A SYSTEMS APPROACH TO STUDENTS' MOTIVATION AND ACADEMIC ACHIEVEMENT

by

Geoffrey H. Hughes M.A., M.Sc., A.R.I.C

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Department of Applied Psychology

SUMMARY

This research followed earlier work (reported in a thesis presented in 1970) on factors associated with the academic performance of a sample of technical college students, which recommended the further study of students' motivation. The technical college then became part of a polytechnic, but the courses chosen for the continuation of the research were all of a specifically vocational character.

The approach was influenced by Angyal (1941) in seeking to relate symbolic processes to broader behaviour patterns within a systems framework. Forms of semantic differential were developed to obtain the students' responses to words representing various activities and various people both within and outside the academic environment. Also, a 'growth motivation questionnaire' was produced using ideas from self-actualisation, job satisfaction and expectancy theory and examination marks were recorded.

From pre-coded responses to the growth motivation questionnaire, scores on a 'study satisfaction' factor were calculated, and subsamples of students were taken at the extremes of this scale. Written responses from the same questionnaire and semantic differential factor scores showed contrasting patterns between the two subsamples. Interpretation of these patterns suggested a diversity of approach to academic work among the students which calls for greater flexibility in the educational system serving them.

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CONTENTS

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1. INTRODUCTION

A previous investigation (1) of factors associated with the academic success of a sample of technical college students on courses for which they had already been selected on intellectual criteria concluded with the following paragraph:

> "In brief, the students who achieved the greatest success in their examinations did not in general do so by virtue of superior intelligence or of an unusually studious personality. There were indications that some (the 'Cinderellas') who had previously been disappointed in their educational experiences and who tended to have a modest opinion of themselves as students, found great satisfaction and encouragement in the realisation of their abilities at the college. Multidimensional measurements of the attitude structures of the two subsamples of successful students suggested that greater individual attention to students' attitudes offers a better prospect of improvement of academic performance than any further selection by ability."

The research reported in the present thesis is a continuation of this work.

In this thesis, it is argued that the study of human motivation may best be pursued by using the systems approach. A classic exposition of general systems theory is given by von Bertalanffy (2), who distinguishes summative characteristics such as weight from constitutive characteristics of structure, such as occur in chemical isomers. A system by definition is characterised by relationships between its components. An open system is one which is in interaction with its environment, and it is a part of general systems theory (the principle of structural isomorphism) that all open systems have certain characteristics in common.

Three arguments for the application of systems thinking to the study

of any of the phenomena of life have been presented by Emery (3), in the following words,

> "There have in fact been two arguments for a systems approach to the analysis of living phenomena. First has been the argument that only such an approach will reveal the 'Gestalten' properties that characterize the higher levels of organization which we call 'living systems'. .....Second has been the argument that many of these Gestalten properties are common to the different levels of organization of living matter (from bacteria to human societies) and hence provide a valid and powerful form of generalization. There is at least one further line of argument although it has had little apparent attraction to the main contributors to the systems approach. This is that a systems analysis of living organizations is likely to reveal the 'general in the particular'. Analysis of part systems in cause-effect terms, for example, of liver disorders, death rates, recruitment, training, or productive efficiency, builds up a certain kind of knowledge. However, the total systems of which they are a part usually offer alternative paths which will minimally meet organizational requirements and/or provide substitute feedback control systems. Analysis of the total system is likely to reveal those properties, general to the species, that have enabled the species to adapt and survive in its typical environment."

In recent years there has been an explosion of publications based upon systems theory, but this has been devoted almost exclusively to systems larger than the single human individual. The Open University set book on Systems Behaviour (4) for example, contains articles of an introductory nature, on man-machine systems, on social systems, on biological and ecosystems and on applications of systems theory in practice; but the article on "Systems and Psychology" referred only peripherally to mental functioning.

Andras Angyal (5) in 1941 proposed a systems framework for the holistic approach to the study of personality. The organism was

viewed as a dynamic whole having an organised pattern of life process. This process 'does not take place within the organism, but between the organism and the environment.' Determined partly by the organism and partly by the environment, the process characteristically shows a 'trend towards increased autonomy'. 'The organism expands at the expense of its surroundings.... The expansion may be a material one as in the case of bodily growth, or a psychological one as in the case of the assimilation of experiences which result in mental growth, or a functional one as when one acquires skill, with a resulting increase of efficiency in dealing with the environment, and so forth.' The organism also expands through its creativeness in inventing instruments, machines etc. This trend is consistent with such current motivation theories as those of Maslow (6), (7) and Herzberg (8), which are discussed below (Section 2.2.2)

Angyal emphasises the importance of symbols in psychological functioning and distinguishes two aspects of the perceptual process, the production of perceptual pictures and their utilisation as symbols for empirical objects. The task of the holistically-oriented psychologist, however, is not only to study the intra-psychic organisation of mental processes but, recognising the universal symbolic character of mental function, to relate it back to the holistic personality background out of which these mental processes are elaborated' (ibid).

Osgood's 'Measurement of Meaning' (9) contributed to the study of symbolic processes by offering a technique for identification of dimensions of response to particular stimuli and for measurement in these dimensions. The technique is not necess-arily bound to the stimulus-response theory to which Osgood related it, or to the particular dimensions which he identified. It offers an opportunity

to take up Angyal's challenge, to begin the task of relating the intrapsychic organisation of mental processes to their holistic background.

There remains, however, an important feature of systems theory which was not particularly considered by Angyal, the question of energy relationships. It is axiomatic that any open system requires inputs of energy in order to maintain itself and to produce outputs. In the individual human system energy is derived from food but its utilisation is regulated, as in many other systems, by a controlling subsystem which uses much smaller amounts of energy. The study of this control process, however, has been complicated by the subjective nature of our experience of this process; for example of our feelings of being "stimulated" by particular sensory inputs so that it seems as if the sensation itself acts as an energy source. Wollheim (10) discusses Freud's speculations on this topic, written for the 'Project for a Scientific Psychology' in 1895. In its 'primary function', the mind receives 'energy' from stimulation and discharges it through motor activity, with the aim of tension-reduction. (Tension being the accumulation of energy.) Stimulation, however, arises internally as well as externally and may, like hunger, develop gradually. The mind, in its 'secondary function', is able to tolerate the accumulation or storage of 'energy' and to draw upon the store as and when it is needed for action. Although the concept of psychic energy is a difficult one, the energy-storage model is now in common use in everyday language, as when we speak of ways of relieving tension which has been building up.

An important corollary is that, as in other types of systems, stimulation can only be effective in such forms as the system is able to accept. Katz and Kahn, (11), discussing the common

characteristics of open systems, remind us that 'the functioning personality is heavily dependent upon the continuous inflow of stimulation from the external environment' but that the reception of inputs is selective. As in digestion, '...systems can react only to those information systems to which they are attuned.' Further, 'the feedback system has to do with information input, which is a special kind of energic importation, a kind of signal to the system about environmental conditions and about the functioning of the system in relation to its environment.'

Whether or not we regard the input of information as equivalent to the importation of energy, the crucial issue is the nature and operation of the feedback arrangements by which sensory data ~~is~~ are filtered and modified as an aspect of the control process.

It has been suggested by Maslow (7) that in the peak-experiences felt more frequently by self-actualising people than by others, there is 'effortlessness and ease of functioning when one is at one's best.' This feeling of effortlessness, however, is not always reported by successful students, who may say that they are working extremely hard (1).

In the present investigation no specific plan was made to study energy relationships. The aim was to relate growth motivation to perception, within the academic environment, and so to contribute to an understanding of the functioning of the system as a whole.

2. THE RESEARCH PLAN

Among the published studies of factors associated with academic performance, the most relevant for the present study are those in which combinations of characteristics have been reported. This approach helps to focus attention on the student rather than on the factors. The work of Entwistle and Brennan (12) and of Smithers (13) shows that identification of subsamples of students who have a common pattern of characteristics can be more revealing than straightforward correlations and supports the arguments mentioned in Section 1 for the systems approach.

Two aspects of systems analysis are recognised, the 'broad systems approach' in which the system and its interactions are broadly mapped on the basis of existing knowledge and of hypothesis, and 'systems modelling' in which the relevant data are collected and the model built and tested. The two approaches are not mutually exclusive. In the present study, the 'map' was provided in outline by Angyal's "Foundations" and the aim was to relate the general motivational tendencies of the students (particularly, the 'trend towards increased autonomy) to their 'perceptual pictures' of some aspects of their academic environment, which might be expected to throw some light on the underlying value systems. Operationally, the plan was to construct a growth motivation questionnaire incorporating ideas from current motivation theories related to that of Angyal, and to use the semantic differential technique for the study of the 'perceptual pictures'. In addition the examination marks or other assessments would be used to calculate a criterion score. The choice of these methods is discussed in Section 2·2.

The sample of students, described in Setion 2·1, was heterogeneous. The plan was to identify patterns or dimensions of growth motivation

using the growth motivation questionnaire and then to select subsamples according to their self-reported motivation and by behavioural criteria. The motivational characteristics of the subsamples could then be related to their perceptions as measured by the semantic differential.

The work of Herbst (14) indicates the diversity of behavioural principles which may operate in individual cases. This, however, does not preclude the identification of dimensions which in individual cases may or may not be used. Thompson (15) prefaces his book about organisations with the following remarks:

> "No useful theory can rest on the assumption that everything is unique. It is probably inevitable that the early history of a scientific endeavor will be characterized by the opposite assumption, and by the search for universals. This certainly has been the case with organization theory, which until recently has been preoccupied with discovering the essential elements of all complex organizations.
>
> "I believe it is a sign of relative maturity when a field begins to focus on patterned variations. The discovery of universal elements is necessary, but alone it provides a static understanding. To get leverage on a topic, we must begin to see some of the universal elements as capable of variation."

These remarks may be applied to the individual human system just as well as to organisations of large numbers of individuals. Comparison of the results from the subsamples mentioned above would be expected to show variations in pattern.

2.1 The sample of students

For convenience of administration of group tests the sample consisted of complete classes of students. From the wide range of courses offered by the Polytechnic a selection was made so as to include full-time and part-time students at academic levels from C. & G. Intermediate Technicians to post-graduate courses, with a wide variety of vocational specialisations.

This sample was as heterogeneous as was possible, but it did not include any 'non-vocational' courses. When the author recently asked all the available first-year members of a CNAA degree course what occupations they expected to follow after completing the course, not one of them had specific intentions for a career. The present research did not include any such students, whose motivation might be expected to show differences in emphasis from that of the 'vocational' students.

The sample was drawn from four courses, as follows.
MT3 (Mechanical Technicians, 3rd year) was a part-time day and evening course leading to a City and Guilds Certificate. Three classes of this course took part, numbering 14 + 42 + 18 = 75.
DMS I and II were the first and second years respectively of the Diploma in Management Studies course, a part-time course for post-graduate (or 'equivalent') students. 45 members of DMS I and 49 of DMS II, totalling 94.
The Clinical Teachers' course, CT, was a full-time six-month course for qualified nurses who wished to become teachers of pupil and student nurses. Only 11 of these were available.
The YESTB (Youth Employment Service Training Board) course was a one-year full-time post-graduate course for prospective careers officers. There were 26 of these.
The total number from all courses was 206.

2·2 The choice of methods

The use of a sample of students sufficiently large for the selection of subsamples imposed constraints on the methods available. Individual interviews, although desirable for confirmation and extension of questionnaire data, were not possible within the time available. Collection of comprehensive and accurate biographical data was also ruled out for the same reason.

The classes of students listed above were available for periods of either 1 hour (MT3) or 1½hours (the remaining courses), but it was tactful to use a little less time than this on each of the two periods of contact with each class. The first period was used for a brief introductory talk about the research, to emphasise the confidentiality of the responses and to establish rapport, and then for administration of a questionnaire on growth motivation. The second period was used for administration of a form of semantic differential. In addition, the marks awarded to each student in his examinations or other assessments were recorded.

The three subsections below deal with the requirements which these instruments were required to meet, and the experimental development of two of them is described in Section 3.

2.2.1 The criterion score

The choice of a varied sample of students made more dubious the use of examination marks as a criterion, since the examinations were not directly comparable with each other. The MT3, CT and DMS I courses were assessed by series of traditional examinations. DMS II took only one examination, an open-book examination in Law, and the YESTB course was organised on a modular basis with both theoretical and practical assessments throughout the year.

In the previous work, in which all the courses sampled used series of examinations, a criterion score was calculated by standardising the marks for each class for each examination to a mean of 100 and a standard deviation of 15, and taking a mean of these standardised marks. This provided a comparison of the examination attainment of each student with the standard of his class, irrespective of academic level, although certain of the well-known limitations of examinations were apparent (1).

The diversification of assessment techniques in recent years has made even more difficult the comparison of one set of results with another. However the marks recorded provide the only available estimate of the attainment of each student according to the standards and values of his course, and no improvement could be found to the statistical procedure formerly used. For the calculations, the computer program previously written was revised to suit the ICL 1900 computer now in use.

2·2·2 The growth motivation questionnaire

Much of the influential work on motivation published since Angyal's 'Foundations' is consistent with his concept of increasing autonomy and can conveniently be accommodated within systems theory. Three of these lines of research were particularly considered in the search for a suitable method of investigating and measuring the general trend of students' motivation.

Maslow (7) presents several lines of evidence, not explicable on need-reduction theory, which point to a need for psychological growth as a fundamental human need. His generalised definition of self-actualisation is 'on-going actualization of potentials, capacities and talents, as fulfilment of mission (or call, fate, destiny or vocation), as a fuller knowledge of, and acceptance of, the person's own intrinsic nature, as an unceasing trend toward unity, integration or synergy within the person.' Growth motivation is distinguished from deficiency-motivation, which is its necessary precursor, by clinical characteristics and a longer list of basic propositions, some of which are 'way out ahead of the data'.

Although part of Maslow's data were derived from critical incident analysis, his work rests mainly on clinical methods which were impracticable for the present investigation. Nevertheless a number of the characteristics listed amplify and to some extent operationalise Angyal's increasing autonomy. These include the tendency to welcome challenge and tension, to enjoy life in practically all its aspects, a 'serenity that one experiences when functioning easily, perfectly and at the peak of one's powers', inner-directedness and independence of the environment. (Maslow's view of self-transcendence is also consistent with Angyal's 'trend towards homonomy', but

that is beyond the scope of the present thesis).

Regarding the 'clinical and personological effects of gratification', Maslow writes, 'Deficit-need gratifications and growth-need gratifications have differential subjective and objective effects upon the personality. If I may phrase what I am groping for here in a generalised way, it is this: satisfying deficiencies avoids illness; growth satisfactions produce positive health.'

This is the message in Herzberg's Two-Factor Theory, which has had considerable influence in industrial circles. His 'Hygienes', now more often referred to as the extrinsic factors, can be identified with Maslow's basic needs, and the 'Motivators' or intrinsic factors as aspects of self-actualisation. Herzberg (8) lists as 'Hygiene factors', Company policy and administration; Supervision-technical; Salary; Interpersonal relations-supervision; working conditions. As 'motivators' - determinants of job satisfaction - there are Achievement, Recognition, The work itself, Responsibility and Advancement, 'the last three being of greater importance for lasting change of attitudes.'

A pilot trial of Herzberg's critical incident method in a simplified form was carried out with a class of university students, with reference to their educational experience instead of the industrial situation. In Herzberg's survey, employees were asked to describe in a semi-structured interview, incidents or periods when they felt either particularly good or particularly bad about their jobs. After this, the interviewer followed up with supplementary questions until all the topics in the schedule had been covered and then asked for a description of the other (bad or good) incident. The students first answered the interview questions in writing as a group, and

then, after an explanation of the original research, scored their own stories according to a simplified version of the published scheme. The class responded favourably to the experiment, which has immediate appeal to the respondent's own individual experience; and the results, as far as they could be interpreted, did not disagree with Herzberg's own findings. (The same exercise has repeatedly been carried out with classes of management students who have been able to answer from their industrial experience, and the results even in a very informal and simplified version of the method have been consistently in the predicted direction for the 'good' incidents, although not always so for the 'bad' stories.) This method in a more rigorous form could have been used conveniently in a college setting.

However, the criticisms of the method are serious. In the 'bad' stories, particularly, the likelihood of selective bias in recall and a tendency to project individual failure onto external sources make interpretation of the findings uncertain, even if the technical difficulties such as avoidance of bias in scoring are overcome. Although the distinction between intrinsic and extrinsic factors is useful as a basis for discussion and for comparison with that between basic and growth needs as expressed by Maslow, the pilot study did not suggest any ways in which the limitations of the critical incident technique could be overcome and the use of this technique was not pursued. For the purpose of construction of the questionnaire, however, Herzberg's principles were regarded as hypotheses in devising the items to be included. (Section 3·1)

The third line of research which was considered in connection with the questionnaire design was expectancy theory. The concept of

level of aspiration has been developed by researchers in industry by considering simultaneously the value of the expected outcome, so that if either this value or the expectancy of its attainment is zero, motivation becomes zero according to the equation,

$$M = E \times V$$

where M = motivation, E = expectancy that a particular outcome will follow from action by the subject, and V = the value of this outcome to the subject.

Hackman and Porter (16), investigating the work of a force of sales representatives whose diligence might have led to a variety of possible outcomes, found that the best predictor of their behaviour was the sum of the products (E x V) for each of these outcomes. There have been other applications.

Wankowski's observation of the 'disenchanted elite' (17) and that of Hughes (1) of 'Cinderellas' suggest that in education at least, a change of expectancy may be more important than its absolute level. Wankowski's subjects had been the elite at school and, finding themselves to be merely ordinary performers at university, became discouraged. The 'Cinderellas', having had disappointing educational experiences at school, found a degree of fulfilment at the technical college and became enthusiastic. A complete investigation of this aspect of motivation was beyond the scope of the research planned, but the topic was included in the questionnaire.

The development of the growth motivation questionnaire is described in Section 3·1.

2·2·3 The semantic differential

The place of the semantic differential in the research plan was to provide information about the way in which each individual perceived his academic environment.

It is a simplification to suppose that the presentation of a printed word or phrase as the stimulus in the semantic differential produces the same 'perceptual picture' as the object itself. In the words of Osgood et al., 'The pattern of stimulation which is not the significate is a sign of that significate if it evokes in the organism a mediating process, this process (a) being some fractional part of the total behaviour elicited by the significate and (b) producing responses which would not occur without the previous contiguity of non-significate and significate patterns of stimulation.' The relationship between sign and significate becomes more remote when the stimulus word is an abstraction such as 'homework'.

In addition to this theoretical difficulty the semantic differential technique poses its own technical problems, which are discussed in Section 3·2. In spite of these the technique has been found capable of producing a pattern of results which can be related to life data. In previous work (18), subsamples of successful students appeared to differ from their fellows not by showing uncritical approval of all aspects of the college but in the pattern of their attitudes.

