A PERSONAL CONSTRUCT THEORY APPROACH TOWARDS UNDERSTANDING STUDENT GOALS AND BEHAVIOUR, THEIR INFLUENCE ON USE OF TIME, ACADEMIC SUCCESS AND PERSONAL WELL-BEING

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A C K N O W L E D G E M E N T S

I WOULD SINCERELY LIKE TO THANK
DR E. V. THORNTON, MR E. PACE AND MISS C.J. ROBERTS
FOR THEIR ENCOURAGEMENT, WISE COUNSEL, SENSE OF HUMOUR
AND PATIENCE, ALL OF WHICH HAVE BEEN OF
TREMENDOUS VALUE TO ME,
IN COMPLETING THIS STUDY.

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ABSTRACT

The aim of the research was to investigate the 'undergraduate student life experience', the meaning activities have for individuals and selected groups of students.

Personal Construct Theory (P.C.T. Kelly 1955) was the guiding theoretical perspective. Personal goals were identified by examining the construing of activity experiences. Activity was seen as hierarchically structured, a concept elaborated and validated in a preliminary investigation. Consequently special consideration was given to hierarchical organisation of constructs, that is to the super-ordinate-sub-ordinate distinction. Psychological well-being was operationally defined and validated in P.C.T. terms and empirically validated.

Answers to the following practically important questions were sought: What are the personal goals of under-graduate students? What happens to those goals as a result of college experience? What are student activity priorities? How do differences in personal goals and activity priorities influence students' use of time? What differences are there between successful and less successful students with respect to goals, priorities, time use and psychological well-being?

Four new research instruments were developed for the investigation. Firstly, a 'Life Space' questionnaire was used to to establish a normative data base of students' life experience. Secondly, a Life Activities Grid (L.A.G.) consisting of 16 elements and individually elicited constructs, 14 elements were taken from three life spaces (work, sport and recreation), and 2 reflected life overall ('Life now', 'Life ideal'). Thirdly, a content analysis schema for categorising the activity experience constructs. Fourthly, a 'use of time' diary to monitor student time allocation to their normative life activities.

Data from the 'life spaces' questionnaire revealed that the life of Physical Education students is almost exclusively college-based, and their sports interest pervades both their work and recreation choices. Preliminary investigations undertaken prior to the main study showed that L.A.G. procedures were reliable and that the inter-judge reliability of the content analysis schema was high.

The two main studies used the L.A.G. to establish students' personal goals and action priorities. The first was a cross-sectional study in which comparison of students in their first year at college was made with with those in their final year at college. The second was a longitudinal study of students over their first fifteen months at college. The 'use of time' diary was utilised in this study.

The construct data of the cross-sectional study when classified according to the content analysis schema showed that in general there were only seven types of constructs as identified by the content analysis schema, which occurred frequently in P.E. student construct pools. They were 'intrinsic motivation', 'emotions', 'mastery-achievement', 'esteem-recognition', 'autonomy choice', 'physical' and 'group-affiliation' constructs. Mastery-achievement constructs were more frequently in the construct pools of 'successful' students and also the more 'experienced' students. Action priorities were assigned according to the activity element loadings of a Principal Component Analysis of L.A.G. Priorities were very similar for both student groups on the main dimension of meaning (Component 1) but very varied on other dimensions (Components 2 and 3).

The longitudinal study of students during their first fifteen months at college largely supported the results of the cross-sectional study and additionally revealed aspects of construct pools stability and change. The evidence supported the notion that construct system change over the time of the study took place around a relatively small number of stable constructs

(5 through to 7). 'Enjoy - not enjoy' and 'happy - unhappy' were nearly universal stable constructs across subjects. It was also shown that a stable construct was statistically more likely to be a super-ordinate than sub-ordinate construct. The precise meaning of a stable construct such as 'enjoy' was seen to be individual specific and redefined over time as reorganisation of them in the system took place and changes occurred in other constructs within the construct pool.

Data from the 'use of time' diary indicated that successful students spend more time on 'private study for assignments' than do the 'less successful' students, the extra time coming from sacrificing recreation time. Overall the number of 'mastery-achievement' constructs in student construct pools was found to correlate significantly with time given to 'private study on assignments'. The P.C.T. measure of well-being contained in the L.A.G. was significantly correlated with subjective enjoyment and happiness, but not related to academic success.

Supplementary case study reports were used to provide a more idiographic and holistic presentation of results. They also revealed the limitations of the procedures currently available for examining personal meanings of activity.

The present research findings are related to other theoretical perspectives and discussed in relation to the potential of L.A.G. for use in student counselling or personal education.

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SECTION A

AN OVERVIEW AND RATIONALE

CHAPTER 1 : ORIGINS

Overview of General Orientation and Guidelines

This chapter will show why particular questions considered in this applied psychological research are important and how they have been developed. In so doing the logic and shape of the research report will be established.

The development of research questions in applied psychology is often a less neat process than one would hope for. If simple elegance were the measuring stick of research quality, applied psychological research would not always measure up too well. One reason why this is so, is that 'good' applied research always works for more than one master. On the one hand applied research is very pragmatic, practical solutions to problems emerging out of experiential concerns are investigated, whilst on the other hand it is theory driven, empirical support for theoretical positions is sought.

Unless the more pragmatic approach of solving practical problems is informed by psychological theory the knowledge gained will lack an organised framework within which specific problems and solutions can be placed and general principles established. Equally a 'good' theory is required to have ecological validity (Neisser 1976). The research questions which are framed using psychological theory as a guide must also take on board experiential knowledge gained in real world natural settings if the research is to be practically useful as well as informative to theory. Theory and practice interact with one another, giving and taking from each other both are valid concerns.

The rationale given below will show that the present research questions emerged out of both psychological theorising and the need for solutions to practical problems. It is hoped that ecological validity of the chosen theory, Personal Construct Theory (Kelly 1955), will be established in

relation to the chosen focal practical issues, personal goals and development of under-graduate Physical Education students, and that useful guidelines for practice of student teaching and/or counselling will be indicated.

Continuity is a consideration when targetting a direction for research as it evolves over time. There needs to be a systematic and logical development of ideas and action as the research progresses, and it too may relate to the logical development of theory or to the practical needs of the practitioner in the targetted practical domain. Continuity in both senses is sought in this research.

The resolution of tension between practical and theoretical concerns was found in adopting an eclectic use of psychological theories when approaching the practical concerns. But eclecticism carries with it the danger of becoming mere expedience that can sometimes work against continuity of theory development unless curbed. To avoid this in the present research effort, one theory, P.C.T., as stated earlier, was given pre-eminence but other theoretical perspectives were also used. Theories other than P.C.T. were selected only if they were seen as clearly compatible with the central tenets of P.C.T. and indeed, that they provided insights useful to the development of P.C.T. As such a selective rather than expedient ecleticism was engaged in so that continuity of theory development would be maintained, whilst practice and practitioners became informed.

In sum the research follows three general guidelines.

It will:-

(a) be clearly related to psychological theory with research objectives arising out of theory.

(b) strive for continuity in the sense of a systematic logical development of ideas, in both the practical and theoretical domains of knowledge.

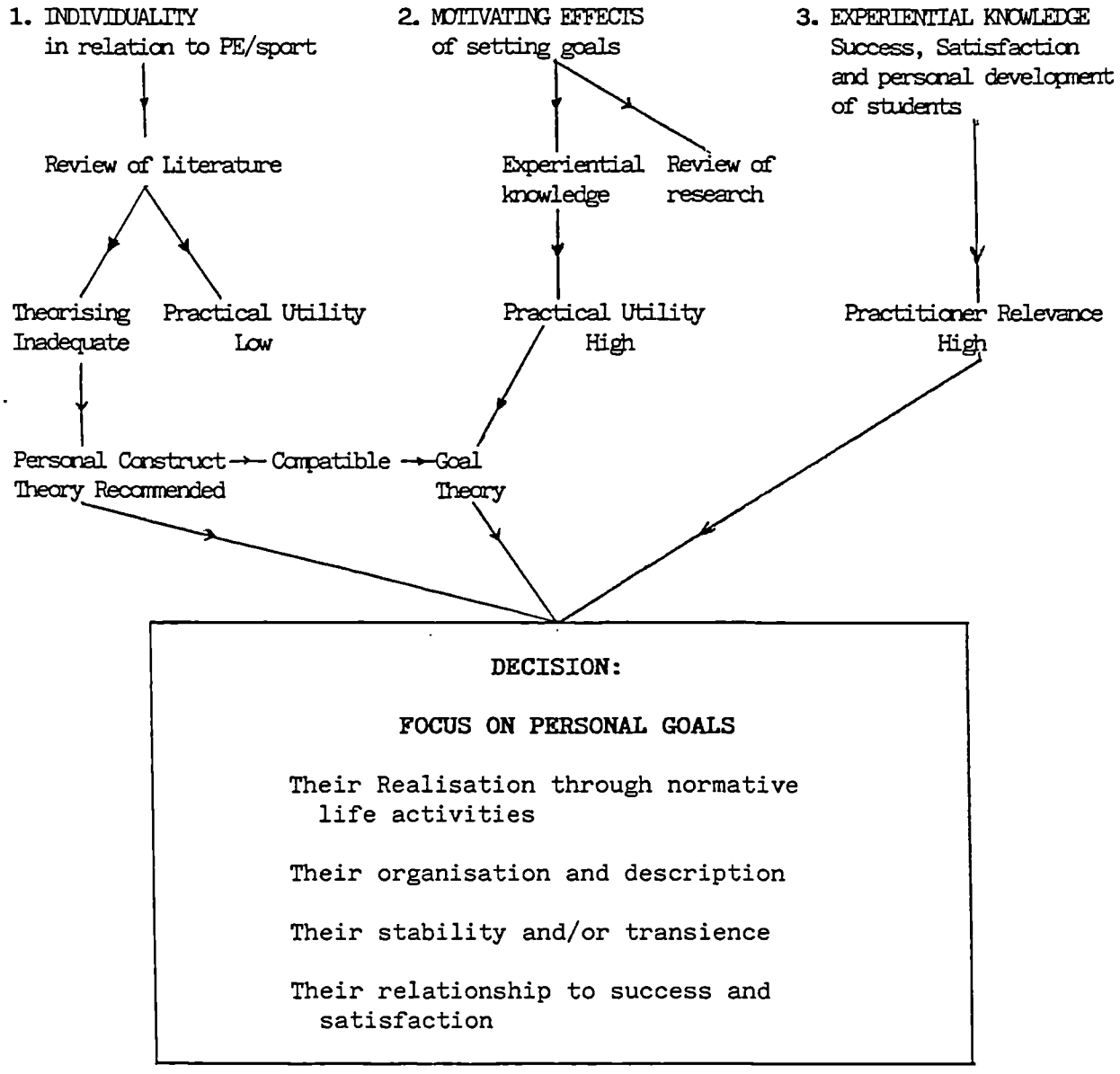
(c) relate to specific issue(s) arising within the domain of sport and physical education, so that practical utility value of the findings is clearly shown.

Rationale for the Specific Research Foci:

Diagram 1 overleaf shows in schematic form the three areas of concern with which the general guidelines given above helped to direct the research effort towards the particular focal issue of personal goals. It shows that individuality in relation to persons and behaviour in sport and physical education contexts was a major starting point to the research. A review of the pertinent literature (chapter two) showed that in this area of knowledge inadequate theorising was prevalent and very little information of practical utility arose from the research effort. In consequence, a new theoretical base was needed and "Personal Construct Theory" (Kelly 1955) was recommended (Savage 1981) since it was seen to hold promise of overcoming the theoretical malaise and generating some practically useful ideas. It is an ipsative approach to understanding the person and their interaction with their environment.

Simultaneously with the review of individual differences literature, the author was concerned with research into the motivating effects of goal setting based on Locke's theory of goal setting (Locke 1967). This provided a focus on an area of investigation with high and proven practical utility value. However, it was observed that Locke's theory and associated research neglected issues relating to qualitative dimensions of goals and individual differences therein. Qualitative information is central to P.C.T. but research in that area has not yet addressed itself to the notion of personal goals. Furthermore, the two theories seemed to have something to gain from

Diagram 1: The research context and focus. The relationship of three major areas of concerns: individuality in P.E. and Sport; the motivating Effects of Setting Goals, and the Success, Satisfaction and Personality Developments of Students.



cross-fertilisation. Kelly's metaphor of "man the scientist" appeared to the present author to have much in common with the implicit metaphor of "man the decision maker" adopted in Locke's theory, reinforcing the notion of beneficial cross-fertilisation. The compatibility of the two theories will be elaborated in chapter 2.

The research focus was also influenced by the author's work in educating undergraduate Physical Education students in two domains - personal and academic development. A deeper understanding through research was sought for purely practical pragmatic reasons, namely to identify why some students are more successful in academic work than are others, and why some are more satisfied with the college experience than are others. From such knowledge it may be possible to generate strategies to influence success levels in each of these two domains. The strategies could be pratitioner generated and/or theory related, and be the focus of research beyond the current effort.

The research thus evolved to be naturalistic, situation specific, person specific and longitudinal in design. It focussed on two practical issues and examined cognitions as well as behaviours. The main issue was concerned with what college life means to students as revealed by their personal goals and how those goals influence activity choices, use of time, academic success and life satisfaction. Included in this issue was the notion of changes in students' personal meanings during adaption to a new culture, such as to the college environment. Suggestions were made for counselling processes which may facilitate successful adaption. The research into the main issue consisted of two related studies, one cross-sectional in design and the other longitudinal. Construing of normaly life activity experiences was the process used to identify subjects' personal goals and a Life Activities Repertory Grid was developed specifically for the investigation.

The design, reliability and interpretation of this grid involved empirical investigation which is reported prior to the main study report. The second and subsidiary practical issue investigated, concerned how to describe complex behaviour, in particular purposeful goal directed behaviour, as it occurs in natural life activities. An empirical study was carried out in relation to behaviour description to test the notion that complex behaviour is best described as multiple goal-action nests which are hierarchically and sequentially structured. The findings of this investigation were formative in the development of the main research investigation.

Describing complex behaviour

The issue of complex behaviour description needs some further comment here. Taking part in normal life activities involves the participant in complex behaviours. To investigate construing of normal life activity experiences as was done in the main investigation, a notion of what constitutes complex behaviour is necessary. Construct theorists have not addressed this issue. The little which Kelly himself wrote on the construing of activities, together with the "organisation corollary" of his theory, which emphasises that constructs are hierarchically organised, suggested that from a construct theory perspective, behaviour can effectively be construed as hierarchical structures. This notion of actions consisting of hierarchical structures was not new (see, for example, Annett et al 1971; Savage, 1975), but it did lack empirical support.

A preliminary experimental research project building on prior work of Savage (1975) was initiated (chapter 3). Its aim was to validate the notion of hierarchical action structures and relate it to construing of activities. It enabled hypotheses relating to hierarchical organisation of constructs, as stated in P.C.T., to be generated and investigated, and was a pervasive influence during the design of the main study.

SECTION B

REVIEWS OF LITERATURE

CHAPTER 2 : ORIGINS OF THE RESEARCH QUESTIONS

Introduction

The genesis of this chapter was a critical review presented by Savage (1981) of the then current situation in sports personology. Subsequent independent overviews of the area, Silva (1984) and Fisher (1984) have been consistent with Savage. They suggested that a new idiographic and interactionist perspective was needed in sports personology. Savage suggested Personal Construct Theory (P.C.T.) (Kelly, 1985) as one such theory which should be investigated. He also made the point that sports personology had not generated much practically useful information and that research using P.C.T. could overcome this deficiency.

By way of contrast Locke's theory of goal setting (1967) had generated much practically useful information but neglected the areas of individual differences and qualitative dimensions of goals.

The bringing together of ideas from the two theories brought forth the notion of personal goals and how they influence behaviour.

Personality, Sport and Personal Construct Theory

The study of personality in relation to sports participation and achievement has a considerable pedigree but a dubious reputation.

Its' pedigree would suggest a sustained interest and faith in personality theory as a medium for deepening understanding of persistent problem areas in sport. A dubious reputation would suggest either that faith in such theories is misplaced or, that putting theory into practice has been inadequate. Fisher (1984) has commented similarly, suggesting that the limited knowledge gained from over 1,000 studies in the hey-day of sports personality research leaves two inescapable interpretations.

> Either personality characteristics are not very significant to the various group differences

> investigated and personality does not change with sport participation, or the methodology and subsequent results are suspect. Which explanation is correct? (p.70)

The general aim here is to examine the dubious reputation of personality studies to see whether or not faith has been misplaced or, if indeed, practical research has been inadequate. The four objectives of this quest are:-

(a) to chart the historical development of research into personality and sport, identifying the questions asked and the dominant theoretical perspectives used.

(b) to critically evaluate sports personology research.

(c) to highlight some of the new trends being developed in this area;

(d) to establish the potential importance of 'Personal Construct Theory' to sports personology.

Historically two types of question have dominated the study of personality in relation to sports participation and achievement and a third type has emerged more recently (table 1).

Table 1: Questions, Objectives and Assumptions: The 3 types of questions posed in sports personality research, with their objectives and the assumptions they implicitly make concerning the nature of personality.

Type 1: does sports participation change personality?	To channel change in appropriate directions.	Personality is dynamic and developing. Development is directed by the nature of situational experience.
Type 2: Can one identify sports person stereotypes?	To screen athletes, to select accurately the potential high level performer.	Personality is stable, which can be observed in consistent behaviour patterns.
Type 3: How can one optimise a given persons athletic performance?	To increase the performance level after selection of participants.	Personality and behaviour have a transient nature and can be temporarily influenced by immediate situational cues.

The first type of question concerns the influence that sports participation may have in changing personality dimensions of the athlete. For example, does the experience of success or failure change a persons personality, does sports participation make one less aggressive, or a better leader?

Secondly, there are those questions concerned with finding specific personality profiles which may characterise a certain sport or group of athletes. For example, are the personalities of active and sedentary persons different, are there differences between recreative and competitive sportsmen or between team and individual sportsmen, is there such a person as a 'soccer type' or 'swimming type'.

The third type of question concerns how a sport participant's performance can be optimised once the decision to participate has been made.

Behind each question are certain pragmatic objectives and implicit assumptions about the nature of personality. It is important to consider these objectives and make the assumptions explicit if one is to fully evaluate the research into sports personality. (Table 1.)

Type 1 Questions: can sport change personality?

The objective behind this line of reasoning is to enable change to be channelled in appropriate directions. Perhaps sports participation could enhance co-operation or self-reliance, develop leadership qualities, or help participants move towards self-actualising. The implicit assumption behind this objective is that in some way personality is dynamic, capable of development in response to experiences gained.

To operationalise hypotheses in relation to this, (and the second type of question), it has been normal practice to take recourse to personality theories generated in general psychology. One must ask in relation to the theories chosen (a) whether they have been compatible with the questions

posed. That is do they share the assumptions implicit within the practical questions? and (b) whether they have been appropriately utilised. That is, interpreted correctly and employed comprehensively rather than partially.

To evaluate the development of research into sports personology it is necessary to try to answer these questions. Undoubtedly, historically the most popular approach in sports personology has been personality trait theory typified by the work of R.B. Cattell (1965) and H.J. Eysenck (1967) and overviewed by Hardman (1973). Trait theory emphasises personality stability, it proposed that there is considerable cross-situational consistency in a persons behaviour, but considerable between persons variance in the substance of those consistencies. A person's behavioural style is encapsulated by their consistencies and personality described as trait patterns. Clearly this central assumption of trait theory is not consistent with the implicit assumptions behind type 1 questions. One might then expect that this perspective would be unsuccessful in identifying personality changes (see also Silva 1984, p.65). In a major longitudinal study Werner and Gottheil (1972) did indeed fail to find personality changes over a three year period in a student sample group Ishmael and Trachtman (1976) on the other hand have used trait measures and reported personality changes due to exercise participation. However their before and after research design incorporated self-report measures which seems to be fallible to experimenter demand contaminating the results and it is likely that reported changes are more apparent than real.

One must not, however, conclude that personality doesn't change due to experience but merely that trait measures are inappropriate to detecting change should it occur. Other, more appropriate perspectives may prove more sensitive to detecting changes.

Type 2 Questions: can one identify sports person stereotypes?

The objective of these questions is to facilitate success by selecting potentially highly skilled participants on the basis of their personality profiles. For example if there is a 'swimming type', one might select such personality types in preference to others, to train for swimming. In another context one might design a school sports programme to offer a range of sports to suit a range of personality types, thereby ensuring enjoyable participation for all. Each participant's sporting experience could be compatible with their personality type.

Basically, then, in answering a type two question, one is attempting to discriminate between persons on the basis of inherent personality characteristics. The implicit assumption is that there are relatively stable personality characterstics which the person brings to the sports situation which will determine behaviour, and hence one's level of success and/or enjoyment, in sport. This of course contrasts considerably with the assumption of type 1 questions and is highly compatible with the general assumptions of trait theory.

One of the earliest research studies in this area of stereotyping was by (Heusner 1952), using Cattell's 16 P.F. inventory. He described champion track and field athletes as stable and extravert, however, it is worth noting that subsequent studies have never demonstrated quite such a definite description of champion athletes, nor his generalisation of profile characteristics from athletes to sportsmen in general. The general picture of sporting profiles is discerned from reviews by (Hardman 1976, Hendry 1976, Kane 1978, Morgan 1978, Martens 1975). The consensus is that research has in general been poor having theoretical and methodological weaknesses.

Silva (1984, p.64) comments that the approach has been too simplistic, resulting in contradiction and confusion. In fact he poses the question as to whether the search for stereotypes is futile, since an "ideal profile" may not exist at any competitive level. Kane (1978) however, suggests that the descriptive studies based on traits have been useful in opening up the possibilities for further advanced study. On balance, an "ideal profile" may indeed not exist but examination of the notion of stereotypes may establish the limits of its pragmatic usefulness and promote a clearer sense of the way forward in personality research.

The evidence from Diagram 2, derived from the work of Hardman, suggests that the generalisation given by Heusner (1952), of a general athlete stereotype who is extravert and stable is not valid. Firstly, although there is a tendency for the more introverted and anxious persons to avoid sport and the more extraverted stable persons to compete within the sporting arena, as opposed to merely recreatively participating (Hendry 1976), there are definite intersports differences, e.g. introverted cross- country runners versus extravert/stable wrestlers (Morgan 1978). It also appears that introverted/stable persons are under-represented as participants in the range of sports covered.

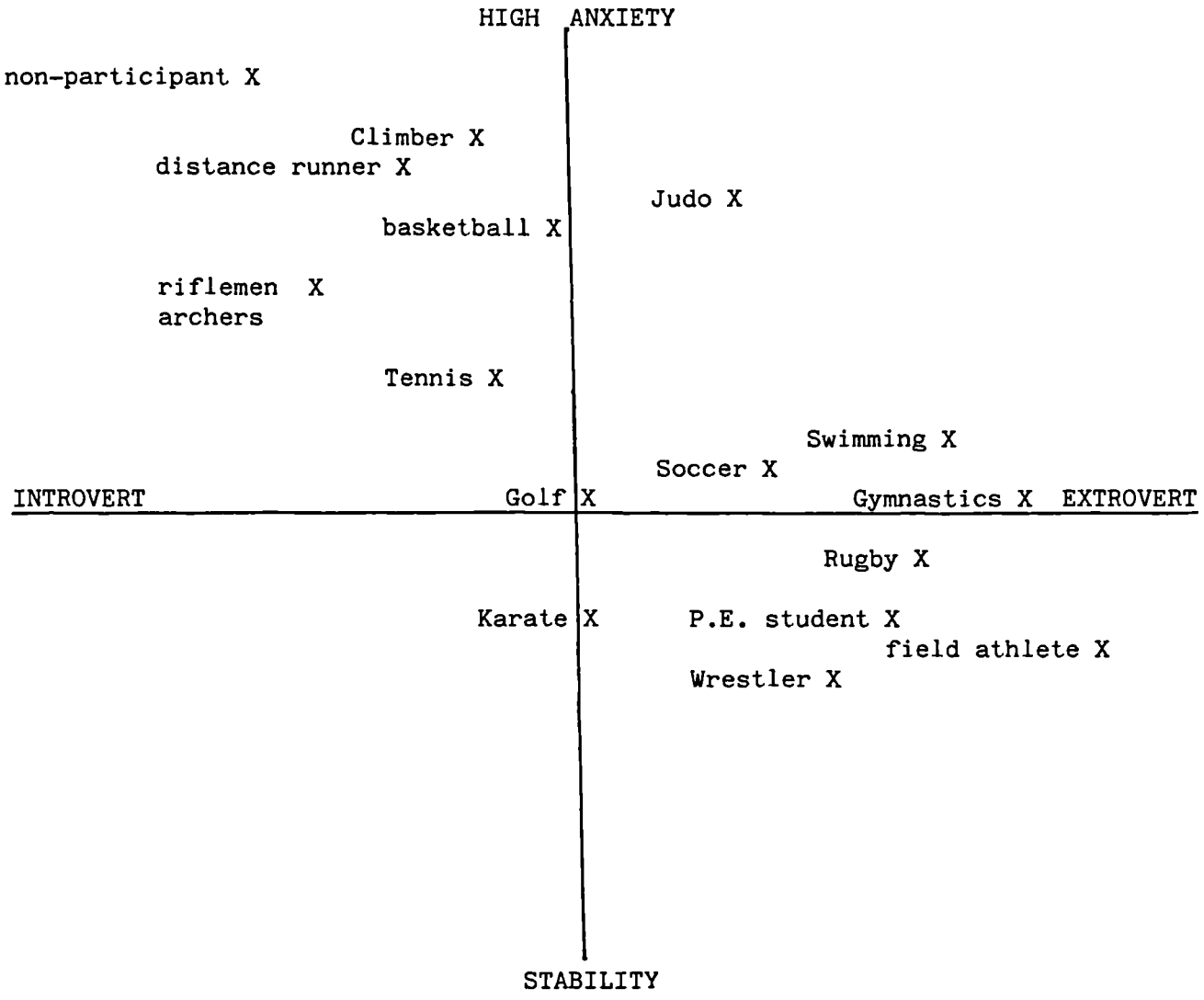


Diagram 2: Sports Person Stereotypes. A scattergram of mean personality ratings of participants in a range of sports (as derived from Hardman, 1976).

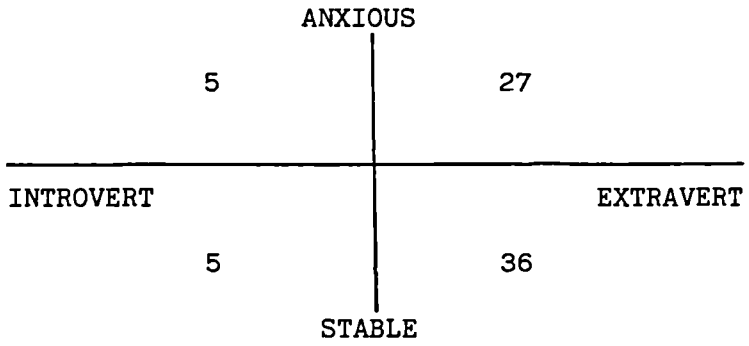
One problem in this area of research is that researchers do not always carefully define such terms as athlete non-athlete, elite and non-elite and so on, when developing profiles. Any lack of specificity can mean lack of clarity in results, and profiles are likely to overlap where comparison groups are heterogeneous.

In addition each sport stereotype profile is by definition a generalisation across a number of persons to which there will be many individual exceptions. These issues make it difficult to define boundaries

between groups. Physical Education students are for example sometimes stereotyped as being extrovert/stable personalities and although the general pattern is supportive of the profile there are obvious exceptions (see Diagram 3).

Diagram 3:

Personality types of 73 final year P.E. students, classified into four types.



The explanation for these limitations lies in the very nature of nomothetic research, in which profiles are based on group means, which inevitably masks individual differences. A nomothetic approach is by definition looking for generalisations. Although it may reasonably be expected to reveal gross personality differences such as may occur between footballers and cross-country runners, it will probably be insensitive to less gross differences such as those between first and second string footballers should they exist. It would seem desirable to pursue the exceptions to see why they are successful inspite of their 'deviant' personality profiles, an approach which would indicate a need for idiographic studies. One may conclude that these stereotype profiles are not yet accurate enough to use as a basis for sports selection, and as such they fail to fulfil the pragmatic objectives outlined previously. Perhaps they never will be able to meet those objectives, since as implied above there is a serious conceptual difficulty at the heart of this approach. An example of the concept of profiling may be used to reveal this difficulty more explicitly.

Consider that there exists a swimmers' personality profile, and also a soccer players' profile. One is actually assuming, from a trait perspective, that each profile represents a separate characteristic behaviour pattern, the former matching the behavioural requirements of success in swimming contexts, the latter of soccer contexts. Thus, in defining the personality profiles for sports, it is necessary to differentiate between the behavioural demands of various situations, in effect a taxonomy of situations is needed. Ad hoc discriminations as typically used in sports research are inadequate, since they have failed to include any systematic analysis of sports environments in which athletes are immersed and their behavioural demands (see also Fisher, 1984, p.72).

The importance of this point can be further appreciated if one considers a re-analysis of Heusner's results by Kane and Warburton (1967).

Heusner analysed his personality data for all his track and field athletes taken together, as a single sample, thereby assuming there is a single athletic type taken from an homogenous population. He found them extravert and stable. However, Kane and Warburton distinguished explosive events persons and distance events persons, creating two samples prior to their analysis. In effect, they are making a more detailed discrimination of athletic situations separating out situations where fast, short-term behavioural acts bring success from those needing slow longer term acts. They found explosive events persons were indeed stable/extraverts but distance events persons were significantly less so. Thus the findings on persons is seen to depend on one's choice of sample organisation which, in turn, reflects one's description of situations. Logically it follows that one must consider how to distinguish between situations and in what detail a distinction between situations is possible before personality types based on normative data would fail to materialise. The more detailed a situation is specified, the more restrictions there are on behaviour alternatives within

that situation, hence the more detailed the person profile specification must be to successfully match person and situation, that is take an interactionist perspective. The discussion above suggests that eventually the nomothetic general trait approach will be too insensitive. Thus a critical dilemma emerges. In each taxonomy, be it persons or situations, to what degree of detail must one discriminate? For instance, do traits, such as introversion/ extraversion, which are said to influence behaviour in all situations, offer too high a level of abstraction or too general a description of persons behaviour to enable one to differentiate between persons in various sports situations? At what level of detail will a nomothetic approach inevitably fail?

One solution to this dilemma is that one must take a problematic rather than a prescriptive view of taxonomies, firstly defining ones objectives and only then deciding how to describe persons and situations. Mischel (1981) describes the position in regard to taxonomies of situations as follows:-

> Depending on one's purposes many different classifications are possible and useful, to seek a single 'basic' taxonomy would be as futile as searching for a final or ultimate taxonomy of traits, we can label situations in at least as many different ways as we can label it's people. It will be important to avoid emerging simply with a trait psychology of situations, in which events and settings rather than people are merely given different labels. The task of naming situations cannot substitute for the job of analysing how conditions and environments interact with the people in them. (p.10-11)

In sports psychology such a "problematic approach" opens up a number of possibilities and will be further discussed later in the chapter, particularly with reference to type 3 questions concerning performance optimisation where such an interactionist approach seems essential. However, before leaving trait theory and sports stereotyping two further points need to be elaborated.

The first is that profiling must be multidimensional, whereas to date it has been almost entirely unidimensional (Savage 1981; Fisher 1984, p.73; Silva 1984, p.68). Kane (1978) produced one such multidimensional study, showing that extroversion may be linked with general athletic ability and stability with explosive strength. Further studies broadly sampling the personal domain such as this might increase the accuracy with which stereotypes can be defined and the understanding of behaviour in sport. It stands to reason that physiological, motivational and motor ability components will be needed to develop a more complete sports profile.

Secondly, a more complete use of trait theory as opposed to only deploying trait measurement might be beneficial. Whiting (1979) has shown how effective the use of theory can be in developing worthwhile information. On the basis of Eysenkian theory he hypothesised that anxious introverts would be the type of person to condition most easily to fear inducing situations such as those found at swimming pools. They may then be more likely to become persistent non-swimmers (water phobic). Implicitly Whiting is adopting an interactionist position. Results support his hypothesis and consequently suitable precautions and teaching procedures were recommended for dealing with this type of person in the specific situation.

Building confidence, and avoiding anything which might induce fear were key factors. This example shows that good theorising can lead to profitable control of performance even when working with groups.

Perhaps further headway can be made (even within a trait theory perspective) if good theorising prevails. Much of the work concerning stereotypes discussed previously seemed to suggest that fixed person attributes are the predominant and perhaps the only factors, to determine behavioural response to a given situation. This does less than credit to

the sophistication of the predominant trait theories of Cattell and Eysenck. Full use of the many dimensions which these theories offer should be employed rather than limited use of only selected aspects of the theories.

It may, therefore, be too soon to consider totally abandoning trait theories as a medium for understanding and controlling sportspersons' behaviour since they have not yet been fully explored or exploited. However, one must accept the possibility that in some areas use of this general trait perspective may indeed prove to be ill-founded. One may need to develop sports specific person and situation inventories, or consider an idiographic approach.

Type 3 Questions: How can one optimise a given participant's performance?

This type of question has recently received considerable attention, examples of which are: should one 'psych up' prior to a game? How can one prevent fluctuations in competitive performances and peak at the right time? The objective behind this type of question is optimising of performance, after the performer has been selected. In particular, consideraton of this type of question precipitated much debate on theoretical perspectives in sports personology. (Holtzmann 1976, Kane 1978, 1979, Martens 1975, Morgan 1978, Rushall 1973.)

In trying to optimise performance, one is immediately faced with a rather subtle problem. One is aiming to predict and control behaviour post selection, with person factors already determined. The inference is that situational variables play a significant role in determining a persons behaviour and the degree to which they do so is the issue in contention.

Cattell (1977), for example, suggests and offers experimental support for the view that there is a personality state for each personality trait. Take anxiety, for example. Trait anxiety is a relatively stable tendency to be anxious across all situations and this trait is partially determined by

innate physiological factors and also by previous life history. However, anxiety level is not absolutely fixed, it fluctuates in response to the immediate situational demands. The immediate level of anxiety as measured by such physiological measures as G.S.R. blood pressure, heart rate, or Spielberger's State Anxiety Inventory (1970), is a persons state anxiety level. Thus, anxiety level is broadly defined by one's trait anxiety but one responds to immediate situational demands, and this will ultimately determine state anxiety, and influence performance. Essentially one is suggesting that between person variations in anxiety are greater than within person variations and hence between persons behavioural acts vary more than within person acts. Basic support for such situational responsiveness may be found in Langer (1966), Morgan (1978), and more recently Scanlan (1984) and Passer (1984).

The intriguing possibility that arises is whether a person can control their emotional arousal level to optimise performance potential. It may be feasible by use of such techniques as autogenic training, relaxation techniques, or assertive training (see, for example, Suin 1977, Rushal 1979, Weinberg 1984). The key point here, however, is that adequate theorising in sports personology will encompass person responsiveness to situational change.

Contemporary Theoretical Perspectives

The review so far has covered the trait theory perspective in relation to three types of questions, but recently other theoretical perspectives have been advocated. The most recommended alternative is interactionism, (Burton 1977; Smith, Smoll, Curtis 1978; Fisher 1984, Silva 1984). Fisher (1984, p.73) suggests interactionism must place specific sports situations to the forefront and the most distinguishing characteristic of the interactionist approach is its emphasis on situational specificity.

Individuals regulate their behaviour according to the situation. Fisher (1984, p.73) suggests the essence of interactionism is reciprocal interaction which means

> ....behaviour, personality and environment are inter-dependent. Personality influences behaviour, and behaviour affects personality. For example, highly anxious athletes who worry about their performance often behave less competently. To make matters worse, the less competent outcomes increase the athlete's anxiety or worry about both past and future performance.

Studies from an interactionist perspective based on the concepts of interactionism specified by Endler and Hunt (1966) and appertaining specifically to sports situations have been reported by Burton (1977) Fisher and Zwart (1982) and Flood and Endler (1980).

The approach here was descriptive and nomothetic with the associated limitations already mentioned in relation to trait studies. Burton developed an S-R (situation-response) inventory of hostility (Diagram 4) that related specifically to situations encountered in connection with three contact sports...ice hockey, lacrosse, and soccer and is representative of this body of research. Essentially his inventory consisted of 15 situations and 11 modes of response which occur in the sports investigated. The subjects were 108 colleagiate athletes. They were required to describe the likelihood of each behavioural response to a common sports event/situation cue. Ratings were on a 5 point Scale. Higher scores equal high hostitlity.

Diagram 4
Sample page of the S - R Inventory of Hostility

Your Team mate Fails on a Defensive Play and you are hit hard upon Receiving Possession.

Card 1

1. Want to Hit Something or Someone	Not at all	1	2	3	4	5 Very Much
2. Lose Patience	Not at all	1	2	3	4	5 Very Much
3. Swear	Not at all	1	2	3	4	5 Very Much
4. Grind Teeth	Not at all	1	2	3	4	5 Very Much
5. Heart Beats Faster	Not at all	1	2	3	4	5 Very Much
6. Want to Yell	Not at all	1	2	3	4	5 Very Much
7. Frown	Not at all	1	2	3	4	5 Very Much
8. Feel Irritated	Not at all	1	2	3	4	5 Very Much
9. Hands Tremble	Not at all	1	2	3	4	5 Very Much
10. Become Enraged	Not at all	1	2	3	4	5 Very Much
11. Become Tense	Not at all	1	2	3	4	5 Very Much

Burton's results and for comparison those of Endler and Hunt (1966) upon which his study was modelled are given in Diagram 5.

Diagram 5
Comparative Results of Sport and Non-Sport Hostility Studies Utilizing the S-R Inventory Approach.

Burton Results	Sources of Variation	Endler and Hunt Results
20.17%	Persons (P)	19.08%
12.22%	Situations (S)	4.54%
5.07%	Modes of Response (M-R)	13.90%
15.35%	P x S	10.40%
8.65%	P x M-R	12.62%
3.19%	S x M-R	3.01%
35.35%	Residual	32.15%
100.00%	**Total**	**100.00%**

The two studies produced very similar results, so only Burton's results will be discussed in detail. The interesting feature of this work is that it gives an indication of the relative importance which person factors, situational determinents and person/situation interactions have in precipitating hostile behaviour, in sport, for a group of 'normal' sports participants.

Person factors accounted for 20% of the total variance in behaviour statistically speaking, situational determinants (12%) were of slightly lesser consequence, and simple person/situation interactions accounted for 15% of the variance. Other interactions combined accounted for 12% variance whilst residual unexplained variance was 35%. The relatively low percentage of variation in behaviour attributable to person factors (20%) gives further insight into why a trait approach which considers only person factors and ignores situation determinents has produced limited results. Interaction

effects between persons and situations may have a limited meaning here since they merely indicate that certain persons in certain situations precipitate given behaviours. Interactionism must also encompass learning effects which may arise out of interactions of persons with situations. To show these effects requires longtitudinal research designs as recommended by both Savage (1981) and Silva (1984, p.69).

The appropriation of variance to persons or situations or interactions as discussed above implies that absolute proportions may exist and are being identified but that is misleading, they cannot be absolutely fixed. They will vary with both situations and persons, obviously in some extreme situation or extreme person the proportions given above are meaningless, e.g. for a pathologically neurotic person all situations are alike, they all induce anxiety. Hence for the neurotic, all behaviour can be said to be person determined but for the "normal" person, behaviour must be flexible to a degree to meet current situation demands.

The proportions of variance in Burton's study are in effect averages for the population sampled and whilst they may be said to be generally correct for the sample group they are not accurate or fully meaningful for any single individual in that group. This is a direct consequence of the nomothetic approach adopted in the research, and led Savage (1981) and Fisher (1984) to comment that for a full understanding of any single individual an ipsative approach is required. Such an approach would be person specific, search out the unique behavioural patterns displayed by an individual, their consistencies and inconsistencies, their ability to make appropriate decisions and carry out actions in the light of situational demands.

In sum, a number of recommendations emerge from this review. Most notable of these is that the interactional model become the primary paradigm guiding personology research in P.E. and sport. However, it must be used in

ways which are clearly appropriate to the applied research questions being asked, that is, with research objectives succinctly defined. It would also seem desirable that the mistakes of a "shot-gun" approach be avoided for a systematic body of knowledge to be developed. This requires that poorly designed a-theoretical research be avoided. Results centred around a 'good' theory will ultimately be more valuable than ad-hoc investigation.

Four central tenets of an interactionist approach may be summarised and highlighted as important. It should be situational specific (such as sports specific). It should be person specific, to encompass individuality. It should be longtitudinal to enable behavioural consistency and change to be observed and, finally it should examine the subjective as well as objective, taking into account personal cognitions and meanings of events which indicates that qualitative as well as quantitative research is required.

Conclusions

The studies and approaches reviewed here, particularly the state-trait approach to anxiety and performance, developed specifically for the sports domain by Martens (1977) and the situations-response approach exemplified by Burton (1977), meet many but nor all of the recommendations stated above. Whilst it is neither necessary nor perhaps desirable that all studies meet with all the recommendations there is clearly a gap between theory and research. Savage (1981) has suggested that Personal Construct Theory (G. Kelly, 1955) is a well articulated theory which meets all the requirements given above and as such merits development within the sports personology domain.

The genesis of the present research is thus laid bare. Personal Construct Theory (hereafter called P.C.T.) has been applied to a sports/ physical educations problem, its theory and methods explored, and its usefulness evaluated. However, P.C.T. is not used in isolation but in concert with other theories, previously shown to be effective in the sports

domain - Locke's theory of goal setting is the most important of these. It is a theory which has drawn attention to the importance of goals within volitional human behaviour, and led to many practically useful and experimentally supported ideas. It was this theory which helped focus the P.C.T. research effort on a particular area of practical relevance, personal goals and their relationship to personal behaviour patterns and their outcomes.

Locke's Theory of Goal Setting

Locke's theory of goal setting takes it as axiomatic that much of human behaviour is intentional and purposeful, that is goal directed. A goal is "what a person is trying to accomplish, the objective or aim of an action" (Locke, Shaw, Saari, Latham, 1981). The essence of goals research is now presented and subsequently Locke's theory is related to P.C.T., with the intention of exploring the notion of personal goals and their influence on behaviour. Locke's theory has generated an impressive body of research, supportive of the practical utility of goal setting as a motivational technique (Locke, 1968, 1975). Reviews by Locke et al (1981) and Latham and Locke (1979) of many experimental and field studies concluded that goal setting is both effective in enhancing task performance and easy to use. Savage (1977 and 1985) has shown that the theory is relevant to the sports domain and in particular to performance in the natural setting of Physical Education students' normative course. He examined goal setting in undergraduate student swimming courses. In the first experiment, a specific individualised goal was set for swimmers in relation to a 25 metre breast stroke swim. Experimental groups when set this specific goal showed enhanced performance over control group swimmers set a general 'do your best' goal. The average difference in performance levels was 9%. In a second experiment the goals were for a 20x25 metres distance swim and showed that an immediate hard goal enhanced performance more so than did a moderately difficult goal (14% as against 6½% improvement over baseline performances). However, when similar but distal goals were set for the same task, that is 5 weeks in advance, no such differences between levels of goal difficulty emerged, even though sub-goals had been set to achieve en-route to the main goal. Both groups showed improvements in the order of 16% over baseline performances which may in part be due to the goal setting but since no control group was employed this is not certain.

The issues examined in these two studies are typical of the general body of research in this field. They involve quantitative assessment of performance and the issues of goal specificity and goal difficulty. Other studies have investigated issues of formal feedback on progress towards a goal, rewards for goal attainment, assigned or negotiated goals and goal acceptance. All of these factors have been shown to be relevant to effective use of goals as a motivating technique (Locke et al 1981).

Clearly the concept of goals and goal setting in relation to motivation and task performance has ecological validity and is worthy of further investigation in sports and P.E. One avenue in need of further research was indicated by Savage (1985). He noted wide individual differences within the generally positive response of persons to goals set and suggested that the differences were due to qualitative rather than quantative aspects of the goals set. Taking an interactionist position, he suggested that a quantitative goal such as a specific task performance standard may emphasise through its qualitative aspects that achievement of standards of personal excellence on the task is the essential goal, which is consistent with the type of goals most valued by highly achievement orientated persons. (see for example Atkinson and Steele, 1974, p.34.) Thus such persons would respond more so to this type of goal than persons of low achievement motivation although both would respond to some extent.

When the goal task (a 20 length swim) emphasised effort, results did not support the hypothesis. However, when a more complex task was used, a 75 metre medley swim and a distal goal set necessitating both increased effort and mastery of new techniques for its achievement, the data did support the hypothesis. Task mastery requiring protracted learning periods is a further motivational orientation for persons with a high need for achievement and it is highly probable that this is the salient factor differentiating between the two sets of results. In this instance the low

need for achievement persons improved by only an average of 6.3 seconds over baseline scores on their medley swim but the high need for achievement persons improved by an extra 2.2 seconds. This extra improvement of approximately two metres represented not only a statistically significant effect but also a significant distance difference in swimming terms.

Clearly the qualitative nature of goals, person factors, their interaction and relationship to task performance is an important area for goals theory to consider, as yet it has generated little empirical study.

In consequence of this, the notion of goals was chosen as the present research focus, in particular the qualitative nature of goals and their relationship to behavioural choices and task performance.

In chapter two a need for ipsative approaches in sports psychology was established and P.C.T., a theory which emphasises personal constructions of reality was recommended. P.C.T. is ideal for qualitative research. The focus of the research was therefore refined to target the qualitative nature of personal goals.

Personal Goals: Locke and Kelly United

The meaning of the term 'personal goals' within a PCT framework has yet to be established. A useful starting point in overcoming this deficit would be to take the concept of a goal from Locke's theory and see how this can be developed in PCT. This of course can only be achieved if there is some compatibility between the fundamental assumptions of the two theories.

The underlying metaphor of the person in Locke's theory is 'man the decision maker', and in P.C.T. it is the 'person as scientist'. These two metaphors and hence theories are highly compatible. The 'decision' maker in Locke's theory anticipates ouctomes to volitional actions which are termed goals. In P.C.T. Kelly (1955) said that each person has a personal theory of the world realised through their personal construct system. The system enables the person to anticipate life's events. The person's anticipations

are hypotheses and actions are the experiments by which the hypotheses and theory are tested. A simple statement from Bannister and Fransella (1971), illustrates this basic point:

> Constructs are essentially predictive. Thus when we construe a man as honest rather than dishonest we are essentially predicting that if we lend him money we shall get it back. (p.27)

Here, the behaviour is volitional. The man is construed as honest on the construct 'honest to dishonest' and the action 'to lend money' is chosen since honest men are also construed as being "likely to give him money back". The anticipation is that the man will return the money and since the action taken to lend the money was volitional one might say that 'not to lose money' is a goal of the lenders action. There may be other goals being simultaneously pursued such as 'to be kind' if the behavioural act of 'lending money' is contrued as 'a kind action'.

It is clear in this example that the person in P.C.T. is also a decision maker who exercises choice when deciding upon which action to take, anticipating the nature and outcome of their actions as in Locke's metaphor. The anticipated outcomes of volitional behaviours are derived from the person's construing of events and are recognisable as goals.

A formal discussion of this decision process can be found in Kelly (1955, p515), it is called the C.P.C. cycle but what is important here is that a person's construing of events which involve their volitional actions can reveal their personal goals.

In sum, it is feasible that the deficits of Locke's theory noted previously, that it has not given attention to individual differences and qualitative dimensions of goals, may be overcome by considering goals within a P.C.T. framework. If the investigation is set within a sports or Physical Education context, sports personology will move in a more practically useful direction than hitherto.

To realise these aims, the personal goals of P.E. students must be established by examining their construing of their life activity experiences, with a focus on those experiences arising from their volitional behaviours that is events in which a choice of action or non-action is exercised.

So far the discussion has proceeded on the assumption that the term behaviour is easily understood. But is it? It is a term which is frequently used but little examined. Volitional behaviour is inextricably linked to goals thus understanding behaviour is of central importance to understanding personal goals and its meaning was explored prior to the main P.C.T. investigations (see chapter 5). The understanding eminating from it were of considerable influence in framing the objectives of the main study. It can also be considered as an autonomous study, worthy because of its own merits.

A further aim of the research was to relate the notion of personal goals to that of academic success and how students' use their time. Research in this area is reviewed in chapter 3.

