in Fig. 3.1. shows that the behaviour surface in the region of the bifurcation set takes the form of an overfold, and this means that a student could be conceived to be on either the upper or the lower level of the surface depending on his recent history and the prevailing constraints. Thus, the model shows 'overlapping paths' in the region of the bifurcation set and this is a phenomenon which has its counterpart in psychological field theory.

The essence of field theory, as, for example, in physics, is that the distribution of forces or constraints within any particular environment determines what an object with certain properties will do in that environment. Deutsch (1968) points out that the essential nature of field theory in psychology lies in the emphasis on what is real for the person in any particular situation, and this, of course, implies that 'reality' is different for different people. For purposes of the present study what is real for the AP- or AV-type students depends on their individual study-related schemas, and this will include the phenomenological perception of various salient features of their working environment conditioning in them a variety of approach and avoidance motives.

Serious criticisms have been directed at Lewin's 'topological' psychology (e.g, Garrett, 1939), which formed an aspect of his field

theory, but in Deutsch's opinion the 'topological or 'hodological' concepts were not much more than diagrammatic representations of Lewin's brilliant theoretical and experimental insights, and one of these insights led psychology to a closer realisation that understanding behaviour requires not only a knowledge of the person, such as his past experiences, present attitudes and capabilities, but also a knowledge of his immediate situation. (Ref. Lewin, 1935).

Just as Brown (1965) maps approach-avoidance motivational conflict into a balance model, so in the present work an attempt will be made to map this form of conflict, as experienced by students at tertiary level, into a cusp catastrophe model. The catastrophe model, as has already been indicated, is a topological model and hence it may very appropriately be related to a conceptualisation in field theory terms. In this sense, as Deutsch indicates:

> The concept of overlapping situations has been employed to characterise instances where the person is on more than one path at the same time. The simplest example is that of divided attention.
> (Deutsch, 1968, p.198)

In terms of the catastrophe model it may be more appropriate to conceive of a student not so much as being on two overlapping paths at the same time as alternating between them so far as his emphasised study policy is concerned.

However, the 'overlapping paths' view of the behaviour surface provides the clue to the required definition of delay. The projection of the over-fold region of the surface on to the control space in the 3-dimensional model takes the form of a bifurcation set characterised by a cusp. Thus delay might be regarded as commencing when a student becomes conscious of being in a situation of overlapping paths, i.e, when he is on one 'path' but aware that he should be on another. This is also implied by the notion of 'local' and 'distant' majorities in the changing distributions 'frozen' at times t_1, t_2 and t_3 in Fig. 3.2.

A student who is delaying would, therefore, be on a path whose projection lies within the bifurcation set, or cusp, region of the control space.

The foregoing attempt at a definition of delay in terms of the topological catastrophe model leads to speculation on the nature of the experience for a student of being within the cusp area of the control space: that is to say, what would be the experience resulting from the inferred interplay of strong conflicting motives represented by this region of the model? As has already been indicated in Chapter Two, the pilot study revealed some evidence of conflict in the dissonant cognitions of AP students, which might prove to be both an aversive experience and a motivating influence. Further, it was reported that AV students exhibited fewer indications of dissonance and stress, including anxiety, in their study-related cognitions. For this reason it was hypothesised that the dissonant cognitions detected are an indication of the stress or conflict suggested by the overlapping paths in the cusp model. The 'cusp experience' is, therefore, envisaged to be a form of conflict or dissonance, with accompanying press for resolution.

The cusp experience might also, quite conceivably, be characterised by relatively high levels of anxiety, perhaps in both facilitating and debilitating forms (Alpert and Haber, 1960) in addition to the cognitive dissonance already referred to. Indeed it is true, as has already been mentioned, that in delaying some students, certainly those of AP type, might be conceived of as defending themselves against situations which are anxiety-arousing. Thus, referring to Dollard and Miller's work, Sarason points out that: "at the level of covert responding, defence mechanisms are viewed by Dollard and Miller as responses to anxiety" (Sarason, 1972. p.76), i.e, anxiety is a stimulus to which some form of defence mechanism is a response,

and Sarason considers that one facet of this stimulus-response approach which has been particularly seminal is concerned with conflict.

The empirical evidence relating to these hypotheses will be reported in Chapter Five. Furthermore, since more or less permanent cognitive conflict would seem to suggest a less settled, or more unstable, work pattern as a student fluctuates between different levels of perceived demand on study emphasis (SE) some attention must also be paid to this pattern itself. For any one course of study the AP study emphasis (SE) pattern over time may well be inherently unstable, exhibiting relatively high-frequency oscillations between different SE levels, as, indeed, was also suggested in the report of the pilot work. Hence the empirical investigation of this hypothesis relating to the SE pattern over a critical period of preparation for one particular course also forms a major feature of Chapter Five.

Operational Forms of the Cusp Model

The control space of the cusp model may be conceptualised in terms of a number of control factor configurations which purport to 'explain' observed behaviour patterns in the student population and serve to furnish hypotheses concerning the psychological nature of the controls themselves. Naturally the conceptual nature of the controls were determined by the theoretical framework in terms of which the initial aspects of the enquiry were to be conducted. Principal structural features of this theoretical framework were:-

(a) The extent to which students tended to delay in engaging with study-related activities.

(b) The extent to which students of different 'delay' type appeared to experience cognitive conflict or dissonance, or other recognisable form of stress, such as anxiety, in adjusting to the apparent exigencies of study.

These controls, or motivational determinants of behaviour, are apparently related to dispositional judgements (Warr and Knapper, 1968) concerning study-related situations. Under crisis conditions, however, as a critical deadline loomed it appeared that episodic judgements were influencing pronounced delay-type students in a manner which led to behaviour contrasting with their normal, i.e, dispositional, mode, and which appeared to stem from their experiencing social pressure to conform to the expectations of the evaluating system. In part, no doubt, this 'social pressure' would derive from a realisation that the majority of fellow students were placing relatively high emphasis on study (see the distribution at t_1 in Fig 3.2.) and that further delay might entail undue risk to the self-concept.

The bifurcation set of the cusp model, i.e, the area of the control space bounded by the downward projection of the pleat in the behaviour surface, is a feature of considerable interest in considering the orientation and intensity of the control vectors, whether these are of 'normal' or 'splitting-factor' configurations (see Fig. 3.1.). This area is, hypothetically, one in which tension, stress or conflict are likely to be at maximum values since either the influence of any bimodality in the controls or the effect of a splitting factor would be at a maximum in this region. Thus it is in this 'cusp' region, which gives its name to the model itself, that a student might experience some of the cognitive dissonance already referred to, possibly in a pronounced form, resulting in the catastrophic changes in behaviour represented by the pleat in the corresponding region of the behaviour surface. Such intensification of the influence of control factors would be most likely under conditions of episodic judgement such as that operating when a critical confrontation, such as an examination, is impending.

It may be hypothesised that there are certain vector configurations

of the control factors implied by normal, or dispositional, behaviour which might, therefore, model subjects' dispositional covert characteristics as they prevail at times relatively remote from any crisis. These latter configurations would constitute a more subtle basis for classification of students than would overt behaviour since different intensities and configurations of the controls would result in identical behaviour. This is illustrated in Table 3.3.

Table 3.3.

Hypothetical Relationship between Study Disposition and Delay Tendency at a Time Remote from a Crisis

STUDY DISPOSITION (NORMAL CONTROL)	DELAY TENDENCY (NORMAL BEHAVIOUR)
Unimodal 'Approach'	High SE
Unimodal 'Avoidance'	Low SE
Unimodal 'Neutral'	Intermediate SE
*Bimodal 'Approach' and 'Avoidance'	High or Low SE (but not Intermediate)

* It should be noted that an instrument designed to yield a summative score indicating delay tendency could result, in a bimodal subject, with a total score identical to a unimodal 'neutral' subject.

Considering first the appropriate modelling of conflicting approach and avoidance motives, the cusp model suggests a control space without a splitting factor. The dynamics of such situations have interested workers both in psychology and in education for some time, though they do not appear until now to have been cast into the form of model proposed here. In fact, students of AP type might, quite reasonably, be supposed to be high in need for achievement (McClelland, 1961; McClelland, Atkinson, Clark and Lowell, 1953). Such students

could, indeed, in extreme cases, be overstrivers, and evidence that this was certainly true of a small number (N = 5) was discussed earlier in this report. One problem in modelling such a system arises partly from the fact that the question as to whether or not the motive to achieve is a single dimension is still unsolved. In discussing this point Covington and Beery (1976) refer to the so-called 'unitary' and 'competing' views. "The unitary view holds that the disposition to strive for success and to avoid failure are simply two ends of the same continuum... The competing view holds that success striving and failure avoidance are two separate dimensions." (p. 50). The unitary view would have it that individuals combine both 'approach' (striving) and 'avoidance' but in different proportions. As Covington and Beery point out, the unitary view is most convincing in the case of people who are clearly dominated by one or other of these dispositions. In contrast to this the competing view considers that approach and avoidance dispositions are two separate dimensions, a view which admits of a virtually unrestricted series of combinations of the sub-motives in all conceivable intensitites.

If these references to the unitary and competing theories of approach and avoidance motivation are cast into terms of catastrophe theory then those students characterised by strongly unimodal disposition might best be represented by a splitting-factor version of the cusp model. For students of this type the control space would have the configuration of control factors shown in Fig. 3.4. The position of a student on the approach-avoidance dimension would tend to be either clearly 'approach' or clearly 'avoidance', since these are the stable attractor states, and the switch from one to the other in terms of behaviour (i.e, degree of 'study emphasis', or SE) would tend to be more catastrophic to the extent the subject was susceptible to social pressure.

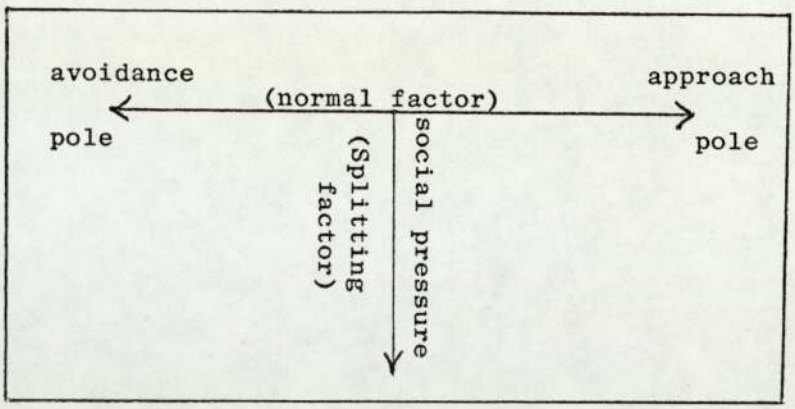


Fig. 3.4. Hypothetical Control Space for Students of Unimodal Disposition.

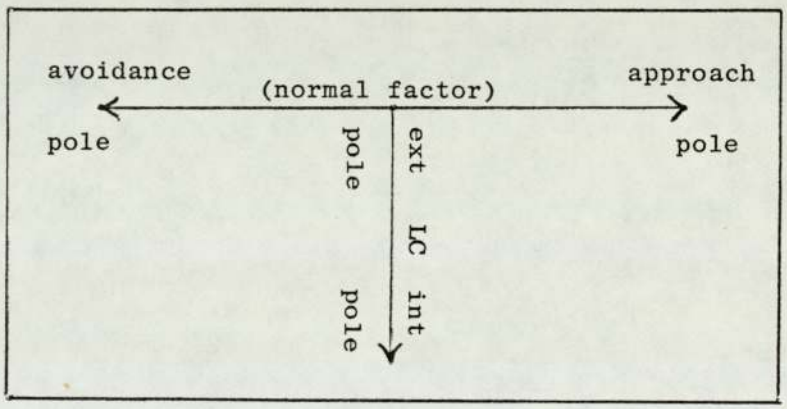


Fig. 3.5. Locus of Control (LC) as a Hypothetical Splitting Factor.

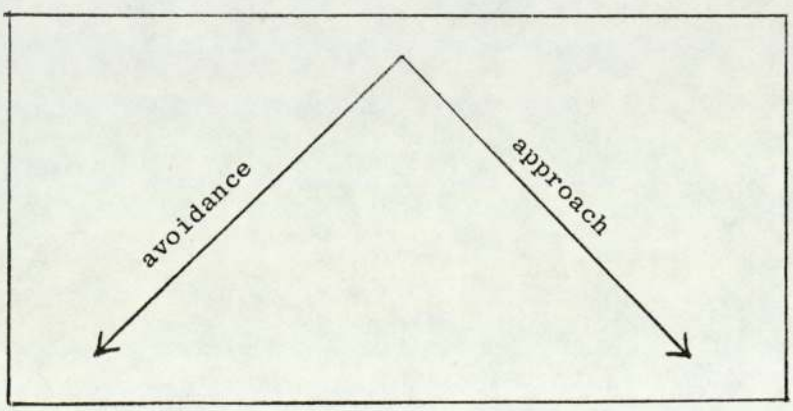


Fig. 3.6. Hypothetical Control Space with Conflicting Normal Factors for Students of Bimodal Disposition.

Flay (1978) has discussed evidence supporting social pressure as a splitting factor in one of his operational forms of cusp model, and elsewhere Zeeman (1976) has suggested anxiety as a variable with this function. In the present investigation the evidence gained during the pilot study implied that the variable most probably bifurcating the population was locus of control (Rotter, 1966), which might be construed as 'degree of susceptibility to social pressure'. For this reason it may be appropriate to substitute 'locus of control' for 'social pressure' as the splitting factor in Fig. 3.4. This is shown in Fig. 3.5.

Bearing in mind Zeeman's reference to the function of anxiety as a splitting factor under certain conditions, together with the evidence of stress among students in connection with critical evaluations - especially examinations - it was decided to administer an anxiety questionnaire which might distinguish between anxiety in its facilitating and in its debilitating functions for the target sample. The instrument chosen was that developed by Alpert and Haber (1960), since it appeared to be particularly appropriate for this purpose, and this investigation is reported in Chapter Four.

In the case of students not dominated by one or the other of the two controlling dispositions it might be inferred from Covington and Beery (1976) that, in terms of the cusp model, such subjects would be appropriately modelled by means of 'competing' approach and avoidance motives, and that the influence of a splitting factor would be minimal. For such students, constituting in all probability the great majority, the hypothetical functional configuration of the control space vectors would be as shown in Fig. 3.6. Depending on the intensities of the competing dispositions, or motives, it can be seen that behaviour controlled by these factors could range between smooth and catastrophic in terms of adjustment. This 'competing' configuration of the control

space, in fact, appears to suggest a more or less rapid oscillation between relatively high and relatively low SE rather than more or less smooth, or 'continuous' adjustment, whereas the unitary configuration referred to above and illustrated in Fig. 3.5. appears to suggest a form of stable-limit oscillation with the preferred position being in one of the two contrasted forms of study-related behaviour, i.e, low SE or high SE respectively.

Enpirical Investigations Suggested By the Cusp Catastrophe Model

The operational forms of the cusp model set out above and developed from the earlier pilot study suggested a range of hypotheses which lent themselves to empirical investigation. These hypotheses were as follows:-

1. Dispositional delay tendency is a feature related to significant motives underlying the study behaviour of the population and, therefore, to performance.

2. Bimodality, or ambivalence over study, is a feature of the overall structure of the measured delay tendency of individual students, in particular those of intermediate, i.e, AP-m and AV-m, types (where 'm' signifies 'moderate').

3. The degree of bimodality is positively correlated with anxiety over study.

4. Internal locus of control (LC) students (i.e, those tending to independence and self-determination) are distributed more widely in their tendency to delay over study than are external LC students (i.e, those tending to conform to the perceived requirements of the evaluating system at any one time).

5. The actual study behaviour patterns of students in terms of 'study emphasis' (SE) is associated with their measured dispositional delay tendency as follows:-

   (a) In AP-e students (where 'e' signifies 'extreme), either a sustained high level of SE, or, more likely, an unstable pattern of fluctuation between SE levels with a high mean.

   (b) In AV-e students, a stable pattern characterised by relatively long periods of low or zero SE with sharp transitions to briefly-sustained high SE at times of academic crisis, such as examinations.

   (c) In AP-m and AV-m students, an intermediate pattern of study behaviour.

6. Dispositional delay or delay-avoidance tendency is associated with characteristic perception, judgement and evaluation of the nature of institutional study.

The investigation of these hypotheses formed the major empirical aspect of the research and these investigations will be reported in Chapters Four, Five and Six.

In view of the fact that no distinction was made between male and female students in analysing data from the empirical research it should be mentioned that the proportion of female to male students in the surveys was very close to 3:1. For this reason the findings would be dominated by female characteristics, should these typically be different from those of male students within the terms of the present research.

Summary of Chapter Three

1. A brief recapitulation of the significant classificatory dynamic features of the system of adjusting students was presented before other systems comparable in their major dynamic features were reviewed.
2. Catastrophe Theory, which has been successfully applied recently to the modelling of such systems, was introduced.
3. The nature of catastrophe theory was outlined with especial reference to the characteristics and potential value of the Cusp Model for purposes of the present research. A theoretical example in terms of the present research was discussed in order to illustrate the application of the model.
4. The 'likelihood function' concept was used to illustrate the probability conditions, referring in this case to motives and study behaviour in a student population, which could be appropriately systematically related by means of the cusp model.
5. The cusp model was used to provide a definition of 'delay over study' in terms of psychological cognitive-field theory in order to illustrate a further aspect of its systematic value in the present enquiry. This led to a discussion of possible relevant operational forms of the cusp model.
6. The model was used to derive a series of research hypotheses for later empirical investigation.

CHAPTER FOUR

THE DIMENSIONS OF DELAY : AN EMPIRICAL STUDY

Design of the Delay Tendency Questionnaire (DTQ)

It has been repeatedly stressed in the foregoing chapters that the nature of delay over study is an important feature of this research, and the choice of the cusp catastrophe as a provisional model for student adjustment in relation to study was conditioned largely by reason of the fact that the cusp model included a clear 'hysteresis' characteristic (see Fig. 3.1). Further, as discussed in Chapter Three (pp. 69-70), the overfold region of the model with its suggestion of 'overlapping paths' implied a definition of delay in terms of ambivalent student perceptions. This notion of delay suggested that students would be aware of the extent to which they did involve themselves in some sort of delay over study, and it suggested that an operational definition of delay might be found in an instrument which summed students' responses to a series of statements relating to their normal, or dispositional, behaviour over a wide range of study-related situations.

For these reasons an instrument was sought which concentrated on the behavioural characteristics of students in such a wide range of study-related circumstances in order to explore students' perceptions of their own typical, or dispositional, behaviour. A search of the literature revealed no instrument which exhibited the appropriate face validity and also suggested a reasonable degree of parsimony in terms of time required for administration. Hence an instrument needed to be devised and validated for present purposes, and fortunately an earlier American study provided an appropriate starting point. The Survey of Study Habits and Attitudes (SSHA) of Brown and Holtzman (1966) is an instrument widely quoted in the literature, both British and American, and the initial modification and adaptation of the questionnaire

resulting from this work was begun, as reported in Hill (1976).

The criterion validity of Form C of the SSHA is acceptably high for survey purposes, varying from .27 to .66 for men, and from .26 to .65 for women, the average validity coefficient being .42 and .45 for men and women respectively. Similarly, the reliability of the instrument's subscales has been shown to be very high. The only sub-scale of interest here is Delay-Avoidance, and a test-retest coefficient for this basic scale was found to be .93 over a four-week period.

There is little doubt that sufficient work has now been done using the SSHA to form a very useful basis for comparison with further studies. Cowell and Entwistle (1971), however, expressed their feeling that the SSHA is by no means ideal for work among British students and suggested that a revision may be necessary in order to improve it in this respect. In the work reported here it was also felt that some of the language and certain of the American idioms were inappropriate to the locale of the research. Nevertheless, it was desired to take advantage of the accepted validity of the Brown and Holtzman work, so the following method was adopted in order to achieve a revised instrument.

Statements and opinions in the literature, together with impressions from counsellors and lecturers working in higher education, which appeared to be expressive of the various dimensions of delay over study, were collected to form a pool of 50 items. This pool, expressed as statements, was scrutinised for the face validity of the items in such terms as: fear/anxiety; distractibility; other directedness and other-awareness in relation to study; conscientiousness; strain; awareness of 'putting-things-off'; the perception of study as only one aspect of life among equally important aspects. As a result of such careful scrutiny by the researcher and a group of experienced professional colleagues, 25 items were selected as expressing well the particular characteristics for which face validity was sought. These items were

chosen to form one of the two sub-scales of the pilot questionnaire (the AH sub-scale). The remaining sub-scale (designated SS) was formed by rendering the 25 Brown and Holtzman 'Delay-Avoidance' sub-scale items into a form of language and referring to a parallel content, which was thought more appropriate to an English college setting. In fact, only minor modifications were made in order to minimise the risk of losing the accepted and attested validity of this sub-scale in the process of divesting it of any specific and highly American reference. It was particularly important to minimise the risk because it was desired to establish the degree to which the AH and SS sub-scales were measuring the same dimensions of behaviour, and there could be no check on the validity of the modified SS sub-scale. Thus, the concurrent validity of the new AH sub-scale was to be established by correlation with its SS counterpart.

The two sub-scales were arranged so as to form one questionnaire, SS first, forming items 1 to 25, followed by AH, forming items 26 to 50. The order of the SS items was left as it appears in the original Brown and Holtzman DA sub-scale, whereas the order of the AH items was decided by random selection.

Scoring was based on the SSHA scheme, in which a series of five 'boxes' appears opposite to each item, labelled R, S, F, G and A respectively. The meaning of these letters, i.e, Rarely, Sometimes, Frequently, Generally and Always, was explained at the head of each page of the questionnaire. Finally the numerical score for each 'box' was decided by the form of the statement in such a way that 'Delay-Avoidance' scored high and 'Delay' scored low. Thus Box F always scored 3, while boxes S and G were scored either as 2 or 4, and boxes R and A were scored 1 or 5. Responses simply took the form of a tick placed by the subjects in the appropriate box opposite each item.

The subjects in the pilot study were a group of Third Year students (N = 33) from an earlier course than that forming the population used for the investigation proper. It should be mentioned that, whereas the population from which the final sample was drawn was comprised entirely of undergraduate students reading for the B.Ed. degree, the pilot sample used for the purpose of validating the new instrument was drawn from students registered for the Certificate in Education. This seemed to be perfectly acceptable for two good reasons:-

(a) So far as could be ascertained both the Certificate and the B.Ed students evinced the same range of adjustive patterns in terms of study behaviour.

(b) The major part of the subsequent enquiries were carried out in relation to forms of adjustive behaviour and their corresponding controls: the emphasis was not directly in relation to academic performance.

It was felt that the advantages of this earlier pilot sample outweighed any possible disadvantages in that contamination of the intended final sample was minimised. The students comprising the pilot sample agreed not to discuss the nature of their participation with others, and there is no reason to suspect that they reneged on this agreement.

The first procedure in the work after administration of the instrument to the pilot sample was an item analysis using the Likert internal consistency method (Oppenheim, 1966), in which the Pearson product-moment correlation coefficient of each item with its own sub-scale total was determined. Thus, items 1 to 25 inclusive were correlated with the SS total, and items 26 to 50 inclusive were correlated with the AH total. Finally each item in the two sub-scales was correlated with the sum of the SS and AH totals, i.e, the instrument's overall total.

Inspection of the item analysis results revealed that most items had high correlation coefficients with a significance level of $p = .001$. Indeed, only thirteen items failed to reach a significance level of $p = .05$, and of this group eight had a face validity which appeared to be high enough to warrant their being retained: these ranged from $r = .34$;

p = .052 to r = .24; p = .187. The remaining five items were rejected. They appeared to form a statistically separate and unrelated group in an otherwise very acceptable series of items.

In order to estimate the concurrent validity of the new sub-scale the AH total was correlated with the overall total. This was found to be r = .96; p = .001, which indicated a very high level of agreement and clearly suggested that the two sub-scales were probably measuring the same dimension of student behaviour, i.e, Delay Avoidance in terms of the SSHA.

Thus the revised questionnaire, which was used as the instrument measuring Delay Tendency in the final study comprised 45 items, 23 from the former SS sub-scale (re-numbered 1 to 23, and 22 from the former AH sub-scale (re-numbered 24 to 45). A specimen of this final form of the new Delay Tendency Questionnaire (DTQ) is given, complete with scoring key, in Appendix II.

The Average Student: A Delay-Tendency Profile

The final version of the DTQ was administered to a sample of Third Year students (N = 52) at the end of the Spring term. This point in the course was chosen because by that time students were sufficiently influenced by the prospect of the examinations to be aware of their own attitude to study and conscious of their normal behaviour. At the same time the examinations were not immediately pressing and no distortions through extreme polarisation of opinion, or 'panic' responses, were anticipated. The intention was to obtain an index of self-reported typical study-related behaviour which could be regarded as a multiple-act criterion of delay tendency.

As has been made abundantly clear in the earlier discussions, this research does not seek to lump students together so far as their study motivation is concerned but rather to distinguish between motivationally

distinct types so that the covert, as well as the overt, nature of the distinguishing features may be examined and classified in terms of an appropriate model. However, there are two exceptions to this rule so far as analyses of data are concerned. Both concern the DTQ and both are intended to reveal any general or preponderant dispositions, indicating motives, in the sample.

The first of these is an analysis of the DTQ data for each item in terms of descriptive statistics in order, primarily, to ascertain the mean response to each item. In a sense, therefore, this analysis yields a delay tendency profile for the average student, a fictional entity who would be characterised by all the preponderant dispositions and behaviours of the real members of the sample, and who could be used, therefore, as a reference against which more extreme individuals or particular groups could be compared and contrasted. The second form of analysis of an overall or general kind, concerned also with the search for the most significant underlying dispositions, or motives, is a factor analysis of the DTQ data.

The factor analysis will be reported at a later point in the present chapter. First, the delay tendency profile for the average student, derived from the DTQ item mean scores, will be presented in order to establish the preponderant behavioural dispositions of the sample in relation to delay over study. For this purpose the 'CONDESCRIPTIVE' programme of the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner and Bent, 1975) was used for computer analysis in order to determine the mean score for each DTQ item. The full statistical result for each of the DTQ items is reproduced in Appendix III.

The study characteristics of the 'average student' in behavioural terms derived from the means are listed below in groups or clusters, arrived at by inspection, which suggest a certain degree of relationship in terms of the associated cognitive controls. Following this listing

a further list is given for the sake of immediate comparison which indicates those items in the DTQ on which students differed widely. To conclude this section of the report an attempt is then made to summarise the significant features of this analysis.

Main Clusters Indicating Preponderant Tendencies

Cluster One

Stick to dull and boring assignments;
Mental concentration not a problem;
Not too tired, bored or sleepy to study efficiently;
Not readily distracted from work by daydreaming;
Not conscious of making a sacrifice in order to study;
No need to avoid the strain of intensive study;
Not difficult to keep to a sustained study programme;
Not easily distracted from study;
Prospect of study not experienced as cold and forbidding.

Cluster Two

Catch up backlog of work without prompting from tutors;
Do not try to talk over difficulties in the work with tutors;
Assignments tend to be completed on time.

Cluster Three

Not hard to resume study after a social occasion;
Return to social life after intensive study experienced as a great relief.

Cluster Four

Assignments not kept up-to-date on a day-to-day basis;
Difficulty experienced in making a start on study;
Tendency to work best under pressure;
Possibly would not study given the choice.

Cluster Five (a complex cluster)

Social activities considered as important as study..... but:
Do not become involved in social affairs at the expense of college work;
Can dismiss study problems from mind if they do not seem urgent;
Pangs of conscience when not working as well as one might;
Not irritated if having to work while college friends were relaxing.

Cluster Six

Tendency not to keep the workplace uncluttered;
Tendency not to organise work so as to utilise time most effectively ... but:
Study not a hit-or-miss affair;
Time given to study is not left to chance.

Characteristics in Terms of Which Students Differed Widely

The extent to which 'phone calls, people coming in and out of their work-room, sessions with friends, etc, interfere with studying.

The time needed to get 'warmed-up' to studying.

The tendency to put work off until the last minute.

The tendency to waste too much time talking, reading magazines, listening to the radio, watching TV and going to the cinema for the good of their studies.

The extent to which studying is carried out in a random, unplanned manner - impelled mostly by approaching deadlines.

The extent to which regular study is essential for peace of mind.

The extent to which there is enough time to do all they would like to do.

The extent to which 'study' and 'pleasure' are thought of as being two quite different aspects of their lives.

The extent to which they would feel guilty to find that only they and a few friends were not studying.

The extent to which they would feel that too much was being left to chance if study was left to the last moment.

Summary

There is a suggestion of last-minute rush with assignments, i.e, a tendency not to keep assignments up-to-date on a day-to-day basis, but yet to complete them on time. This impression is also supported by the general tendency to find difficulty in making a start on study. This suggests that catastrophic adjustment is the norm. Yet the overall impression is that most students are not so much wilful delayers as, for one reason or another, unable to avoid delay. This delay is, apparently, not due to extra-curricular activities or problems outside college, but distractions within college or the circle of friends does have an adverse influence on attention to study.

In the main students appear to avoid contact with tutors when they consider that it is not absolutely necessary, and this even applies to the talking over of work difficulties with tutors. But they do not

usually need prompting from tutors before catching up with a backlog of work. There is little evidence that, in the main, students are conscious of making a sacrifice in giving up time in order to study, and they tend not to find it difficult to keep to a sustained study programme.

The suggestion of avoidance of contact with tutors unless absolutely necessary suggests that the phenomenological worlds of tutor and student are distinct and it may be that such avoidance is the means of securing a degree of 'defence' (Mechanic, 1962). This could be true even if the comfort stemmed from wilful self-delusion since it is an aversive experience for a student to find that a tutor:-

(a) explicitly or implicitly indicates a considerable amount of work still remaining to be done - especially if this work was totally unexpected.

(b) evinces a cognitive structure concerning the field to be evaluated somewhat at odds with the cognitive structure of the student himself.

This point may, in fact, be linked closely with the results of students' perceptions of those elements of courses of study which potentially lend themselves to the process of evaluation by a tutor, which is an aspect of the present research to be reported in detail in Chapter Six. Commerce with a tutor is clearly a process in which a student risks adverse evaluation or other form of threat!

The evidence suggests that students consider that they work best under pressure, but since they tend to avoid direct contact with tutors (who might presumably exert such pressure) the 'pressure' in this case would probably be a form of 'social pressure' (see Flay, 1978, referred to in Chapter 3, p.74), i.e, due to their own subjective judgements of the imminence of a deadline. Since, as already mentioned, they do not keep up-to-date on a regular daily basis, and find difficulty in making a start, the implication is clearly of a last-minute rush to complete,

and this would represent in operational form the 'sudden transition' in the cusp catastrophe model inherent in the behaviour of the sample.

It is worth noting in the light of the foregoing evidence that, though it might be true of tutors in general, it appears to be a fallacy to suppose that the typical student in the sample studied here has a strong commitment to, and pleasure in, all or even most of the work in which they became involved. Tutors are, in all probability, committed to the development and refinement of a particular intellectual field, which forms the community of interest of a fraternity of like-minded professionals. Their career and consequently their social and domestic circumstances, through status and income, are dependent very substantially on the achieving of a particular form of understanding of specialist subject-matter. This may in no sense be true of a student who may merely seek a provisionally acceptable version of the tutors' understanding for a period long enough to secure instrumental value in some process of evaluation, such as an examination, which may be yielded by this provisional and relatively unrefined understanding.

This line of discussion seems to suggest that the student would develop provisional study schemas for instrumental purposes, multi-stable in nature and subject to sudden 'switching' or discontinuity between different forms during the course of implicit or explicit negotiation of their 'position'. Such processes may well be threatening and highly aversive for many students during tertiary-level study programmes - especially if they should be in the hands of indifferent or unsympathetic tutors!

DTQ Summative Scores and Associated Behaviour Patterns

The validity of the DTQ as an instrument capable of registering students' disposition to delay over serious engagement with study was confirmed by means of a number of checks made on a sample (N = 20) of

students returning scores categorised as high, intermediate and low. The comparison of the actual behaviours of these students with the DTQ scores was made by a number of 'judges' on the college staff, and their general impressions were that the summative scores agreed well with the delay characteristics indicated by scores on the instrument in every case. The distribution used for this work was:-

(a) High DTQ Summative Score (N = 5); greater than 1 SD above the mean.

(b) Intermediate DTQ Summative Score (N = 10); within + or - 1 SD.

(c) Low DTQ Summative Score (N = 5); greater than 1 SD below the mean.

This check, confirming agreement between the DTQ score and fairly clear overt indications of different patterns of behaviour in relation to study, was very encouraging and did much to remove doubt in the researcher's mind concerning the possibility that, in spite of their assurances of intended probity in their responses to the DTQ items, some students might have reconsidered the matter and decided upon a policy of discretion in view of the fact that their responses were to be seen by a member of the college staff. It seems, however, that the absolute guarantee of confidentiality given to the target population before the empirical investigation began was sufficiently reassuring and the responses to the instrument were probably quite valid in their reflection of actual behaviour.

It appeared, therefore, that high DTQ summative scores were associated with the overt AP behaviour pattern and that low DTQ summative scores were similarly associated with the overt AV behaviour pattern. These results clearly appeared to refer students with high scores to the higher (AP) surface of the cusp model, and students with low scores to the lower (AV) surface. In other words, these scores relating to dispositional behaviour served to refer students to their normal, or most probable, position in the hysteresis dimension of the model. However, considerable interest lay in certain less obvious characteristics of

student responses as they related to the catastrophe model and it is to a consideration of one of these, the phenomenon of bimodality, that attention is now turned.

Bimodality in the DTQ Responses

The relationship between high DTQ score and AP behaviour, and low DTQ score and AV behaviour respectively is conceptually clear. This is not true to the same extent of subjects who returned intermediate scores, by reason of the different ways in which these intermediate overall or summative scores could be made up. Referring back to Chapter Three where the characteristics of the cusp model were set out, it can be seen that, in addition to the 'pure' AV and AP types of behaviour, represented by the lower and upper surfaces respectively of the model, there is a region of overfold which projects downward on to the control space to form the 'bifurcation set' (see Fig. 3.1). It was reasoned that 'pure' AP-type and AV-type subjects would be located unequivocally on the upper and lower surfaces respectively of the model, i.e, outside the region of overfold. The reason for this follows from the mathematical and psychological nature of the overfold, which represents dual probability. Thus a student whose behavioural controls were located in the bifurcation set of the control space would probably experience competing demands exerted by both 'approach' and 'avoidance' motives. Now a student who scores either very high or very low in terms of the DTQ summative score must be supposed to be reporting dispositions the corresponding motives of which would not admit of their being referred to the overfold region of the model, since very high and very low summative scores must reflect uniformly high or low scores respectively on individual items within the instrument.

In view of this hypothesis generated by the cusp model, despite the tentative typology suggested in Chapter One and referring to only two major types, i.e, AP and AV respectively, it appeared necessary to

postulate three types of student characterised by high, low and intermediate delay tendency respectively. This modification, does not, however, by any means represent an abandonment of the earlier typology since it might be considered that AP-e and AV-e are the two distinct extreme behavioural forms while AP-m and AV-m types might be regarded as one broad category comprising two distinguishable but overlapping sub-categories. This latter category, i.e. AP-m plus AV-m, would then comprise the intermediate category suggested both by the cusp model and by the distribution of DTQ summative scores. (The full implications of the suffixes 'e' and 'm', i.e, 'extreme' and 'moderate' respectively, may be found in the typology set out in Chapter One,(pp. 12-13). It was further reasoned that, whereas there could be only one type of high DTQ summative score and only one type of low DTQ summative score, i.e, unimodal distributions with respect to individual item scores, in the case of intermediate DTQ summative scores there could be two broad categories of distribution:-

(a) Summative scores made up of intermediate-range individual item scores, i.e, unimodal intermediate distribution;

(b) Summative scores resulting from a mixture of both high and low individual item scores, with relatively few intermediate scores, i.e, a bimodal distribution.

These theoretical categories of DTQ score distribution can be illustrated diagrammatically and this is done in Fig. 4.1. The correspondence between these diagrams of theoretical distributions of DTQ scores and the 'Likelihood' or probability function referred to in Chapter Three (see Fig. 3.3) is quite clear.

Since bimodality is a characteristic feature of systems which may be modelled by means of Catastrophe Theory the DTQ data was explored for evidence of this characteristic, and it was hypothesised, in the light of the foregoing argument, that it would be found among scores of intermediate type.

Analysis of the DTQ data was carried out by means of the SPSS

computer programme (Nie et al, 1975). A new variable, 'Extremism' (EXT) was computed which summed the difference between the response for each item in the scale and the mean response (computer variable 'MRESP') for the entire scale for each case (N = 52). Thus, the greater the tendency to respond in extreme categories of the DTQ items the greater the EXTREMISM, or bimodality, score. The procedure of taking the mean response for each case instead of the overall mean as the datum from which to measure 'Extremism' served another purpose in that it enabled the DTQ summative score for each case to be correlated with bimodality, since the 'mean response' to the DTQ is analytically equivalent to the DTQ summative score for purposes of statistical correlation (i.e, DTQ mean response = DTQ summative score/45).

The result of this analysis proved unexpected in view of the hypothesis derived from theoretical probability functions. Correlating DTQ Mean Response with Extremism (in other words, Delay Tendency with Bimodality) gave $r = -.50$ ($p = .001$). Evidently such degree of association as is indicated by this result suggests that relatively high extremism is associated with relatively low DTQ mean response. In other words, bimodality tends to be associated with students of AV-type - those located dispositionally on the lower surface of the model.

In order to examine the actual scores on the variables the contents of the computer file for MRESP (DTQ mean response) and EXT (extremism of DTQ score pattern, or bimodality) were listed by means of the computer for inspection and the following points noted:-

(a) The five highest DTQ mean response scores were those of the small group of obsessive workers referred to earlier in this study.

(b) These 'high-DTQ's' were all low-extremism scorers. That is, they were, as expected, unimodal in the distribution of their score patterns and this agreed very well with their 'preferred' position on the upper, or AP, surface of the cusp model, which had been inferred from the pilot investigation.

(c) Contrary to earlier expectations the most pronounced bimodality was detected among students returning low DTQ summative scores (or low DTQ mean response, as measured for purposes of this particular analysis). In fact, the student with the highest bimodality score was one of those with the lowest DTQ mean response scores.

Interpreting these results in terms of the cusp model, it would seem that, unlike the AP-e students, AV-e types are quite likely to exhibit occasional sharp transition-points in their behaviour since there is a greater probability of finding a pronounced degree of ambivalence in their self-reported disposition. This would, in fact, locate some such students in the region of the over-fold in the model and, while earlier work during the pilot study suggested that they do not subjectively experience conflict or dissonance, it seems that the bimodality found in their study-related disposition would nevertheless predispose them to make catastrophic changes in study-related behaviour, both as a result of steady changes in social pressure over time as critical deadlines loomed, and also as a result of their moving between different kinds of study-related situations, as set out, for example, in the various items of the DTQ. Certainly, such dramatic discontinuities in behaviour were found to be characteristic of these 'low-DTQ' students.