Development of appropriate forms of semantic differential for use in this research, as well as development of the growth motivation questionnaire, was therefore undertaken as described in Section 3.

3. DEVELOPMENT OF THE INSTRUMENTS

The aim of the work described in this section was to identify dimensions in which variation among the students in the sample could be observed, and to provide measurement scales.

3·1 Development of the growth motivation questionnaire

Several lines of research into motivation, which might be relevant in the study of students' academic motivation, were described in Section 2:2·2. These were used to generate a pool of items, some of which were precoded to simplify the analysis and some which were open-ended to provide case-study material. After informal preliminary trials, a selection was assembled to form a draft questionnaire and administered as a pilot study to fourteen second-year students of the Higher National Diploma in Mechanical and Production Engineering and to thirteen students who were working for Institute of Personnel Management examinations. Responses to the open-ended questions were grouped into categories to find out whether each item had elicited the information hoped for, and a few items were discarded. The pre-coded items were examined for spread of results and for internal consistency. Between certain items there was some inconsistency, possibly due to unsatisfactory format. The original 9-point scale was changed to 7 points and the format improved by providing a separate box for each possible response and, except on the last page, by labelling every box with its meaning. The list of items used in the final version is shown in Table 3·I, page 19.

After administration of the final version to the sample of students described in Section 2·1 (N = 183 after attrition), the numerical results were examined by cluster analysis. Using the 'nearest neighbour' method, (19), a graph plotter output was obtained which indicated a single cluster with no marked variations in density.

In the cluster analysis program used, the basis of the clustering was an unrotated principal components analysis from which the first six components were used. Since an unrotated analysis does not necessarily offer the clearest possible psychological meaning, the structure of these components was compared with the Varimax and Promax solutions by using a separate program (20). In this second analysis the number of components extracted was five instead of six. Of these the first factor was altered very little by rotation. Table 3·II, page 21, shows the loadings of the 18 items on the first factor and in this table, items 7,8,10,15 and 17 appear as the five most heavily loaded items in each of the solutions, although their rank order varies.

The remaining factors in the Clustan analysis were considerably modified by rotation. The rank order of the five most heavily loaded items on each factor are shown in Table 3·III, page 22, The two rotated solutions are in agreement as to the second and third factors and suggest hypotheses for future work. The interpretation however is speculative in view of the low correlations from which the factors were derived and the first factor scores only were chosen for use in the present research.

From examination of the first five items in each of the solutions, it appears that this first factor represents satisfaction through the college work. Students with high scores on this factor were feeling conscious that they were learning; could find a quiet place to work in without interruption; felt that the course offered scope for the kind of work they wanted to do; could concentrate on their work; and took pleasure in the increase or development of

their abilities.

It is possible that if a further cluster analysis had been attempted using Varimax factor scores as the basis, some heterogeneity in the sample might have been revealed. From the figures available, however, there was no evidence to suggest that the sample should be treated as consisting of more than one population. This being so, the Factor 1 score as calculated by the Clustan program was adopted as a factor of study satisfaction, and used as described in Section 4·2 for selection of a subsample of students.

The open-ended responses of students selected for the subsamples were used as described in Section 4·2.

TABLE 3·1

Wording of pre-coded questionnaire items

1. If you compare your progress on the course so far with what you expected at the beginning, are you (extremely disappointed.... extremely pleased)

2. What do you think now is the most likely result of your exam? (Brilliant.....fail hopelessly)

3. Compared with the expectation you had when you first joined the course, is this forecast (enormously better than you first expected.....hopelessly worse)

4. When you have some college work to do and want to settle down and concentrate on it, do you usually find this (extremely difficult... ..extremely easy)

5. Can you find a quiet place to work in without interruption (always.....never)

6. How do you think your career prospects now compare with your expectations when you left school? (Very much better.....very much worse)

7. Apart from the value of the qualification at the end of the course, how useful do you think the course itself will be as training for your career? (Extremely useful.....Absolutely useless)

8. Ignoring both the value of the qualification and its usefulness in your career, how interesting do you find the course? (Extremely interesting.....Extremely boring)

9. Would you prefer the teaching staff to: (stop bothering you and leave you to get on with your work / take a much closer interest in your work)

10. Does the course offer you scope for the kind of work you want to do (all the time / never)

11. In the planning or supervision of your work, are you: (left entirely alone, or / told exactly what to do all the time?)

12. Is this: (exactly how you like it,/ or entirely wrong for you?)

13. Is your work (much too easy for you, or / much too difficult for you?)

14. Do you feel that you have your work under control? (Yes, completely / No, completely out of control)

15. Do you feel conscious that you are learning? (Yes, definitely / No, not a bit)

16. In your college work, are you in your own opinion working: (as little as possible / extremely hard)

17. Can you take pleasure in the thought of increasing or developing your abilities during this course? (Yes, definitely / No, not a bit)

B. Wording of open-ended questionnaire items

1. How do you feel about being a student? Please explain.
2. Do you get what you want from the Polytechnic?
3. Do you spend your time efficiently while working? If not, why not?
4. Are you spoon-fed too much, or not enough?
5. Do you think the facilities in general are reasonably adequate?
6. What in particular do you like or dislike about your course?

If you have more than one point to make, please indicate the order of importance.

7. (Combined with pre-coded item 6): How do you think your career prospects now compare with your expectations when you left school? Please explain.

8. What differences do you find between this course and your previous education?

9. (Following precoded item 12, above) Please add any further comments.

10. (Following precoded item 17, above) Can you comment on this?

TABLE 3·II

CLUSTAN FACTOR 1 STRUCTURE (Polarities omitted)

Unrotated solution		Varimax		Promax	
Item	Loading	Item	Loading	Item	Loading
15	.746	8	.767	8	.763
8	.682	15	.730	15	.759
10	.664	7	.707	7	.705
7	.630	17	.651	10	.663
17	.610	10	.630	17	.661
1	.556	16	.585	16	.571
14	.490	1	.388	1	.453
16	.482	18	.335	3	.339
4	.443	3	.293	18	.298
2	.421	6	.267	6	.288
3	.415	2	.188	4	.262
12	.357	4	.173	2	.261
5	.285	13	.163	14	.254
6	.281	14	.137	12	.167
18	.196	5	.105	5	.163
11	.135	12	.063	13	.100
13	.075	11	.039	11	.021
9	.021	9	.012	9	.020

TABLE 3·III

Comparison of factor structures (polarities omitted)

	Unrotated		Varimax		Promax	
	Item	Loading	Item	Loading	Item	Loading
Factor 2	13	0·688	13	0·737	13	0·706
	14	0·597	2	0·671	2	0·704
	2	0·531	14	0·656	14	0·689
	16	0·426	4	0·552	4	0·567
	11	0·420	5	0·500	5	0·486
Factor 3	11	0·586	12	0·756	12	0·775
	6	0·533	11	0·722	11	0·712
	12	0·484	6	0·471	6	0·487
	3	0·359	14	0·400	14	0·464
	1	0·338	17	0·309	17	0·354
Factor 4	18	0·498	5	0·598	5	0·614
	9	0·485	9	0·598	9	0·592
	8	0·360	2	0·336	10	0·383
	5	0·339	10	0·309	6	0·329
	12	0·337	6	0·300	4	0·288
Factor 5	5	0·590	1	0·715	1	0·774
	18	0·450	18	0·581	18	0·513
	1	0·398	3	0·524	3	0·567
	3	0·343	4	0·232	15	0·311
	9	0·310	12	0·215	16	0·303

Factor 2 could be interpreted as 'feelings of progress on the course' and Factor 3 as 'independence'.

3.2 Development of the semantic differential

In the study previously reported (1), in which semantic differential scores were used as a measure of students' attitudes to the college and academic work, this application of the technique was found to offer more information than could be obtained by a unidimensional attitude scale. The evidence for this conclusion included face-validity of the mean scores and plausibility of differences in pattern of scores shown by subsamples.

There remained, however, uncertainties regarding some aspects of the technique. It was clear that some of the scales, if not all, were not applied in the same way to all the 'concepts', which were so diverse as to include 'Homework' and 'Lecturers' in the same analysis. As Osgood et al. suggested in their discussion of this problem, 'scale-concept interaction' could possibly be overcome by carrying out separate analyses for different types of concept, and this strategy was followed in a pilot study described in Section 3.2.1, below. It was also open to question whether the purpose of the investigation was well served by the assumption of orthogonality of the axes. Since some correlation was observed between the scores on the three factors which emerged from the analysis, the alternative is available of considering a hierarchical structure by the method proposed by Schmid and Leiman (21).

Correlation between factor scores was, in fact, observed in the original work of Osgood et al., who coined the phrase 'dominant characteristic attribute' to describe the diagonal along which the concepts were clustered in the three-dimensional semantic space. In research which aimed to establish a set of scales by which measurements in the three dimensions, Evaluative,

Activity and Potency could be made for any type of concept, it became clear that the meanings of scales and their relations to other scales varied considerably with the concept being judged; and, although they found the dimensions to be stable, the meaning of all scales tended to shift towards evaluative connotation for emotionally loaded concepts. As a more general hypothesis, 'In the process of human judgment, all scales tend to shift in meaning toward parallelism with the dominant (characteristic) attribute of the concept being judged.'

It might be helpful to consider the nature of the 'evaluative' factor. There seem to be at least two kinds of criteria of value or goodness. For a functional object the judgment rests mainly upon its utility, which in terms of semantic differential factors means activity and potency. When a person is regarded as an instrument, as in 'a good footballer', his value lies in his speed and willingness (activity) and his strength and skill (potency). Goodness, however, also has the meaning of virtue or piety. Beauty might perhaps be linked with this latter meaning, or else be regarded as a third meaning.

A respondent asked to apply the scale 'good-bad' to any particular concept might perhaps give a rating which represented an amalgam of his judgments, highly susceptible to the 'halo effect'. It is not clear that the evaluative dimension should be treated as independent of the other dimensions, as is assumed when the semantic space is accorded Euclidian properties in the calculation of the distances between concepts. The hierarchical solution cannot be excluded from consideration.

In order to examine further the dimensions which might emerge in each of the forms of the differential used for the different types of concept, the results of several analytical methods were compared as described below. In addition, to minimise the halo effect, both the polarity and the order of presentation of the scales were randomised and a different random order used for each of the concepts.

A further area of difficulty lies in the statistical treatment of the factor scores. The original data from which the scores are derived, on the scale "Extremely - very - slightly - neutral", cannot be regarded strictly as better than ordinal data. The analysis, from the calculation of mean ratings for the sample of subjects to the final interpretation of factor scores, implies that the data can be treated as if parametric statistical methods were applicable.

The problems of scale-concept interaction and of correlations between factors were considered in a pilot study designed to provide forms of the differential appropriate for this research, and these with the addition of the problem of statistical propriety were pursued in the analysis of the data from the main research sample.

3.2.1 The pilot study

Two separate forms of semantic differential were prepared and administered to the same 39 subjects, all students at the (then) South Birmingham Technical College. These volunteers were the members of three separate classes of students, considered by their lecturers to vary in their collective behaviour. One class was regarded as hostile and uncooperative, one was keen and appreciative and one was unremarkable. The variety of attitudes represented was felt to be greater than would normally be encountered.

The 'concepts' chosen are shown in Table 3·IV (next page). At this stage it was envisaged that concepts unconnected with education could serve as controls and in both the 'Activities' and the 'People' series, such unrelated concepts were included. the remaining concepts were based mainly upon the 1970 study. For the activities series some of those chosen were more arduous than others, which was a matter of particular interest because the subsamples of successful students had rated these more active occupations favourably, by comparison with the general consensus. In the people series, it was envisaged that inclusion of figures representing non-educational as well as educational relationships, and authority and non-authority status, might enable comparisons to be made which might illuminate the scores in particular cases. In addition, the comparative method might overcome the observed tendency of some subjects to use extreme ratings throughout while others confine themselves mainly to the 'slightly' responses.

For presentation, the 20 scales used for the ratings of activities were randomised in polarity and in order of presentation, separately for each of the concepts. Table 3·V shows as an example the order

TABLE 3·IV

Two series of concepts used in the pilot study

Activities	People
Instructional films	Your worst lecturer
Unusual problems	A policeman
Examinations	Your best lecturer
Lectures	Your last head teacher
Difficult calculations	Yourself as a student
Watching football	The laziest student in your class
Homework	Your father or guardian
Travelling on buses	Your favourite male singer
Practical classes	Yourself as a person
Dictated notes	The cleverest student in your class

TABLE 3·VII

Example of presentation of concepts and scales in the pilot study

(Activities series)

Instructional films

Important	_'_'_'_'_'_'_	Unimportant
Refreshing	_'_'_'_'_'_'_	Exhausting
Useful	_'_'_'_'_'_'_	Useless
Distressing	_'_'_'_'_'_'_	Satisfying
Difficult	_'_'_'_'_'_'_	Easy
Efficient	_'_'_'_'_'_'_	Inefficient
Good	_'_'_'_'_'_'_	Bad
Unpopular	_'_'_'_'_'_'_	Popular
Active	_'_'_'_'_'_'_	Passive
Boring	_'_'_'_'_'_'_	Interesting
Entertaining	_'_'_'_'_'_'_	Dreary
Frustrating	_'_'_'_'_'_'_	Rewarding
Soothing	_'_'_'_'_'_'_	Irritating
Monotonous	_'_'_'_'_'_'_	Exciting
Unnecessary	_'_'_'_'_'_'_	Essential
Unpleasant	_'_'_'_'_'_'_	Enjoyable
Valuable	_'_'_'_'_'_'_	Worthless
Busy	_'_'_'_'_'_'_	Resting
Satisfactory	_'_'_'_'_'_'_	Unsatisfactory
Agreeable	_'_'_'_'_'_'_	Disagreeable

TABLE 3·VIII

Example of presentation of concepts and scales in the pilot study

(People series)

Your worst lecturer

Good	__'__'__'__'__'__'__	Bad
Hard	__'__'__'__'__'__'__	Soft
Unfair	__'__'__'__'__'__'__	Fair
Hostile	__'__'__'__'__'__'__	Friendly
Successful	__'__'__'__'__'__'__	Unsuccessful
Active	__'__'__'__'__'__'__	Passive
Unimportant	__'__'__'__'__'__'__	Important
Helpful	__'__'__'__'__'__'__	Obstructive
Useless	__'__'__'__'__'__'__	Useful
Ignorant	__'__'__'__'__'__'__	Knowledgeable
Busy	__'__'__'__'__'__'__	Resting
Clever	__'__'__'__'__'__'__	Stupid
Considerate	__'__'__'__'__'__'__	Inconsiderate
Pleasant	__'__'__'__'__'__'__	Unpleasant
Attractive	__'__'__'__'__'__'__	Repulsive
Tonguetied	__'__'__'__'__'__'__	Fluent
Hardworking	__'__'__'__'__'__'__	Lazy
Foolish	__'__'__'__'__'__'__	Wise
Popular	__'__'__'__'__'__'__	Unpopular
Cheerful	__'__'__'__'__'__'__	Miserable

used for the first concept. The same procedure was followed for the 'people' series, and a corresponding example of the answer sheet is shown in Table 3·VI.

Analysis of pilot data

For each series of concepts, the means of the ratings by the 39 respondents were calculated for each concept on each scale, using a computer program modified from previous work. The correlations between scales were then analysed using:

1) Principal Components analysis, with Varimax and Promax rotations,

2) Schmid and Leiman's hierarchical method, and

3) Factor analysis (maximum likelihood method). This last analysis gave results closely resembling the Promax rotation and is not further considered here.

In the activities analysis, the scree test suggested that four factors should be extracted but Kaiser's criterion gave only three. Three were used in the program used for the rotations. Reference to the factor loadings showed that in each case the Promax rotation gave the closest approach to simple structure. The first factor loadings were high for 13 scales, the four highest being those for Enjoyable, Satisfying, Agreeable and Entertaining. Four scales were clearly separated on the second factor, Useful, Valuable, Important and Essential; while on the third factor only three scales were separated, Busy, Active and Difficult. The factor loadings for the Promax rotation are shown in Table 3·IX. The loadings underlined under each factor can be shown graphically to be sharply differentiated from the rest.

TABLE 3·IX

Promax factor loadings - Activities analysis (x 1000)

Scale	Factor 1	Factor 2	Factor 3
Important - Unimportant	364	939	437
Refreshing - Exhausting	871	219	492
Useful - Useless	509	981	317
Satisfying - Distressing	978	337	108
Difficult - Easy	347	296	765
Efficient - Inefficient	856	674	302
Good - Bad	885	750	283
Popular - Unpopular	919	147	368
Active - Passive	401	481	824
Interesting - Boring	936	500	126
Entertaining - Dreary	962	261	023
Rewarding - Frustrating	842	577	231
Soothing - Irritating	955	353	222
Exciting - Monotonous	903	331	269
Essential - Unnecessary	255	925	393
Enjoyable - Unpleasant	983	313	154
Valuable - Worthless	422	981	510
Busy - Resting	131	357	952
Satisfactory - Unsatisfactory	919	643	164
Agreeable - Disagreeable	968	447	140

In the above table the polarities of the scales have been adjusted so that scales with high loadings on each factor are in agreement.

Hierarchical solution

The Promax factors and their intercorrelations are shown in Table 3·X , below.

Table 3·X

Promax factors and their intercorrelations

	Factor 1	Factor 2	Factor 3
	Enjoyable Satisfying Agreeable Entertaining	Useful Essential Valuable Important	Busy Active Difficult
F1	1.0	0·423	-0·017
F2		1·0	0·418
F3			1·0

The Schmid-Leiman method produced a hierarchy consisting of a general factor, two group factors and three specific factors which corresponded to the Promax factors above. The factor loadings when tabulated showed that the first four scales representing each factor in rank order of loadings were:

General

Valuable
Good
Useful
Important

Factor 2

Agreeable
Soothing
Enjoyable
Satisfying

Factor 3

Busy
Difficult
Active

Factor 4

Entertaining
Exciting
Enjoyable
Satisfying

Factor 5

Essential
Useful
Important
Valuable

Factor 6

Busy
Active
Difficult

In the light of the pilot results, one change was made in the list of scales. The scale 'Refreshing - Exhausting' was deleted and replaced with 'Gentle - Vigorous', in the expectation that this would have the effect of increasing to four the number of scales representing the third factor. In addition three changes were made in the list of concepts. In anticipation of larger numbers of female students in the research sample, 'watching television' was substituted for 'watching football'; and to make 'dictated notes' and 'difficult calculations' more generally applicable, 'taking notes' and 'reading' respectively replaced them. The factors extracted are discussed in Section 3·2·2, with those in the research sample study.

The analysis of the 'people' series was carried out in the same way, and four factors emerged. The factor loadings for the Promax solution are shown in Table 3·XI. The most heavily loaded scales were:

Factor 1 Good, Useful, Clever, Successful.