CHAPTER 3 : THE REASONS BEHIND ACADEMIC SUCCESS IN HIGHER EDUCATION

There are many reasons presented in the literature for academic success and failure of students in higher education. In consequence of this the material presented in this review is selective. It elaborates those reasons which are psychological in nature and significance, that is those areas most pertinent to providing a satisfactory context within which to perceive the present P.C.T. research into personal goals and behaviours and which have been empirically investigated. The studies presented move from broad contextual and abstract considerations to narrower more concrete considerations. Emphasis in the review will firstly be placed on identifying the factors perceived by lecturers and students as important influences on academic success, drawing on general survey studies such as Fontana et al (1986). Secondly, evidence will be presented and evaluated from studies whose aim is to substantiate a linkage between aspects of motivation and study habits to academic success. Studies are reviewed which investigate the importance of setting specific study goals (e.g. Morgan, 1985), the importance of goal specifity (e.g. Wankowski, 1973), the qualitative aspects of goals, in particular achievement orientation (e.g. Entwistle and Wilson, 1977) and the quantity and quality of time used for academic study (e.g. Cooper and Foy, 1969).

The perceptions of academic goals by lecturers and students

What is it that lecturers say they are aiming to achieve with their students, what do students think is required of them if they are to be successful and do lecturer and student views concur? Entwistle and Percy (1971, 1974) found that lecturers expected subject knowledge and skills to be developed in students, but their primary aim was to develop students

capacity for critical thinking, and to stretch the intellect to its capacity. On the other hand many students come to University with different priorities, reflecting extrinsic motivations. Entwistle and Wilson (1977) reported that from a sample of 522 University students that 40% endorsed the view that they were primarily at University to get a qualification useful to a career, 36% stressed the importance of social life and only 10% of students gave academic or subject interest as their main reason for being at the University. Taking a narrower focus Fontana et al (1986) asked 150 students at one polytechnic to respond freely to the question "what do you think is important for you to succeed academically?" Content analysis of their data revealed 12 primary response categories in which the 832 responses could be placed. The results supported those of Entwistle and Percy. They showed that Subject Interest was more lowly rated, ranked 6th in importance, than Extrinisic Motivation, ranked 5th. They also suggested that Social Life ranked 4th, could interact with academic life. The results only partially aligned themselves with tutor aims as reported by Entwistle and Percy. Success was seen as being dependent on 'study skills', ranked 1st, but also on formal and informal staff-student relationships ranked 2nd and 3rd. Development of critical thinking was not mentioned by students at all either as an aim of being at University or as a pre-requisite for academic success.

Another study (Entwistle and Wilson, 1977) supported the Fontana findings. Students were questioned about deficiencies in the learning environment, at their University including the teaching and it was found that quality of teaching was easily the most common type of deficiency mentioned, and lack of informal staff student contact was the second most common. Perhaps the finding that lack of informal staff-student contact can

affect success reflects the broad perspective to academic work adopted by most students. They perceive higher education as a learning experience which necessarily extends beyond the lecture room.

The discrepancy between student and tutor perceptions of undergraduate priorities may be a source of conflict between them, and affect student academic success. This conflict may be most acute during the students' first year at University since as Wankowski (1973) argued, relationships between teacher and pupil are often close in schools and course objectives externally set and evaluated. At University students can encounter a more impersonal system, their tutor is also their evaluator.

> The approach adopted by a student depends not just on his own attitudes, habits abilities and personality, but also on the demands made by the staff of the institution. Students are rarely free to learn what they like, when they like, or how they like.
> (Entwistle 1981, p.103)

It seems likely that students will during their time at University change their perceptions to align them with their lecturers' expectations and resolve the conflict if they are to succeed. Indeed one might argue that student change is at the heart of the higher education process.

Evidence from Heath (1964, 1978) and Perry (1970) support the notion that students change as a consequence of their higher education experience and that such change is desirable. Both researchers utilised open-ended interviews when collecting data upon which to base their theories. Perry interviewed 67 U.S.A. students and gave the more detailed developmental schema, one in which 9 positions are possible. At one extreme of the schema is the student who sees the world in absolute terms, where there is a right and wrong, knowledge is correct or incorrect, whilst at the other extreme, knowledge and values are seen as contextual and relativistic, and the student makes a commitment, open to revision which unfolds and is expressed in activity and life-style. Perry, however, failed to relate his schema to

academic success or to use it to promote an understanding of how a student's everyday activities lead to intellectual development. Heath, too, saw change in which students move from several possible starting positions towards a desirable end-point, which he called 'reasonable adventurer'. The resasonable adventurer is marked by six attributes: intellectul ability, close friendships, independence in value judgements, tolerance of ambiguity, breadth of interests and sense of humour, and has two mental attitudes: the curious and the critical, which are brought to bear alternately, both being valuable. At times he is a 'believer', at times a 'sceptic'.

Both theories have an intuitive appeal and their schema end- points relate reasonably well to the views noted previously of the lecturers avowed aim to produce critical thinking persons and to the students stated broad social objectives. A review by Entwistle (1981) pointed out (p.75) that Perry and Heath rely heavily on intuitive impressions from interview transcripts and the findings are hard to validate other than by an appeal to the readers' own experiences of higher education.

Heath did produce evidence that fewer students are 'reasonable adventurers' in their first college year than their last and that more academically successful students reach that elevated position than do less successful students. However, there seems a lack of rigour here too, since classification was undertaken by only Heath himself. Thus although change seems likely and intuitively desirable, these two studies do not provide definitive data but they do indicate that research into student success should incorporate study of how students change due to the their college experience.

Returning to student attributions of academic success, Fontana et al (1986), showed that in the students' eyes behaviour in terms of study habits are by far the most important determinent of success with 309 mentions, out of 832 responses. This broad category had 7 sub-categories: these were in

order of importance reading skills, examination technique, time management, note-taking skills, organisation of work, revision and place. Clearly these skills are important whether the student's primary goal is 'stretching the intellect' or 'getting a job qualification', and establish some common ground between tutor and student perceptions. But such skills are unlikely to be adopted when social life is the primary priority for a student and/or subject interest is low.

The student views in the Fontana et al study serve as useful background to reviewing other research into student success, which as will be shown, is considerably supportive of their views, but limitations to the Fontana et al data must be borne in mind. It was a study of one sample from one polytechnic, consisting of only first year students. The nature of the study makes it possible to give only a general perspective on what students think is important, it does not enable anything to be stated concerning any individual students attributions, or suggest whether students will behave in line with their idealised 'good' student. Interestingly, Fontana et al report that many students suggested that they would not, or could not, make behavioural choices in line with their perception that study habits are of primary importance to success. It remains to be determined which students can and will use good study habits and whether student motivation as defined by their personal goals determines behaviour patterns. A further limitation occurred within the Fontana et al categorisation system, since a number of potential interactions between items in different categories were ignored. Categories were not mutually exclusive. For example, interest will vary with lecture content, and influence ones tendency to use reading skills. Lecture content and presentation will interact with note-taking skills, e.g. good structure of lectures making note-taking easier. Thus whilst it is helpful up to a point to separate out motive dimension into categories, one must not be simplistic when interpreting them. As well as observing

interactions between categories one might also ask whether or not a 'good' student requires to be well placed on all or only some of these categories. Interestingly, in the light of the historical emphasis on personality factors within psychological research which examined the notion of such factors as determinants of academic success, students themselves in this study seemed not to invoke such variables.

In sum, the views expressed by lecturers and students in these descriptive nomothetic studies indicate that there is not one key factor to which academic success may be attributed but several which refer to both general life-style and, more narrowly, to behaviour in specific situations such as lectures. The studies reviewed have highlighted possible factors behind success such as the reasons or motives students have for attending university, the balance and interaction between students' social and work activities; the quality of contact between students and lecturers particularly in the context of the lecture; student interest in the academic subject studied, the study habits of the student and the adaptation of the student to their new environment. Some of these factors may be more important in promoting academic success than are others, but exactly how the various factors influence the level of success achieved by a particular student has not been established and may ultimately be peculiar to each individual student. They do, however, give some indication of a suitable framework within which to consider the focii of the present research: individuals, their goals, behaviour and academic succes.

Student motivations and adaption to the college environment are probably two key factors in the success equation, and although neither is directly addressed in the P.C.T. literature, they are open to investigation using a P.C.T. approach. Motives can be investigated by examining students' personal goals using repertory grid techniques and adaption by considering the move from school to college as a period of transition. From a P.C.T.

perspective the transition from school to college and the experience of undergraduate life can be seen as a biographical turning point for the student. It is a time when there is clear evidence of changes in their courses of action, and is a time in which marked changes can be expected in their construct system (Kelly, 1955, p771). To go to college is to enter a new culture, so student adaption to college can be elaborated by abstracting from Kelly's 1955 development of the notion of cultures as follows.

The student upon entering the new culture and sub-cultures will be involved in many new activities and groups. Although the student involvement in the new cultures is voluntary the new activities may "involve the young adult in an overall pattern he did not initially envisage for himself". Some invalidation of anticipations, and hence constructs will occur and lead to changes in the construct system, although "the revision of constructs is not always easy to accomplish" and will take place over a period of time. In any culture or sub-culture one's anticipations are repeatedly subjected to validation, and invalidation but the specific cultural system "limits the kind of evidence at his disposal", although "how he handles it is his own affair".

By identifying the students' culture groups, one may "appraise the validational systems operating". Since validation comes from, "groups of people who are prepared to see the client as somewhat like themselves", that is as producing similar anticipations, employing similar constructs, it is likely that successful transition into the college culture will mean the student will to some degree "start using the construct system the group uses" as defined by their communality of thinking. The student is a member of several cultural sub-groups, academic, recreational, sporting etc and the degree of change to his/her active construct system may be different for successful transition in each of these cultural life-spaces.

The function of education may also in part be seen as providing "cultural expectancies which operate as validators for the individual pupils' constructs, they open up the channels of movement for him within the culturally accepted network".

P.C.T. is most suitable for examining student adaptation to college. A broad perspective is necessary to enable examination of the student construing across a range of life activities and groups. Monitoring of student development in response to the new cultural experiences is central to this study and requires a longitudinal design. Within this broad perspective a narrower perspective which focusses on reasons for academic success is embedded. Further research data pertinent to this narrower perspective in particular studies relating to student motivation and study habits are now reviewed.

Motivation, goals, use of time and academic success

It is the notions of goals and motivation that are now addressed, in particular, their relevance towards an understanding of behaviour and successful learning outcomes in higher education. There is no P.C.T. research with this precise focus so research from motivation and goal theory is reviewed, and implications drawn for P.C.T.

Kohut (1971, 1977) has developed a psychological theory of the self within which personal goals have a central place, which was overviewed and related to academic success of undergraduate students by Patton and Robbins (1982). Kohut postulated that the person moves through a number of stages over the life-span towards the emergence of a firm adult self. The adult self refers to a person who has desire and energy for accomplishment, which is realised by establishing specific goals. Patton and Robbins (1982) have reported on the development of operational procedures in line with Kohut's theorising and they suggested that students who had a disturbance of self

would complain of a general lack of direction, and have difficulty sustaining direction on specific projects. They investigated 72 under-graduate male and female students of whom 60 completed the full investigatory procedures. Goal stability was measured using a self-report inventory developed by Robbins (1983) to assess the individual's goal directedness. This scale contained 10 statements in a Likert format. Statements like "I wonder where my life is headed" and, "I have confusion about who I am". Goal instability was significantly correlated to both the Course grade ($r = -0.31^{*}$) and G.P.A. ($r = -0.37^{**}$). This suggests that goal instability can influence performance although correlational techniques prevent any causal inferences. Scott and Robbins suggested:

> The implications of this study are important for learning centre and counselling centre staffs. Instructors of study skills courses should be aware that some students are at risk to perform poorly in their classes. Lack of self direction and high goal instability have been associated with the unsatisfactory performance of students. Referrals to counsellors may be appropriate and possibly the only way to reach students with disturbances of the self. (p.132)

Intervention programmes based on the concepts described have yet to be reported and evaluated through research, yet they would seem to offer highly promising possibilities given the encouraging initial results reported by Scott and Robbins. Such counselling would have, at its core, procedures for promoting personal goal clarification, the development of which is a major aim of the present research.

Further research supportive of personal goal clarification procedures is the study of Wankowski (1983). He investigated student goals as part of a broader study of student achievement. A 15% stratified random sample taken from 1451 undergraduates at one University completed structured interviews in their first year at college. A part of the interview concerned vocational and social goal orientation. The three questions used were:

(a) Reasons for entering University: "State your two most important reasons for coming to University."

(b) Short range goals: "Name your vocational objectives including plans for using your degree qualifications."

(c) Long Range Goals: "What are your most strongly anticipated goals within the next ten years? (Wankowski, 1973, p.5)

Based on their responses a 'measure' of motivation intensity was taken with scores on each question rated 1-3 and thus overall ranging from 3-9. (Responses to the goals questions (b) and (c) were rated by judges as 1 for "definite", 2 for "vague", 3 for "unknown", whilst question (a) was rated 1 for "crisp", 2 for "woolly", 3 for "indeterminate"). Low scores represented students who were considered as very definite about why they were at University, and what they inteded to do with their degree and life in both the short and long term. One may reasonably suggest that such students would score highly on the Patton and Robbins measure of 'goal instability'. Those students with a high Wankowski score were considered indeterminate about why they were at University, vague or unknowing about where their degree would take them in the short or long term. They lacked direction, interest or power to use their abilities in the terms of Patton and Robbins.

Overall this rather straightforward method of quantifying motivation showed that low scores correlated positively and significantly with degree results (scale 1-9) for males $r=0.27^{**}$, for females $r=0.31^{*}$ which as Wankowski noted was similar to the previous recognised best indicator of success namely correlations between degree results and admission grades (G.C.E. 'A' levels).

Dividing the students into 3 groups: clear, moderate and poor motivation, gave results indicated below:

MOTIVATION (SCORES RANGE 1-7)			
	Clear (1)	Moderate (2,3,4)	Poor (5,6,7)
Failed/withdrew	2%	6%	16%
Hons (1, 11i, 11ii)	21%	19%	5%

Table 2: Clarity of student motivation and academic success.

The figures in Table 2 are computed from the information given in Wankowski (1973, pp.7-8) and show that a considerable degree of linkage between motivation and achievement.

A further point of interest in the Wankowski study was the relationship between goal clarity and life-stress experienced as measured by frequency of visits to the University Health Centre. High achievers with clear goals were least stressed, whilst low achievers with clear goals were most stressed.

Although one might query the Wankowski operational definition of 'stress' the findings did indicate that students who sought student services help for problems would seem to be those whose skills were inadequate to realise their own clearly defined personal goals. This suggests that clear goals in themselves are not sufficient to ensure high achievement but that behaviours appropriate to the goal achievement must also be developed and carried through successfully. This will for example require as noted previously good study skills. Many student counselling interventions operate at this micro level, with study skills combined with self-regulatory skills seemingly most effective (Kirschenbaum et al, 1982).

Clearly, a problem with the Wankowski research is that to date no intervention strategy based upon these goal-motivation insights has been fully developed, let alone tested. Secondly, both the research evidence presented by Scott and Robbins (1985) and Wankowski (1973) is limited in quantity, retrospective and nomothetic in nature. Wankowski (p.92) noted:

> The most persistent feature arising from the analysis of the survey data is the changeability which are accentuated or diminished as the populations are sub-divided into various categories and classes, be they those of school, attainment, motivation, temperament or attributes of background and attitudes to learning and tuition. These changes are, of course, inevitable and to account for all such variations it would be necessary to assess and analyse individual differences between one student and another....the central research can only be meaningful in its interpretation if it is confined to discussion of overall trends with occasional, bold excursions into specific regions.

Thirdly, there was no discussion or analysis of qualitative dimensions of goals, for example their appropriateness to the courses being pursued. Finally, there was the interactive nature of education to consider, students' interactions with tutors and tuition processes. Wankowski reported (p.119) that weakly motivated students had more dissatisfaction with teaching methods but suggested that this evidence was not adequate to conclude that the blame for such dis-satisfactions must lie at the student's door. His suggestion was that University teachers should seek ways by which at least some of their own inspirations could influence their students. This aspect of motivation in relation to achievement, as noted previously, needs further development, including investigation of how and why student goals change and develop, either appropriately or inappropriately, as students interact within their educational and social milieus.

The work of Entwistle and Wilson (1977) also related to motivations and academic success, and whilst it shared many of the limitations detailed above, it did draw attention to qualitative dimensions of motivation, focussing on achievement motivation. It also drew attention although in an a-posteriori analysis, to the changeability of motives and goals. They commented that:

> Motivation is by no means a straightforward dimension, although it is popularly used to explain student success and failure. At the common-sense level it should certainly appear as a close correlate of academic performances, but the research literature does not entirely endorse this view. There is need for a clearer definition of the term itself, followed by the development of conceptually unidimensional scales. Entwistle and Wilson (p.31)

They developed such a scale. It measure the degree to which the subject attempts to maintain or enhance self-esteem through high standard of performance. They used five statements embedded in a much broader questionnaire each of which the student was asked to respond to with an 'agree', 'disagree' response.

Statement: 1. It is important for me to do really well on the courses here.

2. I hate admitting defeat, even in trivial matters.

3. I play any game to win, not just for the fun in it.

4. I get disheartened and give up easily if something is too difficult for me.

5. I enjoy the challenge of a difficult new topic in lectures.

They reported a test-retest reliability for these of r=0.78 over a 2 week interval. In two large studies, the 'Abderdeen Study' and 'Rowntree Study' (each involving about 1000 students), they found the measure had weak prediction power. Low achievement motivation on this measure emerged as a stable indicator of lack of success indicators but only for failure rates of male students. In the Rowntree Project (p.112) correlation coefficients

between motivation and success indicators were on average 0.23, ranging from 0.09 in humanities year 3 to 0.39 for applied science year 3 with results tending to be just at the 5% statistical significance level.

They commented that:

> the most striking finding with this variable in the Rowntree study was the change in relationships between first and third year questionnaires. Across subject areas the median correlation with motivation in the first year was 0.19 rising to 0.25 in the third year.
>
> Whilst it is unusual to expect closer relationships between variables measured in the same year, the increases are larger than anticipated. (p.145)

They suggest that motivation is perhaps unstable, at least as measured in their studies, indeed they considered that whilst motivation may have some causal properties in academic attainment, the relationship is likely to be 2-way with success and failure histories leading to changes in motivation. Once again, this draws attention to the interactive nature of the motivation-success relationship. The studies suggested that achievement motivation may be a pertinent qualitative dimension of motivation related to academic success and which is open to change due to 'University experience'. This indicates that studies of student motivation and success should incorporate a longitudinal perspective.

It would seem, however, on the basis of the evidence presented that Entwistle and Wilson were over-optimistic when they suggested that their motivation inventory, alonside personality and study methods inventories, could form the basis of a diagnostic instrument which would identify different types of study difficulties.

Other data has been more conservative in attempting to examine goal-achievement relationships, concentrating on the micro-level of study skills. Research by Morgan (1985 and 1987) is particularly informative in that it relates directly to academic study at the tertiary level. It focused on

goal setting as a study skill. It had clear theory based hypotheses and rigorous experimental design and the results have implications for both teaching staff and students, both of whom acknowledge the importance of good study skills to academic success.

In his first study, Morgan (1985) compared the use of specific behavioural goal setting after the style of Mager (1962), and in line with Locke's theories. Goal setting techniques were initially taught to the 240 students and then they set their own goals for study. This they aimed at private study periods for one particular course and setting them took about half-an-hour each week. A distal goal condition meant that the students set a single comprehensive goal for a complete study week, whilst a sub-goal condition involved setting goals relating to the amount of time spent on the target course for each day of the week, the number of pages to be read during each study session and topics to be covered. Criteria for mastery were also established. Subjects in a further group were required to self monitor their use of time by setting a weekly study time target and monitoring the actual study time. A no treatment control group was included in the study. Subjects were allocated to conditions in a random block design with academic development prior to college being blocked into three groups. The dependent variables of interest were the target course grades, other course marks out of 100, and study time on the target course.

The primary result was that the specific sub-goal study condition proved superior to the other three study conditions, which did not differ from each other. The results were consistent across prior achievement blocks. The mean difference in marks between the specific sub-goal group and the other conditions being 6.2 (67.7 - 61.5). There were two further points of interest made by Morgan:

> Confidence that the sub-goal groups' superior performance was indeed due to the specific study technique is boosted by two related features of the results. Firstly, study condition had no impact on courses

> other than the target course. In other words there was no evidence that the superiority of the sub-goal group was due to a differential emphasis given to study of this topic to the detriment of other courses. Second, the sub-goal group spent significantly less time on study than did the time group, and yet obtained significantly better scores. (p.627)

The former observation is indeed valid, yet one must note that although 'sub-goal subjects' did not do worse on other courses, neither did they do any better and one must ask whether they generalised their new found skills? It appears that they did not. This may be because goal-setting did not become a part of their personal repertoire of study skills and this prevented the technique having any broad or long-term impact on academic success. The second point concerns the lack of impact on achievement of the extra time spent on study by the time monitoring group. Indeed, overall use of time correlated only 0.08 with achievement and stands in apparent contradiction to the common sense view of this relationship. Clearly quality use as well as quantity of study time is important and the data indicated that sub-goals may bring about more qualitatively effective use of time. This use of time issue was looked at in more detail in the Morgan 1987 study and is of considerable relevance to the present research project in which use of time both qualitatively and quantitatively is hypothesised to vary with goal orientation and in part to determine levels of success. Attention will, therefore, be given to this second Morgan study and other studies by Mount and Tyrel (1977), Entwistle and Wilson (1977), Fontana et al (1986), Savage, R.D. (1972), Cooper and Foy (1969), Krantz (1983), Wankowski (1973) which focused specifically on use of time in relation to academic success probabilities.

Student Use of Time

Morgan's (1987) investigation was very similar in design to that of Morgan (1985) reviewed above and in order to avoid unnecessary repetition full details are not presented. The important new emphasis of the 1987 research lies in the nature of the three experimental groups. One group as described above set specific use of time goals at weekly intervals, a second group monitored their use of time, monitoring along the same three time dimensions as the goals group: total time on targetted study areas each session, number of pages read per study session and topics covered during the study session. The third experimental group received both the goal-setting and self-monitoring instructions. Control subjects were in two groups: a placebo group (who read through what needed to be done in the week), and an untreated group. It was found that all three experimental groups had superior performance to the two control groups but did not differ one from another. The extent of the treatment effects were very much in line with Morgan's (1985) results, reported for the goal-setting group.

Interestingly, however, the self-monitoring was more effective on this occasion and it would seem that increased effectiveness lay in the increased specificity with which the time-monitoring was conducted compared with the previous more general approach. Instead of just monitoring overall use of time on specific tasks, appropriate target behaviours were monitored. It is noteworthy that the critical selection of appropriate task times to monitor was made by the experimenter and it is perhaps this analytical decision making process which the student needs to learn if the non-generalisation of skills noted in the original study is to be overcome.

The similarity of outcomes for all three experimental interventions was unexpected since it was hypothesised that the combined goals and self-monitoring would be the most effective. A likely explanation is that formal requirements to formulate sub-goals may have resulted in

informal self-monitoring and vice-versa. Some support for this explanation came from the results of an open-ended, post-experimental questionnaire given to subjects 2 weeks after the examination was completed.

> When subjects in the SG and SM groups were asked what effects the goals setting/self monitoring had on their study, 34% of subjects in the SG group spontaneously said that setting sub-goals brought about an evaluation or assessment of how well they had attained these goals. Furthermore, 39% of the SM group said they tended to set goals or aims. These results suggest that in practice it may be difficult to separate effects due specifically to either goal setting or self-monitoring. (Morgan, 1987 p.132)

The need to specify specific appropriate use of time, as opposed to a more general emphasis on quantity of private study, for the sub-goal/self-monitoring procedures, may be one key as to why previous studies looking for relationships between private study time and academic success have produced variable results and at best only weak relationships.

Mount and Tyrel (1977) compared three methods of time monitoring: cards, graph, and cards and graph, with 94 students randomly allocated to each condition. Within each monitoring condition subjects monitored either time studying, collecting information immediately after the four monitored activities; reading textbooks, reviewing class notes, talking shop with peers, or guilt-time. Guilt time was the time they felt they should be studying when they were not and was specified in examplars.

Best grades came for combined card and graph monitoring students regardless of which time (guilt or study) was monitored. The magnitude of group differences were in the same order as Morgan's study reported above, and support the suggestion that monitoring needs a detailed specification of time to be monitored. This study introduced the additional concept of guilt-time and the specific monitoring technique as a dimension which can influence successful interventions.

Entwistle and Wilson (1977, p.32) have also commented on the methods of quantifying study time, and the probable unreliability of students having to remember their work patterns in retrospective questionnaires. In their Rowntree study they used a card diary which guided students through the previous week, and they reported this to be a more reliable technique.

Using this technique they found that for their sample of 1531 students average study hours were 22.7 (s.d.=9.6), but students who withdrew from University for academic reasons (n=55) had a mean of only 16.2 hours per week. Withdrawal students for non-academic reasons (n=27) still averaged 21.2 hours per week. The data provides an impression of the number of hours students work and suggests that low hours of study may lead to increased probablility of failure, without appropriate quantity of work hours necessarily leading to higher levels of success. Indeed comparing high and low achievers they found high achievers (top lower seconds or better) across all subjects, except mathematics, worked significantly longer hours than low achievers, the differences being in the order of 6 hours per week. However, whilst study hours correlated significantly with degree results, Year 1 and year 3, they were only in the range of 0.13 to 0.38 according to subject area. Year 3 students spent an average 5 hours more per week studying compared to year 1 students suggesting that an adaption to the demands of University, or perhaps an upping of effort as finals loom large, took place.

The thorough and reliable study of Entwistle and Wilson suggests that overall study hours does effect overall degree performance although apparently not to a massive extent. This might seem at odds with Morgan's (1985) result where previously it was noted that an overall increase in study time for time self-monitors did not enhance their grades. However, in that study the grades were taken for a single course rather than for overall study. It is conceivable that the overall study time Entwistle and Wilson referred to is important in enabling adequate time to be allocated to each

sub-study area and thus focuses on a personal organisational skill. Perhaps studies of overall time planning enriched by assessment of detailed in-course time use planning, would increase the level of relationship between grades and time-allocation observed.

Interestingly, Savage, R.D. (1972) also drew attention to the broad issues of time allocation in relation to student success. He found that study habits measured by the questionnaire of Wrenn (1941) discriminated between high and low achieving students, in particular that distributing time between social and work activities was more difficult for low achieving students, unfortunately no further details were given.

Fontana et al (1986), as reported earlier, found that students considered balancing time demands between social and work activities was the 4th most important factor in promoting academic success and study habits were seen as the most significant factor in promoting academic success. Within the large study habits category, sub-categorisation was possible, and provides further evidence for considering time organisation to be important to academic success. The 'organisation of work' and 'appropriate time slots in which to work' were highly rated sub-categories (ranks 3,4), only exam technique and reading skills came higher.

In sum the evidence reviewed so far, whilst not definitive, does suggest that 'use of time' is a factor which can influence academic success. Students must be able to allocate sufficient time to 'study activities' as opposed to 'social activities', and make quality use of the time allocated, both targeting specific activities such as relevant reading and using self-regulation techniques such as goal setting or self-monitoring. This author would suggest that there are implicit hidden factors to consider in trying to arrive at an overall picture of the study processes operating. Firstly, why do some students skilfully manage their lives enabling adequate study time? Is it that they have different executive goals (motivation)

which enable action priorities favouring academic success to be set? Secondly, have they acquired the analytical and decision making skills whi h enable the successful time allocation to appropriate work activities? Research is required to investigate whether or not these threads of possibility can be drawn together.

Three studies, Krantz (1983), Wankowski (1973) and Cooper and Foy (1969), however, caution against the trend of the studies presented so far. Krantz looked at compensatory actions taken by students prior to re-examination following failure on a previous exam. Increased study time over baseline levels was one of a number of compensations measured when students completed a daily self report card similar to that of Entwistle and Wilson (1977) but less detailed than the method Morgan used. Krantz found that increases in study time correlated only weakly (r=.14) with exam grade increases, even so it was the strongest relationship between student compensatory measures and re-examination scores. Krantz comments:

> Why is it that the pay-off for academic behaviour is low? One possibility is that the crucial parameters of the behaviour were not measured. For example, certain qualitative aspects of studying (e.g. the particular strategies used to organise and integrate the material) may be more important than the duration of study. Another possibility is that the behaviours prescribed by our culture for improving performance are ineffective or recommended indiscriminantly. For instance some students might benefit most from increasing academic behaviours, whereas others might benefit most from anxiety management techniques. (p.542)

This emphasises the need for careful individually based observations and interventions.

Wankowski (1973, p.71) asked students in their second year at University to complete a diary of work commitments and leisure time during one mid-term week. Unfortunately, no details of the measure are given, but it would seem to be open to the problem of retrospective reporting suggested by Entwistle and Wilson. This reliability factor undoubtedly influenced the

results which showed no correlation of significance between this measure of study time and degree success levels (r= 0.00 males r= 0.08 females). Over and above the reliability question mark one must also query the choice of the particular block of study time chosen. It would seem unlikely that a self-reported single mid-year week of study would be the best indicator of examination results taken at the end of year. General mid-term study levels are not necessarily as directly pertinent to examination assessment as would be more specific uses of time (re Morgan) or measures of revision time which is a more examination specific use of time. So whilst Wankowski did not find support for the study time/academic success relationship, his results may reflect inadequacies in the research methods which would miss any but the very strongest of relationships.

Cooper and Foy (1969) investigated study/time as reported by 1st, 2nd and 3rd year pharmacy students in response to two questions, 'how many weekdays are spent in private study' and 'how many weekend days spent in private study'? This crude measure is open to the problems of specificity and reliability previously raised. The questions formed part of a questionnaire containing 45 questions relating to study habits. The simplistic analysis consisted of correlations between each question and the level of degree success. This was done for 2 groups of 3rd year students only, and of the 90 correlations just three were significant, an outcome hardly higher than chance alone, so little significance may be attached to such data.

Conclusions

In conclusion the research evidence examined in this chapter considered goals and goal setting, and time and time management in relation to academic

success. Overall it supports the view that both of these notions are significant to the understanding of academic success. Both concepts have what may be termed macro and micro dimensions. At the macro level the ability to set broad goals and sustain the direction of one's behaviours towards well clarified outcomes is important to success. Counselling interventions aimed at goal clarification are indicated but remain to be developed and validated. Qualitative aspects of broad motivational goals also showed promising results notably when achievement motivation specifically directed at academic studies was measured, but the method and results fell far short of offering an adequate diagnostic procedure to follow. An interesting aspect of this work was the indication that the achievement motive was open to change over time and this suggests that student-college interaction is a key issue to consider in future research. At the micro level specific goal setting to direct one's efforts towards time on appropriate study tasks coupled with time-use-monitoring, showed positive outcomes for single targetted courses but did not generalise to other areas of their study. A result to be explained, can generalisation take place and if so how might it be facilitated?

At a macro level the time management skill concerns allocating sufficient time to study as opposed to social and other necessary activities and it seems that this skill is a pre-requisite to the more specific micro issue of directing study time optimally to study tasks. Each aspect of time management requires decision making skills, which will reflect motivation and activity priorities. Research producing negative results concerning time allocation and academic success did so because of design limitations.

A 'use of time' diary will be used in the present study, to tap the person's experience systematically and enable relationships to be investigated between "use of time", qualitative aspects of personal goals particularly achievement goals and academic performance levels.

CHAPTER 4 : THE DEVELOPING CONSTRUCT SYSTEM

Introduction

This chapter aims to identify the characteristics of a well-functioning construct system, with emphasis on the issues of qualitative aspects of constructs and their organisation in the system. In so far as both issues are involved in giving meaning to events they overlap, but it is convenient to present studies in relation to each issue separately. The research reviewed is taken from a variety of domains: psychotherapy, education and vocational guidance, but statements applicable to construct systems in general will be made. Implications for the design and interpretation of the present P.C.T. investigation will then be drawn out.

Organisation of Construct Systems

When a person decides upon an action more than one construct will normally be involved. Indeed Adams-Webber (1979, p.7) suggested that "a necessary condition for organised thought and action is some degree of 'linkage' between constructs. Linkage is specified in Kelly's 'Organisational Corrollary' which states that:

> a person characteristically evolves for his convenience in anticipating events, a construction system embracing ordinal relationships between constructs.
> (Kelly 1955)

This means that constructs are hierarchically organised within the system. For example, construing an activity experience as 'work', on the 'work - leisure' super-ordinate construct indicates that 'work' is a fundamental feature of the activity. For a more detailed construing of the activity further sub- ordinate constructs such as 'physical' - 'non-physical' must also be used. The ordinal relationship between the constructs allows one to construe the activities as being the same at higher levels of

construction, both may be 'leisure' activities, and yet at lower, more detailed levels of construction, they may be differentiated into 'physical' or 'non-physical'.

Construct 'linkage' may also be evaluated by examining their degree of similarity in usage. Related usage of two constructs occurs when for example, "work" activities are also frequently construed as "physical". When their usage is unrelated "work" activities will be equally as often construed as "non-physical" as they are construed "physical". These types of operationally defined relationship (linkages) would typically be identified in terms of inter-construct correlations within a repertory grid analysis or by the number of implications between constructs within an implications grid. Going beyond the concept of just two related constructs one can easily envisage a cluster of inter-related constructs which form a sub-system within the overall construct system such as 'physical', 'leisure', 'relaxing' 'optional'. A study by Maklouf-Norris et al (1970) investigated construct clusters, and developed the notion that an articulated construct system, that is a system of constructs organised into clusters which are inter-linked, is a well-functioning system. They compared the construct systems of a group of obsessional neurotic patients with those of a group of persons without any psychiatric disorder, that is 'normals'. They identified primary clusters of constructs, operationally defined as, a set of constructs, each of which correlates with all other members of the cluster at the 0.05 level of statistical significance. A construct significantly related to some but not all constructs within a primary cluster was termed a secondary construct whereas a construct which significantly correlated with one or more constructs in two or more clusters was considered a 'linkage' construct. Finally constructs which failed to correlate with any other construct were termed 'isolates'.

The obsessive neurotic subjects and normal control subjects were in carefully matched pairs (matched by age, sex, marital status, socio-economic class and length of hospitalisation). A 20 elements (people) grid was formed for each subject, with 16 constructs from triad elicitation procedures (Kelly 1955). Construct organisation according to the guidelines above were established for each subject. Nine out of eleven normal subjects were found to have articulated systems, that is, systems with two or more clusters joined together by linkage constructs. Only four obsessional subjects had such articulated systems, whilst six had monolithic systems with one dominant cluster and some secondaries. The final patient had a segmented system, that is a number of separate clusters without any linkage constructs.

A further point to be derived from the study was that for articulated systems super-ordinate constructs were located as part of the linkage system between clusters, whereas they were located in the primary cluster for monolithic systems. This observation was based on the assumption that constructs with greater numbers of significant correlations to other constructs are super-ordinate constructs. Of course not all linkage constructs satisfied the conditions for super-ordinacy and, given a large number of constructs in a primary cluster of an articulated system, one would expect some of those to be super-ordinate in standing relative to other constructs. Unfortunately it was not possible to investigate these assumptions more fully since no other means of operationalising super-ordinancy was presented.

Evidence in a more recent study by Raz-Duvshani (1986) supports the contention that articulation in construct systems is typical of a well functioning system. He compared the organisation of psychosocial construct systems for 27 psychoneurotic student subjects. Comparisons were made before and after a 6 month period of 30 psychoanalytically orientated

psychotherapy sessions. Three subject groups were compared, those who 'improved', 'did not improve' and those who 'dropped out' of treatment. The pre-treatment assessments showed similar levels of articulation in the construct system of each group. Improved subjects moved from a tighter, less articulated to a looser more articulated organisation, whilst non-improvers moved in the opposite direction. Raz-Duvshani commented that such a movement is equivalent to "freeing the personalities for acting and behaving" allowing "more freedom to anticipate events and exercise pathways of movement" with neurosis being viewed as a condition which "reduced possibilities of choice among alternative forms of behaviour".

The two studies elaborated illustrate what constitutes a well-functioning construct system in the domain of psychosocial construing.

Nevill, Neimeyer et al (1986) and Neimeyer and Metzler (1987) have considered cognitive structures and their development in the domain of vocational schema, which support the notion that well-functioning construct systems are articulated.

Nevill et al observed that two aspects of cognitive structure may reflect vocational construing: Differentiation, (after Crockett 1965) which refers to the number of different dimensions of judgement in the vocational schema, Integration (after Bannister 1960) which refers to the level of inter-relationship among these dimensions.

They noted that previous work in the vocational domain had emphasised either integration or differentiation of construct systems but had not considered the two simultaneously. Neimeyer et al (1986) had made efforts to combine the two measures, stating that for a construct system development

> the most functional stage would be both high in differentiation and integration. Here the individual would be able to distinguish among a wide array of career information and organise it into cohesive and comprehensive schema.
>
> (Nevill et al 1986 p.111)

This constitutes an articulated system. They suggest that such a system develops out of less functional systems and that the

> earliest and least functional structures would be those marked by low differentiation and integration. This stage would consist of relatively few poorly organised dimensions. Intermediate stages would be those that are mixed i.e. low differentiation and high integration or high differentiation and low integration. (p.111)

These constitute a monolithic structure and a system of isolates. They said the cognitive structuring "would carry direct implications for vocational behaviour" and at its most functional should enable individuals to process career information more effectively and accurately, and to regulate a greater variety of potential career alternatives (Neimeyer et al 1985, p.194).

Both studies used the Cognitive Differentiation Grid (Bodden 1970) in which 12 occupational titles (e.g. physician, social worker and farmer) are rated on 6 point likert type scales along a 12 bi-polar constructs (e.g. high income - low income, high status - low status). Differentiation was measured using Landfields' 1977 method and Bannister's method of Integration (Fransella and Bannister 1977).

They employed cross-sectional designs. Subjects, university students, were grouped in terms of levels of cognitive development as indicated by levels of differentiation and integration. Four groupings were considered, with Differentiation high or low being combined with Integration scores, high or low. Levels of cognitive development were then related to a number of measures considered relevant to vocational decision making, for example, knowledge of vocational information (a reading and recall exercise), number of career alternatives, career decision-making, self efficacy scale (a measure of confidence an individual feels at being able to complete the tasks necessary to make career decisions), and a vocational identity measure (which indicates the degree to which an individual possesses a clear and

stable picture of goals, interests, talents in the vocational domain). The studies demonstrated an impressive consistancy with which interaction effects between integration and differentiation measures related to the wide variety of other measures used.

Neimeyer, Metzel stated that:

> Consistent support was found for the relationship between more advanced stages of structural development and more advanced stages of identity development within ideological, vocational and occupational domains. (p.30)

For well-functioning systems within this domain of vocational schema, high differentiation combined with high integration is required. Their data support the most important findings of Maklouf-Norris et Al (1970) and Rav-Duvshani (1986) that a well-functioning system is an articulated one.

Qualitative aspects of Personal Construct Systems

There is a qualitative change in the meaning of events whenever one changes the organisation of ones constructs, or how those constructs are applied to elements within their range of convenience.

The normal procedure adopted in investigating changes of construct systems over time is to take a series of grids over a period of time, each having the same constructs and the same elements, often with the constructs supplied by the investigator. Such procedures, give a limited view of qualitative change in personal meanings since they capture only changes resulting from construct re-organisation. A further dimension of change must be considered which is of fundamental importance, that is, qualitative change due to construct replacement within the construct pool. Landfield and Nawas (1964) similarly noted the two possibilities for change within the context of psychotherapy,

> subjects seen for a longer period would show changes in choice of dimensions (a more basic change), whereas, subjects seen for a shorter period might show changes in rating within the same dimensions (a more likely and easily obtained change)(p.333)

In order to study qualitative change in its fullest sense, "changes in choice of dimensions" as well as construct organisation and application must be explored. Procedurally it follows that constructs must be elicited from subjects rather than supplied on every occasion the construct system is investigated. Furthermore, elicitation procedures must be such that a full pool of salient constructs is accessed from the subject ensures that new construct inclusion and redundant constructs exclusion may be observed.

It is surprising how few studies are actually targetted at systematically charting qualitative change in this its broadest sense and those that do, frequently do not meet the procedural guidelines stated above. It is studies which do emphasise construct appropriateness, construct stability and replacement over time which will now be reviewed.

Three studies from the field of education give tacit support for using a subjects own constructs. They are Phillips (1981), Kevill, Shaw, Goodacre (1981) and Diamond, Zuber-Skerritt (1981). Specific supporting statements taken from these investigations are:

> The aim is to acquire some systematic information from the viewpoint of the student, "which" enables the researcher to enter, at least to some extent, the world of the participants.
> (Phillips 1981 p.2)

Kevill, Shaw, Goodacre (1982):

> .... it was decided not to use a questionnaire, or a rating scale to evaluate the Diploma, but to seek a more reflective and sensitive instrument. Questionnaires necessarily force subjects to use criteria which have been selected by the 'experts' and as such, they may be alien to the subject's own meaning systems. p.46)

and Diamond, Zuber-Skerritt (1981):

> We merely demonstrate how students personal perceptions or constructs of research effectiveness can be generated and how these constructs change and grow over time. (p.162)

Each study will be reviewed more fully. In many ways they are remarkably similar one to another, and as such they share similar merits and tend to have similar limitations. In particular, they all reveal and confirm the changes in the available salient construct pool over time. They also indirectly link these changes to behavioural changes in the subjects.

Phillips (1981): Students' construing of research

Phillips (1981) investigated post-graduate students and their tutors (n=7 of each), her intention being to observe the "process of research as it was experienced by the participants". She felt that this would be more illuminating than comparing successful and less successful students as determined by the end product since it would lead to "an understanding of the requirements for the compilation of the research degree rather than merely revealing aspects of evaluation of the training based on eventual performance". Repertory grids were taken from the students at 6 monthly intervals. The grid elements used were eight items important to the successful completion of the Ph.D., chosen by the subjects, and which in the event turned out to be activities, things to do. Constructs were elicited on the first occasion using the triadic method. On subsequent occasions, opportunity was provided to add to both the construct and element pools. No specific itemising of this particular aspect of the study appears in the report, but it would seem that this method would not fully ensure that subsequent grids would contain the most relevant pool of constructs. This is because, in the first instance, redundant constructs are not omitted. Secondly, that merely asking for new constructs, rather than eliciting as was done previously, is actually to involve the student in a potentially quite difficult exercise and one which is not necessarily going to produce new constructs even when the subject has indeed got new constructs to

produce. Nevill, Shaw, Goodacre (1982) using the same technique report no new constructs at all being added to their subjects' construct pools over a period of 9 months!

Grids were analysed using FOCUS (Shaw 1980) and subjects received feedback. (FOCUS is a 2-way cluster analysis which systematically re-orders the rows and columns of the grid to produce a focussed grid so that constructs which are most alike are placed adjacent to each other as are elements too). In this way students were able to gain insight into their own view of research. However, as Phillips acknowledges, this interaction may in itself influence the subjects' construing of research, and yet it may be necessary so that the fullest understanding of the student's construing is elaborated with the researcher.

> The post-graduates were helped to articulate in some detail aspects of their thinking about their work that had not previously been clearly defined "exploring" specific issues of importance to them "which" helped to define their roles as research students.
> (Phillips 1981 p 6)

When two successive grids were available, feedback was given from focussed grids and also through a CORE analysis (Shaw 1980) which compares all equivalent constructs in a pair of grids and records the level of match in each pair (i.e. to what extent they have been similarly used on the elements). The procedure allows the grid to be reduced in size until it contains only constructs and elements which have sufficient level of agreement. The sufficiency level is defined by the researcher. This reduced grid is the CORE of retained meaning over the passage of time between the two grids but it does not locate new meanings established in new constructs. Thus in the feedback sessions it was possible to examine current construing and reflect upon both retained meanings and changes in

meaning over time. The discussions were prompted by use of the question "The way you think about....has changed in the last 6 months (or since you started your Ph.D. etc) can you account for it?".

No systematic analysis, such as a content analysis of constructs was presented but a thematic search revealed a number of common trends, in particular with regard to changing constructions of three aspects of their work namely supervision, the Ph.D. itself, and writing the thesis. With regard to supervision, the central theme of interest concerned autonomy versus dependency. This was closely related to the ability of students to evaluate their own work. That is, act upon tutor feedback and set their own work objectives and schedules. As the sense of autonomy increased so the perception of the tutor changed from "generating external approval and information" towards "one of colleague". Phillips observes that not all students achieved this and recommended that "the skill to interpret and judge their own work, together with those needed to impose structure on the planning of projects" were most needed and should be taught at the start of their three years training. The theme which emerged regarding students' perceptions of their Ph.D. was "growing disillusionment with, and disinterest in the programme on which they had embarked so enthusiastically". Phillips' remarks that the reasons behind this disillusionment and unrest only became clear when the discussion was based on particular constructs that had changed, emphasising that the detail supplied by the investigatory approach used in the study was important.

To recap, this study was able to chart the constancies and qualitative changes in construing of the activities involved in doing a research degree. In doing so, individuals were able to more clearly articulate in detail the meaning of events which they were experiencing and perhaps be influenced by this articulation process. The researcher could become involved in the student's world 'through her eyes' and establish patterns and themes across

the body of student perceptions, as well as coming to understand individuals in depth. This lead to recommendations for improved training, including the grid plus feedback as an instrument to help students and supervisors identify problems and develop strategies for a more humane training in the skills needed for successful research. In relation to writing their thesis, it was more usually perceived as merely the logical conclusion of months (or years) of data collection rather than as an integral part of research work, in which writing and thinking are acknowledged. Perhaps there should be a re-emphasis on this aspect of Ph.D. learning.

This in-depth study over an extended period of time was undertaken with only a small number of students which places constraints on generalising with confidence from the findings to other students, tutors, courses, institutions. Reservations concerning the construct pool used in this study have already been expressed and a further reservation in this area concerns the notion of hierarchical structuring of the construct pool. There was no particular technique used either to ensure the presence of, nor indeed the discrimination of, super-ordinate versus sub-ordinate constructs within the construct pool. This perspective on changing meanings could therefore not be discussed. For example, were there changes in super-ordinancy, and were the super-ordinate constructs more constant in their usage? The issue of super-ordinancy is important in constructs theorising and needs to be addressed in research. The need to be aware of it is further highlighted in the other studies.

Kevill, Shaw and Goodacre (1982): Study of the impact of post experience education on teachers' construing of learning:

Kevill, Shaw and Goodacre (1982) employed very similar techniques to Phillips (1981) with a sample of 13 teachers.

In contrast to Phillips, however, they took grids on only two occasions, one early in the post experience diploma course which the teachers were following and the second 9 months later upon the teachers' return to their schools. As with Phillips, construct elicitation was restricted to the triadic method, on activity elements consisting of activities making up the teachers normal working day. No new constructs or elements were added on the second grid occasion although subjects were invited to introduce and use them if they so wished. The feedback sessions occured after each grid, and were based on the FOCUS and CORE analysis of grids. Again, discussion of constancies and changes to both constructs and elements ensued, with students being requested to say why they felt changes had taken place and what the effects of the changes were on their activities. Outcomes of these discussions which lasted for 1½ hours were written up by both students and investigators to ensure reliable and comprehensive reports. Changes on each pair of grids for each subject were studied by getting into the thinking of the grids using the experimeters and the subjects account of the changes. An independent researcher examined the reports and raw data and agreed that the accounts fully and accurately captured the causes and outcomes shown in the grids. Whilst not a totally infallible procedure it does raise confidence that the reports were more than just one person's view.

Each person's change and its effects could be charted. The effects were potential changes in behaviour which however could not be confirmed as actual changes in behaviour since no direct observation of behaviour took place. Subject 8 for example changed towards 'processing more knowledge' with an 'idea of what I am looking for', and its effects included making more informed decisions, taking more care and hence time to make decisions, greater concern with long-term effects of decisions when assisting teachers.

An interesting point is whether the questioning technique used in the two studies reported here (Phillips, Nevill et al), both of which essentially ask 'why' changes have taken place, are identifying super-ordinate constructs, of which some may, and more significantly some which may not, already be part of the construct pool elicited by triads. This conjecture arises out of the similarity of their question form to that used in Hinkle's Laddering technique (1965) to identify super-ordinate construct, starting with a single root construct. A preferred pole is identified and then the subject states 'why' it is preferred. This process is repeated on several successive occasions. It is also considered within Personal Construct Theory that change takes place under the regnancy of super-ordinate constructs. Thus for subject eight above, the construct 'more knowledge about - less idea about' could be a super-ordinate construct to the other constructs 'taking care - doesn't need care', 'time consuming - not so', 'requires informed decisions - quick decisions' and 'long-term decisions - short term decisions' when construing activities. This is of course only speculation on the part of this author but some means of knowing what super-ordinate constructs are available to subjects and their involvement in change would be useful.