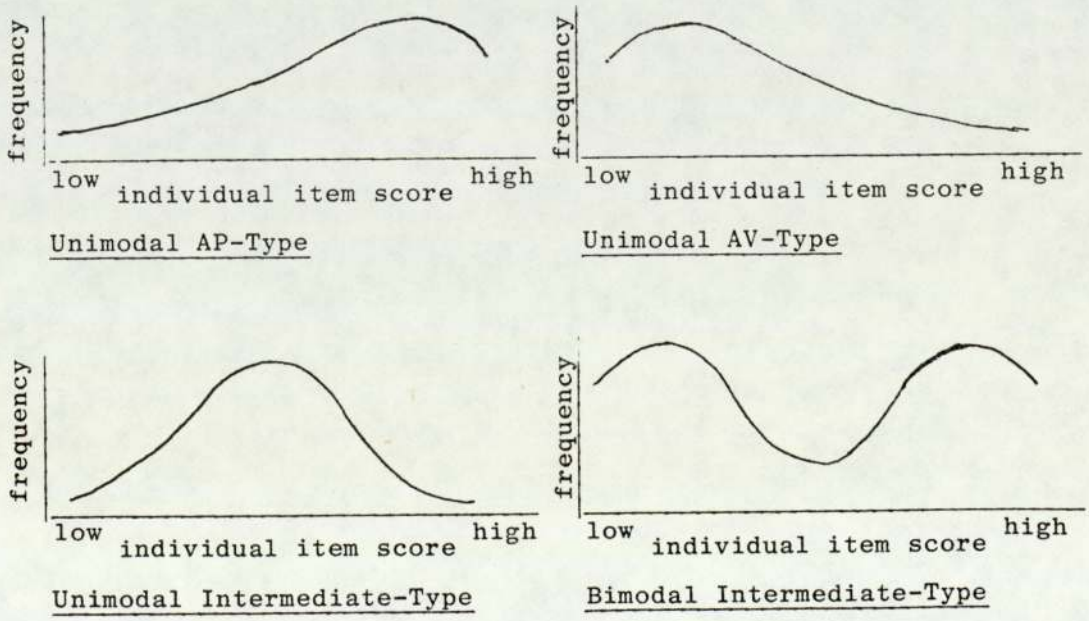


Fig. 4.1. Theoretical Categories of DTQ Summative Score Distributions for Students of the Three Major Types suggested by the Cusp Catastrophe Model.

The Factor Structure of the Delay-Tendency Data

Reference has already been made in this study to the inferred complex of factors which are inferred to act as controls over behaviour and it was felt to be an essential feature of the research to gain some insight into the nature of these situation-specific motives.

Since the DTQ items were either derived from a comparable survey by Brown and Holtzman (1966) of study habits and attitudes, or were selected by a panel of experienced judges for their face validity in referring to study situations likely to discriminate between students of different adjustive type, there is a sense in which the responses to the individual items themselves constitute an indication of the motives. However, it is near-impossible to conceptualise the relationship between scores on the 45 items of the DTQ and the control space of the catastrophe model precisely because of this superabundance of relevant data. Evidently some means of data reduction was required and this was achieved by factor analysis of the DTQ data. Thus the factor structure of the DTQ data was to be used as an indication of the principal motives underlying students' study-related behaviour, and would correspond to the 'approach' and 'avoidance' dimensions in the control space of the cusp model.

Considerable time was spent in exploring the data for the most meaningful analysis. Experience gained in a closely-related study carried out somewhat earlier (Hill, 1976) proved valuable here and, in a sense, the earlier work constituted a pilot study for the present investigation.

It was found that, with the criterion of factor extraction set at eigenvalue 1.0, too many factors were extracted, i.e, 14. A 'scree' test (Cattell, 1966) revealed no sharp break of slope in the plot of eigenvalue against factor number, but the change of slope suggested that the most parsimonious meaningful factor solution might lie somewhere between 4 and 8 factors. The graph of the scree test is given in Fig. 4.2. Accordingly,

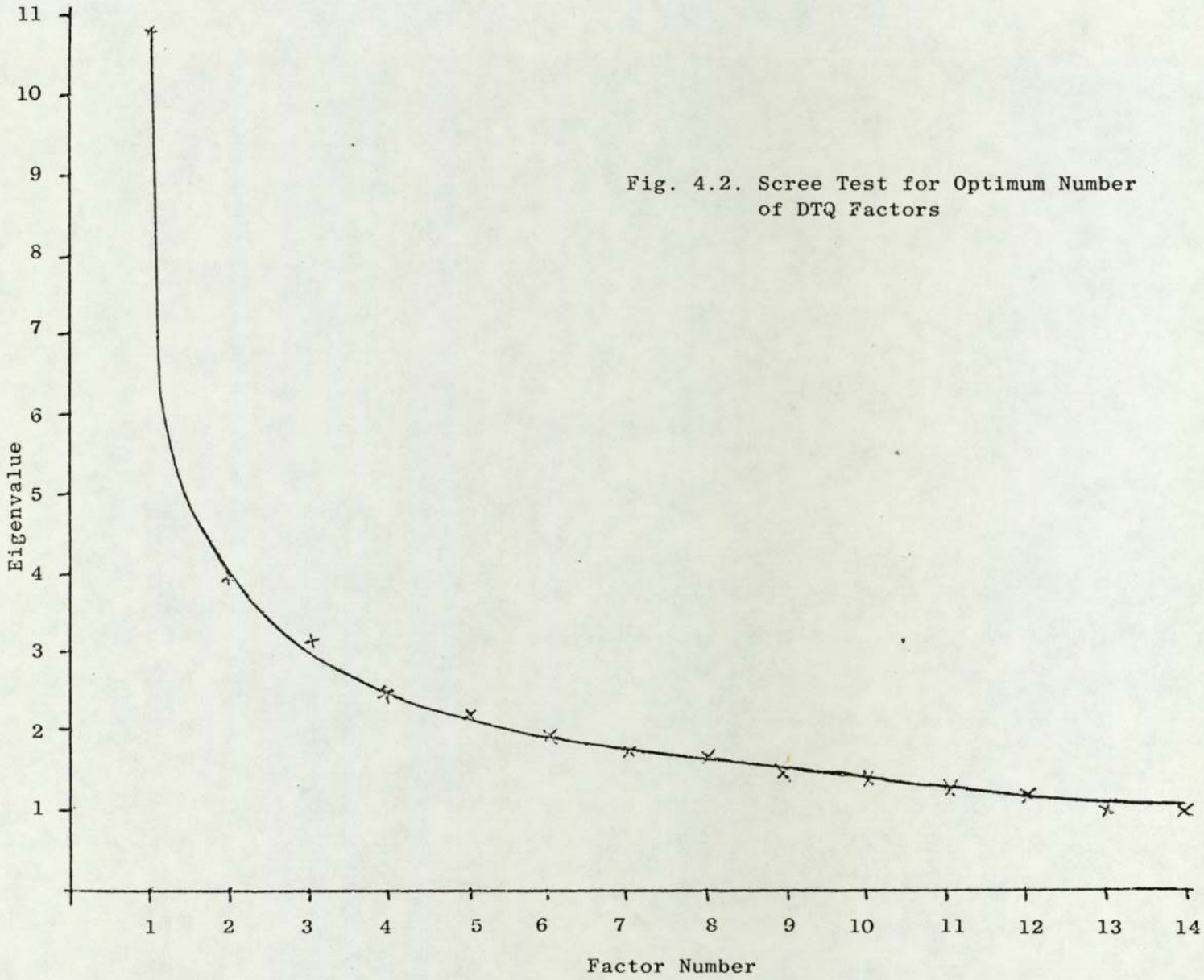


Fig. 4.2. Scree Test for Optimum Number of DTQ Factors

successive analyses were carried out in order to extract 4, 5, 6, 7 and 8 factors respectively using the SPSS subprogramme FACTOR, and in each case both oblique and orthogonal, or Varimax (Kaiser, 1958), rotations were explored in the search for the most clearly interpretable solution.

In fact, there was very little difference between the oblique and orthogonal solutions, but such difference as there was indicated a balance of advantage in favour of the orthogonal rotation, both in terms of sharper separation and somewhat clearer interpretation. Hence this was the form of analysis selected for the purposes of the study. The Varimax matrix is shown in full in Appendix IV, but the convention of taking a minimum value of 0.30 for a significant loading was adopted in the interpretation of the matrix. The best solution under these terms gave six factors and the percentage of the total variance accounted for by each factor is shown in Table 4.1, where it can be seen that Factor 1 accounts for approximately three times the variance accounted for by Factor II, the next most significant factor. Indeed, Factor I accounts for nearly half the total variance in the matrix.

Table 4.1.

Percentage of the Total Variance Accounted for by Each Orthogonal Factor Derived from the DTQ Data.

Factor No.	Percentage of Total Variance
I	47.5
II	16.0
III	13.0
IV	9.1
V	7.8
VI	6.6

An indication of the qualitative nature of each of these six factors is given in the following summaries:-

Factor 1

The highest item loadings suggest a motive related to 'making an effort to work in spite of difficulty and trying to keep up-to-date in order to ensure peace of mind. There is a strong suggestion of motivation of an aversive kind here and the character of this motive is indicative of 'fear of failure'.

Factor II

The highest loadings suggest characterisation in terms of 'inertia' or 'reluctance' and the associated motive would be concerned with 'reluctance to study'.

Factor III

Highest loadings are related to 'persistence' or 'perseverance' and catching-up without prompting', and the associated motive appears to be concerned with the significance of time in study-related activities. In view of the high loading of an item indicating the extent to which any backlog of College work is made up without prompting this factor seems to have a clear bearing upon the pattern of adjustment to study demands. It suggests 'orientation towards study'.

Factor IV

The highest loadings might be summarised as being concerned with 'distractibility due to external influences', e.g, leisure reading, radio and TV, and daydreaming. However, the factor is complex and also relates to 'level of organisation in planning study'. In this sense the factor appears to include components indicative of at least two motives which are inferred to be related. Or, it could be that the factor taps opposite poles of the same inferred motive.

Factor V

The highest loadings correspond to 'concentration' and 'distractibility due to internal (i.e, within the person) influences', e.g, restlessness, moodiness, depression and tiredness. But, as in the case of Factor IV, this Factor has another aspect indicated by high loadings related to 'time taken to warm up to study' and 'consciousness of making a sacrifice when giving up time to study'. Thus, this factor too is complex. It may be contrasted with Factor IV in its reference to internal as distinct from external influences upon study-related behaviour.

Factor VI

The high loadings indicate a factor which is characterised by the extent to which 'study' and 'pleasure' are perceived and experienced dichotomously, i.e, they are separate and distinctive aspects of life. This suggests possible conflict in motivational terms and may well be related to the stress which is indicated by other aspects of the research.

Bearing in mind the fact that the DTQ items were selected by experienced judges for their appropriateness and 'coverage' of significant situations encountered by students in their study careers, the factor analysis is of very considerable interest. To the extent that the items in total tend towards a compendium of significant study-related cognitions and behaviours then the factor structure of the data, in the sense that it reduces the overall complexity, should give some definite indication of the more fundamental cognitive and behavioural 'clusters' forming the basic model for the sample studied. From this, the motivational structure of the sample may, at least, be inferred.

Fig 4.3. sets out the DTQ factors in diagrammatic form in an attempt to gain an overall impression of the total motivational model. The meaning of the factors lies, of course, in their indication of underlying controls over behaviour which cause covariance of behaviour-related variables. These 'underlying controls' were conceptualised as what are usually termed 'motives', since they did actually appear to result in the kinds of study-related behaviours indicated in the DTQ item scores. Since the factor analysis was carried out on the same data as formed the basis for classifying students into AP and AV types it is reasonable to infer that clear AP and AV students respectively would display the influence of these controls or motives, in different degree.

An interesting point emerges from this aspect of the research which is possibly relevant to the work of Lazarus (1968) already referred to in Chaper 2 (see pp. 25 and 26), in which motivation was virtually conflated with the concept of adaptation ('adjustment' in his later work (Lazarus, 1976). The DTQ is clearly referring, in its separate items, to students' adaptive-adjustive responses to extended study programmes and no set of clearly-defined or unidimensional motives emerges from

the factor structure of the data. Factors I, II and III come closest to relatively simple structure, though the term 'simple' does not do justice to the internal complexity of the factors. Factors IV, V and VI, however, are inherently very complex and any attempt to represent them in unidimensional terms would be quite inappropriate. The evidence suggests, therefore, that student adaptation and adjustment to study are, perhaps not surprisingly, very complex in their control structure.

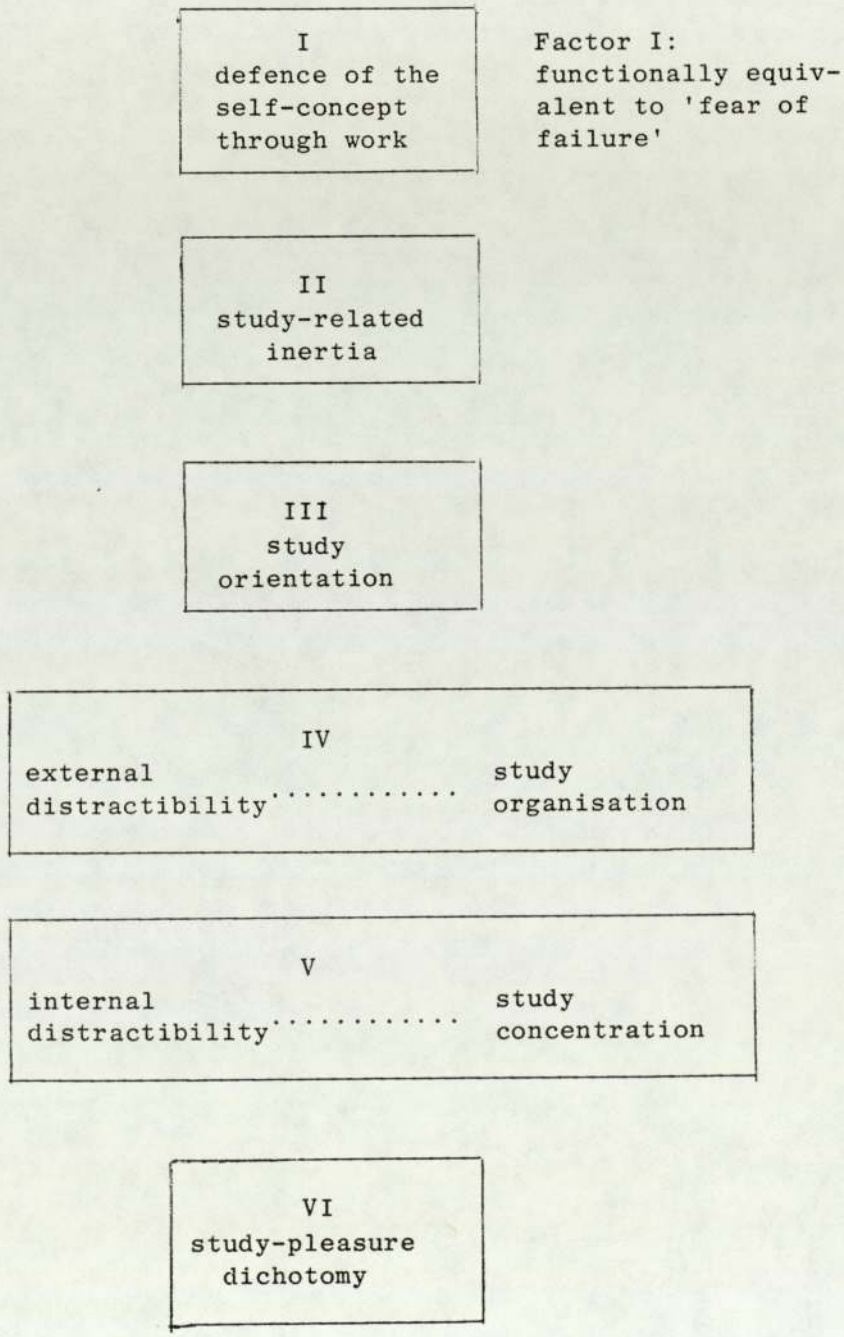


Fig. 4.3. Diagrammatic Representation of the DTQ Factors

Of considerable interest, in the light of the foregoing discussion, is the finding by Ramsden and Entwistle (1981) that factor analysis of an 'Approaches to Studying' questionnaire, involving a very large number of University and Polytechnic students (N = 2208) across a range of contrasting departments, confirmed factors representing 'achieving orientation' and 'dilatoriness and disorganisation'. These results are clearly comparable with the factor structure of the DTQ, which is encouraging since the analysis of the latter, involving as it did only a relatively small number of cases (N = 52), could hardly be regarded as secure a basis from which to generalise as is the Ramsden and Entwistle study which relates to a student sample of the order of forty times as great!

Delay Tendency and General Anxiety

The 'delay tendency' factors which give an indication of the motive structure associated with study disposition include, in the form of the factor accounting for most of the variance, the implication of 'fear of failure' as a major feature (Factor I). For this reason the possibility of 'trait' or 'state' anxiety being a significant feature associated with student delay was considered.

It will be remembered that, very early in the research programme, the theoretical categories of DTQ responses was conceived to be:,

(a) High Summative Score resulting from a high score on virtually all individual item scores. These cases would be unequivocally of AP type.

(b) Low Summative Score resulting from a low score on virtually all individual items. These cases would be unequivocally of AV type.

(c) Intermediate Summative Score resulting from either of two possible kinds of individual item scores:-
  (i) All responses in the intermediate range
  (ii) Some responses high and and some low, giving an intermediate total.

With reference to category (cii) above, it seemed likely that the

highest scores on 'bimodality' or 'DTQ Extremism' would be found in this intermediate group. Since bimodality or extremism seemed to measure a certain degree of inconsistency in the DTQ response pattern it was thought conceivable that this variable might be associated with stress or anxiety, i.e, that anxiety and DTQ Extremism might covary.

So far as trait anxiety was concerned data for such an analysis was already available from an earlier study (Hill, 1976), where the anxiety measure was the 16 PF (Cattell, 1962) second-order factor which is widely accepted as an indicator of trait anxiety. The results of that work would be likely to give some indication of the probable relationship between trait anxiety and DTQ Extremism in the target population of the present research, since the two samples were very similar.

Three correlations are shown in Table 4.2. The table facilities comparison between Study Disposition (in terms either of DTQ Summative Score or DTQ Mean Response, which are equivalent for purposes of correlation), DTQ Extremism (conceived of as a form of bimodality) and Trait Anxiety. It can be seen that trait anxiety has a low negative correlation with the DTQ summative score, and a near-zero correlation with Extremism, whereas the correlation between the DTQ Mean Response and Extremism was of an altogether higher order.

Table 4.2:

Correlations Between DTQ Variables and Trait Anxiety (N = 106)

	Trait Anxiety	*DTQ Mean Response
* DTQ Summative Score	-.21 (p = .01)	
DTQ Extremism (Bimodality)	.06 (p = .28)	-.53 (p $\gg$ .01)

* DTQ Summative Score and DTQ Mean Response are interchangeable variables for purposes of comparison and correlation since DTQ Mean Response = DTQ Summative Score/45 (see text).

It was concluded that, on the basis of these results from data furnished by the earlier study, trait anxiety was not associated with bimodality measured as DTQ Extremism and only very slightly with Delay Tendency as measured by the DTQ Summative Score.

Thus on the basis of evidence from an earlier, very comparable, investigation trait anxiety was discounted in the present study, both as a significant feature in the experience of delay over study and as a controlling factor in behaviour. Under the latter heading it might have figured as a splitting factor in the bifurcation set of the cusp model (see Fig 3.1.). A further disconfirmation of expectation emerging from the results in Table 4.2. is that the correlation coefficient for the DTQ Mean Response and Extremism ($r = -.53$) in the earlier study again suggests that it is the relatively low-scoring, rather than intermediate, DTQ cases which tend to return high Extremism or bimodality in their DTQ responses. Hence, the relationship was reconceptualised and the low-DTQ (AV) type came to be conceived as relatively ambivalent over study. The analysis suggests that the AV type is, therefore, likely to suffer behavioural catastrophes in relation to study, and this tends to confirm observations of the delay-prone who do seem to evince sudden switching of behaviour from low to high Study Emphasis in advance of looming deadlines.

Work intended to investigate the actual self-reported behaviour patterns of students, as distinct from informal evidence through chance observation, forms the main feature of Chapter Five, but before presenting that aspect of the work an exploration of the possibility that situation-specific anxiety might be associated with delay and academic performance will now be reported.

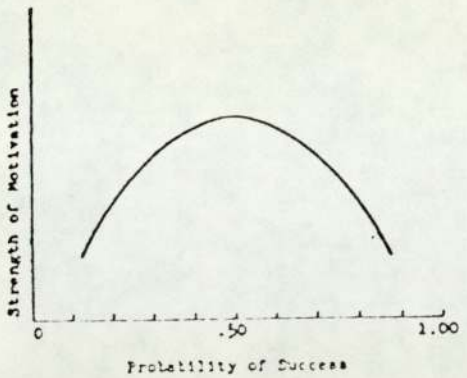
Delay Tendency, Specific Anxiety and Academic Performance

There is an ample literature concerned with the effect of stress or anxiety on perception and academic performance and reference has already been made in Chapter Two to some of those studies having a more

or less direct bearing on the present work, i.e, Yerkes and Dodson (1908), Tolman (1948), Runkel and Damrin (1961) and Mechanic (1962), and to those may now be added Atkinson (1957) and Alpert and Haber (1960).

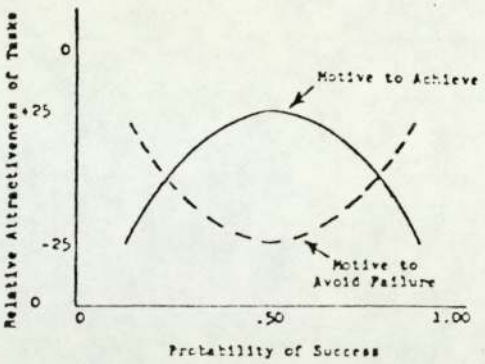
There is a distinct possibility that some students take a conscious risk in delaying serious engagement with study - perhaps in order to gain an additional motivational boost from the risk involved. In this it is suggested that they may rely on the anxiety engendered to thrust everything else from their minds at the eleventh hour in order to concentrate exclusively on work for the looming deadline. Yet anxiety is also recognised to have an opposite effect in that it may act as a deterrent to action. This dual effect of anxiety was explored in a paper by Atkinson (1957) which was designed to establish "... the motive to achieve and the motive to avoid failure influence behaviour in any situation where performance is evaluated against some standard of excellence." (p. 371). Atkinson refers to the tendency of anxious people to set very high or very low aspirations, a tendency which was recognised very much earlier by Lewin, Dembo, Festinger and Sears (1944). He drew attention to the significant point that when such behaviour is examined closely it emerges that the persons concerned are involved in a form of defence, and that either a very high or a very low aspiration level will accomplish this.

The theory of motivation proposed by Atkinson, when applied to competitive-achievement behaviour such as work for examinations, indicates that the strength of motive to achieve or to avoid failure is a curvilinear function of the probability of success (see Fig. 4.4.). The theory predicts that a predominant motive to 'achieve' will produce precisely the opposite effect in the setting of achievement levels from that of a predominant motive to 'avoid' (see Fig. 4.5.). Both hypotheses were supported in experimental work by Atkinson involving college students.



Strength of motivation to achieve or to avoid failure as a function of the subjective probability of success, i.e., the difficulty of the task.

Fig. 4.4. Strength of Motivation and Probability of Success. (From Atkinson, 1957).



Relative attractiveness of tasks which differ in subjective probability of success (i.e., in difficulty). The avoidance curve has been inverted to show that very difficult and very easy tasks arouse less fear of failure and hence are less unattractive than moderately difficult tasks.

Fig. 4.5. Relative Attractiveness of Tasks and Probability of Success. (From Atkinson, 1957).

Other workers have been concerned to establish the extent to which anxiety might be relied on to predict academic performance. Thus Alpert and Haber (1960) found that tests of anxiety tended to be unidimensional in relation to performance and were, in fact, typically concerned with the debilitating effect. They set out to construct a scale that would reveal the directional effect of anxiety in an intellectually relatively homogeneous population such as that represented by college students. They hypothesised, following the work of Mandler and Sarason (1952), that anxiety has, potentially, both a facilitating and debilitating effect upon performance and that an individual may be characterised by significant amounts of both forms of anxiety, or of one without the other, or of none of either. Their Achievement Anxiety Test (AAT) was constructed to investigate these hypotheses and the results confirmed their expectations in that "... a scale for the measurement of 'facilitating' anxiety ... added significantly to the prediction of grade-point average when it was combined with a measure of debilitating anxiety." (Alpert and Haber, 1960, p. 215).

Alpert and Haber argued that the relative merits of situation-specific versus general reference anxiety scales can be evaluated by inter-

correlating the scales. High correlation would indicate a single underlying state for which a general scale would be appropriate, while low inter-correlations would indicate the appropriateness of using scales which are specific to particular situations in which they might have predictive validity. Table 4.3, which reproduces the results of this enquiry, shows that correlations among general anxiety scales range from r = .32 to r = .39, while between general and specific scales the correlations range from r = .24 to r = .38. In contrast, among specific scales the correlations range from r = .40 to r = .64. Evidently the specific anxiety scales do exhibit a clear superiority over the general scales in this respect.

From Table 4.4. it can be seen that correlations between the two forms of the Achievement Anxiety Test and four performance measures range from r = .21 to r = .37, while the corresponding range of correlations between the general anxiety scales and the same four performance measures are, in general, much lower, ranging from r = -.22 to r = .15. Alpert and Haber are clear that specific anxiety scales and general anxiety scales measure different qualities in subjects, while from the aspect of their work summarised in Table 4.4. they draw the inference that, whatever the variables measured exclusively by the specific scales, the latter are shown to be superior to general scales in predicting academic performance.

In the light of the work already cited in connection with anxiety, or stress and study-delay, it may be considered that the term 'approach' may be a misnomer for the form of overall study motivation actually experienced by students of AP adjustive disposition. It may be that, following the suggestion of Brown (1966), it is revealing to 'invert' problems of this kind and ask, not what a student is seeking, but what he is avoiding. It might be pertinent to consider whether a student is striving to achieve, as he is involved in his particular behaviour pattern, or afraid of not achieving. Brown writes:

Table 4.3.

(After Alpert and Haber, 1960)
Intercorrelations Among Six Measures of Anxiety

Test	REL	AI	AS	TAS	AAT-	AAT+
General Anxiety Scales						
MAS	.89	.39	.32	.32	.38	-.33
AI	.84		.34	.28	.37	-.25
AS	.73			.38	.30	-.24
Specific Anxiety Scales						
TAS	.82				.64	-.40
AAT-	.87					-.48
AAT+	.83					

Abbreviations used in the Table:

MAS	The Manifest Anxiety Scale (Taylor, 1953)
AI	The Anxiety Index (Welsh, 1952)
AS	The Freeman Anxiety Scale (Freeman, 1953)
TAS	The Test Anxiety Scale (Mandler and Sarason, 1952)
AAT-, AAT+	The debilitating and facilitating subscales of the Achievement Anxiety Test (Alpert and Haber, 1960)
REL	The reliabilities of the tests.

Table 4.4.

(After Alpert and Haber 1960)
Correlations between Six Anxiety Scales and Four Measures of Academic Performance.

Test	Grade Point Average	Course Grade Psych 1	Final Exam Grade Psych 1	Midterm Exam Grade Psych 1
General Anxiety Scales				
MAS	.01	-.08	-.02	-.19
AI	-.04	-.05	-.03	-.22
AS	-.06	.14	.15	-
Specific Anxiety Scales				
TAS	-.24	-.21	-.16	-.32
AAT-	-.35	-.26	-.28	-.25
AAT+	.37	.23	.26	.21

Abbreviations are as given in Table 4.3

> As a tentative solution to this problem it is proposed that the significant motivational component underlying many of the supposed acquired drives for particular goal objects may be a learned tendency to be anxious (discontented, insecure) in the absence of those objects .... This learned uneasiness would function to energise whatever behaviour is directed towards the securing of affection, prestige or money: and its reduction, subsequent to the achieving of these goals, would be reinforcing. (Brown, 1966. pp. 141-142).

This explanation certainly accommodates the expressed fears and anxieties of AP students in the pilot study, and would account for the inferred drive underlying the 'agitated' and work-obsessive nature of the AP study behaviour pattern. That is to say, the AP student may, in effect, be avoiding, so far as is possible, achievement of a lower order than his level of aspiration has determined to be minimally acceptable, and this is associated with fear as an acquired drive. No such drive would motivate the AV student to any significant extent.

In view of the apparent suitability of the AAT for relating situation-specific anxiety to performance, the test was administered to the Third Year student sample (N = 52) forming the target of the present research at the same time as the DTQ. The results were later correlated with the two performance elements forming the basis of the assessment for a final degree module. These two elements were course work and the written examination, and the results of the correlation are given in Table 4.5.

The correlations are very low, tending to zero, and are in quite sharp contrast with the results of the Alpert and Haber set out in Table 4.4. This indicates that in the context of the present research the AAT, though quite specific in its reference, is of little value in predicting academic performance, and the inference must be that, although during the pilot study a number of students admitted experiencing stress and anxiety over the course, they were probably able to defend against the admission of achievement-related anxiety under AAT test conditions, thus confounding the possibility of a valid measure. Further analysis, in fact, suggested that the behaviour

pattern associated with the DTQ may be a better predictor of stress and anxiety than the explicit anxiety scale! Indeed the DTQ-implied pattern of adjustment may well be inherently related to the stress and anxiety characteristics of academic subjects.

The possibility that the DTQ Summative Score is a better predictor of academic performance than the AAT was tested by correlating the former with the two components of final degree assessment already referred to above and in Table 4.5, and the results are given in Table 4.6. It will be observed that these correlations are much higher than those obtaining between the AAT and performance scores in the present work, and are, in fact, rather higher than the correlations between the AAT and performance reported by Alpert and Haber and set out in Table 4.4. There seems, therefore, good reason for inferring that in the present context, the DTQ fulfils the same predictive function as the AAT in the work of Alpert and Haber.

To judge by the empirical evidence just cited the AAT was inappropriate for the purposes of the present research despite the terms of its declared validity in the original work by Alpert and Haber (1960). For this reason no attempt was made to correlate the results of the test with the DTQ indicator of bimodality, i.e, 'extremism'. Hence a direct test of the hypothesis that there is a positive association between degree of bimodality and anxiety (see end of Chapter Three p.78) was not possible. The only definite indication of the subjective experience of ambivalence suggested by relatively high bimodality, i.e, the experience of being within the area determined by the bifurcation set, or cusp area of the control space of the catastrophe model (see Fig. 3.6.), was that gained during the pilot study.

However, the empirical finding that relatively high bimodality tends to be a feature of AV-e, as well as of intermediate ('m'-type), students, taken together with the pilot investigation, which suggested no evidence of stress in the form of study-related anxiety among these subjects, does

Table 4.5.

Correlations between the Achievement Anxiety Scale and the Two Components of Final Degree Assessment in a Compulsory Course (N = 52)

Test	Course Work Grade	Examination Grade
AAT-	-.05	-.07
AAT+	-.08	-.04

Table 4.6.

Correlations between the DTQ Summative Score and the Two Components of Final Degree Assessment in a Compulsory Course (N = 52)

Test	Course Work Grade	Examination Grade
Delay Tendency Questionnaire (DTQ)	.28	.32

p = .05 in both cases

suggest that specific anxiety is probably not a significant dimension of delay for most students. For the AP-e group, who displayed strong signs of anxiety in the pilot study, the actual study-related behaviour pattern set out in the earlier typology (see Chapter One) may also be a better indicator of study stress than measured anxiety.

A detailed exploration of these study-related behaviour patterns forms the substance of Chapter Five but before ending this enquiry into the dimensions of delay in catastrophe terms the hypothesis derived from the model and set out at the end of Chapter Three (p.78) relating to the bifurcation of the 'delay' dimension by the dimension of 'locus of control' will first be explored.

Locus of Control as a Splitting Factor

One of the hypotheses derived from the operational forms of the cusp model which were set out at the end of Chapter Three was that internal LC (locus of control) students, i.e, those tending to independence and self-determination, would be more widely distributed in their tendency to delay over study than external LC students, i.e, those tending to conform to the perceived requirements of the evaluating system. In effect, this hypothesis suggests the operation of a splitting factor. The nature of a possible splitting factor in the target population of the present research was the cause of considerable speculation (see Hill and Small, 1977) and a number of potential motivational dimensions were considered. However, as indicated at the end of Chapter Three, attention was finally directed to locus of control since there was evidence which bore obliquely on the validity of such a factor. For example, Flay (1978) suggests 'social pressure' as a splitting factor in the cusp model but the problem confronting am empirical researcher was to cast this concept into appropriate operational form. However, if it could be argued that those most susceptible to the influence of social pressure are subject to external locus of control and those least susceptible are under internal control then a research hypothesis might be formulated.

First, however, a suitable measure of locus of control was required.

For this purpose a scale was constructed which was based on the work of Teevan and Fischer (1966). In this the significant five items were interspersed with six neutral items (which are not scored) to give a summative measure. This instrument was entitled 'Success-Failure Criteria' and it was administered at the same time as the Delay Tendency Questionnaire. (A specimen copy of the instrument with scoring key is given in Appendix II).

For purposes of analysis the scores were subdivided into two sub-samples:

(a) A subsample characterised by internal LC (relatively high scorers on the instrument) (N = 26).

(b) A subsample characterised by external LC (relatively low scorers) (N = 26).

Note: 'Relatively high' and 'relatively low' scores here indicate above and below the LC mean score respectively. Since the number of students in the subsamples was small it was clear that caution must be exercised in attributing significance to the results of the analysis. It was intended to be an indicator only of the possible operation of a splitting factor.

Results

The results of the analysis are set out in Table 4.7. and Appendix V. It can be seen that while the analysis in no way conclusively substantiates the hypothesis referring to locus of control given at the end of Chapter Three the results are certainly interesting. The external LC group did tend to cluster rather more closely around the overall DTQ summative score mean, while the internal LC group were more widely dispersed in this respect. Hence there are grounds for supposing that, in the population studied, locus of control tended to operate as a splitting factor, and, as Flay (1978) suggests, 'social pressure' may indeed be significant in bifurcating the population and thereby inducing catastrophic transitions in behaviour.

TABLE 4.7.

A Comparison between the Distribution of DTQ Summative Scores about the Overall DTQ Mean for Students of Relatively High and Relatively Low Locus of Control.

INTERNAL LC SUBGROUP			EXTERNAL LC SUBGROUP		
DTQ CLASS INTERVAL	FREQUENCY	GROUP MEAN	DTQ CLASS INTERVAL	FREQUENCY	GROUP MEAN
190	3		190	1	
181 - 190	1		181 - 190	0	
171 - 180	1	187.25	171 - 180	3	167.42
161 - 170	6		161 - 170	4	
151 - 160	2	OVERALL MEAN	151 - 160	4	OVERALL MEAN
141 - 150	3		141 - 150	3	
131 - 140	4		131 - 140	4	
121 - 130	2	136.36	121 - 130	5	137.07
111 - 120	2		111 - 120	2	
101 - 110	0		101 - 110	0	
100	2		100	0	
INTERNAL LC SUBGROUP DTQ VARIANCE = 767.00			EXTERNAL LC SUBGROUP DTQ VARIANCE = 433.08		
DTQ OVERALL MEAN = 149.02					

Summary of Chapter Four

1. Details were given of the design of a survey instrument, the Delay Tendency Questionnaire (DTQ), specifically intended to provide an index of a student's tendency to delay over study. This instrument was used initially to provide a 'delay' profile for the average student in terms of self-reported characteristics.
2. A form of analysis of the DTQ data measuring extremism of response was used as an operational indicator of bimodality, i.e, ambivalence over study, in the students' scores. Contrary to hypothesis, pronounced bimodality was found to be quite typical of AV, and not merely intermediate (i.e, AP-m and AV-m), students. This indication of the influence of both 'approach' and 'avoidance' tendencies was inferred to be associated with the sudden and high-order transitions in study behaviour characteristic of such students immediately before and after deadlines.
3. The factor structure of the DTQ data was determined in order to give a strong indication of the major underlying study-related motives in terms of 'approach' and 'avoidance' characteristics. The factor accounting for nearly fifty per cent of the total variance was found to be strongly reminiscent of 'fear of failure'. In general, however, the factors suggested a non-unitary structure for the corresponding motives.
4. Evidence gained from the pilot investigation suggested that some students experienced stress over their studies. In view of the bimodal nature of the control factors associated with the bifurcation set forming a feature of the cusp model it was hypothesised that there would be a positive correlation between bimodality and anxiety. Yet evidence from an earlier, comparable, study suggested that general, or trait, anxiety is not significant in this context, so attention was directed

to specific anxiety as a more likely dimension of delay.

5. A consideration of the Achievement Anxiety Test (AAT) suggested its suitability for measuring specific anxiety both in relation to delay and as a predictor of academic performance. Its use in an empirical survey, however, indicated that it was not completely satisfactory for these purposes in the present context and that the DTQ is a superior instrument for the predictive function. Other available evidence, however, indicated that specific anxiety is probably not significant as a typical dimension of students' delay behaviour. The pattern of study-related behaviour itself is likely to be a better indicator of stress.

6. The chapter concluded with an evaluation of the hypothesis that locus of control is a factor bifurcating the 'delay-tendency', i.e, hysteresis, dimension of the catastrophe model, and some evidence which was congruent with earlier theorising (e.g, Flay, 1978) was found to substantiate this.

CHAPTER FIVE

PATTERNS OF ADJUSTMENT TO STUDY

Introduction

Detailed examination of actual study-related behaviour was required in order to confirm interview and questionnaire data relating to delay tendencies and catastrophic switching from low to high levels of study and vice versa as patterns of adjustment. The behaviour patterns of interest here were those given by variations in the extent to which students emphasised or de-emphasised study over the period of the survey. For this investigation simply the degree of study emphasis (SE) was required, and this was conceived as compounded of intensive properties, such as concentration and depth or quality of involvement during the unit period, and extensive properties, such as the actual time spent on various aspects of achievement-related work. Details of the actual activities in terms of, say, reading, note-taking, or writing final drafts and copies, were not required.

Until this point in the research reference has been made to relatively superficial appearances and hearsay concerning the different patterns of study-related behaviour, and the need was felt to provide some form of guarantee that:-

(a) appearances did not deceive and the different patterns of adjustment could be detected

(b) the patterns revealed suggested catastrophic change or discontinuity between different levels of SE for at least some members of the sample

Personal observation of a representative sample of students over a period of time by the investigator was clearly not possible and for this reason a 'tracking' exercise was mounted in which a group of volunteer subjects, who underwent familiarisation training in the technique, kept a personal diary of their own 'study emphasis' over

the six weeks leading up to final examinations. Because of the demands and constraints of this task only twelve students completed the task and, more by chance than choice, the sample included clear AP, AV and Intermediate students. The appropriate collection of data sheets covering the six-week period for any one student is here referred to as the Study Emphasis (SE) Tracking Diary.

Agreement to participate in the SE Tracking Diary exercise involved the student in making a daily entry, preferably recorded at the end of the day in question, but in any case as soon as possible thereafter, which combined the intensive and extensive properties of study already referred to in a single numerical score. Evidently the responses would be quite subjective and would inevitably involve approximation. Indeed it was simply students' own impressions of the qualities in the concept of 'study emphasis' that was required as the basis of the responses. The essential feature was a fairly accurate, albeit subjective, comparison between one day and another for any one student because it was on this comparative feature of the daily responses that the establishment of a study-related adjustment pattern depended. And it was, of course, the differences in this pattern between different students that was of primary interest for this part of the research.

The Study Emphasis Tracking Diary

The actual form of the diary was determined by a small but stringent set of requirements:

(a) Easy entry of any day's record.

(b) Ready comparison of any one day's entry with those immediately preceding and following in order to ensure self-consistency in the record.

(c) The possibility of submitting the record to the researcher in appropriate instalments at reasonable intervals of time in order to avoid undue loss of time for the student and yet to ensure that the period for which a submission was required did not become unduly long.

(d) Confidentiality. This was essential both in order to preserve the agreed privacy of individuals participating and also to avoid mutual interference between respondents.

(e) The requirements of the diary must not be so complex as to require frequent discussion between subjects and researcher, which might possibly necessitate 'interpretation' by the latter which could have risked distortion of the emerging pattern.