Factor 2 Friendly, Unimportant, Lazy, Cheerful.

Factor 3 Wise, Fair, Busy.

Factor 4 Knowledgeable, Fluent, Fair, Clever.

Contrary to expectation, the intercorrelations between these factors were low:

Factor	1	2	3	4
1	1·000	0·008	-0·242	-0·184
2		1·000	0·028	-0·072
3			1·000	0·029
4				1·000

The hierarchical solution was therefore inappropriate.

TABLE 3·XI

Promax factor loadings - People analysis (x 1000)

Scale	Factor 1	Factor 2	Factor 3	Factor 4
Good - Bad	933	130	087	117
Hard - Soft	781	410	490	138
Fair - Unfair	624	008	803	418
Friendly - Hostile	120	900	260	202
Successful - Unsuccessful	917	194	124	333
Active - Passive	878	287	306	057
Important - Unimportant	024	875	156	095
Helpful - Obstructive	899	016	429	068
Useful - Useless	933	253	342	256
Knowledgeable - Ignorant	127	252	333	860
Busy - Resting	454	584	559	172
Clever - Stupid	925	170	290	395
Considerate - Inconsiderate	835	472	334	066
Pleasant - Unpleasant	900	319	063	244
Attractive - Repulsive	683	498	162	232
Fluent - Tonguetied	868	255	196	507
Hardworking - Lazy	333	865	140	087
Wise - Foolish	028	224	881	163
Popular - Unpopular	901	153	037	076
Cheerful - Miserable	245	837	248	222

The results of the pilot 'people' analysis led to two changes in the scales and two in the concepts. The scale 'Attractive - Repulsive' aroused occasional comments from the students at the time of administration from which it was clear that they found the idea of a man being attractive a difficult one to handle. The scale 'Ignorant-knowlegeable' correlated only -0·38 with 'Clever - Stupid' but with r = 0·5 with 'Unfair - Fair' and with 'Hostile - Friendly', possibly because 'Ignorant' was used in the sense of 'boorish'. For these two scales, 'Strong - Weak' and 'Well-informed - Ill-informed' were substituted. Among the concepts, 'Your last head teacher' was, surprisingly, not always understood and this was changed to 'Your last school head'. 'Your favourite male singer' was also the cause of some difficulty and 'Your best friend' was substituted.

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3·2·2 Research sample study

The revised forms of semantic differential were administered to the research sample described in Section 2·1. The concepts are shown in Table 3·XII and the scales in Table 3·XIII.

The format was designed to enable the computer staff to work directly from the original answer sheets without any intermediate transcription, and to facilitate this the respondents were asked to record their ratings of each concept on each scale by writing a number instead of a cross in the appropriate square, as indicated by the column headings.

A computer program was written in Algol to derandomise the data and the modified mean and standard deviation program used for the pilot data was used again to produce means and standard deviations for each cell of the matrix of ratings. (The standard deviation is meaningless as such, but the program was originally written to find the mean and standard deviation of the figures in any matrix of data and the s.d. was left in as a semi-quantitative indication of dispersion in the present application). The 'activities' and 'people' data were then analysed separately, using the Principal Components, Varimax, Promax and Schmid-Leiman solutions as described above.

The grand means of the ratings of each concept on each scale are tabulated in Tables 3·XIV and 3·XV, pages 39 and 40.

The 'standard deviations' are not reported .

Table 3·XII

Two series of concepts used in the research sample study

Activities	People
1 Instructional films	1 Your worst lecturer
2 Unusual problems	2 A policeman
3 Examinations	3 Your best lecturer
4 Lectures	4 Your last school head
5 Reading	5 Yourself as a student
6 Watching television	6 The laziest student in your class
7 Homework	7 Yourself as a person
8 Travelling on buses	8 The cleverest student in your class
9 Practical classes	9 Your father or guardian
10 Taking notes	10 Your best friend

Table 3·XIII

Two sets of scales used in the research sample study

	Activities	People
1	Important - Unimportant	Good - Bad
2	Vigorous - Gentle	Hard - Soft
3	Useful - Useless	Fair - Unfair
4	Satisfying - Distressing	Friendly - Hostile
5	Easy - Difficult	Successful - Unsuccessful
6	Efficient - Inefficient	Active - Passive
7	Good - Bad	Important - Unimportant
8	Popular - Unpopular	Helpful - Obstructive
9	Active - Passive	Useful - Useless
10	Interesting - Boring	Well-informed - Ill-informed
11	Entertaining - Dreary	Busy - Resting
12	Rewarding - Frustrating	Clever - Stupid
13	Soothing - Irritating	Considerate - Inconsiderate
14	Exciting - Monotonous	Pleasant - Unpleasant
15	Essential - Unnecessary	Strong - Weak
16	Enjoyable - Unpleasant	Fluent - Tongue-tied
17	Valuable - Worthless	Hardworking - Lazy
18	Busy - Resting	Wise - Foolish
19	Satisfactory - Unsatisfactory	Popular - Unpopular
20	Agreeable - Disagreeable	Cheerful - Miserable

TABLE 3·XIV

Activities - Grand means of semantic differential ratings

Concept	1	2	3	4	5	6	7	8	9	10
Scale										
1	2·51	2·83	3·33	2·51	2·12	3·92	2·98	3·96	2·18	2·86
2	3·96	3·45	3·18	4·13	4·13	4·40	3·64	3·98	3·45	3·73
3	2·34	2·67	3·36	2·62	2·10	3·37	3·00	3·49	2·27	2·96
4	3·13	3·00	4·14	3·44	2·44	3·36	3·93	4·68	2·83	4·21
5	3·13	4·77	4·76	3·50	3·47	2·25	4·51	3·78	3·75	3·69
6	2·97	3·45	4·37	3·77	3·18	3·81	3·80	5·20	2·84	4·12
7	2·57	2·68	4·26	3·32	2·67	3·57	3·73	4·73	2·43	3·96
8	2·77	3·37	5·57	3·70	3·15	2·38	2·75	4·76	2·71	4·88
9	4 26	2·91	3·00	4·13	3·79	4·96	3·42	4·44	2·50	3·44
10	2·93	2·19	3·95	3·52	2·68	3·40	4·07	4·92	2·19	4·82
11	3·09	2·93	4·46	3·85	2·87	2·90	4·49	4·91	2·91	4·97
12	3·26	3·01	3·51	3·52	2·75	3·50	3·75	5·21	2·66	4·39
13	3·79	4·36	5·33	4·32	3·28	3·59	5·08	5·49	3·77	5·13
14	3·80	2·90	4·42	4·29	3·38	3·87	4·56	5·24	2·97	5·17
15	2·85	2·83	3·77	2·59	2·13	4·19	3·16	3·38	2·27	2·77
16	2·86	3·07	5·19	3·51	2·63	3·06	4·53	4·84	2·57	4·80
17	2·53	2·50	3·23	2·66	2·15	3·39	3·00	4·03	2·08	2·88
18	4·13	2·96	2·62	3·85	4·00	5·49	2·96	4·11	2·65	2·93
19	3·06	3·14	4·24	3·72	2·77	3·80	3·86	4·86	2·83	3·85
20	2·91	3·28	5·08	3·63	2·78	3·18	4·38	4·88	2·52	4·57

Key 1 and 7 - Extremely (left or right pole resp. in Table 3·XIII)

2 and 6 - Very

3 and 5 - Slightly

4 - Neutral.

TABLE 3·XV

People - Grand means of semantic differential ratings

Concept	1	2	3	4	5	6	7	8	9	10
Scale										
1	6·08	3·34	2·31	3·65	3·25	4·28	3·01	2·90	2·40	2·50
2	4·62	2·82	3·75	3·21	3·73	4·18	4·09	3·86	3·82	3·71
3	4·45	3·63	2·18	3·43	3·14	4·38	2·60	3·08	2·59	2·58
4	3·75	4·01	2·28	3·54	2·69	3·46	2·48	3·34	2·30	2·12
5	5·33	3·51	2·37	3·01	2·99	4·60	3·02	2·56	3·15	2·78
6	4·62	2·92	2·60	3·53	3·25	5·01	3·17	3·15	2·90	3·18
7	4·02	2·38	2·70	3·10	3·38	4·74	3·33	3·54	2·59	2·79
8	4·37	3·28	2·02	3·48	2·77	4·27	2·54	3·41	2·43	2·38
9	5·16	2·59	1·95	3·20	3·12	4·68	2·87	3·01	2·61	2·65
10	3·81	3·66	1·80	4·85	3·28	4·45	3·04	2·90	3·07	2·81
11	3·95	3·30	2·59	3·22	3·56	5·32	3·29	2·75	2·90	3·18
12	3·56	3·83	2·13	2·86	3·09	4·25	3·07	2·45	2·84	2·73
13	4·53	4·04	2·62	3·55	3·08	4·68	2·73	3·51	2·70	2·43
14	4·08	3·69	2·15	3·78	2·92	3·40	2·65	3·15	2·44	2·08
15	4·89	3·14	3·13	3·32	3·38	4·45	3·56	3·65	3·10	3·09
16	4·31	3·61	2·27	2·59	3·56	3·76	3·27	2·98	3·09	2·94
17	3·81	3·31	2·37	2·97	3·52	5·51	3·30	2·60	2·43	3·03
18	4·19	3·81	2·53	3·02	3·40	5·11	3·22	2·97	2·70	2·92
19	4·96	4·19	2·39	4·07	3·25	3·77	3·02	3·44	2·46	2·41
20	3·97	3·81	2·23	3·97	2·67	3·27	2·55	3·28	2·77	2·36

Key - as previous page

Analysis of Activities data

The grand means of the semantic differential ratings were analysed using the computer program mentioned in Section 3·1, which gives a Principal Components analysis with Varimax and Promax rotations and the Schmid-Leiman hierarchical solution. Three factors were extracted. Comparison of the factor loadings showed that the nearest approach to simple structure was in the Promax solution, and this solution was adopted. The loadings for each factor are shown in Tables 3·XVI, 3·XVII and 3·XVIII on the next and following pages.

The original work on the semantic differential suggested that the factors which so consistently appeared in different analyses represented fundamental dimensions of human judgment, although the scales representing these scales varied somewhat from one concept to another, or at least from one class of concept to another class. The present research offers no opportunity to make a comparable general survey of the factors, because the scales have not been selected at random, or in any representative way such as Osgood used in the Thesaurus study. The choice of scales for the study of students' attitudes in the present writer's 1970 thesis was made in the expectation that the usual three factors would be extracted, and polar terms were chosen which seemed applicable to aspects of the college and academic work and among which the expected factors seemed likely to be represented. For the pilot study described in Section 3·1, the factor "interesting/enjoyable" which appeared as the third factor in 1970, was regarded as particularly worthy of further investigation and additional scales which seemed likely to correlate with "interesting" and "enjoyable" were included. After the pilot study, the list of scales was further modified with the intention of increasing the number of

TABLE 3·XVI

Activities series: Factor 1 loadings (x 1000)

Principal Components		Varimax		Promax	
Scale	Loading	Scale	Loading	Scale	Loading
7	988	11	971	4	973
19	980	14	952	11	967
4	973	10	941	20	967
6	958	16	885	16	962
20	939	4	877	7	957
10	925	20	877	10	955
16	922	7	840	14	939
17	916	13	837	19	926
3	909	6	802	6	921
14	892	19	788	13	918
11	878	8	760	17	795
13	867	17	611	8	780
1	801	3	548	3	778
12	767	12	494	12	633
8	698	1	375	1	622
15	655	5	224	15	452
9	274	-18	198	5	256
5	148	15	179	-18	153
-2	068	9	133	9	151
18	011	-2	074	-2	147

TABLE 3·XVII

Activities series: Factor 2 loadings (x 1000)

Principal Components		Varimax		Promax	
Scale	Loading	Scale	Loading	Scale	Loading
18	987	2	978	2	966
9	907	9	922	18	964
2	904	18	919	9	941
-5	888	-5	893	-5	904
12	582	12	529	12	581
-13	467	-13	414	-13	419
-8	454	-8	351	-8	379
1	411	-16	281	-1	324
15	404	-20	256	17	296
-16	348	17	233	-16	288
-11	330	1	224	15	273
17	317	14	209	-20	256
-20	309	10	180	-11	208
3	178	-11	163	14	168
-4	122	15	154	10	151
19	075	-4	073	3	117
10	034	19	067	19	098
-6	033	-6	047	-6	068
14	032	7	039	-4	067
7	016	3	035	7	058

TABLE 3·XVIII

Activities series: Factor 3 loadings (x 1000)

Principal Components		Varimax		Promax	
Scale	Loading	Scale	Loading	Scale	Loading
15	573	15	930	1	992
-14	423	1	892	3	969
1	420	3	828	17	946
-2	378	17	738	15	937
3	360	12	637	12	862
-10	345	19	586	19	849
-11	322	6	523	7	805
-9	215	7	520	6	795
5	202	4	437	4	725
17	180	20	377	20	639
-8	144	16	334	10	619
-16	065	13	311	16	599
-4	063	18	304	14	577
12	043	9	275	13	535
19	042	10	242	9	464
-20	037	14	164	11	457
-18	029	8	117	18	359
-7	011	11	117	-8	341
-6	007	-5	052	-5	117
-13	007	-2	037	2	111

the intercorrelated scales with high loadings on the third factor, so as to increase the reliability of the factor scores which would eventually be calculated. There is therefore no guarantee that the factors extracted are exhaustive.

The first factor in Osgood's work, the Evaluative or Value factor, included scales which could not be applied literally to all the varied concepts which were judged. Such scales were Black - White, Nice - Awful, Clean - Dirty, Beautiful - Ugly, Sweet - Sour and Fragrant - Foul. The use of these scales where they were not logically appropriate required the respondent to make his judgments by analogy or by association. Other scales measuring Value related to morality or even to piety, such as Honest - Dishonest, Fair - Unfair, Sacred - Profane and Kind - Cruel. The factor takes its name, however, from the scale "Valuable - Worthless", which correlated highly with "Good - Bad".

It was suggested in Section 3·2 that for a functional object the dimensions of potency and activity might define "Value", as well as the kinds of scales mentioned above. The first factor in the Activities analysis, both in the pilot and in the research sample studies, appeared to refer to the subjective element of the students' responses and in this respect resembled the Osgood factor of Value. The first four scales in order of loadings were (considering for simplicity only the positive terms), Satisfying, Entertaining, Agreeable and Enjoyable. 'Good'was fifth. 'Valuable', however, did not appear among the ten highest-loaded scales, which were separated from the rest by a discontinuity in the series of loadings shown in Table 3·XVI.

"Valuable" was in fact the third scale in Factor 3, the others in

the first four being Important, Useful and Essential. Although it might be argued that this factor is Osgood's 'Potency', a term more suited to the particular research seemed desirable and the name 'Utility' was given to it. Similarly Factor 1 was named 'Feelings'.

The second factor could undoubtedly be identified as the familiar 'Activity' factor of Osgood, the scales most heavily loaded being Vigorous, Busy, Active and Difficult. In the present investigation it appeared to refer to the amount of energy the respondent felt he expended in each of the activities considered, and the factor was named the 'Energy' factor.

Factors 1 and 3 were appreciably correlated. The coefficients are shown in Table 3·XVIV, below.

TABLE

	Promax factors and their intercorrelations		
	Factor 1	Factor 2	Factor 3
	Satisfying	Vigorous	Important
	Entertaining	Busy	Useful
	Agreeable	Active	Valuable
	Enjoyable	Difficult	Essential
F1	1·000	-0·083	0·643
F2		1·000	0·278
F3			1·000

The hierarchical structure from the Schmid-Leiman analysis expressed these correlations, the general factor representing the overall correlation; the two group factors were Feelings/Utility and the

almost uncorrelated Energy; and the specific factors were those of the Promax solution.

Analysis of the 'People' data

The analytical procedure was the same as that used for the Activities data, and three factors were extracted. The scales were similarly tabulated in order of factor loadings, and the Promax rotation was again selected. The four most heavily loaded scales on each factor and the intercorrelations between the factors are shown below.

TABLE 3·XX

	Promax factors (People) and intercorrelations		
	Factor 1	Factor 2	Factor 3
	Strong	Pleasant	Wise
	Useful	Popular	Busy
	Active	Cheerful	Hardworking
	Important	Friendly	Clever
F1	1·000	0·527	0·670
F2		1·000	0·680
F3			1·000

In the unrotated Principal Components analysis the first factor accounted for 72% of the total variance and was difficult to interpret except as a general factor (in the Spearman sense). The results of the two rotations were broadly similar in the scales representing the factors, but the usual Evaluative, Activity and Potency could not be identified. Using the term 'dynamism' in Osgood's sense of a combination of activity and

potency, the first and the third factors were both dynamism but with different aspects. The first was concerned with strength and importance whereas the third included Wise and Clever; and so these two factors were named Physical Dynamism and Academic Dynamism, respectively. The second factor was named Likeability.

Although the choice of scales was restricted, the opportunity was available to the respondents to structure their responses in the expected way. The scales Good-Bad, Strong-Weak and Active-Passive, usually taken to represent independent dimensions, could have been so used; yet the correlations between them were in fact high. (0·90, 0·84 and 0·91) The emergence of a structure which differed from that expected, yet having equal face-validity for the particular concepts judged, casts some doubt upon the assumption of universality of the Value, Potency and Activity factors as fundamental dimensions of judgment. The results are those of a specialised sample, judging a class of concepts which had deliberately been made homogeneous, on a set of scales selected for their applicability to those concepts. The technique is not necessarily bound to the dimensions originally identified in the research which aimed to find universals and its application to further specialised situations might enrich our knowledge.

The Schmid-Leiman analysis produced a 'general' factor on which almost all the scales had high loadings, with no sharp cutoff point. The nine scales with loadings greater than 0·9 were Fair, Useful, Active, Helpful, Successful, Wise, Considerate, Good, Strong; in that order.

Factor Scores

For the sake of reliability, Osgood et al. (9) recommended that at least three scales should be used for the calculation of any factor score. For each of the factors in the Promax rotations of the Activities and of the People data, four scales were available and a further computer program was written in Algol to take the mean of the four scales representing each factor, for each concept judged, for each individual in the research sample. For the "People" data, an additional score was calculated for the "general" Schmid-Leiman factor, by taking a mean of the first nine scales on this factor.

The uncertainty mentioned in section 3.2 as to the statistical treatment of the factor scores arises from the desire for the convenience of parametric methods in spite of having collected ordinal data. If the distribution of factor scores could be shown not to deviate significantly from the normal, it might be argued that means and standard deviations could be used in the usual way.

In the Kolmogorov-Smirnov One-sample Test, the observed cumulative frequency distribution is compared with a specified theoretical distribution. The point of greatest divergence between the observed and theoretical distributions is determined and the probability that a divergence of such magnitude would occur by chance is found from tables of critical values.