Two common themes were identified in this study as the root of changes,

(1) Greater knowledge, sounder theoretical base, more ideas.

(2) Enhanced self-awareness and greater objectivity.

Using five independent teachers as judges, the effects of these could be identified and organised into clusters. For example, greater knowledge led to 4 types of effects, those in relation to organisation planning, communicating, (such as consultations with colleagues and parents), child

centred changes and some negative or ambivalent changes. The two major causes of change were clearly related to the course aims. (Kevill Shaw Goodacre, p.54).

As in the Phillips study, this investigation into qualitative dimensions of construing produced meaningful results in which both individual and group patterns of change were identified. It was seen that this could reasonably be considered to initiate changes in the subjects behaviour and changes were consistent with course aims.

The limitations of the study are similar to those identified for Phillips (1981) concerning comprehensiveness of construct elicitation, ignoring of super-ordinancy, difficulties of generalisation due to restricted numbers of subjects and the potential impact of the research process itself on the processes being observed.

Diamond, Zuber-Skerritt (1986): the study of the impact of a research course on students' construing

Diamond, Zuber-Skerritt's study was again an intensive investigation of a small group of students (n=8) who were following a one year full-time university course in which Problems and Methods in Research (P&M), was one of 4 taught courses, which together constructed half of the full course. Repertory grids were completed at the start and completion of the P&M course making a 3 month interval between grids. A group of 4 faculty staff, experienced researchers, did likewise. The grids focussed on the processes of research, a focus which directly relates to the students' course aim to demonstrate to students the importance of articulating the theoretical premises from which they would commence their own research, and of defining the research methodology they would employ. (Diamond, Zuber-Skerrit, p.163).

Participants learned to interpret their own grids and took part in group discussions. It was intended that grid production and the subsequent feedback discussion sessions should help students and staff become aware of their own formerly tacit perceptions of what constitutes research effectiveness and, to quote:

> By investigating the current state of the learner, steps can be taken to help him or her build even more personally useful model since,
>
> a greater awareness and understanding of one's own theory and that of expert others can lead to improved learning, teaching or research

The overt intention to influence the processes under investigation and to include the comparison to expert others, separates this study from those of Phillips and Kevill et al discussed above.

Elements were 6 people, significant researchers known to the subjects, including 'the researcher I am', 'the researcher I want to become', 'a good researcher', 'a poor researcher'. Constructs were elicited on each occasion using randomly selected triads. Thus the changes in construct pool could potentially be identified as changes of dimensions as well as structural changes. However, it must be noted that only eight constructs were elicited for each person and a ninth was supplied, effective-ineffective. It seems unlikely that this would represent the full pool of constructs available to the subjects and thus it would limit the appreciation of qualitative changes which took place, as would the non-identification of super-ordinate constructs in the elicitiation procedure. This is not to say that what is reported is 'incorrect' but merely that the study was limited by the operational procedures used.

The grid analysis consisted of both FOCUS and SOCIOGRIDS (see Thomas, Harri-Augstein, 1985). The latter is a means of identifying and extracting the most common ordering of the elements used by the subjects and gives a group mode grid.

The first mode grids showed that students tended to construe their own role as researchers negatively rating themselves on average at 3.70 across the nine constructs in this grid, using a 5-pt scaling, where 1 is positive. Their 'good researcher' ratings averaged 1.50 and 'poor researcher' 4.30. Staff however saw themselves positively as researchers but not perfect on their MODE GRID, rating 2.40 on average in comparison with 'poor researcher' 4.50 and 'good researcher' 1.70.

These group evaluations were of course based on qualitatively different constructs for students and staff. For example although similarly rated numerically, 'good researchers' were evaluated along dimensions 'making economical use of time', 'good data interpretation', 'digests material and ideas' 'thorough', 'previous research' and 'effective' by students. Staff only clearly overlapped with students on this latter dimension (the supplied dimension). Constructs elicited from staff, were for example, 'publications', 'research efficiency', 'productive', 'committed to theory', 'analytical', 'brilliant', 'fast', 'sharing'. Thus qualitiative and quantitative differences were observed between the two groups on the first grid, illustrating the need to consider the content of construct pools.

On the second mode grid, the students showed considerable change in construing with constructs being more varied: 'able to analyse theories/ literature well', 'having a definite hypotheses', 'defining a long-term plan at the outset', 'being careful with work', 'good time manager', 'seeing research through to the end', and 'effective'. The basis exists here for a structured systematic approach to a thesis. The students now saw themselves more positively as researchers with an average 2.40 across constructs as against the previous 3.70. Staff on the other hand showed considerable overlap between mode 1 and mode 2 grids with only two new constructs appearing, 'reliable in team research' and 'relate to a broader field of knowledge'.

A number of issues arise from this study. Firstly, since elicitations were not exhaustive it is not possible to tell to what extent the changes in mode grid constructs are entirely representative of the 'real' changes in thinking either on behalf of students or staff. Perhaps important constructs were omitted in one or other of the elicitation sessions for some or all staff and students, constructs which could influence the make-up of the mode grid. Do changes and consistancies reflect meanings or methods? Secondly, there was no identification of super-ordinancy and thus such questions as 'are mode grid constructs more likely to be super-ordinate constructs than sub-ordinate constructs?' were impossible to answer. Thirdly, the precise process of feedback and discussion was not made clear. For example, what questions were posed about grid changes, to what extent was discussion concerned with individual grids as against group grids, to what extent were students and staff (experienced researchers) compared?'. Fourthly, systematic classification of constructs, say by content analysis, which would have helped pin-point general differences in construct types between subject groups and across time was not undertaken.

Finally, it is possible that students and researchers were not construing the same type of events making comparisons between their constructions questionable. It seems to this writer from acknowledging students inexperience as researchers, and from reflecting on the Mode 2 grid constructs seen in this study, that students were construing researchers relative to their completing a single research project. Conversely the staff subjects were more broadly construing the career of researchers who are involved in a number of research projects over a period of time. Thus differences in construing between student and staff subjects may in part be due to this difference in their perspective.

A consequence of this is that mode 2 student constructs can be considered as focussed on a single study, such as 'has a definite hypothesis' with only 'more careful work' and 'good time managers' having broader range of convenience and super-ordinate status. All staff constructs seemingly have a range of convenience beyond construing a single study e.g. 'Relate to a broader field of knowledge', 'publications', 'productive and brilliant'. Again attention is drawn to the importance of identifying super-ordinate constructs and also drawn to the care required to produce satisfactory results in the elicitation process notably care in selecting the elements to be used.

Is it possible to know whether or not the process used was useful in promoting the observed changes in construing bearing in mind the uncertainties mentioned above? Anecodotal reports by both students and staff suggest it was. One staff researcher commented that "it fulfilled the function of sorting out the categories in his mind", another "would have like to have added to his list some of the constructs elicited from colleagues" and students asked for a third grid to be taken on completion of the course, they:

> realised that the two pictures of the self (as well as of the group) were not identical but different and changing over time. For them it amounted to a learning experience and a revelation of themselves as growing researchers.
>
> (Diamond Zuber-Skerritt p.162)

It is however not clear which particular aspects of the whole process were influential in producing the observed changes.

Despite the limitations of the three studies, they all clearly show that the study of qualitative changes in construing is important, and suggest that it can be influenced, for example, by awareness raising exercises and/or comparison with the constructions of others, including experts. Finally, they give a strong suggestion that changes in construing

does lead to change in behaviour. It is recommended that future studies use full elicitation procedures inclusive of identification of super-ordinate constructs, include some direct measurement of behaviour, and if possible the notion of comparison groups such as control or experts.

Sperlinger (1976): A study of qualitative aspects of construing of depressed persons

Sperlinger (1976) investigated the construing process of depressed subjects longitudinally, but employed different procedures to those discussed above. His research introduced procedures for identifying construct sameness across elicitations and also content analysis as a useful procedure for observing qualitative consistancy and change in construct pools. It provides some elaboration of the notion of construct appropriateness.

The primary concern was to identify areas of constancy in construing over a lengthy period of time, of depressed patients. He suggested that:

> If repertory grid procedures do elicit important aspects of the individuals' construing then it would be expected that grids completed by the same individual at different times would show some degree of stability. In addition such changes which do occur should be predictable in terms of the life changes which the person involved has experienced. (p.341)

Only 26 persons out of 76 approached agreed to take part in his research and only 18 completed two grids, spaced on average 7.7 months apart. As with Diamond and Zuber-Skerritt, Sperlinger elicited constructs on each occasion a grid was completed, using only triadic measures of elicitation to produce 12 constructs for each subject. It is observed that specific techniques to identify levels of super-ordinancy were not used and that 12 constructs probably do not represent a comprehensive pool of constructs available to the subjects. The elements used were 12 people known to the subjects who fitted role titles such as self, ideal self, mother, father, sibling, friend etc. Qualitative aspects of change and

constancy were identified in two ways. Firstly, constructs the same as previously elicited were identified. The criteria for 'same constructs' were:

> if one pole of each of the two constructs was given exactly the same word(s) and the other poles of the two constructs were also given the same word(s) or given word(s) which appeared to have the same meaning. (p.346)

Whilst this is a fairly rigorous condition it was applied by only a single judge, namely the researcher. Twenty-five (20.8%) of constructs elicited on the second occasion were identical to those elicited on the first occasion. Sperlinger comments that this estimate of repeatability is perhaps on the low side since the criterion set for establishing identical constructs was stringent and that had the criterion been instead 'identical meanings' the figure would be higher.

Comment is required on both general procedures and the specific figures. Two inter-related factors could have influenced the percentage of construct repeats between grids, each making the reported figure on the low side. They are the factors of comprehensiveness and reliability of the elicitation procedure. As previously stated a procedure which only elicits 12 constructs is not comprehensive; the complete construct pool will not be identical and this would reduce the likelihood of constructs appearing on both elicitations. All elicitation techniques no matter how thorough will be less than 100% reliable, contain some measurement error, and tend to reduce the number of repeating constructs across elicitations. To obtain a better understanding of which construct dimensions are stable over a long period of time, a control group for comparison purposes is needed. For controls, re-elicitation of constructs with only a short time space between first and second elicitations is suitable. Changes in construct dimensions for the control group would then be largely due to measurement error, or severe instability in the construct dimensions being used. In fact studies

suitable for 'control' comparisons have been carried out by Hunt (1951), Bieri and Blacker (1956), Fjeld and Landfield (1961). All three studies produced similar results, the average percentage of repeats across their five studies was 65% (range 60.8%-70%). They used comprehensive elicitation procedures, e.g. Hunt presented 40 triads. Also the criterion of establishing identical constructs was based on meaning, perhaps a less severe criterion than Sperlinger used, as he himself noted, and identification was by subjects rather than by the experimentor. The criterion varied marginally across the studies but were all similar to Hunt's which were:

(a) both constructs judged as similar by the subject;
(b) the subject could only apply both constructs to the same figures in identical ways;
(c) the subject answered affirmatively to the question 'Is a person who is - (on construct A) almost always - (construct B)? and its logical converse.

These seem to be stringent criteria.

So, whilst Sperlinger has shown some degree of stability within construct dimensions over a long period of time, methodological deficiencies make the figure of 20.8% difficult to interpret exactly, but it is probably an under rather than an over estimate of dimension stability. It is of course not possible to tell from these studies whether super-ordinate constructs are more reliably elicited in the short term or retained more often in the long term than are subordinate constructs, since none of the above studies concerned with construct repeatability identified super-ordinate constructs. One may also safely infer, but not quantify, the considerable change in the construct pool that has occured.

The second means used by Sperlinger to investigate qualitative change and constancy was that of classifying the constructs using Landfield's (1971) classification system. Sperlinger modified the procedure in two small respects. Firstly, classifying by dimension rather than single

construct poles, and secondly, placing constructs into the one most appropriate category rather than all possible appropriate categories. Furthermore, a non-classifiable category was added whilst two of Landfield's categories, (comparatives, quantitives), were omitted. This meant 21 categories were used. 25 subjects on test 1 had 300 constructs, whilst 18 subjects on test 2 had 216 constructs. Constructs were rated by two judges independently who had only 58% initial agreement, the remaining constructs were classified following discussion between the judges. Rank order correlation between test 1 and test 2 showed a very high similarity in the distribution of construct dimensions to classes ($r=.87$, p 0.001). Overall only 1 category showed a significant change in the proportion of constructs in it from test 1 to test 2 (MORALITY 4% to 8.3%). For individuals 6.2 constructs on average (i.e. 57.7%) were placed in the same categories. Similarity with Landfield's figures for construct types given by his sample of students, (correlation $r=0.79$, computed by the present author from figures given in Sperlinger) for 19 categories shared by the 2 studies led Sperlinger to suggest that:

> there may be considerable similarity between individuals in the type of constructs they use to construe others - even if the particular constructs used are quite different. (p.346)

One notes that Sperlinger's subjects have more emotional arousal constructs (14.4% v 7%), less forcefulness (14% v 20%), more time orientation (5.3. v 1%), and less involvement (0.7% v 6%), than Landfield's subjects. He suggests that:

> as would be predicted from construct theory, individuals elaborate their construct systems in problem areas that are presenting them with particular difficulties; this is then reflected in the relatively large number of constructs they have available in this area, when compared to other members of their culture.

This would support the contention that consideration of dimensional changes is fundamentally important to any study of qualitative changes in construing, and both the types of construct used and specific individual constructs which appear in the construct pool should be assessed if qualitative changes in construing are to be fully evaluated. Classification of constructs by types using a reliable and valid classification system is vital to this exercise.

A few cross-sectional studies relating to the developing construct systems of children (Barrett 1977, Brierly 1967, Duck 1975, Little 1968, Scarlett et al 1971) have successfully employed a classification system. Barrett, Brierly and Duck all used classification systems closely based on the system first developed by Little, whereas Scarlett et al used a different system. Each study showed that the construct types used by the children changed as they grew older (ages ranging from 7 through to 15) in ways consistent with predictions.

Fixed Role Therapy

One further way to consider the nature of well-functioning construct systems is to examine the means by which movement can be encouraged in them. This has added significance in that the information developed in the present research will be the foundations of future work to investigate how to help students move in their construing of events and change their behaviours to become more successful in the college environment. Here success is construed as finding college life personally satisfying and/or being able to optimise academic performance. The means of change considered is Fixed Role Therapy, the novel therapeutic intervention suggested by Kelly (1955).

Actively facilitating change in the qualitative dimensions of constructs systems is a major aim of 'fixed role therapy' (F.R.T.) (Kelly, 1955), a therapy developed uniquely within a P.C.T. framework. Fixed role

therapy is seen by Kelly as an investigative project on the part of the subject. It is undertaken by a person to enable active exploration of alternative constructions of events to those usually employed and to explore the meaning of these new constructions in acting out the behavioural implications of the constructions. The subject in effect acts out a new role, but the context of the acting is the real world rather than the theatre, although as in the theatre some rehearsal and development of the character will be necessary. This is undertaken by the subject and his therapist, thus both subject and therapist must both clearly understand the role being explored. Bonarius (1970) has emphasised that the aim of F.R.T. is to promote qualitative changes in construing through initiation and development of a new set of inter-related constructs, giving the subject a new, flexible approach to the future. Essentially the process of F.R.T. is as follows. The subject writes a brief character sketch of himself from the perspective of a third person who knows him well. Based on this information the therapist can develop a new character which can be acted out by the subject. The self-characterisation sketch lets the therapist know the principal dimensions along which the subject construes himself and how these are translated into behaviours. Adams-Webber (1979, p.128) describes the next stage in the following way:

> In producing the enactment sketch itself, the psychologist usually attempts to formulate at least one hypothesis to be tested. This hypothesis may either be stated explicitly in the sketch or merely implied. It may also be an alternative to one which the client himself proposed in his own characterisation. For example, if the client portrays himself as a 'cautious' person, the alternative from his own point of view might be to play the role of someone who is 'aggressive'. Kelly (1955) himself recommends casting the enactment in terms of a novel dimension - one which may never have occurred to the client, and which he may find quite difficult to integrate with the current structure of his personal construct system. Nevertheless, he can explore the implications of the new dimension by playing the part depicted in the enactment sketch, that is, by using the new dimension to structure his own behaviour.

During the development of the new role there will be frequent sessions at which the psychologist and subject plan the behavioural experiments and review the results of previous experiments. The enactment period may be relatively brief say a week or fortnight.

Kelly asserted that it is not the intention of F.R.T. to cause the subject to totally replace the character he sees himself to be prior to the enactment, but to enable the subject to grasp the fact that this is but one character he may be, by exploring the world in becoming, at least temporarily and in part, another character. Clearly F.R.T. is a means of getting a construct system on the move, it raises awareness of the subjects' current construction of reality, explores how it can be reconstrued using both presently available constructs, new constructs, and behavioural experiment, all of this being done with the psychologist as co-experimentor. In these steps it has much overlap in general if not in detail with the procedures discussed previously in this chapter in reviewing the work by Phillips, Diamond Zuber-Skerritt and Kevill et al. However, in their studies the emphasis was on raising awareness of the subjects' construction of events over a period of time and discussion of constancies and changes in construing, including exploring reasons for those changes. Only Diamond, Zuber-Skerritt directly introduced the possibility of new constructs, and only Nevill et al directly considered the behavioural implications of changes in constructions. None of the studies involved directing behavioural experiments as in the case in F.R.T.

Although a number of case study examples can be found using F.R.T. (References Bonarius 1970, Skene 1973, Diamond, 1985), in which improved psychological functioning is reported, only one experimental study to date has systematically explored its efficacy, (Karst and Trexler, 1970). They explored F.R.T. in relation to treatment of public-speaking anxiety, comparing it with Rational-emotive therapy (Ellis 1958) and treatment

controls. Rational-emotive therapy emphasises changing the subjects' interpretation of events and their anticipations of action outcomes, as does F.R.T. The study involved 22 subjects, 6 in the control group and 8 in each experimental group. A ten point anxiety scale showed significant differences in post-treatment results, with the F.R.T. group showing less anxiety on this measure than R.E.T. group, who in turn were less anxious than controls. No other significant difference on dependent measures post-treatment were found between F.R.T. and R.E.T. treatment groups. However, F.R.T. was superior to control groups on two measures; Fear Survey Schedule (Reynold, 1967) and Personal Report of Confidence as a Speaker (Paul, 1966). R.E.T. was significantly different to controls only on the latter of these two measures. F.R.T. was superior to R.E.T. on both of these measures although the difference was not significant. Neither a social fear scale nor any single item from the Fear Survey Schedule on public speaking showed any differences between groups. Karst and Trexler suggested that based on these results, F.R.T. seemed slightly more effective than R.E.T. and both are clearly superior to no treatment. Subjects reported on a post-experiment data sheet how helpful they felt their treatment to be.

Adams-Webber (1979, p.137) suggested Karst and Trexler were too conservative in their estimation of the superiority of F.R.T. versus R.E.T., but notes that whilst the results are encouraging there is a need for further studies.

As noted above F.R.T. involves several steps and the relative contribution of the separate components remains to be established. It can, however, be seen to indicate, indeed emphasise, that qualitative dimensions of construing, and their behavioural links, is an appropriate starting point for understanding well-functioning construct systems.

Summary and Conclusion

Evidence has been presented which has shown that a well-functioning construct system has a pool of appropriate constructs organised into an articulated system. Consideration of both aspects is essential to a full understanding of a persons construction of events. The system is open to change, and both construct pool consistency and change must be considered in addition to construct organisation within the pool and their deployment on specific events. The notion of construct ordinancy seems to be theoretically important but empirically neglected. This situation must be remedied by future studies. Some research into procedural issues needs attention in future studies too. Full elicitation of constructs on every occasion, identification of super-ordinate constructs, use of comparison groups both for control and expertness should be considered. Content analysis seems a promising procedure and some direct measurement of behaviour to relate to construing seems desirable. Further longitudinal studies seem to be essential and investigations of intervention strategies which could facilitate qualitative change in construct systems and relate it to behavioural indices are needed.

SECTION C

A PRELIMINARY INVESTIGATION

INTRODUCTION

Consideration is given in this section to the issue identified in chapter 2, of how to describe behaviour, in particular the validity of hierarchical descriptions of behaviour.

CHAPTER FIVE : DESCRIBING COMPLEX BEHAVIOURS: HIERARCHICAL MODELS

Introduction

Personal goals are the anticipated outcomes of behavioural choices which occur during the execution of a behaviour, reflecting the perceived experience of carrying out the behaviour and also upon its termination, as a direct consequence of executing the behaviour. Hence the study of personal goals automatically leads on to the study of personal behaviours and how they are subjectively experienced.

Kelly (1955) referred to the construing of behaviours as "the appraisal of activities". In the present research it is assumed that examining the subjects' construing of behavioural experiences within their normal life activities will reveal their personal goals. Kelly gave only a brief section of his theory exposition to construing of behaviours (Kelly, 1955, p.732-73) within which he suggested that it had "many of the most significant applications" of the theory "yet to be described" (Kelly, p.773). They still remain to be described.

The aim of the preliminary investigation is to develop an understanding of the term behaviour, since it is a pivotal term in this study and relate that understanding to theoretical premise contained in P.C.T. In partiuclar it will be related to the concept of construct ordination as expressed in the P.C.T. Organisation Corrollary (Kelly, 1955).

In the absence of the elaboration of the term behaviour within P.C.T., reference is taken to other theories within which it has been elaborated.

Subsequently implications and insights for P.C.T. will be developed and hypotheses generated for testing within the main study.

The central premise explored is that complex behaviour can usefully be described as being hierarchically structured, that is consisting of micro-behavioural units embedded within larger macro-behavioural units. In P.C.T. the Organisation Corrollary indicates that constructs are hierarchically ordered when it states that a construct system embraces ordinal relationships between constructs. This axiom will be reflected in the construction of meaning of behaviour, for example Kelly stated that:

> One always does what 'one wants to do' if we reach high enough in placing the level of wanting. In a sense also one does 'what one has to' if we look at his behaviour in a sub-ordinate aspect.
> (p.732)

The unfolding argument leads to the notion that construct superordinancy is linked to behavioural superordinancy in strategic planning.

Review

The elaboration of hierarchical organiational of behaviour in this review is in two stages. Firstly, inductive reasoning based on the relevant basic conceptions of the "person as decision maker". Secondly by consideration of hierarchical organisation concepts as they appear in theories other than P.C.T. which have goals, actions and decisions as central features. Following the review an empirical test of the model is presented.

Stage 1: The 'Decision Maker' - some Logical Consequences for Behaviour Description

There are two consequences of some importance which are inter-related and logically flow from considering the person as a decision maker. The first of these is that for any model of behaviour to be complete it must include an adequate conceptualisation of time. Secondly, goals and actions may most usefully be described as forming hierarchical structures within which events at each level of the hierarchy occur in some relatively restricted sequence determined by events at a higher level of the hierarchy.

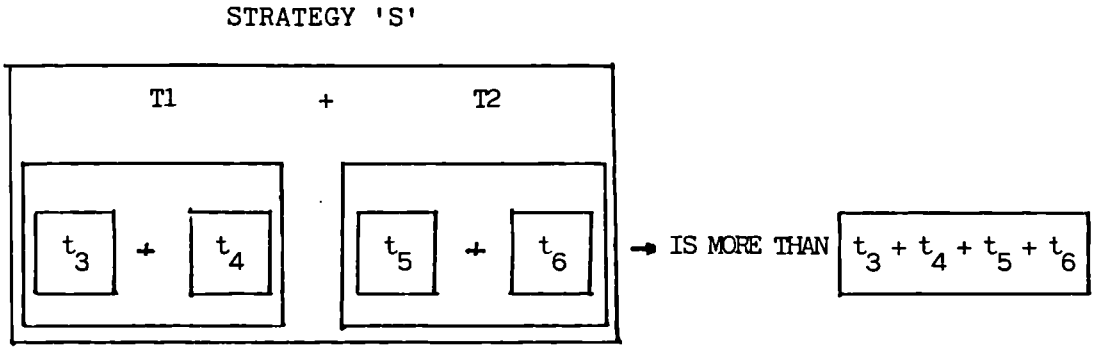
A goal is by definition a circumstance which will occur at some point of time in the future relative to time of its setting. To decide upon a goal is, therefore, to exercise anticipation, a process which must also occur when the person decides upon appropriate actions by which to realise goals.

In sum decisions require anticipation of events as contained in goals and actions. Since anticipation may be for any time duration, short medium or long-term, it logically follows that decisions, goals and actions must also be related to various time durations but there remains the question of how to conceptualise the relationship between events in the short-term perspective and those in the longer term perspective? At its simplest the question may be answered by considering time as a continuum, a linear sequence in which seconds pass and a series of sixty seconds becomes a minute, minutes become hours and so on. In a similar manner a series of short-term actions simply follow on one after the other and with the passage of time make up a long-term action. However, a more phenomenological

approach would suggest a more complex analysis. It would suggest that long-term actions are more than just the short-term actions of which they are made up, they are events in their own right. Also the subjective experience of time is more than the sum of seconds which marks its passage, it is invested with meaning by the events which mark its passage. The resolution of these two viewpoints, the rather simple atomistic view with the phenomenological, lies in holding them both to be true at one and the same time. United they give a more complete meaning to events than either does on its own.

A unification of the two viewpoints may be effected if one were to consider events as hierarchically structured (diagram 6). To see specific short-term actions (t) in a hierarchical relationship with medium-term tactics (T), and long-term strategies (S) gives them a meaning greater than if they are just seen as a series of actions without higher order organisation.

Diagram 6: Tactics and Strategies Relationship



Short-term actions known as tactics are in a hierarchical structure chosen to be compatible with the long-term strategic action plan and it is the implementing of tactics over time that eventually realises the overall strategic actions pattern. Tactics and strategy share a reciprocal relationship, the one embedded within the other.

This selection of short-term actions under the direction of long-term strategic plans shows that the decision process itself is also hierarchically structured. The sub-decisions taken in the context of long-term decisions are important for controlled implementing of strategic actions. Diagram 7 illustrates the relationships between time, decisions, action selection and control.

Diagram 7 - Illustration of the hierarchical structure of decisions.

Actions	Process
Long-term ↓ Medium-term: sub-goals ↓ Short-term: sub-goals	SELECTION + CONTROL requires Selection + Control requires selection + control

Actions selected to achieve a long-term goal require controlled implementation. This may be achieved through selection of sub-goals and actions to achieve on-route to the long-term goal. These sub-actions in their turn require control through selection of further sub-goals and actions.

Action control may, therefore, require many sub-decisions to be taken. Naturally decisions at each successive level of control are progressively concerned with actions of shorter and shorter time duration. It is also clear that this process is not open to infinite expansion, since each decision will occupy a period of time at the very least in the order of a simple reaction time. Thus a decision at one level, which is taken at a fixed point in time and anticipates a goal achievement at a future point of time can only have a finite number of sub-decisions en-route to control its implementation.

In sum the very notion of decisions concerning goals and actions logically involves the process of anticipation, and must relate to the concept of time. Inter-relating these concepts is more meaningful if they are organised within hierarchical structures. Executive levels contain long-term goals and actions whilst sub-ordinate levels contain short-goals and actions.

Stage 2: Hierarchical Concepts in Psychological Theory

Two models will be considered here, the T.O.T.E., model of action control (Miller, Galanter and Pribram 1960), perceptual schema and the process of perception (Neisser 1976). Each of these theories will be shown to contain concepts of hierarchical organisation of actions. They are also both information processing models in which 'man the decision maker' is the central metaphor.

In Miller, Galanter, Pribrams' model plans are central. Plans are "any hierarchical process in the organism that can control the order in which a sequence of operations is performed" (Miller, Galanter, Pribram 1960). A T.O.T.E. unit is the basic component of a plan and hierarchical decision and control processes are developed in this concept.

Essentially a T.O.T.E., means that the organism tests the environment to determine whether there is incongruity between its current state and some desired state. Obviously this requires that information from the environment is compared with internally stored information concerning a possible goal state. Where incongruity is revealed by the 'test', an operation (O) is performed to eliminate it that is a decision on appropriate action results from the comparison of information made in the test. Subsequent to the action being taken a further test (T) determines whether the incongruity, has been removed, if so the goal pursuit is terminated, if not, further action operations take place.

Miller, Galanter, Pribram (p32) go on to state that controlled implementation of an operation may require a string of several sub-T.O.T.E. unites and the completion of each sub-T.O.T.E. operation may in its turn require sub-sub-T.O.T.Es an so on establishing a hierarchically organised series of actions.

Miller, Galanter, Pribram dwell minimally on the concept of time in their theorising, only stating that, the time duration of a plan is one of its definitive features (p101), but they do not develop at in terms of their hierarchical concepts.

Neisser (1976) developed very similar concepts to those stated above, when he elaborated upon the process of perception. Perception is the central aspect of the 'test' step in a T.O.T.E., it concerns the perceiver coming "to terms with the information offered by the environment" (Neisser 1976, p9). He cogently argues that such a concept of perception requires actions such as, eye, head or body movements (in visual perception), (Neisser 1976, p21), which are controlled by schema. In visual perception schema can be considered as a specific variety of T.O.T.E. unit, one where the operations are all aimed at information collection, schema act "as a plan, of the sort described by Miller, Galanter and Pribram" (Neisser p55). An essential feature of schema is the embedding within orienting schema of further schemata for more detailed seeing.

> Their relationship parallels that of the real objects with which they deal. Just as the room and the lamp exist together, one including the other, so my orienting schema and the schema of the lamp are simulataneously active, the former including the latter....they cannot be comfortably separated.
>
> (Neisser, p113)

That is to say that orienting schema are not replaced by a series of more detail searching schema, but that detail searching schema are contained within orienting schema. This means that for information collection in his view,

> Actions are hierarchically embedded in more extensive actions and are motivated by anticipated consequences at various levels of schematic organisation.

This is a further parallel with Miller, Galanter and Pribram and it is no surprise to note that Neisser sees schema as having an anticipatory and controlling function (Neisser, 1960, p21).

Once again, as for Miller, Galanter and Pribram, there is relatively little development of the concept of time by Neisser, it is, however, noted that "perception is an activity which takes place over time" (Neisser, 1976, p9) involving perhaps a hierarchy of schemata, and that skilled perception is probably more future orientated and more effectively goal orientated than is less-skilled perception (Neisser, 1976, p182). This is an important point in relation to personal construct theory which will be developed later.

Thus both the models considered involve the notion of the person as a decision maker, including the concepts of goals, actions anticipations and hierarchies, but the concept of time is minimally developed.

In sum it has been seen in this section through inductive reasoning and consideration of two major theories, that complex behaviour as it occurs in naturalistic settings can be effectively described as having hierarchical structuring, which is a notion consistent with hierarchial organisation of constructs in P.C.T. It must also be noted that such principles of behaviour organisation require validation through empirical investigation.

Cranach and Harre (1982) have reviewed the area of goal directed behaviour and place the notion of actions as hierarchically and sequentially structured as one of three concepts central to this area. They also presented the limited evidence available for its support. Some guidelines were given for further research into hierarchical structuring, since as they noted their "conceptual network, even if convincingly formulated, could be completely fictitious" (p.47). They considered that research should at present be descriptive rather than analytic and that principles of hierarchical organisation

> ....should be investigated in real and natural situations. In this statement 'real' is meant to indicate that the action related situation conditions are not just fictitious but exist in reality, 'natural' means that from the actor's viewpoint they are neither artificial nor alienated and could be part of his everyday life in his culture" (p.52).

One such piece of empirical work was presented, in which Cranach and Kalbermatten (1982) were able to give some support to the notion of hierarchical behavioural structures. They showed that children separated into 'winners' and 'losers' in a "possesion fight" for a ball displayed different frequencies of particular individual action units. Frequency differences were also noted when units were organised into higher order categories. In effect, behaviour in their observational research is being described at three hierarchically ordered levels, macro level behaviour (winners versus losers), category level and individual act level.The present study sought to extend this meagre empirical support with the specific aim of validating the notion of hierarchical sequential task analysis.

Methods

Task: There are two important aspects of any analysis to consider when evaluating its validity. Firstly, the analysis content, is it correct as defined by the particular analyst doing the analysis, and secondly, are the

principles which dictate that the content should be in hierarchical and sequential form soundly based. It is the latter question which is most relevant here, but it is only possible to answer that second question if the answer to the first is affirmative. If the content of the analysis is incorrect, it will not be possible to evaluate the form of the analysis.

The realisation of a completed description of action requires a formal analysis of some particular complex action. The particular task analysis empirically investigated here is "good" breast stroke swimming (table 3). It is a description of the actions which superior performance breast-stroke swimmers do when swimming well. One major variety of "good form" is included in the description, the 'straight-arm', wedge-kick'. The analysis gives action statements at three levels of description, the whole action, the fundamental sub-actions, and basic detailed sub-actions. The analysis format was based on Savage (1975), who extended the pioneering work of Annett, Duncan, Stammers and Grey (1971) into sporting contexts. The analysis content was derived from Counsilman (1974). (Full details of the practical procedures involved are available from the author.)

Subjects: the subjects were sixty-nine first year physical education students, aged 18-19 years, who were enrolled in swimming classes as part of their course credit.

Measures: All swimmers considered themselves to be capable of swimming at least 25 metres in the breast-stroke style, but their performance levels were widely divergent. Swimmers were timed for a twenty five metre maximum effort swim (push start, no dive, no feedback to swimmers). Subsequently each swimmer was observed and analysed by a further two independent and trained judges using the hierarchical analysis sheet given in table 3.

TABLE 3:

SWIMMING ANALYSIS: RECREATIONAL BREAST STROKE
(Molar Description) Straight arm, wedge kick

LEVEL 1 redescription (Broad fundamental actions)	LEVEL 2 redescription (detailed molecular description)
1. ARMS: THE SHAPE IS Cyclical Symmetrical Elliptical (egg shaped In front of shoulders Under water Thumbs down pull back Thumbs up push forward	9. ARMS POWER: Hands together arms full extension Pull back and down to 12/18" deep and just beyond shoulders palms back CATCH Pull out and back
	10. ARMS RECOVERY Brings Hands together at chest mid-line Push straight out full extension glide
2. LEGS: THE SHAPE IS Cyclical Symmetrical Elliptical Behind hips Under water Toes in, recover Toes out, push back	7. LEGS RECOVERY straight out toes pointed feet together draw heels to seat Heels together Knees apart beyond hip-width
3. Co-ordination of arms and legs Pull arms, arms and legs, in, all out, glide.	8. LEGS POWER: HEELS move out 12" PUSH BACK & ROUND
4. Body: Prone, hips at the surface throughout	11. Hips drop to 12" s head lifts Return to surface before kick
5. Head: on line	12. Face in water cresting forehead Push chin forward until mouth clears water Face lowered
6. Breathing Explosive - air out Draw breath in Hold breath co-ordinate with head action	

Each judge was blind to the overall purpose of the experiment and the swimmers' timed swim levels. They were asked to observe the swimmer for one length of three-quarter effort swimming, to do so in the order 1 to 12 as indicated by the numbering of the analysis sheet, to evaluate each parts efficacy in turn and to indicate where the first stroke inadequacy was observed. An inadequacy was defined as when the swimmers observed behaviour does not match the behaviour as described in the 'good swimmer analysis'.

The raters shared 90% agreement on the placement of swimmers' first inadequacy. For cases where they disagreed they subsequently observed the swimmers together and came to a mutually acceptable rating.

It is important to be clear about the order in which the analysts considered the aspects of technique shown by each swimmer, since this is critical to understanding the results and exactly what the hierarchical analysis is attempting. The analysis is ordered from the top down, that is working from fundamentals through to details. Firstly the stroke is considered holistically. The evaluation is of whether the observed stroke is more like breast-stroke than any other alternative stroke, such as back-stroke. Level 1 description is used next then level 2. Level 1 can be considered as redescription of whole action into stroke fundamentals and Level 2 redescription of level 1 fundamentals into basic stroke elements. As each level of analysis is utilised, the sub-units within that level are used in sequence. Thus the ordering of the analysis has an overall sequence which is a combination of units ordered by levels and within levels sequencing. This enables swimmers to be rank ordered according to their technique match to the analysis and thus in a way which it is predicted will reflect their performance levels.

For the breast-stroke swimming analysis this order is indicated by box numbers 1 through 12.

Hypotheses

Hypothesis 1: Swimmers who are identified as having mastered the breast-stroke technique at both fundamental and basic levels will show superior performance times to those who have only mastered the stroke at the fundamental level.

Hypothesis 2: At each and every level of the hierarchical analysis, performers identified as having errors early in the specified sequence of sub-units will be inferior to those whose performance is seen to have early parts of the sequence correct, but errors in the later parts.

Hypothesis 3: Using the analysis from the top down, combining hierarchical identification of errors through levels with sequential identification of errors within levels will give a complete ordering of swimmers by technical mastery.

For the breast-stroke analysis (table 3), the ordering is indicated by box numbers one through twelve.

Results

Not all boxes 1 to 12 in the original analysis contained sufficient samples for analysis, that is subjects for whom the first error observed occurred in that box. However, six groups were identified and they will now be referred to as Boxes A, B, C, D, E, F and respectively were Arms 1, Legs 1, Body-Head 1, Legs 2, Arms 2, Body-Head 2 (box numbers 1, 2, 4 and 5, 7 and 8, 9 and 10, 11 and 12 in table 3). Results are given in table 4.

Table 4: The mean times for 25 metres breast-stroke of swimmers (n=64) classified according to technical profiency, that is according to where the first area of faulty technique was found (the area marked by a cross). This is the recommended starting point for teaching. The order of assessment determined that aspects of technique preceding the cross were considered to be correct and marked with a tick (e.g. Box D, Legs 2, fault are swimmers competent on all level 1 aspects as described in boxes A,B,C, but not competent on legs 2 which was the first aspect to be assessed at level 2. Note also that Box A swimmers, Arms 1 faults had errors at the very first Level 1 point of assessment and they were deemed as not swimming breast-stroke, except in the sense that their stroke was more similar to breast-stroke than it was to any other stroke such as front crawl). Significance, across boxes A-F, Kruskal-Wallis one way A NOVA H=43.5, df=5 $p<0.001$.

	PERFORMANCE : FIRST FAULT					
	LEVEL 1			LEVEL 2		
	Arms 1 A	Legs 1 B	Body-Head 1 C	Legs 2 D	Arms 2 E	Body-Head 2 F
PERFORMANCE : TIMES FOR 25m BREAST-STROKE						
t_A = 37.6 (n=8)	×					
t_B = 27.9 (n=13)	✓	×				
t_C = 27.7 (n=25)	✓	✓	×			
t_D = 22.7 (n=7)	✓	✓	✓	×		
t_E = 21.2 (n=6)	✓	✓	✓	✓	×	
t_F = 19.6 (n=5)	✓	✓	✓	✓	✓	×

Discussion:

Hypothesis 1: It was stated that swimmers showing action competence at each successive, deepening level of redescription would show different performance standards. Thus it was predicted that t $t_{A+C} > t_{D+E+F}$ (table 5). This was strongly supported by the results.

Table 5: The mean times for swimmers classified according to the level of technique within which the first detected fault occurs. Swimmers showing faults at level one have been separated into two groups. 'U' test for large samples, comparisons of adjacent pairs, $t_A > t_{B+C}$ ($p < 0.001$, $z=3.8$), $t_{B+C} > t_{D+E+F}$ ($p < 0.001$, $z=5.29$).
N.B. t_A is a stroke similar to breast-stroke

	1st Fault Level 1	1st Fault Level 1	1st Fault Level 2
Detected Error	Box A	Boxes B or C	Boxes D, E or F
Times in seconds	t = 37.6	t = 27.8	t = 21.3
Number	n=8	n=38	n=18

Hypothesis 2: It was stated that within each level of the hierarchy goal-action units are specified by use of rules, which define a co-ordinated and timed sequence of sub-units in accordance with the form of the overall action at the next higher level of description. It was hypothesised that swimmers having errors early in the specified sequence of sub-units would have reduced performance standards in comparison with swimmers whose primary errors occurred later in the sequence.

In some tasks, stating sub-unit sequence rules is quite straight-forward but in the swimming-stroke analysis it is complex, in that the action is cyclical. There is a short sequence of actions, which are repeated, with overlap in several sub-actions such as breathing and leg actions. Establishing actual sequential ordering and co-ordination of actions at each level is relatively simple. However, choosing which point of the sequence in each cycle to consider the starting point is more problematical. Indeed different starting points were chosen at levels 1 and 2 of the description. The conclusions reached are as indicated by the

number sequence given in the analysis, table 3, and by the letter sequence in table 4. They show that it is predicted that at level 1 $t_A > t_B > t_C$ and at level 2 $t_D > t_E > t_F$

The data (table 4) largely support hypothesis 2 at level 1 average times are t_A = 37.6, t_B = 27.9, t_C = 27.7 and at level 2 t_D = 22.7, t_E = 21.2, t_F = 19.6. Further discussion of the results are incorporated within the presentation of results for hypothesis 3, given below:

Hypothesis 3: Combining the ordering of analysis through levels (hypothesis 1) with sequencing within levels (hypothesis 2) indicates an overall ordering of analysis and hence of performance levels.

Across groups A through F in order.

$t_A > t_B > t_C > t_D > t_E > t_F$

Table 4 shows that this hypothesis is strongly supported, the Kruskal-Wallis ANOVA indicating overall significant differences between the averages ($p < .001$). Mann-Witney 'U' test comparisons were made between all possible adjacent subject groups of times 2 comparisons were significant, (AB, U=14, n_1=18, n_2=13 $p < 0.002$; CD Z=7.8 $p < 0.001$), 2 strong trends (DE, U=11 p=0.09; EF, U=7 p=0.089) and only one non-significant difference BC.

This latter result was the subject of a post-hoc analysis. To probe further and discover the reason for the exception. The comparison was the one between swimmers in group B classified as having faults in Legs 1 and the adjacent group C, Body and Head 1 faults.

Examination of group B analysis sheets (n=13, t_B = 27.9) showed a bi-modal distribution and consequently this group could easily be split into two sub-groups. The two groups having significantly different speeds ($p < .001$).

The first sub-group contained those subjects whose only fault marked on the analysis sheet was the technical fault "not symmetrical". A fault only in the sense of breaking the rules of swimming, but one which is not

necessarily going to impose severe limitations on the mechanical production of power. This "technical fault" group (n=6) had an average time of 23.6 seconds, whilst the other "mechanical fault" group a time of 30.6 seconds. For this mechanical fault group the difference in times to the next group BC comparison is significant ($Z=50$ $p < 0.001$).

Conclusions

The results provide support for the hypothesis that an efficient form of task description is hierarchical and sequential. The results also support the theoretical premise upon which they were constructed. In particular, that actions (behaviour) and the decisions involved in their selection and control are hierarchically organised. Fundamental actions and decisions which shape behaviour have embedded within them sub-actions and decisions which refine and polish that shape and allow more precise outcomes to be achieved. Without such organisation the control of actions would be more demanding on the person's information processing capacities and probably less successful. It follows that swimming behaviours would best be learned by learning the general nature of the whole action first then attending to the constituent parts, firstly by shaping the fundamental action sub-units in detail by selecting and learning the basic action units as described in the analysis given above.

More generally the findings indicate that whilst worthwhile changes in behaviour do take place at the micro behavioural level where detailed behaviour is prescribed, broader behavioural change necessitates changes at the macro behavioural level. The impact of the macro behavioural change is great because it precipitates a cascade effect, causing changes to occur at the micro behavioural level whilst the converse does not hold.

These insights will now be related to, and developed within, a framework of P.C.T.

The Relationship of hierarchical descriptions of behaviour to Personal Construct Theory

In P.C.T. (Kelly, 1955) a person's pool of constructs is considered to be hierarchically organised, that is some constructs are super-ordinate to others (Organisation Corrollary). Complex behaviours have been shown to be validly described as hierarchical organised too, with broad long-term actions at one level of description having smaller short-term actions embedded within them. The decision process by which actions are selected, therefore, involves long-term and short-term anticipations, and must also be hierarchically organised.

Relating the concept of construct ordination to the understanding of complex intentional behaviours as hierarchically organised suggests that the different orders of constructs within a construct hierarchy, super-ordinate and sub-ordinate, are related to the continuum, long-term decisions - short-term decisions. In particular that only super-ordinate constructs are salient to long-term decisions involving relatively extensive time anticipation and strategic behavioural choices whilst sub-ordinate constructs will only be salient to short-term decisions, involving limited time anticipation and selection of short-term behaviours, which fit with and specify the detailed form of strategic behaviours.

The distinction in functions stated in this hypothesis is implicitly suggested in an example given by Bannister (1970);

> For some of us, courteous - discourteous may be a sub-ordinate construct to kind - unkind, and if this is so we may in exceptional circumstances decide to be discourteous if we feel that in the long run this is the kindest way to be. (p.57) (emphasis is the current author's).

It is apparent that if this distinction in functions is correct a greater period of time would need to pass for validation (or invalidation) of a super-ordinate as compared to a sub-ordinate construct, and it follows

that super-ordinate constructs will tend to be more stable over time than sub-ordinate constructs. Kelly (1955, p927) has explained that super-ordinate constructs are overriding constructions which control behaviour, and that the controlled person "performs long-cycle experiments; the impulsive person indulges in short-range experimentation" although "both must bow to the outcomes of their experimentation sooner or later".

This suggestion would also seem to be consistent with the differences in resistance to change of super-ordinate and sub-ordinate constructs (reviewed in Adams-Webber 1979, p.56-59), but the premise given here to explain the phenomena is different to that given previously by Crocket and Meisel 1974. They emphasised that super-ordinate constructs are more resistant to change than are sub-ordinate constructs since their change would be more disruptive to the whole construct system due to their more extensive implications network that is connections to other constructs. There is no reason to assume that the two perspectives are incompatible. However, the present hypothesis seems more enlightening in its concern with the function of constructs rather than simply their inter- connectedness, since the former necessarily precedes and leads to the latter whilst the reverse is not a logical necessity.

Stable constructs are in operational terms, the persistent members of an individual's pool of constructs across time and are revealed on successive elicitation occasions whilst other constructs are more transient members and in time disappear from the construct pool. The persistent constructs are relatively more super-ordinate than are the less persistent constructs within a person's construct pool. The latter constructs disappear from usage when they are no longer salient, they are constructs of which the subject might say "I just don't look at things that way anymore". A process of construct replacement takes place. Constructs from the construct pool are displaced by new constructs, which develop the meaning of

the super-ordinate constructs in the pool more adequately than could those they replace. Over a period of time some new constructs will emerge as super-ordinate constructs.

These hypotheses can be related to what is known about the process of construct change encapsulated in the 'modulation corrollary' (Kelly, 1955), which states that

> the variation in a person's construction system is limited by the permeability of the constructs within whose range of convenience the variants lie.

and that variation, if successful, will occur within the range of convenience of permeable super-ordinate constructs,

> it is under the regnency of such constructs that the more sub-ordinate aspect of one's construction system can be systematically varied without making the whole psychological house fall down. (Kelly 1955, p.81)

Kelly elaborated this statement (p847-8), suggesting that revising constructs could cause some disorder and anxiety, but

> A semblance of organisation can be maintained, however, if he has some super-ordinate structure to his life which is permeable enough to deal in a general fashion with the strange and unruly elements for which he is seeking precise structure. The permeable structure of his 'long-range goals' keeps him from collapsing in complete anxiety.

Thus, the suggested persistent super-ordinate constructs hypothesised above are recognised now as the permeable super-ordinate constructs described by Kelly, and if the hypotheses are supported then so too is the existence of permeable super-ordinate constructions at the centre of a successfully developing construct system. Indeed, what is being suggested is a definite procedure for identifying such constructs, an operational definition in fact of 'permeable super- ordinate construct'. This issue is not yet developed in the construct theory literature.

There are a number of longtitudinal investigations each of which examined changing constructions across time (Ryle and Breen 1974, Phillips 1980, Winter 1982, Lifshitz 1974) and as such they are relevant to this discussion. They did not, however, allow the hypothesis here to be evaluated since they did not address themselves directly to the question of construct retention and replacement. They typically used only one complete elicitation of constructs and that at the start of the period of observation. Winter and Phillips did allow for new constructs to be added on later occasions, but neither study appeared to allow for construct omission. Overall these studies direct their attention primarily towards the structural changes taking place within the system.

It is contended here that for a full investigation of changing constructions examination of qualitative change simultaneous with structural change within the system is required. With reference to the hypotheses currently being examined such qualitative change is pre-eminent.

Some studies which have directly addressed qualititative change (Ben-Perez 1983), Adams-Webber 1979, Review p.188-195) but not in a comprehensive manner. Ben-Peretz research makes an interesting and typical example of this work. She showed that first and third year teacher trainers had qualitative differences in their construing of curriculum material. However, the Ben-Peretz study, in common with the others, employed a cross-sectional observational methodology. Although giving consistent support to the notion that training produced qualitative changes in construction, they did not address the hypotheses currently elaborated which requires a longtitudinal as well as qualitative study.