A specimen copy of the SE Diary sheet is given in Appendix II. It can be seen that the instrument is very simple in layout and so point (a) is readily met. The sheet takes the form of a grid in which a daily entry was made, commencing on a day specified at the head of the sheet so that any particular point or sequence in the record can be located exactly. Each sheet starts on Monday and is completed at the seventh daily entry on the following Sunday. Thus requirements (b) and (c) are met quite reasonably. Point (d) is guaranteed by the purely personal form of the record. In fact, once the fortnight trial period in advance of the survey proper had been completed there were no complaints or difficulties reported by the participating students concerning points (a) to (d) inclusive. Point (e), however, was in a sense attempting to legislate for the unknown. It was, naturally, left to individual students to decide whether or not to consult the researcher on any point requiring clarification in order to maintain the integrity of the record, but in connection with point (e) a most enlightening, not to say surprising, piece of evidence emerged from one member of the sample (Case No. 5). This student felt compelled to consult the researcher in order to explain a very singular fact. She was almost embarrassed to have to explain right at the commencement of the survey that she had already completed every item of assessable work required for the course being 'tracked' and, therefore, any work appearing as SE in the record would be concerned purely and simply with revision for the examination six weeks later!

The record completed by each student was plotted to give a graph

of the SE Time Series, which, therefore, represented self-reported actual study patterns. In addition to a visual analysis of each pattern and the comparison between the different patterns which constituted the main point of interest in the diary results, a numerical form of analysis of each of the individual patterns was carried out in order to gain some impression of the balance of apportionment of students' SE over the total period of the survey. The major yield from this latter analysis is an indication of the 'SE deficit' in each student's work pattern, and this will be explained later.

Visual Analysis of the SE Time Series

Figs. 5.1(i) to 5.1(xii) inclusive show the plotted time series of daily SE for the sample over the six-week period of the survey. In order to preclude the risk of over-impressionistic interpretation of the plotted SE time series the scores are given in Table 5.1. for each case in the sample, for DTQ sum score, DTQ mean response score, and DTQ extremism score. The mean scores for all these variables are also given. The function of this aspect of the research was to furnish for each student in the sample an overall study-related behaviour pattern under virtually identical conditions, so far as the expectations of the evaluating system were concerned.

The following is a case-by-case interpretation of the SE time series patterns:-

Case 01 INTERMEDIATE TYPE
Mixed high-frequency and low-frequency oscillation, superimposed in part.
Mixed high- and low-order catastrophic adjustment.
Some 'breaks' occur in the pattern where SE is zero.

Case 02 AV TYPE (a fairly extreme example)
Low-frequency oscillation predominantly.
Mainly high-order catastrophic adjustment.
A significant 'break' occurs in the pattern where SE is zero.

Figs. 5.1 (i) to 5.1 (xii)

Time Series of Estimated Study Emphasis During the Six-Week Period Leading to a Final Examination for 12 Cases.

Key E: indicates a final examination day

Fig. 5.1 (i) CASE No. 01.

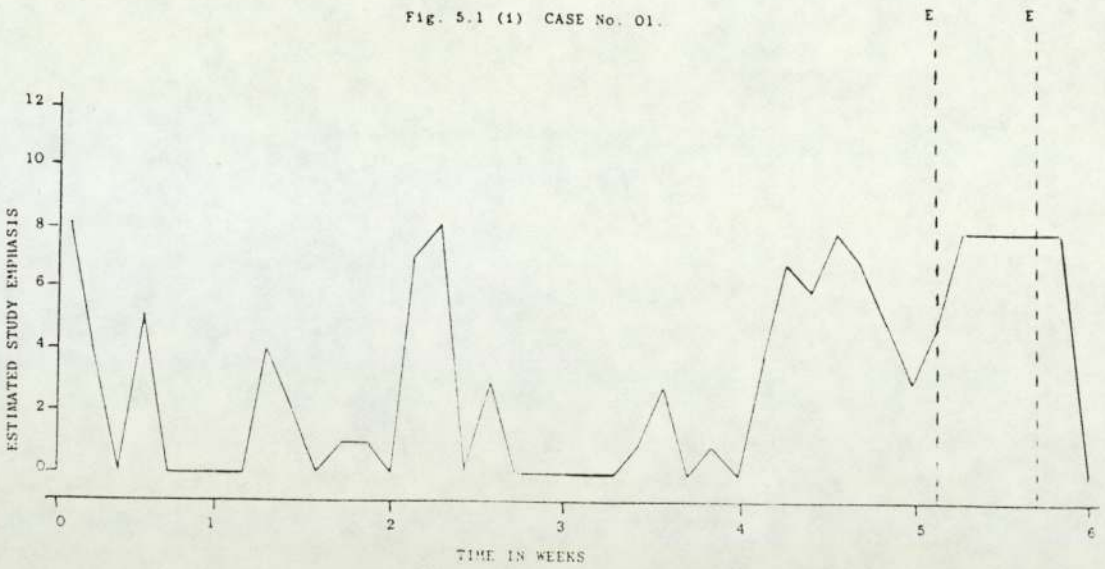


Fig. 5.1 (ii) CASE No. 02

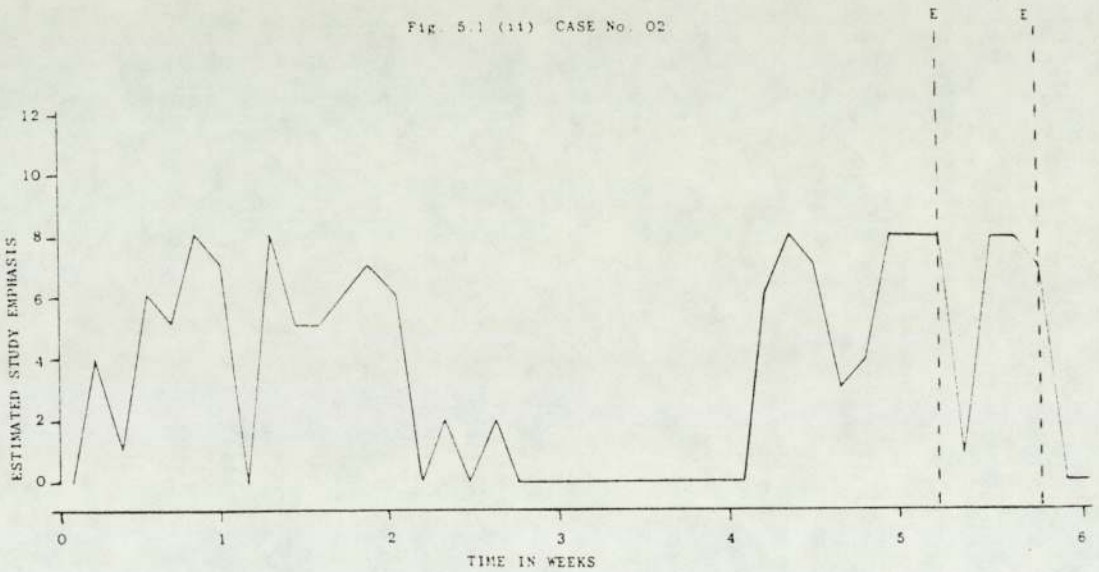


Fig. 5.1 (iii) CASE No. 03.

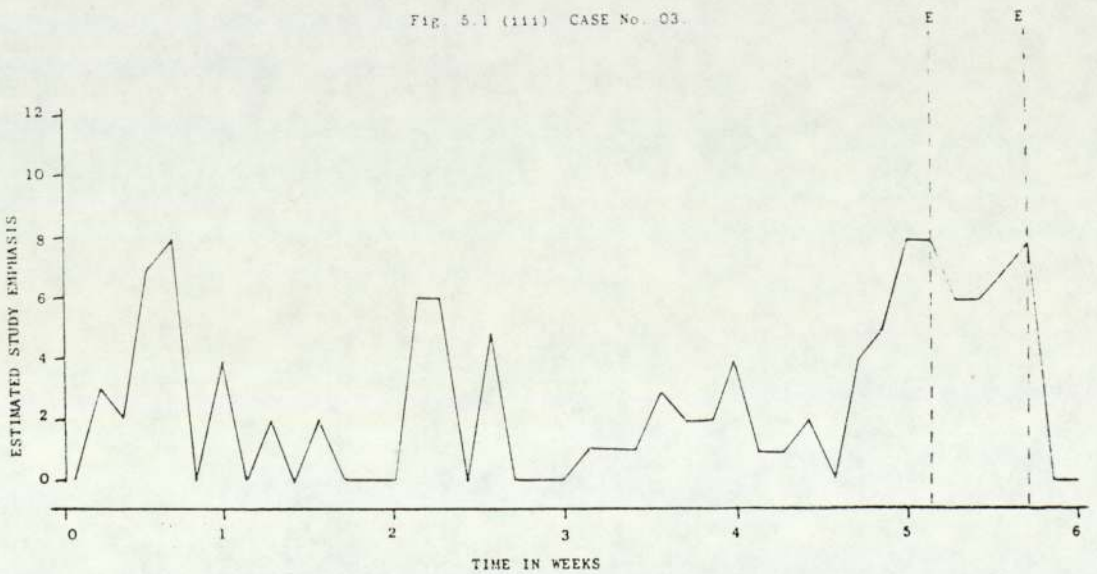


Fig. 5.1 (iv) CASE No. 04.

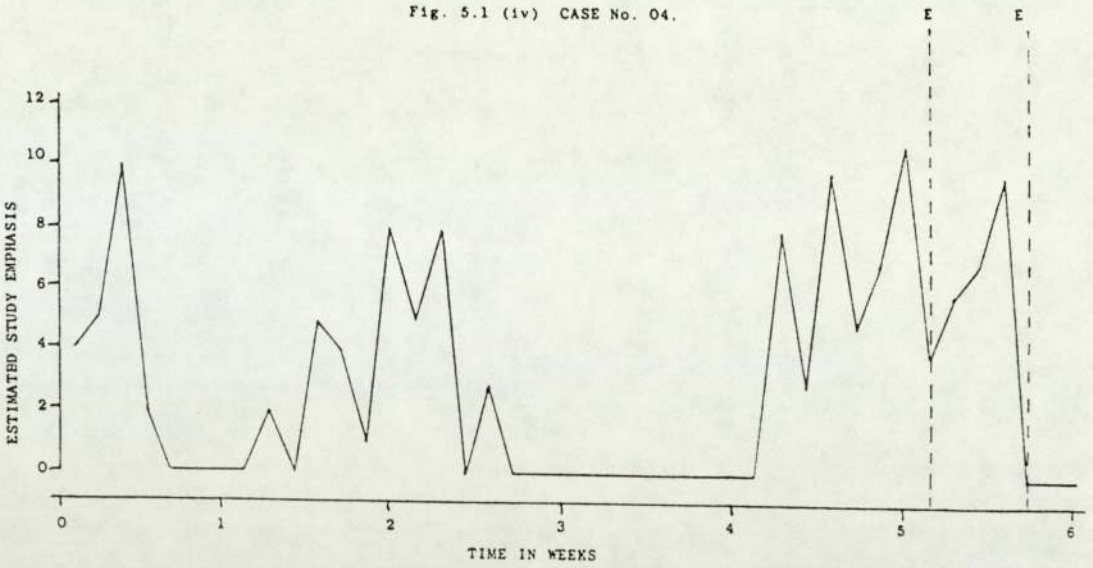


Fig. 5.1 (v) CASE No. 05.

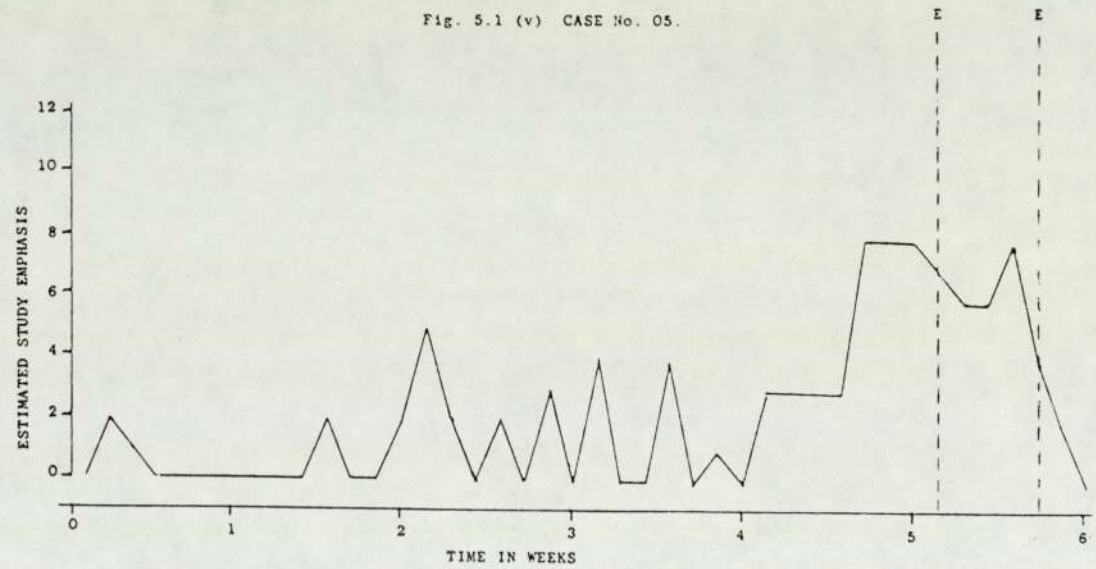


Fig. 5.1 (vi) CASE No. 06.

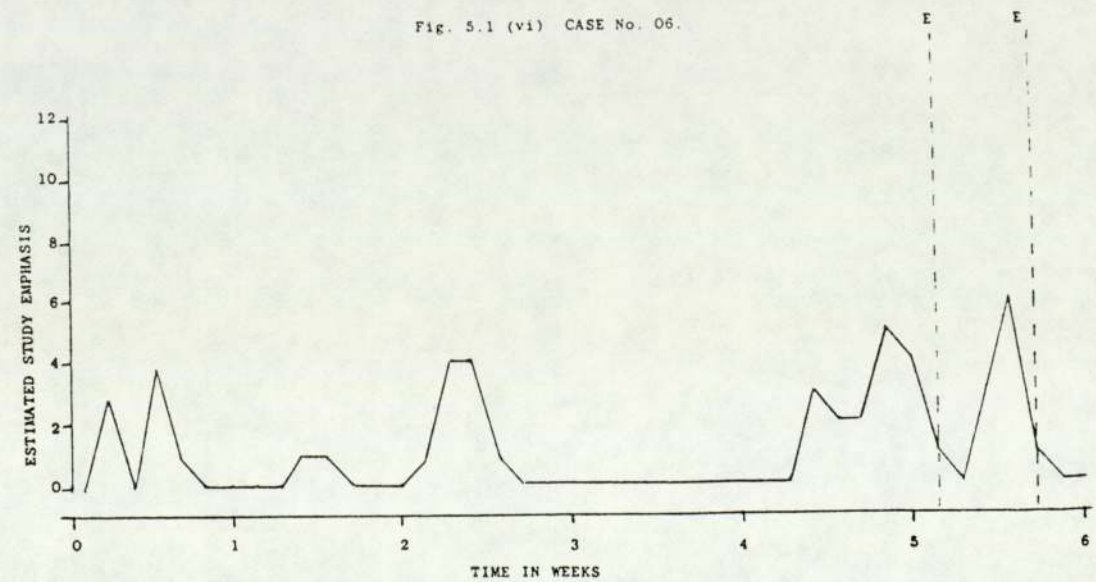


Fig. 5.1 (vii) CASE No. 07.

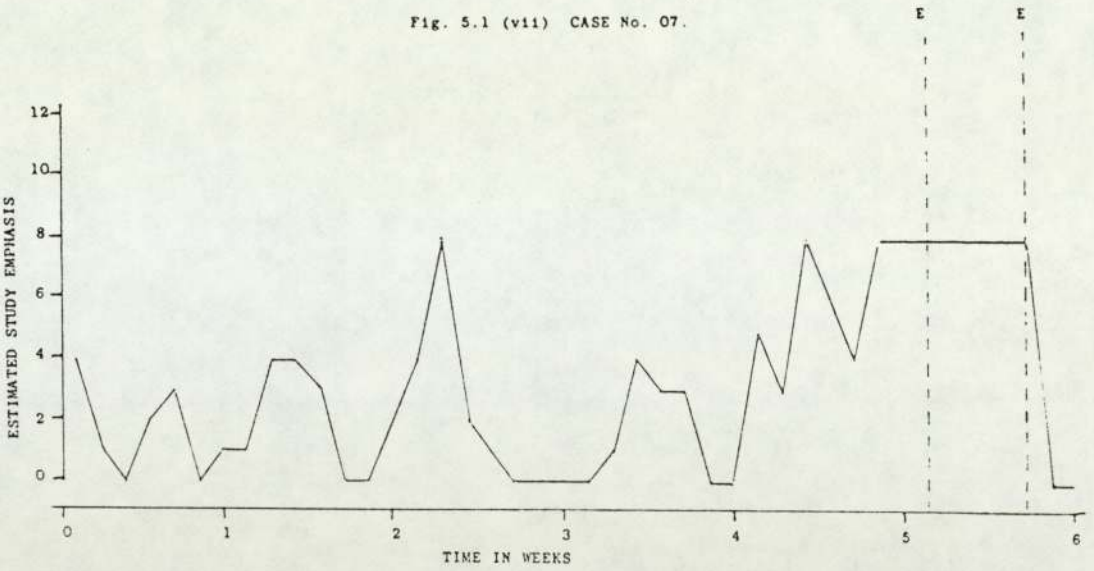


Fig. 5.1 (viii) CASE No. 08.

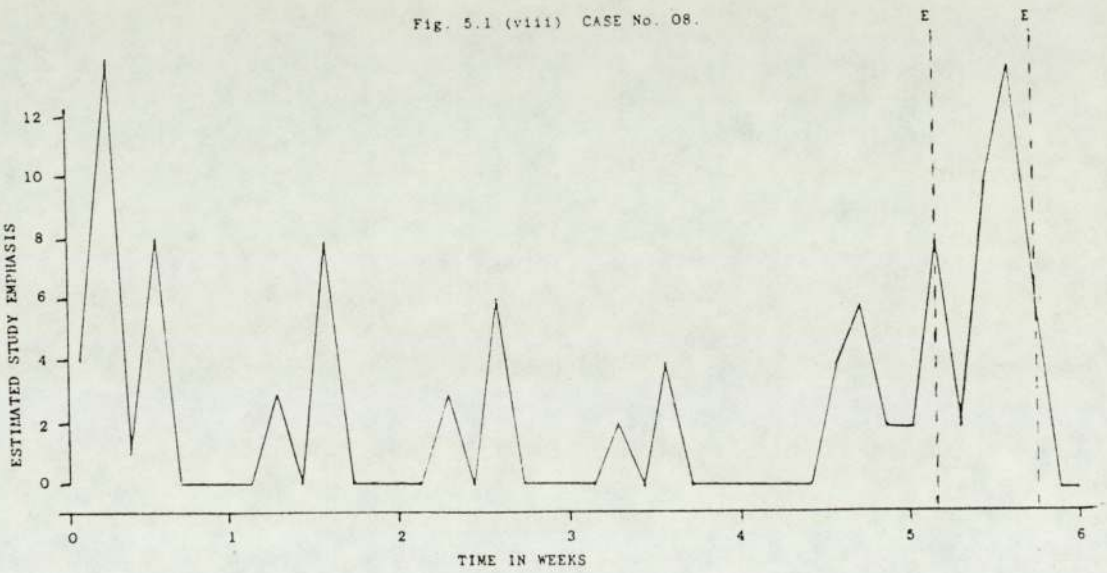


Fig. 5.1 (ix) CASE No. 09.

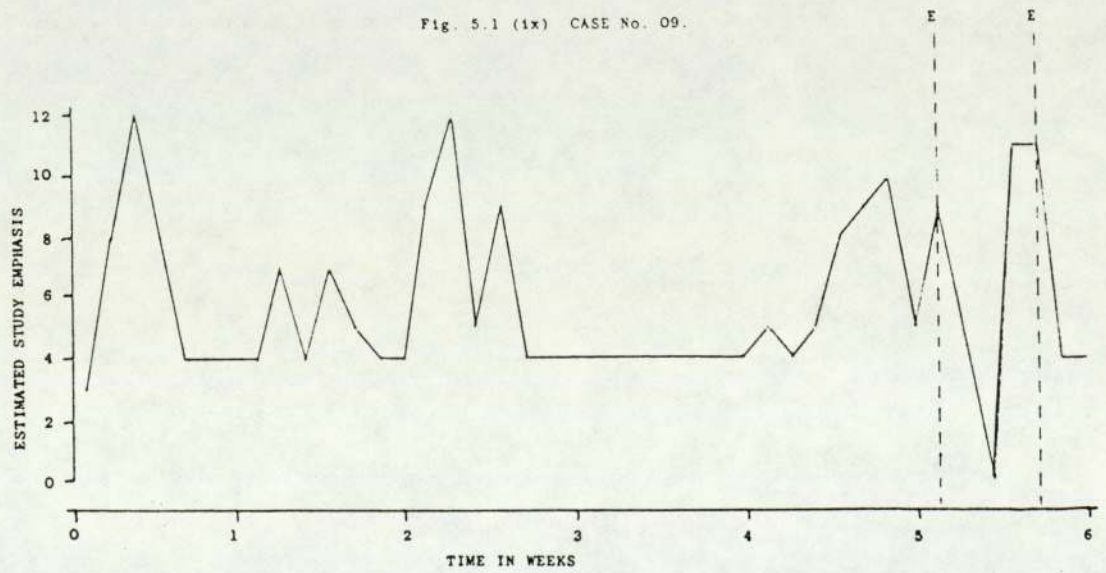


Fig. 5.1 (x) CASE No. 10.

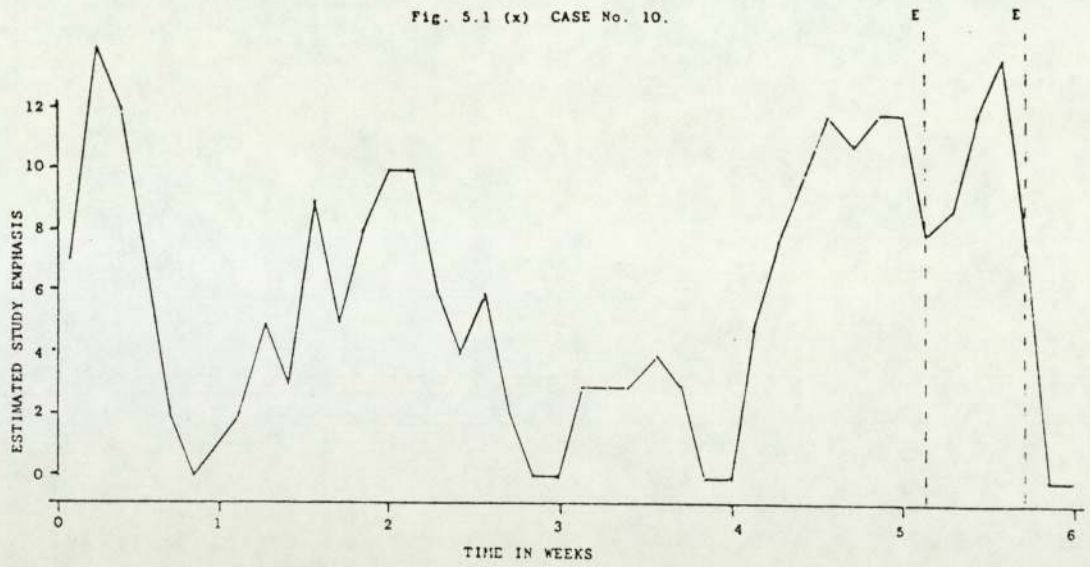


Fig. 5.1 (xi) CASE No. 11.

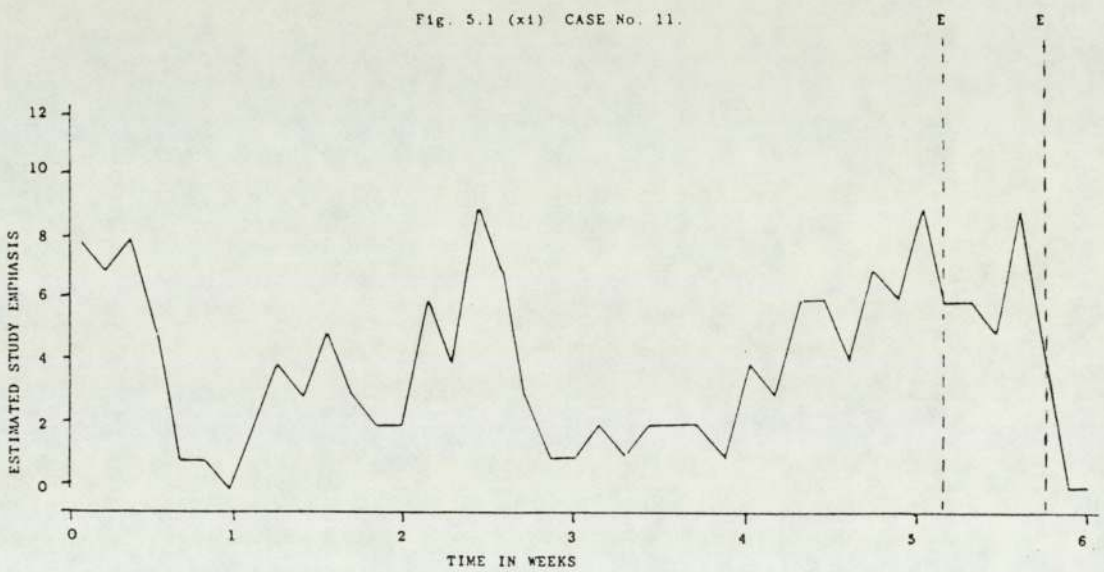


Fig. 5.1 (xii) CASE No. 12.

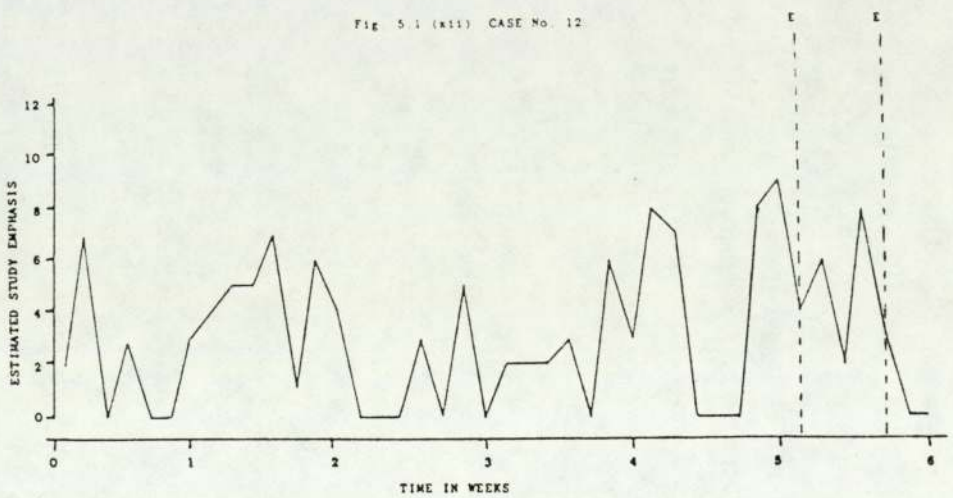


Table 5.1.

Delay Tendency Data for Students completing The SE Diary (N = 12)

Case No.	DTQ Sum (M=148.49)	DTQ Mean Response (M = 3.30)	DTQ Extremism (M = 1.07)
01	157	3.49	1.10
02	115	2.56	1.48
03	193	4.29	0.76
04	153	3.40	1.12
05	191	4.24	0.67
06	144	3.20	1.21
07	155	3.44	0.86
08	128	2.84	1.03
09	164	3.64	1.02
10	164	3.64	1.14
11	148	3.29	0.92
12	195	4.33	0.77

The mean (M) score is given for each variable

Case 03 AP TYPE
Mainly high-frequency oscillation.
Low-order catastrophe appears to be the norm.
Any breaks in the pattern where SE is zero are very short.

Case 04 INTERMEDIATE TYPE
Mixed high-frequency and low-frequency oscillation, superimposed in part.
Mixed high- and low-order catastrophic adjustment.
A significant break occurs in the pattern where SE is zero.

Case 05 AP TYPE (extreme form)
Mainly high-frequency oscillation.
Mainly low-order catastrophic adjustment.
NB The one break when SE is zero was felt to be admissible by this student since she had completed all her course-work assignments before the SE Diary 'tracking' began. The pattern shown refers exclusively to examination revision.

Case 06 INTERMEDIATE TYPE
Mixed high-frequency and low-frequency oscillation.
Relatively low-order catastrophic adjustment.
Significant breaks in the pattern where SE is zero.

Case 07 INTERMEDIATE TYPE
Mixed high-frequency and low-frequency oscillation, with some superimposition.
Mixed high-order and low-order catastrophic adjustment.
Some breaks occur in the pattern where SE is zero.

Case 08 INTERMEDIATE / AV TYPE
Mainly high-frequency oscillation.
Mixed low-order and very high-order catastrophic adjustment.
Frequent breaks occur in the pattern where SE is zero.

Case 09 INTERMEDIATE / AP TYPE
NB This case exhibits an aberrant feature in the SE trace, viz a 'false zero' at SE level 4. The student's subsequent explanation of this mode of recording was that she felt bound to distinguish between a 'normal' low-to-zero SE, which she recorded at scale point 4, and the complete setting-aside of work in any shape or form. This latter 'true zero' she considered to be very rare, and represented a complete clearing of the mind of any study-related matters. It is, perhaps, significant that the '0' score was returned immediately following the first of the two final examination papers included in the period covered by the SE Diary. It seemed best to regard the 'false zero'of scale point 4 as the true zero and to use 4 rather than 0, therefore as the datum in this case. If this is accepted the SE pattern is then quite consistent with the DTQ sum score indicating intermediate / AP type. The visual analysis of the trace would then be:-
Mainly high-frequency oscillation.
Mixed high-order and low-order catastrophic adjustment.
Significant breaks in the SE pattern where SE is zero.

Case 10 INTERMEDIATE / AP TYPE
Mixed high-frequency and low-frequency oscillation, entirely superimposed.
Mixed high- and low-order catastrophic adjustment.
No significant breaks in the pattern indicating zero SE.

Case 11 INTERMEDIATE TYPE
Mixed high-frequency amd low-frequency oscillation, almost entirely superimposed.
Mixed high- and low-order catastrophic adjustment.
No significant breaks in the pattern indicating zero SE.

Case 12 AP TYPE (extreme form)
Mainly high-frequency oscillation.
Mixed high- and low-order catastrophic adjustment.
A few short breaks in the pattern indicating zero SE.

Clearly the behaviour of a relatively small opportunity sample such as that participating in the SE Diary tracking investigation may not be truly representative of the study-related behaviour of the total population (N = 68) of Third Year students during the six week period immediately preceding a final examination, and no firm generalisation can be attempted. There were, however, some indications of regularities in the self-reported behaviour as between students differentially referred to AP or AV typing respectively by means of the DTQ sum score. Tentatively, these regularities, which seemed to be characteristic of students in the different broad categories, were as follows:-

AP-TYPE Predominantly high-frequency oscillation between relatively low and relatively high SE and vice versa.
Predominantly low-order catastrophes in adjustment between different levels of SE.
Few, if any, breaks in the pattern where SE is zero.

AV TYPE Predominantly low-frequency oscillation between relatively low and relatively high SE and vice versa, OR some superimposition of a high frequency upon a lower frequency change in the level of SE.
Predominantly high-order catastrophes in adjustment between different levels of SE.
Significant breaks in the pattern where SE is zero tend to be characteristic of this type of adjustment.

INTERMEDIATE TYPE Characteristic tendency of high-frequency, short-period oscillations to be superimposed on low-frequency oscillations with a much longer period.
Catastrophic adjustment is of both low and high order.
There seems to be no consistent tendency so far as the occurrence of breaks in the pattern is concerned which would indicate zero SE.

Attempting an integration of the properties revealed in these glimpses of preferred behavioural patterns in order to suggest what may be thought of as different study 'personalities' is a difficult and risky procedure, but in the absence of further evidence some attempt to 'go beyond the information given' is perhaps admissible, and is possibly the only route to further insight open to us (Bruner, 1973).

Most interesting, perhaps, is the evidence that smooth or non-discontinuous adjustment, in the sense implied at the outset of the research, simply does not occur! Of course, it may be that the unit period of analysis, i.e, the 'day', was an inappropriate unit to detect such a phenomenon, and that within this unit smooth adjustment did occur. But this is within the realm of pure speculation: no hard empirical evidence of any form was forthcoming throughout the enquiry to substantiate it. The actual evidence suggests that AP students' typical pattern of adjustment fluctuated rapidly from a relatively low to a relatively high level of SE and that this was achieved with a less dramatic series of transitions between levels than in the case of AV students. It seems that the former students very rarely allowed a lengthy period of non-study activity to occur - the exceptions being when every assignment within a given period had been completed, or when a student essentially needed to escape some of the stress inherent within study situations for this 'type' by taking some free time before a deadline while ensuring that an adequate period of preparation time remained. This appeared to be an escape or defence mechanism (Mechanic, 1962) and its function appeared to be to shorten the period of time in which essential but stressful coping strategies must be employed.

The AV pattern revealed contrasting characteristics - notably the lower-frequency oscillation and longer period of stability in

relatively high or low SE, the latter predominating. There were also transitions which were high-order catastrophes imposed upon the slower-changing and less dramatically represented 'groundswell' of SE change over time, and the breaks in the pattern where SE was allowed to reduce to zero were fairly common, even when assignment deadlines were in the offing and when a pattern of final examinations was beginning to loom. The pattern seemed altogether less immediately responsive to what might be considered to be 'perceived demand' by the evaluating system: altogether a more 'relaxed' and less obviously achievement-related pattern.

For all students in the sample, however, there was a clear transition to high SE just before the examination. No matter what had characterised the pattern previously, from that critical point, and during the period of the examinations, the sample became behaviourally homogeneous to all intents and purposes. This critical point appeared to correspond clearly to t_2 in Fig. 3.2 and seemed to indicate the operation of Maxwell's Rule, whereas for AV-type students at least, the earlier pattern was hypothesised to manifest the influence of the Delay Rule.

Numerical Analysis of the SE Time Series

The SE Diary yields a profile for each student's degree of study engagement over the six week period leading up to a final examination. In addition to the visual analysis of the profiles reported above the numerical form of the record also facilitates a numerical analysis designed to furnish a measure of the relationship of a student's actual SE at any point in the series to their total SE score. This affords a measure of the extent to which students are involved in SE 'deficit'. This deficit index can be either positive or negative and it is clearly related to delay/delay avoidance in study-related activity.

The analysis was carried out by translating the SE Diary scores for each student into a 7 by 6 SE Raw Data Matrix, and this is numbered 'Matrix One' in the example given in Table 5.2. The SE total from Matrix One was then divided by 42, i.e, the number of days over which the survey was carried out, in order to obtain the daily score for a hypothetical student having the same total SE, but whose daily SE had been absolutely uniform over the period of the survey. This latter figure was then used to calculate the elements of the Cumulative Percentage Steady Study (SS) Matrix, numbered Matrix Two in the tables following. Matrix Three, The SE Percentage Matrix, was derived by transforming the raw data of Matrix One into percentage terms. Matrix Four, the Cumulative Percentage SE Matrix, was derived from Matrix Three by calculating cumulative percentages from the daily scores. Finally, Matrix Four was subtracted from Matrix Two to give the Percentage Study Deficit Matrix, numbered Matrix Five.

Matrix Five in each series is particularly interesting in that it shows the deficit with respect to the 'steady study' (SS) situation at any one time. Thus, it clearly identifies the point of maximum positive or negative deficit and shows whether, over any particular period of time, amount of investment in SE is in advance or in arrears with respect to the SS state. In attempting an interpretation of Matrix Five it is, of course, important to bear in mind that 'positive deficit' indicates a situation which would be 'in arrears' with respect to hypothetical SS, whereas 'negative deficit' indicates a state of being 'in advance' of the hypothetical SS investment in SE.

Apparently the expectation of most evaluating systems at tertiary level, bearing in mind the organisation of the courses according to a regular and frequent pattern of lectures and seminars, is that of 'steady study'. This expectation appears to form a datum to which a student's apparent degree of application is referred when tutors make

Table 5.2.

Numerical Analysis of SE Diary for Case 01 (Given as an example of the calculation of 'Percentage Study Deficit').

Matrix One: Raw SE Data

Week	Mon	Tue	Wed	Thur	Fri	Sat	Sun	
1	8	4	0	5	0	0	0	
2	0	4	2	0	3	3	0	Overall
3	7	8	0	3	0	0	0	Total
4	0	0	1	3	0	1	0	137 SE
5	4	7	6	8	7	5	3	Units
6	5	8	8	8	8	8	0	

Daily steady study (SS) increment: 137/42 = 3.26 units, or 2.38%

Matrix Two ; Cumulative Percentage Steady Study (SS)

Week	Mon	Tue	Wed	Thur	Fri	Sat	Sun
1	2.38	4.76	7.14	9.52	11.90	14.28	16.66
2	19.04	21.42	23.80	26.18	25.58	30.94	33.32
3	35.70	38.08	40.46	42.84	45.22	47.60	49.98
4	52.36	54.74	57.12	59.50	61.88	64.26	66.64
5	69.02	71.40	73.78	76.16	78.54	80.92	83.30
6	85.68	88.06	90.44	92.82	95.20	97.58	100.00

Matrix Three : SE Percentage

Week	Mon	Tue	Wed	Thur	Fri	Sat	Sun
1	5.84	2.92	0	3.65	0	0	0
2	0	2.92	1.46	0	2.19	2.19	0
3	5.11	5.84	0	2.19	0	0	0
4	0	0	0.73	2.19	0	0.73	0
5	2.92	5.11	4.38	5.84	5.11	3.65	0
6	3.65	5.84	5.84	5.84	5.84	5.84	0

Matrix Four : Cumulative Percentage SE

Week	Mon	Tue	Wed	Thur	Fri	Sat	Sun
1	5.84	8.76	8.76	12.41	12.41	12.41	12.41
2	12.41	15.33	16.79	16.79	18.98	21.17	21.17
3	26.28	32.12	32.12	34.31	34.31	34.31	34.31
4	34.31	34.31	35.04	37.23	37.23	37.96	37.96
5	40.88	45.99	50.37	56.21	61.32	64.97	67.16
6	70.81	76.65	82.49	88.33	94.17	100.00	100.00

Matrix Five : Percentage Study Deficit

Week	Mon	Tue	Wed	Thur	Fri	Sat	Sun
1	-3.46	-4.00	-1.62	-2.89	-0.51	1.87	4.25
2	6.63	6.09	7.01	9.39	9.60	9.77	12.15
3	9.42	5.96	8.34	8.53	10.91	13.29	15.67
4	18.05	20.43	22.08	22.27	24.65	26.30	28.68
5	28.34	25.41	23.41	19.95	17.22	15.95	16.14
6	14.87	11.41	7.95	4.49	1.03	-2.42	0

judgements of his effort on the course. Hence it was felt to be of great interest in the present research to gain an indication of the extent to which students of both high and low delay tendency actually compared with such a 'steady study' (SS) datum.

The DTQ, of course, provided the actual measure of general self-reported delay tendency and the SE Tracking Diary afforded the means of determining both the actual total investment in a course considered as intensive and extensive SE qualities over a period of time, and the distribution of this SE with respect to the steady study (SS) datum. Hence 'delay' may be defined as the extent to which a student falls short of the steady study (SS) 'path' over a particular period of time: SS itself being defined as the even distribution over that period of the total SE reported by a student. In this analysis the 'day' was the unit of time, and hence for any student the SS datum is given for the 42-day tracking exercise as:-

$$\text{Daily SS} = \frac{\text{Student's Total Reported SE}}{42}$$

The daily SS sums steadily over the 42 days, and this cumulative total forms the SS datum for any one student. The actual SE cumulative total, obtained from the daily record of the Tracking Diary, is compared on a daily basis with this SS datum in deciding whether the deficit in SE is positive or negative. If positive, then the student is delaying at that point. If the deficit is negative then the student is 'ahead' at that point, indicating negative delay, or 'approach' to study, in terms of his own overall investment. The data has been expressed in percentage terms for purposes of comparison between students.