The basic statistics program BAS1 at the University of Manchester Regional Computer Centre reads in ungrouped data and computes a number of statistics including the Kolmogorov-Smirnov D_{max}.

This program was used for the analysis of the two matrices of factor scores for the 183 students in the sample. The results showed that of the thirty (3 x 10) factor scores from the Activities data, sixteen had values of D_{max} which could not have been obtained by chance at the level of probability of $p = 0{\cdot}05$, and of these six exceeded the critical value of D_{max} at $p = 0{\cdot}01$. Of the factor scores from the "people" data, nine exceeded the critical value at $p = 0{\cdot}05$ and three of these at 0·01. None of the distributions of the Schmid-Leiman g factor scores exceeded the critical value at $p = 0{\cdot}05$.

Some caution is therefore required in the interpretation of the means and standard deviations of the factor scores. Over half of the factor score distributions did not differ significantly from the normal and even for the others, the parametric statistics offered some indication of central tendency and of dispersion. For significance testing, however, these statistics could not be regarded as having the properties normally attributed to them.

Comparison of data from subsamples

In Section 2·1, the varied nature of the classes of students comprising the research sample was described. It was possible, in view of the variation in both academic level of the courses included in the sample and in the occupations represented, that there might be systematic variation not only in the judgments expressed through the semantic differential but also in the dimensions used.

As a test of the stability of the factors described above, separate analyses were carried out for each of the classes of students.

In every case the size of the subsample was far below that considered acceptable for a factor analysis; but if any class (or classes) was using a pattern of judgment which differed materially from that of the others, the factors described above could not appear in their data.

In the Activities analyses, all three classes from the DMS course and two classes of the MT3 course gave the same three factors in the same order as above. The CT class and the remaining class of MT3 showed the same factors in the order Feelings, Utility, Activity while the YESTB class made the order Utility, Activity, Feelings. However in all analyses the same factors could be identified, with some variation in the scales representing these factors especially in 'Feelings'.

In the People analyses the number of factors varied. The three classes of MT3 and the first-year class from the DMS course showed the same three factors as above extracted in various orders, and with some variation in the scales included. The CT and YESTB classes, the two classes which had a majority of female students, each gave four factors not all of which could clearly be identified. The two classes from the second year of the DMS course yielded only two factors, the first of which resembled the Physical Dynamism factor and the second, Likeability. The Academic Dynamism factor did not appear.

Further comparisons were made of the factor structure of the responses of subsamples selected on different criteria. Four subsamples were used, the sixteen students with the highest Factor 1 scores in the Clustan analysis of the growth motivation questionnaire; the twenty who left the course without completing

their examinations; and subsamples selected as having the highest and the lowest criterion scores. These subsamples might be expected to differ in their overall view of academic activities and people. In all four Activities analyses the same three factors emerged in the same order. In each of the People analyses three factors emerged which were identified as before, but the order of extraction varied.

In view of the small numbers in the subsamples the agreement between the various analyses was high. In the People analyses there was some evidence of variation in the dimensions used by various subclasses, but this was not sufficient to invalidate the calculation of factor scores on the basis of the results from the research sample as a whole.

4. RESULTS

4·1 Normative data

Although the purpose of this section is to provide norms by which the data from subsamples and from individuals may be interpreted, the norms themselves have some intrinsic interest. Comments in the main stream of the research are reserved for the discussion in Chapter 5, but adventitious topics are dealt with as they arise.

4·1·1 The criterion scores

The assessments used under this heading have in common the fact that the results are expressed in numerical form, but little else. The only assessment used in the DMS 2 class was a single examination in Law, which was held over from the earlier year for timetabling reasons and which took the form of an open-book examination. The YESTB assessments included both formal examination marks and 'continuous assessments' which included both written work and practical performance ratings. The remaining classes were assessed by series of traditional examinations and the figures in Table 4·I, particularly the standard deviations, speak for themselves. The CT class was subdivided into general and psychiatric nurses and one group took three exams while the other had only two. The YESTB assessments were not all equally weighted (see footnote).

TABLE 4·I

Means and standard deviations of assessment marks

Class	Mean	s.d.	Class	Mean	s.d.
MT3 PA	41·00	21·50	CT (i)	56·92	7·54
	58·54	15·91		56·75	7·01
	62·00	18·43	CT (ii)	56.38	8·82
MT3 B	47·73	19·59		55·88	9·78
	41·70	18·37		56·00	7·92
	47·49	15·98	YESTB	103·45*	13·76
MT3 D	61·94	8·71		59·61	8·68
	51·28	16·38		61·10	8·66
	40·17	21·91		62·90	10·00
DMS 1	58·52	9·71		68·39	10·15
	70·75	13·35		69·95	10·01
	56·88	9·47		64·55	6·29
	63·35	8·06		36·26+	6·78
DMS 2	64·69	8·70		58·58	10·26

*Marked out of 150

+Marked out of 50

4·1·2 The growth motivation questionnaire

The question of using parametric statistics for the analysis of the ordinal data from the semantic differential was considered in Section 3·2·2. The same difficulty arises in the analysis of the numerical data from the growth motivation questionnaire. The Clustan package used for the cluster analysis uses product moment correlations, and Table 4·II shows the matrix of these correlations taken from the computer output. For comparison, the S.P.S.S. package (22) was used to calculate the matrix of rank order correlations by Spearman's method, and these are shown in Table 4·III. The similarity was reassuring.

Means and standard deviations for the seventeen questionnaire items are shown in Table 4·IV. For seven of these items, the calculated means fell outside the range 3·0 - 5·0 (i.e., outside the 'slightly' points either side of neutral). Favourable expectations were reported as to the results of the forthcoming examinations, and favourable changes in expectations in this respect. (Items 5 and 6) Concentration (item 7) was rated difficult, although the lack of a quiet place to work in did not seem to be the reason (item 8). A majority of the students would have preferred a closer interest by staff (item 9), but items 15 and 17, consciousness of learning and pleasure in developing abilities, were favourably rated.

The indications of disperson given by the calculated standard deviations confirm the finding of the pilot study that the responses to these items were well spread. On 13 of the items, the extreme points at the ends of the scales were both used. In this respect, the questionnaire served its purpose of differentiating between the members of the sample on the topics mentioned in Section 2·2·2, and the open-ended responses (some of which are included in the

TABLE 4·II

GROWTH MOTIVATION QUESTIONNAIRE - ITEM CORRELATIONS

(product-moment)

1	1·00																
2	-0·18	1·00															
3	-0·38	0·26	1·00														
4	0·25	-0·29	-0·06	1·00													
5	-0·01	0·11	0·09	-0·29	1·00												
6	-0·00	-0·02	0·01	-0·04	0·09	1·00											
7	-0·20	0·13	0·23	-0·15	0·17	0·17	1·00										
8	-0·30	0·17	0·26	-0·21	0·05	0·15	0·47	1·00									
9	0·09	0·13	-0·01	-0·04	-0·09	-0·05	-0·06	0·05	1·00								
10	-0·36	0·08	0·19	-0·19	0·20	0·13	0·46	0·35	-0·09	1·00							
11	0·10	0·17	-0·03	-0·07	-0·01	0·09	0·04	0·06	0·06	-0·02	1·00						
12	-0·19	0·11	0·07	-0·16	0·07	0·18	0·08	0·09	-0·01	0·23	0·38	1·00					
13	0·00	0·35	-0·01	-0·21	0·17	-0·15	-0·02	0·06	0·07	-0·07	0·09	0·02	1·00				
14	-0·16	0·42	0·15	-0·31	0·28	0·17	0·09	0·09	0·08	0·23	0·19	0·36	0·34	1·00			
15	-0·43	0·19	0·23	-0·22	0·10	0·24	0·42	0·52	-0·02	0·44	-0·01	0·15	-0·06	0·28	1·00		
16	0·26	-0·07	-0·14	0·23	-0·00	-0·07	-0·31	-0·35	0·04	-0·37	0·12	-0·01	0·26	-0·05	-0·30	1·00	
17	-0·22	0·18	0·10	-0·08	0·07	0·19	0·37	0·45	0·02	0·33	0·18	0·16	-0·05	0·20	0·50	-0·23	1·00
18	-0·09	-0·18	0·01	-0·03	-0·08	-0·03	-0·11	-0·20	0·01	-0·13	-0·04	-0·02	-0·08	-0·11	-0·10	0·07	-0·09	1·00

TABLE 4·III Growth motivation questionnaire - item correlations

(Rank-order)

1	1·00																
2	-0·19	1·00															
3	-0·38	0·28	1·00														
4	0·23	-0·27	-0·08	1·00													
5	0·01	0·12	0·08	-0·29	1·00												
6	0·01	-0·02	-0·02	-0·05	0·09	1·00											
7	-0·19	0·08	0·21	-0·14	0·10	0·22	1·00										
8	-0·28	0·09	0·23	-0·15	0·05	0·16	0·55	1·00									
9	0·05	0·11	0·00	-0·05	-0·10	-0·04	-0·09	0·04	1·00								
10	-0·33	0·04	0·20	-0·17	0·19	0·10	0·45	0·35	-0·10	1·00							
11	0·05	0·16	-0·05	-0·04	0·02	0·11	0·00	0·03	0·10	-0·01	1·00						
12	-0·19	0·10	0·10	-0·17	0·11	0·14	0·12	0·11	0·05	0·23	0·39	1·00					
13	-0·04	0·35	-0·04	-0·18	0·20	-0·12	-0·11	-0·01	0·06	-0·07	0·06	0·04	1·00				
14	-0·15	0·42	0·15	-0·31	0·32	0·12	0·03	0·04	0·08	0·18	0·20	0·35	0·37	1·00			
15	-0·44	0·16	0·24	-0·21	0·09	0·23	0·41	0·49	-0·00	0·41	-0·03	0·16	-0·01	0·27	1·00		
16	0·24	-0·02	-0·13	0·23	0·04	-0·06	-0·33	-0·31	0·05	-0·37	0·11	-0·03	0·26	-0·06	-0·2	1·00	
17	-0·19	0·20	0·08	-0·03	0·08	0·22	0·33	0·40	0·02	0·26	0·24	0·17	-0·03	0·21	0·47	-0·17	1·00
18	-0·08	-0·17	0·00	-0·04	-0·09	-0·02	-0·11	-0·20	0·02	-0·11	-0·07	-0·01	-0·08	-0·09	-0·10	0·06	-0·11	1·00

case studies in Section 4·2) were in general consistent with the pre-coded ratings.

The criterion score was not highly correlated with any of the questionnaire items and did not appear as a highly loaded variable in any of the factors extracted in the Principal Components analysis or the rotations.

TABLE 4·IV

Means and standard deviations of questionnaire items

Item	High score signifies:	Mean	s.d.
1	Career expectation now worse	3·8	1·2
2	Course itself useless	3·5	0·7
3	Course boring	4·0	0·9
4	Pleased with progress (cf. expected)	3·7	1·4
5	Exam result expected - poor	2·6	1·3
6	This (5) is worse than expected	2·6	1·4
7	Concentration easy	2·5	1·1
8	Quiet place never available	2·8	1·4
9	Prefer closer interest by staff	5·0	1·3
10	Course never offers scope	3·6	1·4
11	Told what to do all the time	3·4	1·4
12	This (11) is wrong	3·4	1·7
13	Work too difficult	3·6	1·0
14	Work out of control	3·2	1·5
15	Not conscious of learning	2·8	1·6
16	Working extremely hard	3·9	1·5
17	No pleasure in developing abilities	2·4	1·4
(18	High criterion score	100·6	12·1)

4·1·3 Norms from the semantic differential

Grand means and standard deviations of the factor scores of the research sample are shown in Tables 4·V and 4·VI, in which the Activities and People data are presented separately. In each case the results of certain supplementary calculations are shown.

Activities

Some of the activities of a student are seen as requiring more effort than others. In the 1970 study, one of the characteristics which distinguished the more successful students was that they gave more favourable ratings than the norms to certain of the more arduous activities such as homework. In the computer program written to calculate factor scores in the present work, calculations were included to find the mean scores on each factor for the four activities during which the student is expected to produce an output (Unusual problems, Examinations, Homework and Taking notes) and for the three activities in which he accepts an input (Instructional films, Lectures and Reading). In addition, a comparison was made between two academic activities (Instructional films and Unusual problems) and two non-academic activities (Watching television and Travelling on buses).

People

Some of the 'people' included in this set of concepts represented the academic environment, and others were intended for comparison. 'Yourself as a student' was intended to be compared with 'Yourself as a person','Your last head teacher' (possibly an authoritarian figure) was to be compared with 'A policeman', 'Your best lecturer' with 'Your father or guardian' and 'The cleverest student in your class'with 'Your best friend'. Calculation of the means of the factor scores for the academic people and for the non-academic

people and of the difference between these means was included in the computer program and the results are included in the Table.

The patterns of the mean factor scores in both sets are in agreement with expectation, in general. The 'output' activities gave rise to less enjoyment and satisfaction than the 'input' activities, were less useful but more energetic. The academic people had lower Physical Dynamism and Likeability than the non-academics, but higher Academic Dynamism! (The differences are small, but the 99% confidence limits for this sample size are much smaller)

In the Activities series of concepts, generalisations were required about types of activity. In the People series, particular individuals were identified. The consequence of this was that the scores for the People were more idiosyncratic than those for Activities and although statistical generalisations such as those above could be made from the means, the comparisons between the People concepts were unreliable for individuals.

TABLE 4·V

Grand means and standard deviations of Activities scores

Concept	Feelings		Energy		Utility	
	Mean	s.d.	Mean	s.d.	Mean	s.d.
1 Instructional films	5·00	0·75	3·70	0·71	5·44	0·91
2 Unusual Problems	4·93	0·88	4·86	0·70	5·30	0·96
3 Examinations	3·28	1·18	4·92	0·79	4·58	1·51
4 Lectures	4·39	0·84	3·85	0·84	5·41	0·90
5 Reading	5·32	1·09	3·89	0·98	5·87	0·88
6 Watching television	4·88	0·86	2·85	0·81	4·28	1·18
7 Homework	3·67	1·21	4·62	0·73	5·00	1·32
8 Travelling on buses	3·17	1·31	3·81	1·00	4·29	1·23
9 Practical classes	5·29	0·99	4·79	0·78	5·80	0·92
10 Taking notes	3·36	1·17	4·40	0·80	5·10	1·27
Output activities	3·81	0·75	4·70	0·52	4·99	0·79
Input activities	4·90	0·62	3·81	0·58	5·57	0·63
Academic activities	4·36	0·56	4·26	0·44	5·28	0·60
Non-academic activities	4·03	0·86	3·33	0·72	4·29	0·92
(Acad. - Non-acad.)	0·33	0·91	0·92	0·81	1·00	0·98

TABLE 4·VI

Grand means and standard deviations of People scores

Concept	Phys Dyn.		Likeable		Acad Dyn.		g factor	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
1 Your worst lecturer	3·33	1·08	3·81	1·37	4·12	1·05	3·15	0·89
2 A policeman	5·24	0·78	4·07	1·03	4·44	0·91	4·64	0·81
3 Your best lecturer	5·41	0·74	5·74	0·80	5·60	0·81	5·59	0·66
4 Your last school head	4·71	1·14	4·16	1·44	5·98	1·08	4·65	1·14
5 Yourself as a student	4·72	0·81	5·11	0·81	4·61	0·80	4·85	0·65
6 The laziest student...	3·28	1·02	4·52	1·17	2·95	0·92	3·39	0·90
7 Yourself as a person	4·77	0·79	5·33	0·78	4·78	0·82	5·03	0·67
8 The cleverest student...	4·66	0·83	4·70	1·02	5·31	0·81	4·86	0·71
9 Your father or guardian	5·20	0·98	5·51	1·02	5·29	0·89	5·27	0·84
10 Your best friend	5·07	0·86	5·76	0·90	5·04	0·88	5·28	0·77
Academic people	4·88	0·51	4·93	0·61	5·13	0·55	4·99	0·45
Non-academic people	5·08	0·55	5·17	0·57	4·89	0·55	5·06	0·52
(Academic - Non-acad.)	-0·20	0·56	-0·24	0·59	0·24	0·55	-0·07	0·49

4·2 Subsamples

The study satisfaction scores which were calculated using the Clustan package were used to select subsample of students who had extreme scores on this factor, for convenience called HICLUS and LOCLUS; and the criterion scores were used in the same way to select HICRIT and LOCRIT. These four subsamples are described below.

A further subsample was studied, of those who left their courses before completing their examinations. The sample was heterogeneous, and although certain of the individuals offered vivid examples of human problems, no significant generalisations could be made from the data and the subsample is not considered further in this thesis.

4.2.1 Subsamples "HICLUS" and "LOCLUS"

The first factor extracted in the Clustan analysis of the data from the growth motivation questionnaire appeared to represent the satisfaction of personal needs through academic work. It was therefore named the "study satisfaction factor".

The factor loadings tabulated in Table 3·II, page , show no sharp differentiation between items on this factor. Rotation made some difference to the rank order of factor loadings but did not produce simple structure. Interpretation was based upon the five items which had among them the five highest factor loadings in each of the three solutions. These items were:

15. Do you feel conscious that you are learning?

8. Ignoring both the value of the qualification and its usefulness in your career, how interesting do you find the course?

10. Does the course offer you scope for the kind of work you want to do?

7. Apart from the value of the qualification at the end of the course, how useful do you think the course itself will be as training for your career?

17. Can you take pleasure in the thought of increasing or developing your abilities during this course?

The Clustan package included a procedure for calculating factor scores from the unrotated principal components, and these scores for the "study satisfaction" factor ranged from -6·54 to +5·35. In order to obtain subsamples containing roughly 10% of the research sample at each extreme, cutoff points of -3·00 and +2·30 were chosen. The identifying numbers, courses, study satisfaction scores and criterion scores of these two subsamples are shown in Tables 4·VII

and 4·VIII, below. The mean criterion score of the HICLUS subsample is slightly below the grand mean but this difference is not statistically significant. The subsample mean criterion score for LOCLUS of 94·4 is significantly below the grand mean ($p = 0{\cdot}05$).

TABLE 4·VII

Composition of "HICLUS" subsample

Student's number		Study satisfaction score	Criterion score
131	DMS II	2·346	107·44
133		2·429	79·84
136		3·307	74·67
201	MT 3	2·402	106·87
203		2·449	108·37
214		3·210	111·30
229		2·800	85·87
307		2·412	84·08
308		5·354	113·52
309		3·466	121·41
502	DMS I	2·797	89·45
517		3·925	105·46
523		3·063	112·64
902	YESTB	2·313	104·69
924		2·372	96·72
925		2·381	84·72

TABLE 4·VIII

Composition of "LOCLUS" subsample

Student's number		Study satisfaction score	Criterion score
109	DMS II	-3·152	98·81
125		-3·096	114·33
127		-3·258	102·26
129		-3·439	98·81
130		-4·619	90·19
139		-30·30	79·84
185	MT 3	-6·485	105·65
189		-3·182	81·82
190		-3·448	87·97
192		-3·751	90·31
193		-3·635	84·68
198		-3·338	93·14
204		-4·450	90·74
206		-6·544	77·29
501	DMS I	-5·228	104·92
906	YESTB	-3·536	109·79
913		-3·501	99·77
917		-3·111	97·78

Confirmation and extension of the information contained in the study satisfaction scores was sought by comparing the responses to the open-ended items in the same questionnaire, item by item.