SECTION D

MAIN STUDY

PART I

Introduction

In this section the primary research procedure used to investigate students' construing of their life experiences is presented. It is the Life Activities Grid (L.A.G.) A rationale is given for its structure and also a statement of the procedures to follow for L.A.G. production. An example of a completed L.A.G. is given in Appendix 1.

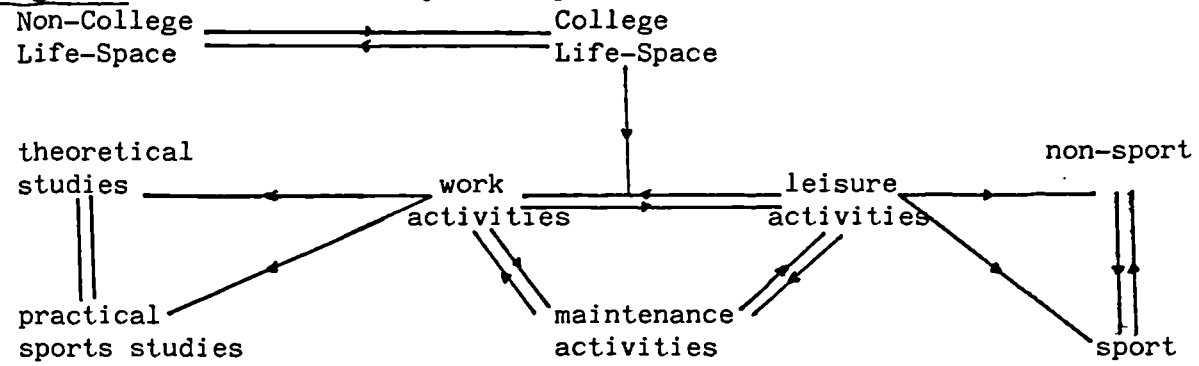
As a part of the L.A.G. development, it was necessary to establish the P.E. student's life-activities pattern. This guided the grid element selection. A survey using a specially designed Life-Spaces Questionnaire was used to establish student life-style. This research effort is presented first (chapter 6) and related to selection of activity elements for the L.A.G. Presentation and rationale for other procedural aspects of the L.A.G., that is construct elicitation, rating of elements on constructs and the use of L.A.G. to evaluate 'Life Satisfaction' are then given.

Subsequently (chapter 7) issues concerning the effective use of the L.A.G. in investigation of personal goals and behaviour are investigated. These are the reliability of the procedures, its interpretation by Principal Component Analysis, the development of a content analysis schema for classifying constructs produced by the L.A.G. and to enable constructs to be related to natural behaviour, a diary procedure for recording time allocated to each behaviour.

CHAPTER 6 : DEVELOPMENT OF THE LIFE ACTIVITIES REPERTORY GRID (L.A.G.)

Individuals' lives take shape through the activities in which they involve themselves. Activity involvement occurs in a variety of life-spaces. Identifying a persons primary life-spaces, observing their selection and patterns of activity can reveal the form their life takes.

Diagram 8: Students' Primary Life-Spaces



The schematic representation above, suggests that a students' life spaces can be dichotomised into college life and non-college life. The two way arrows suggest that these two life spaces can interact with each other.

Within the college life-space it is useful to consider activites as consisting of 3 main types: maintenance, work, and leisure activities. Again the arrows indicate that they are viewed as inter-active, rather than independent types of activity.

Work and leisure activities can both be sub-categorised, theoretical studies and practical sports studies constitute work to the students whilst non-sport and sports activities constitute leisure. Again some interactions are indicated. Further developments of the schema are clearly possible, theoretical studies can for example be dichotomised as formal taught studies and more self-directed private study. Further interactions beyond those indicated can also be suggested, for example between involvement in practical sports work and sports leisure activities.

This schema will be a helpful guide in developing a questionnaire to investigate student life-patterns whilst they are at college.

Objectives

Objective 1

The first objective of this investigation was to map student life patterns since no study exists which attempts to identify the overall life activities of P.E. students, or to describe at a general level the activity purposes and priorities of this particular sub-group of under-graduate students. The specific areas of investigation are listed below:-

(i) Motivation for attending a College offering P.E. as a main study.

(ii) Motivation for electing to read Physical Education as a part of their degree.

(iii) The significance of the college situation in determining their life-style.

(iv) The relationship between sports practical and applied theory within their degree as perceived and experienced by the student.

(v) The nature of student leisure activities with particular reference to the role of sport.

(vi) The satisfaction levels in sport, work and leisure.

(vii) The experience of conflict between work and leisure, does it exist, can it be resolved?

(viii) Time and Place of Work.

Objective 2

To determine the similarities and differences in life patterns of selected sub-groups of P.E. students. In particular sub-groups which differ by gender (male v female), experience (first year v third year) or by level of success (higher course grades v lower course grades).

Objective 3

To create a nomothetic foundation upon which idiographic studies of students life experiences can be built. In particular, studies which investigate the personal meaning of life activities held by students, their personal goals, and activity priorities. A repertory grid will be developed, as a means of operationalising aspects of George Kelly's (1955) Personal Construct Theory. This grid requires that a number of activity elements be selected and then rated along a number of dimensions of meaning known as personal constructs. The nomothetic foundation based on this questionnaire survey will be used to guide the selection of those activity elements.

Kelly (1955) did not give extensive directions as to how a grid should be constructed, in particular how grid elements were to be selected. But appropriate selection of elements according to one's purposes is a primary key to building a successful grid. Some general guidelines do exist, however.

Fransella and Bannister (1977, p.11-13) state:

> "Elements are chosen to represent the area in which construing is to be investigated", and "there are two important factors to bear in mind when selecting the type of element to be used in a grid."

The first of their factors is that the "elements must be representative of the pool from which they are drawn". In this study they are to represent the personal experience of activity in the students' primary life spaces, with particular reference to P.E. students and life whilst at college. A suitable range of activity elements in which P.E. students normally participate is needed. The second factor from Fransella and Bannister (1977) is that "the elements must be within the range of convenience of the constructs to be used". To a large extent this condition should be met if the first guideline is followed successfully and if constructs are elicited

rather than supplied. In the present study, however, all subjects will use only their own constructs, elicited using the elements selected for the grid. In practical terms the success of this operation will be seen in participants being able to apply the constructs elicited to the elements selected.

The third objective of this investigation may now be restated in operational terms as:- to facilitate the selection of suitable types and range of activity elements to include in a repertory grid aimed at the investigation of the personal meanings of life activities of Physical Education undergraduates.

Questionnaire Development

The primary consideration in designing the questionnaire was that it should truly give the opportunity for students to state as fully as possible and in their own way, what they did, why they did it, how often they did it. To promote this, students were maximally involved in the design process, including their being trained in appropriate skills such as interviewing when it was needed.

The four major design steps were:

(i) group discussion (ii) individual interviews
(iii) pilot questionnaires (iv) final questionnaire

The first three stages involved 14 final year honours P.E. students who worked on developing the pilot questionnaire under the direction of the author, to obtain course credit. The author gave instruction on interview techniques and questionnaire design, and acted as quality controller at all design stages. At the first session, a brief outline of the research purposes was described and agreement to develop the pilot questionnaire obtained. Two sub-groups of students were formed and each briefed to discuss and record information on the general area of interest, that is patterns of student life activity. Discussion lasted for 1½ hours. The

following questions were used to guide each group discussion. "What is it like as a P.E. student at ..... College? Consider such things as what activities P.E. students are involved in, why they take part in each of the various activities named, and how frequently they are likely to take part in each activity." The information from the two discussions was recorded and collated.

A series of semi-structured interviews were subsequently planned and executed. Instructions and practice of question writing and interview techniques were given (using role modelling by the author, video play back and written instructions) for a period of five hours. The 14 final year students working in pairs then interviewed 2 first year students each, thereby ensuring the views of students at both ends of the experience spectrum were sampled at this exploratory stage. From this body of information initial questions and pilot questionnaires were developed and administered to a small sample of 1st and 4th year students.

The final questionnaire (Appendix 2) was constructed on the basis of two student pilot instrument and subsequently administered to a large group of students.

Subjects

85 undergraduate students. Comprising 44 first years (28M, 16F) and 41 third year students (27M, 14F); all students sampled, were studying P.E. as one of their two main subjects towards their degree. The first year sample was 73% of the student intake. Loss of numbers occurred due to absenteeism when the questionnaires were completed. Similarly 76% of third year students completed the questionnaire.

Male students were subsequently further divided into successful and less successful performance categories on the basis of their year grades. Successful first year students were those who gained C+ (49%) or better on both their academic subject areas. Of the 14 successful male students 12

went on to complete an honours degree requiring similar levels of performance at the end of their third year of study whereas of the 14 less successful male students only 5 went on to gain a place on the honours course. (Chi square comparison, 5.92, p 0.01 one tail test). Year three successful students were those selected for honours as against those rejected. The full sample were also similarly split into two performance level groups.

Results and Discussion

Whole sample results only are reported except where differences between sub-groups were statistically significant. Significance testing used the chi square statistic on the raw data.

Coding used throughout is as follows:

I	-	year one	A	-	all student sample
III	-	year three	S	-	successful student
M	-	male student	LS	-	less successful student
F	-	female student			

The numbers of male and female students dictated that only male students could be meaningfully split into S versus LS groups these are indicated as MS and MLS.

Results and Discussion are presented question by question. The results are presented in percentage form. Motivation questions 1, 2 and 13 are presented first. Responses to these questions are relevant only for first year student results. Third year students were not asked to respond to these questions since their responses would be contaminated by, and reflect their actual experience of, being at the college.

Motivation

Table 6: Q.1: Why this College? - Why Physical Education?

1. Why did you choose to read for your degree at .....?

	All Subjects	MS	MLS
i Personal recommendation from school, friends or family	61.3%	42.8%*	85.7%*
ii You thought the course relevant to your career intentions	90.9%		
iii There was a specialist P.E. course offered	90.9%		
iv The location is attractive to live in whilst studying for a degree	72.7%		
v You were influenced by reading the prospectus	56.8%		
vi It was the only college to accept you	0%		

(i) MS v MLS Chi square 3.89 $p < 0.05$ two tail test.

The results show that two motives were pre-eminent for coming to the College, namely that the course was relevant to career intentions and that it had a specialised P.E. component. 90.0% response rates were recorded for each motive in the relevant/highly relevant response categories. Percentages recorded in these two categories were moderately high for three other motives. The location of the college as a nice place to live (72.7%), influence of reading the prospectus (56.8%) and thirdly personal recommendations (61.3%). The latter motive was less common amongst the more successful students (42.8%) than for the less successful students (85.7%) which is perhaps indicative of successful students tending to have taken

personal responsibility for coming to the college. Perhaps they are also students who are less open to the influence of others over what they do. Both of these indications are in line with the demands of undergraduate studies in which personal commitment and solo studying perhaps often need to take precedence over social activities and peer pressure to join in such activities.

Table 7: Q.2: Why did you choose P.E. as a main subject?

		All subjects	M	F	MS	MLS
i	You like playing sport	100%				
ii	You wanted a career involving sport	88.6%				
iii	It seemed an easy degree to get	4.5%				
iv	A lot of interesting people study P.E.	29.5%				
v	An opportunity to widen your theoretical studies in P.E. such as physiology, psychology, history of P.E.	59.1%	46.4%	75%	28%	64.2%
vi	P.E. offered a good opportunity to play a lot of sport	90.1%				

(v) Chi square M v F 6.02 $p < 0.02$ two tail.

MS v MLS 5.17 $p < 0.05$ two tail.

Three reasons were pre-eminent for the selection of P.E., they like playing sport (100%), P.E. offers a good opportunity to play a lot of sport (90.1%) and they wanted a career in sport (88.6%). Also considered relevant or highly relevant by a large percentage of students was an opportunity to

study theoretical areas of P.E. This however was not cited as often by the more successful male students (28%) as it was by the less successful males (64.2%) or indeed female students (75%). This suggests that it is not a vital motive for men to have at entry for student success whilst at college. Indeed the reverse is the case. This further emphasises that liking, opportunity to play and desire for a career in sport is pre-eminent and sufficient motive for coming to college to study P.E. It leaves the question of how the student becomes academically interested and successful in P.E. open to further investigation.

Question 13 also examined the motive for a career in sport. It enabled a more detailed evaluation by offering a wider range of response categories. It also provided an opportunity to compare career intentions at years one and three. Students were asked whether or not sporting consideration would influence their choice of career. Male and female overall response rates were very similar in the top two categories of influence, a lot or very much (M 73.3%, F 74.7%).

The differences revealed between successful and less successful male students which occur for both year one and three students are interesting. Less successful students showed less intense response to this motive than did more successful students, with overall (years I and III combined) 92.8% of the more successful students thinking sport would influence their career choice, a lot or very much but only 55.5% of less good students held similar views (Chi square 6.9, $p < 0.01$). It may reasonably be concluded that commitment to a career in sport is a slightly stronger motivating goal for year 1 than for year 3 students and much stronger in successful as against less successful students.

Commitment to College Based Activities

Questions 3 and 6 investigated commitment to college. The students' commitments to college as their number one life-space during college term-time is reflected in the high proportion of students (73%) who only go home once or not at all during college term-time.

The commitment to college-based life is also reflected in the student response to question 5, which shows that only in very rare instances do students join clubs outside of college, and then the clubs tend to be in activities generally thought of as minority interests, such as Kung Fu fighting, which are not available in the college club structures.

Work Activities : expectation and tensions

In general the students who come to the College to study P.E. as a main subject in their degree have on entry expressed a strong investment in living within college fraternities. They also hope for a high involvement in practical sport which they like and a career in relation to sport, but they are seemingly less intent on pursuing theoretical studies in P.E. (obviously a main thrust of a degree course). The gap between desire and reality will be further discussed later. There exists here, perhaps necessarily, an in-built tension between the desires for the relatively immediate rewards coming form participation in practical sport and the demands of a university degree course even if it will ultimately open up a career opportunity in a sport related domain.

Several of the questions aimed at a closer examination of what the students expectations were in terms of balance between practical and theoretical studies. In presenting the data one should be aware that first year students would be expressing naive expections, since they have limited experience of the course at the time of completing questionnaire. In

contrast, third year students were perhaps expressing a more informed opinion, having greater experiences of student life upon which to formulate their responses.

Responses to question 17 concern the balance between theory and practical activities, showed there was a high consensus of opinion across all groups of students (85.6%) that degree studies in P.E. should not in the main be study of practical sport but should be an even balance between theory and practical studies. Indeed, only a very small number of students felt that it should involve mainly practical studies. So although developing P.E. theory may not be a primary reason for coming to college to study for many students, there seemed to be a general awareness that to some extent this would and should happen if they wished for a career in sport. A more detailed examination of the expected course content through Questions 14, 15 and 16 allows the student perception of work activities to be examined particularly highlighting their anticipations of any possible tensions between their expectation and college reality.

Table 8: Q.14 If you were to pursue a career in sport to what extent might the following areas of study be important components to include in your P.E. studies.

(a) Theoretical Studies		(b) Practical Work	
History of P.E.	14.1%	A limited range of sports some studied in depth some new experiences	64.7%
Sport in Society	69.4%		
Biomechanics	72.9%		
Applied Psychology	91.8%		
Applied Physiology	95.3%	As many sports as possible	31.1%

Ratings are expressed as percentages of sample responding 'very' or 'extremely' important.

(a) There was an appreciation that applied theory of sport is developed from a number of knowledge domains covering historical, sociological, bio-mechanical, psychological and physiological perspectives. In evaluating their importance however, not all of the academic studies were viewed as equally relevant. Historical perspectives were decidely negatively viewed, 85.9% of students considered it as 'unimportant' or 'very unimportant'. On the other hand psychology and physiology were seen by 91.8% and 95.3% of students respectively as important' or 'very important'. Both biomechanics and sociological aspects fell between these two extremes having 72.9% and 69.4% of students respectively seeing them as 'important' to 'very important'.

(b) In practical sport studies the overall consensus was three to two in favour of a course offering a limited range of sports inclusive of a few studied to some greater depth, as opposed to a course giving as many different sports as possible.

In sum the responses to Q14 showed quite clear student preferences for a course in which there exists a practical to theory balance, and preferences for particular types of theoretical studies to be pursued. A number of issues need elaboration for fuller understanding to be reached. Firstly, one must consider what in reality the balance is between theory and practical studies in their degree course, both overall and for P.E. in particular. Secondly, there are limitations to the data which need to be borne in mind when interpreting student responses to questions concerning course theory content. Thirdly, one must consider perceived relationship between theory and practical courses as well as the two courses in isolation from each other. The student is aware of the inter-relationship between the two areas as opposed to the discretness of the two areas implied in questions and discussion so far.

Taking the first issue, the proportion of practical in the course taken was in reality 43% of the total P.E. course in the first year but only 40% in years 2 and 3 and honours candidates following a 4th year of more intense study did no assessed practical work at all. Other than the honours year these proportions are at the lower end of what may be deemed as a course giving 'an even balance' between theory and practical and are certainly not in accord with one of 'mainly practical'. Thus student expectations were not totally fulfilled by the course. One can add to this discrepancy if one places the P.E. course into the context of the overall degree course. In year 1, two further subjects were studied, and in Years 3 and 4, one, ensuring proportions of practicals in the overall course fall to around only 18% for year 1 and 17% for year 3.

Given that students, as previously noted, thought a specialist P.E. course was a highly relevant motive for coming to study at the College and hence viewing it perhaps as their number 1 subject, it is likely that for many students their expectations in terms of the quantity of practical sport in the courses were not fully realised. However other factors would also influence the extent to which college life is in concert with motives for coming to college. The extent to which academic study per se is considered as important will influence the students' wish to pursue their academic studies in their other subject choices. In addition, the chance to take part in sports clubs at a suitable level within the general college life may be pertinent and enhanced by studying at a college with a significant sub-group of P.E. students. The interactions between these areas of influence are likely to be complex and even uniquely intermeshed for each individual.

The second issue concerns the data limitations to bear in mind when interpreting the responses on the course theory content. Only theoretical studies contained in the particular degree course were evaluated and other

potential applied theory courses such as recreation management studies were not included. Perhaps the results would be different if a more comprehensive list of theory areas of study were included.

Turning to the third issue, that of the theory-practical inter-relationship, in the light of the above discussion, it would seem critical that such relationships do exist and are seen to exist by the student. These could be seen as the vehicle through which expectation and reality come together. More detailed information on this issue can be obtained from responses to Q15.

Table 9: Q.15 To what extent, if at all, are concepts within the following applied theoretical areas of P.E. shown to be relevant to practical work in P.E.?

	All Subjects (I and III)	Year III Only
History	5.0	
Sport in Society	X	7.3
Biomechanics	48.2	
Applied Psychology	X	61.0
Applied Physiology	69.4	

Percentages given, are the percentage of subjects who responded to the question in categories very much or a major emphasis. (Three other categories given were more than a little, a little, not at all). Sport in Society and Applied Psychology had not been taken by year I at the time of setting the questionnaire hence only year III results were given.

It may be noted that 1st year views may be rather circumspect or even naive and year 3 views rather more informed. Furthermore year 1 students had not taken either psychology or sport in society courses at the time of completing the questionnaire, so the figures given in those areas refer

solely to the year 3 student responses. Overall the pattern of results are reflective of those reported previously concerning the perceived relevant of academic subjects to studies in P.E. at degree level, again particularly marked differences between academic subject ratings were revealed. 'Historical' perspectives were uniformly seen as having 'little' or 'no relationship' to practical work in P.E. (95% of responses) as were 'sport in society' perspectives (92.3%). Biomechanics faired somewhat better, overall 48.2% of ratings came in the 'very much' or 'major emphasis' categories giving the relevance of theory to practice. Psychology and physiology were subjects in which the theory-practical relationship was more strongly drawn out with 61% and 69.4% considering courses gave 'very much' or 'major' emphasis to theory into practice. These results would suggest that theory-practice relationships can be drawn out enabling the student to see theory studies in a personally meaningful way and that it is relevant to understanding the student's core interest area of practical work.

In sum physiology, psychology followed by mechanics were seen as both the most relevant and also practically meaningful subjects, and whilst 'sport in society' was seen as next most relevant it was not seen as related to practical P.E. Perhaps here one would need to investigate whether in a broader less immediate sense of practical such as developing recreational programme for the unemployed, promoting healthy life-styles or development of appropriate P.E. curriculum in schools, it can perhaps be established as relevant in student eyes. It is likely that the responses to the question posed in this questionnaire did not tap this area of views but more likely tapped views on playing, coaching or teaching of sport.

Unequivocally however, historical perspectives are seen as both irrelevant and unrelated to practice. Should it be taught at all to undergraduate students and if so, in what manner must it be taught to overcome these limitations?

Leisure Activities - Expectations and Tensions

Questions 5,7,8 and 10 concerned leisure. Students choosing to study P.E. at College because they 'like to take part in sport' and 'to do as much sport as possible' are likely to want and have an opportunity to immerse themselves in an intense sporting sub-culture through their leisure pursuits as well as their more formal work involvements at College. It is to these hypothesised sporting leisure commitments that attention is now given, it too could be an important factor in gaining an appreciation of compatibility between students and the college.

In the questionnaire the area of life constituting 'leisure' was defined as:

> any activity apart from work activities which one freely chooses to participate in, which can produce pleasure and satisfaction for you.

which contrasts with the work definition which was:

> Those activities which are an integral part of reading for a degree, such as attending lectures, completing assignments, and private study related to your course.

If an intense P.E. sports sub-culture does exist then it will involve the P.E. students in sports extensively during their leisure time to the exclusion of other types of serious leisure activities. This implies that sports involvement may well dominate friendship patterns since sports activity would be a primary vehicle for meeting people, although friends may also emerge from opportunities to mix with non-P.E. students whilst studying their other academic subjects.

There are also the inter-relationships between work and leisure to consider, for example involvement in sports leisure may be seen as advantageous to progress in the formal study of sport within formal 'work' of degree studies.

Questions 7 and 5 investigated students leisure involvement in a general way whilst questions 10 and 8 looked at more specific details of leisure activity.

Table 10: Q.7 How interested are you in the following areas of life?

	All Subjects I and III
Politics and Religion	10.5
Current Affairs	40.0
Sport	88.2

Figures are percentages of 'very interested responses as opposed to mildly or disinterested.

Very little interest was expressed in religion or politics, indeed overall response rates even when combining the scores for religion and politics into a single category showed only 10.5% of subjects responses were in the 'very interested' category. More interest was shown in 'current affairs', here 40.0% of subjects were more than 'mildly interested'. Most interest was expressed for sport, indeed massively more interest was shown than for any other area. Overall 88.2% of subjects said they were 'very interested' in sport.

Responses to Q.5 gave further convincing support for the dominance of sport in student leisure interests.

Table 11: Q.5 To which clubs at college, if any, do you belong? Percentages of responses in the 'yes' category.

Music/Religious/Other categories combined	10.3%
Sports	97.6%

Question 10 further develops the concept of student sports involvement. Students were asked to what extent if at all they participated in each of 26 sports. Since some sports such as soccer are seasonal, respondents were asked to reflect in-season participation rates and leisure participation rates rather than course-work sports involvement.

Table 12: Q.10 How often during your leisure time do you participate in the sports listed below'? The average number of responses per person in the combined categories 'very regularly' or 'regularly' and also for those in the 'occasional' category are given. Answers were requested for 'in-season'.

Regularly / Very Regularly	4.1
Occasionally	4.8

Participation rates were very similar across all groups of students (male, female, 1st and 3rd years, good, less good), each group reporting on average, regular/very regular participation in around four sports (overall average 4.1), and 'occasional' participation in around a further five sports (overall average 4.8).

The most popular sports for men were fitness work which included weight training, major ball games (soccer or rugby), tennis, swimming and an outdoor activity such as canoeing, walking or sailing. For women fitness (but not including weight training), swimming, tennis, hockey and other racket games (badminston/squash) were most popular.

Nobody can play sport all of the time and question 8 investigated participation rates in 18 other recreational activities, some serious, some less so, from car maintenance, shopping or photography to eating out, going for a drink or just visiting friends.

Table 13: Q.8 Indicate how important or unimportant the following activities are in your leisure time? Percentages given are responses which were in the 'very important' and 'extremely important' categories as opposed to the 'important, mildly or unimportant categories'.

Visiting friends or listen to music	88.8%
Going for a drink, or spectating at sport or general reading	46.7%
Others not included above (12 activities were named)	19.2%

Percentages given are for groups rather than single activities. The activity groupings are pragmatic, based on the activities drawn together in each group having had very similar percentage ratings. The distributions clearly identified three distinct groups of activities, representing very important, moderately important and unimportant types of activities.

Listening to music and visiting friends were the most frequently rated non-sports leisure activities, with on average 88.8% of subjects' responses placing these activities as very or extremely important. Only three of the further activities were generally seen as important. These were going for a drink, spectating at sport and general reading. In each the participation rates were similar and a combined ratings average across the three was 47.6% Third year students showed higher participation rates (54.4% against 39% for

Year 1) and first year women had the lowest overall rate of 27%, although none of these differences were statistically significant. The other thirteen activities all had low importance rating. Grouping the scores together these activities only have an average of 19.2% importance ratings. First year women had a higher rate than other sub-groups, 30% which perhaps counter-balances their lower rates, given above, for the previous category of participation.

P.E. students' leisure appears largely dominated by sports involvement and the general relaxations of visiting friends, and listening to music. To a lesser extent leisure involves spectating at sport, going for a drink and general reading. Thus non-sports leisure is largely pure relaxation and hedonistic.

A further aspect to be examined is the influence of sport on friendship formation, Q.13 investigated this by asking for the number of friends which P.E. students had at college, who were also involved in sport. Overall 47% of students report that in excess of half their friends were formed out of a shared participation in sport. Men developed friends in this way more so than did women, 52.7% and 36.6% respectively, with more than half their friends developed through sport. This reinforces the notion that an intense sports sub-culutre exists amongst P.E. students and suggests it is stronger for men than women students. Since the broader college fraternity was biased in a ratio of about 2:1 female to male perhaps one reason for this difference is the greater availability to female students of same sex persons not involved in sport amongst whom friendships could be established.

Asking students to report on actual usage of facilities is another way to investigate how they spend their time and the relevant question is Q4.

Table 14: Q.4 How frequently on average do you use the following facilities during your leisure time? The response categories ranged from never to daily with in total five divisions. Results are the percentage of responses given for the top two categories, i.e. weekly or 2/3 days a week.

	I	III	ALL
Sports facilities; gym, pool, fields	58.6***	30.2***	44.9
The bar	65.9 (m=83**)	46.3	56.5
General recreation facilities	39.3 (m=45.4*)	22.8	29.5

Combining results for sports facilities, gymnasium, games field and swimming pool (each of which had similar usage patterns), show that overall each sports facility is used on 2/3 days a week (or more) by 44.9% of the students, first year students reported spending more time at sports facilities than did third year students with 58.6% as against 30.2% reporting using each of the facilities beyond twice a week (Chi Square = 20.9, $p < 0.001$). The bar facility was used regularly, that is twice or more per week by 56% of the students but first year male students tended to use this facility more so than other students with 83% using it more than twice per week, indeed significantly more so than the next most prominent users Year 3 women, 37% (Chi Square 7.5, $p < 0.01$). General recreation rooms, (TV rooms and the like), were less frequently used than sports and bar facilities. Overall only 29.5% of students reported using the general recreation facilities more than twice per week. First year men utilised the facilities most often. 45.4% used it more than twice a week whilst first year women were the least frequent users, year I women 28.4% (Chi Square, 4.0, $p < 0.05$).

It is concluded then that leisure time use of college facilities is spent largely at sport facilities, to a lesser extent in the bar and even less so at the general recreation rooms. First year men stand out as heavier users of the latter two facilities.

This survey, however, does not reflect activities such as visiting each others rooms, going to bars or clubs off campus in the city. Perhaps third year students and women students socialise in these contexts rather than in the campus general-use facilities which the first year men seem to prefer. Whatever the accuracy of the conjecture, they do not seem to have any influence on how satisfied students rate either their non-sports or sports leisure (Q.9, 11). 82.2% of non-sports, and 78.8% of sports leisure ratings fell into the top two categories on a 5-point satisfaction scale.

Work and Leisure Inter-relationships

Students who are heavily involved in a non-academic work area such as sport which is both physically tiring and time consuming, may in consequence find that the quality of their academic work suffers. They may have difficulty allocating sufficient time to academic work and also in maintaining concentration when working. Time and effort must be effectively managed if these deleterious effects are to be avoided. Questions 16 and 21 investigated the inter-relationships of work and leisure.

Q.16 investigates the potential for work-sport-leisure conflicts by examining the perceived importance of those life-space activities to passing a degree and towards influencing general life styles.

Table 15: Q.16 Which activities do you think - are important to obtain a degree; have influence on your overall life-style.

		ALL SUBJECTS	
		Passing Degree	Influence Life-Style
STUDIES	Theoretical	84.7%	28.2%
	Practical	56.5%	48.2%
LEISURE	Sports	11.8%	67.1%
	Non-Sports	7.1%	54.1%

Each area was evaluated (along a 5-point scale), unimportant to extremely important.
Results are tabulated with a split taken between points 3 and 4 enabling percentages of the ratings which considered an activity as 'very' or 'extremely important' to be identified for each activity area. These are reported.

In each case four areas of life space were examined for their influence, namely theoretical and practical study aspects and sport and non-sporting leisure concerns.

Overall the results suggest, as one might expect, that theoretical studies were clearly perceived as most important to 'passing my degree', practical studies were next in importance and 'sport' and 'non-sports' leisure were seen as having little relevance. However, there were rating differences between the more successful and less successful male students, for both Year one and Year three students to similar extent. The Year one and Year three students' combined results showed that 75% of the more successful men saw practical studies as 'very/ extremely important' to their degree whereas only 40.7% of the less successful men perceived it that way (Chi Square = 3.64, $p < 0.1$). It seems likely therefore, that for the less successful men taking part in practical has a different meaning than it had for the more successful men.

In terms of 'influencing life-style' the overall results almost reversed the ratings of importance given to each activity space. Sports leisure, non-sports leisure, practical studies and finally theory studies influenced the student life-style. The overall percentages of responses in the very/extremely important categories for each area respectively were 67%, 54.1%, 48.2% and 28.2%. Clearly leisure and sport are strong influences on general life-style, more so than academic theory studies. However, for third Year students, male and females together, differences between successful and less successful students are observed, (although not for first Year students). Overall more successful students are more likely to perceive practical studies and sports leisure as important influences on their life styles (57.1% to 30% and 92.8% to 61.5% respectively). Combining the two sets of sports importance ratings to obtain an overall measure of total sports importance, then Year 3 successful students place them higher in importance within their life-style than do less successful students (75% to 42%; Chi Square = 7.34, $p < 0.01$).

The percentages of men perceiving practical studies as very/extremely important influences on life-styles were for successful men 57.2% against 23% for less successful men, comparable figures for sports leisure activities were 92.9% against 61.5%.

When both halves of Q16 results are combined they clearly support the notion that for P.E. students activities which are perceived as influences on 'life-style' are often different to those which are perceived as influences on successfully obtaining a degree. More successful male students in both Years one and three attach greater significance than do less successful men to practical studies in helping to obtain a degree. They also see sports leisure and practical studies as important influences on their life-style. They appear more committed to sport in whatever context or guise.

Question 21 investigated whether students experienced any conflict in their lives between work and leisure objectives. Whilst 34.1% of students considered that there were no difficulties balancing work and leisure demands, 29.4% considered work affects leisure and 36.5% considered leisure demands affected work, a total of 65.9% thus experienced some conflict. There were no sub-group differences, so successful and less successful students were equally likely to experience conflicts. One might have expected some differences since their prefered life spaces were different. It would seem that a balance between work and leisure demands is possible in more than one way. The successful student is not necessarily experiencing more conflict than the less successful student, but conflict is frequent.

Satisfaction

Questions 9 and 11 examined leisure satisfaction levels; whilst question 22 examined whether work involvement was of a satisfactory nature. Response ratings in each instance were taken across a 5-point scale from very dissatisfied to very satisfied. Response rates are reported for fairly/very satisfied categories combined versus the three remaining categories just satisfied, fairly satisfied, very satisfied. General, and sports leisure was highly satisfying to the vast majority of students, 85% and 82% respectively in the top two category responses. However, somewhat fewer, 57.6% of students were fairly or very satisfied with their work involvement. The reasons for this lower level of satisfaction in this work life-space centred primarily on the less successful Year three men, who were less satisfied than the successful men, 46.2% against 71.4%, scoring in the top two categories (Chi square, 3.0, $p < 0.05$). This still leaves 28.6% of successful men, 'just satisfied' at best. Clearly there is more to success than being satisfied with the work experience.

Work Patterns

Attention is now given to specific work patterns, questions concerning

where students work and for how long.

Self-report of time usage from memory is not particularly reliable (Entwistle, 1979), and what is intended here is limited to obtaining a general impression of time usage since more exact figures can be obtained from the use of time diaries reported later in the Chapter 10. No significant sub-group differences were present and the total sample scores are given. Question 18 investigated the preferred place of study. Students varied in their preferred place of study, with 18.4% preferring the library 54% their own accommodation and 27.6% a mixture of the two locations.

Question 19 asked about study periods. Most students tended to study between 1-2 hours at a session (64.7%) with some working shorter sessions, ½-1 hours (25.8%) and a small minority working longer sessions (9.5%).

Question 20 investigated private study hours for assignments or other work. 16.1% of students reported studying less than four hours per week on assignment work, whist 55.8% reported similarly for other private study. There were 46.0% who did between four and eight hours for assignments but only 36% who did the same for other study. The comparable figures for 8-12 hours categories are 26.4% and 7.0% and finally for greater than 12 hours, 11.5% and 1.1%.

Two observations can be made here. Firstly, that for this sample of P.E. students work is biased towards that which is externally demanded and has a pay-off in grades obtained, namely work on assignments rather than private study. Secondly, the working hours seem rather low compared to those reported elsewhere e.g. Entwistle (1983). Perhaps P.E. students put in less hours of work per week than do other students, or perhaps it is a measurement artifact since only four response categories were given, with the most extreme being 'more than 12 hours'. This may have produced an under-estimate of work hours.

Conclusions

Conclusions in relation to Objectives 1 and 2

The major findings of this survey in relation to the two objectives of drawing a map of P.E. student life patterns and highlighting significant differences between student sub-groups may now be summarised.

The sample of students studying Physical Education as one of two major components of their degree were motivated by their liking for playing sport, felt it was relevant to their career and that led them to a college which offered a specialistic P.E. course. Male subjects who were less likely to want to pursue a sports-related career were also less successful on the course than other men.

There was a high commitment to the college life space and participating in college fraternities, particularly sport. First year men seem to be a distinct sub-culture their life-style involved them using communal facilities more so than other students.

An even balance between practical and theory based aspects of the degree course was hoped for by the students within which practical work should enable breadth of sports experience and some selective depth, whilst physiology and psychology were seen as the most relevant and important applied theoretical studies. Relationships between theory and practice were observed by the students particularly in physiology and psychology courses. It was noted that these expectations of the course were not totally fulfilled since students only spent a part of their time studying P.E./Sport.

Leisure time was dominated firstly by sports activities and secondly by non-serious social activities with friends, who frequently had a shared interest in sport. (This was less so for female as opposed to male students.)

Theoretical studies were seen to be most influential in passing a degree but leisure activities clearly seen to influence life-style. However, practical sports studies it was observed, influenced both life-style and opportunities to pass a degree. The latter perception was significantly more frequent for 'good male' as opposed to 'less good male' students, which is suggestive of a qualitative difference in sports experience for the two groups. Sport in general was overall more important to successful students.

There was little perception of severe conflict between the varied demands of work, sport and leisure. Seemingly each student has worked out their own salvation. Nevertheless 2 out of 3 students felt some conflict. Conflict occurred in equal proportions in each direction, work-leisure or leisure-work.

Satisfaction levels were high for students in leisure and work life spaces, with the exception of less successful men in their third Year at college of whom just over half reported low satisfaction with work.

The direction of the cause to effect relationship, that is, between success and satisfaction, cannot be answered in this study.

Time spent on private study was rather low but this may in part be an artifact of the scaling system used.

Within such sub-cultures there will of course be individual differences but this nomothetic study of P.E. students gives a context within which more idiographic investigations can be placed.

Conclusions in relation to Objective 3: The selection of elements for a life space activities grid (L.A.G.)

A central objective of this survey was to help selection of elements of a 'life experience' repertory grid.

On the basis of the survey information sixteen elements were selected to represent the major life spaces of the target population, P.E. students during their time at college, primarily to reflect the results in the 'life spaces survey', and to be consistent with three major life-spaces identified at the start of this chapter; work, leisure and sport. As the survey showed the sport life-space overlaps both the work and leisure life spaces and thus requires parity with them in the element selection process.

Work activities as reported by the students have several constituent parts each of which is represented in the elements chosen. The first of these is 'lectures', which is the compulsory contact time which the student has with the college teaching staff. Of these contact sessions 'sports lectures' which involve practical experience and participation in sport can be separated from other compulsory contact sessions. The second type of work is 'private study', which is work other than lectures, and in which the student has some freedom to select time, place, quantity and quality of the work. Of this 'private study', 'assignments' work is more specific and directed than other parts. It involves work on a specific, tutor-set piece of work, which is graded and counts towards course completion and success levels. Whilst it is compulsory to do such work, to pass the degree, obviously the student retains some element of choice in terms of time, place, quality and sometimes direction of the work and different work ratings do exist amongst the students. The third type of work activity is 'examinations', it is compulsory and purely for student assessment purposes rather than a learning experience and as such is distinctive from other work activities.

Leisure has two constituent parts, 'general leisure or non-sports hobbies just to unwind' and 'sports leisure'. The former leisure is for P.E. students dominated by non-serious activities often termed socialising whilst the latter is rather varied in specific content but pervasive in quantity. The constituent parts of sports leisure are seen as 'sports matches' which are organised and usually involve some aspect of competition, and 'sports training' which can be group or individual and is essentially voluntary. It may also be desirable to separate out social or fun sport but this was not done in this study, since the nature of this type of sport and, therefore, the constructs to describe it would be a mixture of the other sports and socialising activities.

Three elements were included to establish a link with past life-spaces and also to ensure that a full construct pool would be elicited, particularly for the first Year students who on their first elicitation occasion would have had little experience of college life and hence could only use constructs developed through previous experiences. These three elements were activities 'which influenced me greatly', 'P.E. whilst at school' and 'any activity done regularly at home'.

One activity was included to ensure specific information was obtained about social interaction rather than more general socialising activities, namely an activity 'with liked people'. As a direct contrast and partially to help in evaluation of the grids validity, an activity with 'antagonistic others' was incorporated as an element.

Three elements were included to enable a perspective on the students life overall to be established, 'life as it is now', 'life as I would ideally like it to be' and 'life whilst I am injured'. A comparison of the first two was assumed to reflect the state of psychological well-being of the subject. Furthermore, when used in a repertory grid the 'life as I would ideally like it to be' element acts as an anchor reference point for

analysis, by establishing what in general a fully positive experience would mean to the student subject. The latter element 'life when I am injured', could reasonably be assumed to be a negative experience for P.E. students. As such this should be reflected in the repertory grid analysis and act with the injury element as a simple test of grid validity.

In all, therefore, there are 16 elements that is, activities which represent the major life spaces of the college P.E. students which are included in what from now on will be termed the 'Life Activities Repertory Grid' (L.A.G.). Elements in the order they appear in the grid, are 'P.E. whilst at school', 'lectures at college', 'sports lectures', 'sports matches', 'sports training', 'general leisure, non-sports hobby', 'with antagonistic others', 'with liked people', 'which influenced me greatly', 'regular activity at home', 'life when injured', 'private study', 'assignments', 'doing examinations', 'life as it is now' and 'life as I would ideally like it to be'.

The activity elements within construct theory

At this juncture it would be useful to review these elements in the light of the sparce writings on construing activities by Kelly (1955). He states that (p.734) elements which constitute freely chosen activities give experiences through which the person attempts to actively develop their construing. Clearly the student chooses to go to college and take part in the activities offered and is attempting to develop their construing.

Kelly (p548) emphasised vocational activities will reveal the subjects' permeable super-ordinate constructs, the constructs which enable controlled change in construing to take place. Vocational activities are for the student the college directed work activities, such as 'lectures' and 'private study' and hence construing these may reveal super-ordinate constructs.

The elements concerning sport and training are easily seen as interests, a set of volitional activities which Kelly says reveal "those areas in which his construct system appears to him to operate effectively". Work of course can be interesting and in the present context it is to be hoped that it is. Should work not be interesting it may precipitate problems,

> the relation of spontaneous activity to the nature of one's vocation should be considered. Where there are no harmonising constructs to tie the two together, the vocation stands to become a threat or at best a stagnant area of development. If a person is to develop himself successfully in his vocational line he must show some spontaneity - or in the language of P.C.T., some permeability - in that area. (Kelly, p742)

This comment is particularly apposite for the P.E. students of this study who have chosen their work/vocation activities, primarily on the basis of their construing of practical sports in which they were involved prior to entering college. In consequence of this the constructs used to construe these events are not necessarily going to stretch their range of convenience to successfully encompass academic P.E. activities, that is they may not be permeable enough to encompass these new events.

Should interest in work not develop successfully or at times evolution of the construct system be difficult, problems may arise for the student. It seems to the present author that the prior writings of Kelly support the author's view that the elements selected for the L.A.G. grid which encompass work (vocational) sport (vocational and interest) and leisure (interest) activities are appropriate and they should enable a comprehensive pool of activity constructs to be revealed inclusive of permeable super-ordinate constructs.

L.A.G. Procedures

Construct elicitation

Two elicitation procedures were employed to obtain a comprehensive sample of each subject's pool of personal constructs, inclusive of super-ordinate constructs. Firstly constructs were elicited by the 'triadic method' (Kelly, 1955) and secondly by 'laddering' (Hinkle, 1965).

Triadic Procedure

In the triadic procedure only 13 of the elements were used, the three more general elements such as 'life as it is now' were not used. Triads for presentation were randomised as follows. Each element name was written on a card and the subject thought of a particular event to represent the activity named in the title. A few words were written on the card, by the subject to cue the event when it appeared in a triad. Cards were shuffled and then taken in a series of three from the pack, until no cards remained, at which point the pack was shuffled again and the process repeated. Fifteen triads were used in all.

For each triad the subject was requested to elicit one, or more, constructs in the usual manner, that is by identifying a way in which two activity experiences were similar and contrasting with the third activity. They were also encouraged to establish a construct if they could see a way in which all three activity experiences were the same.

The question used in each elicitation was "consider the experience of taking part in each of these three activities and say in what way two of those experiences are similar for you and constrast with the other experience". After the triads procedure, constructs elicited were listed. Subjects usually had 12 to 15 constructs after repeats had been eliminated. They were then requested to select four of their constructs which they saw as contrasting in nature to use for the laddering elicitation procedure.

Laddering Elicitation

This limited number of constructs were chosen to ladder, since only a few super-ordinate constructs were being sought. The very nature of hierarchical organisation means that only a relatively few super-ordinate constructs organise a relatively large number of sub-ordinate constructs and hence only the few starting points for laddering are needed to lead to a few super-ordinate end-points. Moreover, this limitation prevented an excessive increase in subjects time commitment to what was already a lengthy elicitation operation.

For each construct selected for laddering the subject was asked (after Hinkle, 1965) "which type of experience do you generally prefer to be involved in" thereby identifying a prefered construct pole. Next they were asked "why do you in general prefer this type of experience". Subjects were asked to build a 3-step ladder, by repetitive use of the 'why' question asked of their previous answer. Three steps were chosen since on previous work in laddering similar constructs it was frequently found that producing constructs beyond the three steps was either impossible for the subject or the subject produced a construct which had appeared previosuly lower down the ladder. Super-ordinancy is a relative designation and a construct produced on top of the three steps of the ladder are super-ordinate to the constructs lower down the ladder, but they may not be the constructs most super-ordinates in the subjects system. A systematic study of this aspect of the ladder remains to be carried out. On completion of the ladder, the subject provided a contrast pole for each construct, and added any new constructs elicited into the original twelve to fifteen constructs pool which came out of the triadic procedures. The construct at the top of each ladder was labelled a super-ordinate construct.

An example of constructs within a students' ladder is given below. The starting bipolar construct for the ladder was "leads to learning...just for now". This was laddered up the preferred life-hand side. The super-ordinate construct identified was "feeling of personal growth...static, meaningless".

feeling of personal growth.....static, meaningless
↑
WHY?
↑
sense of achievement.....feel a failure
↑
WHY?
↑
helps me to be more able.....sense of helplessness
↑
WHY?
↑
Leads to learning.....just for now

N.B. The contrast poles are not necessarily the construct poles which would emerge from laddering on the right-hand side, starting with "just for now". Sometimes it is not possible to ladder to three levels, and the ladder will stop after 3,2,1, or even 0 steps. In each instance the top of the ladder is taken as the most super-ordinate construct.

Rating elements on constructs

The sorting of elements according to constructs is the central operation any subject must do when completing a repertory grid. It is the key to the personal meanings of the subject's elements and also to revelation of construct inter-relatedness and organisation. There is no one 'correct' or 'dominant' way to sort elements along construct dimensions. Rank ordering and rating scales are very frequently employed but there are no absolute procedures (Fransella and Bannister, 1977). The present investigator selected a 10 point rating scale upon which to rate each of the 16 activity elements and asked the subjects 'whenever possible use the full width of the scale in making your ratings'. Some writers, for example Adams-Webber (1959), have suggested that the degree of scale usage is a reflection of a construct meaningfulness, and thus in encouraging full-scale use a means of establishing construct meaningfulness may have been lost. However, for this research only elicited constructs are used and these are

generally considered more meaningful to the subject than supplied constructs (Adams-Webber 1979). Consequently, the use of full-width scale is justified. In addition, the use of 16 elements on a 10 point scale, even if the full-scale is used, retains considerable freedom for the subject in their allocation of elements along the scale. In sum, the scale was chosen as a pragmatic compromise between ranking and rating of elements.

Life Satisfaction - A P.C.T. Approach using the L.A.G.

Two elements in the L.A.G. merit special consideration. The first of these measures 'life as it is now' and represents an evaluative overview of the current meaning of life experience whilst the second 'life as I would ideally like it to be' represents an idealised, perhaps even unattainable aspiration of the perfect meaning to life, as envisaged at the time of completing the grid. The discrepancy between the two element scores, taken construct by construct then summated indicates the degree to which 'life as it is now' is able to fulfil the personal aspirations of the subject and is assumed to give a global measure of psychological well-being. Subsequent to the design of the life experience grid as used in the present study the results of a study into psychological well-being by Blackshaw (1982) became available. In this context Blackshaw's most important finding was that satisfaction, both global and within separate activity domains such as work, leisure, family, church and so on, can be successfully measured using a methodology taken from Personal Construct Theory which was very similar to that used in the L.A.G. His work gives some support to the assumption above that the discrepancy score is in fact a meaningful measure of global life satisfaction.

Blackshaw noted (p.7) that previous studies into well-being had utilised survey methods and that little research into subjective assessments of the main two areas of well-being, satisfaction (cognitive) and happiness (affect), in a purely psychological setting had occurred. This deficit was

particularly apparent in psychological counselling settings where individual needs and differences are paramount. He argued that using a persons own construction of reality as the basis of measurement of well-being means that affect and cognition need not be separated, but both are indeed combined in the one measurement. It was argued that the distinction between happiness and satisfaction as difference between affect and cognition had not been proven, indeed, Blackshaw (1982) cited McKennell (1978) who had showed that both happiness and satisfaction, as measured in survey methods loaded substantially on both cognitive and affective factors with happiness reflecting more affect and satisfaction more cognition. Thus well-being he said should be considered as both affective and cognitive not as two distinct entities.

In Blackshaw's methodology subjects were asked to select life activity domains for exploration which they saw as important to their 'life satisfaction'. Each subject then chose freely a number of sub-activities to represent each broad domain. These activities became the elements for the purpose of construct elicitation. In general the subjects selected 3 to 7 areas (modal class 5) as important to gaining life satisfaction and named on average 11 activities/experiences within those areas. Using the triadic elicitation procedure 17.0 constructs on average per person were elicited from Blackshaw's subjects. In 99% of instances these constructs could successfully be used to rate all the life activities chosen. This indicates that they have a wide range of convenience and have a high degree of abstraction.