The plots of this numerical analysis, given in Fig. 5.2(i) to (xii) inclusive show quite plainly that even students self-rated as non-delayers in terms of general tendency actually do delay under

Figs. 5.2 (i) to 5.2 (xii)

Time Series of Percentage Study Deficit During the Six-Week Period Leading to a Final Examination for 12 Cases.

Key E: indicates a final examination day

SS: Steady Study

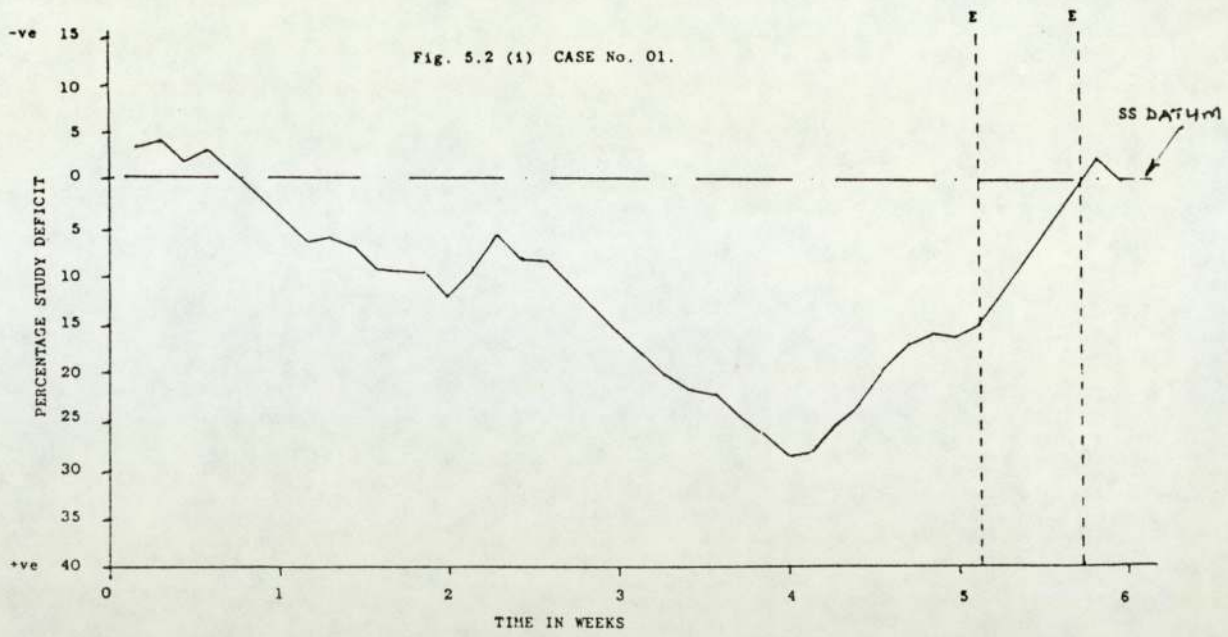


Fig. 5.2 (i) CASE No. 01.

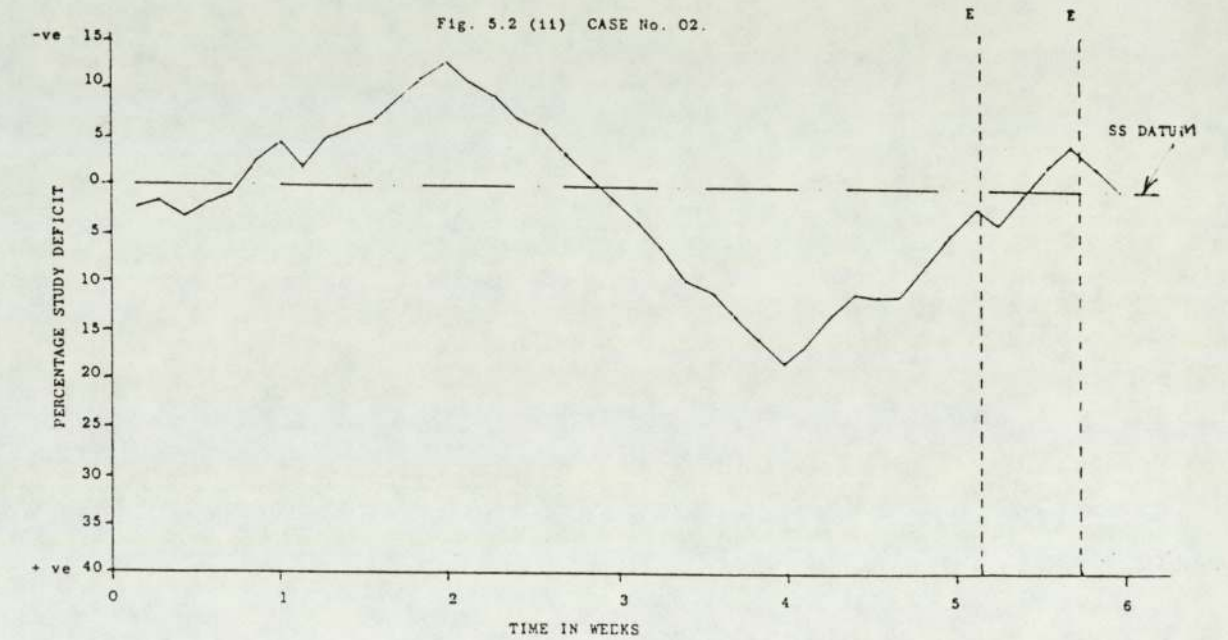


Fig. 5.2 (ii) CASE No. 02.

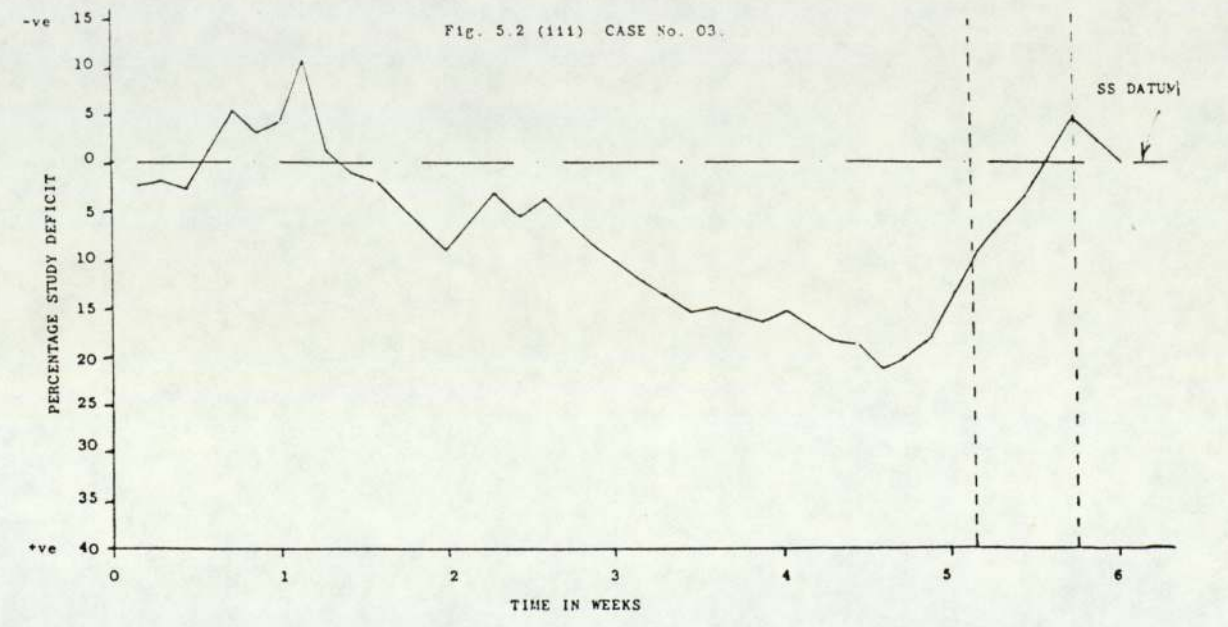


Fig. 5.2 (iii) CASE No. 03.

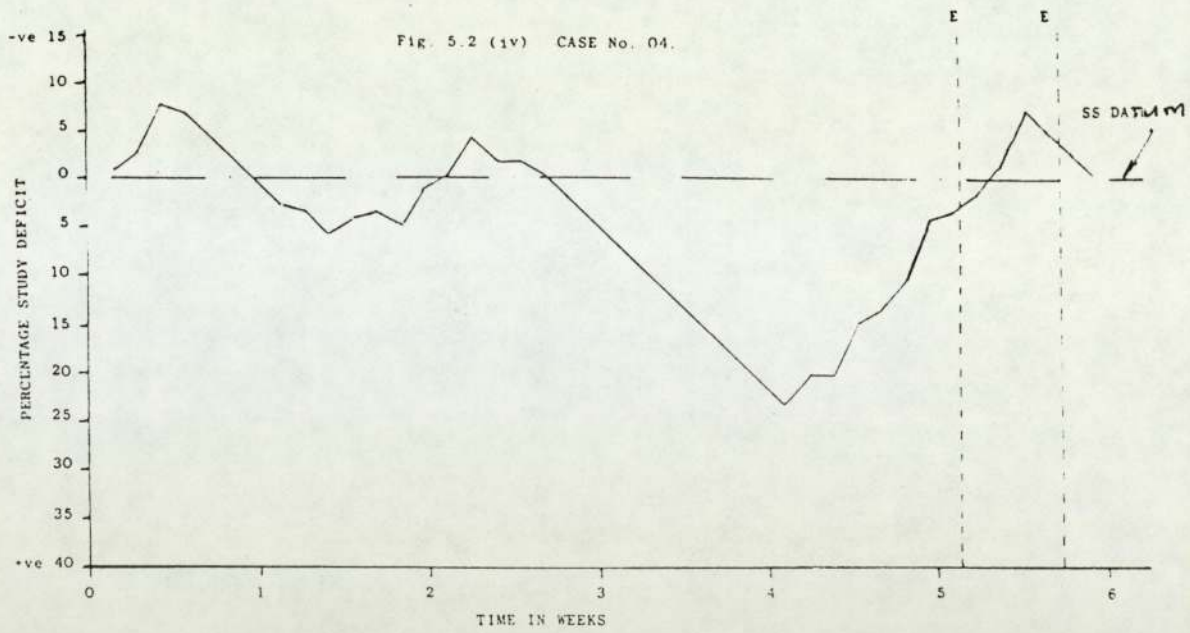


Fig. 5.2 (iv) CASE No. 04.
E
E
SS DATUM
-ve 15
10
5
0
5
10
15
20
25
30
35
+ve 40
PERCENTAGE STUDY DEFICIT
0
1
2
3
4
5
6
TIME IN WEEKS

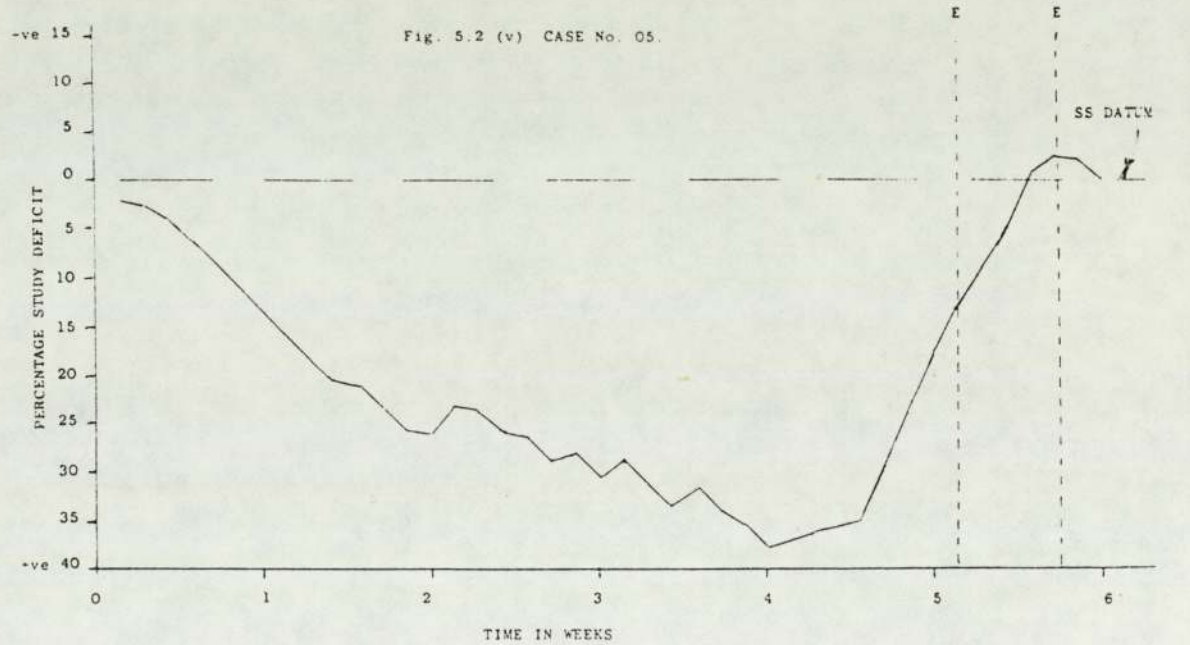


Fig. 5.2 (v) CASE No. 05.
E
E
SS DATUM
-ve 15
10
5
0
5
10
15
20
25
30
35
+ve 40
PERCENTAGE STUDY DEFICIT
0
1
2
3
4
5
6
TIME IN WEEKS

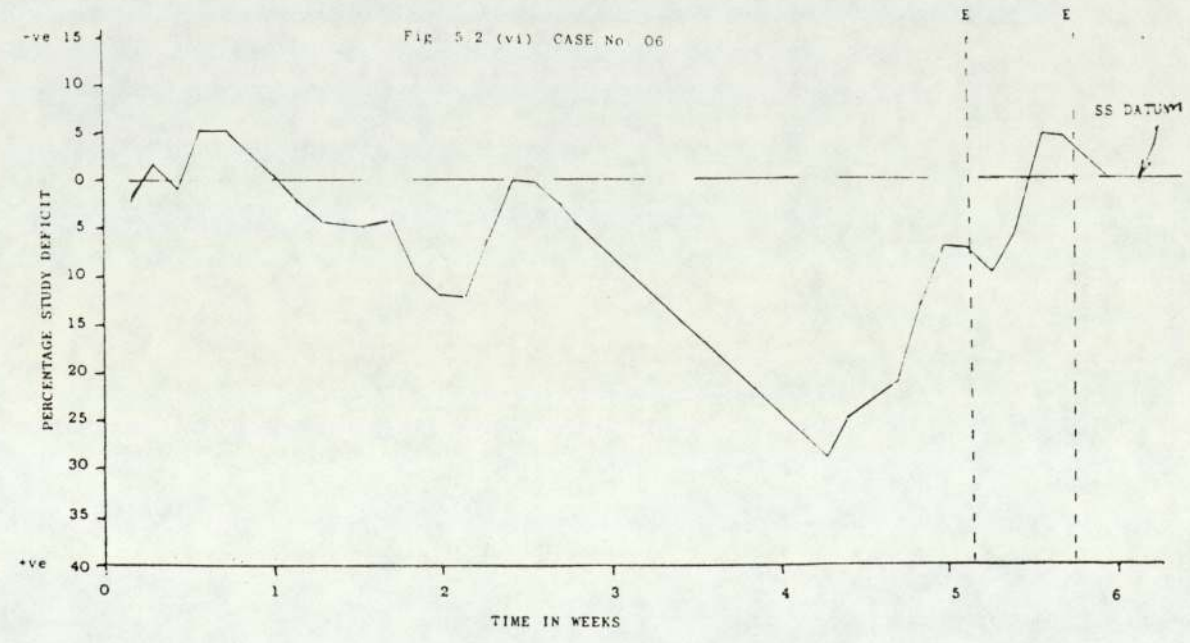


Fig. 5.2 (vi) CASE No. 06
E
E
SS DATUM
-ve 15
10
5
0
5
10
15
20
25
30
35
+ve 40
PERCENTAGE STUDY DEFICIT
0
1
2
3
4
5
6
TIME IN WEEKS

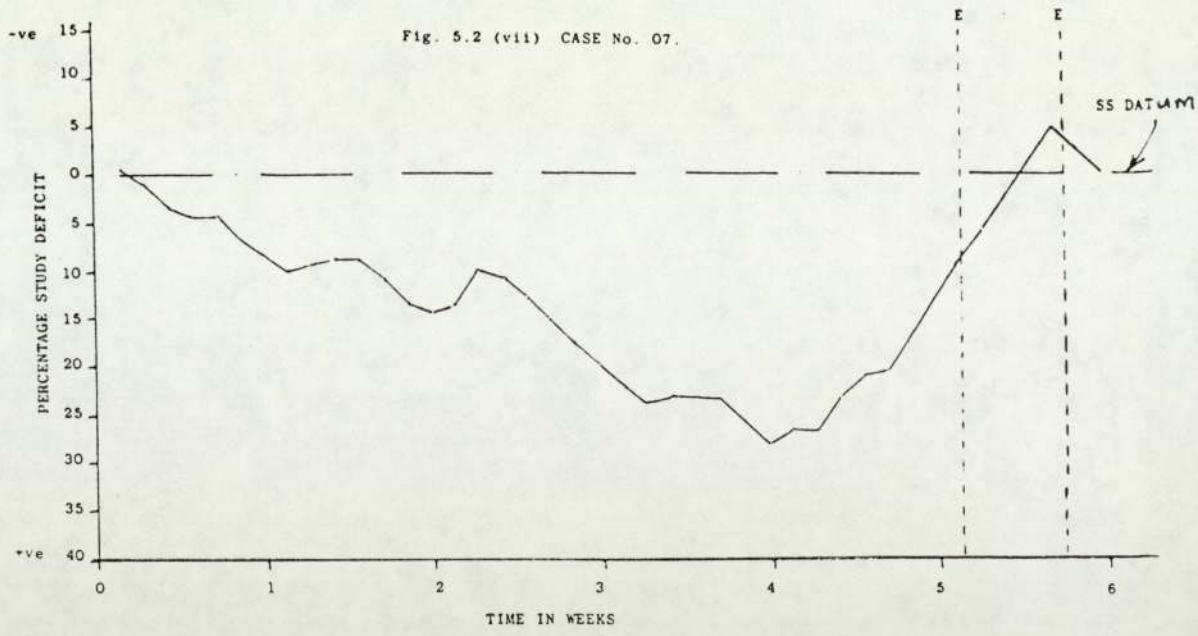


Fig. 5.2 (vii) CASE No. 07.
E
E
SS DATUM
-ve
+ve
PERCENTAGE STUDY DEFICIT
TIME IN WEEKS

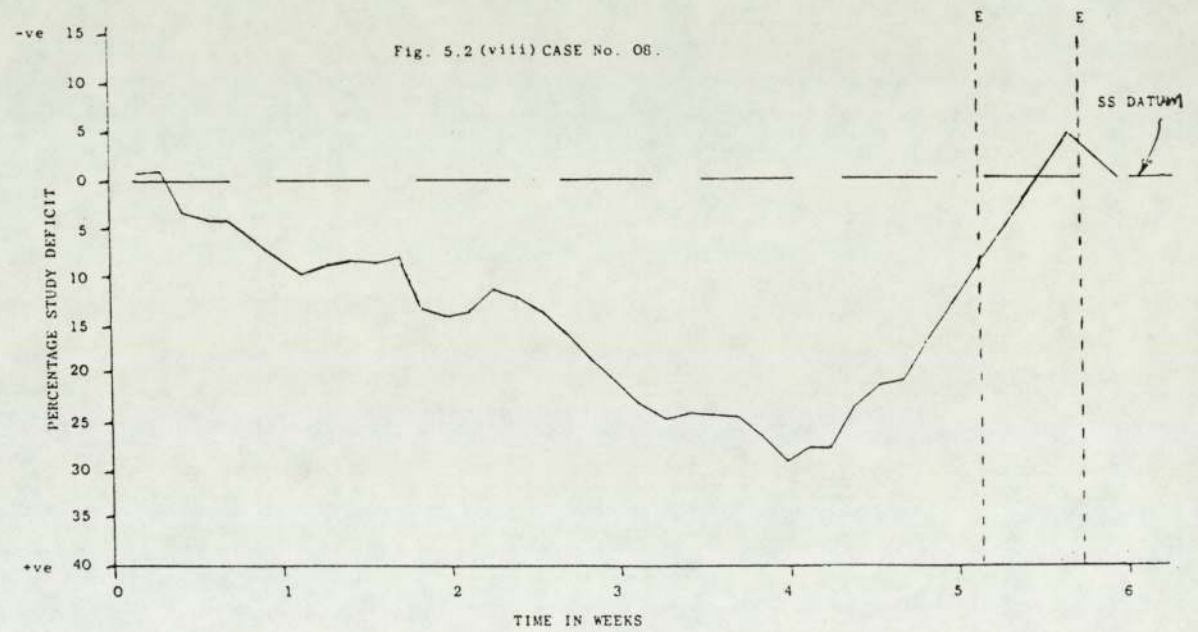


Fig. 5.2 (viii) CASE No. 08.
E
E
SS DATUM
-ve
+ve
PERCENTAGE STUDY DEFICIT
TIME IN WEEKS

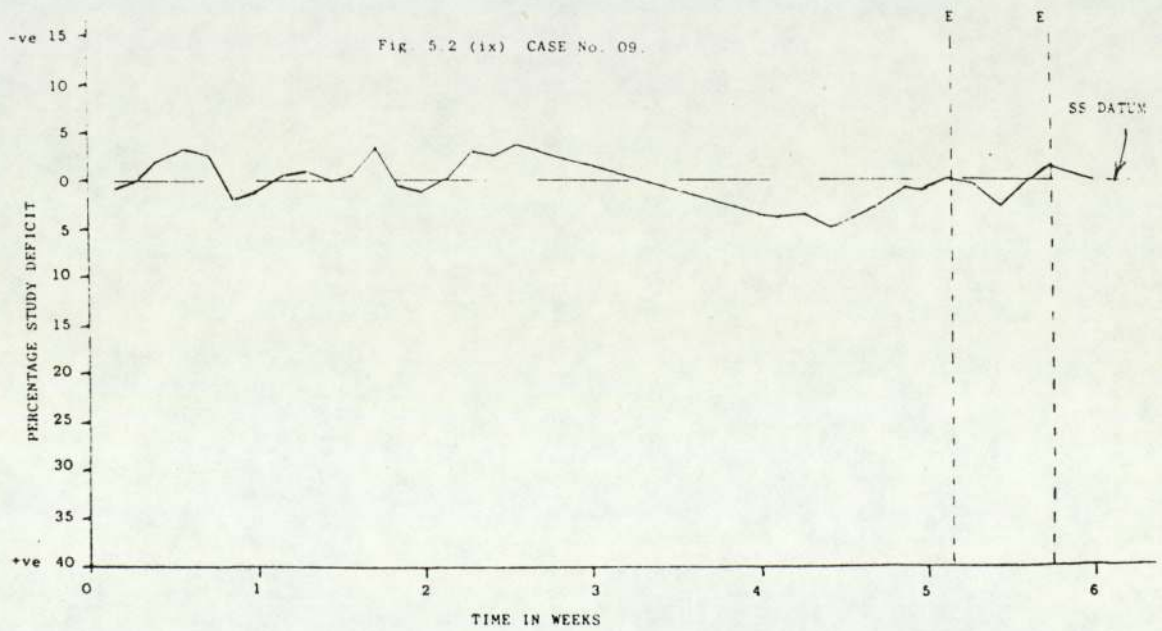


Fig. 5.2 (ix) CASE No. 09.
E
E
SS DATUM
-ve
+ve
PERCENTAGE STUDY DEFICIT
TIME IN WEEKS

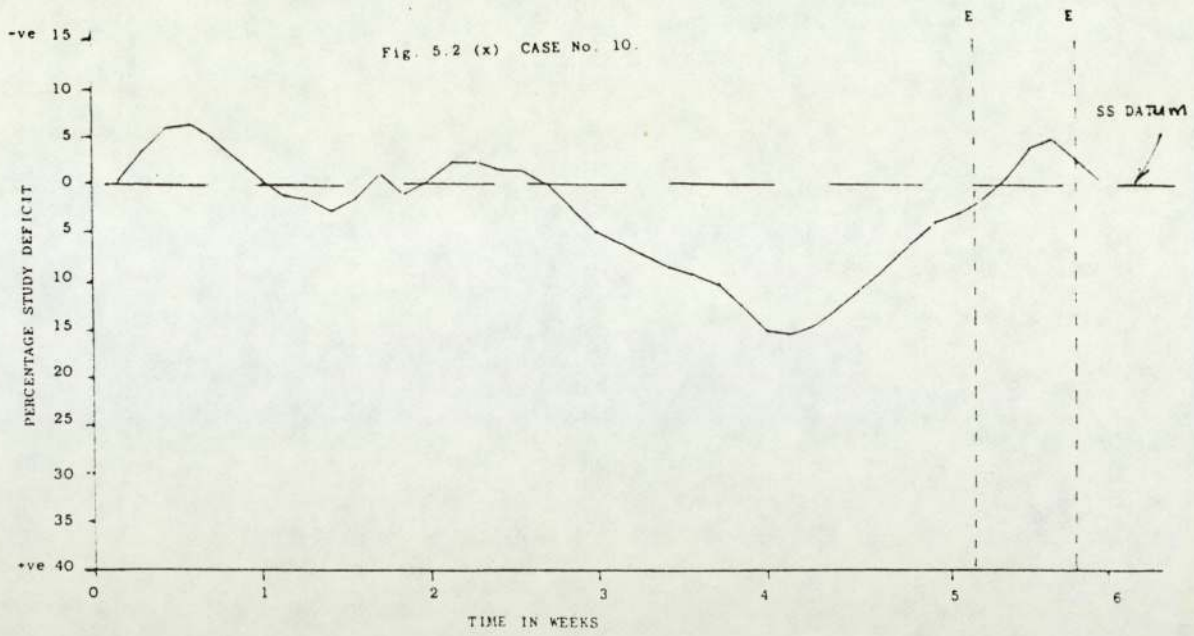


Fig. 5.2 (x) CASE No. 10.

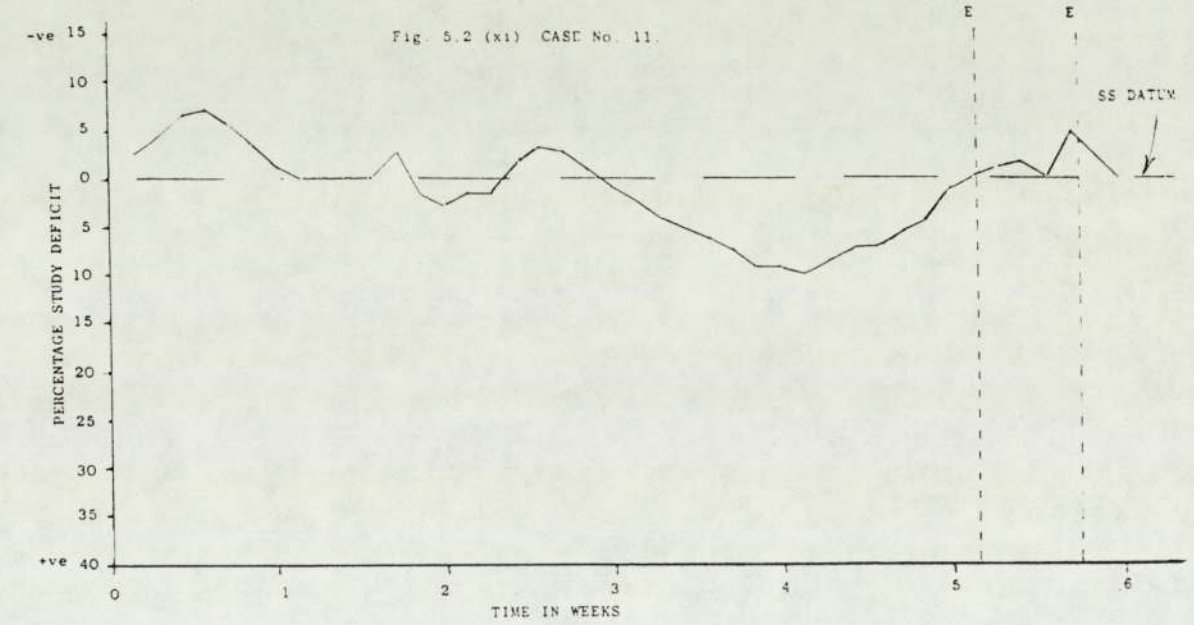


Fig. 5.2 (xi) CASE No. 11.

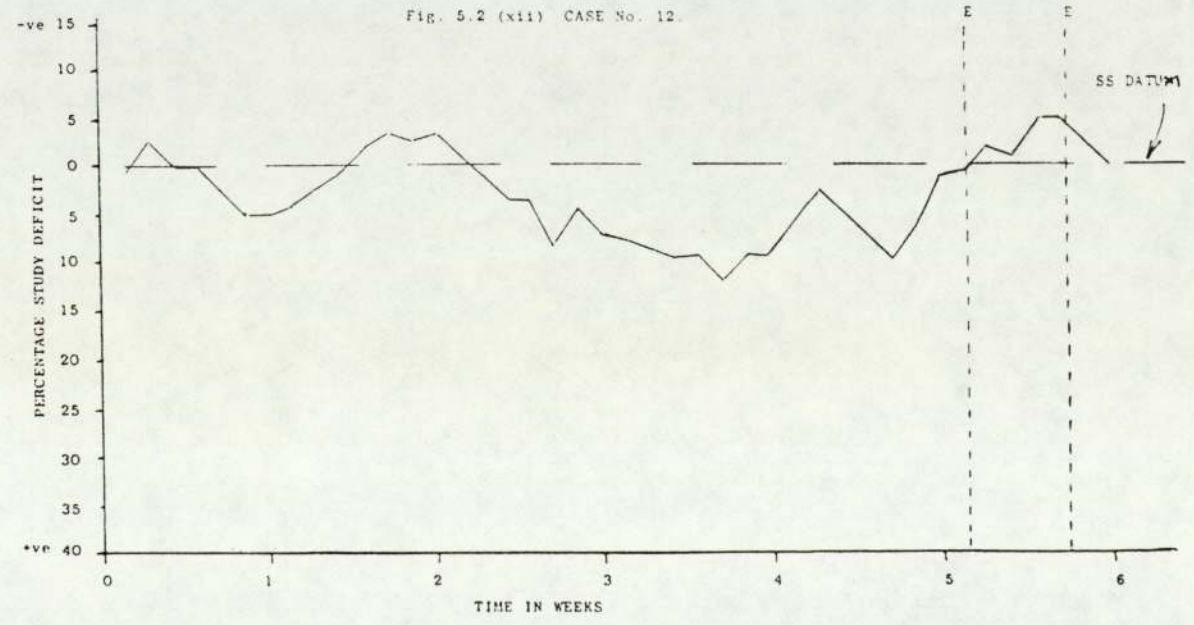


Fig. 5.2 (xii) CASE No. 12.

the present definition even at times of impending crisis. This substantiates the AP student protocol quoted in full in Chapter Two, (see pp.39-40) which indicates that delay may indeed be a form of psychological defence, and yet also feature as an element in cognitive dissonance spurring a student at a later point in the time series to greater SE intensity - typically just before a critical deadline.

A Refinement in the Interpretation of Study-Behaviour Patterns

Until this point in the report the patterns of student adjustment have been considered in terms of 'high SE - low SE' and this has been related to the upper and lower surfaces respectively of the cusp catastrohpe model. In fact, this conception did seem to be perfectly appropriate, at least to the AV student, in the light of all the evidence gathered during the study. In the case of the AP students, however, the surface representing high SE can be construed as indicating mean SE, though actual behaviour is a series of rapid fluctuations between different aspects of study. Thus, unlike the AV pattern, the AP pattern of the dispositional upper surface is likely to range over a band in which there is a high probability of finding any one student engaged in adjusting to competing work-oriented activities, i.e, engaged in alternating forms of study between which he will 'switch' rapidly under the 'social pressure' of the institutions' demands.

An attempt is made in Fig. 5.3. to illustrate this interpretation diagrammatically. The adjustive paths of both AP and AV types in terms of the cusp model are shown in the same diagram for purposes of comparison, AV-type in broken line and AP-type in continuous line. In this schematic diagram the upper surface of the model is AP-dispositional and the lower surface is AV-dispositional in terms of the DTQ. Thus, although AP-type students may be found in the lower surface and AV-type subjects in the upper surface, both states are

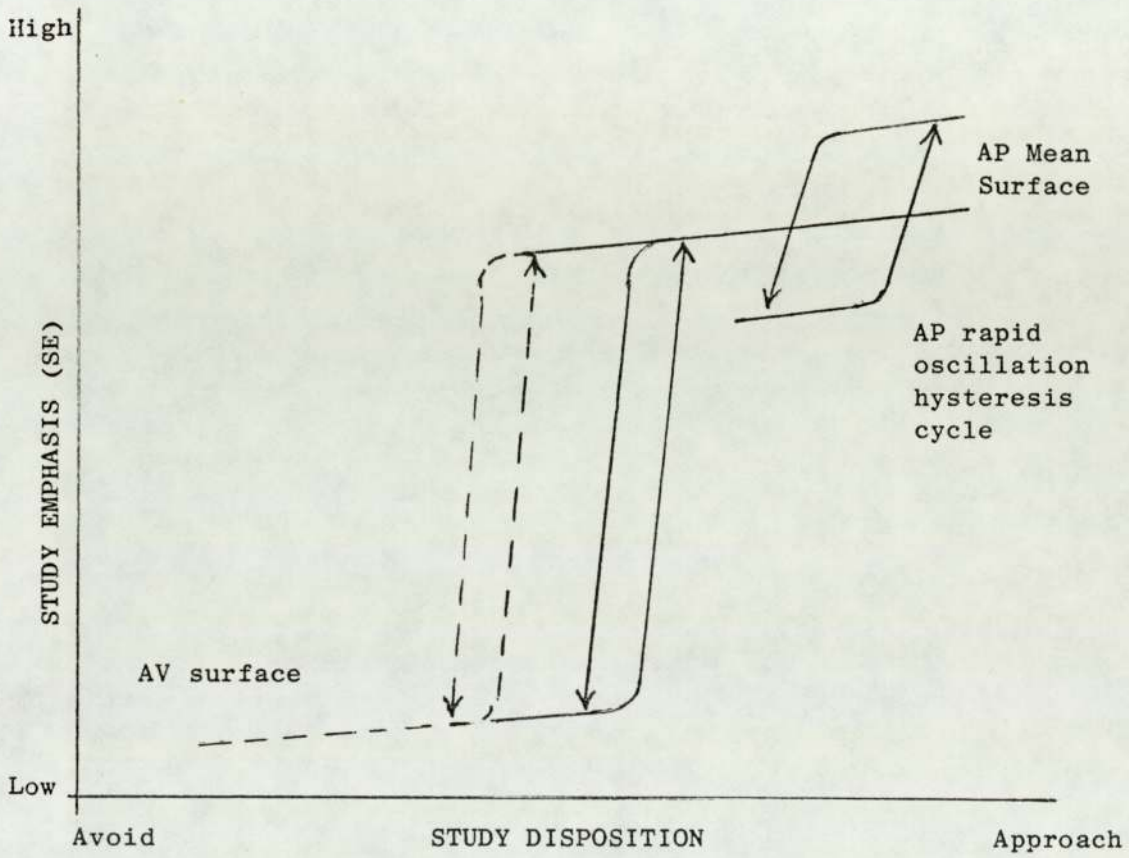


Fig. 5.3. Schematic Study Adjustment Patterns

Key

_____ AP Adjustment

- - - - - - - - - AV Adjustment

unstable and rapidly revert to the stable condition.

It is worth recapitulating briefly the psychological significance of the bifurcation set since it is conceptually important in further characterising the students of different type. The bifurcation set of the control space i.e, the set of two-dimensional coordinates which do not have a single or unique corresponding point on the behaviour surface, corresponds to the overfold, or 'pleat', in the behavioural surface of the cusp catastrophe model, and this indicates a region of dual probability of control, i.e, the control factors operate competitively in this region and the corresponding subjective experience would be of pursuing one line of action while being clearly aware that another line of action is demanding attention. This accords with the DTQ 'Extremism' analysis reported earlier. The Extremism scores, indicating degree of bimodality in study disposition under different circumstances as measured by the DTQ, showed that clear AP-type subjects (high DTQ summative scorers) were characterised by very low bimodality, whereas the highest bimodality was found among the clear AV-type subjects (low DTQ summative scorers). The inference that must be drawn from this is that there is a tendency for low DTQ scorers, though overtly AV in behavioural type, to be covertly ambivalent, and such students may, indeed, from time to time be located on the high surface of the model. Since, however, this particular form of high SE reflects an aspect of overall bimodal tendency, then, by definition, a catastrophic adjustment from low to high SE, and vice versa, would be expected. And, of course, observation confirms the expectation.

Considerable interest attaches to the AP surface of the model in view of the empirical evidence of high-frequency oscillation in the pattern of study among students of this dispositional type gained from the SE Tracking Diary. The inference must be that the AP surface

shown in diagrams so far conceals another dimension of catastrophic behaviour in which the ordinate axis (behaviour) is bipolar and refers to the two most probable areas of study activity at any one time. The abscissa on this model represents social pressure favouring one or the other of these alternatives. This is illustrated in Fig. 5.4.

The lower, AV_1, surface is obviously likely to accommodate alternating forms of study over a significant period of time, but it is far more likely over a short period to be between 'low SE' and any one particular area of study, such as Area A or Area B, as shown in Fig. 5.5. At times of crisis, such as Final Examinations, such AV students will switch catastrophically to the upper surface and will be virtually indistinguishable from AP-dispositional subjects, but for a very limited period only.

The model shown in Fig. 5.4. of the alternating nature of the AP-type behaviour is very significant in the light of evidence gathered during the present study. This relates to the subjective experience of students who dispositionally involve themselves in this rapid alternation between competing demands as a major feature of their study-related adjustment. This subjective experience has been referred to earlier as the 'cusp experience' referring to the bifurcation set of the catastrophe model, which is a significant feature in the modelling of the control factors inferred to underlie such behaviour.

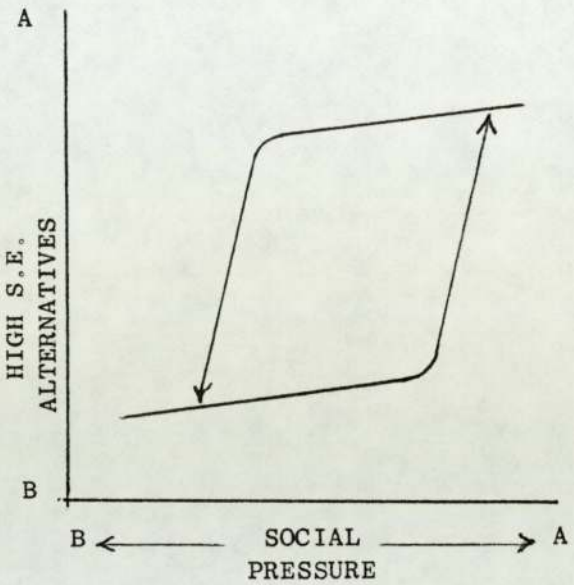
The 'Cusp' Experience

The term 'cusp experience' was introduced into the present study in Chapter Three (p.71),where students' subjective experience of conflict was used in an attempt to derive an operational definition of 'delay' related both to catastrophe theory concepts and to psychological field theory. This subjective experience, characterising

high AP-students is not a form of achievement anxiety of the debilitating kinds referred to by Alpert and Haber (1960) in the formulation of their Achievement Anxiety Test (AAT). The evidence of associated hysteresis and sharp transitions in behaviour reflect the dissonance and dislocation of the underlying cognitions. In Chapter Two (see pp. 39-42) reference was also made to the evidence for cognitive dissonance inherent in the sub-group of clear AP students, and its virtual absence from the clear AV students. Fig. 5.4. portrays diagrammatically the topological form of this dissonance. The low DTQ bimodality scores indicate the AP disposition to be unimodal for this group. Their commitment and obsessive work-orientation in behavioural terms was near-absolute. But the subjective experience of cognitive dissonance and conflict reported by members of the group was very stressful, and presumably this stress must be reflected in the form of Fig. 5.4. Certainly it contrasts strongly with the inferred negligible bifurcation set and associated low dissonance and relatively stress-free characteristics of the AV group shown in Fig. 5.5. This form of modelling suggests something of the probable differences in the 'meaning' of study activity between AP and AV students, and this is explored more fully in Chapter Six.