In the tabulation below some corrections have been made to spelling and punctuation.

Item 1 'How do you feel about being a student? Please explain.'

HICLUS responses

131: 'Being a part-time student, enjoy a greater amount of freedom.'

133: 'I think quite honestly that I am happy because I gain more every day of my life by being a student. I improve myself by my own hard work. I am not a sponsored student.'

136: 'Enjoy it a lot. I like the youthful role it allows me to play!

201: 'Lucky at my age to get the opportunity.'

203: 'It's good being able to have the time to put your brains to work, and achieve something at the end of it.'

214: 'I don't feel much about being a student. It is a necessary stage in my education to enable me to reach the standard required by my employers.'

229: 'I am grateful to get the opportunity to be a student at such a well equipped and modern college.'

307: 'I feel that it is allowing me to learn a certain topic, thus increasing my knowledge. Broadens my outlook on life.'

308: 'By being a student I am able to do further education.'

309: 'The idea of being a student to me is a course carried on after school for further education in the field of work you choose.'

502: 'I consider that being a student is quite a normal situation since, in certain respects, you are a student all your life, if you (have) an absorbing hobby then you are a student of such hobby; likewise with an educationally recognised course such as D.M.S.'

517: 'OK. I find that gathering of knowledge is always interesting.'

523: 'I feel that it is necessary to obtain knowledge to enable me to perform my job to the best of my ability.'

902: 'I am enjoying being a student again. I enjoy theoretical arguments, investigations and discussion for their own sake although I do not always relate this to the practical situation.'

924: 'Very pleased. Before coming on this course I spent 2 years

in a large business organisation in whichI was not particularly happy, and I am delighted to return to something I find intrinsically more satisfying.'

925: 'Distinctly in favour.- the chance to revert to a "contemplative life" after the rat-race and daily pressures of Industrial Management is most welcome.'

Item 1 responses of LOCUS subsample

109: "I don't really feel like a student, as I have no connections with the college except four lectures on a thursday. Certainly I like a day off work for academic training."

125: "O.K."

127: "Bored"

129: "Disappointed. Year 1 was largely a waste of time. Some aspects of Year 2 seem the same."

130: "Not uneasy."

139: "Rather restricted in so much as I find it difficult to fit in my studies with my other interests."

185: "Nothing"

189: -

190: -

192: "Being only a part time student it is difficult to give an opinion on this question."

193: "IT'S SOMETHING I HAVE TO DO FOR MY JOB."

198: "I do not have any feelings and have never really thought about it. I just accept what I am and leave it at that."

204: "As a part-time student I feel that it takes a lot more to learn the work that if were here for say 3 months on block."

206: "REASONABLE"

501: "BORED - the course is very disappointing at present

906: "I like it in general. I enjoy learning being with other people learning the same basic things, and the discussions that ensue. I like the flexible hours, the informality, the freedom to decide whether or not to attend lectures, etc. I don't like the chores often involved in being a student, such as essays and discussions which seem to be introduced for the sake of keeping me busy - if they are intrinsically interesting, then that's fine, but often they are just boring."

913: "Confused - in that being an undergraduate several years ago I became disenchanted with student attitudes + isolationism. Now as a seconded student I find that I am again conforming to these attitudes which are really irrelevant to the working situation."

917: "I enjoy being a student, mainly becos' having come straight from school + university I have never done anything else. It allows me a good social life, opportunity of meeting people, plenty of spare time and an opportunity to be irresponsible"

Item 2 Do you get what you want from the Polytechnic?

HICLUS responses

131: 'Hope to qualify for a certificate at the end of IIIrd year.'

133: 'Judging from my improvement in my educational standards, I can say quite frankly that I am gaining from the Polytechnic.'

136: 'As a student no. There is no social grouping or formal structure that involves me.'

201: 'I think so.'

203: 'Knowledge, yes.'

214: 'Yes, I believe I do, but after being here for only 10 days, I cannot be sure.'

229: 'The Polytechnic is quite helpful when there is any difficulty especially the Students Union. The lecturers are quite helpful.

307: 'Yes.'

308: 'Yes'

309: 'In the sense of education yes.'

502: 'Mainly I wish to obtain knowledge in order that I can become a better manager, secondly by becoming a better manager I will (I hope) obtain promotion. I also wish to obtain Dip in Management Studies although this comes last in scale of preference since this does not necessarily make a better manager.'

517: 'What I expected'

523: 'I only want knowledge - as far as I can judge to date, the course which I am following is providing me with the sort of info. I require.

902: 'On the whole, yes. Enough basic information and references are given for one to pursue subjects further given the time. Again, though, there is the problem of relating this to my occupation.'

924: 'Not always, although I think defects are more often connected with organization/administration rather than with course content.'

925: 'Yes'

Item 2 responses of LOCLUS subsample

109: 'I hope to get the diploma. The course content is not very good'

125: 'No.'

127: 'No.'

129: 'Only partly'

130: 'Not particularly.'

139: 'Facility wise (as a building) - Yes.

'Lecture and Course wise - No.'

185: 'No'

189: 'NOT ENTIRELY'

190: -

192: 'I get what the syllabus requires that I get.'

193: 'I GET WHAT THE COURSE ALLOWS ME TO GET'

198: 'The only reason I go to a polytechnic is to learn and this I get, if I am prepared to work. Which I must admit is not all the time.'

204: 'No! ' The course does not cover the work I do in practice.'

206: 'MOSTLY'

501: 'D.M.S.'

906: 'Not really (but this is only one area of the Poly - the YESTB course). The course is just not stimulating - in fact, the reverse. Of the South Centre in general, it seems to lack the liveliness (academic and social) I found at university.

913: 'A post-graduate qualification.

'Friendship from other students.'

917: 'Not really, facilities for socialising, learning, reading etc. bad. Little chance to integrate with other groups within the Poly.

Item 3 Do you spend your time efficiently while working? If not, why not?

HICLUS responses

131: 'Yes I do.'

133: 'Yes'

136: 'Yes'

201: 'YES'

203: 'Yes'

214: 'Most of the time I do, sometimes I have problems my mind tends

to wander off the problem in hand.'

229: 'I do spend my time efficiently because the scope of work to do is always interesting.'

307: 'Yes.'

308: 'Yes'

309: 'Yes'

502: 'I consider that I do.'

517: 'Not always since on some days I find a certain lack of interest'

523: 'Not particularly efficiently in class - better in my own time.'

902: 'No. I tend to work in bursts, according to "mood" '

924: 'Impossible to generalize here. By and large I spend my time more efficiently, more productively than I did at university, although I still have difficulty at times with concentration.'

925: 'To the best of my ability.'

Item 3 responses of LOCLUS subsample

109: 'Not really as it depends quite a lot on the effectiveness on the lecture'

125: 'No - direction of studies uncertain
lecturers uncertain of objectives
and best way to achieve them.'

127: 'No, lack of enthusiasm'

129: 'It depends on the individual lecturer concerned: some are too vague about course direction.'

130: 'No; basically due to motivation problems.'

139: 'NO. Lack of participation on course - much of the syllabus I have covered before.'

185: 'NO, NOBODY WORKS EFFICIENTLY FOR 8 HOURS A DAY.'

189: 'Not always. I mess about too much.'

190: 'No! I don't think the lessons are varied enough. Too much writing mainly dic tation. Excuses given to students that dictation

is used to enable all the work in the course to be completed. If this is so I think the courses should be reduced to make course more interesting and less boring. (This applies to some lessons only)'

192: 'No. Probably because I get bored and because I do not apply myself enough.'

193: 'NO, TOO MANY DISTRACTIONS'

198: 'I do not spend all my college time efficiently because I get bored during some lessons.'

204: 'Yes and no. No because I find that the majority of the lecturers know what they mean but cannot 'put it over' to you.'

206: 'NO, TOO MUCH DISTRACTION FROM OTHER STUDENTS.'

501: 'No. - it is not possible in the public sector, this is improving and gives vast scope for young managers.'

906: 'While working, yes, normally. I only work (at this course anyway) if under pressure to hand in something - the object is normally to get it out of the way as quickly as possible, but I try to maintain a reasonable standard and wouldn't hand in something I thought wasn't up to this.'

913: 'No. In so far as, do I find the lectures instructive? Much of my time is wasted, possibly through laziness or lack of application or possibly lack of interest in the subject matter (in some cases).'

917: 'When working, very efficient time spending. But I dont work for long or often! '

Item 4 Are you spoon-fed too much, or not enough?

This item did not differentiate between the subsamples. Opinion was divided within each subsample.

Item 5 Do you think the facilities in general are reasonably adequate?

This item also was similarly answered by the two subsamples. The majority of each subsample answered 'Yes', but the DMS and YESTB students tended to complain about the library.

Item 6 What in particular do you like or dislike about your course? If you have more than one point to make, please indicate the order of importance.

HICLUS subsample

131: 'Like the contents of the course but dislike their presentation (some parts)'

133 'The length of time the course will take. I would prefer to do the rest on full time and finish off earlier, because my Government is pressing for me to come home and take up a position.'

136: 'Simple topics are made too important and are stretched out too much.'

201: 'The number of hours spent in one day i.e. $11\frac{1}{2}$ hours.'

214: 'There's no real question about liking or disliking it. Its part of the working week and a necessary part of my education.'

229: 'I don't dislike any subject because all the subjects are so interesting.'

307: 'Some subjects are taken into too much detail others are not taken enough into detail. In two subjects in particular the work is not explained enough. This is due to the tutor.'

308: 'The difference in teaching methods used by lecturers. Some treat students like schoolchildren.

309: '1) In some cases you are not allowed to state your case in a particular subject you must listen and not discuss

2) Some lecturers have different ways of teaching some good some bad.'

502: 'The most important factor is that subjects such as sociology/psychology are great thought inducing subjects and this alone is of great benefit when analysing problems, especially problems with a human aspect.

'The subjects making up the course leave a little to be desired since I feel it is difficult to say exactly what a management student should or should not be taught.'

517: 'The actual content of the course appears to be OK but the big difficulty lies with persuading the students that the ideas concerning human relations in industry are important and worth considering in real industrial situations.

523: '1) Course content

2) Course participation'

902: '1) Like - the fact that the tutors are being very flexible, trying to arrange - and if necessary alter - things in order that we can get the most from our time here.

2) Dislike - the timetable is usually very full which means that I am not able to do as much private study as I would like.'

924: '1) Opportunity to mix with people of similar interests etc.

2) Opportunity to tackle problems I can see to be significant.

'Having to travel to the University or the centre of Birmingham to see some decent books! '

925: 'I find the variation in the subjects maintains my interest and avoids the risk of boredom. As almost every subject is new to me it adds interest to the range of subjects.'

Item 6 responses of LOCLUS subsample

109: 'Dislike 1) lack of seminars and group discussion

2) lack of outside lecturers who are expert in a particular area

3) Extremely slow progress of some of the subjects'

125: 'Lacking in pace, lacking in direction, lacking in lecturers competence'

127: '1) Waffle-type lecturing in common

2) Most subjects too superficial '

129: '1 Lack of direction in some subjects

2 Slow pace in some subjects'

130: 'The general standard does not seem to be of what ought to be a post-graduate standard.'

139: '1) We are 'lectured at' too much. Insufficient participation

2) The course, due to 1), is boring and uninteresting.'

185: 'I strongly dislike the hours. How can anybody absorb knowledge from 9 a.m. to 8.30 p.m. Why don't they split the course into $1\frac{1}{2}$ days instead of this barbaric carry on Them yobos are alright at the university with their snooker tables etc. Prejudice I call it'

189: 'Dislike - does not always apply at work

'Like - part time.'

190: -

192: -

193: -

198: '1) A lot of the work bores me

2) I think General Studies is a waste of time

204: 'I don't do either I put up with the good and bad.'

206: 'Does not teach me what I want to know too much theory and NO! practice. The day is too long.'

501: 'I do not find the course practical enough in its content. It is very disappointing after the H.N.C. in Business Studies - this I found a better course.'

906: ' I find it very disappointing in that it is not stimulating or interesting. This seems to be the result of uncertainty among the course organisers about how to tackle things, and a fear of giving us any information. As a result, we have endless tenuous discussions based on very little fact; discussion is fine, but it helps to have some idea what you are talking about.'

913: 'Dislikes 1) Assessment system,

2) Non-productive group work.

Likes 1) Practical placements

2) Social involvement with staff and students.

917: 'Dislike attitude of staff, often patronising, disinterested. Also very often lack of relevance of subject matter presented. Lack of stimulation generally.

Item 7 (This is combined with a pre-coded rating scale)

How do you think your career prospects now compare with your expectations when you left school? (very much better/very much worse)

Please explain:

HICLUS subsample

131: 'Being professionally qualified, expect to get better and better.'

133: 'I have a good knowledge of things now than when I started the course. I have more confidence of myself now and this gives me joy.'

136: 'When I left Sec. Mod. I was very surprised to have obtained

6 'O' levels together with my teachers. Then I obtained a HNC at 20 years of age, and got into University. I was fairly pessimistic and lacked confidence.'

201: 'To change ones job completely after 22 years must set a few problems. I was a patternmaker, I wish to be a teacher.'

203: 'Now if I'm successful I can gain a full Cert equal to an H.N.C. which I can use for a secure job.'

214: 'I left school with 3 'O' levels and I didn't know how Industrial life would suit me or me it, but after working for over 2 years I feel that I like the career and that I am suited to the work.

229: 'I should say that in about 10 years time, especially now we are in the common Market, all the people with all the responsibility and the top jobs are people with letters after their names;'

307: 'For a start I have more qualifications now also my knowledge (general) is much greater. Broader outlook on life. Older thus more common sense.'

308: 'When I left school I had made a mess of my school exams, but in the last two years at college I have done very well and achieved very high marks in my exams.'

309: 'When I left school my ambition was to become a design draftsman with help and an apprenticeship from the firm they have put me on the right lines for success.'

502: -

517: 'Since I now know which path I wish to follow and have a better understanding of how to achieve this.'

523: -

902: 'When I left school, I had little or no ideas of a future career - and was personally very immature. Now that I am older, and have found a more satisfactory occupation, I feel I am able to contribute much more.'

924: -

925: 'I am now on a route which will lead to a job from which I am confident I will derive immense satisfaction and will feel that what I am doing is of help to todays young people and society. I am conscious that my values have changed over the last few years, particularly influenced by those people I have come to know well who are in the 'supportive' and educational sphere. The narrowness of outlook of commercial undertakings led me to seek a sphere with broader horizons and the Careers Officers role has all I seek, meeting and dealing with young people, using the wide range of industrial experience I have acquired and, not least, giving me the chance to acquire knowledge for improvement of my broad education and the assistance of others.

LOCLUS subsample

109: 'A university degree was obviously the major factor in improving my career expectations. I expect this diploma will be of slight benefit.

125: 'I never considered a Professional type career with academic qualification e.g. Degree because I was not good enough at school. Since then I realise that I can achieve more academically in various subjects. I believed one had to settle into ones own social level and that not everyone had to go to University. I now believe my career prospects are better than I envisaged when I left school.

127: 'Change from Chemistry to Industrial Engineering, more scope.'

129: ' I know where I want to go and the general route I want to take.'

130: 'On leaving school went straight to University, hence career prospects must be better; I do not think they have altered by attending this course.'

139: 'I had no clear view of my career prospects when I left school. I now have a much clearer view of the future.'

185: 'NO'

189: 'I did not think I would get my present job.'

190: -

192:'If a person with a decent I.Q. enters engineering where I entered, unless he drives hard all his life his future is zero. The answer obviously is to get out and do what one wants to do, by doing something different or by gaining better qualifications and then come back.'

193: -

198: 'When I left school I went into a job that I knew very little about. I think I was lucky that I found I enjoyed the work I was doing.'

204: 'As I work for a large firm you have to be extremely clever to be noticed even slightly.'

206: 'I was completely hopeless at school now my prospects look better.'

501: 'I am a senior administrative assistant in the health service - my career prospects are good. I enjoy my work and think that new ideas etc. will improve the public sector, I hope I may have a chance of introducing some of these ideas.

906: 'The difference is largely between potential when I left school, now to some extent realised in a degree, some job experience and so on. To some extent this is off-set by the fact that I'm older, so would hesitate to consider certain jobs/careers now.'

913: 'As one gets older and specialises in certain fields, the available careers obviously become narrower.'

917: 'I never had any expectations'

Item 8 What differences do you find between this course and your previous education?

HICLUS subsample

131: 'Much easier.'

133: 'A marked difference because it has helped to make easier the areas of my difficulties.'

136: 'The course itself is somewhat basic but has prompted me to read more academic books than ever before. The course perhaps allows more self expression and involvement in discussion.'

201: 'Easier'

203: 'It tends to be more advanced but things always get harder as you go along. I take it more seriously now because I know my future depends a lot upon my success at the end of the course.

214: 'I don't really know the reason why, but I find the education at this college better than at Hall Green where I studied my Part I. The facilities here are obviously better here and this makes me feel like being more industrious.'

229: 'Very much higher and also much more interesting.'

307: 'Course covers a far wider range of studies in a particular class. Work is much harder now due to the work being far more advanced.'

308: 'If by the question previous education means school the differences are great as at school there is not much specialisation towards an eventual career. At college I am working towards my eventual job which gives the incentive to work harder.'

309: 'The attitude to work is greatly different. The atmosphere is much better and you are treated like a human being and not a machine. You can see your life pattern ahead of you.

502: 'I feel that any form of study, provided it is undertaken

willingly (as is this course) assists in developing my abilities.'

517: 'Since my last course was with the physical sciences (chemistry) then the lack of absolute terms of reference on DMS is a little difficult to (illegible, possibly appreciate) also that partial course was given in a more formal setting.'

523:' Allows me to develop previous interest in subjects, which to date I have studied little.'

902: 'The main difference is in the vocational content of the course. As all previous study has been academic, the emphasis has been on theoretical arguments. Now, although it is easy (and enjoyable) to become involved in such discussions, one is always aware that the main point of being here is to do ones job better, afterwards.'

924: —

925:' More adult in aspect and with a far higher degree of pupil participation.'

Item 8 responses of LOCLUS subsample

109: -

125: 'Very poor administration - worse than most colleges - which are generally bad. Course tutoring and lecturing not up to the standard expected (?) and generally for a major City Polytechnic!

127: 'Much less factual, imprecise, slow.'