Clearly there are close parallels with the present study which has three activity domains: sport, work, leisure and 13 specific activity experiences from which 19 constructs on average were elicited. This makes comparisons between the two studies feasible. There are, however, some differences in precisely how the constructs elicited were used in each study to quantify 'life satisfaction'. The method of determining a discrepancy

score used in the present study has already been described. It involved summing discrepancies between global ratings on each construct of 'life as it is now' and 'life as I would like it to be' then taking an average. Blackshaw (p.71-74) however, asked his subjects to rate activity domain on each construct rather than rating every activity, then averaged the scores across the domains. He used a 9-point scale anchored at each end by the two construct poles. For example, the questions for the career domain read: 'consider where you feel you are at this present time in your career' and 'consider where ideally you would like to be, if everything were going well'. Thus within each activity domain, an absolute rating of 'life as it is right now' and also a discrepancy rating could be computed. Averaged across activity domains these gave an absolute rating (MXAA) and a discrepancy rating (MDAA) which is equivalent to the L.A.G. scorings.

Rating scales of satisfaction as employed in previous studies were also used. Subjects were asked firstly to respond to the question 'consider how satisifed you are at the present time' on a 5-point rating scale in relation to each activity domain and secondly 'consider how satisfied you feel at the present time in your life as a whole' on a similar scale on two occasions during the interview. Average scores for each set of questions were labelled (MSA) and (LSM) respectively. Comparisons between satisfaction scores on the P.C.T. measure of well-being (MXAA, MDAA) and the normal rating scale method scores (MSA, LSM) were made.

Blackshaw found for his sample of 42 subjects that there were significant correlations between the four measures and these are summarised in Table 16. They clearly show that P.C.T. based measures of well-being and the rating scale measures of satisfaction are related but they do not give exactly the same results. They indicate that the P.C.T. measure of well-being is worthy of further investigation. It should also be noted that the construct based measure has a clear advantage over the single scale

measure of satisfaction since it enables identification of personal sources of satisfaction and dissatisfaction, but it is also a time consuming and sometimes difficult procedure. This might well be justifiable in a counselling situation where clients are reporting excessively high levels of dissatisfaction.

Table 16: Satisfaction measures

Correlations between rating scales measures of satisfaction and Personal Construct Theory measures of satisfaction (Blackshaw, 1982).

Well-being		Satisfaction Rating Scales	
		MSA	LSM
Personal Construct Measures	MXAA	.60	.61
	MDAA	-.60	-.45

	MSA
LSM	-.69

Two reservations must be noted in respect of the methods used in the Blackshaw study. Firstly his procedures could have falsely strengthened the relationship between P.C.T. and rating scale measures of satisfaction since the two measures were taken one after the other making them prone to response set bias. Secondly, as Blackshaw noted, satisfaction is but one aspect of psychological well-being, which emphasises the cognitive component, but the other affective aspect of well-being, happiness, is not considered in his study and it is not known how the P.C.T. measure of well-being might relate to happiness ratings.

In sum procedures have been established for creating a L.A.G. incorporating a measure of overall psychological well-being for which there is some empirical support.

CHAPTER 7 : RELIABILITY AND INTERPRETATION OF THE LIFE ACTIVITIES GRID

Introduction

Consideration is given here to issues important to consider prior to using the L.A.G. to establish a subject's personal meanings to activity events and their relationship to actual behaviour. They concern the effective use of L.A.G., the reliability of its procedures, its interpretation by Principal Component Analysis, the development of a content analysis schema for classifying constructs produced by L.A.G. and a supplementary procedure for documenting student allocation of time to life activities.

L.A.G. Reliability

Bannister and Mair (1968, p.156) have suggested in respect to grid reliability that "since there is no such thing as the grid there can be no such thing as the reliability of the grid" which clearly indicates the size of the measurement challenge in P.C.T. Whenever a novel grid form is employed as was the case in the present study, the designer/researcher must take responsibility for establishing the reliability of the new investigatory instrument.

There are a number of reviews of reliability in relation to repertory grids (e.g. Fransella and Bannister, 1979; Adams-Webber, 1979; Yorke, 1983), but none of the studies reviewed, nor studies elsewhere, concerned the construing of activities or employed the precise procedures used to produce a L.A.G., or involved a P.E. student population. The main value of previous studies has been to indicate which aspects of the grid to examine for reliability and procedures by which to establish it.

A number of measures of reliability were chosen to use with L.A.G. in the spirit of Fransella and Bannister's (1977) comment that 'reliability' should be seen as:

> the name for an area of inquiry into the way in which people maintain or alter their construing and not to estimate the value of the grid in terms of whether it has 'high' or low reliability but whether or not it is an instrument which enables us effectively to inquire into precisely this problem.

To enable comprehensive investigation of L.A.G. properties, with co-operation of volunteer subjects, it was necessary to conduct three investigations. Each investigation had its own set of subjects and examined a different aspect of L.A.G. liability and interpretation.

Three empirical studies are now presented. The first two examine aspects of the reliability of construct elicitation procedures and the third the reliability of L.A.G. interpretation.

Study 1: Reliability of construct elicitation procedures

The first measure examines the construct elicitation procedure, to see if the pool of constructs elicited is consistent in the short term.

Subjects: Eleven P.E. students, seven of whom completed all procedures.

Procedures: Test-retest procedures were used with retest 1 week after test. A second retest took place after a further week.

Results: 74.9% and 80% of constructs were re-elicited on the first and second re-elicitations respectively, which indicated that the elicitation procedure was reliable.

Discussion: These results are very similar to previous results reported (Hunt, 1951; Bieri and Blacker, 1956; Fjeld and Landfield, 1961) from which Bannister and Mair (1968, p.158) have suggested, that 'grids' are delving into a limited repertoire of constructs which the subject has available and there is no fear of being confronted with the everlasting pages of an infinite personal directory.

This study is reported in further detail in Chapter 8, since it is an integral part of the construct change with experience studies. The subjects were the control group used in that study and use of the control group enabled changes in the subjects' construct pools occurring over a long period of time to be compared with changes over a short period of time, to highlight the changes in construct pools due to subjects' long-term rather than short-term experience and minimise measurement artefacts.

Study 2: Reliability of L.A.G. interpretations

The study reported here investigated five areas of L.A.G. reliability, namely:

(a) Grid consistency, element ratings overall consistency, shown by the cell by cell correlation of two grids;

(b) the factorial similarity between two grids, calculated by rank ordering all correlations between pairs of constructs on each grid and computing the correlation between the ordering of the two grids;

(c) the consistency with which component meanings were established in a principal component analysis of the grid, indicated by the consistency with which the components of a P.C.A. of the two grids were labelled by constructs;

(d) the consistency between grids of the percentage variance explained by the first two components of a P.C.A. of each grid;

(e) the consistency between grids with which elements are placed upon components by the P.C.A.

Subjects: Nine final year undergraduate students all reading P.E. and Education studies, and aged 21.

Procedure: The nine subjects completed a 10x10 repertory grid using 10 'life activities' as elements and 10 constructs selected by them from their own pool of elicited constructs. Construct elicitation was by triad and ladders procedures. Elements were a subset of the L.A.G. elements. Each element was rated on each construct on a scale of 1-10. A second grid was completed using the identical grid elements and constructs after a one week interval. Six of the nine subjects completed both grids.

Results and discussion

(a) Element ratings, overall consistency, whole grid correlations were all significant $p < 0.001$ (n=100). Correlations for subjects one to six respectively were 0.733, 0.642, 0.848, 0.877, 0.839, 0.494.

These results clearly give confidence in the basic reliability of the L.A.G.

(b) Factorial consistency: the correlation between construct correlation matrices for each subjects' pair of grids, for subjects one to six respectively were:

0.34, 0.66, 0.08, 0.84, 0.79, 0.67.

For all except Subject 3 (r=.08) correlations were significant ($p < 0.005$ n=45)

The atypical result for Subject number 3 was further examined particularly since his whole grid consistency of ratings given above was 0.848. The construct correlations for his two grids formed unusual matrices. All but a very few of correlations between constructs on each grid were similar and high ($r > 0.7$) and as such, small changes in correlation magnitude produced considerable change in construct position relative to other constructs and hence a low correlation between the grid pairs. However, there was not a dramatic change between tests in grid interpretation, both grids being essentially uni-dimensional. The first component of a P.C.A. explained 79.9% of the variance on Grid 1 and 90.9% on Grid 2.

Overall the construct correlation matrices were reliable on the test retest procedure and results are similar to those of other studies reviewed by Fransella and Bannister (1977) who commented that "studies tend to yield co-efficients of reliability which fall largely within the range of 0.6 to 0.8.

(c) The consistency of labelling the P.C.A. factors using original constructs.

A further way to establish the reliability of the meaning extracted from a grid is to consider the constructs which most define the meaning of each component of a P.C.A. of the grid. These are those constructs

which load most highly on each component. In this procedure the value taken as a cut-off point between low and high loading is in part a pragmatic decision. Loadings are overall consistently higher on component 1 (C_1) than component 2 (C_2), so chosen cut-off values may be different on each component. Values chosen were r = 0.8 on C_1 and r = 0.5 on C_2. Overall 90.3% (28 out of 31) of constructs of the 6 subjects' Grid 1 constructs which loaded high on C_1 also did so on Grid 2 (binomial test, $z=4.6$ $p<0.001$). This established that the primary qualitative meanings for Grid 1 and Grid 2 established by C_1 are the same.

Similarly on C_2, 14 out of 17 constructs (82%) which loaded high on Grid 1, did so again on grid 2. (binomial test, $z=3.15$ $p<0.001$).

On C_3, only 6 out of 20 constructs, 30% repeated at loadings greater 0.3 which is not significant.

The figures across C_1, C_2, C_3, read 92%, 82%, 30%, thus it would appear that high loading constructs on C_1 and C_2 gave repeatable, qualitative definitions of personal meaning, but this was not true for C_3. C_3 had few constructs of high loading and they were inconsistently allocated, it is thus not advisable to attach much significance to the qualitative meaning of this component, but to rely more on the meanings given by C_1 and C_2 when using P.C.A., interpretation of L.A.G.

(d) The consistency of the percentage of variance attributable to C_1 (and and also to C_2) in P.C.A of L.A.G.

This was consistent between the two grids. For the six subjects rank correlation coefficients between Grids 1 and 2 on this measure were 0.99 for C_1 variance and 0.83 for C_2.

(e) Element reliability: The rank ordering of elements on components for the two grids

Ordering of the 10 elements on Grids 1 and 2 correlate for each subject and component as follows:-

on C_1: 0.82, 0.90, 0.82, 0.91, 0.93.

on C_2: 0.62, 0.60, 0.95, 0.96, 0.38.

Significance levels for rank order correlations n=10, $p < .05$, r=.56.

$p < .01$, r=.74.

Since there is only one non-significant correlation it can be concluded that ordering of elements by components is normally reliable and in general there is more consistency on this measure for C_1 than C_2. These results are similar to those reported by Fransella and Bannister (1977, p.89).

Conclusion

A number of ways of extracting meaning from the activities grid have been examined, and all found to be reliable. This gives confidence that interpretation of a grid will reliably reflect the meaning that activity has for the individual, at a particular moment in time. An important cautionary note is that component three of a P.C.A. may be unreliable, a point also made on the basis of a 'monte carlo' investigation by Gleason and Staelin (1973). Chambers (1985) stated that:

> measurement error has played a very small role in construct theory. There is no reason, however, to think that people do not make errors when completing repertory grids
>
> Chambers continues 'the existance of errors in grids is difficult to verify because repertory grids are supposed to reflect perceptions that are unique to the individual'.

One should not, however, neglect the problem of error in operationalising P.C.T. merely because it is difficult to handle, one must give it due consideration so as to maximise the probability that real insights into a persons personal construct system and behaviour are gained. Reliability studies help in this quest.

A further cautionary note to add relates to generalising of the results to other subjects and grid sizes. The grids in this study had ten elements and ten constructs and the results, therefore, are most relevant to information generated by grids of this size. The grid size was chosen to enable reliability information on this particular type of grid whilst placing a reasonable demand on participant subjects. The 10 x 10 grid requires a subject to provide 100 pieces of information when completing the grid, whereas the larger grid size, 19 x 16 (the average grid size when all of the subjects' constructs and elements are used; see table 26, 191), requires 304, which is considerably more demanding of the subjects.

Equally, it is observed that there can be no ideal grid size prescribed for reliability studies, since ultimately the grid size and the change of information generated by the grid, is reflective of the individual completing the grid. Test re-test reliability, that is change in grid information over a short-period of time would, therefore, need to be uniquely ascertained for each subject and each grid size for maximum certainty of obtaining meaningful results.

The results of the procedures followed above are, therefore, taken as indicative rather than definitive of changes in the information arising from L.A.G. procedures over the test re-test period of one week.

Interpretation of L.A.G. using a Principal Component Analysis and the Concept of Construct Ordination

Introduction

It is often tacitly assumed that the first component of a Principal Component Analysis of a grid identifies the major dimension of meaning within the construct system, but how does this relate to the Kellian concept of ordination? Does the first component of the P.C.A. reflect super-ordinate constructions more so than other components? Are the higher loading constructs on component 1, of the P.C.A. super-ordinate constructions? Is the second component producing a second independant meaning/super-ordination? Clearly these are questions which require answers if grid interpretation using P.C.A. is to be most effective, since they relate to the important linkage between theoretical concepts and their elaboration through grid operational procedures. What happens to constructs of different types when a grid is processed by a principal components analysis is a neglected issue in P.C.T. The issue of where super-ordinate, sub-ordinate and trivial constructs appear in P.C.A. is the focus of this study.

Super-ordinancy of constructs has been assigned in a number of ways. Of most interest here are firstly Hinkle's (1965) laddering procedures, which had support from Crockett and Meisel (1974), and secondly statistical procedures such as taking the highest loading construct on C_1 of the grid following P.C.A. as being super-ordinate. Bannister and Salmon (1965) investigated the relationship between the Hinkle laddering measure of super-ordinancy and statistical measures. The laddering procedure results did not have any significant relationship to statistical procedure results, in particular it had no relationship with the single construct having

highest loading on C_1 of a P.C.A. of the grid.

An alternative, rather pragmatic approach to this issue of relationships between measures of super-ordinancy was taken here. The assumption was made that the constructs identified by laddering are indeed relatively super-ordinate constructs and then grids were examined to see where they appeared following a P.C.A. of the grid. A number of hypotheses based on this pragmatic approach were formulated. Should these hypotheses be supported one would have a firm basis upon which to interpret future grids and the concept of super-ordinancy would be supported and its inclusion justified.

It is also of value to know where 'trivial' constructs, (that is those due to measurement error in elicitation procedures), appear in a P.C.A. of grids so that their impact on interpretations may be discounted or at least minimised. However, normative procedures adopted in construct elicitation and grid constructions in which only one elicitation of constructs is taken prior to grid completion do not allow for trivial constructs to be identified. At least two elicitations are needed for trivial constructs to be identified. This is clearly a time-consuming and demanding task and should, therefore, be avoided whenever possible if there is no detriment to grid interpretation. The present investigation may enable future grid interpretations to make allowance for trivial constructs within the system without the need to pursue time consuming and tiring repeat elicitation procedures. Trivial construct placements were investigated in similar manner to super-ordinate construct placements.

Objectives; to show that

(1) Super-ordinate and sub-ordinate constructs mainly load on component 1 of a P.C.A. of a repertory grid whilst trivial constructs load more randomly across the P.C.A. components, since they are the least

meaningful type of construct. Trivial constructs will have a greater tendency to load on Components 2, 3, 4 of the analyses than will the other two types of constructs.

(2) Those super-ordinate constructs loading on Component 1 will have higher loadings than sub-ordinate constructs, which will in turn have higher loadings than trivial constructs loading on this component.

(3) Super-ordinate constructs loading on Components 2 or 3 will have higher loadings than other constructs loading on those components.

Subjects and Procedures

Eleven volunteer subjects completed the following procedures at the start of their second year at college. Elicitation of constructs on 3 occasions using the triadic method and followed by laddering of 4 selected constructs on each occasion. This enabled both super-ordinate and trivial constructs to be identified. The 12 elements used for each construct elicitation were experiences of activities such as 'taking part in P.E.', 'taking part in examinations', 'taking part in sports matches', 'taking part in lectures'. Elicitations were spaced at 7 day intervals. Subjects then completed repertory grids. The constructs chosen for the grid were those elicited on the first elicitation occasion by each subject. They were identified as super-ordinate, sub-ordinate or trivial by the experimenter using the following rules.

Super-ordinate constructs were defined as constructs fulfilling at least one of the following two conditions:

(a) identified as a super-ordinate constructs via the laddering technique on at least 2 of the 3 elicitation occasions;

(b) super-ordinate constructs on one elicitation but elicited as a construct on all 3 elicitations.

Trivial constructs were taken as those which appeared on only a single elicitation.

The remaining constructs were designated as subordinate constructs. In the grid ratings of elements on constructs were on a 1-10 scale. Five subjects completed all the procedures and 1 subject who had taken part in 2 elicitation sessions and completed a grid was also included in the data analysis.

Results and discussion

The percentage variance explained by component 1 was on average 45.8% (57,45, 42,54,44,33) and total variance accounted for by the first 3 components averaged 81% (90,78,80,82,83,74).

Objective 1: Super and sub-ordinate constructs will mainly load on C_1 of P.C.A. of grid whilst trivial constructs will be more randomly loaded across C_1, C_2, C_3. The results are presented in Tables 17 and 18.

Table 17: Number of constructs elicited and classified by type, super-ordinate, sub-ordinate, trivial.

There were significantly different numbers of each type of construct in the construct pool (Friedman 2 way ANOVA, X^2 = 10.33, n = 6, k = 3, p = .0017). This was a consequence of many more sub-ordinate constructs relative to superordinate constructs which in turn have superior numbers to trivial constructs.

Subject	Number of Constructs	Super-ordinate	Sub-ordinate	Trivial
1	15	4,	8	3,
2	18	4,	9	5,
3	17	6,	7	4,
4	19	3,	16	0
5	20	6,	11	3,
6	20	4,	15	1,
Total	109	27 (25%)	66(69%)	16 (15%)
Average	18.2	4.5	11.0	2.7

Table 18 shows quite clearly that in absolute terms the super and sub-ordinate constructs tended to load more so on the major components, the effect being strongest for superordinate constructs, but trivial constructs were evenly split between Components 1, 2 and 3.

Table 18: Percentage of Constructs of each type loading greater than 0.5 on each Component of the P.C.A., with absolute numbers in brackets.

Note on rare occasions (n=6) where a construct which loads greater than 0.5 on two components the larger loading is acknowledged in the results.
Three comparisons using Friedman's 2 way ANOVA across C_1, C_2, C_3, super-ordinates $x^2 = 10.2$ n=6. k=3, $p < .001$, sub-ordinates $x^2 = 6.2$, p=.05, trivials n=5, k=2, $x^2 = 7.34$, p=.024. Also comparisons between super-ordinate and sub-ordinate construct numbers on C_1 and C_2 employing Wilcoxon matched pairs test (Siegal 1956);
C_1, n=6, T=3 no significant difference;
C_2, n=6, T=0 significantly more sub-ordinates;
C_3, n=6, T=0 significantly more sub-ordinates.

	C_1	C_2	C_3	C_4
Super-ordinate (n = 27)	85 (23)	7 (2)	4 (1)	4 (1)
Sub-ordinate (n = 66)	56 (37)	27 (18)	12 (8)	5 (3)
Trivial (n = 16)	44 (7)	31 (5)	25 (4)	0 (0)
TOTAL	61 (67)	23 (25)	12 (13)	4 (4)

The first component of P.C.A. contained many more super and sub-ordinate constructs than trivial constructs with sub-ordinates having a majority over super-ordinates (37 v 23, but not a statistically significant difference). Sub-ordinate constructs had a clearer and significant majority on Components 2 and 3, but on these components the trivial constructs outnumbered super-ordinates. Eventually on component 4 which was only defined for 3 subjects and then only by 1 or 2 constructs, there was an even mix between types of construct. Thus, in general terms, as one moves from component 1 through 3, one moves from a component whose meaning was derived equally from sub and super-ordinate constructs to components defined by sub and trivial constructs. Examining each type of construct in turn, it becomes clear that an overwhelming majority of the super-ordinate constructs contained in the construct pool loaded on component 1 (82%). Sub-ordinate constructs also had a majority loading on component 1 (56%) with a steady decline across to component 4 (27%, 12%, 5%) but trivial constructs appeared to load fairly evenly across components 1 to 3 (44%, 31% and 25%). This dispersion reduces their impact on the meaning of each component to insignificance since there were in absolute terms only a few trivial constructs in total.

This discussion is based on a small sample (n=6), of 'normal' subjects. All subjects clearly have a higher percentage of variance explained on their first component, than second component. The results show the placement of the first three types of construct is consistent with Objective One. The whole dispersion of trivial constructs suggests the potential source of method induced error will not distort the interpretation of personal meanings established through the P.C.A. of the repertory grid if only the first two components are used. Less confidence can be placed in the meaning of Components 3 and 4 and these components have dubious value being highly contaminated by method errors. The results require further validation in a

larger study using a broader sample group. Moreover, it is not clear whether these results would hold for subjects with abnormal construct systems, such as would occur in a clinical population.

Objectives 2 and 3

Super-ordinate constructs will load more highly than sub-ordinate constructs which will load more highly than trivial constructs on C_1 of a grid P.C.A. Similar effects will be seen on C_2.

The results in Table 19 support the notion that high loading constructs on C_1 of a P.C.A. grid analysis are a mixture of super and sub-ordinate constructs. A large proportion (74%) of super-ordinate constructs had high loadings on C_1, whereas sub-ordinate constructs were evenly split between high and low loadings on this component (41% and 59%).

Table 19: Constructs on Component 1 classifued by type and strength of loading

Constructs with very high loadings ($L > 0.8$) are separated from constructs with low loadings ($L < 0.80$) for each type of construct.

Note: Percentages in brackets are percentages of the number of the particular type of construct loading on C_1. The Wilcoxon Matched pairs test (Siegal 1956) indicates that there is no significant difference between the numbers of super- and sub-ordinate constructs loading > 0.8. However it is quite clear that there is a significant difference between the numbers of super and sub-ordinate constructs loading 0.8 Wilcoxon matched pairs $T=0$, $p < 0.05$.

Binomial test, (Siegal 1956) show no significant difference for sub-ordinate constructs to have higher ($L > 0.8$) than lower ($L < 0.8$) loadings, but there is a significant difference for super-ordinate constructs ($p=.02$).

Constructs	Loading on C_1	
	$L > 0.8$	$L < 0.8$
Super-ordinate (n=23)	17 (74%)	6 (26%)
Sub-ordinate (n=27)	15 (41%)	22 (59%)
Trivial (n=7)	4 (57%)	3 (43%)
Totals	36 (54%)	31 (46%)

Clearly super-ordinate constructs gravitate to the higher loadings on component 1. As observed previously, 85% load on C_1 and of these 74% (n=17) have loadings greater than 0.8 and 65% (n=15) have a very high top 4 placing (table 20). A similar but weaker pattern exists for sub-ordinate constructs, 55% load on C_1 and of these 41% (n=15) load greater than 0.8 only 22% (n=8) have a top four placing. For trivial constructs 57% (n=4) load highly, 14% (n=1) was top 4.

Table 20

The highest loading constructs on Component 1 classified by type

P.C.A. Component 1 Loading	Type of Construct		
	Super-ordinate	Sub-ordinate	Trivial
1st place	4	2	0
Top 4 place	15	8	1

The emerging pattern is reinforced when one observes the single highest loading constructs on C_1 for each grid (Table 20). Four subjects had a super-ordinate construct as their highest loading construct on C_1 and although the other two subjects had a sub-ordinate construct with highest loading they had a super-ordinate construct as second highest. No trivial construct had such a high loading.

In sum tables 19 and 20 show that super-ordinate constructs were most sure to load significantly on the higher loadings, component 1, and in the top 4 loadings in particular. Sub-ordinate constructs were fairly evenly split between high and low loadings on component 1 and only modestly represented in the top 4 loadings, particularly when one recalls their overall numerical superiority. Trivial constructs as noted previously were only a very small percentage of the total number of constructs and can have very little impact on the interpretation of a grid. This is most obvious in considering the higher loaded constructs on Component 1 where only 1 trivial construct appeared in a top 4 place. The results support the expectation stated in Objective 2, although the numbers in the sample prevent full statistical analysis.

However, in contradiction to Objective 3 few super-ordinate constructs loaded significantly on Component 2 of the P.C.A.

One can with reasonable confidence now state that when presented with a P.C.A. of a grid that the 1st component is the most important dimension of meaning, and that its highest loading constructs establish the subjects super-ordinate levels of meaning. One cannot say exactly which constructs are or are not super-ordinate constructs from the P.C.A. data alone, but this is of little importance since operationally all the top 4 constructs are very highly correlated. One can also say that whilst the second component of a P.C.A. of the L.A.G. represents another statistically independent dimension of meaning, it mainly reflects sub-ordinate level construing. Finally, components beyond 1 and 2 seem to be heavily contaminated by trivial constructs and assigning much credence to their meanings is very dubious. It is perhaps sufficient in a grid interpretation merely to note the presence of those constructs.

Although a larger study is needed in this area, such studies are not easy to compile. Each subject is required to spend a large amount of time in 'data' production. Elicitation procedures must be completed not once but at least twice. Procedures are particularly time-consuming since they must include not only triadic methods but laddering techniques. A full grid must then be completed. This involves in the order of 6 hours of subjects' time, concentrating on a task which is not always stimulating. Perhaps it is for these reasons that such studies have not previously appeared in the Personal Construct Theory literature, but they are necessary if meaningful interpretation of repertory grids by P.C.A., which are truly aligned with the theory, are to be developed.

Development of a Content Analysis Schema for Classifying Personal Constructs

Introduction

A suitable content analysis schema will enable constructs elicited using the L.A.G. procedures to be organised into groups according to qualitative similarity. This will facilitate the study of qualitative changes in the subjects' construct pool over time and enable comparisons to be made between the qualities of constructs employed by groups of subjects such as between "more successful" and "less successful" students. It will subsequently aid interpretation of constructs in individual case studies.

Two objectives need to be met when designing a content analysis schema. Firstly, a valid set of discrete categories must be established into which constructs can be allocated and secondly, there must be a high level of inter-judge reliability in allocating constructs to categories. The aim here is to meet these two objectives and devise a suitable schema to classify the constructs elicited when life activities are the elements under consideration. Such constructs may be seen as motive dimensions, and it is to the literature on motivation that attention is now directed to derive a suitable schema.

Qualitative differences in motives for taking part in activities: A review of the literature

Graeff, Csikszentmilhalyi and Gianinno (1983) commenting on recent trends in motivation research suggested that a more experiential perspective was being taken towards the study of human behaviour than previously,

> motivational researchers have expanded their measure to include task or activity content and people's perspectives of their involvement in activities rather than just circumstantial evidence about why they probably behave as they do.

And later on they comment,

> perceptions of, or attitudes towards an activity are more important indicators of motivation - of the likelihood of repeating an action - than are the actual external circumstances.

Clearly this perspective on motivation is one which is highly compatible with the emphasis of the present study, the personal construction of experience, and hence it is to Graeff et al and studies sharing this perspective on motivation (Watson, Blanksby and Bloomfield 1984; Beard and Ragheb 1983; Gill, Cross, Huddleston, 1983; Alderman and Wood, 1976) that attention is given to reveal possible content categories for the proposed content analysis schema.

Graeff et al studied intrinsic motivation as it occurred in everyday life activities. They suggested that the intrinsic motivation literature had a theme, to the effect that people "engage in activities for their own sake" they find "immediate, internal rewards for doing an action" rather than relying on "conventional extrinsic rewards for example money or social recognition". But what are immediate internal rewards? Graeff et al suggested on further examination of the literature that they include a perceived freedom of choice (wanting to do, or continue to do, activity rather than having to), a sense of competence (a balance between perceived challenge and skill levels), a sense of positive well-being (feelings of happiness and relaxation). At such times the person will be confident and experiencing enjoyment and fulfilment.

They investigated 107 full-time working men and women from five companies, using an ESM (experience sampling method). This involved paging subjects at random times using an electronic paging device. When paged the subjects were requested to respond to six rating scales derived from the dimensions described above to establish whether subjects were intrinsically or extrinsically motivated and to indicate with which of 9 types of activity

they were involved (such as, job related activities, socialising, active leisure, personal maintenance). They paged subjects whilst they were taking part in a variety of activities and established that intrinsic motivation (I.M.) levels varied from one type of activity to another. Work was experienced as I.M. on only 3.4% of the time but leisure activities were I.M. on 40% of occasions. Freedom to choose to take part in an activity was confirmed as an element of I.M. experiences. Furthermore, I.M. experiences were rated high on positive affect (more happy and less tense) and E.M. as more boring and leading to lowered *feelings of self-confidence.*

Clearly this study suggests a number of valid categories to consider for the content analysis schema. Intrinsic motivation, to include constructs relating to enjoyment and interest, choice and wanting to do the activity, challenge and competence. Categories for extrinsic motivation seem appropriate for constructs relating to rewards and recognition from others. A further category for affective states such as happiness, joy, relaxation would also seem to be required.

Watson et al (1984) also investigated sources of intrinsic motivation and concurred with Graeff et al in the assumption that engagement in an activity, the level of performance, and likelihood of repeating the activity are all more powerfully motivated by intrinsic motivation systems than external rewards. They built a rational out of Deci's theory of intrinsic motivation identifying two perspectives on sport. One positive, which they termed the child's perspective, and the other negative which they termed the adult perspective. The child's expectations of positive sporting experiences were hypothesised as including:

(a) intrinsic reward associated with personal satisfaction;
(b) opportunities for co-operative interaction with peers, particularly through shared involvement in training and social activities - the element of 'social reciprocity';
(c) ....reference to acheivement mastery and the attainment of success;

(d) ....reference to extrinsic rewards derived from competitive swimming.

Their negative experience expectations were hypothesised as including reference to:

(a) the demand for training and discipline to become actively involved;
(b) the impact of competitive anxiety through the process of participation in 'competitive swimming' events;
(c) reference to the extrinsically motivated techniques of coaches to produce excellence devoid of a feeling of awareness of the child's need for a sense of 'competence' and self-determination.

They interviewed 87 boys and girls involved in the Australian Junior Swimming Championships, an elite group of athletes, taken from one sport, generalisation of the results may prove to be limited. The relevant section of the interview covered the impact of swimming on the children in terms of its positive and negative aspects. On average 3 responses were made by each child for each category of information producing 520 responses in total. Content analysis proceded through three steps both for positive and negative question responses. For example, positive impact of swimming was found to have 39 types of statement, such as, form friendships, doing well, hard training, which were then seen to fall into 13 categories and ultimately five dimensions. These categories with percentage of children mentioning them in brackets were as follows:- Social Reciprocity (meet people 75.9%), Achievement/Mastery (winning, competing, 50.6%), Intrinsic Reward (enjoyment, training, healthy sport, something to do, travel, fun, 35.6%), Extrinsic rewards/prestige (success, coach attention, 29.9%), Challenge (challenge, excitement, 23%). Two judges worked on this exercise, although reliability measures are not given. It seems that the categories and divisions development was guided by theory and executed through judgement. This reliance on judgement is a limitation of the research, factor analytic techniques could be beneficial, yet its strengths are in the clear link to theoretical premise and face validity.

The negative influences described by the children were organised by the Watson et al into 5 dimensions, less obviously linked to their theoretical premise. These were Training (72.4%), Time restrictions (19.5%), Prospect of defeat (14.9%), Adult expectations (9.2%), Club organisation (5.7%). However, on closer examination one can see that the negative dimensions contrast directly with the positive dimensions. Instead of the positive, extrinsic reward, prestige from coach attention there is the negative, adult expectation, coach pressure to do well. Achievement/mastery contrasts with the prospect of defeat, social reciprocity with time restrictions and restricted social life. The intrinsic motivation of feeling fit and healthy contrasts with the training excesses giving aches, pains and fatigues. Interestingly, the hard work of training was given first as a positive expectation then subsequently as a negative expectation. The long hours, long distances and early mornings, coupled with pressure to do well, and boredom represent a loss of control and intrinsic motivation. Finally whereas the authors had the category of excitement for positive affect, they had no separate category for negative affect, for statements such as jealous or anxious.

In sum categories derived from the negative expectations of swimming do not seem to demand an increase in the categories previously identified through the organisation of positive expectations. However, the importance of each category to each of the two sets of expectations is different, and usefully illustrates the value of the qualitative information and content analysis in building as understanding of motive structures.

A further research effort by Beard and Ragheb (1983) was similar in general approach to the Watson et al study discussed above. It too aimed to examine the major dimensions of motivation, but rather than focussing on the rather narrow population of competitive swimmers, they focussed more broadly, on motivations for persons participating in leisure activities.

They commented that leisure activities are interesting activities to study when trying to discover why people behave as they do, because "there are no obvious external forces compelling individuals to engage in particular leisure activities", that is they are voluntary in nature. They also commented that previous studies had tended to be narrow, either in the range of subjects investigated and/or by using a limited set of supplied motive-attributes investigated. To make good these limitations their study was concerned with the full range of leisure activities. It involved both students and non-students, who were asked to report their own reasons for engaging in leisure activities.

They derived an initial pool of 150 items deemed to relate to theories and previous studies. These were then reduced from 150 to 106 by a team of judges who evaluated their relevance to leisure motivation and their clarity. The statements were used in a questionnaire using a 5-point Likert scale to assess reasons for engaging in leisure activities. The subjects at this stage were 174 students. Factor analytic techniques were employed to derive a number of factors to build more general sub-scales. Initial analysis revealed 6 factors explaining 56.8% of the variance in the item responses, which they felt were interpretable in terms of the dimensions and theories discussed in their paper. They then proceeded to develop a 4-factor solution which for their aim of building a general leisure motivation instrument they thought preferable. However, for the purposes of this study the six-factors will be preferable. The first factor Ragheb et al termed "Intellectual" and contained statements concerning creating, imagining, exploring, discovering, learning, one might also term this self-actualisation. The second and third factors both relate to "social reasons", for participating namely "to be with others", "to develop close friendships", and "to gain others' respect", "so others would think well of me doing it", i.e. affiliative needs and need for recognition and esteem

from others. The 4th and 5th factors were "competence-mastery" orientated and particularly those relating to physical activities, examples here are, "to get a feeling of achievement", "to be good in doing them", and "to keep in shape physically", "to develop physical fitness" "to develop physical skills and abilities". The sixth factor exemplified by "stimulus-avoidance" "to relax", "to be in a calm atmosphere", related to arousal and the need to get away from over-stimulating life-situations and be emotionally calm. The six factors have great coherence with general motivation dimensions revealed in the previous studies presented, even though different subject types and activities were under investigation, thereby reinforcing their appropriateness as content analysis categories.

Further research by Gill et al (1983) investigated participation motivation in youth sports. They commented that there are far ranging sports activities such as baseball, judo, gymnastics and that,

> Youngsters obviously have varied reasons for participating. Unfortunately we have little empirical information to indicate what those reasons might be.

Their research objectives were to describe the reasons for participation and to derive a standard measure of participation motivation. They created a 30 statement questionnaire based on pilot studies using open ended interview questions developed out of a literature review relating to the reasons for participation and the objectives of youth sports. The importance of each statement was indicated on a 3-point Likert type scale. Statements such as the following form the 10 top-rated statements: "I want to improve my skills", "I want to learn new skills", "I like the action", "I like to compete", "I like being on a team", "I want to be physically fit", "I like to have fun" and "I like the challenge" and are suggestive of the

motive dimensions which factor analysis revealed. They indicated the similarity of results to the previous studies, in spite of its descriptive approach rather than theory guided approach.

Their factor analysis revealed eight factors accounting for a surprisingly high percentage (90.9%, of overall item score variance, single factors ranged from 19.4 - 9.2%). The factors are consistent with the previous studies and in order of variance explained they were:

(1) status and recognition;

(2) team or group involvement;

(3) physical fitness;

(4) energy release;

(5) situational factors, parents, coach, influence, good facilities;

(6) skill development, mastery;

(7) friendship, affiliation;

(8) fun and excitement.

Although eight factors were clearly distinguished, not all eight dimensions included statements considered important reasons for participating in sport. This comment is based on the mean ratings of importance reported for each statement by Gill et al and the factor upon which the statement loads. From this post-hoc analysis of this study it seems that factors 2, 3, 6, 8 team involvement, fitness, achievement/ mastery and fun are the most important reasons for taking part in sports in general, and 1, 4, 5, 7, esteem/recognition, energy/tension release, situational factors, affiliation/freindship are less important reasons for taking part in sports.

These results may not fully generalise to the total population of sports participants since as Gill et al point out they "...may partly be a characteristic of the specific sample. Data was collected at a summer sport school...." which whilst giving valuable information to organisers of such programmes, would for example promote bias in results.

> ....skill development is stressed to a greater extent at a sport school than in a recreational youth sport programme. Fun is likely to be the most important reason for many youth sports participants. (Gill et al).

This author would suggest affiliative/friendship reasons would also rate more highly as they did in the Watson et al (1983) study presented previously. Clearly then, discarding from the content analysis schema any of the 8 identified motive dimensions on the grounds of non-importance, would be premature.

Alderman and Wood (1976) also investigated incentive motivation in young athletes primarily based on the concept elucidated by Birch and Veroff (1966).

Alderman and Wood state that:

> it is the nature of the activity itself and the manner in which the individual perceives that nature that partially determines whether or not the person will be motivated to engage in that activity.

The perceived meanings of activities they thought would fall into the 8 general categories suggested by Birch and Beroff, namely "independence", "power", "affiliation", "arousal" (later termed stress, a negative affective arousal) "esteem", "excellence" (achievement) "aggression". Their 84 question inventory was completed by 424 11-14 year old hockey players. The results showed that the term, "aggression" was an impure category, correlating excessively to "independance", "power", "esteem", "excellence".

Of the seven categories remaining "affiliation" followed by "excellence" were the most highly rated incentives, whilst "arousal" and "esteem" were moderately rated and "independance" and "power" less highly rated. Correlations of "esteem" to both "excellence" and "power" (0.49 and 0.37 respectively), suggest that to understand esteem it must be known whether it is pursued through achievement motives or dominance motives. However, it will be left as a separate category within the content analysis system, and only when the individual construct systems are analysed will its full meaning be known.

Summary of Formative Studies

The first fundamentally important point to make is that although the studies reviewed ranged across a variety of activities, namely everyday activities, leisure activities, sports activities, and also a range of subjects, namely youth and adult, male and female, there are a number of motive dimensions which based on their definitive statements recur across the studies. These may be summarised in Table 21. The research methodologies in general attempted with some success to be comprehensive in trawling participation reasons; provide theoretical rational for motive dimensions and adopt factor analytic techniques of analysis. This suggests that an effective categorisation schema has emerged from the review. Pilot studies using P.C.T. revealed that two further categories were necessary, they were, cortical arousal and altruism. The full analysis schema is given in Table 22.

Table 21: L.A.G. Content Analysis Schema Categories
The content analysis categories and the studies from which they were taken. Two categories emerged from initial pilot trials utilising the schema, with

P.C.T. data 15, altruism and 3, arousal.

	Graeff et al (1983)	Watson et al (1984)	Beard *Ragheb* (1983)	Gill *et al* (1983)	Alderman and Wood (1970)
1. Fun, want to do Intrinsic Motivation	/	/		/	
2. Affect (Emotions)	/	/	/		/
3. Arousal Cortical stimulation					
4. Achievement Mastery	/	/	/	/	/
5. Self-actualising			/		
6. Conformity v. autonomy					/
7. Status-esteem from others		/	/	/	/
8. Affiliation friendship		/	/	/	/
9. Group Involvement				/	
10. Physical, fitness health		/	/	/	
11. Situational		/		/	
12. Compensation escape				/	
13. Power control others					/
14. Extrinsic Rewards		/			
15. Altruistic, help others					
16. Others, unclassifiable					

Content analysis schema for Classifying Personal Constructs relating to Activity Experiences.

1. Fun, Want to do Intrinsic Motivation
   (a) Enjoy
   Engrossment
   Excite
   flow
   fun
   interest
   meaningful
   satisfying
   spontaneous
   thrill
   variety

   (b) attractive
   choose
   desire
   fulfilling
   good
   nice
   pleasant
   sought after
   valued
   want to do

2. Affect, feeling (Emotions)
   (a) affection
   calm
   certainly
   confidence
   contentment
   emotional
   happiness
   hope
   joy
   love
   proud
   relaxing
   serenity

   (b) anger
   anxiety
   apathy
   boredom
   depression
   fear
   feel bad
   frustration
   grief
   guilt
   hostility
   insecure
   panic
   pity
   sadness
   shame
   tension
   threat
   worry

3. Arousal Cortical Stimluation
   alertness
   stimulate

4. Achievement Mastery
   achieve goals
   be Number One
   be good at something
   develop skill
   discover potential
   effort
   get to higher level
   improve skills
   learn
   meet challenge
   master things
   practise, train
   progress
   try hard
   win

5. Self-actualising

creative,
original
curiosity
develop self
discover new
things
expand interests
expand
knowledge
explore new
ideas
learn about
things
learn about
slef
to widen
experience
to make things
meaningful

6. Conformity
Autonomy

avoidable
chance
constrained
- by others
- by time
to please others
no choice
organised by
others

7. Status-
Esteem
Recognition
attention
others
admiration
be popular
be well
thought of
feel
important
have status

8. Affiliation
Friendship

acceptance
belonging
meet others
make friends
not
competition
social
relations
share
trust
with others

9. Group
Involvement
shared goals
team work
team spirit
with others

10. Physical
Fitness
be active
be fit
be healthy
exercise
physical effort
physical ability
stay in shape

11. Situational

home based
college
attractice
facilities

12. Compensation
Escape
to make up
for
deficiencies
or escape
from other
life areas

13. Power-
Control others
direct others
influence others

14. Extrinsic
Rewards
the good life
material rewards
useful to career
medals

15. Altruistic

help others

16. Unclassified

examples
recreation
fight
instinct
long-term

The classification schema was developed in by two judges, to include examples of key words appearing in personal construct systems. These were based on the key statements of the studies reviewed above and constructs elicited from pilot subjects.

Constructs generated by subjects often have several words to label them. When completing the L.A.G. subjects were asked to label their constructs using the single word which most adequately identified the meaning of the constructs for them. It was those key words which were categorised using Content Analysis Schema.

In subsequent trials, 100 constructs from 6 subjects were classified according to the schema by two judges, independently, with 93% agreement between the two judges. Subsequent discussion revealed two errors in use of the system, miscategorising two constructs. There was also a problem in classifying constructs in which one pole was from one category and the other pole from a second category. The decision taken here was to give the tiny minority of constructs to which this applied, a double classification. Both judges reported that they found the system both easy and quick to use. The ease is such that reliable results can be achieved by a single judge.

It must be noted, however, that the exact meaning of any one construct is determined by its position in relation to other constructs within an individual's construct system. For example, whilst "to achieve goals" and "interest" and "recognition" are from three separate categories of constructs, in the construct system of a particular subject "to achieve goals" could correlate with either "interest" or "recognition". Accordingly it would be seen as either an element of that person's intrinsic motivation for participation or their extrinsic motivation system. Indeed, a single subject may "want to achieve" for both intrinsic and extrinsic rewards, and examination of their unique system would reveal this and also which held the higher priority.

Measuring the Use of Time

A 'use of time diary' was developed to quantify the students allocation of time to their major life-space activities. A fairly detailed diary was designed to give information rich enough to form part of case-studies, as well as group studies. The diary was developed largely from the author's experience both of working with students similar to the subjects in the present research and of being a Physical Education student himself. It was initially designed for teaching purposes in relation to 'time management' workshops. The questions guiding the design process were:

What are the significant areas of time allocation which may be problematic for the students and/or influence their success in sport and academic studies?

What are the other main areas of activity which can fill the students' day?

What is the appropriate unit of time to measure to give meaningful information?

What ethically is a reasonable demand to make of students revealing personal information?

What procedure would produce accurate reliable information yet be easy for students to use?

The instrument resulting in response to these questions is given below, table 23. A key decision made was to consider social life, work and sport involvement as the areas most likely to precipitate time allocation problems for students striving to meet the recreational, academic and sporting demands of a P.E. student's life. A further key decision was made in relation to recording private academic study time. It was split into two parts namely that time targetted towards specific assignments carrying grades and other more general study time, since the former was seen as likely to influence academic success levels and be a potential problem area for the poorer student. A half-hour time slot was chosen as the unit of

time to be recorded and seen as a reasonable minimum time slot since it would allow for short study periods and sports sessions to be captured and few activities of interest to the studies' objectives to be missed. The decision to complete the time recording at the end of each day was taken to ensure minimum loss of information due to subjects' memory lapses without placing onerous demands on the students, it could easily become a 10 minute routine each evening. The choice of recording 14 workings hours was taken to maximise relevant information collected whilst avoiding excessive intrusion into personal information.

Reviewing of the substantive literature (chapter 2, p49-54) suggested that this intuitive experiential decision process had produced an appropriate instrument. No formal test of its reliability has been undertaken.

NAME ______________________ **ACTIVITIES DIARY**

DATE

Fill in the HOURS on your time scale, to cover 14 WAKING HOURS

	MON	TUES	WED	THURS	FRI	SAT	SUN
.00 - .00							
.30 - .00							
.00 - .30							
.30 - .00							
.00 - .30							
.30 - .00							
.00 - .30							
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.30 - .00							
.00 - .00							

N.B. 1. R - relax 2. M - maintenance 3. L - lectures 4. Lm - missed
5. A - assignment 6. Ps - private study 7. C - competition 8. Rs - recreative sport
9. B - travel other activities named 10. 11. 12. 13.

MAIN STUDY PART II

Introduction and Overview

The empirical investigation presented in this section had the overall aim of examining the personal construct systems of P.E. students and the impact that college experience had on those systems. Comparisons were drawn between students at different levels of experience and a group of first year students were monitored for a 15 month period. The investigation comprised several sub-sections in which qualitative aspects of student construct systems were not only related to their experience level, but also to their action priorities, use of time and academic accomplishment.

Presentation: The study was conceived as a whole unit but is necessarily presented in a series of fairly discrete parts. A holistic perspective in which the parts are inter-related is realised through case-studies which form the second part of the report.

Design: There were two designs employed. The first was a cross-sectional design in which comparisons were made between aspects of the construct systems of students at two levels of experience, that is students at entry to college and those at the start of their final year of study.

The second was a longitudinal design in which student construct systems and 'use of time' were monitored as they moved from entry to college through to part way through their second year at college. There was some overlap between the two studies in the subjects used and the concepts investigated. The longitudinal study aimed to confirm and extend the findings of the cross-sectional study.

Subjects: There were three groups of subjects, totalling 47 in all. In the cross-sectional study there were 18 final year students and 18 first year students at entry to college. Subjects in the longitudinal study were the

18 first year students of the cross-sectional study and a control group of 11 students. The control group enabled comparison of short-term (1 week) change in subjects' construing as revealed by L.A.G. with long-term changes.

All subjects were volunteers between 18 and 21 years old studying for a first degree in combined subjects, one of which was Physical Education. Only three students were reading science as their second subject, the majority read arts or education studies.

Rating Academic Accomplishment: The two primary reasons for rating students on their performance whilst at college were to establish general levels of performance for this specific sample group and to enable the sample to be split into groups of 'good' performers and 'less good' performers.

Consideration of the subjects pre-college academic attainment at 'A' level examinations indicated a group of uniformly modest success. Accomplishment at college level was, therefore, seen as reflecting student adaption to the college environment. The average points total was 4.5, equivalent to grades D,D at 'A' level examinations. Only 7 subjects gained 3 rather than 2 'A' levels, and the best grades were E,E,B, and D,D,D. Only 6 subjects gained a 'B' in an 'A' level examination.

Accomplishment levels for students at college were on the basis of their overall study grades in two subjects. The correlations between 1st and 2nd subject were 0.5** in year 1, 0.35* in year 2 and 0.74** in year 4 (* significance 0.05, ** significance 0.01). Ratings were made for both subject areas of study constituting the degree at both Year 1 and Year 3, and where relevant, on the Year 4 honours course. The rating scale adopted was 1-8 with each number being equivalent to a percentage band. 1(40-45), 2(46-49), 3(50-53), 4(54-57), 5(58-61), 6 (62-65), 7(66-69) and 8(70+). All grades taken from student records were converted to this 1-8 scale. It was found that in the records physical education grades were expressed in percentages and also by numerical or letter grades (A-E), thus

determinining performance on the 1-8 scale was straightforward, but for attainments in other subjects this was not always the case. Grades were often not given in percentages, but only in letters or numerical scale. A grade conversion was made when necessary, according to college guidelines in operation at the time of the study, which equated letters to percentages. For the honours year, grades were given on the 8-point numerical scale or sometimes a 12-point scale which were readily converted into the 8-point scale of the study. One residual problem could not be overcome, some areas of study in Year 3 merely used a truncated 5-point scale rather than an 8-point scale, where a 5 on the truncated scale represented a 5,6,7 or 8 on the full 8-point scale. The reason for this being that the scale was primarily used, as a selection instrument by which to recommend students to go on for an honours year and fine gradings were not deemed to be necessary. There was no way of overcoming this restricted grading. Thus Year 3 gradings at the upper end in those study areas were not as discriminating.