The 'cusp experience' must be regarded as the subjective experience of a student engaged in the process of coping with salient competing demands. This feature of study stress has been studied by Mechanic (1962), who identified the major features of the coping process as:

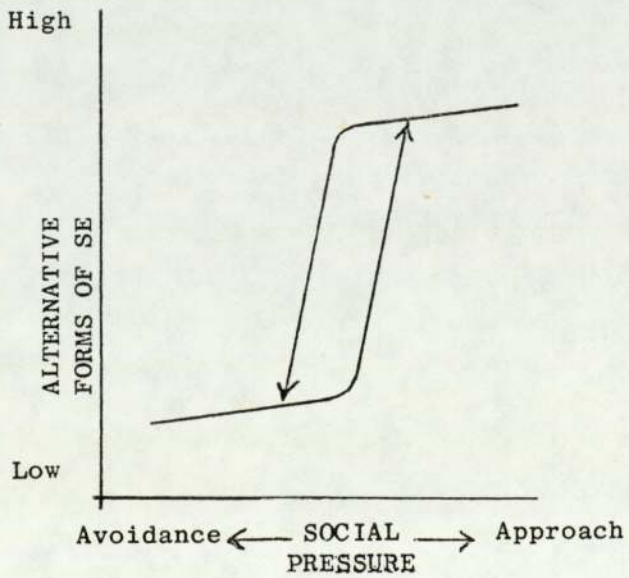
(a) The time spent on various study activities. (For purposes of his investigation Mechanic used this concept as one component of an operational definition of 'coping', and, in order to ensure that his subjects were experiencing pressure from the imminence of a significant confrontation, he chose the period one month before the crucial examination for the investigation of this component).



NOTE:
(1) Both catastrophe surfaces are 'high SE'

(2) Hysteresis is marked, and this suggests reluctance to change and, therefore, possible stress (i.e, some form of 'cusp experience').

Fig. 5.4. Characteristic AP Alternation at High Study Emphasis between Different Areas of Study, A and B respectively.



NOTE:
(1) Only the upper catastrophe surface is 'high SE'.

(2) Hysteresis is very slight or negligible: there is no significant 'cusp experience'.

Fig. 5.5. Characteristic AV Alternation between Low and High Study Emphasis.

(b) The overall amount of time spent by students in studying and in courses. (This quite closely approximates to the concept 'study emphasis', or SE, used in the present study).

However, in the light of evidence emerging from the research reported here it is suggested that the strategies inherent in (a) and (b) above imply a covert psychological stress factor of great significance to work-ridden AP students. It is clear that these students are necessarily involved in maintaining an adequate level of engagement with all the major areas of study comprising their degree course in any unit of preparation time. In choosing to engage with any one aspect or course there is a cost to the AP student, and this is the value of the work which is foregone on the next most pressing aspect of their programme. In other words, though the students may not identify the stress in these terms it is suggested here that a significant component of AP-type adjustment to study is in the unavoidable decision-making or executive function of their particular style. They are, just as are executives harassed by their perception of pressing demands on time and resources in any productive system, compelled through their study disposition to take decisions involving opportunity-cost in order to provide time to engage in any aspect of their work.

To express the foregoing concept of opportunity-cost in specific terms it may be said that if a student is to choose between two pressing claims on his study time and effort, e.g, mathematics and sociology, and chooses, say sociology at any one time, then the opportunity-cost of this choice is the profitable work in mathematics that must be foregone by reason of this choice. However, sooner or later, the growing consciousness of the risk involved in de-emphasising mathematics will compel a reappraisal, and a new decision must be made between emphasis on one or the other of the two subjects. Should no 'policy' change be made then the risk taken over mathematics will

correspondingly increase. Should a switch be made to mathematics, then the cognitive 'set' and momentum developed during the application to sociology immediately preceding the change must first be overcome before the psychological, as distinct from the more superficial 'clerical', emphasis on the fresh subject yields worthwhile results in terms of the internalising of content. In the DTQ responses virtually all students reported difficulty in making a start on study and this is, no doubt, due to this psychological inertia which is valuable in any ongoing learning situation but which proves so difficult when change is required. However, should the decision-making process be continually repeated, and the catastrophic 'switch', with its required cognitive adjustments, repeatedly punctuate the adjustive cycle, then a great deal of psychological work must be done in order to counter the 'mental entropy' induced by the transitions.

What the present research reveals is that these phenomena, some of which are already well-known, are 'rule-governed' and that the rules are modellable in terms of catastrophe theory concepts.

AP Adjustment, Stress and Functional Disorder: Implications from Related Research

The indications that stress is a factor of significance in AP behaviour may be related to earlier experimental work in psychology which investigated the association between stress and pathological condition. It will be recalled that AP students are involved in a succession of decisions regarding their study activities, i.e, how to distribute their study emphasis (SE) among competing demands in such a way as to achieve relative peace of mind. Unfortunately, the problem of choice is fraught with risk in the sense already discussed above. In other words the stress appears to be associated with an 'executive' form of decision-making, and this is reminiscent of the work of Brady, Porter, Conrad and Mason (1958) and Weiss (1972).

Both studies were made with animal subjects because of the severity of the experimental conditions, but both bear on the functional disorders which may be associated with induced stress, and possible inferences may be drawn from this work concerning the stress-related behaviour of students.

Weiss, working with rats in carefully controlled experimental conditions, first investigated the effects on functional disorder of the predictability of an aversive stimulus and found that those animals unable to predict the stimulus were subject to higher levels of gastrointestinal ulceration. Weiss next investigated the effect of coping behaviour on the incidence of functional disorder. He found that under the conditions of this experiment predictability was of negligible importance. Differences in weight loss depended on the extent to which avoidance or escape (i.e, coping behaviour) was possible. Successful coping resulted in a lower incidence of the disorder. Combining the results of both experimental conditions, it can be seen that predictability reduced the incidence of the disorder in both the avoidance-escape condition and in the yoked condition, but the avoidance-escape group always developed a lower-intensity disorder.

These results appeared to conflict with results obtained by earlier workers. Brady et al (1958), reported experiments on monkeys subjected to externally imposed stress in much the same manner as Weiss's rats. In the earlier work, however, the monkeys were arranged in pairs, one member being yoked and having no control over the aversive stimulus , whereas its partner, the so-called 'executive monkey', was able to control the incidence of the aversive stimulus for <u>both</u> members of the pair. In these experiments the 'executive' animal developed severe gastrointestinal ulcers and died, whereas the yoked animal survived with few, if any, deleterious consequences.

However, Weiss developed a theory to indicate the explanatory power of his results. The theory states that the intensity of the functional stress disorder is a function of two variables:

(a) The number of coping attempts, or responses, an animal makes.

(b) the amount of appropriate or relevant feedback these coping attempts produce.

Weiss explains, "... conditions can certainly exist wherein an animal that has control will ulcerate severely. Specifically, in cases of low relevant feedback, ulceration will be severe if the number of responses made is high" (p. 241). He considers this point to be the key factor in affording a reconciliation between his own findings and those of Brady and his co-workers.

The 'executive' monkeys died of severe gastrointestinal ulceration even though they were engaged in a form of coping behaviour. However, in the first place the response rate of the animals was maintained at a high level. In fact, the 'executives' were selected for their high rate of responding. Thus, according to Weiss's theory, the executive animals were more ulcer-prone by reason of the relationship between this tendency and their high-response disposition. In this sense the executives were more ulcer-prone by disposition. Further, any feedback came exclusively from internal cues, and it was clearly insufficient to counteract the very high response tendency. Conversely, for the yoked animals, dispositionally of lower-response type, their protection was further assured by the high-response activity of their doomed partner, for the incidence of aversive stimuli was low.

From these studies it appears that high response rate to aversive stimuli is associated with severe psychological stress and functional disorder, and a coping strategy is, in itself, no guarantee of remission. But this appears to suggest a dire form of stress risk

for AP students, torn between, and adjusting to, competing work demands in the manner indicated earlier. Of course, there is a very great difference between the general complexity of the cognitive controls as between animals and students, but the similarity, especially in terms of the resulting behaviour, are significant. The 'high response rate' executive monkey parallels the AP student, characterised by rapid, catastrophic transitions through a short hysteresis cycle between competing demands in order to avoid 'aversive stimuli', i.e, either failure or achievement at a lower level than their high aspirations demand. Of course, this reference to level of aspiration in the case of the students marks a major distinction between their control features and those of experimental animals, and the inference that there is a determining judgemental-attitudinal structure underlying the differences between the students of contrasted AP and AV types is explored fully in Chapter Six.

Summary of Chapter Five

1. Hard empirical evidence was required of the reality of delay and catastrophic transitions in actual study-related behaviour. This was confirmed in a small (N = 12) but representative sample of students by means of the Study Emphasis Tracking Diary. This instrument was designed to reveal patterns of adjustment to the demands of study.

2. The emergent patterns displayed catastrophe characteristics peculiar to AP and AV students respectively, while the intermediate pattern could be regarded as a superimposition of AP upon AV characteristics. Of considerable interest is the absence of smooth (i.e, continuous) adjustment even among AP students.

3. Numerical analysis of the SE Diary data revealed that even AP students do not conform to the widespread 'steady study' expectation of college teaching staffs. It appears that all study patterns are inherently discontinuous.

4. More refined insight into the upper and lower surfaces of the catastrophe model, obtained by combining the SE Diary data with other evidence gained earlier in the study, suggested great differences in the dimensions of the versions of the catastrophe models applying respectively to clear AP and AV types respectively. These related mainly to the pronounced 'bifurcation set' and its related stressful 'cusp experience' for the AP group. The bifurcation set of the AV form of the model was inferred to be negligible and this indicated a relatively stress-free condition.

5. The high response style of the AP-e student was compared to the results of relevant experimental research on animal subjects where it was found that animals with the same tendency to high response, or high number of coping attempts, in aversive situations suffered

severe stress-related disorders. The sinister implications for extreme AP students were noted.

CHAPTER SIX

CONTRASTED INTERPRETATIONS OF THE NATURE OF STUDY.

Introduction

Notwithstanding the value of evidence concerning motivation related to dissonant cognitions (Aronson, 1973), already reported in Chapter Two, further evidence relating to potentially more stable, and therefore more enduring, cognitive and affective characteristics among the sample was felt to be desirable. The persistent patterns of adjustment characterising AP and AV students respectively were hypothesised to be associated with signifcant and stable differences in the meaning of institutional study between the two groups. The reference to cognitive and affective components in behavioural control would seem to imply differences of attitude between the groups and this consideration weighed heavily in the choice of instrument for investigating such differences in the sample.

In considering whether any differences which might be detected were related to behaviour as cause-and-effect, or merely represent contingent associations, it is worth referring to the work of Lazarus (1968), who explored the relationship between cognition, affect and motivation. Following similar work by Schachter and Singer (1962) and Valins (1966), Lazarus carried out experiments in which he dubbed a comforting soundtrack on to films which were concerned, respectively, with a painful operation and workshop accidents. The soundtrack was intended to depersonalise the emotionally disturbing action in the film for the viewers. This led to 'cognitive reappraisal' of the perceived events, or stimuli, by evoking the defences of denial or intellectualisation. The results of this research by Lazarus and his associates strongly suggested that emotional reactions are a function of cognitions concerning the perceived event. Lazarus, therefore,

considers that emotions are responses rather than motivators. Motivation is more closely allied with cognition than with affect.

An important implication for the present study which emerges from Lazarus's work is that such differences in adjustive behaviour as may be observed among students may be inferred to derive from differences in motivation, which, in turn, find their origins in cognitive differences within the sample. If Lazarus's findings are generalisable it must be assumed that, should significant cognitive differences co-vary with significant behavioural differences in the sample under investigation, then the former features may be determinants of the latter through the inferred mediation of 'motives'.

The factor analysis of the DTQ, reported in Chapter Four, suggested the nature of the motives concerned in the patterns of responses related to study disposition in a range of relevant situations, and the DTQ summative scores give a measure appropriate to subdividing the sample into two broad groups, AP and AV, respectively. It now remains to report an investigation into a very important and salient cognitive dimension which may be construed as the 'meaning of study' for different students, or, perhaps, the nature of attitudes within the two major student groups, since attitudes are considered to be both cognitive and affective in their constitution (Fishbein and Ajzen, 1975).

The measurement of both connotative meaning and of attitude are, as is well known, conflated in one generic form of instrument, viz, the semantic differential, which was fully characterised for the first time by Osgood, Suci and Tannerbaum, (1957). Evidently, if the semantic differential were an inherently reliable instrument and could be produced in a form valid for purposes of the present investigation, then reliance could be placed on an analysis of the responses to such an instrument to provide an indication of the cognitive basis of

students' judgement of significant elements of study programmes at tertiary level. These results could then be taken as indicating at least association between the 'meaning' of the elements and the broad behaviour patterns (i.e, the weak sense of relationship), or even, bearing in mind the work of Lazarus already referred to, as indicating the control, or motivation-related cognition (equivalent to attitude) determining those differential behaviour patterns (i.e, the strong sense of relationship). If the latter, strong, sense can be assumed it would suggest that the cognitive 'judgement' of the institutional elements of study programmes are, at least, one aspect of the motivational schemas controlling the different styles of adjustment.

Attitudes and Social Structural Factors

The interpretative and processing functions of attitudes explored by Schroder, Driver and Streufert (1967) indicate the structural role of the concept of attitude in the superordinate construct 'schema', which has been used by a number of distinguished workers. However, there are those who would deny the value of the attitude concept in the social sciences, arguing that the concept contributes nothing of value to explanations of behaviour which is supposed to derive rather from social structural factors. This criticism parallels that of the term 'motive' itself and similarly derives from a notional theoretical redundancy in the function of the construct.

This charge of redundancy has been countered by Cohen (1966), who has shown that attitude can have an influence on behaviour which is clearly distinguishable from that attributable to social structural variables. Lemon (1973) suggests that the acceptance of such a distinction requires that two significant assumptions also be accepted:-

(a) Attitudes can maintain a stability in the face of changing social circumstances.

(b) Attitudes can change independently of social structural factors.

It should be noted here that these assumptions relate to the information-processing function of attitudes which constructs different 'effective environments' (see Baldwin, 1969, cited in Chapter Two) and thus leads to different personal interpretations and judgements concerning ostensibly common experiences.

Cohen attempted to systematise the conceivable relationships between social structural factors, attitudes and conduct (or behaviour). In brief, these relationships are:-

(a) A relationship in which both conduct and attitudes derive from social structural factors. Thus:

SOCIAL STRUCTURAL FACTORS ⟶ ATTITUDES + CONDUCT

An example of a situation of this type, as given by Cohen himself, would be that of slaves in a totally coercive situation, i.e, slave attitudes are irrelevant to behaviour as compared with the influence on conduct of their social status. Evidently this relationship could not be the one underlying the situation explored in the present research.

(b) A relationship in which attitude takes the function of an intervening variable, mediating between social factors and behaviour:

SOCIAL STRUCTURAL FACTORS ⟶ ATTITUDES ⟶ CONDUCT

Though this has proved to be an interesting model to psychologists, the nature of the relationship suggests that the concept of attitude can contribute little to the possibility of predicting conduct, since ultimately the social factors control the behaviour. In terms of operational modelling 'attitude' as used here would seem to be a redundant construct.

(c) In Cohen's view the third type of relationship is probably the most important in model building and explanation. Here attitudes combine with structural factors to determine behaviour:

SOCIAL STRUCTURAL FACTORS + ATTITUDES ⟶ CONDUCT

This relationship gives scope for explaining numerous examples where the first two relationships could not be used. For example:

(i) Resistance by workers to incentives designed to increase output

(ii) Little or no response from purchasers in spite of the reduction in price of a commodity.

(iii) Opposition to modernisation and change in less developed industries or economies.

In the present research it is postulated that different attitudes combine with social structural factors, which are more or less common to all subjects, to produce broadly different adjustive responses to critically evaluated study. For all the students in the target population social structural factors, or 'social pressure' (Flay, 1978. See Chapter Three), could be construed to be a common feature for all members of the same College course, though having a different effect on the behaviour of different individuals as the corresponding pressure from different effective environments became manifest. Thus social pressure would produce notably different forms of conduct, or study-related behaviour, as it combined and interacted with different attitudes. In other words, the same kinds of information associated with the same institutional events would be processed differentially by different kinds of attitudinal structures and lead to different adjustive behaviour patterns.

Since the widely-reported findings by LaPiere (1934) of a discrepancy between indications of attitude derived from a questionnaire and actual behaviour, psychologists have been at pains to establish the extent to which instrumental responses might be considered a reliable indicator or predictor of behaviour. The confusion has been compounded by the fact that different assessment procedures have sometimes led to different inferences concerning the same person's attitude towards the same object. Not surprisingly such results have stimulated attempts in the literature to 'explain' the discrepancies. For example, one explanation has been to assume that there is a 'true' attitude which has simply not been tapped by the instruments used. Another explanation has been based on the postulating of a distinction between 'verbal

attitudes' and 'action attitudes', which need not, in fact, correspond. A third attempt to explain the discrepancies has suggested that the terms 'attitude' and 'behaviour' can, in practice, be equated - attitudes merely summarising observed consistencies in behaviour. On this view observed discrepancies would be explicable, if insufficient work had been carried out initially, to locate the range of significant characteristic behavioural consistencies.

For purposes of the present study attitudes are to some extent conflated with the notion of 'disposition' for purposes of operational definition. These dispositions have been referred to in AP and AV terms throughout the work so far. Thus in operational terms the two major dispositions, AP and AV respectively, combine with social structural factors, broadly conceived as 'social pressure', to determine the behavioural patterns in relation to the characteristic institutional elements of extended study programmes. These behaviours include statements of belief and feeling (such as those reported in Chapter Two) and related approach-avoidance behaviour (Cook and Selltiz, 1964).

Following Allport (1954) this latter conception of the nature of attitudes is preferred by Cook and Selltiz. This preference rests on the observation of regularities in social behaviour which appear to indicate stable, underlying dispositions towards people, objects and events. For the same reason, viz, the indication of stable underlying dispositions, resulting, through interaction with social pressure, in regular, characteristic patterns of behaviour, the same conception of attitude is adopted here.

In Chapter Three the concept of 'dispositional judgement' was contrasted with 'episodic judgement', since alternation of these two modes is conceived to have a direct bearing on the process by which 'typical' behaviour, associated with stable dispositions, may be

more or less catastrophically replaced by atypical, short-term study behaviour. Before reporting the empirical investigation into AP and AV dispositional judgements of major features of institutional study it is necessary to make clear the sense in which the term 'judgement' is used in the sense foreshadowed in Chapter Three.

Dispositional and Episodic Judgement

In considering an appropriate theoretical framework for the psychological processes of social perception or cognition, Warr and Knapper (1968) refer to the close relationship between such phenomena as perception, conception and attitude. In order to avoid confusion arising from theoretical difficulties concerned with the presence or absence of the stimulus they opt to use the generic term 'judgement' and its synonym 'impression' to refer to the output of the processing of information. Since the purpose of the present work is, in part, to throw light on the nature of the controls operating to determine the kinds of behaviour both observed in the pilot study and reported by students in the later empirical surveys, it may be that an indication of the judgements that students make concerning the significant institutional features of extended study programmes would afford insight into the controls which operate to distinguish between AP and AV students. This is the reason for the adoption of the term 'judgement' in the present work.

Warr and Knapper analyse the process of judgement into three components: the attributive, the expectancy, and the affective components respectively. In making judgements of other people, objects and events, subjects typically attribute to them certain characteristics, and these attributions can refer to both overt and covert characteristics in the judgement of people. It appears that inferences are drawn from the more obvious traits of the stimulus

concerning less apparent, but suspected, characteristics. Clearly study-related events in a College programme, such as seminars and lectures, are person-referenced in the sense that other persons are significantly concerned, and possibly, as in the case of College and University staff, may be a part of the critical evaluation procedure itself. In all probability, therefore, judgements concerning such events partake of the complexity and subtlety of the judgement of persons per se. Warr and Knapper are quite clear that such a focus on judgements about covert variables must overlap with the province of attitudes, and this opinion weighed heavily in the choice of instrument in the empirical investigation. Thus the semantic differential was chosen partly for its suitability as an indicator of attitude but, in particular, for its inherent capability of indicating the connotative meaning of study-related events to students.

A problem for the present study was that of modelling the behaviour of students and the inferred controlling factors in two contrasted situations, viz. (a) during periods of crisis, such as those immediately preceding examinations and essay deadlines, and (b) during less inherently stressful, or more normal, periods between such critical events as examinations or other deadlines. It is, therefore, convenient to refer to the judgements made during these two different phases of study activity as 'episodic' and 'dispositional' respectively following the usage of Warr and Knapper (who themselves 'borrowed the term' from Ryle, 1949). It then becomes natural to refer to the behaviour of subjects acting under the control of dispositional judgements as itself dispositional, i.e, normal or typical, while behaviour inferred to be under the control of episodic judgements is considered to be episodic, i.e, temporarily expedient. In these terms, student adjustment for present purposes is conceived to be relatively lengthy periods of dispositional judgement and behaviour, punctuated at times

of 'confrontation' by the relatively brief episodic mode.

Related to dispositional amd episodic judgements are expectancies, which may or may not be conscious. As Warr and Knapper point out, the existence of such expectancies may be noticed when they are disconfirmed. As a consequence of attributing particular characteristics to a person or event people naturally expect certain outcomes, given particular social structural factors and environmental circumstances. Thus, one form of expectancy is an extrapolation from the judgements themselves. However, in the opinion of Warr and Knapper a further kind of expectancy is more significant. This arises from the tendency to translate episodic judgements into dispositional forms. The latter, by reason of their relatively more general nature, come to bias expectancy concerning the future behaviour of people, or the nature of events, in such a way as to lead to distortion. The result is that people become set to perceive events in idiosyncratic ways and their current dispositional judgements are likely to reflect earlier, episodic, impressions.

This latter point emphasises the importance of exploring dispositional judgements and behaviours, and provides a good reason for the emphasis placed upon such exploration in the empirical work to be reported later. It is also fortunate for the purposes of the present study that dispositional characteristics are more readily investigated than episodic characteristics, since the elucidation of the latter would require the co-operation for research purposes of subjects at times of crisis and hectic shortage of time. Evidently, success in gaining such essential co-operation would be far less likely than in the dispositional phase. In the investigation of a comparable situation by Mechanic (1962), referred to earlier, information concerning episodic characteristics of the population was relatively sketchy and very largely impressionistic. It did, however, presage

some of the findings emerging from the more systematic approach adopted in the present work.

Warr and Knapper readily admit the difficulty of separating the affective from the attributive aspect of judgement but they draw attention to the fact that the perceiver tends to become involved in making evaluations of the person or event forming the stimulus. The positive or negative rating forming the response to certain scales in the semantic differential are considered to be evaluative (Osgood, Suci and Tannenbaum, 1957), and hence some indication of the affective component of judgement should be gained from this instrument.

The Suitability of the Semantic Differential Approach

In the earlier discussion devoted to the conception of attitude most appropriate in the present research it emerged that the most useful view, which related most closely to the cusp catastrophe model set out in Chapter Three, was probably that of a disposition to behave in a particular way in study-related situations. It was further considered that the evidence available suggested that such attitudinal dispositions with reference to study situations were very stable and persistent and could, without too great distortion, be grouped into two major contrasted categories, viz, AP and AV types.

Reference was made earlier in this report to the feasibility of using semantic differential scales to measure attitudes in the appropriate part of the work in order to determine the extent to which measured differences in attitude might function as control factors in the cusp catastrophe model of student adjustment to study. The work of Osgood et al (1957) appeared to establish that there were three basic components of meaning: evaluation, potency and activity. Though the semantic differential arises from efforts to measure the connotative meaning of concepts, it has obvious relevance to the measurement of

attitudes. The most significant dimension of meaning emerging from the original work was the evaluative dimension, and scales loading on to the evaluative factor are considered to be an indicator of attitude. Indeed, Osgood (1965) defines attitude towards an object, person or event as its projection on to the evaluative factor in the total meaning space, and Lemon (1973) refers to the high correlations between measurements made by this means and more traditional attitude measures.

Although 'attitude' would, strictly, appear to be concerned with evaluative responses it has been found that when scales, which load on to all three dimensions of meaning are used in certain combinations, prediction of behaviour is improved Lemon (1973). This, in fact, was demonstrated by Osgood et al (1957) where it appeared that better prediction of voting was given for an American Presidential Election when 'potency' scales were combined with those of evaluative type. On the other hand, the inclusion of 'activity' ratings actually reduced the predictive validity of the measure. This was a somewhat disturbing finding and indicated that considerable caution should be exercised in using any form of semantic differential as an indicator of attitude. The major problems seem to derive from the arbitrary weights which must be put on the 'activity' and 'potency' dimensions in any predictive circumstances and this suggests that every investigation might require its own factor analysis in order to ensure that the scale loadings on the three primary factors did not diverge significantly from those found by Osgood and his co-workers.

In the present study lack of time precluded the possibility of designing and validating an instrument in the form of a semantic differential specifically for attitude measurement in the context of this research. For this reason scales were chosen for their face validity from the work reported in Osgood et al (1957). The choice

was made by a group of judges comprising experienced members of a College staff and senior students not actually included in the samples, and the selection was limited to a maximum of 16 scales. Bearing in mind that the most important reason for wishing to use the semantic differential was not its bearing on attitude measurement, though this was obviously of interest, but for its indication of the connotative meaning of study for students of different behavioural and dispositional type, care was taken to select scales from the three primary dimensions of meaning. The reason for this secondary importance of attitude indication from the instrument arises from the possibility that the DTQ could be regarded as a form of attitude-to-study scale, as will shortly be demonstrated. What was required, of necessity, was a design of study which would enable a comparison to be made of the differences in the meaning of study as between the two broad dispositional categories, AP and AV respectively.

Reliability and Validity of the Semantic Differential

A recent exhaustive study into problems of measurement involving the semantic differential was carried out by Warr and Knapper (1968). These workers were concerned in particular with accuracy in communication to the public by the press. In its operational form this work resolved itself principally into an attempt to identify the factors which operate to filter and modify information between the occurrence of an event and its representation in newspapers. The researchers ultimately conceptualised this problem in terms not so much of newspaper content as of the impressions of readers based upon such content. Hence, the measurement of impressions became a central concern for this research, and the value of this exercise for the work reported in the present study lay both in the work carried out to establish the reliability and validity of the semantic differential as an instrument appropriate

to the measuring of personal impressions, and in the form of analysis of the data resulting from the empirical investigations made during the research.

'Impressions' can be regarded as the attribution of certain kinds of meaning to people, places, objects, events, etc. But the overt characteristics of any of these categories is less likely to be open to interpretation than their covert characteristics and, as Warr and Knapper point out, the distinction between the nature of overt and characteristics has a great deal in common with the distinction between denotative and connotative meaning in the use of language. Clearly an investigation into the suitability of any instrument for measuring aspects of connotative meaning must have major implications for the present research since it is concerned with the interpretations and impressions of students of different behavioural type.

The work of Osgood and his colleagues during the 1950's in developing the semantic differential produced a prototype instrument which was used subsequently across a range of applications. The form of instrument is well known and need not be described in detail here, but its apparent simplicity and ease of administration led to a degree of doubt among some potential users concerning its reliability. Warr and Knapper were cautious and sceptical in their initial approach to the use of semantic differential technique, but by the end of their exploratory studies they were able to report that in their opinion it was completely vindicated:

> We have gathered evidence which compels the conclusion that it is a very satisfactory measure which can fruitfully be used to measure a wide range of aspects of person perception. Although the instrument is most fitted to tap judgements of covert characteristics, we believe it can cope effectively with both direct and indirect, episodic and dispositional perception, involving attributions and expectancies as well as some affective responses.
> (Warr and Knapper, 1968. p.55)

It appears that most researchers who have used the semantic differential have wished to tap the first impressions of subjects in the rating of concepts through the bipolar scales, and have considered that this was more likely to be achieved if the scales were responded to quickly by allowing only a few seconds for each response. While this rapid response rate naturally proves attractive to most subjects and to researchers, it has been the reason for some to suspect the reliability of the instrument. Yet there is clear evidence that rapidity of working does not affect the stability of responses (Miron, 1961).

Other misgivings about the instrument which related to the analysis of collected data have also been allayed. Thus, the requirement that data for analysis by parametric methods should be: (a) homoscedastic (b) derived from equal-interval scales (c) approximately normal in distribution, are all likely to be met. In fact, the number of intervals in a semantic differential scale are so small and the corresponding range of responses is so limited that the first condition is almost guaranteed. The second condition, concerning equal-interval scaling, was investigated by Osgood et al (1957) and Messick (1957), and the results indicate that such errors as may be caused by the assumption of equality of scaling intervals are within the error limits of the instrument itself and may, therefore, be discounted. Warr and Knapper cite opinion which deny that such a condition as interval scaling is even necessary (Ghiselli, 1964; Anderson, 1961; Lord, 1953). Evidently it seems reasonable to discount any fears that the use of the semantic differential in the present study might be invalidated on these grounds.

The normal distribution requirement might be violated under some conditions but fortunately it appears that again there is no great cause for concern in a study such as that reported here. Mitchell (1968), using a population of students, found that responses

were normally distributed , and other studies indicate that extreme responses and a corresponding tendency to departure from normality were less likely to the extent that the respondents were relatively more intelligent (Light, Zax and Gardiner, 1965; Neuringer, 1963). Since the sample utilised in the present research was restricted entirely to undergraduate students the intelligence condition was, in all probability, amply realised.

Thus, in view of these reassuring findings and the nature of the sample, there appeared to be no reason for eschewing powerful parametric procedures in analysing the semantic differential data.

At the beginning of this Chapter reference was made to the importance of indicating stable and enduring attitudes, or meanings, attributed to the various institutional elements of extended study programmes by the two major dispositional-behavioural groups, i.e, AP and AV respectively, in the sample studied. It follows that any instrument which is used for such a purpose must itself yield results which are stable over time, and it is necessary to establish at the outset the reliability of the semantic differential in these terms. Studies of this problem have shown that the instrument can have high reliability coefficients. For example, in test-retest studies the reliability coefficient (r_{tt}) for 7-point scales was stated by Osgood et al (1957) to be high, and other workers have confirmed this. DiVesta and Dick (1966) gave r_{tt} an immediate retest as up to 0.86 and after four weeks as up to 0.77, and there are indications of comparable results from factor scores derived from the semantic differential. Thus, Norman (1959) reported 0.75 as the lowest such factor stability after four weeks.

There can be no doubt that these various studies suggest a very adequate level of reliability in the instrument and this was taken as an encouraging indicator of its suitability for the present context.

Design of the Semantic Differential

The first requirement was a range of concepts considered to represent the essence of institutional study for students. These concepts, or 'institutional elements of study', were derived, as already indicated, from discussions with experienced College staff and senior students. The final list of elements comprised 9 concepts:

SEMINAR; EXAM REVISION; CONTINUOUS ASSESSMENT; TUTORIAL; COFFEE-BREAK; EXAMINATION; ESSAY; HOLIDAYS; LECTURE.

To this group of institutional concepts a further three concepts were added. The first, 'SELF', was intended to give some indication of the self-concept, and the remaining two, 'CLOSEST FRIEND' and 'SERIOUS ILLNESS', were included as 'marker' concepts, i.e, they would reveal the extent to which the two major groups of students agreed when rating concepts which might be supposed, virtually by definition, to be more or less common in their connotations for most people. It was supposed that 'CLOSEST FRIEND' would be rated positively while 'SERIOUS ILLNESS' would be rated negatively. These two concepts were, therefore, included as a check on what might constitute broad agreement so far as connotative meaning was concerned. Thus a total of 12 concepts was included in the final list.

As already indicated suitable scales were selected from across the range of primary dimensions of meaning as given in Osgood et al (1957) and the scales chosen represent these dimensions, in the final form of the instrument, in the ratio:

6 Evaluative : 5 Potency : 5 Activity

This gave a total of 16 seven-point scales, and these were selected randomly for the order in which they would appear under every concept, as follows:

P severe ..... lenient

E good ..... bad

A passive ..... active

P hard ..... soft

E kind ..... cruel

A difficult ..... easy

P strong ..... weak

E pleasurable ..... painful

A complex ..... simple

P cowardly ..... brave

E successful ..... unsuccessful

A excitable ..... calm

P prohibitive ..... permissive

E positive ..... negative

A intentional ..... unintentional

E avoiding ..... pursuing

(E = evaluative; P = potency; A = activity)

A specimen copy of the final form of the instrument and a scoring key are given in Appendix II.

The sample electing to respond to the instrument was slightly larger (N = 54) than that initially involved with the DTQ survey (N = 52). The two additional students were asked to complete a DTQ form before the semantic differential was administered in order to ensure that their pre-semantic differential experience was identical to that of the earlier sample as far as possible.

NOTE: It must be stressed here that the additional two DTQ cases were <u>not</u> included in the factor analysis of that instrument which was reported in Chapter Four.

The administration of the semantic differential took place on the first day of the period during which the SE pattern of a student sample was investigated by means of the SE Tracking Diary, i.e, approximately six weeks before the final examinations (see Chapter Five).

Factor Analysis of the Semantic Differential Data

Direct comparability between the form of semantic differential devised for the present work and that of Osgood and his co-workers depended largely upon a comparable factor structure emerging from the responses. For this reason the data from the new instrument was subjected to a principal components analysis of scales within concepts. For this purpose the FACTOR subprogramme of SPSS (Nie et al, 1975) was used. The resulting matrices were subjected to orthogonal rotation according to the VARIMAX (Kaiser, 1958) procedure.

Inspection of the results showed quite clearly that the loadings certainly did not correspond to the factor structure obtained by Osgood et al (1957) in their large-scale studies. Indeed the matrices cannot readily be interpreted and this naturally gave rise to an initial disappointment. Fortunately, however, the research did not depend upon the emergence of a particular factor structure connected with the attested measurement of attitudes since the DTQ could be considered as appropriate for this purpose through its study-disposition characteristics. (see below).

In order to illustrate the problems concerned with the interpretation of the factor structure of the semantic differential data two examples of the rotated (Varimax) solutions were selected, viz, those for the factoring of scales within the concepts 'SELF' and 'SEMINAR', and these are set out in Tables 6.1. and 6.2. respectively. The column headed 'Dimension' indicates the category, i.e, Evaluative (E), Potency (P) or Activity (A) to which any particular pair of bi-polar adjectives was referred as a result of the original work by Osgood et al (1957). It will be remembered that, for purposes of the present work, the scales were chosen to include these three major factors. The Tables reveal two important features of the analysis. Firstly, the factors are generally not 'pure' with respect to the

Table 6.1.

Semantic Differential Factors. Concept 'SELF'
(Decimal points omitted)

Factor 1

Adjective	Loading	Dimension
Active	70	A
Brave	69	P
Pursuing	67	E
Strong	55	P
Successful	49	E
Positive	48	E

Factor 2

Adjective	Loading	Dimension
Kind	71	E
Pleasurable	65	E
Good	60	E
Intentional	48	A
Strong	43	P
Successful	35	E

Factor 3

Adjective	Loading	Dimension
Simple	68	A
Calm	61	A
Prohibitive	-30	P

Factor 4

Adjective	Loading	Dimension
Lenient	56	P
Soft	45	P
Permissive	44	P

Factor 5

Adjective	Loading	Dimension
Difficult	-56	A
Intentional	55	A
Pursuing	38	E

Table 6.2.

Semantic Differential Factors. Concept 'SEMINAR'
(Decimal points omitted)

Factor 1

Adjective	Loading	Dimension
Permissive	72	P
Positive	70	E
Successful	67	E
Pursuing	66	E
Kind	42	E
Active	41	A
Good	31	E

Factor 2

Adjective	Loading	Dimension
Soft	75	P
Simple	73	A
Lenient	51	P
Easy	40	A
Kind	38	E

Factor 3

Adjective	Loading	Dimension
Strong	54	P
Intentional	49	A
Pursuing	40	E
Pleasurable	35	E
Positive	35	E
Good	31	E

Factor 4

Adjective	Loading	Dimension
Pleasurable	76	E
Good	46	E
Lenient	43	P
Active	39	A
Easy	33	A
Successful	32	E
Permissive	30	P

Factor 5

Adjective	Loading	Dimension
Active	59	A
Excitable	-52	A
Brave	36	P

original major dimensions or categories. Secondly, the actual groupings of adjectives to form the factors are by no means easy in every case to summarise in terms of a clear common 'meaning' to which all the individual components relate.

The Varimax matrices relating to the two concepts are reproduced in full in Appendix VI. Significant loadings were taken as those greater than $\pm$ 0.3.

The Delay Tendency Questionnaire as an Attitude Scale

Fishbein and Ajzen (1974) refer to the low empirical relationship between measured attitude and behaviour and point out that this has resulted in a critique of the attitude construct, including its definition and/or measurement. One aspect of such criticism has been based on the argument that attitudes are, in fact, multidimensional, including cognitive, affective and conative components (Rosenberg and Hovland, 1960). This would immediately suggest that the single score obtained from the traditional attitude scales cannot adequately represent the richness of an attitude's dimensions and hence could not be relied on to predict behaviour accurately.

There is evidence that these various dimensions of attitude are highly intercorrelated (Fishbein, 1967; Ostrom, 1969; Triandis, 1971) and, therefore, any differentiation within the measure of an attitude to accommodate this inherent diversity is unlikely to improve prediction. However, a possible source of confusion is thought to derive from the likelihood that attitude towards an object is only one control influencing behaviour with respect to that object (Erlich, 1969; Triandis, 1967; Rokeach, 1968). Other influences are psychological variables, such as personality, habits and other attitudes, as well as the social structural factors of the kinds already referred to as 'social pressure' earlier in this study.

One line of development has attempted to combine these additional factors together with attitude in a single conceptual framework (Fishbein, 1967, 1972; Ajzen and Fishbein, 1970, 1972; Ajzen, 1971). This approach, which in essence parallels the present study in attempting a systematic model relating endogenous and exogenous controls and behavioural variables, considers that "the relation of traditional attitude measures to overt behaviour is contingent upon their relations to the more immediate determinants of that behaviour." (Fishbein and Ajzen, 1974, p. 60). Clearly this intercorrelation of control factors suggests an explanation for the low empirical relations between traditional measures of attitude and specific behaviours.

Fishbein and Ajzen eschew the usual criticism of definitions or measures of attitude and tackle the attitude-behaviour relationship problem from the other pole, and they do this by examining the nature of the criterion used. In this research they distinguish very clearly between single and multiple-act criteria. They refer to the work of Thurstone (1931), who pointed out that although two persons may hold the same attitude towards the same object "their overt actions (may) take quite different forms which have one thing in common, namely that they are about equally favourable towards the object." (p. 262). In other words, although the strengths of their dispositions may be virtually identical the actual behaviours through which the dispositions are manifested may differ. This implies that an attitude will predict multiple-act, but probably not single-act, criteria.

In a rigorous experimental investigation, involving both self-reported behaviours and behavioural intentions in relation to attitudes, Fishbein and Ajzen (1974) demonstrated that all the attitude scales used correlated highly with the multiple-act criterion, whereas the correlation with single-act criteria tended to be low and non-significant (see Table 6.3.). The following extract referring to

Table 6.3.

Correlations of Five Verbal Attitude Scales with Single- and Multiple-Act Criteria. (After Fishbein and Ajzen, 1974).