129: 'With some exceptions the standard of teaching is lower.'

130: 'The major comparison is with the degree course at University; the disjointed sessions make continuity of thought and work/study difficult, it tends to break up the routine of work.'

139: 'Less practical, otherwise very similar.'

185:'None'

189: 'At school it was general here you specialise.'

190: -

192: -

193: -

198: 'Work before was more general. This is more specialised.'

204: 'The lack of teaching now its all lecturing.'

206: 'None'

501: 'I am very disappointed with this as a course - HNC was far more useful. However if I manage to survive the boredom of this first year things may improve.'

906: 'Comparing it with school, the approach is pretty similar in that I often feel I'm being asked for a "right answer", and also in that discussions are, more often than not, dialogues with the tutor (though certainly there's no similarity between stress on homework and stress on work here). With university, there's a world of difference, largely in the attitude of our main tutors. At university, tutors were very enthusiastic in putting over their subjects; here, there is often the impression that tutors are dealing with a subject because there's no one else to do it, and the sooner they are done, the better.'

913:'Largely unstructured! Perhaps too much reliance on common sense and assumption that all students have similar educational, occupational and experience backgrounds.'

917: 'It is far less academic.'

Item 9 was answered by only six of HICLUS and four of LOCLUS, and did not differentiate between the subsamples.

Item 10 Can you take pleasure in the thought of increasing or developing your abilities during this course?

HICLUS subsample (Nine of the subsample responded)

136: 'Ego gratification! '

214: 'This goes back to the question of the previous page. At this

college, I take much more pleasure in learning than I have before. This may be the college or a slight change of heart.'

307: 'It is very nice to know that my firm are paying me to learn, which is very much to both my benefit and the firms.'

308: 'In working hard during the course it will benefit me in furure years.'

309: 'In increasing my education at college it pays a great deal back when working and using the ideas.'

502: 'Greatly different - apart from conventional grammar school education, most of my previous study has been by correspondence course - an entirely different mode of study.'

517: 'At this point in time yes but only if the learning processes and theories from are allowed to be tested in real life situations.'

523: 'Previous education has been substantially of a technological nature (Mech.Eng.) i.e. very little concerning behavioural sciences. This course places a fair amount of emphasis on the latter.'

902: 'Only to say that I find exploration of any subject, or the acquiring of any skill extremely satisfying.'

Item 10 responses of LOCLUS subsample (Ten of the subsample)

127: 'I would like to think my abilities were being developed but generally I am bored by this course.'

130: 'Yes; I feel that this is something which I have been through previously; i.e. much of the work done so far was covered during the University degree course as a subsidiary.'

139: 'My 'abilities' are not really being developed by the course.'

189: 'If I thought I was learning enough I would take pleasure in doing so.'

192: 'Everybody wants to learn it is just that some things do not interest some people.'

198: 'The only reason is that the work I do now will help me later on.'

204: 'If I did increase my abilities yes.'

501: 'So far I have learnt very little of any practical use.'

906: 'I did, before the course began, but I find the course so stultifying and depressing, that I have lost this, I'm hoping my enthusiasm will rebound - it usually does in this type of situation, so perhaps the depressing picture isn't the long-term one (if I thought it was, I'd be very worried)'

913: 'I feel I am learning by experience, contact with other people and information absorption, but I am undecided as to whether my abilities are developing along the lines that I want them to.'

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The above comments were submitted to five independent judges, qualified and experienced in some branch of social science. The judges were invited to comment on the responses of the two subsamples but were not given any suggestions as to what to look for.

Judge A made a rigorous analysis of the responses item by item and found those of the HICLUS students to be overwhelmingly positive and those of LOCLUS either overwhelmingly negative or far less positive. The written comments of this judge were: "No doubt about the differences between the two groups - the one basically enjoying their college experience, the other critical. .....without further information, impossible to tell why the differences arose. There are hints that the enthusiasts include some unsophisticated students e.g. no previous experience of university after school or foreign born and that the negative group are more sophisticated and the Poly is a come-down....."

Judge B:

HICLUS responses were positive, about themselves as people being developed. The LOCLUS responses were on a different level, about trivial and administrative matters.
HICLUS responded about their development as people, improving themselves. When LOCLUS responses were positive they were functional, about salary, promotions. They responded in terms of appraisal of what happened around them whereas HICLUS referred to what happened inside them. LOCLUS were not so consciously concerned with their needs; their comments were functional, instrumental, and their complaints trivial.

Judge C:

The HICLUS subsample was more clearly defined, consisting of self-improvers. They have come with a fairly clear idea what they want and on the whole feel they are getting it. They are more accepting, conformist, and seem to value knowledge (as opposed to wisdom), not so much forming personal judgments as sitting at the feet of the teacher.
In LOCLUS there are conflicting things- a less homogeneous group. They are tolerating what they have got to do, because employers insist or because they feel it the only way to get on. They show greater questioning of what is because of unfulfilled needs within themselves. They want something apart from a meal ticket and are not getting it - seeking and not finding, where HICLUS were seeking and finding. Possibly they are more intelligent, using the system instead of simply conforming. They have come to get something, but having got here wish they were getting something else; come because of external pressure but wish they were coming for something more. Perhaps they regret a) that they didn't expect more than they did, and also b) that they were in the situation anyway.
A bit disillusioned, playing Society's game but feeling regretful,

making one think, "Isn't it sad."

Judge D:

There seem to be three themes,

1) some in each subsample were strongly job-oriented;

2) LOCLUS felt they were on a conveyor belt, pushed by their firms, training boards etc., and

3) HICLUS felt they were expanding, being broadened, gaining new insights, understanding what they're doing.

Judge E:

The management students talked more about management and named the course.

In item 1 HICLUS gave more evidence of feelings (which was what the question asked for) rather than stating conclusions.
LOCLUS were more glib, also more nil responses, and defensive.
HICLUS tend more to explain, LOCLUS to state conclusions.
In item 2 LOCLUS were more cryptic, defensive, in stating their negative answers.
In Item 3 LOCLUS were the more explanatory. HICLUS were cryptic but tended to relate conclusions to themselves compared with LOCLUS who tended to project, or to lay blame, and not to own their own inefficiency.
In item 7, HICLUS were talking more of personal growth as individuals than LOCLUS were, e.g. broadening outlook, gaining confidence. Felt satisfaction. (LOCLUS did a bit, too, but not so much.)
Item 8 - HICLUS appear to be enjoying themselves more than LOCLUS. With one exception the LOCLUS replies were briefer.
General impressions - HICLUS are more alive. LOCLUS give the impression of being ploddy, "I've done all this before" people who don't struggle beyond "I don't like it". Also some disillusioned who'd like to change the situation.
HICLUS relate a lot to themselves. They have values to do with freedom, growth, development; doing things for their own sake for

the experience and enjoying that.

"LOCLUS make you feel "How sad". Maybe they felt that about themselves as well. You wonder, what would turn them on?"

At this point E agreed with the suggestion of an inner/outer - directed dichotomy.

All five of the judges in one way or another expressed reservations about their subjective judgments and the possibility that they might be projecting their own values. Each, however, was able to offer observations or hypotheses which are discussed in Chapter 5.

The semantic differential scores of the two subsamples are shown in Tables 4·IX and 4·X as deviations of the subsample means from the grand means. The appropriate parametric test of these deviations would be to determine whether the deviation was greater than 1.96s.d./ n, for p = 0·05. (i.e., for n ; 16, 0·49 x the s.d. listed in Tables 4·V and 4·VI, or for n = 18, 0·46 x these values.) An asterisk in the tables of deviations shows a figure significant by this criterion, but no attempt has been made to differentiate levels of significance.

In addition to the subsample means, deviations of factor scores have been calculated for each member of the HICLUS subsample, and these are presented in Appendix A.

TABLE 4·IX

Activities scores: deviations of subsample means from grand means

	HICLUS			LOCLUS		
Activities	Feelings	Energy	Utility	Feelings	Energy	Utility
Instr.films	+0·26	+0·10	+0·01	-0·26	-0·09	-0·42
Unusual prob.	+0·33	-0·00	+0·25	-0·36	-0·25	-0·20
Exams	+1·00 *	-0·14	+0·94 *	-0·68 *	-0·42 *	-0·54
Lectures	+0·42 *	+0·03	+0·47 *	-0·50 *	-0·35	-0·17
Reading	+0·06	-0·09	+0·10	-0·17	-0·40	-0·29
Watchg TV	+0·28	-0·16	+0·25	+0·29	-0·07	+0·35
Homework	+0·58	-0·14	+0·49	-0·90 *	+0·04	-1·04 *
Travg on bus	+0·59	+0·14	+0·49	-0·55	+0·13	-0·03
Pract. class	+0·08	+0·26	+0·25	-0·22	-0·10	-0·21
Taking notes	+0·48	+0·02	+0·48	-0·49	-0·30	-0·19
Outputs	+0·60 *	-0·02	+0·54 *	-0·61 *	-0·23	-0·49 *
Inputs	+0·25	+0·01	+0·19	-0·31 *	-0·28	-0·23
Academic	+0·42 *	-0·03	+0·36 *	-0·46 *	-0·26 *	-0·36 *
Nonacademic	+0·44 *	-0·01	+0·37	-0·14	+0·02	+0·16
Acad.- Nonac.	-0·01	-0·02	-0·01	-0·32	-0·28	-0·52 *

TABLE 4·X

People scores: deviations of subsample means from grand means

	HICLUS				LOCLUS			
	Ph.Dyn.	Likeable	Ac.Dyn.	"g"	Ph.Dyn.	Likeable	Ac.Dyn.	"g"
1	+0·67*	+0·27	+0·24	+0·42	-0·45	-0·51	-0·69	-0·54*
2	+0·04	+0·28	-0·00	+0·07	+0·27	-0·47*	-0·32	-0·12
3	+0·31	+0·37	+0·34	+0·20	-0·33	-0·50*	-0·19	-0·32
4	+0·04	+0·64*	+0·22	+0·10	+0·14	-0·38	+0·04	-0·05
5	+0·39	+0·49*	+0·63*	+0·46*	-0·09	-0·18	-0·55*	-0·27
6	-0·17	-0·01	-0·05	-0·07	-0·09	-0·32	+0·18	+0·07
7	+0·31	+0·22	+0·31	+0·21	-0·18	-0·11	-0·43*	-0·20
8	+0·38	+0·32	+0·16	+0·29	-0·40*	-0·40	-0·28	-0·36*
9	-0·05	+0·49*	+0·42	+0·32	+0·27	-0·22	-0·04	-0·05
10	+0·18	+0·29	+0·06	+0·18	-0·30	-0·35	-0·48*	-0·42*
11	+0·38*	+0·46*	+0·38*	+0·27*	+0·02	-0·29*	-0·32*	-0·29*
12	+0·12	+0·32*	+0·19	+0·19	-0·17	-0·37*	-0·24	-0·25*
13	+0·16	-0·14	-0·14	-0·06	-0·19	-0·08	+0·07	-0·05

1. Your worst lecturer
2. A policeman
3. Your best lecturer
4. Your last school head
5. Yourself as a student
6. The laziest student in your class
7. Yourself as a person
8. The cleverest student in your class
9. Your father or guardian
10. Your best friend
11. Nonacademic
12. Academic
13. Academic - Nonacademic

4.2.2 Subsamples "HICRIT" and "LOCRIT"

The various methods of assessment used as the basis for calculation of a criterion score were outlined in Section 2.2.1 and the means and standard deviations of the marks in Section 4.1.1. Subsamples of students who had very high or very low criterion scores were selected by taking arbitrary cutoff points of 85 and 119. The composition of each subsample is shown below.

TABLE 4·XI

Composition of "HICRIT" subsample (n = 14)			
Student's number		Study satisfaction score	Criterion score
103	DMS II	2·04	128
105		0·23	132
113		0·01	123
117		0·74	120
121		0·33	120
188	MT 3	0·54	127
215		-0·60	123
222		-1·02	121
223		1·54	128
227		2·10	126
(H) 309		3·47	121
410	CT	1·56	120
510	DMS I	1·24	119
909	YESTB	0·87	120

(H) signifies member of HICLUS subsample.

TABLE 4·XII

Composition of "LOCRIT" subsample (n = 17)

Student's number		Study satisfaction score	Criterion score
108	DMS II	0·72	75
118		1·38	75
(H) 133		2·43	80
(H) 136		3·31	75
(L) 139		-3·03	80
140		0·90	83
(L) 189	MT 3	-3·18	82
(L) 193		-3·64	85
194		-1·07	82
(L) 206		-6·54	77
221		0·03	75
239		1·83	79
240		-2·83	84
(H) 307		2·42	84
314		-1·09	85
(H) 925	YESTB	2·38	85
928		-0·87	80

(H) signifies member of HICLUS subsample.

(L) signifies member of LOCLUS subsample.

- - - - - - - - - - - - - - - -

As examples of the open-ended questionnaire responses, the responses to the first two items are compared below.

Comparison of open-ended responses from HICRIT andLOCRIT subsamples

Item 1 How do you feel about being a student? Please explain.

Hicrit subsample

103: Good. Continuing assimilation of knowledge.

105: Keen since day release gives me the opportunity to relate what I am doing at college with the work situation.

113: Life is a University. All men are students.

117: Don't really feel like a student at school or university because of the normal work environment.

121: It is a necessary evil. The method of learning rather than the actual learning.

188: I enjoy going to college.

215: Leaving school and continuing studying is a drag, but an essential to my success in the future.

222: As a mature student I'm glad. But sorry I didn't avail myself for studying earlier in life.

223: This has no bearing in me at all. My job is of more impprtance than being a student.

227: It's a means to an end (i.e.) I am a student to get qualifications.

410: Freedom. Meeting many other people. Away from the rather routine, somewhat military styled life of the hospital.

510: I like studying always something new. This keeps me in steps with modern world.

909: I don't really feel like a student partly because I am seconded so I'm paid and also because I have a more settled domestic existence than when I was doing my degree. It enables one to be more flexible in 'time-keeping' and the distribution of work which I enjoy. On the other hand I cannot identify with many 'student' attitudes.

Item 1 responses of LOCRIT subsample

108: I quite like the idea.

118: It should be stimulating not only in the contents of the course but should also help in my general approach to life.

133: I think quite honestly that I am happy because I gain more every day of my life by being a student. I improve myself by my own hard work. I am not a sponsored student.

136: Enjoy it a lot. I like the youthful role it allows me to play.

139: Rather restricted in so much as I find it difficult to fit in my studies with my other interests.

140: This does not bother me, I have elected to become a student and by doing so aimt to improve myself both in knowledge of the different aspects/depts of my firm and whilst doing so gain qualifications to advance by futurs.

189: -

193: It's something I have to do for my job.

194: -

198: I do not have any feelings and have never really thought about it. I just accept what I am and leave it at that.

206: Reasonable

221: From my own point of view of always being a part-time student the system doesn't seem to be too bad. My own personal view is that a full student reaps most of the benefits by knowing what's going on, most of the time.

239: I look at it 2 ways:- 1) A great chance to gain education to specialize in a certain job, 2) As being part of my job.

240: As I am on day release its a break from work.

314: Being a student, I find that teachers will treat you differently, some treat us as if we were immature. Another reason I don't like being a student is that we are often the target of adult discrimination.

405: Stimulated.

928: Not my first experience so not too strange. Find it stimulating, taxing at times, sometimes confident (35/40%) sometimes threatened (35/40%). Enjoy the young age-group (I am in my forties), like their courage, humour, forward-thinking, questioning.

Item 2: Do you get what you want from the Polytechnic?

HICRIT subsample

103: Not entirely

105: Yes

113: Yes, Management Studies and opportunities for discussion.

117: Management training.

121: 1) The piece of paper

2) A broader base of experience and appreciation

3) Reference notes for future use

188: Yes

222: Yes.

223: Not always.

227: To a certain extent yes.

309: In the sense of education yes.

410: Near enough to it.

Seeing new faces - gain something new and sometimes interesting to think about.

215: Engineering wise Yes

Socially No.

510: Not completely. Subjects which I am studying are not entirely new and sometimes it is boring due to repetition.

909: Not really - I think it lacks an academic attitude and doesn't replace it with anything else. There seems to be little coordination and the facilities for private study, food etc. are abysmal.

Item 2 responses of LOCRIT subsample

108: Yes, on the whole. Some of the subjects have to be brought up to date.

118: This is difficult to assess until the course is completed and I have had a chance to prove the usefulness of the course.

133: Judging from my improvement in my educational standards, I can say quite frankly that I am gaining from the Polytechnic.

136: As a student no. There is no social grouping or formal structure that involves me.

139: Facility wise (as a building) - yes.
Lecture and course wise - no.

140: Basically yes I do get what I want but would suggest that a little more time be given for discussions about the various topics raised in each lecture.

189: Not entirely.

193: I get what the course allows me to get.

194: -

206: Mostly.

221: Not really, not compared to full-time students. Which is further education.

239: Yes

240: Academically, yes.

307: Yes.

314: Yes, as I only attend to be taught about my job.

925: Yes

928: Sometimes. Was brought up in formal teaching situation. Am somewhat geared to this but much appreciate the opportunity to question and discuss, share and participate, not available in formal situation. Seem to have adjusted but still feel some need for formal teaching and guidance.

The responses to these two items show the heterogeneity of the subsamples.