A table of correlations between student grades achieved at various stages of their course (Year 1, Year 3, Year 4) and by single subjects as well as overall grades is given below.

Table 24: Correlations between student academic success at years 1,3,4.

Correlations given for P.E., other subject and overall grades.
Spearmans rank order correlation co-efficient with correction for ties (Siegal 1956) - * = 5% significance level, ** = 1% significance level.
For Physical Education it was also possible to correlate course work grades with examination grades since these were given separately in student records. For year 1, r = .62** and year 3 r = .77**. This information was not available for other areas of study.

Correlation Between	P.E. Grades	Other Subject Grades	Overall Grades
Year 1 - Year 3 (n=36)	0.68**	0.3*	0.58**
Year 1 - Year 4 (n=18)	0.57*	0.29	0.31
Year 3 - Year 4 (n=18)	0.43*	0.77**	0.69**

It is noticeable that for the second subject in particular correlations between Year 1 and Year 3 are low. This could be due to the limitation in upper grades as previously mentioned and to the variety of academic subjects represented.

The pool of subjects in the studies had a truncated performance range since it contains no fail candidates. Pass rather than Honours degrees were gained by 16 students in the sample, eight because they chose not to proceed to honours even though their grades in year 3 of their course merited it, (they chose to seek employment or go into teacher training after their three years course) and seven because they were not selected for honours, their grades being too low and, one subject only achieved pass standard after selection for honours, doing very poorly in his honours year. Of those who continued to honours (n=18), 5 achieved good honours (IIi or I) 8 students in the mid-range (IIii) and 5 third class or pass degree.

Assessing Construct Importance: The importance of different types of construct within a construct system was the main qualitative dimension of construing under investigation. It was conceptualised as the degree to which particular types of construct are used to define the personal meaning of events for a person.

Construct importance was taken as having three dimensions, operationally stated as:

(i) the number of constructs of a particular type present in the system

(ii) the central or peripheral significance of constructs of different types to the system as defined by their loading on Component 1, 2 or 3 of a P.C.A. of the L.A.G.

(iii) the super-ordinate or sub-ordinate nature of the constructs as specified by laddering techniques (Hinkle, 1965).

Variations in construct importance between levels of college experience (first year and final year students) and levels of academic success ('good' versus 'less good' students) were examined.

Order of Presentation: The same concepts were investigated in the study of cross-sectional design as in the study of longtitudinal design. The sub-units of the investigation are where possible, organised for presentation in terms of the concepts investigated, results of the two studies being presented consecutively in each section.

There are 5 sub-units presented:-

1. Qualitative dimensions of personal meaning of activity (Construct Importance).
2. The relative priorities of life activities.
3. The relationship between personal meanings of activity, actual behaviour and academic success.
4. A P.C.T. measure of satisfaction.
5. Selected Case-studies.

CHAPTER 8: QUALITATIVE DIMENSIONS OF THE PERSONAL MEANING OF ACTIVITY IN RELATION TO EXPERIENCE AND SUCCESS

CONSTRUCT IMPORTANCE

A Cross-Sectional Study

Construct Importance: Objective 1

To establish the types of construct used by students to define the personal meanings of their activities in a college culture at two stages of their college experience and to draw comparisons between them.

Subjects:

These were two volunteer undergraduate student groups at different experience levels. Group 1 were eighteen 1st year undergraduate students and group 2 were eighteen honours year undergraduates at the end of their 3rd year of study or start of their 4th year, now referred to as group 3/4.

To enable a comparison to be made between personal constructions of meaning at the two chosen levels of experience. Each Group 3/4 student was selected to match a Group 1 student according to two criteria, their academic attainment at the two relevant stages of their college academic careers, the end of first year and end of the course. Each attainment was on a 1-8 scale (details p.185) in which overall college grades (1st and 2nd subject grades combined) were used as the basis for the matching. It was possible to match 12 students (10 male, 2 female) who had grids taken at entry to college with a further 12 (10 male, 2 female) taken at the end of their honours year. The matching process allowed the effects of 'life experience' on personal meanings to be validly established in this cross-sectional design but at a cost of losing one third of the subjects.

Table 25: Matching of 1st year subjects with honours year subjects.

The table shows the overall match resulting from yoking first and third subjects into pairs. Grades for each of the 24 subjects were given for both their Year 1 and Year 3 performance. GY1 = grade at year 1, GY3 = grade at year 3. In each instance Group 1 results are given first and Group 3/4 second.

	Match on 1st Year Performance		Match on 3rd Year Performance	
	Group 1	Group 3/4	Group 1	Group 3/4
	GY1	GY1	GY3	GY3
Total	73	76	81	87
Average per Subject	6.10	6.30	6.75	7.25

Procedures: All subjects completed the L.A.G. procedures. Grids were processed by P.C.A. Constructs were classified according to the L.A.G. content analysis schema described in the previous chapter.

Results

Results are presented in table 26 for the frequency of 16 construct types identified by the L.A.G. content analysis schema, within

(a) the full construct pool,

(b) constructs appearing on C_1 of a P.C.A. of each subject's grid,

(c) constructs appearing on C_2 of a P.C.A. of each subject's grid.

Comparison is also made between the overall organisation of the grids of Year 3/4 and Year 1 subject groups, taking the percentage variance explained by the components of a P.C.A. as indicative of this grid feature.

Table 26: A comparison of the Number of constructs of each type elicited by student groups Y1, n=12 and Y3/4 (n=12.

(a) The total construct pool for each subject. * indicates a significant difference between groups, $p < 0.025$, Mann-Witney U test.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average per subject
Year 1	49	34	10	44*	12	20	12	12	6	14	2	2	0	0	6	3	223	18.6
Year 3/4	42	35	7	69*	5	16	16	6	8	13	5	2	0	0	11	3	236	19.7
Total	91	69	17	113	17	36	28	18	14	27	7	4	0	0	17	6	459	19.1

(b) Constructs loading greater than 0.5 on component 1 of PCA. * significant difference $p<0.05$.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Year 1	47	32	7	19*	5	8	10	10	3	8	0	2	0	0	2	1
Year 3/4	34	30	4	38*	5	7	11	4	4	5	1	1	0	0	7	0
Total	81	64	11	57	10	15	21	14	7	13	1	3	0	0	9	1

(c) Constructs loading greater than 0.5 on component 2 of PCA.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Year 1	2	2	0	17	7	3	3	3	1	2	2	0	0	0	2	1
Year 3/4	7	2	2	27	2	4	2	1	1	5	1	0	0	0	4	0
Total	9	4	2	44	9	7	5	4	2	7	8	0	0	0	6	1

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

(d) Percentage of variance accounted for by components 1, 2, 3 of PCA analysis.

	Mean C_1	Range	Mean C_2	Range	Mean C_3	Range	Total	Range
Year 1	53.7	25	17	19	9.3	12	80	12
Year 3/4	50.7	24	19.3	20	10.2	6	80.2	17

Discussion:

An examination of percentage of variance explained by each P.C.A. component (Table 26d) revealed no between-group differences but considerable between-individual differences as indicated by the wide ranges of scores. On average, 80.2 and 80.0 percent of grid variance was accounted for by the first three components of the PCA with averages on each of the 1st three components (50.7, 19.3, 10.2) for the year 3/4 group and (53.7, 17, 9.3) for the first year group, with no overall differences between groups or changes which can be attributed directly to college experience.

It is apparent (Table 26a) that there were relatively few construct types which had importance in defining the meanings of activity for the students and they were the same for Year 1 and Year 3/4 groups. These construct types fell into high frequency and moderate frequency sub-groups.

High frequency: intrinsic motivation, type 1 91 (42, 49)

emotions, type 2 69 (35, 34)

mastery/achievement, type 4 113 (69, 44)

(Figures in brackets are numbers of constructs by year group, see Table 26).

Moderate frequency sub-group:

esteem/recognition, type 6 36 (16,20)

autonomy/choice, type 7 28 (16, 12)

physical activity, type 10 27 (13, 14)

being a member of a group combined with affiliation, types 8, 9, 32 and 9, 32 (18, 14) (18, 14)

These 8 construct types account for 86.3% of overall constructs elicited.

Between group comparisons revealed one statistically significant difference between frequencies and hence importance in construct types for the Group 1 and Group 3/4. Type 4, mastery/achievement constructs, were more important to the construing of Year 3/4 students than the year 1 students. (n=69, n=41), (Mann-Witney U test, u = 31.5, $n_1 = n_2 = 12$, $p < 0.025$.)

Further examination of the importance of construct types according to a P.C.A. are now presented. The distribution of constructs by type on C_1 is very similar to that described above for the total set of constructs for Year 1 subjects, the 8 construct types gave 93.2% of constructs elicited. Again comparisons between year groups showed a significant difference for type 4 constructs, mastery/achievement (19, 38) , Mann-Witney U = 37.5 $p<0.05$, $n_1 = n_2 = 12$). On C_2 the distribution of construct types was different. The mastery/achievement type of construct was very dominant in comparison to all other types of constructs for both student groups. There were 27 such constructs for the Year 3/4 group and 17 for the Year 1 group with the construct type next highest in frequency accruing 7 times in each instance. There was no significant difference between Year 1 and Year 3/4 frequencies on type 4 contructs (u = 55, $n_1 = n_2 = 12$).

In sum, there were eight construct types which overall were the most important in giving meaning to activities for both Year 1 and Year 3/4 PE students. Most notable of these eight were intrinsic motivation, emotions and mastery/achievement constructs. There was a significantly greater number of mastery/achievement constructs for Year 3/4 students and these were more central to their construing as indicated by their greater frequency on C_1 of the PCA. This suggests a growing importance for this dimension of construing with increased college experience, although full confirmation of this requires a longitudinal study. The college culture validates achievement/mastery construing.

Construct Importance Objective 2

To show that higher achieving ('good') students establish meaning in activity more through type 4 mastery/achievement constructs than do lower achieving ('less good')students and that this construct type has more central importance within the 'good' students' construct system.

Subjects: The sample was as described under objective 1. To enable the 'good' and 'less good' sample sub-groups to be larger and the range of grades across the subjects wider data was processed for the group 1 and group 3/4 subjects respectively, rather than merely considering the reduced sample produced when group 1 and group 3/4 subjects were matched.

18 students from the Year 3/4 student group (16 *male, 2 female)* who had completed L.A.G. as previously described, were split into two groups according to their degree classification at the end of their course.

The full range of degree results were represented from pass degree classification (3 subjects) through to 1st class honours (2 subjects). The split between 'good' and 'less good' students was taken at above and below the whole sample average grades. Average *grades along a 12 point scale for* the 'good' group was 8.4, for the 'less good' group it was 6.3.

18 Year 1 students (10 male, 8 female), who had completed L.A.G. were split into two groups according to the academic grades at the end of their first college year. The average grades for the 'good' students was 7.7 and for the 'less good' students 4.0. Their final degree classifications ranged from pass degree (n=4) to II (i) (n=1).

Procedure

A L.A.G. was completed by each student as previously described in Chapter 6.

Results

Results are presented in the same way as the results presented in the previous section (C.). Experienced student Group 3/4 results and inexperienced student Group 1 results are presented separately.

Table 27 Comparison of 'good' and 'less good' Year 3/4 students constructs Procedure: All subjects completed the L.A.G. and constructs were classified using the construct analysis schema elicited from 'good' and 'less good' experienced students.

(a) The total number of constructs elicited for each subject listed by construct type. * significant difference, Mann-Witney $p < 0.05$, between 'good' and 'less good' students.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Good (n = 8)	32	21	4	57*	6	13	7	9	3	5	2	3	0	0	6	0	168	21
Less Good (n = 10)	31	27	5	49*	2	13	14	6	10	12	3	1	0	1	8	3	184	18.4

(b) Constructs loading greater than 0.5 on component 1 of PCA.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	T	Average
Good (n = 8)	23	20	4	29	4	9	6	6	2	2	0	1	0	0	6	0	112	14
Less Good (n = 10)	25	23	3	27	1	5	6	5	5	6	3	1	0	1	5	0	116	11.6

(c) Constructs loading greater than 0.5 on component C_2 of PCA.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Good (n = 8)	6	0	1	24	2	3	1	0	1	1	2	1	0	0	0	0	42	5.2
Less Good (n = 10)	6	2	2	14	1	3	3	1	1	6	0	0	0	0	5	0	44	4.4

(d) Percentage of variance accounted for by components C_1, C_2, C_3, of PCA

	Mean C_1	Range	Mean C_2	Range	Mean C_3	Range	Total	Range
Good	50.1	29	19.5	20	10.6	7	80.2	10
Less Good	46.4	23	18.9	11	11.6	7	76.9	24

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

Table 28: Comparison of 'good' and 'less good' year 1 students constructs.

(a) The total number of constructs listed by construct type.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Good (n = 10)	37	29	5	41	8	14	12	12	7	10	2	2	0	0	6	0	185	18.5
Less Good (n = 8)	37	26	7	16	3	7	3	15	2	8	0	0	0	3	4	3	136	17.0
All n = 18	74	55	12	57	11	21	15	27	9	18	2	2	0	3	10	3	321	17.0

(b) Constructs loading greater than 0.5 on C_1 of P.C.A.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Good (n = 10)	30	20	3	20	5	7	9	13	3	8	0	2	0	0	3	0	123	12.5
Less Good (n = 8)	36	22	10	11	3	4	1	16	0	4	0	0	0	3	3	2	114	14.4

(c) Constructs loading greater than 0.5 on C_2 of P.C.A.

*Mann-Witney U=12, $p < 0.01$.

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Good (n = 10)	4	1	0	21*	0	0	4	5	1	1	2	0	0	0	1	0	40	4.1
Less Good (n = 8)	2	5	2	1*	1	2	0	0	1	3	0	0	0	3	1	0	21	2.6

(N.B. Very few constructs did not load on C_1 or C_2)

(d) Percentage of variance accounted for by components C_1, C_2 of PCA

	C_1 Average	C_2 Average	C_3 Average	Total
Good	54.1	18.4	8.2	80.7
Less Good	57.8	19.0	10	78.8

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

Discussion:

Year 3/4 Students:

Consideration is given first to the more experienced students (Year 3/4 subjects). The results are presented in tables 27(a), (b), (c) and (d). The P.C.A. analysis indicates no overall differences in construct organisation between 'good' and 'less good' students (table 28(d)).

The overall pattern of constructs confirmed that found in the previous section and showed 'good' and 'less good' student similarities:

intrinsic motivation,	type 1,	58	(32, 26);
emotions,	type 2,	48	(21, 27);
mastery/achievement,	type 4,	101	(57, 44);

and next in importance are:

esteem/recognition,	type 6,	24	(13, 11);
autonomy/choice,	type 7,	18	(7, 11);
being a member of a group/affiliation	types 8/9	28	(12, 16);
physical activity,	type 10	17	(5, 12).

For good students 88.5% of total constructs and for 'less good students' percentages 78.8% of constructs were from these 8 types.

Comparison between the 'good' and 'less good' sample groups revealed a significant difference on type 4, mastery/achievement. (Mann-Witney U test, $n_1 = 8$, $n_2 = 10$, $U = 18.5$, $p < 0.05$.). On average 'good students had 7.1 such constructs as against only 4.9 for 'less good' students.

Examination of the construct distribution by types following the P.C.A. showed that component 1 had the same pattern of constructs as the overall set of constructs whilst C_2 was dominated by type 4 constructs mastery/achievement. The result mirrors that reported in the previous study for Year 1 and Year 3/4 groups.However, there were no significant differences between the 'good' and 'less good' students constructs when results were

examined for each P.C.A. component separately even though on both components there were more constructs of type 4 for the 'good' group than the 'less good group' (Averages C_1, 3.6, 2.7; averages C_2, 3.0, 1.4). The reason for this rather unexpected result become apparent on closer inspection of individual data. It would seem that whilst all but two of the 'less good' group loaded mastery/achievement constructs mainly on C_1 (of the two exceptions, one split type 4 constructs between components 1 and 2 and for the other they loaded only on C_2), there was a less even pattern of split for the 'good' students. Whilst some 'good students' had all type 4 constructs loading on C_1, 6 subjects split their type 4 constructs between the two components, but none loaded solely on C_2. It was this splitting of constructs between C_1, and C_2 which diluted the difference between the two groups.

Interestingly the three students having most type 4 construct were academically the most successful, and split type 4 constructs between the two components. Two first class honours students showed a split (3, 5,) and a good 2(i) subject split (2, 6).

It would appear then that mastery/achievement can be linked to intrinsic motivation and emotions with all three constructs types loading highly on component 1 of the PCA. However, it may also be a construing of activity in isolation from them, since it often loads highly on C_2 of the PCA when they are not linked. This would appear particularly so for good students. Further consideration of this area will be developed later through case studies.

Year 1 Students:

Results for this group are presented in Table 28: (a), (b), (c) (d). There were no significant differences in the overall construct organisation between 'good' and 'less good' students (Table 28(d)).

The overall pattern of constructs shows the same pre-eminent construct types as for the Year 3/4 students, intrinsic motivation (good 37, less good 37), emotions (29, 26) and achievement/mastery (41, 16), esteem/recognition (14, 7), autonomy/choice (12, 3) type 8/9, group/affiliation (19, 17) and physical activity (10, 8). There were more type 4 mastery/achievement constructs in the total construct pool for 'good' than 'less good' students but this did not quite meet statistical significance level (Table 28(b)). Differences were significant for achievement constructs loading on C_2 of the P.C.A. of L.A.G.'s (Table 28(c)). Since this component is almost exclusively made up of achievement/mastery constructs for good students, they have a 'pure' achievement orientation, secondary to other motives as indicated by C_2 constructs such as recognition gained through group participation, but additional to them and not available to 'less good' students. The nature of the second dimension is important when meanings are being attributed to activities.

Conclusions:

A few construct types were dominant within the P.E. students construing of activity, 'good' and 'less good' students construct pools differed in the number of achievement/mastery constructs they contained, and they occurred more frequently in 'good' students construct pools, both for year 3/4 and first year students, although differences at first year were just outside of statistical significance. However, statistically significant differences did show through for first year students in P.C.A. C_2 constructs.

Construct importance: a Longitudinal Study

Introduction

In Personal Construct Theory, personal constructs are the fundamental elements upon which the quality of personal meaning depends and hence when the constructs deployed to construe events change so too will the personal meaning of those events. Constructs which are stable over time can regulate changes in personal meanings and give them continuity. Construct transience and its corrollary construct stability are the focal issues of this study. The first step (objectives 1 and 2) was to quantify the extent to which constructs deployed to construe events are stable or change. The second step was to examine qualitative aspects of construct stability and change (objectives 3, 4 and 5, page 212).

Objectives 1 and 2:

The rationale for the first two objectives was presented in chapter 3, when implications of the hierarchical structuring of complex volitional behaviours for P.C.T. were developed.

(1) To investigate personal construct pools over an extended time period and show that the constructs forming those pools are open to replacement but that there is also a stable set of constructs retained in the pool over time.

(2) To show that super-ordinate constructs are relatively more stable constructs over time than are sub-ordinate constructs.

Subjects:

In total 29 P.E. Undergraduate students took part. Eighteen were in the experimental group and eleven in the control group.

Experimental Group:

Eighteen volunteer subjects upon entry to a Higher Education college of which 10 subjects completed the full set of procedures on the 3 occasions required, (8 males, 2 females). A number of reasons caused the other students to drop out of the project. Four subjects completed the first grid but declined to take further part on the grounds of time or disinterest and 4 students completed only two grids due to missed appointments, they were unable to complete a third grid within the 3 week period allocated for this data collection.

It must be remembered here that a full elicitation of constructs and completion of a 16 element grid is a very time consuming business, taking easily two or three hours on each occasion. Since the design required this and that no feedback be given of the grid analysis during the study it was quite hard work and of limited interest to the subjects. Indeed one would clearly need to question this dissociation of subject from his/her grid, or indeed the need for a complete grid such as was used in the study with its constraints of both time and interest for the subject, particularly if this were a clinical study, or if one were employing the grid as a practical tool in the counselling situation.

The academic standing of students completing and not completing the research procedures is given below.

Table 29: Student grades, completers versus non-completers.
Comparison of grades at Year 1 and Year 3 of students not completing the investigatory procedures with those who did. No significant difference occurred. In each group 4 students continued to honours.

	GRADES			
	Not Completed: Procedures		Completed: Procedures	
	Year 1	Year 3	Year 1	Year 3
Average	6.11	6.44	6.3	6.9

One can reasonably conclude that partial self-selection of the study group is unlikely to have significant impact on results particularly where comments in relation to ability levels are concerned.

Control Group:

Eleven undergraduate P.E. students in their second year of studies volunteered. Seven subjects completed all the necessary procedures.

Procedures:

Each subject completed the Life Activities Grid on 3 occasions (e_1, e_2, e_3) Experimental group subjects had a 6 months followed by a 9 months time lapse between construct elicitations and the control group had a 1 week time lapse between each elicitation.

Results and Discussion:

All Constructs:

To establish that real change had occured in the construct pools due to college experience and to quantify the degree of construct replacement in line with objective 1, the subjects' total construct pool was examined

across the three elicitation occasions for the experimental group subjects (Table 30), the control group subjects (Table 31) and comparisons made with the control groups (Table 32).

Table 30: The Repeatability of Constructs Across Time For Experimental Group Subjects (n = 10) Elicitation Procedures (e1, e2, e3)

(a) The number of constructs in a single elicitation was consistent.
(b) The repeatability of constructs between elicitations was modest. 38.5% (75/195) of constructs elicited on e1, were also elicited on e2 and 39% (75/191) e2 and e3.
(c) There was a core of stable constructs in the construct pool. Only 29.2% (57/195) of constructs elicited on e1 were elicited on all 3 elicitation occasions.
(d) A large proportion of constructs were unstable. 53% (300/569) only occurred on a single elicitation occasion.

	Elicitations			Stable Constructs, elicited on more than one elicitation			Unstable Constructs, elicited on only one elicitation
	e1	e2	e3	e1 & e2	e2 & e3	e1, e2 & e3	
Construct Total	195	191	183	75	75	57	99.6, (average) (102, 100, 98)
Average per subject (n=10)	19.5	19.1	18.3	7.5 38.5%	7.5 39%	5.7 29.2%	9.96 53%

It is suggested then that there was a stable core of constructs over the 15 month period monitored, 29.2% of the first elicited constructs (e1) were elicited at both the 6 month and 15 month re-elicitations (e2 and e3). Around this stable construct pool core there was a large construct replacement process going on, that is qualitative change in construing was taking place. Some of this change would be due to unreliability of elicitation procedures producing trivial constructs, whilst some would represent more meaningful change in the construct pool, construct replacement due to invalidatory experiences. To distinguish between the two, procedural error and real change, comparison with the the control group is needed.

Table 31: The Repeatability of Constructs Across Time, for control group subjects (n=7), at three Elicitation Occasions (e1, e2, e3)

(a) The number of constructs in a single elicitation was highly consistent.
(b) The repeatability of constructs between elicitations was high. 74.9% (98/131) of constructs elicited on e1 were also elicited on e2, and 80% (103/128) of e2 constructs repeat in e3.
(c) There was a large core of stable constructs. 64.9% (85/131) of constructs elicitated on e1, were elicited on all 3 elicitations. If the 25 trival constructs which appeared only in e1 are removed from the total of 131 constructs of e1, 80.2% (85/106) of remaining constructs occurred in e1, e2, e3.
(d) A small proportion of constructs 17% (64/388) appeared to be trivial since they only occurred on a single elicitation occasion.

	Elicitation Construct totals			Stable Constructs, elicited on more than one elicitation			Unstable Constructs, elicited on only one elicitation	
	e1	e2	e3	e1 & e2	e2 & e3	e1, e2 & e3		
Total (n=7)	131	128	129	98	103	85	21.3	(25,20,19)
Average per subject	18.7	18.3	18.3	14 74.9%	14.7 80%	12.1 64.9%	3.05 17%	

Is is observed that the elicitation procedure reliably identified the construct pool for each subject, however, a small proportion of trivial constructs (approximately 1 in 6) was elicited on each elicitation occasion. Trivial constructs which are procedural artefacts may only be identified as such by carrying out the time consuming elicitation procedure on at least 2 closely spaced occasions, which is usually not practicable but may indeed be necessary on occasions if one is to successfully and completely monitor changing constructions and personal meanings.

Comparison between Control and Experiential Groups

There was no significant difference in the total number of constructs elicited for each group (e1, control group average 18.7 and experimental group 19.5). A summary of the main percentage scores to allow direct comparison between the control and experimental groups is given below (table 32) which shows that on all measures differences were clearly indicative of greater change in the experimental as opposed to control groups.

Table 32: Comparisons of Construct Constancy between the exerimental and control group subjects.

The Number of Constructs elicited on all 3 elicitations, the stable core of repeating constructs, was significantly greater for control than experimental group subjects (Av12.1 controls, Av5.7 experimental, Mann-Witney U, $n_1=7$, $n_2=10$, $u=3$ $p < 0.001$).

Furthermore, all experimental group subjects had a higher number of constructs which appeared on only a single elicitation occasion than did any of the control group subjects. Clearly a significant difference (Av 10.0 for experimental, 2.8 for controls) which indicated change beyond procedural artefacts had taken place in the construct pool of experimental subjects in order of 7 constructs, as constructs dropped out of the construct pool they were replaced by more salient constructs.

	% of constructs on successive elicitations		% of constructs on all 3 elicitations	% of constructs elicited on only a single occasion
	e1–e2	e2–e3	e1, and e2 and e3	
Control Group	74.9**	80.0**	64.9**	17.0**
Experimental Group	38.5**	39**	29.2**	53.0**

This is consistant with the hypothesis that experience of life activities at college, many of which were new experiences, had changed the constructs in the experimental subjects' construct systems.

Super-ordinate Constructs:

Data for super-ordinate constructs only are presented in a similar manner to that used above for the total construct pool. The experimental group subjects super-ordinate constructs are presented in Table 33.

Table 33: The Repeatability of Super-ordinate Constructs (S) for Experimental group subjects (n=7) across 3 elicitations (e1, 2,3)

(a) 20% (27/135) of constructs on the first elicitation were identified as super-ordinate constructs.
(b) 74% (20/27) of constructs identified as super-ordinate in elicitation 1 subsequently repeated as constructs in both elicitations 2 and 3.
(c) 51.9% (14/27) of constructs identified as super-ordinates in the first elicitation were further identified as super-ordinates in either elicitation 2 or 3, but only 29.6% (8/27) were identified as super-ordinates in all 3 elicitations.

	Sel, Constructs identified as S at Elicitation 1	Sel as Repeat Constructs in e2 and e3	Sel as S in one further elicitation e2 or e3	Sel as S Constructs in e2 and e3
Total (n=7)	27	20	14	8
Average per subject	3.9 20%	2.9 74%	2.0 51.9%	1.1 29.6%

*Note: The experimental group normally has 10 subjects but 3 subjects did not complete all the required laddering procedure satisfactorily. Each did so on at least one of the 3 elicitations, but not on all 3 elicitations and for this reason were not included in this section of analysis.

Similar data for the repeatability of super-ordinate constructs for control subjects are now presented in Table 34.

Table 34: The Repeatability of Super-ordinate Constructs (S) across time, Control Group Subjects (n=7) on three elicitation occasions (e1, e2, e3)

(a) 20.6% (27/131) of constructs were identified as super-ordinate constructs on elicitation 1.
(b) 85.2% (23/27) of constructs identified as super-ordinate constructs in elicitation 1, appeared again as constructs (either super-ordinates or sub-ordinate) on both elicitations 2 and 3.
(c) 70.3% (19/27) of constructs identified as super-ordinate in a first elicitation were also identified as such in either elicitation 2 or 3, but only 44.4% (12/27) were identified as super-ordinates in all 3 elicitations.

	Sel, Constructs identified as S at Elicitation 1	Sel as Repeat Constructs in e2 and e3	Sel as S in one further elicitation e2 or e3	Sel as S Constructs in e2 and e3
Total (n=7)	27	23	19	12
Average per subject	3.9 20.8%	3.3 85.2%	2.5 70.3%	1.7 44.4%

Comparison of the control and experimental groups e_1 super-ordinate constructs repeatability within construct pools e_2 and e_3 (Table 35) showed no significant differences which indicates that super-ordinate constructs were a more stable set of constructs over time than were other constructs.

Table 35: A Comparison of Super-ordinate Construct Repeatability between Control Group and Experimental groups, across 3 elicitations

The mean number of core super-ordinate constructs elicited on e1 re-elicited as constructs on e2 and e3	
Experimental Group	Control Group
(74%) 2.86/3.86	(85%) 3.29/3.86

Mann Witney 'U' test ($n_1 = n_2 = 7$), U = 14.5. Non significant.

The control group data also enabled evaluation of the reliability of procedures used to identify super-ordinate constructs.

The procedure used was Laddering of subjects' selected constructs (Hinkle, 1965). 55% (15/27) of constructs identified at e_1 as super-ordinate were also identified as such at e_2. The procedure is not highly reliable in identifying super-ordinate constructs, but the unreliability seems to be in errors of omission rather comission since 70.3% (19/27) of super-ordinate constructs at e_1 were identified as such on one subsequent elicitation e_2 or e_3. In total e_1 elicitation enabled 65.8% (27/41) of constructs identified as super-ordinate construct in e_1, or e_2 or e_3 to be identified.

It is suggested, therefore, that to avoid errors of omission in identifying super-ordinate constructs that more constructs should be laddered than the four used in the current procedure. The current figure of an average 3.9 super-ordinate constructs per person being super-ordinate is considered an under-estimate and the true figure could be as high as six.

Finally it is observed that experimental group subjects had significantly more constructs identified as super-ordinate constructs in e_2 and e_3 which were not identified as such at e_1, than did the control group subjects. For the control group of all constructs deemed super-ordinate on e_2 and e_3 only 34.2 per cent were 'new super-ordinates' but 53 per cent were such for the experimental group (Mann Witney 'U' test of raw data ($n_1 = n_2 = 7$), $u=1.5$ $p < .01$). Since both groups of subjects had 27 super-ordinates at e_1, this data is taken as evidence of 'new' super-ordinate constructs being developed due to experimental group subjects college experience.

Conclusion:

The evidence presented supports the hypotheses presented in objectives 1 and 2. There are qualitative changes over time in a person's construing, the variation taking place under the regnancy of permeable super-ordinate constructs, whose meaning is continually being redefined and realised through replacement of some sub-ordinate constructs by new constructs.

The hypotheses presented here were developed out of concepts of hierarchical organisation of behaviour where it was suggested that the concept of time was integral to full understanding of such hierarchies. It was suggested that super-ordinate constructs may relate to long-term decision making and hence persist across time more so than sub-ordinate constructs since for them it will take that much longer for the validation process to be completed. Hierarchical structuring of one's construct system may be seen then to offer the benefits of stability, and perhaps a sense of continuity and control since long-term anticipations and plans may be made with their help. Radical change may require change in super-ordinate constructs, and as such can be seen from the present perspective to require patience and to be potentially anxiety provoking since it will be a long time before the validity of one's new direction is tested.

The perspective elaborated is that successful development of construct systems will involve the gradual change in higher order constructions modulating more rapid change of lower order constructions to improve the process of anticipation, the quality of decision, the success of actions and the meaningfulness of the world. Clearly 'what to change next' in a person's constructions of the world would be an important question in any counselling intervention. The nature of super-ordinate constructions would necessarily be reviewed prior to reviewing sub-ordinate constructions since these direct long-term planning of behaviours. Change at this level of construing may be more difficult than changing sub-ordinate construing where

super-ordinate constructions are deemed to be appropriate, their further elaboration by changing sub-ordinate constructs will be required to effectively change behaviour.

Construct Importance: Objective 3:

To identify which construct types are important to undergraduate P.E. students at three levels of experience to define their personal meaning of activity. To identify changes in importance of construct types during the period of transition for the student from the school/home environment to college.

In particular, to show an increase with college experience in importance of Type 4 achievement/mastery constructs in student construct systems. To show that constructs of emotion are more important during the first six months of adaption to college experience, than in subsequent periods and to examine whether the 'physical' construct type become less important to the students construct systems over time.

Objective 4:

To investigate differences in construct importance for 'good' and 'less good' students. In particular to see whether differences in the use of mastery/achievement constructs are present at entry between 'good' and 'less good' students and whether as a result of their college experience this type of construct becomes of more central importance in the construct systems of 'good' students than for 'less good' students.

To examine for differences between 'good' and 'less good' students use of emotional and physical constructs.

Objective 5:

To examime the 'core' construction of meaning, as defined by constructs retained in student construct systems over time. To show that super-ordinate constructs are the dominant constructs within that group of constructs and mastery/achievement constructs occur more frequently as 'core' constructs for the 'good' students than for the 'less good' students.

Results:

Data in relation to objectives 3, 4 and 5 are now presented (Table 36, 37a, 37b, 37c). Since constructs which load on component 3 of a P.C.A. of L.A.G. grid have been shown to be both few and predominantly trivial (chapter 7), results are presented only for constructs loading on C_1 and C_2.

Examination of subjects construct organisation revealed one significant difference (Table 36).

At entry to college 'good' and 'less good' students had differences in the relative weightings of component 1 and 2 of the P.C.A. of their grid. For component 1 the percentage of grid variance accounted for was 55.6% for 'less good' students and 45.6% for 'good' students. The corresponding figures for component 2 were 13.2% and 23.4%.

This indicates that for 'good' students component 2 was more important in establishing personal meanings of activities for 'good' students than for 'less good' students at this point in time.

Table 36: Percentage Variance of L.A.G. accounted for by Components 1, 2 & 3 of PCA analysis of grids.

Figures in brackets represent the range of scores. *shows significant difference. In both instances Mann Witney u=2, p=0.16.

(A) at entry

	C_1 Average	C_2 Average	C_3 Average	Total Average
Less Good	55.6* (18)	13.2* (7)	8.4 (6)	79.2 (10)
Good	45.6* (10)	23.4* (11)	10.8 (12)	80.0 (12)
Total	53.1 (25)	15.7 (19)	9.0 (13)	79.6 (12)

(B) at 6 months

	C_1 Average	C_2 Average	C_3 Average	Total Average
Less Good	60.8	17	8.2	86.0
Good	55.9	18.2	8.2	82.3
Total	58.4	17.6	8.2	84.2

(C) at 15 months

	C_1 Average	C_2 Average	C_3 Average	Total Average
Less Good	48.2 (26)	21.2 (20)	10 (7)	79.4 (10)
Good	53.2 (27)	20.8 (22)	9.4 (5)	83.4 (7)
Total	50.7 29	21 (22)	9.7 (7)	81.4 (13)

Table 37: The number of constructs of each type elicited on three elicitation occasions (A, B, C) by 'good' and 'less good' students

Data is given for the complete construct pool than separately for C_1 and C_2.

Only constructs defining the meaning of components 1 and 2 loading greater than 0.5 are included in the analysis since normally C_3 accounts for less than 10% of total grid variance.

(A) Elicitation 1 Entry

ALL Constructs loading on C_1 and C_2 combined

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good (n = 5)	23	19	6	10	2	6	1	9	1	4	0	0	0	0	3	1	85	17
Good (n = 5)	17	14	1	23	8	5	1	6	2	8	2	2	0	0	5	0	94	18.9
TOTAL	40	33	7	33	10	11	2	15	3	12	2	2	0	0	8	1	179	17.9

C_1 Constructs only

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good	23	15	4	9	2	4	1	9	0	1	0	0	0	0	2	1	71	142
Good	15	13	1	8	1	5	0	4	2	7	0	2	0	0	3	0	61	122
TOTAL	38	28	5	17	3	9	1	13	2	8	0	2	0	0	5	1	132	132

C_2 Constructs

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good	0	4	2	1*	0	2	0	0	1	3	0	0	0	0	1	0	14	2.8
Good	2	1	0	15*	7	0	1	2	0	1	2	0	0	0	1	0	33	6.5
TOTAL	2	5	2	16	7	2	1	2	1	4	2	0	0	0	3	0	47	4.7

* Mann-Witney U-test, $n_1 = n_2 = 5$ $U = 0.5$ $p < 0.008$

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

(B) Elicitation 2, 6 months

ALL Constructs on C_1 and C_2

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good n=5	18	18	2	16	4	7	2	3	3	4	2	2	1	2	4	1	89	17.8
Good n=5	25	11	0	21	1	8	10	5	0	6	6	2	0	0	3	0	98	20.0
TOTAL	43	29	2	37	4	15	12	8	3	10	8	4	1	2	7	1	187	18.7

C_1 Constructs

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good	17	16	2	6	2	5	2	3	3	2	1	1	1	2	4	1	68	13.6
Good	21	11	0	8	1	7	8	5	0	6	0	2	0	0	1	0	70	14
TOTAL	38	27	2	14	2	12	10	8	3	8	1	3	1	2	5	1	137	13.7

C_2 Constructs

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good	1	2	0	10	2	2	0	0	0	2	1	1	0	0	0	0	21	4.2
Good		4	0	0	13	0	1	2	0	0	0	6	0	0	0	2	0	28 5.6
TOTAL	5	2	0	23	2	4	2	0	0	2	7	1	0	0	2	0	47	4.7

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

(C) Elicitation 3, 15 months

ALL Constructs on C_1 and C_2

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good n=5	23	6	2	19	1	4	5	3	4	6	0	1	0	0	3	1	78	15.6
Good n=5	15	11	3	25	6	6	8	3	1	7	3	1	0	0	4	0	93	18.6
TOTAL	38	17	5	44	7	10	13	6	5	13	3	2	0	0	7	1	171	17.1

C_1 Constructs

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good	15	5	1	12*	1	4	3	3	4	1	0	1	0	0	2	1	53	10.6
Good	12	10	1	21*	5	3	8	0	1	1	3	1	0	0	1	0	67	13.4
TOTAL	27	15	2	33	6	7	11	3	5	2	3	2	0	0	3	1	119	11.9

* Mann-Witney U-test, $n_1 = n_2 = 5$, $U = 4.5$ $p < 0.059$

C_2 Constructs

Construct type	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good	8	1	1	7	0	0	2	0	0	5	0	0	0	0	1	0	25	5.0
Good	3	1	2	4	1	3	0	3	0	6	0	0	0	0	3	0	25	5.2
TOTAL	11	2	3	11	1	3	2	3	0	11	0	0	0	0	4	0	51	5.1

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

Discussion:

Observations were made for students at 3 levels of college experience and in relation to two dimensions of construct importance as previously stated:

(i) the frequency and hence significance of the 16 construct types in defining the activity meanings that is the number of each construct type in the student construct pool;

(ii) the centrality of each construct type within the construct system. Constructs are considered more central to the system if they load significantly on C_1 of a P.C.A. of the L.A.G. than if they load on C_2, and so on for C_3 and C_4.

In relation to Objective 3 concerning construct importance at different levels of experience it was observed, for the total sample (Tables 37A, 37B, 37C), that the types of construct most significant to ascribing meaning to action were very consistant across the 3 levels of experience and similar to those previously reported in the cross-sectional study results (this chapter). High and moderate frequency grouping of construct types occurred in similar manner acros the three elicitation occasions. Group A were the types of construct which occurred most frequently and Group B the next most frequently occurring types of constructs, 83%, 88% and 86% of constructs were of types covered by groups A and B at elicitations 1, 2 and 3 respectively.

These were the construct types of importance to the P.E. student sample. The numbers of constructs of frequently occurring types on each elicitation occasion are given in Table 38.

There were no statistically significant differences in the frequency with which each type of construct occurred as student experience increased, although Type 4 constructs achievement/mastery did increase from 33 to 37 to 44 constructs at elicitations one, two and three respectively, in line with predictions.

Table 38: Construct Importance by type, for year 1 students was expressed in percentages on three elicitations e_1, e_2, e_3, was:-

			e_1	e_2	e_3
Group A	Intrinsic motivation	(type 1);	40	43	33
(most frequent)	Emotions	(type 2);	33	29	17
	Mastery achievement	(type 4);	33	37	44
Group B	Esteem/recognition	(type 6);	11	15	10
(frequent)	Choice/autonomy	(type 7);	2	12	13
	(less so on grid 1)				
	Physical activity	(type 10);	12	10	13
	Affiliation/	(type 8 plus	18	11	11
	Group involvement	type 9).			

The percentage of group A and group B constructs on 3 elicitation occasions (e_1, e_2, e_3) is given in the table 38.

In relation to the second measure of construct important, centrality within the system, there were no statistically significant differences observed due to college experience. Again type 4 constructs showed increasing centrality in the direction predicated but without results reaching statistical significance. This was indicated by an increase in component 2 type 4 constructs between elicitation 1 and 2 from 16 to 23 and then an increase from 14 to 33 of these constructs on C_1 from elicitation 2 to elicitation 3.

Analysis of results separately for 'good' and 'less good' students showed similar trends for an increase in importance for mastery/achievement constructs due to experience without results reaching the 5% level of statistical significance.

In relation to Objective 4 comparisons between 'good' and 'less good' students construct pools showed two statistically significant differences in the importance of constructs types within the students' construct systems. The first was between groups at entry to college (grid 1) and the second after 15 months of college experience (grid 3).

At entry C_2 was dominated by Type 4 mastery/achievement constructs for 'good' students but not for 'less good' students (Table 36A). The frequencies were 15 mastery/achievement constructs for 'good' students and 1 for 'less good' students. (Mann-Witney U test, $n_1 = n_2 = 5$ $p < 0.008$). After 15 months college experience mastery/achievement constructs loaded more on C_1 for 'good' than 'less good' students, 21 and 12 constructs respectively. (Mann Witney U=4.5, $p < 0.059$). Mastery/achievement constructs had a more central rather than peripheral importance to the 'good' student construct systems. The change for 'good' students of type 4 constructs on C_1 was from 8 to 21 between grid 1 and 3 but only 9 to 12 for 'less good' students.

In sum the evidence from the cross-sectional study reported earlier in this chapter (see pages 192, 198, 199) with the results of the longitudinal study support the conclusion that achievement/mastery constructs are important constructs within the construct pools of undergraduate P.E. students. They occur more frequently within the construct systems of 'good' students at entry to college and this is most evident on Component 2 of P.C.A. of L.A.G.

For both 'good' and 'less good' students the use of achievement/mastery constructs increases with college experience (Table 39a). For 'good'students this type of construct remains more important within their construct system than it is for 'less good' students, being not only more frequent in occurence but also more central to their systems, as indicated by their loading more frequently on Component 1 of a P.C.A. of L.A.G. (Table 39b).

Table 39A: Increase in Achievement/Mastery Constructs over time

A total Construct Pool. Average number of constructs per student.

	Entry	15 months	36 months
'good'	4.6	5	7.4
'less good'	2.8	3.8	4.9

Table 39B Component 1 constructs only

	Entry	15 months	36 months
'good'	1.6	4.2	3.6
'less good'	1.8	2.4	2.7

It is acknowledged that the results do not unequivocally support the position stated and that further evidence is required for full confidence in the position adopted.

Objective 5 relatd to 'core' constructs, that is those retained in the system over time, and stated that super-ordinate constructs would be pre-eminent within this group of constructs and that achievement/mastery construct would be more frequently 'core' constructs for 'good' students than they would for 'less good' students.

Table 40 shows the repeat constructs for the full sample group and for 'good' and 'less good' students.

Table 40: Repeat Constructs (Grid 1, 2 and 3), by type of constructs and achievement level of student.

Construct type	1	2	3	4*	5	6	7	8	9	10	11	12	13	14	15	16	t	Average
Less Good n=5	7	5	0	1*	1	2	1	2	1	3	0	0	0	0	1	1	25	5
Good n=5	9	3	0	8*	2	0	1	2	0	3	0	0	0	0	1	0	29	5.8
TOTAL n=10	16	8	0	9	3	2	2	4	1	6	0	0	0	0	2	1	54	5.4

* significance level, Mann-Witney U test U=3.5 ($n_1 = n_2 = 5$) $p < 0.05$.

Four construct types were notable within the repeat set of constructs, namely:

intrinsic motivation	type 1;
emotions	type 2;
mastery/achievement	type 4;
physical	type 10;

These provided 64% of 'less good' students' repeat constructs and 79% for 'good' students. Of these 4 construct types only Type 4 mastery/achievement, constructs showed a significant difference between the 'good' and 'less good' students in their frequency. (Separate analysis is not presented for construct distribution between C_1 and C_2 since the numbers within each construct class when thus split were so small.) In terms of qualitative difference at a more detailed level, it is observed that individuals differed considerably in the specific as opposed to type of

constructs which were repeated. 15 of 25 specific repeat constructs (60%) were a repeat for only a single person. The most frequent identically named repeats for the 10 subjects were:

Type 1:	enjoy, want to do	9 subjects
Type 4:	mastery, achievement	6 subjects
Type 2:	happy, feeling of well being	4 subjects
Type 10:	physical effort or activity	4 subjects
Type 8/9:	companionship, sharing, friendly	4 subjects

Clearly 'enjoyment/want to do', an intrinsic motivation type, was the single specific repeat construct which occurred most frequently in the P.E. students construct pools as a repeat. The exact meaning of 'enjoyment' to the individual will be defined by both the nature of other constructs within the individuals' construct system and their relationship to the construct 'enjoy'. Thus although it was an almost universally employed construct it had a different precise meaning for each individual subject.

The pattern of results so far suggests that 'good' students were more likely than were 'less good' students to see 'enjoyment' in 'achievement/ mastery terms.

Overall 61% (33/54) of the repeat constructs were identified as super-ordinate constructs on at least one of grid 1, 2 or 3, elicitation occasions, whilst on single elicitations 40%, 34% and 44% of repeat constructs were super-ordinate constructs.

Repeating constructs can be said to have a special significance within the construct system for two reasons. Firstly, because they are a stable base across time in giving meaning to activities and secondly, because of the high percentage of super-ordinate constructs contained in their small number.

Conclusions:

It has been found that the L.A.G. construct elicitation procedures are reliable and they successfully identify the construct pool whose range of convenience is activity experiences. Super-ordinate constructs were reliably but not comprehensibly identified on a single elicitation. Trivial constructs were relatively few and had low impact on personal meanings explored by P.C.A. C_1 and C_2.

Comparisons have been drawn between construct systems of subjects who had different experience levels. Firstly, students at entry into the College with their constructs at 6 and 15 months later and also to other matched subjects who were in their final year at college. In each instance 'less good' and 'good' students were compared. Observations of stability and change in the construction of activity meanings over time were made, noting the patterns of repeat and replaced constructs. Super-ordinate constructs were confirmed as a particular stable group of constructs around which system development takes place.

Two significant findings consistently emerged across the studies. The small sample sizes suggest that the findings are robust and identify meaningful differences between student groups.

For all subject groups a restricted number of construct types were identified as having most importance in defining activity meanings for the Physical Educations students studied:

Most significant were:		followed by:	
Intrinsic motivation	type 1;	Esteem-recognition	type 6;
Emotions	type 2;	Choice-autonomy	type 7;
Mastery/achievement	type 4;	Physical activity	type 10;
		Group involvement-affiliation	type 8,9.

Type 4, mastery/achievement constructs showed clear differences between the constructs systems of 'good' and 'less good' students 'experienced' and 'less experienced' students. Mastery/achievement constructs seem to be a more important (frequent) and more central (core) way of construing activity for 'good' than 'less good' students with differences apparent at student entry to college and maintained and strengthened throughout the course. It is reasonable to conclude that development of this type of construing takes place for both 'good' and 'less good' students with college experience. The precise nature of events which bring about this development was not investigated here, but evidence will be presented later (chapter 10) to show that these differences in construing do lead to different use of time by the two groups which in turn differentially effects the construct systems development of the two groups.

One must remember also that construing has been examined thus far for only groups of subjects and constructs taken as though they are individual discrete units. This is a considerable simplification of the term 'personal meaning' within P.C.T. The meaning of a construct unit is only fully realised when it is seen embedded within the system of the individual of which it is a part. Meanings in this latter sense will be discussed later in the case-study reports (chapter 12).