Scale	Single-act criterion (a)		Multiple-act criterion (b)	
	Behaviours	Intentions	Behaviours	Intentions
Self-report	.137	.162	.640	.604
Semantic differential	.149	.178	.714	.658
Guttman	.121	.176	.608	.656
Likert	.142	.202	.684	.749
Thurstone	.131	.170	.628	.648

(a) Mean correlation with 100 behaviours or intentions

(b) Sum over 100 behaviours or intentions.

their results is particularly significant in its bearing on the present research:

> These results support the argument that an index based on a large number of behaviours can essentially be viewed as an alternative attitude measurement procedure. (p. 62)

They cite an early study in which Rosander (1937) employed Thurstone scaling procedures to develop a scale measuring attitudes towards negroes based on subjects' reports of how they would behave in hypothetical situations. Subsequently it was found that this scale correlated highly with the Hinckley (1930) Thurstone-type scale for attitudes towards negroes. Similar results have been obtained in more recent studies (Ostrom, 1969; Tittle and Hill, 1967; Kothandapani, 1971). In all cases self-reported or intended behaviour, appropriately scaled, correlated significantly with traditional attitude scales in respect of the same attitude object.

The DTQ was specifically designed as an indicator of the disposition of students towards a wide range of study-related situations and responses to the instrument are required in terms of characteristic, i.e, typical or general, behaviour in respect of each situation. Further, the DTQ was developed from an earlier instrument, the SSHA (Brown and Holtzman, 1966) with a widely attested criterion validity. Finally, the items were scaled using the Likert internal-consistency procedure, which is generally accepted to be appropriate for an attitude scale (Edwards, 1957; Oppenhein, 1966). It appears virtually certain, therefore, that the DTQ is a form of attitude-to-study scale based on the alternative measurement procedure of Fishbein and Ajzen. For this reason the failure to obtain an interpretable factor structure from the semantic differential data, which might have lent itself to an indication of attitude to study, can be regarded as compensated for by the information furnished by the DTQ summative scores.

Attitude-Related Differences in the Meaning of Institutional Features of Study Programmes among Students: An Empirical Enquiry.

The sample responding to the semantic differential (N = 54) was sub-divided into 'High-DTQ' and 'Low-DTQ' groups. This was achieved by computing the DTQ summative score mean and referring those scores greater than, or equal to, the mean to the 'high' group, and those scores less than the mean to the 'low group'.

The date chosen for the semantic differential administration was a little less than six weeks before the first Final examination. The date of this administration was also the first day for completion of the SE Tracking Diary, as discussed in Chapter Five.

Immediately before the students gave their responses to the semantic differential the following announcement was made:

> When you give your responses to this instrument you are asked not to go back to alter earlier responses. Decide quite quickly what your rating will be on each scale and put a cross in the appropriate position on the scale. Then let that decision stand without alteration. It is your first impression that is required, and any tendency to lengthy reflection leading to alterations may invalidate the results of the work. Please carry on at your own speed.

A statement to this effect was printed on the facing page of the form (see Appendix II for a specimen page of the scales and scoring key).

Results

The semantic differential data was submitted to t-testing for significance of the difference between the means of the two sub-groups (high and low DTQ summative scores respectively) for each scale within each concept, using the SPSS computer subprogramme T-TEST (Nie et al, 1975). The mean score profiles are set out in Appendix VII in order to facilitate comparison of the responses in a way which avoids arbitrary verbal description of the scores. Table 6.4. sets

out only those differences which were statistically significant or near-significant, and the sense or meaning implied by the differences is translated into verbal description in these cases in terms of the relevant scale and concept.

Discussion of the t-Test Analysis

These results constitute a feature of the greatest interest in the present research and the more significant points are now indicated.

In the cases of all the institutional study concepts except 'exam revision' and 'lecture' high DTQ summative (i.e, AP) scorers perceived the concept in relatively negative terms. Thus, with these two exceptions, the AP students tended to perceive institutional concepts as more, rather than less, difficult; more, rather than less, complex; severe rather than lenient; relatively hard; cruel rather than kind; excitable rather than calm. The converse was true for the AV students. AP students also perceived 'coffee-break' (a well-known study adjunct!) as tending to the 'cowardly' side of neutral, whereas AV students perceived this element as rather 'brave'.

In view of its potentially powerful motivational significance one particular feature of the analysis is worth emphasising. The group of institutional study concepts just referred to as being relatively negatively rated by the AP group, viz, 'seminar', 'continuous assessment', 'tutorial', 'examination' and 'essay', all refer to study components or events which admit of student evaluation. Whether evaluation of student performance is, in fact, a feature of these particular events may be quite irrelevant: it may be enough that the students conceive that it is possible. It is certainly revealing, when viewed in this light, that those study components rated positively in relative terms by AP students, viz, 'exam revision', and 'lecture', do not admit of the possibility of evaluation of student performance.

Table 6.4.

Semantic Differential Scores: T-Test
Significant, or Near Significant, Differences.

CONCEPT	SEM. DIFF. SCORE		t	2-TAIL PROB.	COMMENTS
	HIGH DTQ SCORERS	LOW DTQ SCORERS			
SELF	.5484 (Rather brave)	-.1304 (Slightly cowardly)	1.99	.05	
SEMINAR	-1.1290 (difficult)	-.3478 (rather difficult)	2.02	.05	Evaluable
SEMINAR	-1.3871 (complex)	-.6087 (rather complex)	2.24	.03	Evaluable
EXAM REVISION	1.5484 (active)	.7391 (fairly active)	1.87	.07	Non-Evaluable
EXAM REVSION	1.0645 (successful)	.2609 (slightly successful)	2.38	.02	Non-Evaluable
CONTINUOUS ASSESSMENT	-.5484 (rather severe)	.5217 (rather lenient)	2.39	.07	Evaluable
CONTINUOUS ASSESSMENT	-.6774 (rather difficult)	.1304 (slightly easy)	1.88	.02	Evaluable
HOLIDAYS	1.8065 (very intentional)	1.0000 (intentional)	1.85	.07	
CLOSEST FRIEND	.3871 (rather brave)	1.0870 (brave)	2.04	.05	Marker

Table 6.4. - continued

CONCEPT	SEM. DIFF. SCORE		t	2-TAIL PROB.	COMMENTS
	HIGH DTQ SCORERS	LOW DTQ SCORERS			
TUTORIAL	-.7097 (fairly difficult)	0.0000 (neutral)	2.00	.05	Evaluable
COFFEE BREAK	-.0645 (v.slightly cowardly)	.3043 (rather brave)	2.23	.03	
EXAMINATION	-1.8710 (very complex)	-1.1739 (complex)	1.74	.09	Evaluable
ESSAY	-1.1935 (hard)	-.5652 (rather hard)	2.32	.02	Evaluable
ESSAY	-.0645 (v.slightly cruel)	.3913 (rather kind)	1.81	.08	Evaluable
ESSAY	-.4194 (rather excitable)	.3043 (rather calm)	1.91	.06	Evaluable
SERIOUS ILLNESS					Marker: No significant or near-significant differences
LECTURE	.6774 (rather good)	-.1739 (slightly bad)	1.96	.06	Non-Evaluable
LECTURE	.4194 (rather successful)	-.3043 (rather un-successful)	2.06	.04	Non-Evaluable

These results and the above interpretation are consonant with the impression gained earlier in the research that the AP students do not study because it is a particularly pleasurable experience. Rather, this type of behaviour is in conflict with their dispositional judgement in the sense that their study-related behaviour tends to be positive whereas their judgement of study-related events tends to be negative. It might, in fact, be inferred from this aspect of the study that the first factor in the factor analysis of the DTQ, reported in Chapter Four, which accounted for nearly 50 per cent of the variance in the matrix, could well be associated with fear of failure - a dimension influential in academic motivation through its relationship to 'need for achievement' (Birney, Burdick and Teevan, 1969).

Of the two non-evaluable components rated by the sample, viz, 'exam revision' and 'lecture', only the former was associated with significant differences between the two groups and these were of interest for purposes of characterisation. The AV group rated 'exam revision' as much more painful than did the AP group ($p = .05$), while of the two groups the AP's considered this component definitely more successful than did the AV's ($p = .02$). The other non-evaluable concept, viz, 'lecture', produced no significant differences at $p \leqslant .05$: the nearest to statistical significance was the AP rating of 'rather good' as against the AV rating of 'slightly bad' ($p = .06$).

An interesting result was found in connection with 'holidays', which was hypothesised to yield no significant differences between the groups. This hypothesis was substantiated. The closest to significance was the AP rating of 'more intentional' than that of the AV's ($p = .07$). Though not statistically significant this finding suggests a possible tendency for the AP students to associate a 'planning' or 'purposeful' connotation even with extended periods

of absence from institutional study, which is rather less characteristic of the AV groups.

Finally, the two 'marker' concepts, viz, 'closest friend' and 'serious illness', yielded reassuring results. They were included in the analysis to check that the student ratings were meaningful in normal terms and not aberrant in some way which might cast doubts on the interpretation of the meaning of the other concepts. The hypothesis of no significant differences was substantiated in the case of 'serious illness', and with one notable exception this was also the case with 'closest friend'. In the latter case the AV rating was in 'braver' terms than that of the AP group ($p = .05$). This result could not be clearly interpreted within the context but, since only one difference had <u>just</u> reached significance, it was felt reasonably safe to assume that the indication from the markers was generally congruent with interpretable ratings in terms of widely accepted meanings for all the concepts. In other words, the validity of the interpretation was virtually guaranteed.

Scrutiny of the semantic differential profiles, given in Appendix VII, reveals that the AP group tended to make judgements of the concepts in more extreme terms than did the AV students. The more moderate tendencies of the latter group revealed in the less extreme ratings appears to be related to a more stable behavioural tendency, in contrast to the more unstable AP's. These impressions, or judgements, relate well to the evidence concerned with stability-instability revealed in the time-series plotted from the SE Tracking Diary, given in Figs. 5.1(i) to 5.1(xii) inclusive.

Thus both the t-test results and the extremism of rating shown in the semantic differential profiles supported earlier inferences concerning aversive motivation and stability or instability of disposition. This latter probably relates to the frequency of oscillation in the SE time series referred to above.

Summary of Chapter Six

1. A discussion of evidence from the literature indicating that motivation is more closely allied with cognition than with affect led to a consideration that exploration of the cognitive component of attitudes might yield valuable insights into the operation of study-related motives.

2. An appropriate conception of the relationship between social structural factors, attitudes and behaviour for purposes of the present research was introduced. This was required as a basis for considering differences in behaviour among subjects under the influence of what were ostensibly the same social structural factors.

3. The nature of 'dispositional' and 'episodic' judgement in relation to study events was clarified and the importance of investigating the dispositional form was underlined. The semantic differential was considered to be an instrument appropriate to this investigation.

4. The design and analysis of a form of semantic differential for revealing the differences in the meaning of institutional study between students with different dispositions or attitudes was set out. The instrument could not itself be used for attitude measurement because of its uninterpretable factor structure, but this function was adequately furnished by the Delay Tendency Questionnaire.

5. The principal empirical finding was evidence confirming the hypothesis derived from the catastrophe model that dispositional delay or delay-avoidance tendency is associated with characteristic perception, judgement and evaluation of the nature of institutional study. This was accepted as the cognitive basis of differences in academic motivation.

CHAPTER SEVEN

A REVIEW AND CONSIDERATION OF POSSIBLE APPLICATIONS

A Brief Review

Starting from a relatively naive position this report has traced the development of a novel conceptualisation of major features of student motivation, both as regards the observed and the self-reported behaviour patterns of subjects accessible to the researcher, and also as regards the inferred controls over such behaviour. Student populations have been conceived of as adjusting to the requirements of an evaluating and awarding system in such a way as to reconcile, as far as possible, conflicting demands made upon them. Some of these demands and related goals stem not, in fact, from the actual expectations of the College per se, i.e, from environmental social structural factors or 'social pressure', but from attitudinal and perceptual-judgement factors in the students themselves. The study has addressed itself to the clarification of the behaviour patterns and the inferred controls according to a very broad typology, viz. the AP-AV continuum. Such internal controls and the behaviour patterns to which they relate have been considered to form significant features of study-related schemas which appear to be characteristic of individuals within the typology.

The cusp catastrophe model has proved useful in reducing the degree of arbitrariness inherent in selecting the parametral features of complex systems in earlier studies, as indicated in Chapter Three, and this has been its major contribution to the present work. However, it is readily admitted that such a process of reduction as that required by any process of modelling, while facilitating a systematic approach to the relevant structural features, risks the shortcomings inherent in any preordinate conception. That is, once chosen, the

model establishes the nature of the investigation, determining what kinds of evidence are appropriate and, therefore, what questions to ask. These inherent limitations are fully appreciated as potential disadvantages of the approach chosen, but in mitigation it is claimed that such a method of rationalising the problem was legitimate to the extent that the system under investigation is not arbitrary but rule-governed. This particular mode of translation of a problem from arbitrary into more tractable form has been well described by Bruner, (1972):-

> We solve a problem or make a discovery when we impose a puzzle form on to a difficulty that converts it into a problem that can be solved in such a way that it gets us where we want to be. That is to say, we recast the difficulty into a form that we know how to work with, then work it. Much of what we speak of as discovery consists of knowing how to impose what kind of form on various kinds of difficulties. A small part but a crucial part of discovery of the highest order is to invent and develop models or 'puzzle forms' that can be imposed on difficulties with good effect. (p.167).

This expresses very well the value of the catastrophe model in this study. It is intended merely as an appropriate 'puzzle form' and was required to generate certain hypotheses concerning student behaviour and corresponding controls.

Stated very briefly the evidence from the study suggests that the AP-AV typology, initially postulated on somewhat superficial grounds, actually rests upon foundations in deeper psychological phenomena. The indications of bifurcation in the control factors are present in both groups, though in different forms: in the Approach (AP) group in the form of cognitive dissonance and conflict related to an obsessive work-style, and in the Avoidance (AV) group in the suggestions of strong bimodality in delay tendency under different circumstances, as indicated in the DTQ responses.

Of course, further work along the present lines is required before matters can be generalised, but the evidence so far gathered suggests

that Approach and Avoidance categories represent contrasted syndromes. The Avoidance syndrome appears to be psychologically healthier, in that it is more concerned with coping under more or less favourable circumstances and probably refers to a wider perceptual-conceptual, i.e, judgmental context. The Approach syndrome contrasts with this in that it is related to psychological defence as well as coping, and this appears to be related to characteristic and clearly aversive strategies apparently intended to defend the self-concept. This appeared effectively to narrow the range of perceived cues and related activity among members of this group and left them victims of their own restricted outlook, whether academically effective or not. These comments refer, of course, to the major defining characteristics of Approach students in terms of the AP-AV typology and are not intended to imply a total lack of responsibility or realism in attitude to study.

It may be that the restricted viewpoint characterising Approach students is related to the only statistically significant difference ($p = .05$) between the Approach and Avoidance groups in their semantic differential rating of the concept 'self'. The Approach group rated 'self' as relatively 'brave' as compared to the Avoidance group's rating of relatively 'cowardly'. The exact connotative meaning of such ratings is not immediately obvious, but it could be that it is a reflection in students' minds of their characteristic behaviour in either pursuing narrowly-defined goals upon which their status appears to depend (AP judgement), or the putting-off of what, judging by cues from a wider spectrum of information, may safely be left until relatively late (AV judgement).

Entrepreneurial snd Stress Syndromes

According to McClelland (1961) the entrepreneurial character is

one of personal autonomy and responsibility, an orientation towards tangible goals clearly indicating success or failure, a predilection for forward planning and the acceptance of moderate calculated risks based upon appraisal or judgement of risk-laden situations. This catalogue of characteristics was, of course, drawn up from insight into the characteristics of organisers of successful business enterprises in an achieving society, but, mutatis mutandis, can be used to characterise the archetypal Avoidance student. Thus, the entrepreneurial syndrome seems to subsume orientation to college work which reflects an awareness of wider contexts and opportunities.

The successful entrepreneur is one who exhibits the characteristics already referred to but who does so by a balancing of chances and opportunity-costs. An outlay in terms of time and effort would be required to yield an appropriate return, and the latter would be carefully calculated in terms of the former. Any one area of 'investment' is likely to be referred to a wider range of alternatives and, thus compared, is also likely to be judged in appropriate perspective. The range of significant cues is likely to remain wider for such persons, and although study, as one option among many, may be judged as less immediate and pressing at any one time, actual performance in the long term should be more profitable, particularly if the time scale is extended to include the post-college career. Certainly there is conceivably less stress where it is clear that not everything is at risk because chances are taken in one direction.

Under this conception Avoidance students are likely to suffer less stress amd concomitantly may actually work more efficiently when the demands are very pressing, as they would be immediately before a crucial deadline. The evidence from the present work suggests that the Approach student may be too haunted by the fear of failure, or, what amounts to the same thing for them, fear of an inadequate degree of success, to be

able to make objective and widely-informed appraisals. Study is very much the dominant influence and the major problem is how to conform to the expectation of the evaluating system.

Of interest, bearing in mind the earlier discussion of cognitive dissonance or incongruity (see Chapter Two), is the observation that inability to integrate information from the environment into acceptable meaningful schemas, whether in terms of the self-concept or in terms of a predictive model of the environment, is a fundamental source of anxiety (Epstein, 1972). The stressful style of the Approach students could, in fact, be related to their failure to develop schemas related to a robust acceptance of the risks inevitable in any competitive undertaking. If this is so then a work-obsessive avoidance of failure would be a defensive substitute for an adequate predictive model. This would result in a form of 'coping' strategy, though of a relatively inefficient kind through an overburdened input or 'investment' in terms of harassed effort and excessive time.

This latter aversively motivated style contrasts to some extent with the style forming an aspect of the entrepreneurial syndrome, which is characterised by high confidence of success, a moderately high but realistically calculated level of aspiration (or 'calculated risk'), acceptance of a high degree of personal responsibility, decision-making under uncertainty and delay of feedback about success, extended future time perspectives (which may form the basis of 'study-delay' characteristics), and economical investment of effort. In fact, the evidence relating to the schemas of the Approach students suggests, by contrast, a stress syndrome, overlapping with, yet distinct from, the Avoidance entrepreneurial syndrome.

A Follow-Up Enquiry

Some of the evidence relating to the population of students

studied in the research which became available after the main thrust of the empirical investigations is worth reporting at this point.

Of the five students readily identified in the pilot work, and clearly identified by the DTQ as extreme AP-dispositional (AP-e), all were female. Four ultimately obtained an Honours degree: the remaining student electing not to take Honours and eventually was awarded an Ordinary degree. Throughout the course these five students were found to be sharply critical of any form of institutional organisation which appeared to constitute the slightest hindrance to what they conceived to be an effective and intensive engagement with study, and all were impatient in varying degrees with lapses in such organisation, however slight.

For reasons of confidentiality no details of the individual students' backgrounds can be divulged, but it is worth indicating the range of problems later found to have been encountered by this group. It should be mentioned that every one of the five had at some time been characterised by at least one of the following problems.

(a) Some record of serious disruption of harmonious family life - even to the extent of divorce.

(b) Serious difficulty in maintaining an appropriate balance between the perceived demands of the College course and normal married family life.

(c) Inability to proceed with study activity shortly before a critical deadline due to reported exhaustion and lack of confidence. (This required careful counselling and individual assistance by tutors with the planning of work schedules leading up to the 'confrontation' itself).

(d) A paranoid conception of the supposed sadistic dispositions of examiners! Study was conceived of as an unequal struggle against powerful, and possibly unknown, adversaries, who both decided the rules of play and then interpreted them without benefit of doubt to the student.

It should be repeated that no one student was plagued by all of these stress-related problems, so far as is known, but all five students in this group evinced at least one.

This evidence, though in no sense statistically testable since the numbers were so small, certainly suggests that Approach behaviour may be associated with stress-related 'disorders', which, in a sense, may parallel the functional, or psychogenic disorders induced in experimental animals which were referred to in Chapter Five. If this is so then this form of adjustment, though lending itself to academic work of high quality, may be maladaptive in a more general sense. In other words, when considered in relation to life issues wider than simply academic adjustment, extreme Approach behaviour (i.e, AP-e type) may be disorientating - even disruptive.

Only one AV student was found definitely to have experienced problems of the kind referred to above and these related, in fact, to an earlier divorce. After their College career some of the former Avoidance group were found to have become involved in activities of a more open-ended, or risk-taking, kind. Of course, the information relating to these former students is necessarily incomplete because it is quite impossible to keep track of most students for long after they have left College, but as examples of contrasted enterprises concerned in the various ventures mention may be made of the setting-up and managing of an outdoor adventure centre, and the assuming of responsibilities as Warden in a residential centre for delinquent adolescents. Again there is no possibility of generalising from the limited information available, but such feedback as there is appears quite supportive of the notion of an entrepreneurial tendency among pronounced Avoidance types.

Apart from the setting-up of a part-time business as a piano teacher no former Approach student is known to have become involved in more managerial, or free-enterprise, activities after leaving College. This group appeared, virtually without exception, to have gained employment in teaching sooner or later, and for the extreme

AP-e group already referred to this would have been initially advantageous in terms of salary or prospects for four of them due to their Honours, rather than Ordinary, degrees and the corresponding supportive testimony of academic references.

With the exception of the AP-e subgroup the committed work-style of the Approach group was not associated with a notably more successful performance in the final examinations. This was investigated by reference to a major compulsory common course by correlating the final grade with the corresponding DTQ summative score. This gave r = .33. The correlation was expected to be positive and this was confirmed, though the amount of common variance between final grade for this course and 'delay tendency' (or 'attitude to study') was little more than 0.1.

It appears that predictions concerning academic performance may be possible only for the extreme Approach and Avoidance students, i.e, those dispositionally located on the upper and lower surfaces respectively of the cusp model of adjustment. At least, this is probably true under the present form of course design at tertiary level, and this leads to the speculation that the academic system itself determines the cusp pattern of adjustment. A possible interpretation of the findings of the present research is that the contrasted forms of Approach and Avoidance adjustment are merely the modes in which distinctive study-related schemas, themselves components of more general syndromes, become manifested under the typical conditions of social pressure which forms a significant perceptual feature of tertiary level academic programmes.

Among other features of adjustive patterns in learning situations we may find, for example, 'cognitive style', and, just as insight into characteristics such as 'holism' and 'serialism' (Pask and Scott, 1975) are potentially valuable to teachers and course designers

through their bearing on learning strategies, so the same may be true of an insight into the determining features of the AP-AV Typology. This is discussed briefly below.

Possible Applications of the Findings

One conceivable, and perhaps disturbing, interpretation of the findings reported in the foregoing report is that those students who are ranked most highly on a scale of academic values, such as performance in examinations, or even of continuity and effort in academic undertakings, are not necessarily those who possess general characteristics thought to be consistent with worldly success and the development of a competitive, achieving industrial society. It is tempting for academics to blinker themselves to what may be disconcerting evidence that some students can perform quite adequately in the systems represented by schools, colleges and universities without going to the lengths required to internalise the institutions' values relating to the nature of academic discipline or professional induction. Indeed, such persons may become quite adept at surviving in the system! This form of survival relates to concepts of negotiation referred to earlier and also to an ability to 'read' relevant intelligence in a fragmentary form from appropriate sources before apportioning limited resources. These persons are well adapted in the sense that their adjustment processes concern not only modifications in their own cognitive structure and behaviour, but manipulation of the system in which they function (Lazarus, 1976).

If the information now available from this research were to be interpreted naively it might be supposed that students of Avoidance type might be counselled to conform more to an Approach pattern of work, in terms of higher intensive and extensive qualities in their orientation to study. Correspondingly, the committed Approach student

might be counselled in such a way as to suggest Avoidance-type strategies in order to bring about some relief from the stress which tends to have a debilitating function in the long term, and this would be especially likely at times of crisis when their unremitting effort tends to become an oppressive burden. Such measures may, in fact, have definite palliative value at time of crisis, and an example of moral support of this kind has already been referred to in the counselling of an Approach student as a final examination loomed. Conceivably, in the area of counselling, the kind of information stemming from the present research might result in better targetting of the counselling work. Unfortunately, like all palliatives these measures sometimes treat the symptoms rather than the cause of the problems and may, to some extent, be likened to running repairs on a machine. If it be considered, however, that the machine is not well matched to its work load and conditions it could be anticipated that the external stresses are probably a major cause of the trouble and that unless steps are taken to alleviate these stresses then further running repairs are merely optimistic and temporary expedients. Some redesign of the system is required for more permanent improved functioning.

The analogy is perhaps crude but the parallel is real. In terms of the metaphor either the nature of the machine or the conditions of work, or both, could be modified. But, of course, this degree of freedom is not possible in terms of the system of adjusting students who form the operational units in the evaluating and awarding academic system. Counselling <u>may</u>, as already indicated, be of value but it is surely possible to reconceptualise the nature of progress in this area. Perhaps this might best be considered as a bowing to the inevitable and the utilising of students' inherent strategies of adaptation, rather than an acceptance of the customary imposition of military-

style uniformity on the work patterns of all subjects. Of course, it is accepted that disciplinary requirements may impose an essential degree of commonality in the substantive content of the syllabus relating to any one course, but there could be a corresponding individuality about the ways in which students address themselves to the work of internalising the content. There may also be advantages in student performance, as well as in the wider professional competencies also developed by students while still at College, if the courses reflected as far as possible the styles, schemas and syndromes which inhere in student study strategies. It might be that Approach and Avoidance students would follow courses which not only allowed for but actually harnessed the motivational strengths of their individual strategies as far as possible.

It is not the intention here to discuss fully the implications for academic counsellors and course designers of findings such as those already reported. This would, in any case require additional research. For the present perhaps the implications so briefly stated here are of sufficient interest in themselves.

Envoi

Academic institutions which have major certificating functions tend to run on assessments in the form either of end-of-session examinations or of continuous assessment, or both. These deadlines are very significant aspects of student life and are, as has been shown above, associated with rises and falls in study activity which may be fraught with hitherto largely unexamined difficulties. To achieve success, or even survival, demands that students cope as best they can with the problems of adjustment to the sometimes arbitrary requirements of the evaluating system which are usually considered by tertiary level institutions to have important motivating functions.

In this connection it can, in the light of the foregoing research report, be suggested that:

> Deeper and more refined understanding of motivational factors should lead to the possibility of finer tuning of the system, wiser counselling of individual students, as well as the satisfaction that events are not random and arbitrary but, to an extent, rule-governed.
>
> (Graham and Hill, 1981. See Appendix VIII)

The present study is offered merely as an attempt to clarify some of the problems which currently confound progress towards such desirable goals.

REFERENCES

Allport, G.W. (1954). The historical background of modern social psychology. In: G. Lindzey (Ed), Handbook of Social Psychology, Vol. I: Theory and Method. New York: Addison-Wesley.

Alpert, R., and Haber, R.N. (1960). Anxiety in academic achievement situations. J. abnorm. soc. Psychol., 61, 2, 207-215.

Anderson, N.H. (1961). Scales and statistics, parametric and non-parametric. Psychological Bulletin, 58, 305-316.

Aronson, E. (1973). The process of dissonance. In: N. Warren and M. Jahoda (Eds), Attitudes. Harmondsworth: Penguin.

Atkinson, J.W. (1957). Motivational determinants of risk-taking. Psychological Review, 64, 6, 359-372.

Ajzen, I. (1971). Attitudinal versus normative messages: an investigation of the differential effects of persuasive communications on behaviour. Sociometry, 34, 263-280.

Ajzen, I., and Fishbein, M. (1970). The prediction of behaviour from attitudinal and normative variables. Journal of Experimental Social Psychology, 6, 466-487.

Ajzen, I., and Fishbein, M. (1972). Attitudes and normative beliefs as factors influencing behavioural intentions. Journal of Personality and Social Psychology, 21, 1-9.

Baldwin, A.L. (1969). A cognitive theory of socialisation. In: D.A. Goslin (Ed), Handbook of Socialisation Theory and Research. Chicago: Rand McNally.

Bannister, D. (1970). (Ed). Perspectives in Personal Construct Theory. London: Academic Press.

Biggs, J.B. (1968). Information and Human Learning. Glenview, Illinois: Scott Foresman.

Biggs, J.B. (1969). Coding and cognitive behaviour. Br.J.Psychol., 60, 3, 287-305.

Birney, R.C., Burdick, H., and Teevan, R.C. (1969). Fear of Failure. New York: Van Nostrand-Reinhold.

Brady, J.V., Porter, R.W., Conrad, D.G.T., and Mason, J.W. (1958). Avoidance behaviour and the development of gastroduodenal ulcers. Journal of the Experimental Analysis of Behaviour, 1, 69-73.

Brown, J.S. (1966). Problems presented by the concept of acquired drives. In: D. Bindra and J. Stewart (Eds), Motivation. Harmondsworth: Penguin.

Brown, R. (1965). Social Psychology. New York: The Macmillan Company.

Brown, W.F., and Holtzman, W.H. (1966). A Survey of Study Habits and Attitudes: Form C. New York: The Psychological Corporation.

Bruner, J.S. (1972). The act of discovery. In: M.L. Silberman, J.S. Allender, and J.M. Yanoff (Eds), The Psychology of Open Teaching and Learning. Boston: Little, Brown & Co.

Bruner, J.S. (1973). Beyond the Information Given: Studies in the Psychology of Knowing. London: Allen and Unwin.

Cattell, R.B. (1962). Handbook Supplement for Form C of the 16 PF Test. Champaign, Illinois: Institute for Personality and Ability Testing.

Cattell, R.B. (1966). Handbook of Multivariate Experimental Psychology. Chicago: Rand McNally.

Cohen, P.S. (1966). Sociological attitudes and sociological enquiry. British Journal of Sociology, 17, 341-352.

Cohen, L., and Manion, L. (1980). Research Methods in Education. London: Croom Helm.

Cook, S.W., and Selltiz, C. (1964). A multiple indicator approach to attitude measurement. Psychological Bulletin, 62, 36-55.

Covington, M.V., and Beery, R.G. (1976). Self-Worth and School Learning. New York: Holt, Rinehart and Winston.

Cowan, T.M. (1977). Goal gradient analysis and catastrophe theory: a hybrid model for conflict analysis. Unpublished manuscript, Kansas State University.

Cowan, T.M. (1978). Conflict hysteresis. Presented at American Psychological Association Meeting, Toronto, August.

Cowell, M.D., and Entwistle, N.J. (1971). The relationship between personality, study skills and academic performance in a technical college, British Journal of Educational Psychology, 41, 85-90.

Deutsch, M. (1968). Field theory in social psychology. In: G. Lindzey and E. Aronson (Eds), Handbook of Social Psychology, Vol I. Cambridge: Addison-Wesley.

DiVesta, F.J., and Dick, W. (1966). Test-retest reliability of children's ratings on the semantic differential. Educational and Psychological Measurement.

Edwards, A.L. (1957). Techniques of Attitude Scale Construction. New York: Appleton-Century-Crofts.

Epstein, S. (1972). The nature of Anxiety with emphasis upon its relationship to expectancy. In: C.D. Spielberger, (Ed), Anxiety: Current Trends in Theory and Research, Vol.II. New York: Academic Press.

Erlich, H.J. (1969). Attitudes, behaviour and the intervening variables. American Sociologist, 4, 29-34.

Evans, P. (1975). Motivation. (Essential Psychology Series), London: Methuen.

Festinger, L. (1957). A Theory of Cognitive Dissonance. New York: Row Peterson.

Festinger, L., and Carlsmith, J.M. (1959). Cognitive consequences of forced compliance. J. abnorm. soc. Psychol., 58, 203-210.

Fishbein, M. (1967). Attitude and the prediction of behaviour. In: M. Fishbein (Ed), Readings in Attitude Theory and Measurement. New York: Wiley.

Fishbein, M. (1972). The search for attitudinal behavioural consistency. In: J. Cohen (Ed), Behavioural Science Foundations of Consumer Behaviour. Glencoe, Illinois: Free Press.

Fishbein, M., and Ajzen, I. (1974). Attitudes towards objects as predictors of single and multiple behavioural criteria, Psychological Review, 81, 59-74.

Fishbein, M., and Ajzen, I. (1975). Belief, Attitude, Intention and Behaviour. Reading, Mass.: Addison-Wesley.

Flay, B.R. (1978). Catastrophe theory in social psychology: some applications to attitudes and social behaviour, Behavioural Science, 23, 335-350.

Freeman, M.J. (1953). The development of a test for the measurement of anxiety: A study of its reliability and validity. Psychol. Monogr., 67 (3, Whole No. 353).

Frey, P.W., and Sears, R.J. (1978). A model of conditioning incorporating the Rescorla-Wagner associative axiom: a dynamic attention process and a catastrophe rule, Psychological Review, 85, 321-340.

Garrett, H.E. (1939). Lewin's 'topological' psychology: an evaluation, Psychological Review, 46, 517-524.

Ghiselli, E.E. (1964). Theory of Psychological Measurement. New York: McGraw-Hill.

Graham, N.C., and Hill, A.S. (1981). Why students go off the deep end. Times Higher Educational Supplement, 6th November.

Heckhausen, H. (1968). Achievement motive research: current problems and some contributions towards a general theory of motivation. In: W.J. Arnold (Ed), Nebraska Symposium on Motivation. Lincoln: University of Nebraska.

Hill, A.S. (1976). Significant factors influencing delay in the approach to study at tertiary level. Unpub. M.Sc.Dissertation, University of Aston in Birmingham.

Hill, A., and Small, M. (1977). Student adjustment to assessment. Presented at 139th Annual Meeting of the British Association for the Advancement of Science, University of Aston in Birmingham, September.

Hinckley, E.D. (1930). Attitude towards the negro: Scale 3, Forms A and B. (L.L. Thurstone, Ed). Chicago: University of Chicago Press.

Isnard, C.A., and Zeeman, E.C. (1976). Some models from catastrophe theory in the social sciences. In: L. Collins (Ed). The Use of Models in the Social Sciences. London: Tavistock Publications.

Jenkins, J.J. (1974). Can we have a theory of meaningful memory? In: R.L. Solso (Ed). Loyola Symposium. Lawrence Erlbaum Associates.

Kaiser, H.F. (1958). The varimax criterion for analytic rotation in factor analysis. Psychometrika, 23, 187-200.

Kelly, G.A. (1955). The Psychology of Personal Constructs, Vol. 1. New York: Norton.

Kothandapani, V. (1971). Validation of feeling, belief and intention to act as three components of attitude and their contributions to prediction of contraceptive behaviour, Journal of Personality and Social Psychology, 19, 321-333.

Kuhn, T. (1970). The Structure of Scientific Revolutions. Chicago: University of Chicago Press.

Landfield, A.W. (1954). A movement interpretation of threat, Journal of Abnormal and Social Psychology, 49, 529-532.

Landfield, A.W. (1955). Self-predictive orientation and the movement interpretation of threat, Journal of Abnormal and Social Psychology, 51, 434-438.

LaPiere, R.T. (1934). Attitudes versus actions, Social Forces, 14, 230-327.

Lazarus, R.S. (1968). Emotions and adaptation: conceptual and empirical relations. In: W. Arnold (Ed). Nebraska Symposium on Motivation, Lincoln: University of Nebraska.

Lazarus, R.S. (1976). Patterns of Adjustment. New York: McGraw Hill.

Lemon, N. (1973). Attitudes and their Measurement. London: Batsford.

Lewin, K. (1935). A Dynamic Theory of Personality. New York: McGraw-Hill.

Lewin, K., Dembo., Festinger, L. and Sears, P. (1944). Level of aspiration. In: J. McV. Hunt (Ed). Personality and the Behaviour Disorders, Vol.1. New York: The Ronald Press.

Lewis, M. (1977). Quasi-catastrophe surfaces and psychological crises. Preprint, University of Texas at Austin.

Lewis, M. (1978). A cusp catastrophe model of psychological crisis. Presented at American Psychological Association Meeting, Toronto, August.

Light, C.S., Zax, M. and Gardiner, D.H.(1965). Relationship of age, sex and intelligence level to extreme response style. Journal of Personality and Social Psychology, 2, 907-909.

Lord, F.M. (1953). On the statistical treatment of football numbers, American Psychologist, 8, 750-751.

Mandler, G., and Sarason, S.B. (1952). A study of anxiety and learning, Journal of Abnormal and Social Psychology, 47, 166-173.

MacLean, P.D. (1970). The limbic brain in relation to the psychoses. In: Physiological Correlates of Emotion. New York: Academic Press.

McClelland, D.C. (1961). The Achieving Society. Princeton: Van Nostrand.

McClelland, D.C., Atkinson, J.W., Clark, R.W., and Lowell, E.L.(1953). The Achievement Motive. New York: Appleton-Century-Crofts.

Mechanic, D. (1962). Students Under Stress. New York: Free Press of Glencoe.

Messick, S.J. (1957). Metric properties of the semantic differential, Educational and psychological measurement, 17, 200-206.

Miller, G.A., Galanter, E., and Pribram, K.H. (1960). Plans and the Structure of Behaviour. New York: Holt, Rinehart and Winston.

Miron, M.S. (1961). The influence of instruction modification upon test-retest reliability of the semantic differential, Educational and Psychological Measurement, 21, 883-893.

Mitchell, R.A. (1968). The 1964 general election: cognitive dissonance and the semantic differential, Unpub. Dissertation, University of Sheffield.

Neisser, U. (1976). Cognition and Reality. San Francisco: Freeman.

Nel, E., Helmreich, R., and Aronson, E. (1973). Opinion change in the advocate as a function of the presuasibility of his audience: a clarification of the meaning of dissonance. In: N. Warren and M. Jahoda (Eds). Attitudes. Harmondsworth: Penguin.

Neuringer, C. (1963). Effect of the intellectual level and neuro-psychiatric states on the diversity and intensity of semantic differential ratings, Journal of Consulting Psychology, 27, 280.

Newsome, A., Thorne, B.J., and Wyld, K.L. (1973). Student Counselling in Practice. London: University of London Press.

Nie, N.H., Hull, C.H., Jenkins, J., Steinbrenner, K., and Bent, D. (1975). Statistical Package for the Social Sciences (SPSS) (2nd Edition). New York: McGraw Hill.

Nisbet, J.D. (1980). Educational Research: The State of the Art. In: W.B. Dockrell and D. Hamilton (Eds). Re-thinking Educational Research. London: Hodder and Stoughton.

Norman, W.T. (1959). Stability characteristics of the semantic differential, American Journal of Psychology, 72, 581-584.

Oppenheim, A.N. (1966). Questionnaire Design and Attitude Measurement. London: Heinemann Educational Books.

Osgood, C.E. (1965). Cross-cultural comparability in attitude research via multi-lingual semantic differentials. In: I. Steiner, and M. Fishbein (Eds). Current Studies in Social Psychology. New York: Holt, Rinehart and Winston.

Osgood, C.E., Suci, G.J., and Tannenbaum, P.H. (1957). The Measurement of Meaning. Urbana, Illinois: University of Illinois Press.

Ostrom, T.M. (1969). The relationship between affective, behavioural and cognitive components of attitude, Journal of Experimental Social Psychology, 5, 12-30.

Parlett, M.R., and Hamilton, D. (1976). Evaluation as illumination. In: D. Tawney (Ed), Curriculum Evaluation Today: Trends and Implications, (Schools Council Research Studies). London: Macmillan.

Parlett, M.R., and King, J.G. (1971). Concentrated study: a pedagogic innovation observed. (Research in Education Monograph No.4). London: Society for Research in Higher Education.

Parry, J. (1967). The Psychology of Human Communication. London: University of London Press.

Pask, G., and Scott, B.C.E. (1975). Learning strategies and individual competence. In: J.M. Whitehead (Ed). Personality and Learning, Vol. 1. London: Hodder and Stoughton/Open University Press.

Perry, W.G. Jr. (1970). Forms of Intellectual and Ethical Development in the College Years. New York: Holt, Rinehart and Winston.

Peters, R. (1958). The Concept of Motivation. London: Routledge and Kegan Paul.

Postle, D. (1980). Catastrophe Theory. London: Fontana (William Collins).

Poston, T., and Stewart, I. (1978). Nonlinear modelling of multistable perception, Behavioural Science, 23, 318-334.

Preece, P.F.W. (1978). Problems of discipline on teaching practice, Research Intelligence, 3, 2, 22-23.

Preece, P.F.W. (1979). Student teacher anxiety and class-control problems on teaching practice: a cross-lagged panel analysis, British educational Research Journal, 5, 1, 13-19.