TABLE 4·XIII

Activities scores: deviations of HICRIT and LOCRIT from grand means

Activities	HICRIT means			LOCRIT means		
	Feelings	Energy	Utility	Feelings	Energy	Utility
Instr. films	+0·02	-0·24	-0·07	-0·12	+0·09	+0·28
Unusual prob.	+0·20	+0·10	+0·16	-0·00	-0·10	+0·61*
Examinations	+0·24	+0·70*	+0·65	+0·01	+0·12	+0·67
Lectures	-0·07	+0·22	-0·05	-0·14	+0·00	+0·12
Reading	+0·16	+0·45	+0·31	-0·08	+0·12	+0·16
Watch^{g} TV	+0·44	+0·03	+0·20	-0·23	+0·18	+0·15
Homework	+0·17	+0·62*	+0·55	-0·11	-0·18	-0·48
Trav^{g} on bus	-0·24	+0·21	+0·01	-0·45	-0·04	+0·36
Pract. class	-0·13	+0·21	+0·04	-0·02	-0·32	-0·09
Taking notes	+0·30	+0·39	+0·58	-0·27	-0·16	+0·44
Outputs	+0·23	+0·46*	+0·49*	-0·09	-0·08	+0·32
Inputs	+0·03	+0·15	+0·07	-0·12	+0·08	+0·19
Academic	+0·13	+0·30	+0·28	-0·11	-0·01	+0·25
Nonacademic	+0·10	+0·12	+0·10	-0·35	+0·06	+0·25
Acad.-Nonac.	+0·03	+0·19	+0·17	+0·24	-0·06	-0·00

For HICRIT, $n = 14$; $1{\cdot}96 \times \sqrt{n} = 0{\cdot}52$

For LOCRIT, $n = 17$; $1{\cdot}96 \times \sqrt{n} = 0{\cdot}48$

TABLE 4·XIV

People scores: deviations of HICRIT and LOCRIT from grand means

	HICRIT means				LOCRIT means			
	Ph.Dyn.	Likeable	Ac.Dyn.	"g"	Ph.Dyn.	Likeable	Ac.Dyn.	"g"
1	+0·28	-0·22	+0·20	+0·19	-0·55*	-0·41	-0·40	-0·39
2	+0·15	+0·47	+0·45	+0·30	+0·19	-0·78*	-0·38	-0·31
3	-0·14	-0·06	-0·08	-0·15	+0·13	+0·25	+0·19	+0·19
4	+0·67*	+0·32	+0·75*	+0·69*	+0·17	-0·66	+0·01	-0·07
5	+0·25	+0·07	+0·37	+0·15	+0·28	+0·17	+0·04	+0·22
6	-0·17	-0·23	-0·67*	-0·40	+0·73*	-0·39	+0·42	+0·33
7	+0·31	+0·03	+0·36	+0·21	+0·11	+0·08	-0·25	-0·05
8	+0·52*	+0·48	+0·42	+0·54*	-0·50*	-0·17	-0·46*	-0·23
9	+0·39	+0·28	+0·21	+0·27	-0·04	-0·23	-0·20	-0·06
10	+0·09	+0·12	+0·26	+0·13	-0·17	+0·11	-0·35	-0·19
11	-0·33	-0·20	-0·37	-0·30	+0·03	-0·11	-0·05	+0·03
12	-0·24	-0·22	-0·32	-0·23	+0·02	-0·21	-0·30	-0·15
13	-0·09	+0·02	-0·04	-0·07	-0·00	-0·10	-0·25	-0·18

* as TABLE 4·XIII

1 Your worst lecturer

2 A policeman

3 Your best lecturer

4 Your last school head

5 Yourself as a student

6 The laziest student in your class

7 Yourself as a person

8 The cleverest student in your class

9 Your father or guardian

10 Your best friend

11 Academic

12 Nonacademic

13 Academic - nonacademic

5. DISCUSSION AND CONCLUSIONS

A key concept in this research was that of personal autonomy, elaborated by Angyal (5). In this view the healthy individual, who can conveniently be regarded as an open system interacting with his environment, shows a tendency to behave in such a way as to increase his ability to determine the outcome of these interactions. As an aspect of this tendency he tends to grow psychologically by assimilating experiences. The task of the psychologist, Angyal suggested, was to relate the general trend or pattern of the individual's behaviour to his production and utilisation of perceptual pictures.

In Maslow's view, the self-actualising person becomes not so much the master of his environment as independent of it. Freed from 'deficiency-problems', he is able to concern himself with 'being'. Maslow reports that the proportion of the population who are self-actualising by his criteria is less than 1%. Much of this work is beyond the scope of the present thesis, but the idea of growth motivation (as opposed to deficiency-motivation, which leads us to eat, mate, acquire status etc. with the aim of satisfying deficiencies) is relevant. Growth is in itself a rewarding experience, and the appetite for growth is whetted, not allayed, by gratification.

The students in the Polytechnic sample were clearly differentiated by their scores on the 'study satisfaction factor' calculated from responses to the growth motivation questionnaire. Some, represented at the extreme by the HICLUS subsample, reported satisfaction and enjoyment in their college work, while others expressed dissatisfaction.

Herzberg (8) noted that when describing 'critical incidents' in their employment, his subjects tended to mention extrinsic factors such as money, status, security, working conditions and company organisation in their accounts of times when they were dissatisfied and intrinsic factors such as feelings of achievement, recognition by others, responsibility, the work itself and career development in descriptions of times when they were satisfied. He concluded that the extrinsic factors, which he called the 'Hygiene factors', could lead to dissatisfaction but not to positive satisfaction; job satisfaction could arise only from the 'motivators' (the intrinsic factors).

There was some suggestion in the comments of the judges who read the open-ended responses of the HICLUS and LOCLUS subsamples that HICLUS tended to comment on their own psychological growth. To quote,
Judge A, "basically enjoying their college experience".
Judge B, "...about themselves as people...what happened inside them".
Judge C, "...self-improvers."
Judge D, "...expanding, being broadened.."
Judge E, "...relate a lot to themselves."
On the other hand, LOCLUS tended to refer to the environment.
Judge A used the word "critical".
Judge B, "...what happened around them."
Judge C, "...tolerating what they have got to do" (because of external pressures)
Judge D, "...being pushed,"

These observations are consistent with that of Herzberg, that respondents tend to comment on themselves and their own feelings when describing satisfying experiences, and on the environment in

connection with dissatisfying experiences; but it would be an over-simplification to conclude from this that intrinsic and extrinsic factors are unidirectional in their effects upon the individuals concerned. Burke (23) and Hinton (24), reviewing the research which followed publication of the Two-Factor Theory, found that this view was supported only by those who had followed Herzberg's methodology.

There were undoubtedly some responses from members of each subsample expressing dissatisfaction with regard to intrinsic factors, such as boredom. Also, the negative responses of the LOCLUS students were immediately perceived by two of the judges as defensive, and Judge C particularly saw LOCLUS as "seeking and not finding". These comments were not intended by the judges who made them to be taken as secure findings but as possible interpretations to be considered in the light of other evidence.

The data from the growth motivation questionnaire regarding the students' reports of their general tendencies of behaviour may be related to that from the semantic differential concerning their perceptions of certain activities and certain people characteristic of their academic environment. The factor scores may be taken as representations of the ways in which the individuals in the sample symbolised these "concepts" (to use Osgood's term). The dimensions which emerged from the analyses described in Section 3 were sufficiently stable to form the basis for generalisation, the Promax solution forming the nearest approach to simple structure. The choice of this oblique solution obviated the use of the "D" matrix technique for comparing distances between concepts in a Euclidian semantic space, but the factors had clear meanings in relation to the concepts

judged. In the Activities analysis the factors could be identified with those usually associated with the instrument, but to emphasise their application in the present research were given the names 'Feelings', 'Energy' and 'Utility'. In the People analysis the factors cut across the usual ones, and were named 'Physical Dynamism', 'Likeability' and 'Academic Dynamism'. These latter factors were correlated.

In considering the factor scores there are two issues, the probability that deviations of the magnitude observed could have occurred by chance, and the absolute values of the deviations. In spite of the uncertainty as to the use of means and standard deviations for the data under consideration, the internal consistency of the patterns observed is convincing. For example, the probability that all ten factor scores for the 'Feelings' of the HICLUS subsample would be in the same direction by chance is 1 in 512; but the correspondence of this result with Lady Venables' (25) observation of the "vitality" of some apprentices is intuitively appealing.

The forms of activity which most sharply differentiated HICLUS from LOCLUS were examinations, lectures and homework, and the 'output' activities combined. The perceptions of these activities by HICLUS, by comparison with the student sample as a whole, were more favourable on both the Feelings (satisfying/agreeable) and Utility (important/useful) dimensions; while those of LOCLUS were the direct opposite. Comparison of the People scores of these subsamples showed that HICLUS tended to take a more favourable view of both the academic and the nonacademic people and that LOCLUS also rated the academic and nonacademic people alike but less favourably. This made nonsense of the idea which led to the inclusion of the nonacademic

concepts, that the latter could be used as controls; but it indicates a generalised set in relation to all the concepts rated including the self.

One of the judges of the questionnaire responses suggested that HICLUS were "more accepting, conformist,..." If this were so, it could be expected that academic activities should be rated high on Utility by this subsample indicating that they were perceived as important and useful, and therefore to be accepted. It is less clear that ratings of Feelings, comprising scales of Satisfying, Entertaining, Agreeable, and Enjoyable should also be high, because this would show that the activities were rewarding in themselves. The simpler explanation of the high scores on both factors is that HICLUS are those who found the values of the educational system, or at least that part of it with which they were in contact, to be consonant with their own.

Although the factor scores for Feelings and for Utility showed clear differences between HICLUS and LOCLUS, those for Energy did not. The emergence of this factor in the analysis demonstrated willingness to rate activities in this dimension, and it might be expected that those who reported enthusiasm for academic work might find these activities relatively effortless. When an idea or a situation is 'stimulating', the need for physical or mental effort may be forgotten or disregarded . On the other hand, growth involves the acceptance of challenge, the deliberate choice of the more demanding or difficult course of action in place of the safer or easier. The deviations of the factor scores of individual members of HICLUS from the grand means are shown in Appendix A . Students 131,133, 136, 201, 307 and 924 rated academic activities, particularly those requiring some visible output, as relatively low on the Energy factor;

but 309, 502 and 925 perceived these same activities as relatively vigorous and the remainder of the subsample could not be placed in either of these categories. Important as this aspect of motivation is, no satisfactory interpretation of the factor scores was found.

All the foregoing discussion has been concerned with the subsamples selected on the basis of their study satisfaction scores. The subsamples selected by their criterion scores were not homogeneous with regard to their motivation. Tables 4·XI and 4·XII show that all but two of HICRIT had positive scores for study satisfaction while LOCRIT was more heterogeneous and included four members of HICLUS and four of LOCLUS. The open-ended responses to the growth motivation questionnaire reflected this heterogeneity and the mean semantic differential factor scores, which might be regarded as a diluted version of the HICLUS/LOCLUS comparison, added nothing to the observations previously discussed except as a reminder of the uniqueness of each individual.

The aim of this research was to find a pattern of relationships in students' motivation and, although some reservations remain, a pattern was observed. If the semantic differential scores may be taken as an indication of underlying values which influenced perception, then the students who reported that they were learning and gaining personal satisfaction through their college work had values which were consonant with those they found in their own sector of the educational system. They saw their activities as more useful as well as more enjoyable and satisfying than the grand means; and tended to rate the people around them, and themselves, favourably. At the other extreme, the subsample of dissatisfied

students showed a contrasting pattern of scores.

Some of those who reported favourably on their college experience referred to their academic work as intrinsically satisfying, while others regarded their studies as a means by which they were achieving satisfaction in their careers. Angyal's concept of increasing autonomy covers both of these sources of satisfaction, but the theories which distinguish between intrinsic and extrinsic factors are more difficult to apply in the interpretation of the self-report data. Students who say that they attend college only to gain a better-paid job may, in spite of this declared deficiency-motivation, appear to be finding positive satisfaction in the mastery of their craft or profession. It was clear, however, that some of the students felt that their needs were being met while others with apparently similar needs and attending the same courses, did not.

Referring to their previous education, some students wished that they had realised earlier that it was worth while to study. Similar remarks were made in Lady Venables' study (26) and again in her follow-up study (27). Dissatisfaction, however, was by no means confined to those who had not awakened to their educational needs. Post-graduates felt it as well. The open-ended responses suggested that there was the expected diversity of learning style. It was to be expected that particular aspects of a course would be appreciated by some students and deplored by others. The student, to take a single example, who suggested that his individual project report should be replaced in the assessment scheme by additional examinations may not have been speaking for the majority, but he exemplified the kind of diversity discussed by Hudson (28). The needs and preferences of syllabus-bound and syllabus-free students are not usually considered by those who design courses.

The criterion scores of the dissatisfied students showed that success in examinations can be achieved by those who lack the advantage of enthusiasm for academic work. This criterion of academic performance was used in the absence of any other, but there is a case for regarding the students' own estimates of their progress as being, in some circumstances at least, a more valid indicator of academic achievement. The small correlation between the criterion scores and measures of satisfaction need not be regarded as contradicting the conclusions of this thesis.

The need for diversity in the system of higher education has been discussed by Sir Peter and Lady Venables (29), who quote McConnell as follows:

> "Everything we know about human variability in aptitude, achievement, interests, motivations, attitudes, values and intellectual dispositions among students who will comprise the future college and university population underscores the need for a highly diversified educational system. Fitting students into traditional educational structures will no longer serve their needs or the needs of society. Instead, the system of institutions will have to be adapted to the characteristics and potentialities of students"

This thesis began by proposing the development of systems theory as a convenient framework for the study of students' academic motivation. Emery's three arguments were cited. The first of these, that only such an approach will reveal 'Gestalten' properties, appears tautologous if we accept Bertalanffy's definition of the systems approach as the study of the 'constitutive' characteristics, but the value of the understanding of these characteristics is self-evident. In the second argument, Emery quotes the generalisation that the

common characteristics of open systems represent more than analogy and offer a powerful research tool. Certain notions have been used in this thesis without being identified as part of systems theory. The processes of perception involve feedback mechanisms which are familiar to the systems engineer; the principle of equifinality, that a system has a choice of pathways by which the same aim can be achieved, applies to the ability of the individual to fulfil his tendency to increase his autonomy either through intellectual growth or through career development; and the whole strategy of the research has been to look for relationships between the components of the psychological system of the individual.

Emery's third argument was that the systems approach is likely to reveal the 'general in the particular'; that it may, in fact, resolve the dilemma sometimes felt of having to choose between statistical generalisations and detailed study of particular cases. The observations presented here provide some support for this view.

Systems theory may be seen to be capable of accommodating not only the patterned variations in satisfaction through academic work but the differences in psychological characteristics by which they have been interpreted, within a unified conceptual framework. This framework offers a promising approach to the task of providing a system of education which could match the diversity of students' needs.

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APPENDIX A: Semantic differential factor scores of HICLUS students

Student 131

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+ 0·50	+0·56	-0·44
2. Unusual problems	- 1·18	-1·36	-0-05
3. Examinations	+ 0·97	-0·92	+0·17
4. Lectures	+ 0·61	-0·10	-0·16
5. Reading	- 0·32	+0·36	-1·12
6. Watching television	+0·37	+0·90	+0·72
7. Homework	+0·58	-0·87	+0·28
8. Travelling on buses	+1·33	+0·44	+0·71
9. Practical classes	-0·54	-0·57	-0·05
10. Taking notes	+0·89	-0·90	+0·12
Outputs	+0·31	-1·01	+0·13
Inputs	+0·26	+0·27	-0·57
Academic	+0·29	-0·37	-0·22
Non-academic	+0·85	+0·67	+0·71
Academic - Non-academic	-0·56	-1·04	-0·94

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+0·17	+0·19	-0·12	+0·62
2. A policeman	-0·24	+0·42	+0·81	+0·69
3. Your best lecturer	+0·34	-0·24	-0·60	-0·15
4. Your last school head	-	-	-	-
5. Yourself as a student	+0·03	-0·12	-0·11	-0·18
6. The laziest student in your class	-	-	-	-
7. Yourself as a person	-0·27	-1·07	-0·28	-0·36
8. The cleverest student in your class	-	-	-	-
9. Your father or guardian	+0·30	+0·49	+0·96	+0·62
10. Your best friend	+0·18	+0·24	+0·21	+0·39

Student 133

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-0·25	+0·05	+0·31
2. Unusual problems	-0·43	-0·61	-0·80
3. Examinations	+0·97	-0·17	+0·42
4. Lectures	+0·61	-0·35	-0·91
5. Reading	-0·57	+0·11	-0·87
6. Watching television	-0·13	+1·15	+0·22
7. Homework	+0·58	-0·87	+0·03
8. Travelling on buses	+1·08	-0·06	+0·71
9. Practical classes	-1·54	-1·04	-1·80
10. Taking notes	+0·64	-0·15	+0·40
Outputs	+0·44	-0·45	+0·01
Inputs	-0·08	-0·06	-0·49
Academic	+0·18	-0·26	-0·24
Non-academic	+0·47	+0·54	+0·46
Academic - Non-academic	-0·29	-0·80	-0·71

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+0·42	-0·06	-0·62	+0·18
2. A policeman	-0·74	-0·57	+0·06	-0·53
3. Your best lecturer	+0·59	+0·26	+0·15	+0·18
4. Your last school head	+0·79	+1·59	+0·27	+0·91
5. Yourself as a student	+0·73	+0·14	+0·64	+0·59
6. The laziest student in your class	+1·22	-0·27	+1·45	+1·17
7. Yourself as a person	+0·73	+0·42	+0·47	-0·47
8. The cleverest student in your class	-0·41	-0·20	-0·81	-0·30
9. Your father or guardian	-0·20	+0·99	+0·46	+0·51
10. Your best friend	+0·18	+0·49	+0·71	+0·50

Student 136

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-0·25	-0·20	-0·19
2. Unusual problems	-0·18	-0·11	+0·95
3. Examinations	+1·97	-0·92	+0·17
4. Lectures	-0·39	-0·35	-0·41
5. Reading	+0·93	+1·36	+1·13
6. Watching television	-0·38	-0·35	+0·47
7. Homework	+1·58	+0·63	+0·50
8. Travelling on buses	-0·42	+3·19	-0·79
9. Practical classes	-0·04	+0·46	-1·05
10. Taking notes	+0·89	-1·40	-0·10
Outputs	+1·07	-0·35	+0·39
Inputs	-0·09	+0·44	+0·18
Academic	+0·58	-0·09	+0·28
Non-academic	-0·41	+1·42	-0·16
Academic - Non-academic	+0·98	-1·50	+0·44

People	Phys. dyn.	Likeability	Acad. dyn	"g"
1. Your worst lecturer	-0·85	+1·19	-0·12	+0·07
2. A policeman	+0·01	-0·07	-0·69	-0·20
3. Your best lecturer	+0·59	-0·24	+0·90	+0·30
4. Your last school head	+0·54	+0·84	+0·27	+0·68
5. Yourself as a student	-0·47	-0·11	+0·39	+0·37
6. The laziest student in your class	-0·03	-1·27	+1·05	-0·61
7. Yourself as a person	-0·02	+0·67	+0·73	+0·30
8. The cleverest student in your class	-0·66	-0·70	-1-31	-0·86
9. Your father or guardian	+0·05	-0·51	+0·46	+0·06
10. Your best friend	-0·07	-0·26	-0·04	-0·06

Student 201

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+1.75	-0·70	+0·31
2. Unusual problems	+1·32	-0·14	+1·70
3. Examinations	+0·72	-0·67	+1·17
4. Lectures	+0·86	-1·35	+1·59
5. Reading	-0·07	-1·14	-0·37
6. Watching television	+1·12	+0·40	+0·22
7. Homework	+0·33	-1·37	-1·00
8. Travelling on buses	+0·58	-0·81	+1·71
9. Practical classes	-0·29	-0·79	-0·05
10. Taking notes	+0·89	-0·40	-1·60
Outputs	+0·82	-0·57	+0·07
Inputs	+0·84	-1·06	+0·51
Academic	+0·83	-0·82	+0·29
Non-academic	+0·84	-0·20	+0·96
Academic - Non-academic	-0·02	-0·61	-0·68