In any discussion of construct types as identified by the content analyses schema, one must remember each type contains a number of different specific constructs. For example, Type 4 'mastery/achievement' involves achievement, effort, working towards goals, success and so on. This again simplifies the information contained in the research data. Ultimately one needs to examine individual meanings of activity based on a phenomenological systems examination, based on both specific and type of constructs used by the individual. In pursuing meanings at the level of the individual (e.g.

in case-studies), interpretation of idiosyncratic meanings may be informed by their relationship to the more general meanings so far established for groups.

These results apply to a relatively small number of students of relatively homogenous and modest academic achievement upon entry to college. All were P.E. students, who had some academic success whilst at college in that they gained their degrees, a strength of this research is the discovery of significant results with a small sample which had such a truncated range of pre-college achievements. This suggests a robust, psychologically important, effect has been identified. A conclusion supported by the consistancy of results across groups. Conversely, this may be seen as a weakness in that the results may not generalise to other student populations. The results may be fairly generalised to other groups of P.E. students and they may also indicate factors relevant to all areas of students academic achievements, because success rates were based on results from two academic subjects. However, since the second subject was from the 'arts' generalisations to science students or those taking vocationally orientated degrees other than teaching would be less justified. Neither would it be fair to assume that the results apply equally to male and female subjects since the sample is largely male. Further work is required to validate these potential generalisations but the present results do suggest the approach provides a meaningful line of investigation.

CHAPTER 9: RELATIVE PRIORITIES OF LIFE ACTIVITIES

Introduction

Constructs are used to give meaning to the experience of activity. Some activities come to be construed as offering positive experiences, for example, 'happy' experiences whilst others will be seen less positively, perhaps even negatively, 'unhappy' experiences. As a result some experiences (high priority positive experiences) will be sought after, they are areas where the construct system effectively functions. Others (low priority experiences) are less sought after or indeed avoided. Other sought after activities are chosen because they give experiences which enable elaboration of a person's construct system to take place. Thus a choice to spend time on an activity is a choice to elaborate an area of one's construct system, and a choice to avoid on activity is to consider that in that activity elaboration of one's construct system is unlikely..

Objective:

To show that for all Physical Education students on entry to college, sports and sports related activities will have a higher priority than intellectual and work activities, but, with increasing time and experience of college activities, differences in priorities will emerge between 'good' and 'less good' students. The 'good student' will give higher priority to work and intellectual activity than the 'less good student', for whom sporting activities will remain the highest activity priorities.

Subjects:

The subjects comprised the ten longitudinal experimental group subjects, Y1L as described (pp 203) and the eighteen final year students from the cross-sectional study, (Y4), as previously described (pp 189). Data is also presented for the two matched groups of twelve students Y1 and Y3/4 from the cross-sectional study as previously described (pp 189-90).

Procedure:

The rank ordering of activities on Component 1 and then component 2 of the P.C.A. of the L.A.G. were taken as measures of relative activity priorities on each of these two dimensions of meaning.

Results:

Data in relation to the cross-sectional and longitudinal studies are presented simultaneously. In all groups and sub-groups subjects showed a high level of agreement on their activity priorities (Table 41).

Table 41: Student Activity Priorities
Activity priorities, as indicated by their rank order on component 1 loadings of a P.C.A. of L.A.G. Results are given for Year 1L students (elicitations 1, 2, 3, labelled e_1, e_2, e_3) and for all Year 4 students, Y4. The subjects are also split into 'good' and 'less good' performance groups. The left-hand column under each heading is for the 'good' students, the right-hand column for the 'less good' students. Degree of agreement between subjects of activity priorities was tested for each group and sub-group using Kendals' co-efficient of concordance, W., * marks significance at 0.05 level and ** marks significance at 0.01 level.

	e_1 (n=10)		e_2 (n=10)		e_3 (n=10)		Y_4 (n=18)	
GROUP	83.1**		72.2**		51.2**		153**	
Sub-group good	less good							
41.5**	58.8**		27.1*	63.5**	30.3*	49.6**	170**	76.2**

High concordance was also shown for matched subjects Y1 and Y3/4, (Kendals, W., n=12, 106.2, $p < 0.01$ and 134.3 $p < 0.05$ respectively).

Although similar comparisons were made for activity priorities indicated by C_2 of the P.C.A., only for Year 1L e_2 did the results reach significance. They did so overall and for both 'good' and 'less good' groups. (CHI^2, 72.9, 38.8, 42.9 respectively for 'good' and 'less good' and total sample, all $p < .01$ for n=16). Priorities indicated by C_2 activity ratings seem to be more individualistic than those for C_1 and further discussion of these will be left to case study presentations (Chapter 12).

The high concordance of activity priorities within groups made a second impression of the high level of agreement between subject groups activity priorities possible. Correlations between the groups average priority ratings of activities as indicated on C_1 were taken. These results are given in Table 42. They show in general very high agreement between groups on their activity priority ratings.

Table 42: Comparisons Between Sub-Groups' Average Activity Priorities

(a) Correlation coefficients for whole group comparisons of activity priorities.
(b) Correlation coefficients for good and less good sub-group comparisons of activity priorities.

(a)

Subject Groups	Correlations
Y1L e_1 - Y1L e_2	0.98
Y1L e_2 - Y1 e_3	0.94
Y1 - Y3/4	0.94

(b)

Subject Groups	Correlations between Good and Less Good Sub-Groups
Y1L e_1	0.88
Y1L e_2	0.84
Y3L e_3	0.25
Y3/4	0.94

Discussion:

Clearly there was a very high degree of consistency between subjects concerning their relative priorities of life activities on their major dimensions of meaning (C_1 of the P.C.A.) but less similarity on the more subsidiary meaning (C_2 of the P.C.A.). This suggests that a major reason for any differences observed in the behaviour and performance patterns of 'good' and 'less good' students lies in the qualitative differences in construing of activity events rather than their activity priorities. Such differences are indicated by the construct labels of C_1 of the P.C.A.

The consensus of priorities indicated by the results is presented in Table 43.

Table 43: Overall Consensus of Activity Priorities
The table presents the average rank order position of element activities 1-16 for Year 1 students (elicitations 1, 2, 3, labelled e_1, e_2 e_3) matched subjects at Year 1 and Year 3/4 and all Year 4 students. Subjects are split into 'good' and 'less good' performing groups as previously (excepting year 3/4 matched group). The 'all' students category is the average across subjects from e_1, e_2, e_3 (less good only) and Y3/4. The left-hand column under each heading is for the 'good' students, the right-hand the 'less good' students.

Activity	Y1L e1		Y1L e2		Y1L e3		Yr1	Y3/4	Yr4		All
1. School P.E.	8=	4	11	4	14	5	10	5	6	7	6
2. Lectures	11	11	14	11	4=	12	11	11	11=	11=	12
3. Sport lecture	8=	9	5	9	6=	10=	9	10	7	10	9
4. Matches	5	3	3	3	1	9	4	6	4	5	4
5. Training	10	10	8=	10	13	8	10	9	10	8	10
6. Hobby	2	6	2	5	9	4	4	2	1	3	3
7. Antagonists	12	16	15	16	16	15	14	16	15	15	15
8. Liked people	3	1=	4	2	12	2	2	3	3	2	2
9. Person influence	7	8	10	8	11	7	7	7	9	4	8
10. At home	4	6=	6	6	10	3	8	4	5	6	5
11. Injured	15	15	16	15	15	16	16	15	16	16	16
12. Private study	13	13	8=	12	8	10=	12	12	11=	11=	11
13. Assignment	14	12	12	13	4=	13	13	13	13	13	13
14. Exams	16	14	13	14	6=	14	15	14	14	14	14
15. Life now	6	5	7	6	3	6	5	8	8	9	7
16. Life ideally	1	1	1	1	2	1	1	1	2	1	1

Overall, priorities taken from the 'All' subject column show 'life as I would ideally like it to be' was as expected the highest priority followed by sports orientated activities, 'activities with people I like', 'a hobby (usually sport)', 'sports matches', 'an activity at home (usually sport)', 'school P.E.' which are mainly sports orientated activities. Next came 'life as it is now', which bridged the 'sports' and 'work life' domains, since the next priority group of activities were 'activities with persons of

influence , 'sports lectures , 'sports training', 'private study', lectures', doing assignments'. The three lowest priority activities were 'doing exams', being with antagonistic others' and 'life experience when injured'.

As noted above the only group whose results were significantly divergent from these priorities were Year 1 students at e_3. Examination of the differences between 'good' and less good students at this point in time revealed that it was the ratings of activities by 'good students which were atypical. Comparisons showed that 'lectures', sports matches', 'doing assignments , examinations' were all given higher priority ratings by these good students than by other groups whilst 'P.E. at school', sports training 'hobby' and 'being with liked people' were all given lower ratings. This would suggest that for this group of students, at this particular point in time were more academically oriented than sports orientated as hypothesised. However, the temporary nature of this effect (it did not occur for Y4 students) was not in line with the hypothesis

Perhaps this temporary phenomenon was desirable, an experimental phase helpful in elaborating the construct system. It may on the other hand have been merely an artifact of this investigation. Further investigations are needed to confirm or disconfirm this conjecture.

Whilst activity priorities for groups did seem to be fairly consistent over time, the meaning of those activities as expressed through personal constructs and reported previously was changing over time, particularly in mastery/achievement orientation to activity. Time apportioned to activities was also changing as reported in the next chapter. Overall then, the system of meaning was in a continuous state of flux.

CHAPTER 10: THE RELATIONSHIP BETWEEN PERSONAL MEANINGS OF ACTIVITY, ACTUAL BEHAVIOUR PATTERNS AND ACADEMIC SUCCESS

Objective

To examine the hypothesis that successful Physical Education students spend more time on course relevant tasks, that is work (private study and assignments) and sport (matches and training) than do less successful students and the corrollary that they will also spend less time on recreation/pure relaxation time and other activities such as maintenance and travel. It is hypothesised that these differences increase during the first 12 months students are at college, as the 'good' student places achievement/mastery more centrally within his/ her construct system than does the 'less good' student.

Subjects

The experimental group of 10 students who in the longitudinal study completed grids on three occasions during their first 15 months at college and described previously (pp 203).

Procedure

The L.A.G. was administered to the subjects at entry to college, 6 months and 15 months into the course. The students also completed a use of time diary covering 1 week during the 3 week period allowed for L.A.G. completion. The diaries (see pp 182) were recorded for 12 hours each day 8.30 a.m. to 10.30 p.m, with subjects recording their primary activity during every half-hour period. It was also requested that any significant period of work, or sport outside of this period be recorded.

Clearly such a time-sampling procedure encompassing only 1 week may be atypical of a student's use of time. To control to some extent for this factor the diaries were all taken during the third week of a college work block, each block running for 6 weeks and students were requested to list any extreme changes from 'normal patterns'. There were no such responses. Despite these precautions, it is considered that group results are more likely to be reliable than data from any one individual and it is these which are reported.

Results

Data from the diaries are summarised in Table 44 (a, b, c, d). Tables (a), (b) and (c) are for the diaries at entry, 6 months and 15 months respectively and Table (d) combines this data to give a three week sample of students' use of time.

Table 44: Physical Education Students' Use of Time

Comparison of time spent on work (assignments (A), private study (PS), sport (matches (M), training (T), recreative sport (RS) and hobbies and relaxation). Data on other activities consisting of travel, and maintenance: meals, shopping, washing, sleep etc., which occurred during the 12 hour diary periods are not reported. All data is given in relation to 30 minute periods.

(a) Diaries at Entry (week 9 of college life).

Mann-Witney U tests between 'good' (G) and 'less good' (LG) students in assignment work, U=1 p=0.008, private study U=4 p=0.048, and overall (U=5.5, $p < 0.1$). Overall sports time (U=7.5, $p < 0.2$) and pure relaxation time hobbies, so (U=6, p=0.11).

SUBJECTS	WORK			SPORT				RECREATION
	A	Ps	Total Work	T	M	Rs	Total Sport	Hobbies and Relaxation
LG (n=5)	38	93	131	34	44	9	87	322
G (n=5)	139***	48**	187*	56**	55	0	111*	269*
Total (n=10)	177	141	318	90	99	9	198	591

(b): Diary 2 (At 6 months)

Mann-Witney U test comparisons between 'good' and 'less good' groups for assignment work U=3, p=0.028) for total work time (U=5, p=0.075). For hobbies and relaxation U=4, p=0.048. (Note: subject 4 spends considerable time on drama club and church going. Should these also be considered as recreation? As a drama student perhaps drama shouldn't and church is not normally seen as recreation. However, they are not maintenance or travel. If one includes them as recreation the difference between the groups is increased with 'U' now equal to 3 p=0.028.)

SUBJECTS	WORK			SPORT				RECREATION
	A	Ps	Total	T	M	Rs	Total	Hobbies and Relaxation
LG	41	79	110	28	33	8	69	336
G	98**	83	181*	43	29	7	79	219**
Total (n=10)	139	162	291	71	62	15	148	555

*** $p < 0.01$, * a trend.

(c) Diary 3: (15 months)

Mann-Witney U test comparisons between 'good' and 'less good' subject groups, for assignment work time U=5, p=0.075, for overall time spent working U=4, p=0.048 and for time training U=2, p=0.016 and time on competitive sport U=2.5 p=0.028. (Note: if one again includes 'drama' and 'church' activities in recreation time there is a trend for 'less good' group to spend more time on recreation (U=6, p=0.11).)

SUBJECTS	WORK			SPORT				RECREATION
	A	Ps	Total	T	M	Rs	Total	Pure Relaxation
LG	66	63	129	9	55	6	70	276
G	167*	54	221**	42*	20*	3	65	245
Total (n=10)	233	117	350	51	75	9	135	521

(d): Diary Total: 1 (at 9 weeks) + 2 (at 6 months) + 3 (at 15 months)

Combined samples, 3 diaries, to further investigate work and recreation patterns. Mann-Witney U test comparisons between 'good' and 'less good' student sub-groups show for overall work totals U=4, p=0.048 and for assignment work U=2, p=0.016, for relaxation time U=5, p=0.075. (Note: if one includes 'drama club' hours and 'church activities' totalling 52 hours into recreation hours for subject 4 there is a significant difference, U=4, p=0.048.)

SUBJECTS	WORK			RECREATION
	A	Ps	Total	Hobbies and Relaxation
LG	145	225	370	946
G	404***	182	586**	733*
Total (n=10)	549	407	956	1679

Discussion:

There are identifiable differences between time spent on different activities by the 'less good' and 'good' groups. The most important being the consistant tendancy across the three diaries for 'good' students to have

spent more time on 'assignment work', which was graded work, and less time on 'pure relaxation hobbies' than did 'less good' students. Indeed, the extra time spent on work by 'good' students during the three observation weeks over that spent by 'less good' students was 216 half-hour units, which is almost exactly the number of reduced units of 'pure relaxation' time which was 213. Since there was no difference in 'sports time' or 'other activities' time this could reasonably be regarded as a straight trade-off. On average the 'good' first year P.E. student spent 19.53 hours per week working and 24.4 hours on "pure relaxation", whilst the 'less good' student (but not fail category) spent 12.33 hours working and 31.5 hours on "pure relaxation". (N.B. it should be remembered that the diary was taken only until 10.30 p.m. and that this relaxation figure is almost certainly an underestimate as will be the work time estimate for some students).

Sports involvement averaged 8 hours per week for 'good' and 'less good' students. However, for the first use of time sample taken at entry sports time was higher than the other two sampled occasions, averages being 9.9 hours, 7.4 hours and 6.75 hours. The difference is due to the extra time spent on training by 'good' students at the first sample week (Table 44).

One student of the 'less good' group appears consistently atypical of his group. He worked harder (averaging 21.8 hours per week, group average 12.33) and spent less time on recreation averaging 26.1 hours, group average 31.5 hours).

No results or conclusions are presented about 'time-use' changes over the year of the study. The 1 week sample of time is influenced by factors such as time of year, assignment submission dates, scheduling of sports matches all of which can make comparisons between single week samples

unreliable reflections of 'time use' at different times of year whilst remaining suitable for time-use sampling across groups of subjects at a single point in time.

It was reported earlier that with reasonable consistency there were differences between 'less good' and 'good' students' constructions of activities, but solely in terms of mastery-achievement constructs. The presumption was that differences in the 'use of time' would reflect differences in construing. That is, more time devoted to activities where mastery-achievement can be elaborated, and less to those where it is less likely, namely pure relaxation activities. This indeed appears to be confirmed in the area of work activity and recreation activity, sport being taken as neutral, part work and part leisure. If mastery-achievement constructs totals elicited from subjects over the 3 elicitation occasions are taken as the most reliable indications of their use of this type of motivation in Year 1, and similarly the work totals across 3 samples are taken as the most reliable indication of student work levels in their first college year, their relationship can be established. A correlation of $r = 0.755$, $n=10$, p 0.001, was found between the two variables. Furthermore, work times correlated with grades $r = 0.81$ (p 0.001) and achievement/mastery constructs correlated with grades $r = 0.58$ (p 0.05). In sum it is reasonable to conclude that a mastery-achievement construing of activity will mean a student will direct more time to work activities, notably those pertinent to success (assignments) and less time to pure relaxation. Of course a correlation coefficient is consistent with but cannot establish a causal relationship.

'A relationship between study time and student performance has not been consistently found in previous studies (see Chapter 3). The present data not only shows such a relationship but it also shows that it is a specific area of study time, assignment orientated work, that is important rather

than private study work in general. This discrimination was not made in previous studies and may have masked the relationship between study time and academic accomplishment.

The processes at work here may be speculated upon. It seems that 'good' students construing of activities will lead to their work involvement being targeted to where mastery-achievement is demanded by tutors and can be shown in results, namely in assignments. This work will lead in general to good academic results relative to other students, and a positive attitude towards them by tutors which validates the mastery-achievement orientation in their personal construing. The quality of taking part in such work activities will also be different between good and less good students, and this different process orientation may also be a source of validation, it may be a more enjoyable experience.

To increase student work levels particularly on assignments one might directly help the student through a 'learning conversation' in which personal goals may be clarified and successful personal adaption and change facilitated. This may support the more fortuitous and perhaps inadequate manner by which college experience may normally bring about change.

CHAPTER 11 : PERSONAL CONSTRUCT THEORY MEASURE OF WELL-BEING

Introduction

In the first half of this chapter the objective is to examine the validity of a P.C.T. measure of well-being. In the second half the objective is to explore the relation of the P.C.T. measure to student adaptation to College and also to their levels of academic success.

Objective 1

To test the assumption that differences in ratings on personal constructs of 'life as it is now' and 'life as I would ideally like it to be', when summated across all of a person's salient constructs is an evaluation of psychological well-being equivalent to overall life satisfaction as measured by 'Likert scales'. This construct measure of well-being was termed a discrepancy measures (Sd).

S(x) is the average ratings on all personal constructs of 'Life as it is now' and a sub-objective is to examine the relationship between S(d) and S(x).

Subjects and Measures:

A sample of 18 (14 men, 4 women) under-graduate P.E. students took part in this study. They were in their first year at college and had completed both a 'Life Activities Survey' questionnaire and the Life Activities Grid. General life satsifaction (G.L.S.) was measured by Likert scaling procedures incorporated within the questionnaire (Chapter 6). G.L.S. was the mean of subject responses to 3 questions, which used a five point scale from 'very dissatisfied' to 'very satisfied', on which subjects' rated their satisfaction in three major life activity domains: work, sport and leisure.

The assumption of additivity in measuring the G.L.S. is in line with the emphasis of earlier researchers (Andrews and Withey 1976; Campbell, Converse and Rodgers, 1976, Blackshaw, 1982) and with a previous pilot study (Leung 1983) which employed a P.E. student sample. S(x) and S(d) were derived from the L.A.G. (the average rating on all activities of all constructs of 'Life Now, and the average of differences in ratings across all constructs for 'Life Now' and 'Life Ideal').

Results and Discussion

Table 45 shows the relationship between G.L.S., S(x) and S(d).

Table 45: Correlations between grid and Likert scale measures of Life Satisfaction

	GLS	Sx
Sd	- .18	- .82
Sx	.08	

Sx and Sd were significantly related. Of the two measures Sd is potentially the more useful measure since it helps to identify the specific nature of dissatisfaction by highlighting the particular constructs upon which large discrepancies occur between 'Life now' and 'Life as I would like it to be'.

Neither measure shows any relationship at all to GLS. This contrasts with Blackshaw (1982) whose results supported a relationship between simple rating scales of Overall Life satisfaction and P.C.T. measures S(x) and S(d). The discrepancy in the two sets of results may be found in the methodological and sample differences which exist between the two studies. In the present study a 5 point scale was used to to rate satisfaction within each sub-domain area: work, leisure, sport, which when combined gave a

scaling spread of 12 points (3-15) for G.L.S. In constrast Blackshaw measured G.L.S. using a single nine point scale of overall life satisfaction. The differences in the subjects used in the two studies are perhaps even more important, since the general level of life satisfaction is very different between the two groups of subjects studied. Blackshaw's subjects had an average life satisfaction scores of 4.26 (SD = 1.71), a mean score below the mid-scale point of 5. In contrast, in the present study the majority of subjects' scores were in the positive satisfaction domain and had little spread (mean 11.17, SD = 1.3). Indeed only 1 score of 18 was below the mid-scale point, and 12 subjects scored either 12 or 13, consequently discrimination between subjects for the present study sample by satisfaction levels was low. Two distinctly different groups of subjects were being investigated in the two studies.

Perhaps the relationship of life satisfaction to P.C.T. measures only holds for persons of generally low satisfaction as studied by Blackshaw, or alternatively perhaps the scaling procedure used in the present study was not a satisfactory measure of overall life satisfaction.

Furthermore, the range of activities investigated in the two studies was different which could promote the contrasting results. Blackshaw's subjects were requested to select 'important areas in your life at the present time which are potentially satisfying' which would predispose the subjects to identify a narrow range of activities central to supplying life satisfaction, which contrasts with the full spread of subjects' life activities considered in the present study, and would increase the possibility of a relationship between overall life satisfaction scales and construct measures being supported. For counsellors, being able to home in on clients' activities which have potential to promote satisfaction and to reveal why dissatisfactions have occurred is important and the Blackshaw method is a very useful way to do it, but the overall critical point being

made here is that the two studies under consideration gave different results. Clearly there is a need for further investigation in this area to clarify the relationship between Likert rating scale and P.C.T. measures of satisfaction. Further light may be shed on this matter by post-hoc analysis of results.

A Post-hoc Analysis: The relationship between subjective enjoyment, subjective happiness and grid measures of life satisfaction.

The longitudinal design employed in the present study enabled further exploration of the concept of satisfaction to take place, since it enabled constructs important to subjects over an extended period of time to be identified. Many of the enduring constructs were unique in their importance to only a single individual, but a small minority of constructs were 'important repeats' for most subjects. They were frequently super-ordinate constructs.

'Enjoyment' was the most frequently noted of these constructs occurring for nine out of the ten subjects who produced three grids over 15 months. This is a cognitive dimension of intrinsic motivation within the content analysis system used in this study. Re-examination of the constructs from 18 first year subjects who completed at least one grid, showed that 17 subjects had an 'enjoyment' construct elicited, confirming its general salience to these subjects. Two scores for subjective 'enjoyment', were extracted from each subject's L.A.G., (Ex) was the rating of enjoyment on the element 'life now' and (Ed) for the difference betweeen enjoyment in 'life as I would like it to be' and 'life now'. The first score ranged from 1 to 10 where 1 is high score, the second from 0 to 9.

Similarly to enjoyment, positive affect, 'happy, feel good' was frequently a repeat construct with 12 subjects out of 18 using it on their first grid and 6 out of 10 subjects completing 3 grids using it on all 3 grids. Subjective 'happiness' scores hx and hd are computed in the same manner as Ex and Ed.

In contrast to happiness and enjoyment constructs, only 5 persons used the term satisfaction as a construct on their first grid suggesting that it may not be of universal salience amongst P.E. students, at least it seems less salient than 'enjoy' and 'happiness'.

Overall scores show that the subjects (n=18, and n=12) were enjoying life (average Ex = 3.4, (sd = 2.1)) and happy (average hx = 3.50 (sd = 1.8)). To all intents and purposes the x and d measures were equivalent, (correlations were Sx - Sd, r = 0.91, Ex-Ed r=0.96 and hx-hd r=0.97) and thus from here on only 'd' measures are reported.

The Relationship of Ed and hd measures to Likert rating scales evaluations of satisfaction (GLS) and the construct ratings satisfaction measure Sd are are given in table 46, for whom all three measures are available.

Table 46: Satisfaction and Subjective Happiness and Enjoyment
Correlations between subjective measures of happiness (hd), enjoyment (Ed), and satisfaction evaluated by repertory grid (Sd) and by Likert scales (GLS). All 'd' measures are for differences between 'life now' and 'life as I would like it to be' on repertory grids (* $p < 0.05$, ** $p < 0.01$).

	Ed	hd	Sd
hd	0.64*		
Sd	0.80**	0.65*	
GLS	0.19	0.22	- 0.22

There were significant relationships linking the three measures, Sd, Ed and hd, the strongest relationship coming between Sd and Ed ($r = 0.80$). The gap between aspiration and achievement as measured through personal constructs (Sd) is indicative of overall life enjoyment (Ed) and also of positive affect, happiness (hd). But none of these 3 measures was related to G.L.S. the Likert scale measure of satisfaction.

In sum, Blackshaw (1985) has shown that a personal construct measure of the gap between 'life as it is at present' and 'life as it would ideally be' is, for students requiring counselling, related to their feelings of dissatisfaction in areas of life considered important to gaining of satisfaction. The present results show that the same grid measure of satisfaction for 'normal' P.E. students none of whom were seeking counselling, was related to their expression of subjective enjoyment and happiness. In contrast with Blackshaw it was not related to a rating scale measure of satisfaction.

The present results also suggest satisfaction is not the best term to use when P.E. students global sense of well-being is being measured. In addition, one of the reasons Blackshaw (1985) gave for using a persons own construction of reality as a basis for measuring well-being, was that it is made up of both cognitive factors (satisfaction) and affective factors (happiness) which are moderately correlated, and thus satisfaction on its own is an inadequate measure of well-being. The construct measures do not require the separation of satisfaction and happiness measure.

In consequence of the above, it is suggested here that for P.E. students 'enjoyment' may be a more appropriate index of the cognitive dimension of well-being than is satisfaction, and it reflects interest and intrinsic motivation levels. The P.C.T. measure Sd therefore represents overall levels of psychological well- being, a combination of enjoyment and happiness levels.

Clearly this is a promising result and the personal construct theory approach to understanding psychological well-being is worthy of further investigation, in particular for its potential both as a diagnostic and a counselling instrument. Further research is required to clarify why differences between the two studies presented have emerged.

Psychological well-being and academic success

Objective 2:

The objective was to test specific hypotheses concerning the pattern of Sd scores as they develop during the students first year at college and their relationships to academic success.

A preliminary objective was to present descriptive data of 'Sd' scores and establish guidelines for 'Sd' score interpretation.

It was anticipated that for most students there was an element of 'free will' exercised in choosing to go to college and the early weeks at college would be a time when students would retain an idealised view of the college environment and experience. Students at entry would view college as meeting, (or potentially meeting), their personal life activity goals, well-being would be high and hence 'Sd' scores low. During the early period of adjustment to college life, when a normative life pattern was being established in the new environment, 'Sd' scores would increase, as satisfaction reflected development of more realistic expectations of college. This process of adaption would be continuous but progress at different rates for different individuals but successful adaption to college will occur during the first year of college life.

The objective was to show that in the normal successful transition from pre-college to college lifestyles, 'Sd' scores would be low at entry, high at 6 months and return to moderate scores after 15 months of college experience.

There would be no differences between academically successful and less successful students on global measures of psychological well-being, as assessed by L.A.G. 'Sd' scores.

It was unlikely that subjective measurements of global psychological well-being, Sd which reflect levels of personal goal attainment across a variety of activity domains, would be closely related to 'objective'

measures of students academic performance within a single activity domain, except where extreme life dissatisfaction was being experienced, and a totally inadequate adjustment to the college situation existed.

An academically successful student who views academic activity as an area for the pursuit of excellence could show a low or a high 'Sd' score, reflecting overall life satisfaction or disatisfaction respectively as could a less academically successful student but for disimilar reasons. In the latter case a low Sd score may be recorded by a student for whom the meaning of academic study is not so much concerned with academic excellence, but only with subject interest and who regards a good social life as equally important and is getting it. The 'Sd' score will reflect life experience outside academic work, including such areas as sport, recreation and general living, where it seems unlikely that grade success will affect scores. One would hope, however, that academic success and overall life satisfaction are possible and compatible for some individuals.

Subjects:

18 students (14 men, 4 women) in college Years 3 and 4 (GY3/4) and 18 first year students (GY1) (12 men, 6 women).

Procedures:

All subjects completed L.A.G. at least once. Ten of the first year students completed L.A.G. on 3 occasions over a 15 month period. Subjects were split into 'good' and 'less good' groups according to their grades; the split occuring at the average grade.

Results and Discussion:

(i) Description of 'Sd' score distributions

The results first presented are descriptive. The mean and range of 'Sd' scores are provided to give a framework within which single 'Sd' scores can be interpreted and comparisons are drawn with S(d) scores for

Blackshaw's subjects (1985). Specifically, the 'Sd' score of the low satisfaction U.S. students (Blackshaw 1982) will be compared to the 'Sd' scores of the 'normal' British students.

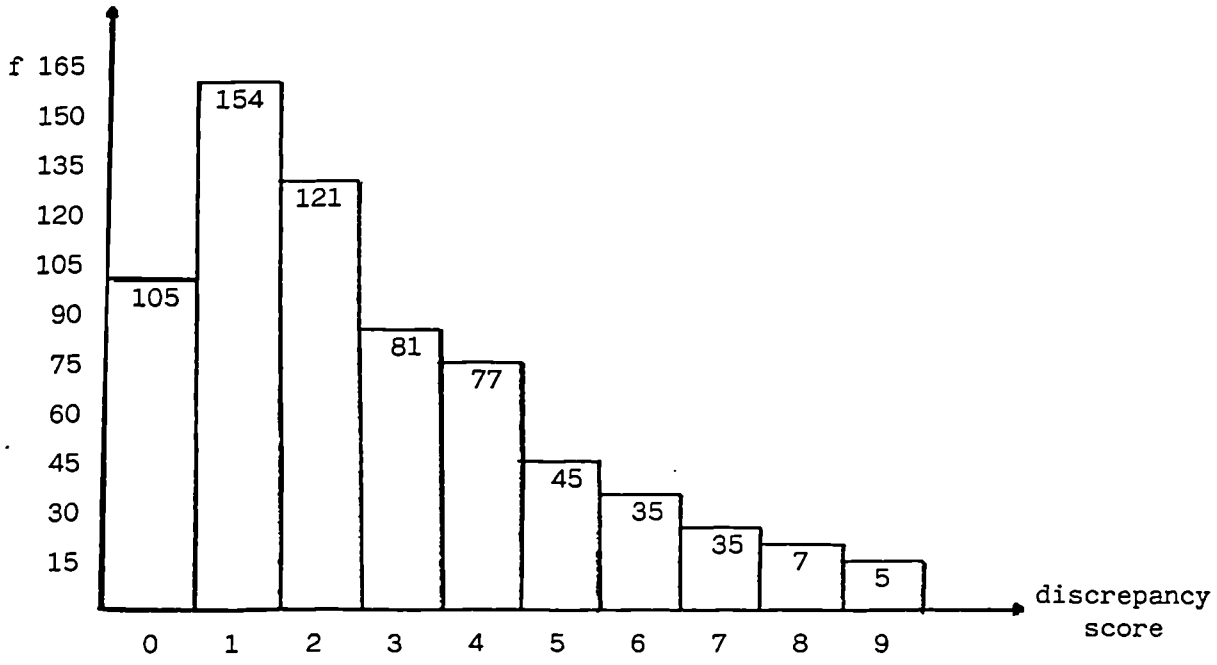
Taking the scores for the whole sample (GY3/4 and GY1), there were 36 independent 'Sd' scores from students. Although not a large or random sample it will provide an initial basis for assessing 'Sd' score norms. The group average 'Sd' score was 2.41 with standard deviation = 1.02. It would seem reasonable on the basis of this limited sample to provisionally suggest that 'Sd' scores between 1.4 and 3.4 (plus or minus 1 Sd from the mean) are the normal range of 'Sd' scores and those less than 1.4 or greater than 3.4 are 'more unusual' scores.

It is interesting to note that the comparable figures for Blackshaw's 1985 low satisfaction students using his nine point 'd' scale rather than the 10 point scale used in the present study were mean 3.23 with standard deviation 1.00, showing the expected higher mean score but with similar Sd.

One can also examine the construing of a single subject. Identification of constructs most contributing to the 'Sd' score for that subject can indicate their key sources of dissatisfaction. A typical score, for example, of Sd=2.4, would emerge from subtracting two rows of ratings for 'life now' and 'life ideal' construct by construct, across on average 19 constructs, and calculating the average. The scores for each single construct will range from 0-9, some greater than the subject's 'Sd' score of 2.4, some less, but at what point does one assume such a single construct discrepancy score to be extremely large, representing a meaningful difference between the two constituent scores from which it was derived? Graph 1 shows the distribution of discrepancy scores for single constructs for all the constructs the 36 student sample produced. It can be seen that 82% of single construct discrepancy scores were less than or equal to 4. A

further 12% had scores of 5 or 6 and only 6% scored more than 6. Thus difference scores on a single construct which are greater than 6 are extreme and scores at 5 or 6 may be considered unusually high.

Graph 1: Histogram of discrepancy satisfaction scores
Distribution of single construct discrepancy scores for 36 subjects, 58% occur in the blocks (0,1,2), 24% in the blocks (3,4), 12% in blocks (5,6) and 6% in blocks (8,9).
(Theoretical distribution of percentages based on random scores are very similar, 49, 24, 16 and 11%.).



In sum 'Sd' scores for normal P.E. students averaged 2.41 (Sd 1.02). Extreme 'Sd' scores lie outside 1.4 and 3.4. Unusually large single construct discrepancies between 'Life Now' and 'Life Ideal' ratings are those greater than 4, (about 12% of scores).

(ii) 'Sd' scores in relation to college experience and academic success.

Table 47 shows the pattern of 'Sd' scores in relation to the time the student was at college and their level of academic success.

Table 47: Psychological well-being, its development and relationship to academic success.

'Sd' scores for the total Year 1 student sample (n=10) at entry and two further points of time: six months and 15 months, and a second sample (n=18) at 36 months of course (Year 3/4, n=18). Sub-group scores for academically successful students 'good' and 'less successful' (less good) are also given. 'Sd' is L.A.G. measure of psychological well-being 'less good' and 'good' are levels of academic success.

	'Sd' Year 1			'Sd' Year 3/4
	Entry	6 months	15 months	
Subjects 'less goods'	2.5	2.1	2.28	2.26
'goods'	1.88	2.7	2.14	2.56
all	2.19	2.4	2.21	2.39

Comparisons between 'less good' and 'good groups' of students in year 3/4 and year 1 (table 47), revealed as hypothesised no significant differences, between the groups levels of well-being (the sign test) neither did comparisons across groups ordered by time, 'year 1 through to year 3/4, contrary to the second hypothesis.

Inspection of these data revealed two interesting points. Firstly, 6 out of the 10 first year students increased their global 'd' score between entry and the 6 month point, two did not change, and only two decreased their score. The latter two had distinctly high scores at entry (4.1 and 3.0) as against the next highest (2.2). It suggests that those who at entry to college experienced a considerable negative discrepancy in 'life now' and 'life as I like it' scores reduced this discrepancy in the first 6 months of the course through making successful adaptation to college, whilst persons who had very low 'Sd' scores, representing over-idealistic expectations of the college environment, changed in the opposite direction, idealistic expectations became more realistic. Secondly, extremely high scores ('Sd' = 3.4) or extremely low scores ('Sd' = 1.4) occurred on only 6 occasions each without any particular pattern to reveal why they occurred. The reasons for these extreme scores needs to be examined as and when they occur for each individual to establish the reasons for their occurrence.

In sum there is no support for the first hypothesis that psychological well-being will move from high to low and back to moderate levels during the 15 months of college experience. Discrepancy scores did increase across the first 6 months of college life as adjustment was made but only for students whose initial 'Sd' score were low (high satisfaction).

It is also suggested that discrepancy scores which were initially high will, however, be modified in the opposite direction. The relatively few subjects falling into this class prevents full confirmation.

The 'Sd' scores at the third time of testing remained within the normal range for 7 of the 10 subjects, but of the other 3, 2 showed extremely low 'Sd' scores and 1 an extremely high score. The expected general lowering of scores at this point in time was not observed. Perhaps to have done so would have represented idealistic rather than realistic perceptions.

As predicted both high and low satisfaction scores occurred for the academically successful and less successful alike.

Much more research is needed if the student adaptation process is to be understood. It was, unfortunately, not possible in this study to investigate levels of well-being with sub-groups of activities for example sports- related or study-related since this information could not be extracted from this Life Activities Grid.

Conclusions of this study are tentative and need to be confirmed for a fuller understanding of student psychological well-being and adaptation to the college environment. However, the 'Sd' measure used in this study seems to offer much potential in future research and as a counselling diagnostic aid.

An Overall Synopsis of the major findings presented in Section D.

1. The L.A.G. elicitation procedures reliably identify personal constructs. They accurately but not comprehensively discriminate super-ordinate constructs from sub-ordinate constructs.
2. The L.A.G. completion and interpretation procedures are reliable.
3. Personal construct systems develop during student's time at college, through construct replacement around a core of stable and largely super-ordinate constructs.
4. Academically successful and less successful students are generally similar in the types of constructs they use to construe activity events, so too are more and less experienced students.
5. One construct type discriminates between more successful and less successful students, and between experienced and inexperienced students. It is type 4 mastery/achievement constructs which have higher frequency in the construct pools of both more successful, and more experienced students.
6. Achievement/Mastery Type 4 constructs also tend to be more central in successful students construct systems, as reflected by super-ordinate constructs, and become more so with college experience, as reflected in the P.C.A. of L.A.G.'s.
7. The relative priorities of activities, assessed by their ratings on C1 of P.C.A. of L.A.G. show very high consistancy across student experience and success levels. Activity priorities as rated on C2 of P.C.A. of L.A.G. show much variabiity.
8. The consistent activity priorities as shown by C1 ratings are firstly for sports and sports-related activities, then study and college work in general, finally a group of 3 negative experiences, examinations, injury and being with antagonistic people.

9. More academically successful students use their time differently to less successful students, spending significantly more time on college assignments, that is graded work, than more general private study. They do not, however, spend more or less time at sport. The extra work time of good students is a direct equivalent to the reduced time they spend in relaxation in comparison to less good students.
10. There is a highly significant correlation between the mastery/achievement motivation constructs in a students construct pool and the time spent on extra assignment work.
11. 'Sd', a measure of psychological well-being taken from the L.A.G., is not related to an independent Likert scale measure of overall life satisfaction but is related to overall measures of 2 psychological dimensions: subjective enjoyment and happiness.
12. The meanings of enjoyment and happiness are defined through their relationships with other constructs within an individual's personal construct pool and are thus unique to that individual.
13. Further investigation of Sd is necessary to clarify and extend its meaning for a range of subjects.
14. There is no one to one relationship between subjective psychological well-being (Sd) and academic success measured by college grades.

These 14 points provide a concise summary of the main findings of this research without the detail of method, subtlety of findings or discussion of reservations which are included in the main body of the text, and to which the reader is referred.

These findings are all based on group analysis and as such are generalisations not necessaraily pertinent to any single individual, the treatment of meanings is atomistic rather than holistic To fully understand

personal meanings of activity at least as far as current methods will allow an idiographic and phenomenological approach is needed, and is possible through case studies.

CHAPTER 12: CASE STUDIES

Introduction:

The presentation of research objectives and findings have so far been in nomothetic and atomistic form, and as such they are incomplete. What is also required is a more phenomenological and holistic presentation of information and this is achieved by three case-studies. The presentation and interpretation of these studies was influenced by the understanding gained through the nomothetic studies thus far presented, but each goes beyond what is achievable in nomothetic studies and adds detail to the information on each subject. Further insights will also be gained though presentation of the studies on the methods used to explore subjects' construing and behaving. Methodological strengths will be highlighted and weaknesses explored.

The case studies presented are for: a 'good' student, a 'less good' student and a student developing over 15 months. The three subjects were chosen as representative of the total pool of subjects to enable major features of the research to be exemplified. One was randomly selected on the 'good' student group; one from the 'less good' student group; one from the 'developing with experience' student group (longitudinal study). Three further parallel case studies are available from the author.

Case Study 1(CS1) : An Outstanding Student

The subject of the first case study graduated with 1st class honours. He was a 21 year old male student reading Physical Education and Education towards a B.Ed. degree.

The elicitation of constructs and completion of repertory grid took place in the fifth week of his honours year of study. Discussion of his grid took place during the subsequent week. It centred on interpreting a principal component analysis of the grid, the subject and investigator working together. Subsequently, further grid analysis was undertaken by the investigator and CS1 gave a written account of how he saw his personal goals in the light of the interactive conversation concerning his grid. The account was based on the grid interview but not restricted to it alone.

A 'use of time analysis' was also made, retrospectively to the week of investigation. This showed that he was a very hard working student, yet one able to maintain a high commitment to active sport. His working commitment entailed 45½ hours of which the larger proportion was assignment work (including that towards a dissertation), which took 24 hours. There was 12 hours devoted to lectures and 7½ hours private study. Private and club sports training took 4½ hours and competitive sport (largely basketball) a further 4 hours, making in total 8½ hours of sport.

Turning now to CS1's repertory grid, he produced 22 constructs for use in his life activities grid (see Tables 48 and 49). Four of these were denoted super-ordinate constructs from their positioning at the top of a construct ladder. Each table corresponds to a component taken from a principle component analysis of the subjects' 22 construct x 16 life activity grid. Constructs are ordered according to their loading on the component (decimal point omitted), rather than their original position in the grid. This position is tabled under the heading 'construct number'. Super-ordinate constructs are marked by the symbol S.

Table 48: Case Study 1, Component 1 of PCA of L.A.G. The percentage of grid variance accounted for is 48.6.

Construct Number	Factor loading	Construct labelling (preferred pole)	Construct Type
22	97	At one with the situation.	1
21	95	Success perceived as possible.	4
4	95	Relaxed.	2
15 S	91	Confident have ability.	4
7	90	Calm, in control.	6
1	89	Active and willing to participate.	1
3 S	89	Enjoying the activity.	1
16	87	In control.	4
19	86	Involvement is more total.	1
2	83	Sense of excitement prior and during activity.	1
14	81	Self-assured and independent.	6
18 S	81	Helps gain self-understanding.	5
13	59	Absence of feeling time-pressed and hassled.	2
10	51	Satisfied with outcome.	1

Table 49: Case Study 1, Component 2 of P.C.A. of L.A.G. Percentage grid variance accounted for is 31.3.

Construct Number	Factor loading	Construct labelling (preferred pole)	Construct Type
9	94	Thought and preparation required.	4
12	93	Commitment needed.	4
5	81	Important, useful, necessary.	1
11	80	Results in sense of achievement.	4
20	78	Viewed as an on-going challenge.	4
10	77	Critical evaluation of outcome.	4
17 S	74	Facilitates active, lifestyle.	1
8	73	Important influence on the future.	14
6	73	Extends one's knowledge / abilities.	5
13	70	Involves some time pressure / hassle.	2

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

The first two components of the PCA grid analysis account for 48.6% and 31.3% of the original grid variance. This gives a total of 79.9% retained variance and indicates that the two components retain a considerable proportion of the personal meaning the subject attaches to his life activities in so far as they are revealed through his personal grid. The

relatively high variance accounted for by Component 2, suggests that it is almost as important a dimension of personal meaning as that denoted by Component 1. An inspection of the type of constructs used by CS1 on Component 1 shows that he employs constructs of intrinsic motivation (type 1), emotions (type 2) mastery/achievement (type 4) and autonomy (type 6).

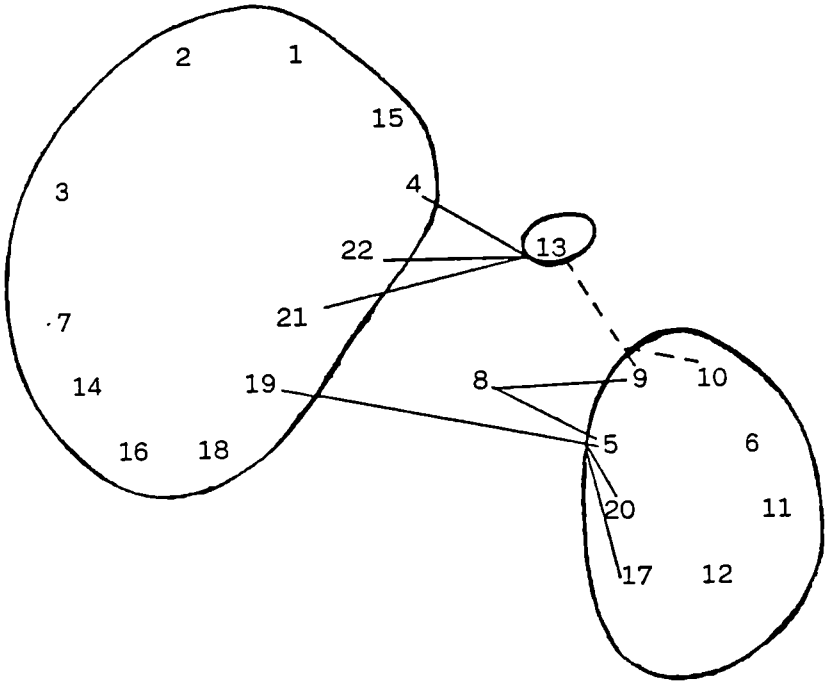
Component 2 is heavily dominated by mastery/achievement constructs (type 4) and this relates to some extent with intrinsic motivation (1).

A second method of looking at construct organisation is the pattern of construct correlations. This of course is the data base from which the P.C.A. components are taken and one anticipates considerable communality of meaning between the two procedures. However, the correlations network allows detail not contained in the P.C.A. to be observed. Presentation of the correlation networks will be given prior to comment and discussion on the organisation and meanings contained therein.

Network Correlations

An inspection of the network of correlations between ratings of activities along constructs (taking $r > 0.61$, $p < 0.01$ when $n = 16$) Figure 1 shows that the construct system is primarily organised into two tightly knit groups of constructs which closely correspond to the two PCA components. There are also two constructs (number 13, 'sense of time pressure', and 19 'involvement is more total') which each link the two primary groups. Number 13 has correlations with constructs in each group but is not clearly in either group and number 19 whilst clearly in group 1 has 4 significant correlations with members of the other construct grouping. This organisation of constructs is an articulated system in the sense used by Makloŭf-Norris (1970).

Figure 1: Case Study 1 Construct Organisation. A schematic representation as indicated by the patterning of significant correlations between constructs ($r = 0.61$, $p<0.01$ for $n=16$). It is an articulated system. Constructs within each circle correlate with all other constructs within the circle. A few relationships, 3 in the big group, 4 in the small circle grouping were only at the 0.05 rather than 0.01 level of significance. The dotted line indicates an inverse correlation.



NOTE: This schematic presentational form is aimed at presenting the pattern of correlations between constructs in a visual and accessible form. It was derived from two influences. Fistly the author's efforts to understand the nature of Principal Component Analysis by examining the underlying correllation networks, in similar manner to that of Morris (1977, p.139) and subsequently relating this to Maklouf-Norris, Jones, Norris (1970) graphs of articulated construct systems organisation.

Thus it can be seen from the first primary group of constructs that for CS1, activities, when positively experienced, are intrinsically motivated since they are perceived as enjoyable (3) give a sense of excitement before, during, and after the event (2) and a sense of oneness is created between performer and task (22). The activities allow a feeling of mastery since there is an experience of confidence, control and success (15, 21) whilst remaining relaxed and calm (4).

CS1 said he prefers situations where "I perceive success as possible, am confident in my own ability to deal with problems arising from involvement and which are a means of gaining greater understanding of myself".

For a sense of total involvement (19) there must also be a perception of challenge (20) and personal importance (5) to the activity, which are important aspects of an interesting life-style (17). This is the linkage between component 1 and 2 groups of constructs and perhaps the heart of his personal meaning. Further examination of Component 2 shows that challenge requires commitment (12) thought and preparation (9). This can help him extend his knowledge and abilities (6) and give a sense of satsifaction with achievement (11). This dimension of meaning also creates the possibility of time pressure and hassle (13) which, linking back to dimension 1, is not seen as conducive to confidence (15) and relaxation (4) or feelings of oneness (22) and success (21). The construct of time pressure and hassle (13) thus creates the potential for CS1 to experience personal conflict, since it is equated oppositely with component one and two needs. It seem that CS1 considers some time pressure and hassle as inevitable if challenge and change are to occur but equally he 'sees' that it needs to be limited, if a confident, successful display of skills is to take place. A balancing is needed.