Ramsden, P., and Entwistle, N.J. (1981). Effects of academic departments on students' approaches to studying, British Journal of Educational Psychology, 51, 368-383.

Rokeach, M. (1960). The Open and Closed Mind. New York: Basic Books.

Rokeach, M. (1968). Beliefs, Attitudes and Values. San Francisco: Jossey-Bass.

Rosander, A.C. (1937). An attitude scale based upon behaviour situations, Journal of Social Psychology, 8, 3-15.

Rosenberg, M.J., Hovland, C.I., McGuire, W.J., Abelson, R.P., and Brehm, J.W. (1960). Attitude Organisation and Change. New York: Yale University Press.

Rotter, J.B. (1966). Generalised expectancies of internal versus external control of reinforcement, Psychological Monographs, 80, 1, 1-28.

Runkel, P.J., and Damrin, D.E. (1961). Effects of training and anxiety upon teachers' preferences for information about students, Journal of Educational Psychology, 52, 254-261.

Ryle, G. (1949). The Concept of Mind. London: Hutchinson.

Saari, D.G.A. (1977). A qualitative model for the dynamics of cognitive processes. Journal of Mathematical Psychology. 15, 145-168.

Sarason, I.G. (1972). Personality: An Objective Approach. New York: John Wiley.

Schachter, S., and Singer, J.E. (1962). Cognitive, social and physiological determinants of emotion state. Psychological Review, 69, 379-399.

Schroder, H.M., Driver, M.J., and Streufert, S. (1967). Human Information Processing. New York: Holt, Rinehart and Winston.

Schwab, J.J. (1964). Structure of the disciplines: meanings and significancies. In: G.W. Ford and L. Pugno (Eds). The Structure of Knowledge and the Curriculum. Chicago: Rand McNally.

Shafer, M.A. (1976). A catastrophe theory model for ambiguous figure perception. Social Sciences Working Paper No. 110a, University of California, Irvine, October.

Skemp, R.R. (1979). Intelligence, Learning and Action. Chichester, John Wiley.

Stenhouse, L. (1975). An Introduction to Curriculum Research and Development. London: Heinemann.

Tall, D. (1977). Conflicts and catastrophes in the learning of mathematics, Mathematical Education for Teaching, 2, 4, 3-18.

Taylor, J.A. (1953). A personality scale of manifest anxiety. J. abnorm. soc. Psychol., 48, 285-290.

Teevan, R.C., and Fischer, R.I. (1966). Hostile press and internal versus external standards of success and failure. Technical Report No. 19. (Cited in: Birney, Burdick and Teevan, 1969).

Thom, R. (1972). Stabilite Structurelle et morphogenese. New York: Benjamin. (Translated by D.H. Fowler, 1975, Benjamin).

Thurstone, L.L. (1931). The measurement of attitudes, Journal of Abnormal and Social Psychology, 26, 249-269.

Tittle, C.R., and Hill, R.J. (1967). Attitude measurement and prediction of behaviour: an evaluation of conditions and measurement techniques, Sociometry, 30, 199-213.

Tolman, E.C. (1948). Cognitive maps in rats and men, Psychological Review, 55, 189-208.

Triandis, H.C. (1967). Toward an analysis of the components of interpersonal attitudes. In: C.W. Sherif and M. Sherif (Eds). Attitude, Ego-Involvement and Change. New York: Wiley.

Triandis, H.C. (1971). Attitudes and Attitude Change. New York: Wiley.

Valins, S. (1966). Cognitive effects of false heart-rate feedback, Journal of Personality and Social Psychology, 4, 400-408.

Warr, P., and Knapper, C. (1968). The Perception of People and Events. London: John Wiley.

Warren, N., and Jahoda, M. (1973). Attitudes. Harmondsworth: Penguin.

Weiner, B. (1972). Theories of Motivation: from Mechanism to Cognition. Chicago: Markham.

Weiner, B. (1974). Achievement Motivation and Attribution Theory. Morristown, N.J.: General Learning Press.

Weiss, J.M. (1972). Psychological factors in stress and disease. (Psychology in Progress). New York: Scientific American.

Welsh, G.S. (1952). An anxiety index and an internalization ratio for the MMPI. J. consult. Psychol., 16, 65-72.

White, R.W. (1959). Motivation reconsidered: the concept of competence, Psychological Review, 66, 297-333.

Woodcock, A., and Davis, M. (1980). Catastrophe Theory. Harmondsworth: Penguin.

Yerkes, R.M., and Dodson, J.D. (1908). The relation of strength of stimulus to rapidity of habit-formation, Journal of Comparative Neurology and Psychology, 18, 459-482.

Zeeman, E.C. (1976). Catastrophe Theory, Scientific American, 234, 4, 65-83.

Zeeman, E.C. (1977a). Catastrophe Theory: Selected Papers, 1972-1977. Reading, Mass.: Addison-Wesley.

Zeeman, E.C. (1977b). Catastrophe models applied to psychology and crime. Presented at 139th Annual Meeting of the British Association for the Advancement of Science, University of Aston in Birmingham, September.

Zeeman, E.C., Hall, C.S., Harrison, P.J., Marriage, G.H., and Shapland, P.H. (1976). A model for institutional disturbances, British Journal of Mathematical and Statistical Psychology, 29, 66-80.

APPENDICES

APPENDIX I

Outline of a Scheme Indicating the Nature of Intellectual and Ethical Development during the College Years (After Perry, 1970. pp 9-10)

The study reported by Perry was designed to reveal the broad stages in cognitive and moral development followed by a group of students who, by definition, would have achieved the final stages of a more general global scehme such as that of Piaget.

The stages in development of this intellectually sophisticated group were summarised in terms of a series of 'positions', or sequential stages, ranging between the relatively naive 'Dualism' to the relatively sophisticated and developmentally mature 'Relativism'.

The following outline, taken verbatim from Perry, indicates the nature of the developmental scheme.

MAIN LINE OF DEVELOPMENT

Position 1: The student sees the world in polar terms of we-right-good vs. other-wrong-bad. Right Answers for everything exist in the Absolute, known to Authority whose role is to mediate (teach) them. Knowledge and goodness are perceived as quantitative accretions of discrete rightnesses to be collected by hard work and obedience (paradigm: a spelling test).

Position 2: The student perceives diversity of opinion, and uncertainty, and accounts for them as unwarranted confusion in poorly qualified Authorities or as mere exercises set by Authority "so we can learn to find The Answer for ourselves."

Position 3: The student accepts diversity and uncertainty as legitimate but still temporary in areas where Authority "hasn't found the Answer yet." He supposes Authority grades him in these areas on "good expression" but remains puzzled as to standards.

Position 4: (a) The student perceives legitimate uncertainty (and therefore diversity of opinion) to be extensive and raises it to the status of an unstructured epistemological realm of its own in which "anyone has a right to his own opinion," a realm which he sets over against Authority's realm where right-wrong still prevails, or (b) the student discovers qualitative contextual relativistic reasoning as a special case of 'what They want" within Authority's realm.

Position 5: The student perceives all knowledge and values (including authority's) as contextual and relativistic and subordinates dualistic right-wrong functions to the status of a special case, in context.

Position 6: The student apprehends the necessity of orienting himself in a relativistic world through some form of personal Commitment (as distinct from unquestioned or unconsidered commitment to simple belief in certainty).

-continued-

Position 7: The student makes an initial Commitment in some area.

Position 8: The student experiences the implications of Commitment, and explores the subjective and stylistic issues of responsibility.

Position 9: The student experiences the affirmation of identity among multiple responsibilities and realizes Commitment as an ongoing, unfolding activity through which he expresses his life style.

CONDITIONS OF DELAY, DEFLECTION, AND REGRESSION

Temporizing: The student delays in some Position for a year, exploring its implications or explicitly hesitating to take the next step.

Escape: The student exploits the opportunity for detachment offered by the structures of Positions 4 and 5 to deny responsibility through passive or opportunistic alienation.

Retreat: The student entrenches in the dualistic, absolutistic structures of Positions 2 or 3.

APPENDIX II

Specimen Copies of the Instruments Used, with Scoring Key where Appropriate:

(i) Delay Tendency Questionnaire

(ii) Achievement Anxiety Test (AAT)

(iii) Success-Failure Criteria

(iv) Study Emphasis Diary : Specimen Sheet

(v) Scoring Key for the Semantic Differential Scales

DELAY TENDENCY QUESTIONNAIRE (DTQ)

SURVEY OF STUDY HABITS AND ATTITUDES

NAME .....

This questionnaire is concerned with an investigation into study habits and attitudes among students in colleges. Your responses will be treated as strictly confidential: this investigation is not organised by the college and your answers will not be seen by the college authorities.

Please note:

You are asked to RATE YOURSELF AS YOU ARE and not as you or others may think you should be. This is very important, and the results of the survey will be invalid if you do not adhere to this request.

Instructions

Please put a tick in one of the spaces marked R S F G A against each statement in the questionnaire. The meaning of these letters is given at the head of each page. No other marks of any kind should be made.

Thank you for your help.

R = RARELY (0% to 15%) S = SOMETIMES(16% to 35%)	F = FREQUENTLY(36% to 65%)	G = GENERALLY (66% to 85%) A = ALMOST ALWAYS(86% to 100%)

		R	S	F	G	A
1.	When my assignments are extra long or unusually difficult, I either give up in disgust or study only the easier aspects.	5	4	3	2	1
2.	When I fall behind in my college work for some unavoidable reason, I catch up with the backlog without prompting from tutors.	1	2	3	4	5
3.	Daydreaming about dates, future plans, etc., distracts my attention from the work while I am studying.	5	4	3	2	1
4.	Even though an assignment is dull and boring I stick to it until it is completed.	1	2	3	4	5
5.	I keep all the notes for each subject together, carefully arranging them in some logical order.	1	2	3	4	5
6.	When I am having difficulty with my college work I try to talk over the trouble with the tutors concerned.	1	2	3	4	5
7.	I lay aside returned work without bothering to note or correct errors indicated by the marker.	5	4	3	2	1
8.	I keep my place of study business-like and cleared of unnecessary or distracting items, such as pictures, letters or mementos, etc.	1	2	3	4	5
9.	Telephone calls, people coming in and out of my room, sessions with my friends, etc., interfere with my studying.	5	4	3	2	1
10.	It takes a long time for me to get warmed up to the task of studying.	5	4	3	2	1
11.	I am unable to concentrate well because of periods of restlessness, moodiness or depression.	5	4	3	2	1
12.	I put off writing up my work until the last minute.	5	4	3	2	1
13.	When I sit down to study I find myself too tired, bored or sleepy to study efficiently.	5	4	3	2	1
14.	I waste too much time talking, reading magazines, listening to the radio, watching T.V., going to the cinema, for the good of my studies.	5	4	3	2	1

Contd.,

R = RARELY (0% to 15%) | S = SOMETIMES (16% to 35%) | F = FREQUENTLY (36% to 65%) | G = GENERALLY (66% to 85%) | A = ALMOST ALWAYS (86% to 100%)

		R	S	F	G	A
15.	My studying is done in a random, unplanned manner - is impelled mostly by approaching deadlines.	5	4	3	2	1
16.	"Extra-curricular activities" - boy/girl friends, clubs and societies, and college socials - cause me to get behind with my college work.	5	4	3	2	1
17.	I utilise the periods between lectures for studying so as to reduce the evening's work.	1	2	3	4	5
18.	Problems outside of college - financial difficulties, being in love, conflict with parents, etc., - cause me to neglect my college work.	5	4	3	2	1
19.	I complete my assignments on time.	1	2	3	4	5
20.	With me studying is a hit-or-miss affair depending on the mood I'm in.	5	4	3	2	1
21.	I study for three hours or more per day outside of lectures.	1	2	3	4	5
22.	I keep my assignments up to date by doing my work regularly from day to day.	1	2	3	4	5
23.	At the beginning of a study period I organise my work so that I will utilise the time most effectively.	1	2	3	4	5
24.	I can dismiss study problems from my mind if I feel that they are not urgent.	5	4	3	2	1
25.	I work best under pressure.	5	4	3	2	1
26.	For me social activities are as important as study in college life.	5	4	3	2	1
27.	Regular, steady work is essential for my peace of mind.	1	2	3	4	5
28.	I am conscious of making a sacrifice when I give up time to study.	5	4	3	2	1

Contd./

R = RARELY (0% to 15%) S = SOMETIMES(16% to 35%)	F = FREQUENTLY(36% to 65%)	G = GENERALLY (66% to 85%) A = ALMOST ALWAYS(86% to 100%)

		R	S	F	G	A
29.	I need to avoid the strain of intensive study by delaying it as long as possible.	5	4	3	2	1
30.	I find it difficult to keep to a sustained study programme.	5	4	3	2	1
31.	I feel the need for frequent breaks with friends during periods of study.	5	4	3	2	1
32.	I find it hard to resume study after a pleasant social occasion.	5	4	3	2	1
33.	The amount of time I spend on study is left to chance.	5	4	3	2	1
34.	I feel that there is not enough study time to do all that I would like to do.	1	2	3	4	5
35.	I feel pangs of conscience when I am not working as well as I might.	1	2	3	4	5
36.	I think of 'study' and 'pleasure' as being two quite different aspects of my life.	5	4	3	2	1
37.	I easily become involved in social affairs at the expense of college work.	5	4	3	2	1
38.	The prospect of study strikes me as cold and forbidding.	5	4	3	2	1
39.	I would be irritated to find that I was having to work while my college friends were relaxing.	5	4	3	2	1
40.	I feel that the greatest difficulty with study is making a start.	5	4	3	2	1
41.	I would feel guilty to find that a few friends and myself were the only group not devoting most of the time to study.	1	2	3	4	5
42.	I would just as soon study as not if given the choice.	1	2	3	4	5

Contd./

R = RARELY (0% to 15%) S = SOMETIMES(16% to 35%)	F = FREQUENTLY(36% to 65%)	G = GENERALLY (66% to 85%) A = ALMOST ALWAYS(85% to 100%)

	R	S	F	G	A
43. If I left study until the last moment I would feel that too much was being left to chance.	1	2	3	4	5
44. I am easily distracted from work.	5	4	3	2	1
45. Returning to a normal social life after a period of intensive study is an immense relief for me.	5	4	3	2	1

Achievement Anxiety Test (AAT)

READ THE INSTRUCTIONS CAREFULLY
For all of the nineteen items below, answer each item by circling the one number which best indicates the degree to which the item applies to you.

1. Nervousness while taking an exam or test hinders me from doing well.

1 2 3 4 5

Never Always

2. I work most effectively under pressure, as when the task is very important.

1 2 3 4 5

Always Never

3. In a course where I have been doing poorly, my fear of a bad grade (mark) cuts down my efficiency.

1 2 3 4 5

Never Always

4. When I am poorly prepared for an exam or test, I get upset and do less well than even my restricted knowledge should allow.

1 2 3 4 5

This never happens to me — This practically always happens to me

5. The more important the examination, the less well I seem to do.

5 4 3 2 1

Always Never

6. While I may (or may not) be nervous before taking an exam, once I start I seem to forget to be nervous.

1 2 3 4 5

I always forget — I am always nervous during an exam

7. During exams or tests, I block on questions to which I know the answers, even though I might remember them as soon as the exam is over.

5 4 3 2 1

This always happens to me — I never block on questions to which I know the answers

8. Nervousness while taking a test helps me do better.

5 4 3 2 1

It never helps — It often helps

Instruction: answer each item by circling the one number which best indicates the degree to which the item applies to you.

9. When I start a test, nothing is able to distract me.

1 2 3 4 5

This is always true of me — This is not true of me

10. In courses in which the total grade (mark) is based mainly on one exam, I seem to do better than other people.

5 4 3 2 1

Never — Almost always

11. I find that my mind goes blank at the beginning of an exam, and it takes me a few minutes before I can function.

5 4 3 2 1

I almost always blank out at first — I never blank out at first

12. I look forward to exams.

5 4 3 2 1

Never — Always

13. I am so tired from worrying about an exam, that I find I almost do not care how well I do by the time I start the test.

1 2 3 4 5

I never feel this — I almost always feel this way

14. Time pressure on an exam causes me to do worse than the rest of the group under similar conditions.

5 4 3 2 1

Time pressure always seems to make me do worse on an exam than others — Time pressure never seems to make me do worse on an exam than others

15. Although "cramming" under pre-examination tension is not effective for most people, I find that if the need arrives, I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use on the exam.

1 2 3 4 5

I am always able to use the "crammed" material successfully — I am never able to use the "crammed" material successfully

16. I enjoy taking a difficult exam more than an easy one.

1 2 3 4 5

Always — Never

Instruction: answer each item by circling the one number which best indicates the degree to which the item applies to you.

17. I find myself reading exam questions without understanding them, and I must go back over them so that they will make sense.

1 2 3 4 5

Never Almost always

18. The more important the exam or test, the better I seem to do.

1 2 3 4 5

This is true of me This is not true of me

19. When I do not do well on a difficult item at the beginning of an exam, it tends to upset me so that I block even on easy questions later on.

1 2 3 4 5

This never happens to me This almost always happens to me

PLEASE CHECK THAT YOU HAVE ANSWERED ALL ITEMS

THANK YOU FOR YOUR CO-OPERATION.

ACHIEVEMENT ANXIETY TEST (AAT)

RATING SHEET

Name .....

Identification Number .....

Date of Administration.....

Facilitating Anxiety (AAT+)*

ITEM	RATING
2	
6	
8	
9	
10	
12	
15	
16	
18	
TOTAL	

* To obtain true AAT+ score, reverse ratings for the above 9 items i.e, 5s become 1s, 4s become 2s, 3s remain the same, 2s become 4s and 1s become 5s.

Debilitating Anxiety (AAT-)*

ITEM	RATING
1	
3	
4	
5	
7	
11	
13	
14	
17	
19	
TOTAL	

* Do not reverse the ratings

Final Scores	ATT+: ATT-:

SUCCESS-FAILURE CRITERIA

NAME .....

Please indicate the response which best describes you by underlining ONE only of the three possible responses (i.e. TRUE, UNCERTAIN, FALSE) for each statement below.

* 1.	Failure is primarily the inability to meet standards set by other people.	TRUE 1	UNCERTAIN 2	FALSE 3
2.	"Knowing the facts" is the most important outcome of study.	TRUE	UNCERTAIN	FALSE
* 3.	My own evaluation of my performance is more important than an evaluation made by other people.	TRUE 3	UNCERTAIN 2	FALSE 1
4.	I prefer areas of study where the answers are clear and definite.	TRUE	UNCERTAIN	FALSE
* 5.	Failure is primarily the inability to meet your own standards.	TRUE 3	UNCERTAIN 2	FALSE 1
6.	Where two theories contradict each other, one at least must be wrong.	TRUE	UNCERTAIN	FALSE
* 7.	I consider myself independent of other people when trying to determine how successful I have been in any endeavour.	TRUE 3	UNCERTAIN 2	FALSE 1
8.	I am tolerant of opinions that differ significantly from my own.	TRUE	UNCERTAIN	FALSE
* 9.	Success and failure are determined by self-evaluation rather than external evaluation.	TRUE 3	UNCERTAIN 2	FALSE 1
10.	There can only be one right answer to a problem.	TRUE	UNCERTAIN	FALSE
11.	I like to compare my understanding of college work with the understanding of other students.	TRUE	UNCERTAIN	FALSE

* Only starred items are scored for measurement of locus of Control (Teevan and Fischer, 1966).

Daily Estimate of 'Study Emphasis' for Educational Studies Course

Name .....

WEEK BEGINNING MONDAY 19

Note: The term 'study emphasis' refers to the combination of time, attention and effort that you give to study over any given period, such as one day.

S.E. SCALE

Try to estimate the extent of your 'study emphasis' for each day of the week in the course name above. You are asked to do this on the S.E. Scale given below. Simply put a x in the box which best estimates your degree of study emphasis.

COLUMN A

If you feel that the S.E. Scale is not extensive (high) enough on any particular day ignore the S.E. Scale and mark the estimated number in the appropriate box of Column A.

S.E. SCALE

	Low 0	+1	+2	+3	+4	+5	+6	+7	High +8	A
MON										
TUE										
WED										
THUR										
FRI										
SAT										
SUN										

This survey is merely concerned with fact-finding. It does not seek to judge you or to change your study pattern in any way, and it is hoped that it will interfere as little as possible in what is readily acknowledged to be your own area of responsibility.

Please hand or send this form in as soon as possible after completion.

Thank you very much for your co-operation.

Scoring Key for Semantic Differential Scales

severe	-3	-2	-1	0	+1	+2	+3	lenient
good	+3	+2	+1	0	-1	-2	-3	bad
passive	-3	-2	-1	0	+1	+2	+3	active
hard	-3	-2	-1	0	+1	+2	+3	soft
kind	+3	+2	+1	0	-1	-2	-3	cruel
difficult	-3	-2	-1	0	+1	+2	+3	easy
strong	+3	+2	+1	0	-1	-2	-3	weak
pleasurable	+3	+2	+1	0	-1	-2	-3	painful
complex	-3	-2	-1	0	+1	+2	+3	simple
cowardly	-3	-2	-1	0	+1	+2	+3	brave
successful	+3	+2	+1	0	-1	-2	-3	unsuccessful
excitable	-3	-2	-1	0	+1	+2	+3	calm
prohibitive	-3	-2	-1	0	+1	+2	+3	permissive
positive	+3	+2	+1	0	-1	-2	-3	negative
intentional	+3	+2	+1	0	-1	-2	-3	unintentional
avoiding	-3	-2	-1	0	+1	+2	+3	pursuing

Descriptive Statistics for the Delay Tendency Questionnaire (DTQ) Data.

ITEM	MEAN	STANDARD DEVIATION	STANDARD ERROR	VARIANCE	KURTOSIS	SKEWNESS
1	4.04	0.89	0.12	0.78	-0.01	-0.76
2	4.42	0.98	0.14	0.96	4.14	-2.07
3	3.35	0.97	0.13	0.94	0.22	-0.61
4	4.17	1.00	0.14	1.01	2.22	-1.52
5	3.83	1.51	0.21	2.26	-0.95	-0.82
6	2.12	1.34	0.19	1.79	-0.48	0.93
7	3.62	1.40	0.19	1.97	-0.94	-0.63
8	1.89	1.17	0.16	1.36	-0.19	1.05
9	2.90	1.30	0.18	1.70	-1.04	-0.90
10	2.81	1.17	0.16	1.37	-1.10	-0.14
11	3.73	1.14	0.16	1.30	0.45	-1.06
12	2.94	1.31	0.18	1.70	-1.16	0.05
13	3.71	0.85	0.12	0.72	0.04	-0.78
14	3.54	1.11	0.15	1.23	0.04	-0.75
15	3.10	1.46	0.20	2.13	-1.40	0.06
16	4.33	0.81	0.11	0.66	0.71	-1.10
17	2.64	1.30	0.18	1.69	-1.18	0.27
18	4.37	0.72	0.10	0.51	0.80	-0.98
19	4.23	1.06	0.15	1.12	0.96	-1.37
20	3.98	1.00	0.14	1.00	0.12	-0.79
21	2.73	1.46	0.20	2.12	-1.22	0.36
22	2.67	1.53	0.21	2.34	-1.37	0.36
23	2.60	1.35	0.19	1.81	-1.16	0.33
24	2.71	1.23	0.17	1.50	-0.89	0.37
25	2.62	1.26	0.17	1.58	-1.01	0.34
26	2.81	1.33	0.18	1.77	-1.16	0.26
27	3.00	1.44	0.20	2.08	-1.40	0.16
28	4.15	1.09	0.15	1.19	3.04	-1.86

-continued-

ITEM	MEAN	STANDARD DEVIATION	STANDARD ERROR	VARIANCE	KURTOSIS	SKEWNESS
29	4.25	0.99	0.14	0.98	1.40	-1.38
30	3.31	1.21	0.17	1.47	-0.80	-0.41
31	3.40	1.19	0.17	1.42	-0.51	-0.54
32	3.35	1.19	0.17	1.40	-0.80	-0.41
33	3.83	1.20	0.17	1.44	-0.54	-0.76
34	3.00	1.43	0.20	2.04	-1.35	0.25
35	3.67	1.12	0.16	1.24	-0.84	-0.44
36	3.25	1.34	0.19	1.80	-1.20	-0.22
37	3.94	1.11	0.15	1.23	1.48	-1.36
38	3.96	1.15	0.16	1.33	1.10	-1.32
39	3.48	1.38	0.19	1.90	-0.80	-0.64
40	2.44	1.31	0.18	1.70	-0.78	0.58
41	2.96	1.46	0.20	2.12	-1.39	0.03
42	2.69	1.23	0.17	1.51	-1.02	0.28
43	2.90	1.53	0.21	2.36	-1.52	0.16
44	3.19	1.21	0.17	1.45	-0.74	-0.51
45	2.40	1.45	0.20	2.09	-1.26	0.45

Factor Analysis of the Delay Tendency Questionnaire (DTQ) Data.
Factor Matrix after Varimax Rotation. (Decimal points omitted).

ITEM	FACTORS					
	1	2	3	4	5	6
01	23	14	10	47	-09	10
02	10	06	78	11	03	11
03	27	24	12	55	44	12
04	25	01	55	05	-01	05
05	34	-06	21	22	-08	-42
06	07	-12	15	36	-16	-08
07	06	06	07	53	33	21
08	29	24	03	34	06	-22
09	05	10	-07	50	05	19
10	22	24	23	29	50	00
11	23	03	-01	14	62	12
12	39	16	36	29	35	-28
13	09	-26	24	38	47	24
14	22	14	05	65	09	10
15	16	10	39	62	21	-13
16	01	-14	43	44	38	22
17	22	16	11	52	-32	-07
18	29	-29	25	13	08	22
19	06	07	78	13	16	-09
20	41	-20	09	57	15	-01
21	54	29	14	32	-18	-12
22	65	09	36	41	01	-10
23	11	-11	12	61	02	-15
24	16	27	06	21	02	07
25	15	-14	07	-02	-07	-56
26	20	37	08	13	-42	03
27	70	03	09	25	11	-02

-continued-

ITEM	FACTORS					
	1	2	3	4	5	6
28	20	43	-40	02	47	12
29	56	17	-05	27	11	-13
30	52	07	25	55	12	-03
31	28	54	-21	33	07	19
32	10	03	29	32	01	62
33	43	06	09	45	-03	-18
34	26	10	-18	39	-37	17
35	10	00	-05	02	-38	-07
36	08	18	01	03	20	43
37	39	07	22	34	07	39
38	09	38	-07	56	32	12
39	26	69	-07	20	02	05
40	-08	71	21	-01	01	14
41	49	-23	16	09	-07	15
42	59	24	-10	-24	12	18
43	59	10	28	28	-13	-30
44	00	43	12	60	12	06
45	-32	59	16	-12	00	46

DTQ Summative Scores for Students
Characterised by Internal and External Locus of Control (LC)

LC Mean 10.40 DTQ Mean 149.02

CASE NO.	INT.L.C. SCORE	DTQ SCORE	CASE NO.	EXT.L.C. SCORE	DTQ SCORE
01	13	162	04	8	126
02	13	192	06	5	138
03	12	157	07	9	167
05	11	99	08	6	168
09	15	111	10	8	171
12	12	144	11	9	113
15	13	164	13	10	124
18	11	115	14	8	176
21	11	135	16	8	160
23	12	193	17	8	178
27	11	152	19	6	135
28	15	132	20	10	155
31	11	164	22	10	168
32	11	191	24	7	115
36	15	148	25	10	153
38	15	126	26	8	128
41	11	188	29	9	149
42	12	93	30	10	155
43	15	130	33	6	129
44	13	133	34	9	195
47	11	131	35	8	126
48	13	169	37	9	138
49	13	170	39	5	148
50	11	176	40	10	134
51	15	147	45	7	163
52	14	169	46	9	146

Cases above the LC Mean are classed as 'Internal'
Cases below the LC Mean are classed as 'External'

Factor Analysis of Semantic Differential Data.
Matrix for Concept 'SELF' after Varimax Rotation.
(Decimal points omitted).

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
01	-15	24	02	56	14
02	05	60	-01	00	04
03	70	04	-23	-03	-11
04	-22	-06	07	45	-07
05	-10	71	05	04	-05
06	02	14	11	04	-56
07	55	43	-03	-04	08
08	11	65	07	28	-19
09	02	09	68	22	-05
10	69	-13	18	-16	-19
11	50	35	-02	29	06
12	-12	-01	61	-17	-13
13	26	06	-30	44	29
14	48	04	-21	-20	15
15	07	48	-08	-14	55
16	67	-13	04	-15	38

Factor Analysis of Semantic Differential Data.
Matrix for Concept 'SEMINAR' after Varimax
Rotation. (Decimal points omitted).

ITEM	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
17	17	51	02	43	13
18	31	-21	31	46	28
19	41	-20	17	39	59
20	13	75	12	-07	-18
21	42	38	28	-04	-16
22	15	40	-11	33	-14
23	22	-21	54	24	00
24	28	06	35	76	-03
25	-28	73	-17	-08	-21
26	04	20	62	18	36
27	67	00	26	32	05
28	-08	21	01	06	-52
29	72	08	-01	30	17
30	70	-06	35	29	24
31	27	00	49	02	-08
32	66	14	40	01	13

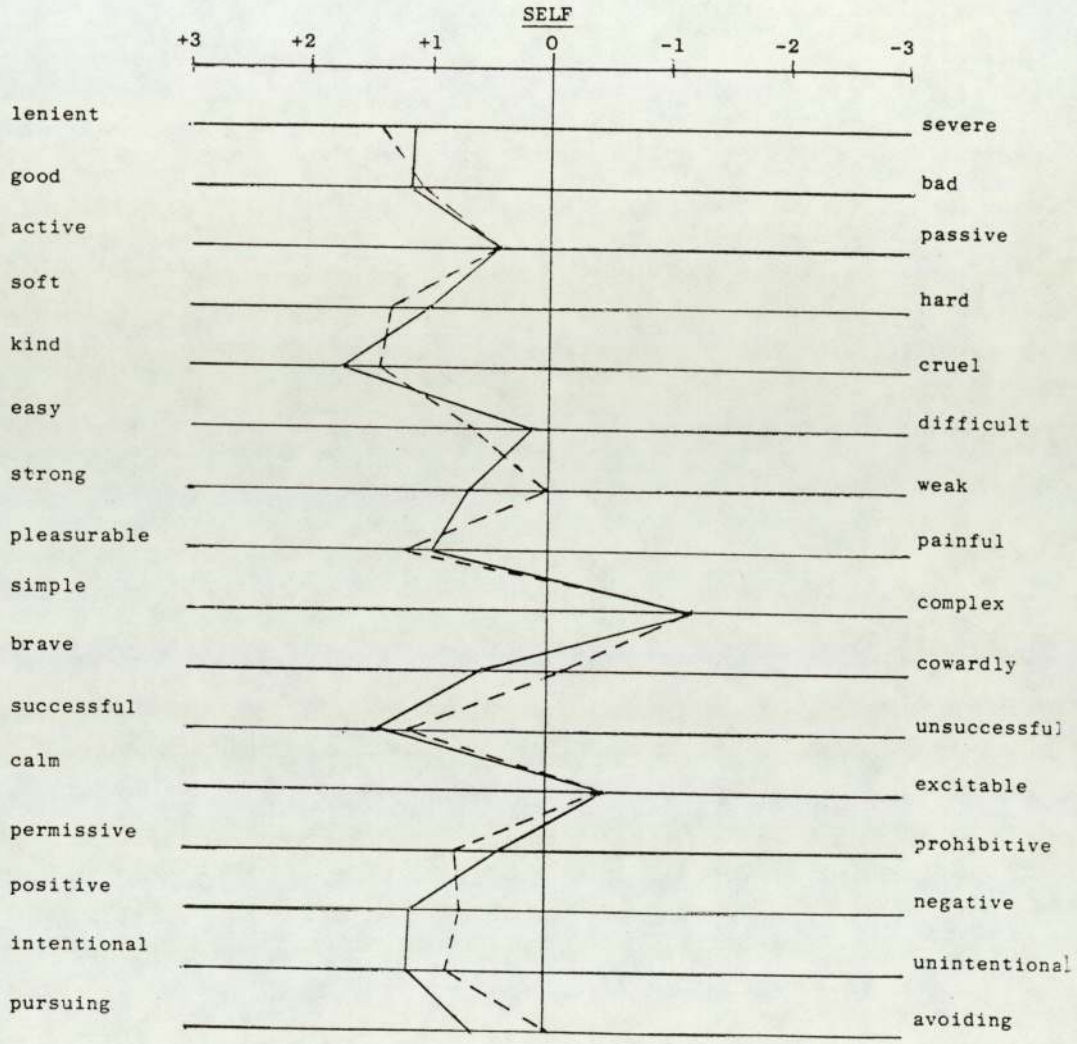
APPENDIX VII

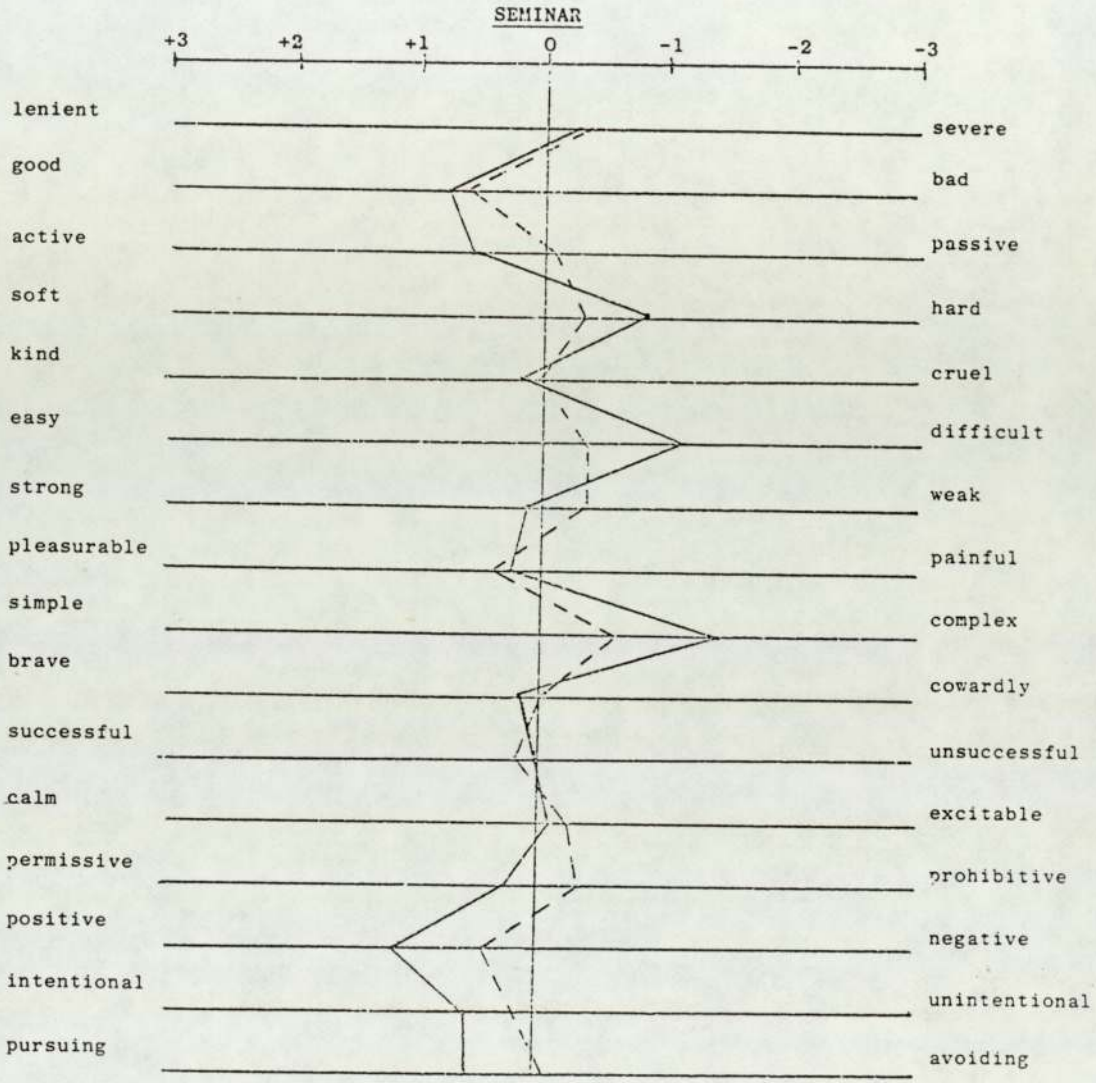
Semantic Differential Data:

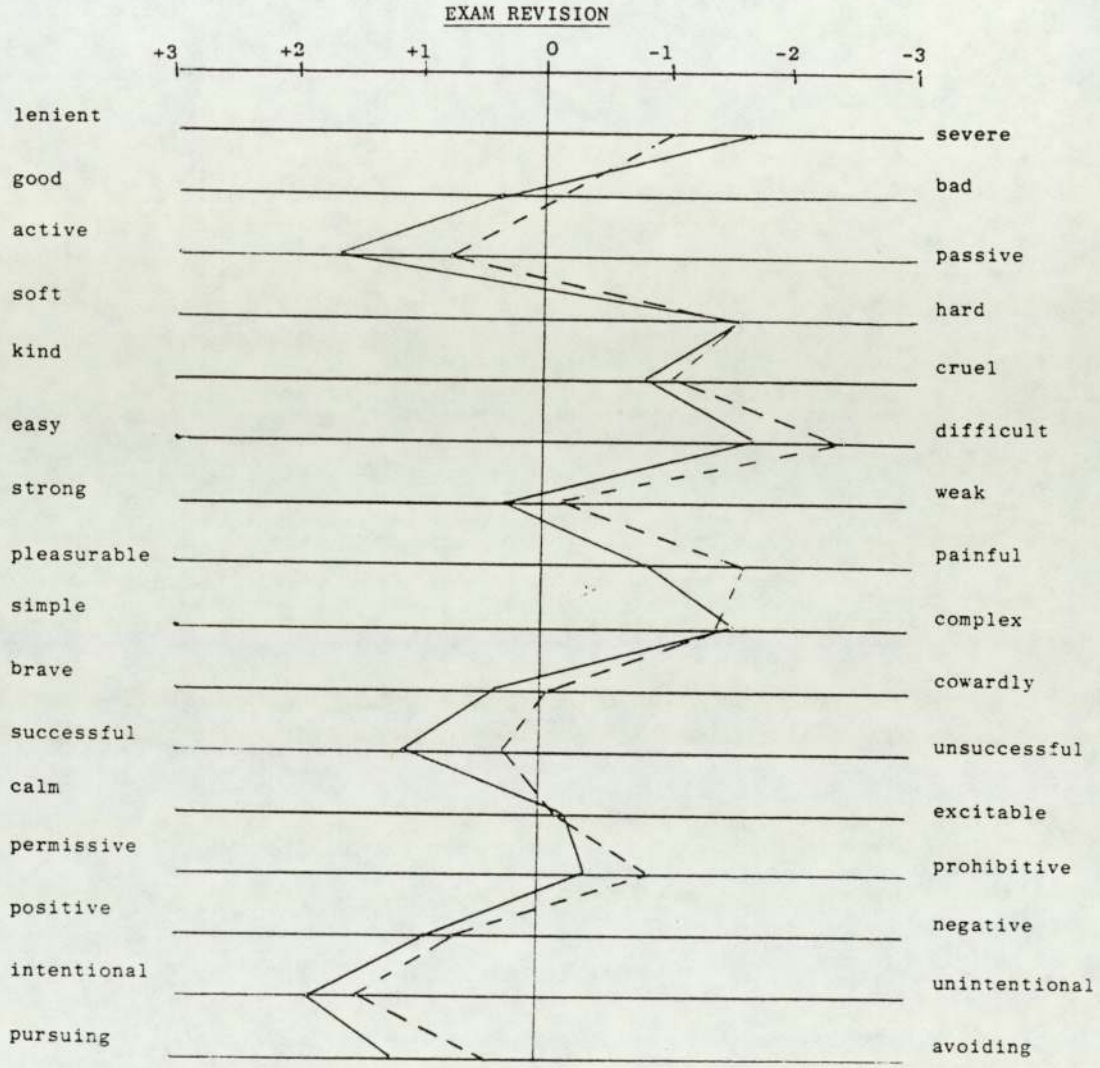
Mean Score Profiles for High DTQ (AP),
and Low DTQ (AV), Summative Score
Subgroups Respectively.