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	-0·33	-1·06	-0·62	-0·71
2. A policeman	-0·26	-0·68	-0·69	-0·31
3. Your best lecturer	+0·34	+0·01	+0·15	+0·19
4. Your last school head	+0·54	+0·84	+0·02	+0·46
5. Yourself as a student	+0·53	+0·14	+0·64	+0·48
6. The laziest student in your class	-0·03	+0·48	-0·20	-0·06
7. Yourself as a person	+0·98	+1·42	+0·47	+0·75
8. The cleverest student in your class	+0·34	+1·05	+0·44	+0·36
9. Your father or guardian	+1·05	+0·49	+0·21	+0·06
10. Your best friend	+0·93	+1·24	-0·04	+0·72

Student 203

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-0·25	+0·55	-0·19
2. Unusual problems	-1·18	+0·36	-1·80
3. Examinations	-0·28	-0·92	+1·67
4. Lectures	-0·39	+0·15	+0·09
5. Reading	-1·32	+0·36	+0·13
6. Watching television	+1·37	-0·60	-0·28
7. Homework	+0·08	-0·12	+0·50
8. Travelling on buses	+0·58	-0·31	+0·21
9. Practical classes	-0·54	-0·54	-0·55
10. Taking notes	+0·14	+0·35	+1·15
Outputs	-0·31	-0·36	+0·39
Inputs	-0·66	+0·36	+0·01
Academic	-0·48	+0·04	+0·20
Non-academic	+0·47	-0·45	-0·04
Academic - Non-academic	-0·96	+0·51	+0·22

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+1·17	-0·06	+1·38	+0·52
2. A policeman	+0·01	-0·57	-0·19	-0·53
3. Your best lecturer	-0·66	+0·26	-0·35	-0·37
4. Your last school head	+0·29	-1·66	+0·02	-0·43
5. Yourself as a student	-0·22	+0·14	-0·11	-0·63
6. The laziest student in your class	-0 78	+1·27	-0·95	-0·39
7. Yourself as a person	-0·27	-0·83	-1·03	-0·59
8. The cleverest student in your class	-0·16	+0·05	+0·69	-0·08
9. Your father or guardian	+0·05	+0·49	+0·21	+0·40
10. Your best friend	-0·82	-0·01	-0·29	-0·39

Student 214

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-	-	-
2. Unusual problems	+0·07	-0·11	+0·20
3. Examinations	+0·72	+0·08	+0·92
4. Lectures	+0·61	+0·65	+1·59
5. Reading	+0·18	+0·11	+1·13
6. Watching television	-0·13	+0·15	-0·28
7. Homework	-0·92	-0·37	-0·75
8. Travelling on buses	-0·17	-1·56	+1·96
9. Practical classes	-0·04	-0·54	+0·20
10. Taking notes	-0·36	-0·15	+1·90
Outputs	-0·12	-0·14	+0·57
Inputs	-0·08	+0·36	+0·43
Academic	-0·10	+0·11	+0·50
Non-academic	-0·15	-0·70	+0·84
Academic - Non-academic	+0·06	+0·82	-0·34

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+1·42	-0·06	-1·12	+0·63
2. A policeman	-0·24	-0·32	-0·94	-0·86
3. Your best lecturer	+0·59	+0·51	+0·90	+0·30
4. Your last school head	-0·46	+0·59	+0·27	-0·43
5. Yourself as a student	+1·28	+1·14	+0·89	+0·82
6. The laziest student in your class	-0·53	-2·02	+0·05	-0·61
7. Yourself as a person	+0·73	+0·42	-0·28	+0·53
8. The cleverest student in your class	+0·84	+1·05	+0·19	+0·70
9. Your father or guardian	+1·05	+0·99	+0·71	+1·17
10. Your best friend	+0·93	+0·99	-0·79	-0·06

Student 229

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-0·25	+1·05	-0·19
2. Unusual problems	+1·57	-0·11	+0·20
3. Examinations	-0·28	+0·33	+2·42
4. Lectures	-0·14	+1·15	+1·09
5. Reading	+0·68	-1·64	-0·87
6. Watching television	+0·62	-1·60	-0·28
7. Homework	-1·08	+0·38	+2·00
8. Travelling on buses	+2·08	-0·31	+1·21
9. Practical classes	-0·79	+1·46	+1·20
10. Taking notes	+0·64	-1·40	+0·90
Outputs	+0p25	-0·20	+1·39
Inputs	+0·09	+0·52	+0·01
Academic	+0·17	+0·15	+0·70
Non-academic	+1·35	-0·95	+0·46
Academic - Non-academic	-1·17	+1·12	+0·23

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+1·42	+0·44	+0·13	+0·85
2. A policeman	-0·49	+2·18	+0·31	+0·47
3. Your best lecturer	+0·69	-0·24	+0·65	+0·63
4. Your last school head	+0·04	+2·84	+2·02	+0·65
5. Yourself as a student	+0·78	+0·89	-0·11	+0·83
6. The laziest student in your class	-1·53	+0·73	-1·95	-0·50
7. Yourself as a person	-0·27	-1·33	-0·78	-0·36
8. The cleverest student in your class	+1·59	+1·05	+1·69	+1·14
9. Your father or guardian	+1·05	+1·49	+1·71	+1·40
10. Your best friend	-0·82	-0·01	+0·21	+0·28

Student 307

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-0·25	+0·30	+0·56
2. Unusual problems	+0·57	-0·36	+0·95
3. Examinations	+0·72	-0·67	+2·42
4. Lectures	+0·36	+0·15	+0·84
5. Reading	-1·07	+0·36	+0·88
6. Watching television	+0·12	+0·65	+0·72
7. Homework	+0·08	-0·37	+0·25
8. Travelling on buses	-0·17	+0·19	-1·29
9. Practical classes	-0·29	-0·79	+0·20
10. Taking notes	-0·11	-0·65	+0·90
Outputs	+0·32	-0·51	+1·14
Inputs	-1·33	+0·27	+0·76
Academic	-0·01	-0·12	+0·95
Non-academic	-0·03	+0·42	-0·29
Academic - Non-academic	+0·02	-0·53	+1·23

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	-0·67	+0·19	-0·37	+0·41
2. A policeman	+0·01	+1·18	+0·06	+0·69
3. Your best lecturer	+0·09	+1·01	+0·40	+0·63
4. Your last school head	+0·29	+1·09	+0·77	+0·79
5. Yourself as a student	+1·28	+1·14	+1·39	+1·26
6. The laziest student in your class	+0·72	+0·23	+0·05	+0·40
7. Yourself as a person	-1·02	-0·08	-1·03	-0·46
8. The cleverest student in your class	+0·34	-2·45	-0·06	+0·36
9. Your father or guardian	-3·95	-1·01	+0·21	-0·83
10. Your best friend	-1·32	-1·01	-0·79	-1·06

Student 308

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+0·50	+0·30	+0·06
2. Unusual problems	-0·18	-0·61	+0·20
3. Examinations	+1·72	-0·17	+2·42
4. Lectures	+0·61	+1·15	+0·09
5. Reading	-1·32	-1·89	-1·87
6. Watching television	+2·12	-0·10	+2·47
7. Homework	+0·08	-0·12	-1·25
8. Travelling on buses	+1·33	-0·31	+0·71
9. Practical classes	+0·46	+0·21	+0·95
10. Taking notes	+1·39	+0·85	+1·65
Outputs	+0·75	-0·01	+0·76
Inputs	-0·08	-0·14	-0·57
Academic	+0·34	-0·09	+0·10
Non-academic	+1·72	-0·20	+1·59
Academic - Non-academic	-1·38	+0·13	-1·50

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+0·92	-1·31	+0·13	-0·04
2. A policeman	+0·26	+1·68	+0·56	+0·80
3. Your best lecturer	-0·41	+1·26	+1·15	+0·52
4. Your last school head	-0·21	+1·84	+1·52	+0·57
5. Yourself as a student	+0·88	+1·64	+1·64	+1·48
6. The laziest student in your class	+0·97	-1·52	-0·95	+0·28
7. Yourself as a person	-0·27	+1·67	+1·47	+0·85
8. The cleverest student in your class	+0·59	+1·05	+1·19	+1·36
9. Your father or guardian	+0·80	+1·49	+0·94	+0·95
10. Your best friend	+0·68	+1·24	-0·79	+0·72

Student 309

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+0·50	+0·80	+0·81
2. Unusual problems	+1·57	-0·36	+0·95
3. Examinations	+1·47	+1·58	+1·42
4. Lectures	+0·11	-0·60	+0·81
5. Reading	-0·57	+0·61	+0·63
6. Watching television	+1·37	+1·65	+2·72
7. Homework	+3·33	+1·88	+2·00
8. Travelling on buses	- 0·92	+1·69	-0·29
9. Practical classes	+0·46	+0·96	+1·20
10. Taking notes	-0·11	+2·10	+1·65
Outputs	+1·57	+1·30	+1·51
Inputs	+0·01	+0·27	+0·76
Academic	+0·81	+0·78	+1·14
Non-academic	+0·22	+1·67	+1·21
Academic - Non-academic	+0·57	-0·88	-0·08

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+2·67	+0·44	+1·38	+1·62
2. A policeman	+0·26	+0·43	+0·31	+0·36
3. Your best lecturer	-0·41	+0·01	+1·40	-0·02
4. Your last school head	+1·29	+1·34	+2·02	+1·91
5. Yourself as a student	+0·03	+1·89	+1·14	+0·71
6. The laziest student in your class	+0·47	-0·77	+0·05	-0·72
7. Yourself as a person	+1·73	+1·42	+2·22	+1·53
8. The cleverest student in your class	+1·84	+1·30	+1·19	+1·47
9. Your father or guardian	+0·05	+1·49	+1·71	+0·95
10. Your best friend	-0·57	+0·99	+0·21	+0·16

Student 502

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+1.25	-0·45	+0·81
2. Unusual problems	+1·57	+1·14	+1·70
3. Examinations	+0·47	+1·83	+1·42
4. Lectures	+1·61	+0·65	+1·59
5. Reading	+0·43	-0·14	+1·13
6. Watching television	+0·37	-1·85	+0·22
7. Homework	+1·83	-0·12	+1·50
8. Travelling on buses	+2·33	-0·31	+1·96
9. Practical classes	+1·21	+1·71	+0·45
10. Taking notes	-1·14	+2·10	+1·15
Outputs	+1·75	+1·24	+1·45
Inputs	+1·09	+0·02	+1·18
Academic	+0·92	+0·60	+1·31
Non-academic	+1·35	-1·08	+1·09
Academic - Non-academic	-0·42	+1·72	+0·22

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	-0·08	+2·19	+0·88	+0·52
2. A policeman	+0·01	-0·32	+0·31	-0·20
3. Your best lecturer	+1·59	+0·51	+0·65	+1·19
4. Your last school head	-1·71	-1·16	-1·48	-1·54
5. Yourself as a student	+1·03	+1·39	+0·89	+0·48
6. The laziest student in your class	-1·78	+0·98	-0·95	-1·17
7. Yourself as a person	+1·73	+1·17	+1·72	+0·97
8. The cleverest student in your class	-	-	-	-
9. Your father or guardian	+1·30	+0·74	+1·71	+1·17
10. Your best friend	+1·93	-0·26	+1·21	+1·28

Student 517

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+0·75	+0·05	+0·31
2. Unusual problems	+1·07	+1·14	+0·70
3. Examinations	+1·22	-0·17	+0·42
4. Lectures	+1·11	+0·40	-0·41
5. Reading	+0·93	-0·64	+0·13
6. Watching television	-0·88	+0·65	-0·03
7. Homework	+2·33	+0·13	+0·53
8. Travelling on buses	-	-	-
9. Practical classes	+1·71	+1·96	+1·20
10. Taking notes	-	-	-
Outputs	+1·32	+0·18	+0·14
Inputs	+0·93	-0·06	+0·01
Academic	+1·12	+0·05	+0·07
Non-academic	-0·03	+0·42	-0·16
Academic - Non-academic	+1·15	-0·36	+0·23

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+0·82	+1·69	+2·38	+0·18
2. A policeman	+0·01	-0·57	-0·44	-0·20
3. Your best lecturer	+1·09	+1·01	+0·65	-0·41
4. Your last school head	+0·29	+1·09	-1·73	-0·98
5. Yourself as a student	+0·53	+0·89	+1·39	+0·82
6. The laziest student in your class	-1·03	+2·48	-1·70	+0·61
7. Yourself as a person	+1·73	+0·67	+1·22	+0·75
8. The cleverest student in your class	+0·59	+1·55	+0·44	+0·36
9. Your father or guardian	-0=70	+0·74	-0·54	-0·16
10. Your best friend	+0·18	+0·99	-1·29	-0·28

Student 523

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	-0·25	-0·20	-0·69
2. Unusual problems	+2·07	+0·64	+1·30
3. Examinations	+3·22	-0·92	+2·42
4. Lectures	-0·14	-0·60	+1·34
5. Reading	+1·68	+0·86	+0·13
6. Watching television	+0·12	-0·85	-0·78
7. Homework	-0·17	+0·13	+2·00
8. Travelling on buses	-0·17	+0·19	-0·29
9. Practical classes	+0·21	-0·04	-0·55
10. Taking notes	-0·64	+0·85	+0·65
Outputs	+1·44	+0·18	+0·95
Inputs	+0·42	+0·02	+0·26
Academic	+0·93	+0·09	+0·60
Non-academic	-0·03	-0·33	-0·54
Academic - Non-academic	+0·96	+0·43	+1·14

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+0·17	-0·56	-0·12	+0·07
2. A policeman	+0·01	-0·82	-0·69	-0·31
3. Your best lecturer	-0·41	+0·26	-0·85	-0·37
4. Your last school head	-0·96	+0·09	-0·48	-0·65
5. Yourself as a student	-0·47	-0·61	+0·14	+0·04
6. The laziest student in your class	-0·78	-0·52	+0·30	-0·28
7. Yourself as a person	-0·02	-0·58	+0·22	+0·08
8. The cleverest student in your class	+1·09	+0·70	+0·19	+0·58
9. Your father or guardian	+0·05	+0·24	-0·29	+0·29
10. Your best friend	-0·07	+0·24	-0·29	-0·17

Student 902

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+0·50	-0·45	-0·19
2. Unusual problems	-1·93	+0·14	-0·05
3. Examinations	+1·97	+0·08	-0·08
4. Lectures	+0·36	-0·85	-0·16
5. Reading	+1·43	-0·39	-0·12
6. Watching television	-0·13	-0·85	-0·78
7. Homework	-0·92	-0·12	-0·50
8. Travelling on buses	+1·08	+1·69	+1·46
9. Practical classes	-1·04	+0·96	+0·95
10. Taking notes	+1·39	-0·40	+0·15
Outputs	+0·13	-0·07	-0·11
Inputs	+0·76	-0·56	-0·15
Academic	+0·44	-0·32	-0·13
Non-academic	+0·47	+0·42	+0·34
Academic - Non-academic	-0·03	-0·73	-0·48

People	Phys. dyn.	Likeability	Acad. dyn	"g"
1. Your worst lecturer	+1·17	-0·06	-0·12	+0·74
2. A policeman	+0·51	+0·43	+0·56	+0·14
3. Your best lecturer	+0·09	-0·24	-0·60	-0·70
4. Your last school head	+1·04	+1·34	+0·52	+0·35
5. Yourself as a student	-0·72	-0·61	-0·61	-0·52
6. The laziest student in your class	+0·47	+0·98	+1·05	+0·61
7. Yourself as a person	-1·52	-0·58	-0·78	-1·03
8. The cleverest student in your class	-0·66	+0·05	+0·19	-0·53
9. Your father or guardian	-2·20	-1·01	-1·79	-2·05
10. Your best friend	+0·18	-0·51	+0·46	-0·26

Student 924

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+0·25	+0·05	+0·56
2. Unusual problems	+0·32	+0·39	-0·05
3. Examinations	+0·53	-0·67	-3·58
4. Lectures	+0·11	-1·35	-0·16
5. Reading	-0·07	-0·89	+0·63
6. Watching television	+0·12	-1·60	-2·03
7. Homework	+0·08	-1·62	+0·50
8. Travelling on buses	-0·42	-1·81	+0·21
9. Practical classes	+0·71	+0·46	+0·70
10. Taking notes	-1·11	-0·65	-1·35
Outputs	-0·31	-0·64	-1·11
Inputs	+0·09	-0·73	+0·35
Academic	-0·11	-0·69	-0·38
Non-academic	-0·15	-1·70	-0·91
Academic - Non-academic	+0·05	+1·03	+0·52

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	-0·83	+0·44	+0·38	+0·41
2. A policeman	+0·26	+0·18	-0·44	+0·03
3. Your best lecturer	+0·09	+0·26	+0·40	+0·08
4. Your last school head	-1·71	-1·66	-0·48	-1·43
5. Yourself as a student	+0·28	+0·39	+0·14	+0·37
6. The laziest student in your class	-1·28	+0·48	+0·55	-0·50
7. Yourself as a person	+0·48	+0·42	+0·47	+0·30
8. The cleverest student in your class	+1·34	+1·30	+0·19	+0·92
9. Your father or guardian	+0·05	+0·24	-0·54	-0·05
10. Your best friend	+0·43	+0·74	+0·71	+0·16

Student 925

Semantic differential scores (deviations)

Activities	Feelings	Energy	Utility
1. Instructional films	+0·75	-0·45	-0·19
2. Unusual problems	+0·32	+0·39	+0·45
3. Examinations	+0·97	+0·08	+1·17
4. Lectures	+0·86	+0·65	+0·59
5. Reading	-0·07	+1·11	+0·88
6. Watching television	-0·53	-0·35	+-·72
7. Homework	+1·33	+0·63	+0·75
8. Travelling on buses	+0·58	+0·19	-0·04
9. Practical classes	+0·71	+0·21	+0·95
10. Taking notes	+2·14	+0·60	+1·65
Outputs	+1·19	+0·43	+1·01
Inputs	+0·51	+0·44	+0·43
Academic	+0·95	+0·43	+0·72
Non-academic	+0·03	-0·08	+0·34
Academic - Non-academic	+0·88	+0·52	+0·38

People	Phys. dyn.	Likeability	Acad. dyn.	"g"
1. Your worst lecturer	+1·67	+0·69	+0·38	+0·63
2. A policeman	+0·74	+0·68	+1·06	+1·03
3. Your best lecturer	+0·84	+0·51	+0·40	+0·52
4. Your last school head	+1·29	+0·34	+1·02	+1·35
5. Yourself as a student	+0·29	-0·36	+0·64	+0·37
6. The laziest student in your class	+0·47	-0·27	+0·30	+0·05
7. Yourself as a person	+0·48	-0·33	+0·22	+0·41
8. The cleverest student in your class	+0·84	+1·05	+0·94	+0·92
9. Your father or guardian	+0·55	+0·49	+0·46	+0·62
10. Your best friend	+0·93	-0·01	+1·46	+0·72

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