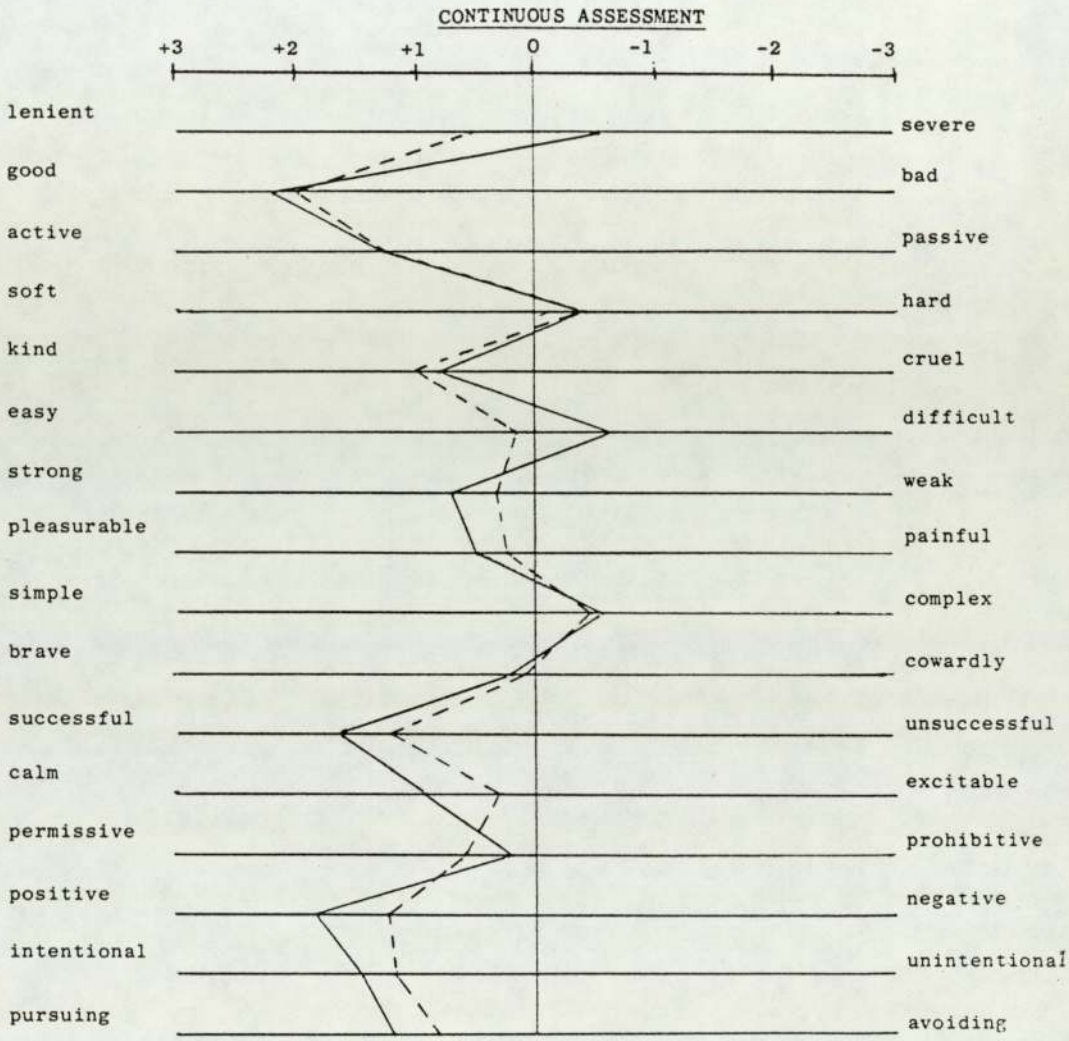
Key AP : continuous line

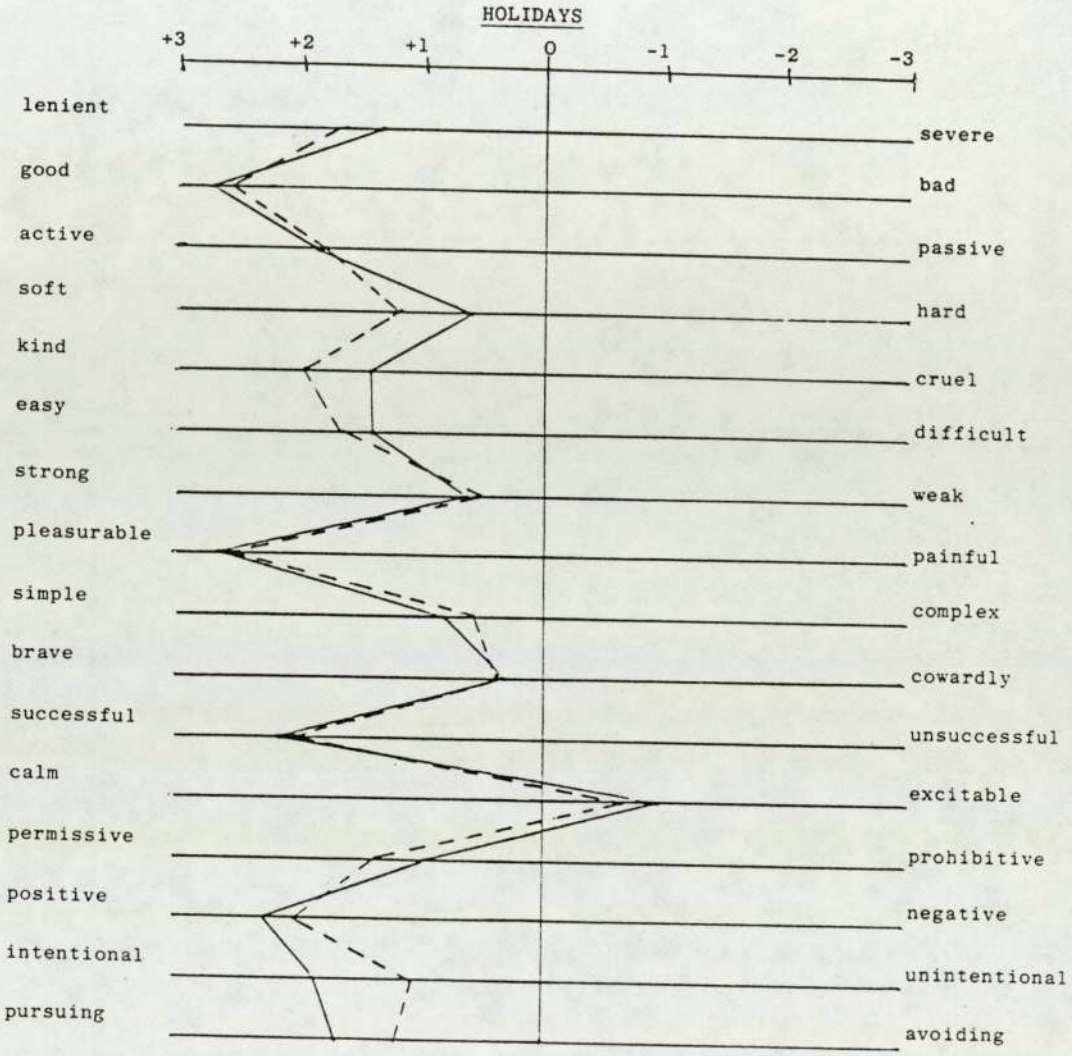
AV : broken line

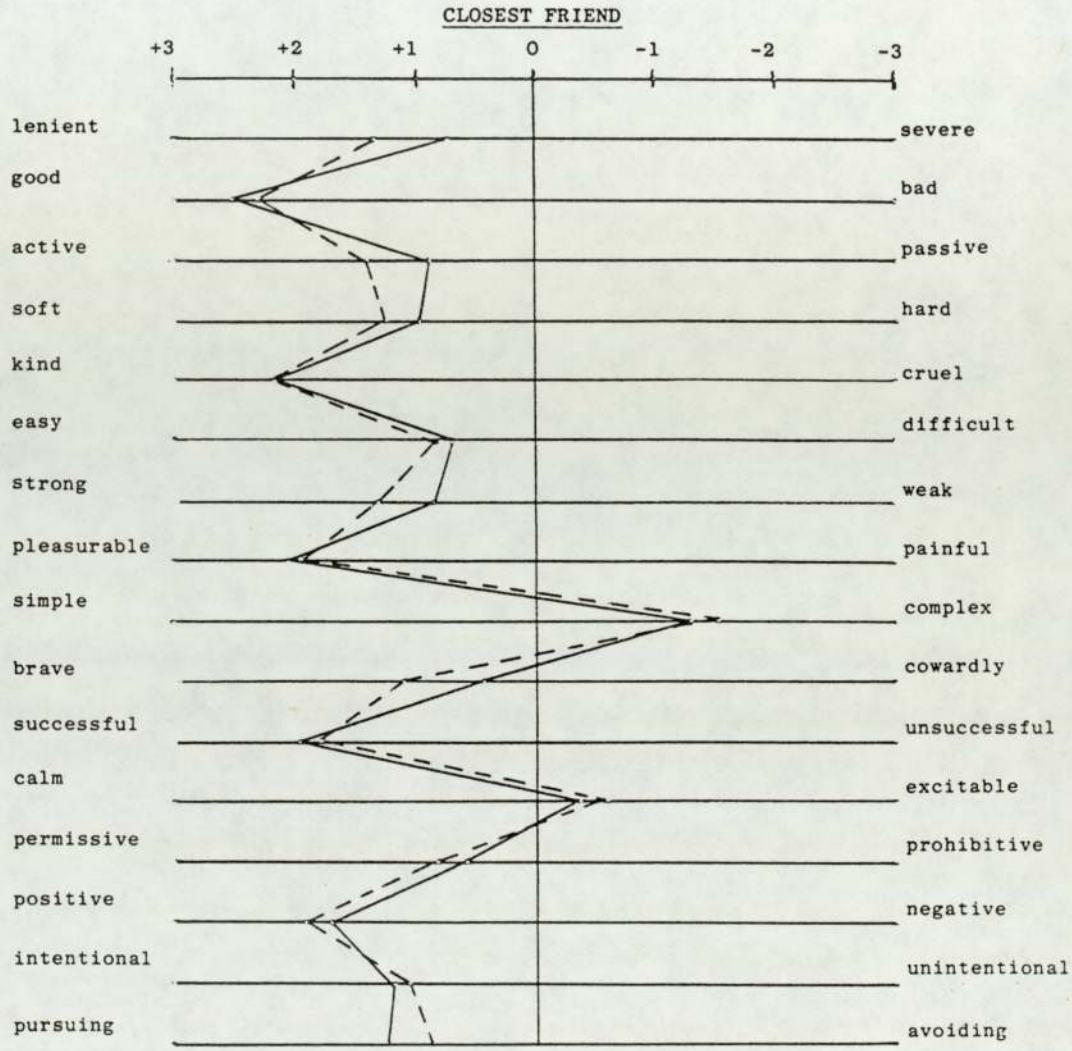

SELF
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

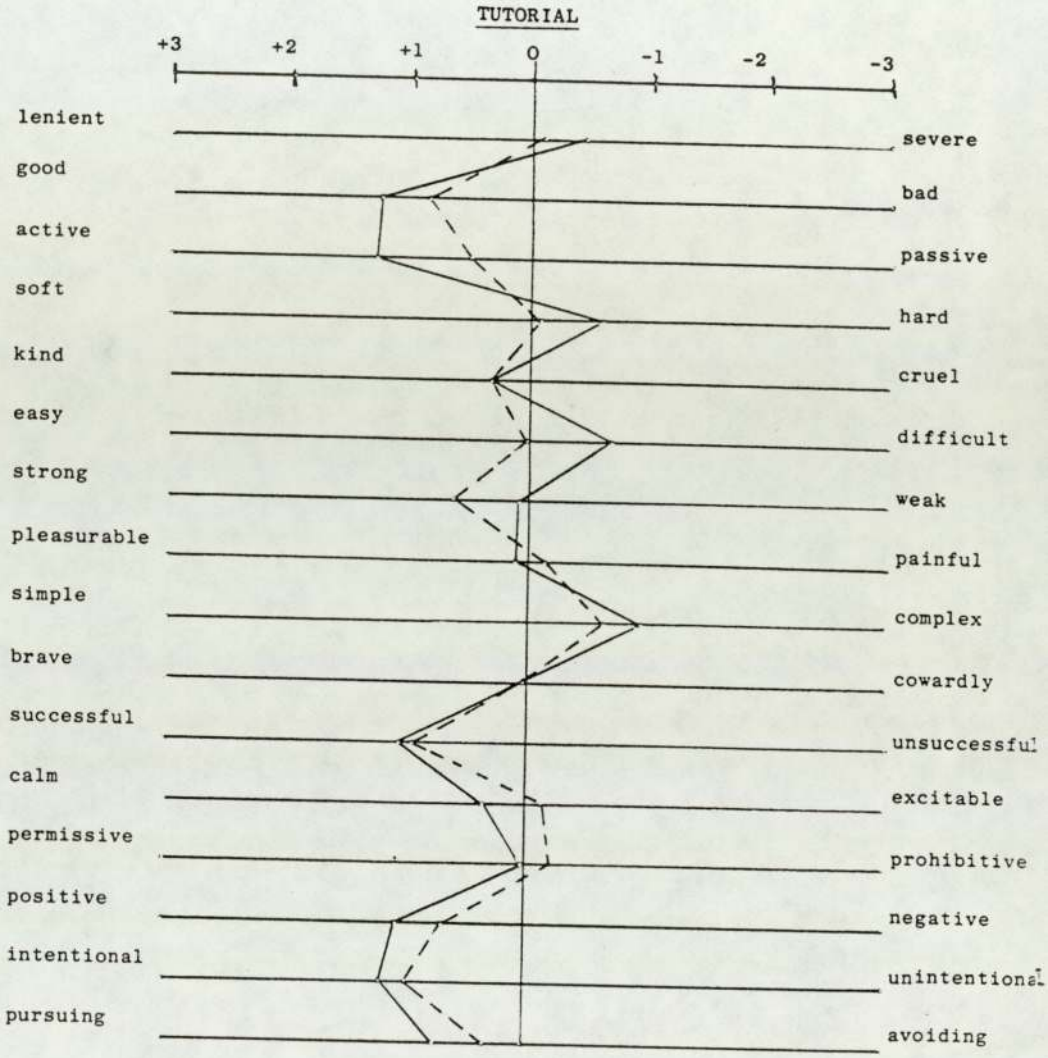

SEMINAR
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

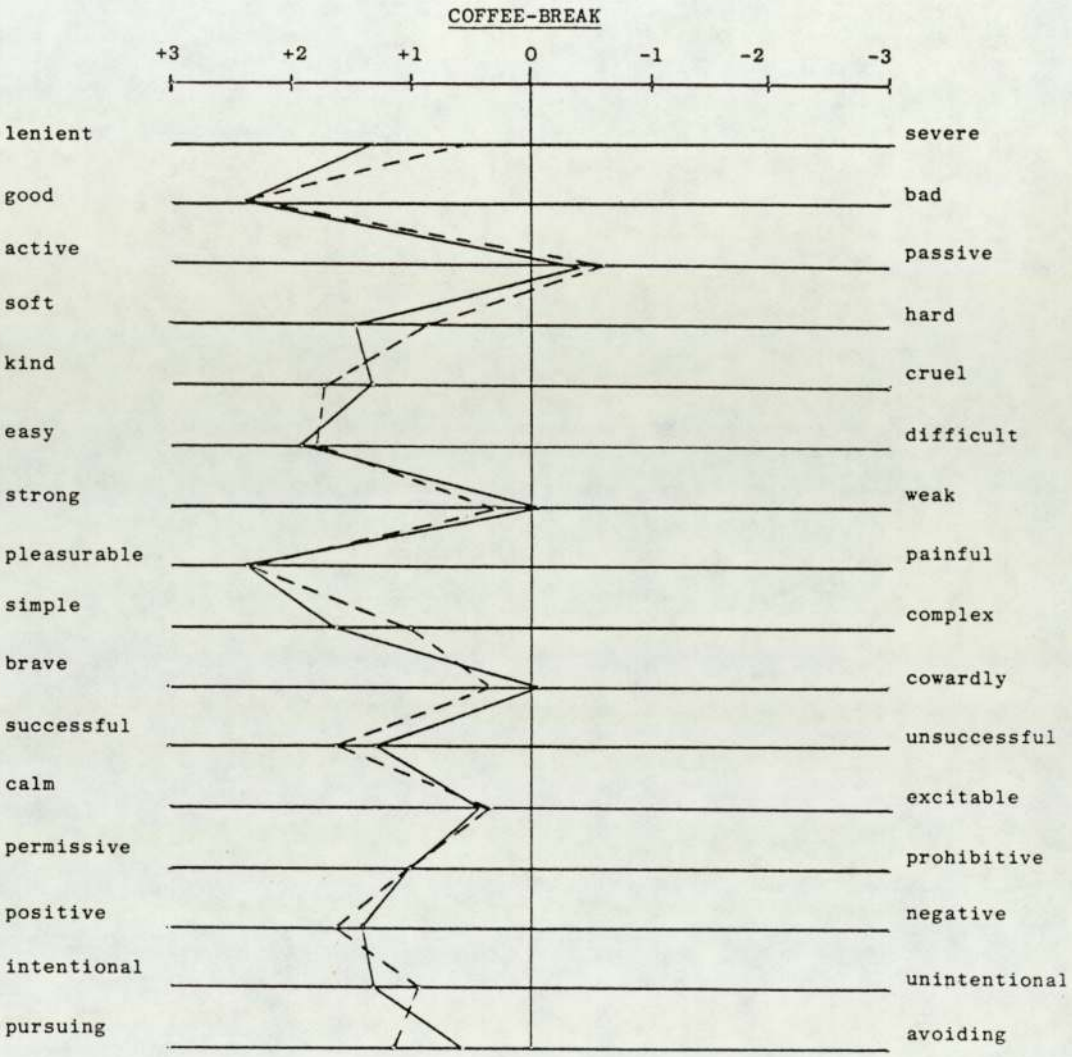

EXAM REVISION
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

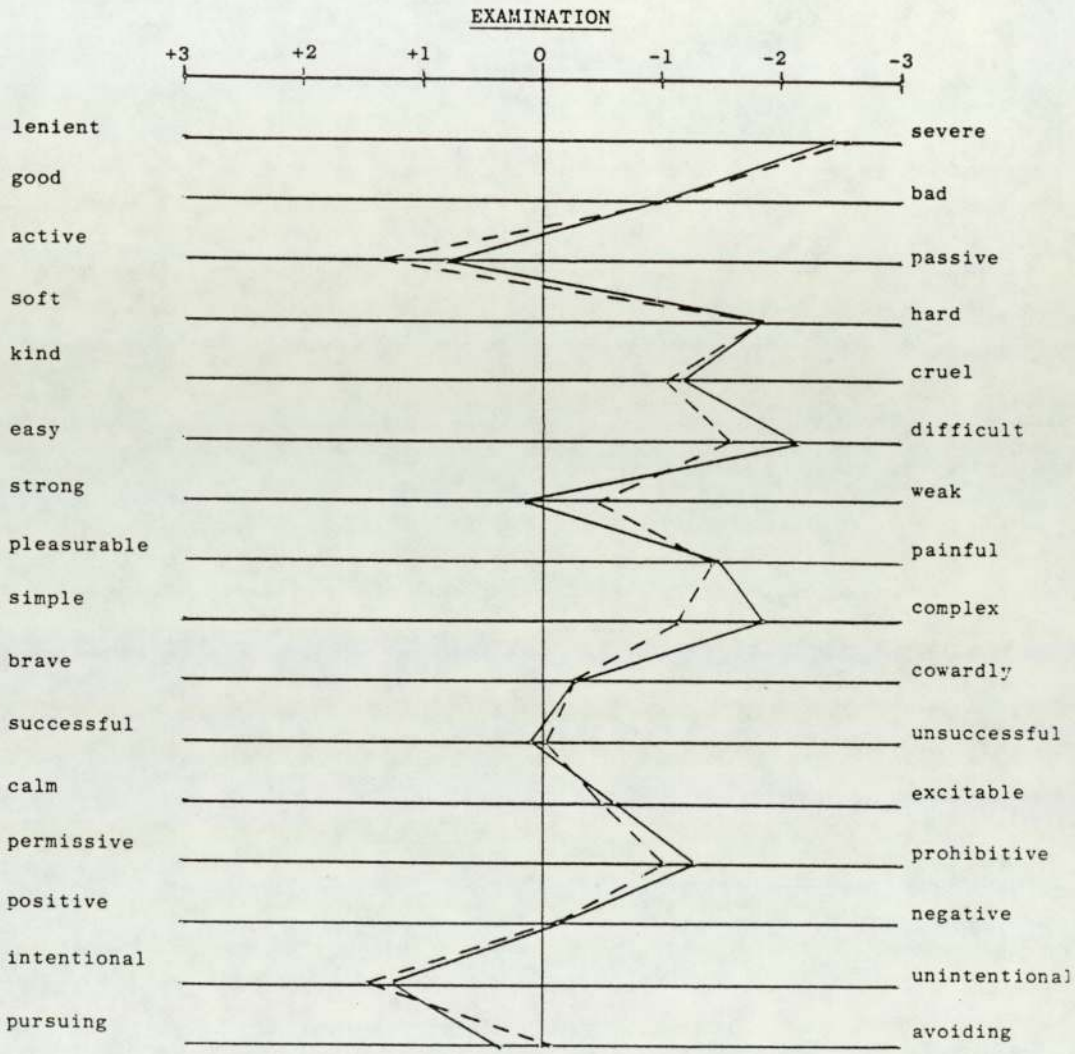

CONTINUOUS ASSESSMENT
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

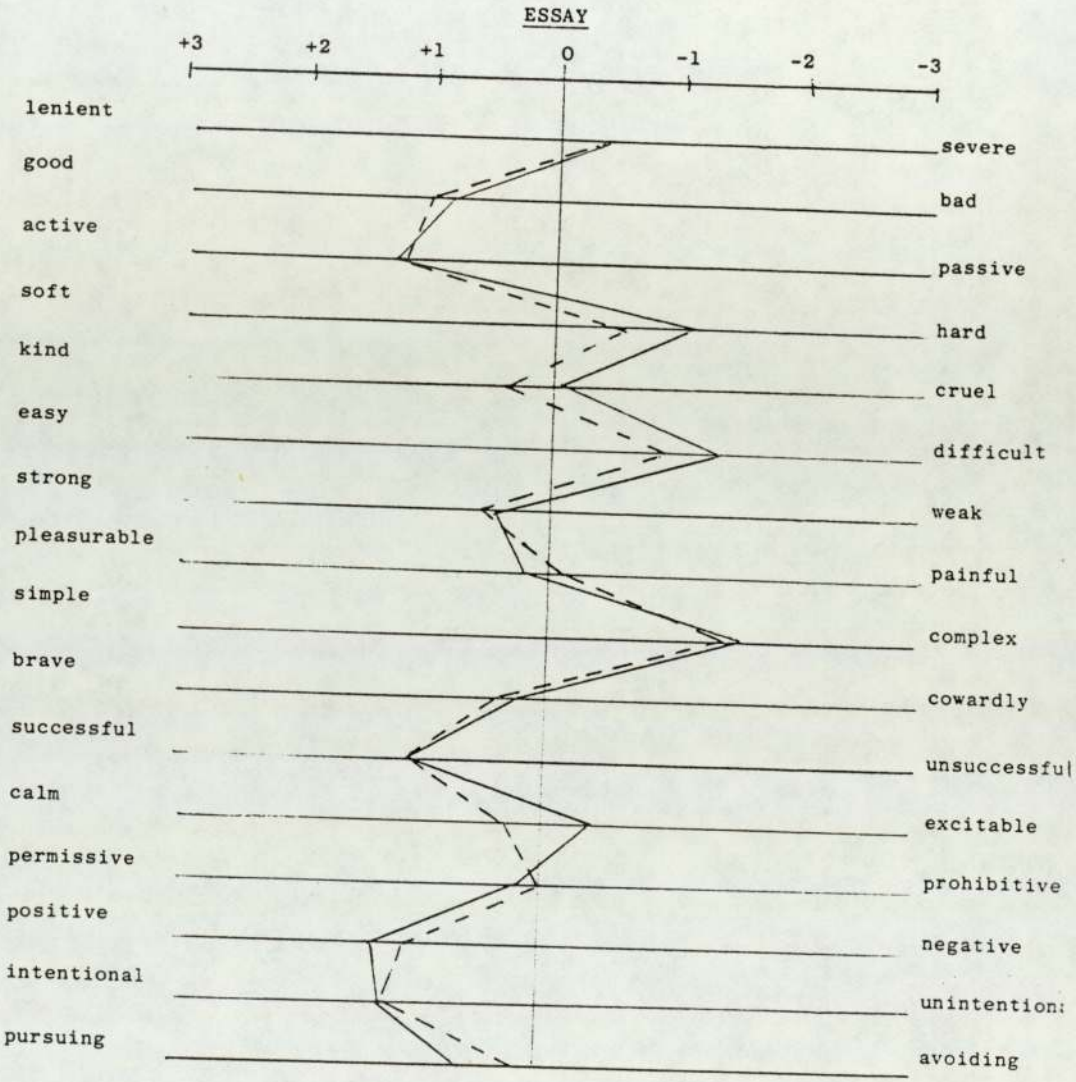

HOLIDAYS
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

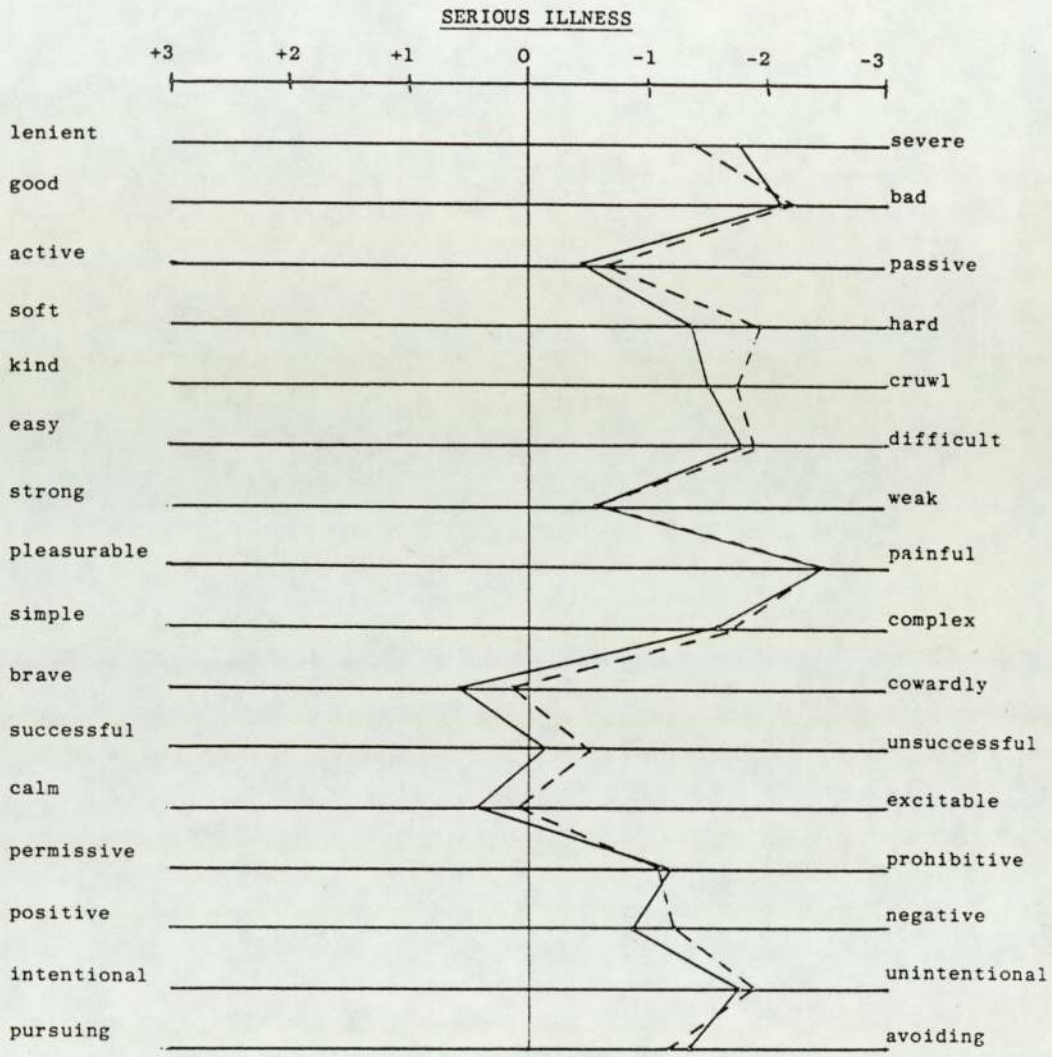

CLOSEST FRIEND
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

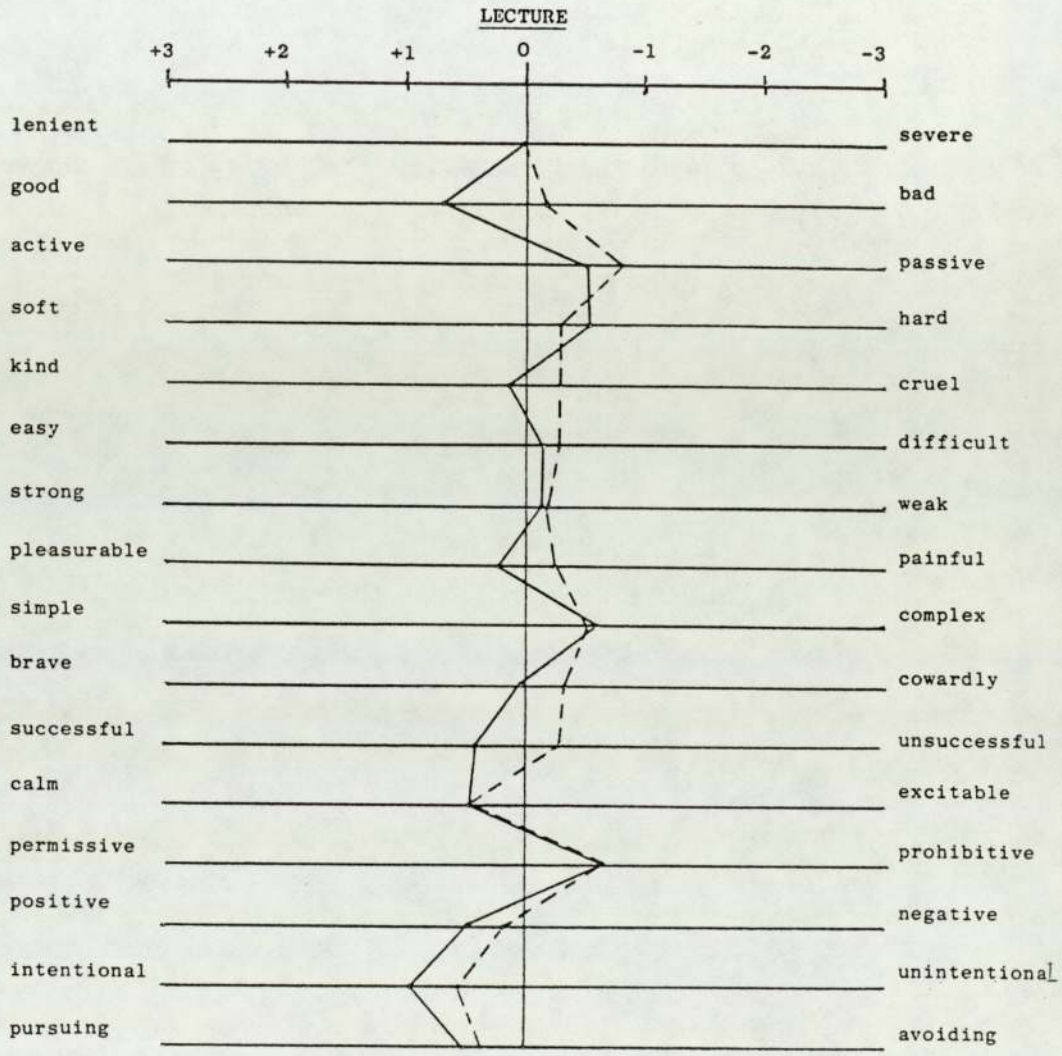

TUTORIAL
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding


COFFEE-BREAK
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding


EXAMINATION
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding


ESSAY
+3
+2
+1
0
-1
-2
-3
lenient
good
active
soft
kind
easy
strong
pleasurable
simple
brave
successful
calm
permissive
positive
intentional
pursuing
severe
bad
passive
hard
cruel
difficult
weak
painful
complex
cowardly
unsuccessful
excitable
prohibitive
negative
unintentional
avoiding


SERIOUS ILLNESS
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruwl
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding


LECTURE
+3
+2
+1
0
-1
-2
-3
lenient
severe
good
bad
active
passive
soft
hard
kind
cruel
easy
difficult
strong
weak
pleasurable
painful
simple
complex
brave
cowardly
successful
unsuccessful
calm
excitable
permissive
prohibitive
positive
negative
intentional
unintentional
pursuing
avoiding

APPENDIX VIII

From: Times Higher Educational Supplement,
6th November, 1981.

WHY STUDENTS GO OFF THE DEEP END

(N.C. Graham and A.S. Hill)

Most members of university and college staffs have probably been intrigued and even frustrated by the apparent vagaries of student motivation. Judged by the standards of the wider community students enjoy a privileged position in the sense that they are involved in work that they have chosen to do and perhaps even enjoy. Furthermore, in pursuing their chosen career they are supported in large measure by public funds and the results of their student career may be the conferring of a lifetime's competitive advantage, professional qualifications and enhanced financial prospects. But it is quite apparent that, despite the advantages that might accrue to those who pursue their course assiduously, students do not always appear to act in their own best interests. Far from giving the impression of committed and sustained pursuit of their studies, all too often, the careful observer finds definite indications of prolonged delay in getting down to the serious business of study.

It is often claimed that a prime factor in student performance is motivation. But it is difficult to see how any of the unitary constructs put forward can account for very complex and untidy reality of student behaviour with regard to their academic work. In particular, that reality includes a very common tendency to resist or ignore very obvious pressures signalling the need for increased application to work for longer than is reasonable. It includes a tendency among some students to display sudden and more or less dramatic switches from a very low or non-existent work rate to a very high one. It includes the experience of conflict between strong and competing motives. These features - delay, discontinuity and bimodality - turn out to be just those which are characteristics of dynamic systems to which mathematical catastrophe theory has been successfully applied.

Catastrophe theory was originated by Rene Thom in France in the 1960s and 1970s as a mathematical system for dealing with natural phenomena in physics, engineering, chemistry, biology which are characterized by sudden and massive changes (termed catastrophes) which cannot be accounted for by the small and relatively insignificant variations in the controlling factors immediately preceding them. The sudden collapse of metal and other structures without warning, the sudden division of cells after brief periods of quiescence are widely divergent cases in point. Professor Zeeman and others have shown how apposite catastrophe theory can be in the explication of events of a similar catastrophic nature in the social sciences. For example, the

-continued-

sudden eruption of a prison riot and the genesis and resolution of a domestic quarrel have been illuminated by modelling the situation in CT terms. The object at this stage appears to be illumination and understanding rather than mathematical prediction. The aim is to show that such events are lawful rather than merely arbitrary. What we need is a more complex and appropriate account of the relevant laws.

Essentially, CT models a system in terms of a hard-to-visualize three dimensional graph (as opposed to the usual two dimensional graph relating a controlling factor or independent variable to a controlled or dependent factor). In the variety of CT used most frequently it is assumed that the behaviour of a system is controlled by two independent factors acting together and that each combination of these two factors is associated with a given level of that behaviour. Represented as height above a floor space, the projected values map a behaviour surface (rather than the conventional graph point) such that any point on the surface is associated with a unique combination of values of the two controlling factors. The characteristic feature of CT is that this surface is folded in one area so that certain values of the controlling factors are associated with not one but two levels of the behaviour surface, one high and one low. It is this feature which captures the notion of discontinuity of change - sudden changes from a low to a high level of the predicted behaviour and vice versa.

Recent research at Aston University has been concerned with establishing the credibility of the CT model in relation to the observed features of student motivation toward academic courses.

In order to establish that student academic motivation conforms to the characteristic models of catastrophe theory, empirical data rather than mere anecdotal evidence is essential. The three features of CT models become the guiding hypotheses: if bimodality is a characteristic of the system then some students will exhibit high levels of motivational-tendencies which are independent of one another but pull in opposite directions in reference to application to academic work; if delay is a feature then some students will report consciousness of, and more or less deliberate indulgence in, such delay; if catastrophe is a feature then some students will exhibit sudden switches between low and high rates of study activity.

A Composite questionnaire (known as a delay tendency questionnaire) was devised, piloted and perfected. It was administered to a sample of 52 students at a college of higher education. Analysis of their responses indicated that students varied from high to low in their experience of and tendency to delay getting down to work in respect of an academic deadline. It is clear that delay in responsiveness to clear danger signals is a feature of many students' way of coping with academic stress. Analysis of the responses to other questions about motives revealed several dimensions of motivation which could be

-continued-

classified as approach or avoidance tendencies to academic study. Results indicated the independence of approach and avoidance factors and that a section of students were subject to considerable conflict in displaying strong and often equal pulls in opposite directions.

Discontinuities were also reported in interviews but it was felt necessary to confirm this so 12 volunteer students were asked to keep a diary over a period of several weeks in which they indicated at a subjective estimate of their level of academic activity during each preceding period of time. The results were transcribed graphically and showed considerable differences among students. Some displays indicated frequent and small fluctuations imposed on rather smooth trends up and down while others indicated rather characteristic massive fluctuations of an almost all-or-nothing nature. This result was taken to imply that there are at least some students for whom dramatic discontinuity rather than continuity of changes in study behaviour is characteristic. The evidence suggests that the dynamics of student motivation may indeed conform to the catastrophe model.

The question now is, what advantages accrue from such a discovery? It is evident that students vary tremendously in their attitudes, and in their modes of adjustment to the various social pressures and academic demands made upon them. Some, perhaps the more prosaically successful, plan carefully, adjust smoothly to the tempo of an academic course and contrive to keep ahead of demand. Others, the deathbed repentance merchants, keep on putting off until, in a frenzy of activity if not of panic, they pile everything into a short space of time just prior to a deadline or examination. Occasionally, these sudden switches from idleness or preoccupation with other matters to high study emphasis come perilously close to a deadline so that the whole business of assessment is fraught with anxiety and generates performances which are inadequate or even causes collapse into states of mind in which all thought and activity are paralysed temporarily.

Learning institutions which have important certificating functions at present tend to run on assessments - either the sudden death of end-of-session examinations or the Chinese water torture of continuous assessment. Deadlines of one kind and another are part of student life and loom large in students' perceptions of their day-to-day life. They punctuate students' approach to their study and are associated with rises and falls in study activity. Success or even survival in the system requires students to cope as best they can with the problem of adjustment to the sometimes arbitrary and intermittent demands to submit themselves or their work for assessment. Institutions, however, are reluctant to relinquish or reduce the emphasis on assessment, in part because they are felt to have important motivational functions. However, currently held theories are unable to link actual student behaviour to any internal or external factors in a systematic way. Catastrophe theory modelling at least is able to give a principled account of important features and thus to bring the promise of order.

-continued-

Deeper and more refined understanding of motivational factors should lead to the possibility of finer tuning of the system, wiser counselling of individual students as well as the satisfaction that events are not random and arbitrary but, to an extent, rule-governed.