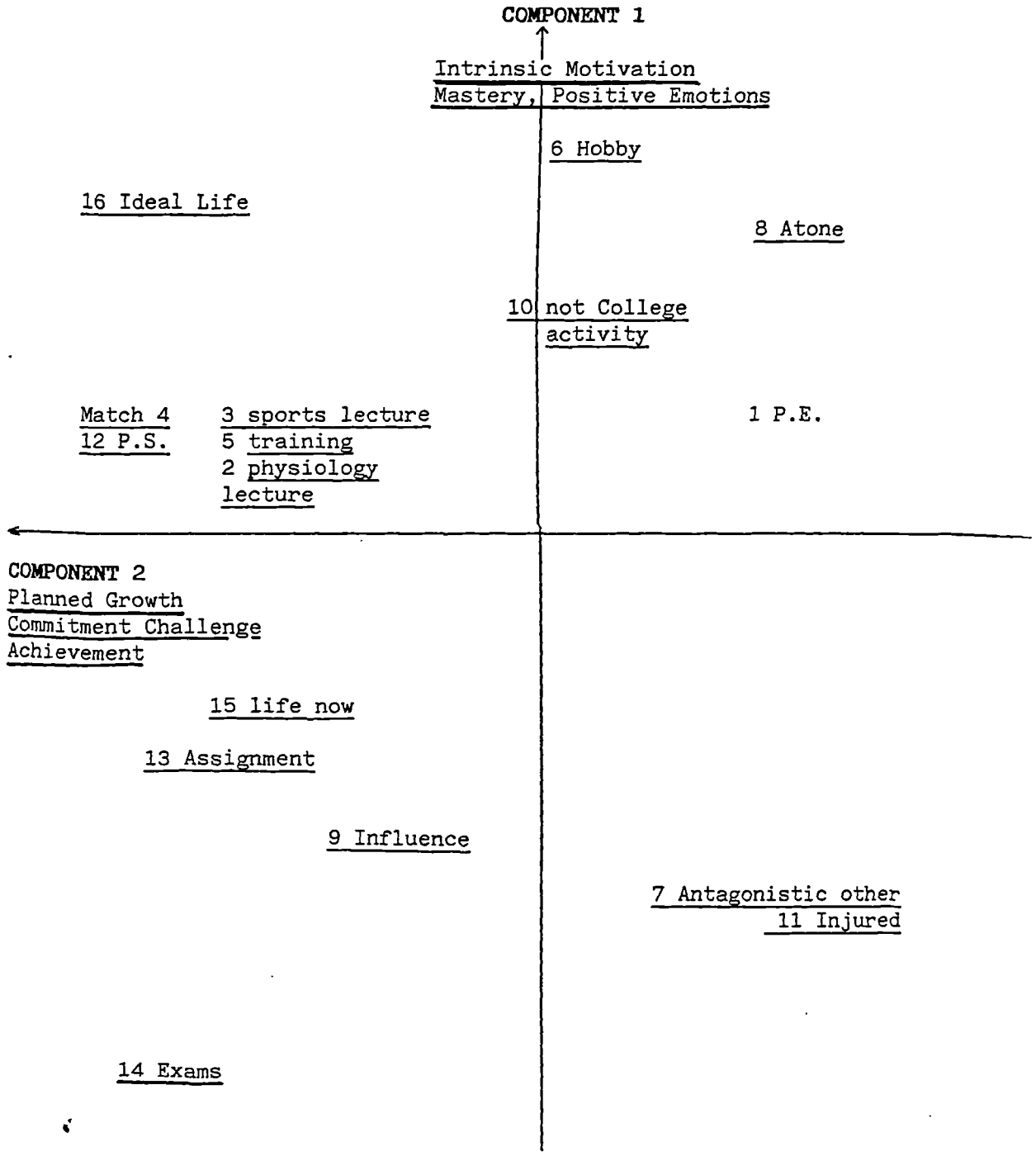
CS1 seems to be looking for the sense of flow needed for optimal experience (Csikszentmihalyi, M., and I.S., 1988) and also an absence of stress, as the term is used by Lazarus (1966), and Martens, R. (1977). Construct 8, 'important to the future', correlates only with the constructs, 'important' (5), and 'requires thought and preparation' (9). This awareness of the future is described by CS1 as follows:- "....the principle that present participation will reap benefits in the long-term", and those benefits "are not financial benefits, but more important personal fulfilment and happiness". Furthermore, when he was commenting on why he chose to return to college to do an honours year of study as opposed to going out into a teaching job he said "the short-term view of finding employment is probably little more than a "hedonistic alternative" which "in the long-term

will lead to professional stagnation, with the resultant constraint on personal happiness". This ability to take a long-term as well as short-term perspective is consistent with Wankowski's (1973a) research into academic success.

PCA Analysis of Life Activities

CS1 subjectively experiences his life activities as indicated in the PCA graph 2. The PCA elaboration of personal meaning is constrained to a two dimensional representation and as such misses some of the subtlety and complexity of the construct organisation described above, notably where linkage between the major clusters of constructs are concerned. However, it does enable the constructs to be related to activities and provides a global impression of the way CS1 experiences his world.

Graph Σ: Element Organisation for CS1
The elements positions for CS1 according to their ratings along the first two components of the PCA of his grid.



At this level of abstraction 3 sub-groups of activities are discernible. Two positive areas of life experience and one negative area. The first group top left quadrant contains the work domain of lectures, private study, and the sports domain involving matches, training and sports lectures. This sub-group of activities rate moderately in relation to the 'mastery intrinsic motivation' dimension of construing (enjoy, success, feeling atone, confident, control) but are most significant to realising planned growth (preparation, commitment, challenge achievement). These activities may also involve an element of time pressure and hassle, and noting the proximity of 'life now' (15) to the group, best encapsualted what life was about for CS1 at this time.

The second identifiable sub-group of activities (see top right quadrant) is smaller and less tightly formed relates more to the leisure than serious activities domain, relaxing hobbies, being at one with a social group, an activity outside of college and interestingly, PE when at school. This activity domain is highly rated for intrinsic motivation and mastery and moderate to lowly rated on the planned growth dimension.

The third sub-group (see bottom right quadrant) includes just two activity elements and these two are the antithesis of what life is ideally like. They are being with antagonistic people and being injured.

Interestingly two elements stand in isolation, life as it ideally would be and doing an examination. Whilst both are similarly seen as planned growth experiences (important, preparation, commitment and so on) exams are also perceived as a strongly negative experience, not intrinsically motivating or allowing mastery to be displayed; certainly they involve time pressure and induce anxiety. CS1 had a history prior to his honours years of under-performing on examinations relative to course work assessments. He

sought much advice from tutors before accepting to undertake an honours course, expressing a fear of not doing himself justice. This fear and examination threat was commented on by CS1 as follows:-

> These tend to be the dominant feelings, although I obviously realise the importance of study as a means of gaining a greater understanding both of myself and others, and as a means of extending knowledge - but there seems to be a pre-occupation with assessment. Such an outlook creates a view of study as a requirement rather than a learning experience, a constant worry rather than an interesting challenge.

However, his honours assessment across his two subjects areas emphasised course work and dissertation assessments with only some 25% of overall marks being allocated to examinations. This allowed much personal choice and less extreme time-pressure and seemingly given his degree classification it helped.

Life as he would ideally like it to be (top left quadrant) would be both high on intrinsic motivation, displaying mastery, and enabling planned growth. The linkage constructs as discussed previously, 'total involvement' and 'time pressure' are interesting to consider, with respect to these idealised life experience requirements. The total involvement requirement construct 19 as it links between the two components is very much in line with the CS1 ideal life, but as noted previously, time pressure requirements constructs were opposing in relation to each of the components. The evaluation of Life Now (15) confirms the ideal is unobtainable and that some inherent conflict exists in his life experience requirement. Some compromise to give perhaps not an ideal but at least equable balance across life activities is seen as necessary.

He comments that "life as I would like it to be is a hypothetical goal - it would seem that few people are absolutely happy with each and every aspect of their life-style".

At the time of completing the grid, life as represented by the element of 'life now' was highly satisfactory in terms of planned growth requirements but a little lacking in terms of intrinsic motivation and mastery requirements.

'Life Now' and 'Life Ideal' Compared

An examination of raw scores on the original grid table 50 for 'Life Now' and 'Life Ideal' elements revealed that the P.C.T. measure of well-being S(d) was 2.70 suggesting that life overall was a positive experience. The difference between ratings given to 'life as it is now' and 'life as I would ideally like it to be' for the twelve Component 1 constructs representing intrinsic motivation and mastery averaged 4.25 and for the seven Component 2 constructs, representing challenge and growth, 1.20. This indicates that whilst life overall was positive there was insufficient intrinsic motivation and mastery (CP1) but the level of challenge and growth (CP2) was good. (The median split of difference scores for all the 19 constructs, gives scores 0-3 as low and 4-7 as high differences. The 12 Component 1 scores split 10 high 2 low, $p = 0.033$ and 7 Component two scores split 0 low 7 high $p = 0.008$ (using the Binomial test). Life was not ideally balanced but overall satisfactory.

Table 50: Comparison of Construct Ratings of 'Life now' and 'Life ideal', presented separately for constructs significantly loading on Components 1 and 2 (CP1 and CP2). Raw scores for CS1 Raw grid for the elements 'life now', 'life as I would ideally like it to be' CP1 = Component 1 of PCA analysis; CP2 = Component 2 of PCA analysis.

	Element Ratings		Differences in Element Scores N-I by P.C.A. Component		
Constructs	Life as it is now, N	Life as I would like it to be, I	CP1	CP2	other
1 Active and willing to participate	6	1	5		
2 Sense of excitement prior & during activity	5	3	2		
3 Enjoying the activity	6	1	5		
4 Relaxing in nature	8	4	4		
5 Useful/imp/nec activity	3	3		0	
6 Extension of ability/knowledge	2	3		1	
7 Calm and in control	7	1	6		
8 Imp influence on future	2	3			1
9 Requiring thought & preparation	2	2		0	
10 Critical of outcome	2	4		2	
11 Sense of achievement (post)	4	1		3	
12 Requires commitment	1	1		0	
13 Time pressure/hassled	2	6			4
14 Self-assured and independent	7	3	4		
15 At ease and confident	8	1	7		
16 Feeling in control	6	1	5		
17 Facilitate active & interesting lifestyle	4	1	3		
18 Greater understanding of self	3	2		1	
19 Involvement more total	5	2			3
20 Viewed as a challenge	2	2		0	
21 Perceived success possible	7	3	4		
22 At one with situation	7	1	6		

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

The 3 single constructs with largest difference scores are, at ease and confident (diff=7), calm and in control (diff=6), at one with the situation (diff=6) closely followed by enjoyment (5) and active and willing to participate (5) all of which loaded on CP1 of the P.C.A. However on this component a 'sense of excitement', and 'learning about myself', were both constructs which had very low difference scores.

CS1 suggests that such discrepancies should "not be valued as source of disillusionment, but aspects which are to be strived for". What a positive attitude this displays.

To sum up, CS1 wrote an outline of his current personal goals, which very much reflects the heart of the discussion so far and was as follows:-

Outline of Personal Goals

"(1) To attempt to view my present academic commitments in a more realistic manner. This doesn't mean to deny their importance, but to try to view them with a more positive frame of mind - not to become overly dominated with worry about personal standards, but to fulfil the requirements to the best of my ability - and to be satisfied with the outcome. (Unfortunately, as personal experience demonstrates, this is not an easy task.)

(2) To maintain a level of sporting participation in the competitive environment - but to be selective so as not to involve too great a time commitment. Competitive participation requires an element of practice/ training, if personal standards are to be at least maintained. Choice of activities should reflect the flexibility in training commitments i.e. number of club sessions (time period involved, late stops etc.) versus the possibility of individual practice (for example basketball in relation to shooting). In this way training/practice can be incorporated into a more flexible schedule with more personal control.

(3) To maintain an involvement with recreative (including sport) and social activities. Such activities provide enjoyment and social participation which are important since they provide a medium for relaxation, and offer an opportunity to meet and share experiences with others.. It is vitally important to have the self-respect to be realistic in the time devoted to such activities, but while involved in them to be involved,

and express oneself without overtly indulging in worries about academic commitments. Such activities are often most rewarding if spent in the knowledge that time usage has been productive, i.e. today I have done...

(4) To combine the learning of the course material with a more general awareness of myself and others, thereby possibly decreasing my pre-occupation with course requirements and examinations. This can only be achieved with a more planned approach, and a more objective attitude."

He also commented that in doing and discussing the grid he felt that insight into personal goals and directions were obtained and that "a number of possible behavioural alternatives have come to the fore". Also that "this awareness of alternatives is not sufficient to promote change in itself (if change is necessary). This requires the acceptance of more appropriate patterns of behaviour which result from personal experience and interaction with others".

Case Study 2 (CS2) - A Student of Modest Accomplishment

The subject CS2 obtained a third class honours degree, having read Physical Education and Education studies towards a B.Ed., degree. His assessed academic work in Physical Education was distinctly superior to that in Education studies. At the time of the study he was 21 years old. Procedures were as described for CS1. His use of time diary for the study week was, as for CS1, a retrospective report. He spent 11 hours involved in sport, with 6 hours competitive sport (badminton and soccer), 5 hours training and practice. He did 19 hours academic work split evenly between assignments and general private study, 8½ hours and 10½ hours respectively.

For his life-activities repertory grid CS2 produced seventeen constructs. Table 51 lists his constructs with their loadings on P.C.A. components one and two and grid number, and type.

Table 51: Case Study 2, Components 1 and 2 of PCA of L.A.G. The percentage of total grid variance accounted for by component 1 is 52.6% and by component 2 17.1% giving a combined total of 69.7% accounted for by components 1 and 2.

Construct Number	Factor loading	Construct labelling preferred pole	Construct Type
C1			
13	94	Happiness.	1
10	92	Mentally stable.	2
7	91	Contentment.	2
5	89	Relaxation.	2
6	89	Freedom.	6
12	85	No stress.	2
14	81	Superior position.	7
9	77	Physically active.	10
16	75	Develop relationships.	8
17	60	Awareness of others.	8
4	58	Success.	4
15	57	Being adaptable.	-
11	55	Emotionally involved.	2
3	48	Others congratulations.	7
C2			
8	82	Awareness of others.	9
2	70	Achieving goals.	4
1	-70	Not Competitive.	8
4	51	Success.	4

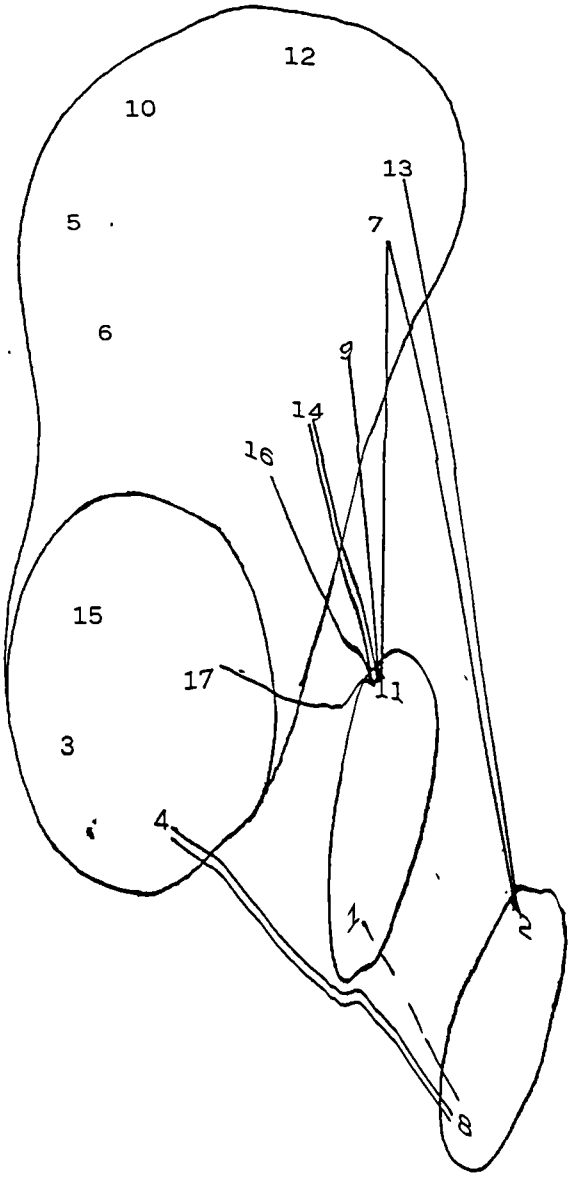
KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

A total of 69.7% of grid variance was accounted for by components 1 and 2 combined (52.6% and 17.1% respectively). Thus a considerable proportion of CS2's construing of life-activities, in so far as it is revealed by the grid, is retained by the two 'component analysis'.

Quite clearly component 1 is the more significantly developed dimension of personal meaning.

A schematic representation of correlations between constructs is given in figure 2 which adds some fine grain to the PCA.

Figure 2: Case Study 2 Construct Organisation. A schematic representation of the CS2 construct system, showing the patterning of significant correlations between pairs of constructs (taking $r \geq 0.60$, $p < 0.01$ and $r \leq 0.42$, $p < 0.05$ when n=16). The pattern reveals an articulated system with one major cluster of constructs (analogous to component 1 of the grid of PCA) and two small secondary clusters each containing just two constructs (2, 8) and (1, 11). The (1, 11) cluster forms links with the other two clusters. Also construct four links with the small cluster (2,8) (the two small cluster constructs and construct 4 load on Compoent 2 of the grid PCA. N.B. the large cluster is divided into two sections. In the first section there are eight constructs which all correlate to each other at the $p < 0.01$ level. The second section has five constructs which mainly correlate with each other at $p < 0.05$ level and do not correlate to all constructs in the first section. The non-relationships were as follows: 4 not to 9, 3 not to 5, 9, 11 or 16; 15 not 9, 16 or 17; 17 not to 5 or 6.



The schematic representation reveals an articulated system with one dominant cluster of constructs (analogous to component 1) and further two small clusters. Some linkage can be observed between all three clusters.

The first component/cluster is first and foremost about psychological well-being as shown by the high loadings of happiness (13), mentally stable (10), contentment (7), relaxation (5), and no stress (12) on C1 of the P.C.A. (Table 51). It is linked to the second cluster through the constructs contentment, happiness and success which correlate to the construct achieving goals (2). The latter also correlates with the construct awareness (8). CS2 thus showed that to some extent his psychological well-being is dependent upon his successfully achieving his goals. This is further amplified and understood through looking at the other constructs correlating with his well-being, so, continuing through component (and cluster) one, well-being is seen as related to being in a superior position to others (14) being physically active (9), developing relationships (16) and being aware of others (17). Quite a combative competitive perspective which is emphasised in that this sub-group of constructs (14, 9, 16, 17) all correlate with competitive (1) and emotional involvement (11) (cluster 2). In sum, for CS2 success in competitive physical activities are a source of psychological well-being, but success can also come from the pursuit of goals. CS2 said that "I find that in normal circumstances I am happiest when competing in sports situations and winning". Constructs which formed a sub-group of comonent 1 were being adaptable (15), awareness of others (17) and recognition from others (3). This set of constructs suggest that CS2 mainly adapts to others to be able to demonstrate his superiority to them and gaining recognition from them when he is successful against them.

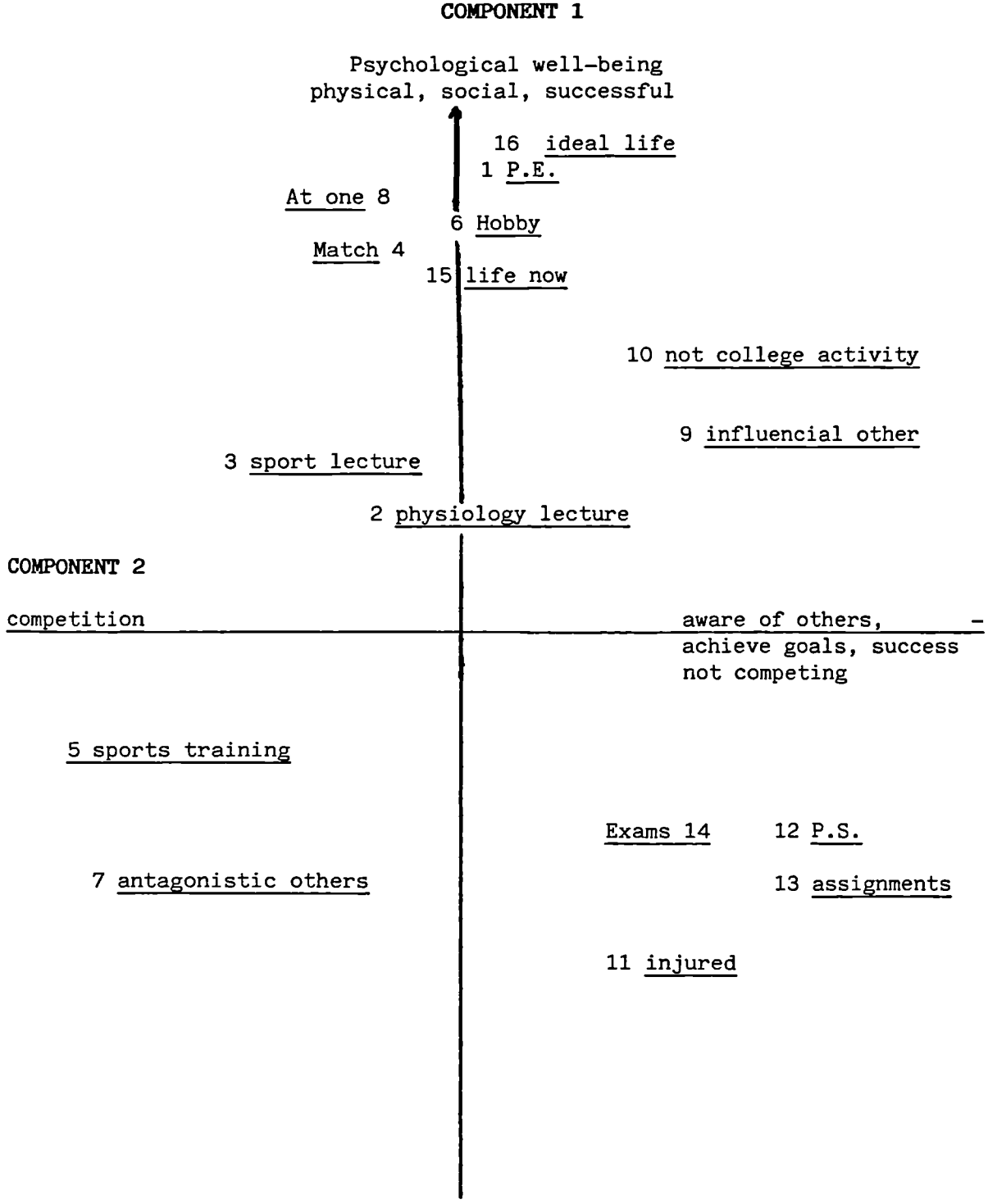
> I am a very competitive person and do not like to reveal my weaknesses even to friends. In doing this I feel that I am the sort of person who has many peripheral friends but no real friends who understand me.

Competition is a difficult construct to understand since it is negatively loaded on component 2. Component 2 is mainly about awareness (8), goals (2) and success (4). Competition is negatively correlated with awareness and not correlated with goals or success. This seems to be why it is negatively loaded on component 2.

P.C.A. Analysis and Activity Elements

The plot of elements on components 1 and 2 is given in graph 3.

Graph 3: Element organisation of CS2
To show the element position for CS2 according to their ratings along the first two components of the PCA of his repertory grid.



Examination of his two-dimensional plot of activities on C1 and C2 immediately confirms the centrality of physical activity and sport as a vehicle for positive life experiences. Physical Education, sports matches, sports lectures, life now and life as I would like it to be, all cluster together at the positive end of component 1 (top centre of the graph). Interestingly physiology lectures and sports lectures are close to this cluster, suggesting that CS2 sees a relationship between this academic discipline and active sport. He states that lectures, both sports and physiology, are situations where "I am content and happy, I don't feel threatened in a lecture and the possibility of failure is not there". Furthermore sports lectures give "a feeling of freedom and contentment" but sometimes "I disagree with some of practical sessions and the level of performance they are aimed at". This element group are also seen to some extent as associated with competitive success but not as much as one might expect particularly in the sports activities. This requires closer inspection. Awareness of others (8) is the construct most significant to defining the meaning of *component 2 and element* positions on this component *will most reflect* ratings of elements on this construct in the new grid. Examination of this raw grid data confirms this. It shows that rating of awareness of others for the elements PE, physiology lectures, sports lectures matches, life now and life ideal are all moderate on the nine point ratings scale and having ratings of 3,4,6,5,7, and 3 but ratings for the same elements are indeed generally higher 1,5,1,1,1,1, for competition construct. Furthermore, looking at competition in relation to goals attainment and success, although competition is loaded oppositely to them on component 2, the 2 major sports participation elements are seen similarly on each of the constructs. That is, PE at school and sports matches are both competitive and about success and goals, whereas other elements are contrasting in their ratings on these constructs. Sports training is seen

as highly competitive but not much concerned with goals or success, but work areas of private study, assignment and examinations are viewed in the reverse light. This is clearly seen by their position on the graph.

Note also that study is seen as not conducive to psychological well-being and being non-physical, solo activities (component 1) they are seen as more positively related to awareness, goals and success (component 2). His feelings with regard to work in general is that "of wanting to undertake a particular piece of work but not being under pressure due to time commitment" and "I feel that examinations are a very stressful situation for me, but that is only a short lived period".

It must be noted that sports training is grouped with the element being with antagonistic others and this requires some explanation. CS2 elaborates thus, "when training I have two distinct feelings that are one, the enjoyment I gain from actually training and the annoyance of individuals who do not try or put 100% effort during a session". The experience of being injured is not surprisingly seen as the antithesis of life as he would like it to be. To quote CS2 "I feel under pressure when I am injured in that I am unable to participate in sporting activity and this makes me feel ill at ease with other individuals and myself. I find difficulty in talking to people so I usually cope with this, by keeping to myself".

Comparison between the elements life now (15) and life as I would like it to be (16) shows that they are very similarly related, indeed raw grid data show that on none of the constructs was there a substantial difference between the two element scores. Differences were only between 0 and 2 except for "awareness" and "superior position" constructs which had differences of 4.

Clearly a satisfactory life style was being pursued from the students' perspective, even it it seems to subjugate the work aspect of college to the sports aspect and ultimately gain him a modest degree.

Case Study 3(CS3) - A Developing Student

The subject of CS3 is a male student. He was randomly selected from the "successful" sub-group of students, observed throughout their first fifteen months at college. He was 18 years old at the start of the observation period. He read Physical Education and Education studies towards a B.Ed., degree. At the end of his third year he chose not to go on to a fourth year of study towards an honours degree, but elected to take a post offered in teaching. This decision was taken in spite of excellent third year results, but was not an uncommon decision at a time when jobs in teaching were difficult to secure. It was not a statement against studying but a positive decision to enter the job market when the opportunities were restricted.

Procedures were as for other case studies except in two respects. Firstly measurements occurred on three occasions rather than one. Secondly discussion of grids was not desirable during the study since such discussion could have influenced the phenomena being observed. Unfortunately discussion of the grids after the observation period which would have been beneficial did not take place for practical reasons relating to time and opportunity.

In presenting this case study two objectives are being pursued. Firstly the meaning of life-activities at each point of observation will be established, and secondly, the changes in life-activities meanings will be mapped over time.

Clearly this is quite a complicated process since at each point in time the meaning of life-activities is a multi-dimensional phenomenon and, therefore, change can take place in a number of ways and indeed the whole phenomenological meaning of life-activity will change.

The main dimensions considered in the case study are as follows:-

(a) The qualitative nature of the construct dimensions, through which activities are attributed meaning. Also, the organisation of those constructs will be examined through PCA of the 'life-activties' repertory grid, enabling the primary meanings attributed to activity experiences to be identified. This will, as for previous case studies, be further elaborated through schematic diagrams of construct correlation patterns to reveal linking constructs and subtleties of meaning not revealed by the PCA analysis. Those constructs which are retained by CS3 across time, i.e. appear at each point in time, at each observation, will be identified and followed across the observations.

(b) The prioritisation of activities will be examined at each observation point.

(c) Comparison of the elements 'life-now', 'life as I would ideally like to it be' will be considered.

(d) 'Use of time' diaries will be examined.

Turning firstly to the use of time diaries an indication of CS3's behaviour patterns can be obtained (see table 52).

Table 52 Use of time by Case Study 3, observed at entry (I), 6 months (II) and 15 months at college (III). Work incorporates private study and 'assignments but' not lectures (17 hours). Sport incorporates competition, club training, private training, recreative sport. Recreation covers time spent for purely relaxing. General maintenance time e.g. washing, shopping, travel, is not included.

Hours of:-	Work	Sport	Recreation
Observation I	18.5	13.5	18.5
II	19.5	11.5	13.5
III	33.5	23.5	9

Clearly CS3 has from the outset devoted himself to work and sport as the core of his college life (observation I). There was also a distinct change in 'use of time' between observation points two and three. Recreation time is down 13.5 to only 9 hours per week (having been at 18.5 hours for observation 1), whilst both work and sports participation time have dramatically increased (19.5 to 33.5 and 11.5 to 23.5 hours). With regard to work this change occurs primarily in the area of time spent on doing assignments (14 hours up to 33.5 hours, whilst other private study has dropped from 7.5 to zero hours). In sport the extra time is devoted to private training. A daily training session is incorporated into his activities schedule, at 7.30-8.30 during the week and also on Sunday afternoons.

Whilst one must always be careful not to over-interpret the data in a case study, it is clear that CS3 is capable of very high levels of personal commitment both in self-directed work and sport at least for the limited time covered by the diary. How representative this limited time sample is of a continuous pattern of effort is an open question, but if it is representative one would expect to observe a considerable change in personal meaning of activity between observation points one and three in line with the observed behavioural changes. One such change would be the number of constructs classifiable as achievement/mastery constructs elicited at each observation point, and indeed whilst only two constructs were thus classified on grid one (numbers 6 and 14) five were on grid 2 (numbers 7, 8, 10, 18, 19) and six at grid 3 (numbers 1, 2, 5, 8, 11, 17).

(See Table 53)

The qualitiative changes in personal meanings will now be developed. Table 53 lists his constructs at observation points 1, 2 and 3.

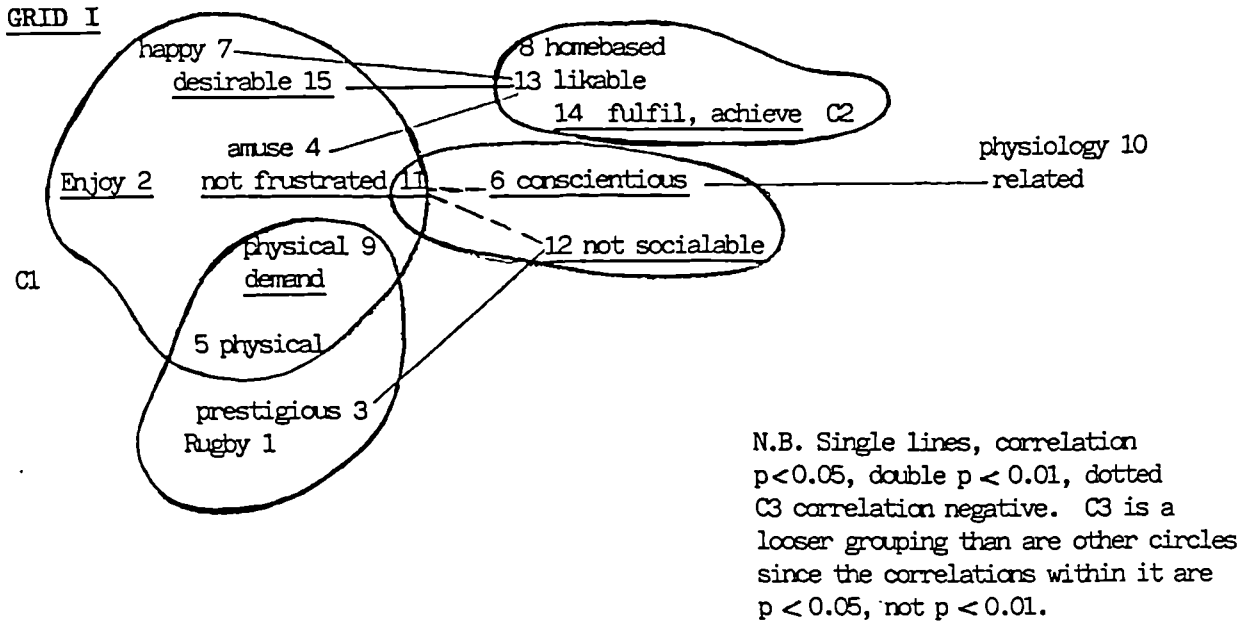
able 53: Case Study 3 Components 1, 2 and 3 of PCA of L.A.G. I, II and III. N.I. is 'not included', that is elicited constructs which were omitted in error from the grid by CS3.

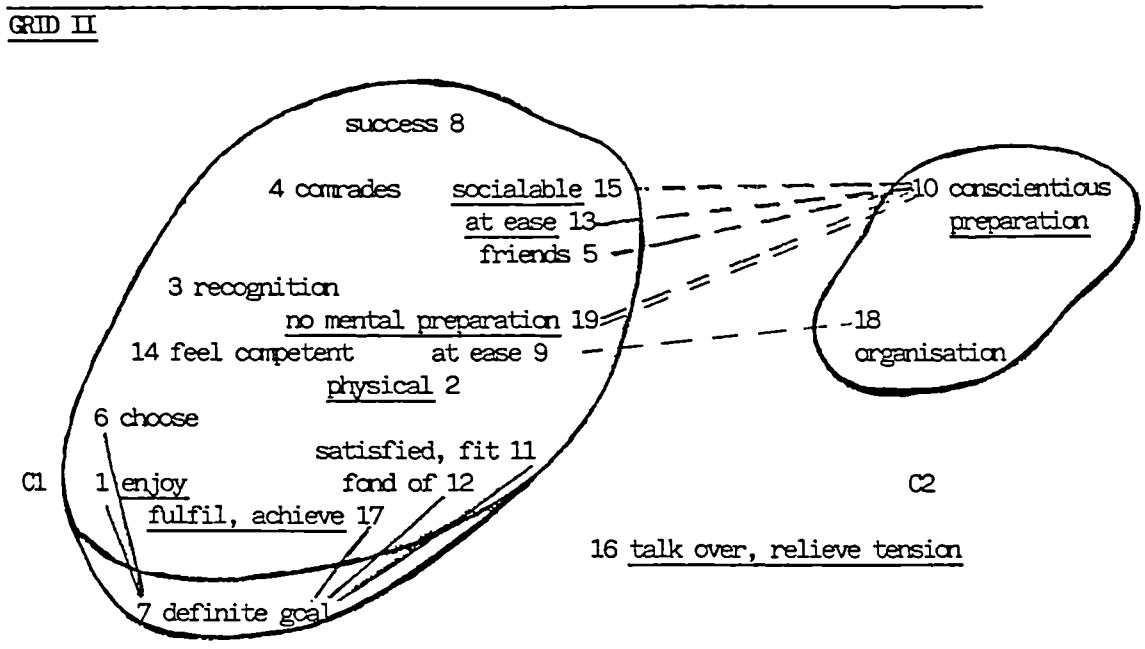
CN = construct grid number. FL = factor loading.
CLPP = construct label positive pole.
CT = construct type, classified on content analysis schema
* = Repeat constructs grid I, II, III or . = repeat on grid I, III.

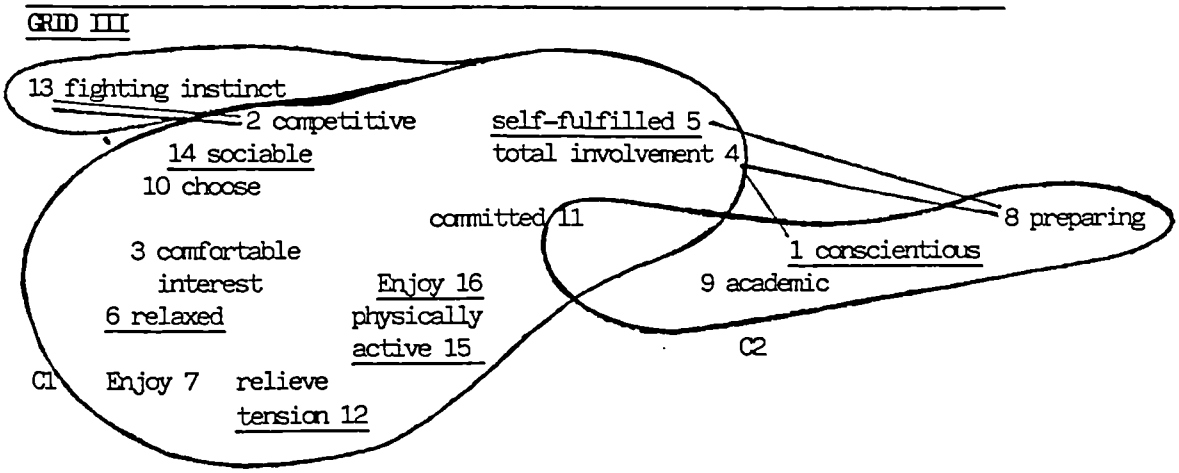
	GRID I			GRID II			GRID III		
	CN	FL	CLPP	CN	FL	CLPP	CN	FL	CLPP
C1	7	96	Happy	S * 17	97	Enjoy	S * 16	93	Enjoy
	15	94	desirable	* 13	95	at ease	S * 5	90	fulfil achieve
	* 11	93	at ease no frustration	12	94	fond of	10	90	choose
	* 2	91	enjoy	* 15	93	sociable	7	86	enjoy
	4	86	amuse	6	92	choose	* 15	86	physical
	* 5	75	physical	S * 17	91	fulfil achieve	* 12	86	relieve tension
	9	73	not mental	8	91	success	3	85	feel comfortable
				3	90	recognition	4	81	total involvement
				* 2	85	physical	* 6	76	relaxed
				11	85	satisfaction	11	72	committed
				14	86	feel competent	2	64	competitive
				4	79	comradeship	* 14	40	sociable
				* 9	77	at ease			
				5	72	close friends			
				S 19	66	mentally prepared			
				7	59	definite goal			
C2	S * 6	84	conscientious	S * 10	82	conscientious	8	80	preparation
	S * 14	80	achieve, fulfil	18	79	organisation	S * 1	77	conscientious
	8	56	home base				9	67	academic
	10	56	physiology				11	59	committed
	S 13	53	be likable				* 14	52	not sociable
C3	* 12	86	not sociable	* 16	90	relieve tension	13	86	fighting instinct
	1	76	rugby base						
	3	75	prestigious						
NI	* 16	-	relieve tension				17		like to win
	S . 17	-	meet expectations others				18		realistic
							S . 19		meet expectations others
VARIANCE FOR C_1 C_2 C_3 total:									
	42, 18, 18, 78%			62, 12, 9, 81%			53, 23, 11, 87%		

KEY: CONSTRUCT TYPES
1 Intrinsic motivation 2 Emotions 3 Arousal 4 Achievement/Mastery
5 Self-actualise 6 Autonomy 7 Recognition 8 Affiliation 9 Group
10 Physical 11 Situational 12 Compensation 13 Power 14 Extrinsic
15 Altruistic 16 Other

Figure 3: Case Study 3 Construct Organisation. A schematic representation of construct organisation, CS3, showing the construct correlations in schematic form. From the top down, grids 1, 2 and 3. Correlations $r > 0.425$, $p < 0.05$, $r > 0.601$, $p < 0.01$ for $n=16$. Underlined constructs are those repeated at elicitations one, two and three.







Two of those constructs elicited on all three occasions were also super-ordinate constructs. There were "conscientiousness" and "achieve, fulfil", and are thus of considerable interest in the following discussion.

If the first point of observation, grid 1, a total of 78% of grid variance is retained by components 1, 2, 3 (60% on the first two components). This is a substantial proportion of grid variance. It is a little unusual to have a third component with 18% variance retained, although the schematic diagram of correlations does indeed clearly show three distinct but linked sub-sets of constructs. Clearly component 1 (table 51) is concerned with intrinsic motivation (happy, desirable, enjoy) and also with physical activity. The second component concerns mastery, (conscientious, achieve, fulfil) and seems connected to acceptance (likeable). The schematic diagram (figure 3) reveals a link here, between "likeable" (13) and "happy" (17) in "desirable" (15) and "amusing activities" (4). It also shows that "conscientiousness" (6) can be related to "physiology" (academic study) (10) and to "physically demanding" activities (9) and is necessary to "fulfilment and achievement" (14). Yet it is also difficult, it can mean that one is not "feeling sociable" (12) and it produces "frustration" (11). This conflict will need resolution. The third component concerns "physical" (5) and "prestigious" (3) activities which are "rugby based" (1) whilst again this is not a "sociable" involvement. Clearly CS3 sees physical activity overall as an interesting and enjoyable but essentially serious activity from which prestige is obtained rather than liking.

Moving to the second observation point, half-way through the first year of studies for CS3, his construing of activities has tightened. Component 1 now explains 62% of grid variance. It is still about intrinsic motivation (enjoyment, at ease and satisfaction) and related to the physical, but now it has assimilated a number of constructs previously loading on component 2 and has some new constructs too. It concerns achievement (fulfilment,

achieve, success, definite goals) and a social dimension (sociable, comradeship, close friends, recognition). It would seem that the core of his well-being is perhaps overly invested in being good at something, it bringing with it friends and recognition. The smaller second component, only 12% explained variance, still concerns conscientiousness and is now linked with personal organisation. Examination of the schematic diagram reveals that this sub-set of constructs links to the major set in a way which suggests dichotomous thinking and also that perhaps the conflicts noted previously around the need to be conscientious have not been fully resolved. Conscientiousness (10) now correlates negatively with "no mental preparation" (19), "sociable" (15) "friends" (5) and feeling "at ease" (13). "Organisation" (18) correlates negatively with feeling "at ease". It will be interesting to see how this area of conflict is resolved, if at all, at observation point 3.

Interestingly, "relieve tension" (16) is an isolated construct, perhaps tension relief is needed in his implicitly conflict generating world.

Examining now the PCA at observation point 3, it can be seen that the construct system has loosened, it has eased away from the almost monolithic structure described at observation 2. The split between first and second components retained variance is now 53 to 23% as compared with 62 to 12% previously. However, at first sight the core meaning of the two dimensions are very much retained, but with component 2 more elaborated. Certainly component one is still about intrinsic motivation ((enjoy, total involvement) and mastery in physical activities (fulfil, achieve, competitive, committed, physical) but it has lost the social dimension (friends comradeship, recongition) which was there previously. Indeed there is little in the construing of CS3 at this stage which involves this social

perspective. It seems that whilst friends and recognition were important in the middle of his first college year, they are less so as he enters his second year.

Recalling that at observation 2 there was some conflict between friends and sociability on the one hand and conscientious preparation on the other, perhaps this conflict has been resolved through no longer seeing sociability and friendship as a major issue. Further information will be presented later in support of this contention, when the schematic diagrams of construct correlations and in particular linking constructs are examined.

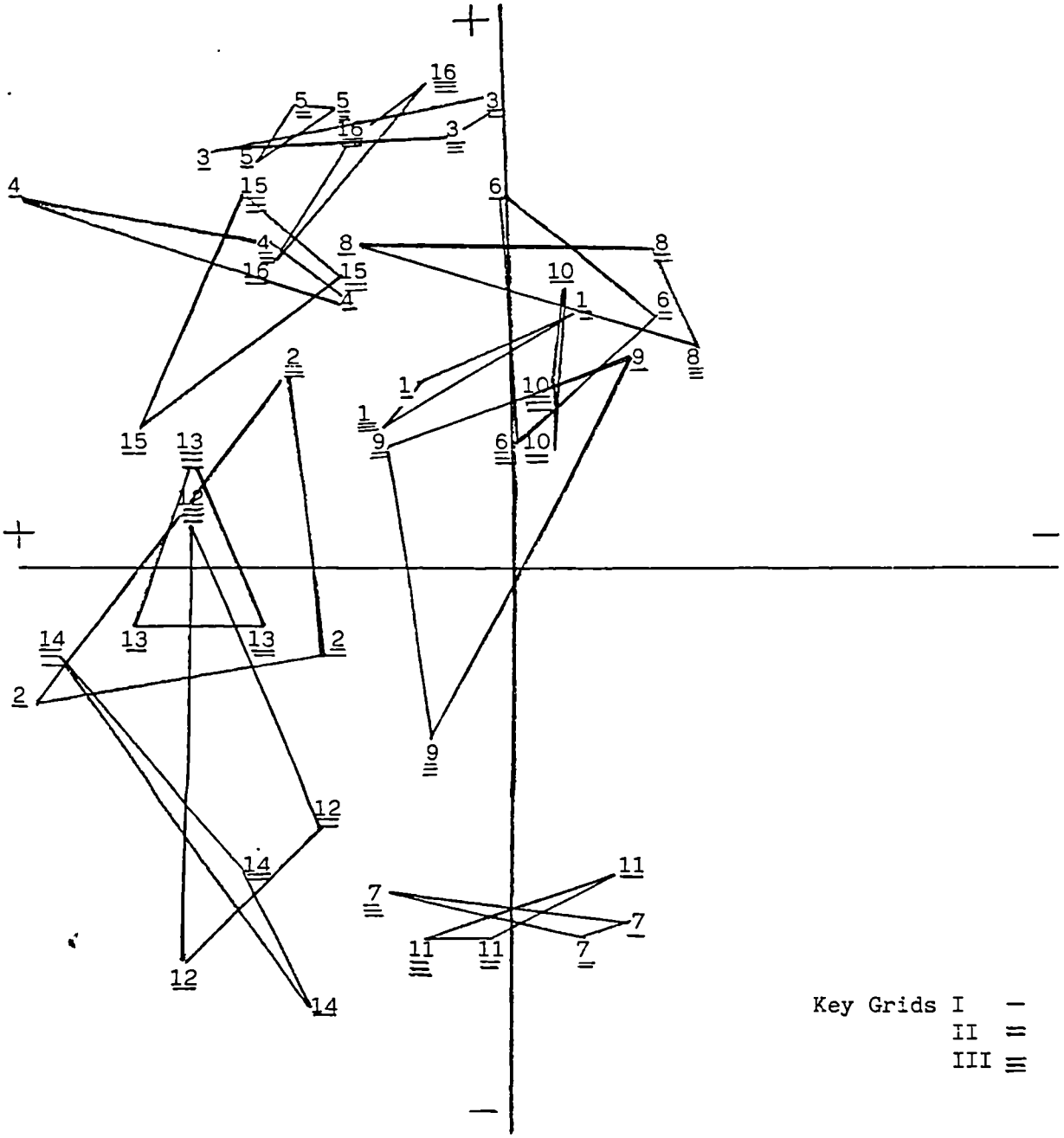
Clearly component 2 is a mastery orientated dimension (conscientious, preparation, commitment) and academic too. However, the mastery orientation links strongly with the first dimension through "commitment" (11) (which has central place in linking the two dimensions) but also through the constructs "competitive" (2), "fulfilment" (5), "total involvement" (4) linking with conscientious preparation (1).

Clearly once again, a serious approach is taken to both physical and academic areas of life, the former bringing enjoyment alongside fulfilment, the later more involving a conscientiousness but both needing commitment. There does not seem any longer the conflicts observed previously between the two dimensions. It appears that the prior emphasis on a social, sports approach to college life has given way to a strong work ethic perspective thus resolving the conflicts the former approach generated.

Turning now to the activity elements and observing how they service the experiential goals of CS3. The organisation of elements, will be discussed first, as a prelude to relating construing to activities. Organisation across three observation occasions may be visually appreciated by the graph 4 in which all three element patterns are superimposed on one set of axes. (Naturally the meaning of each activity experience will have changed in line with the re-construing as described above, but here we are firstly

considering element organisation). The positions of each element on the three occasions are joined forming a triangle. This gives a visual impression of how element positioning on the two axis have changed. Small triangles represent little change (see elements 1, 3, 4, 5, 6, 7, 10, 11, 15, 16) whilst larger triangles represent more change (see elements 2, 8, 9, 12, 13, 14).

Graph 4: The Element Organisation for CS3 showing the position of each activity element on components 1 and 2 of PCA of grids I, II and III.
+ represents the preferred pole and
- represents the contrast pole.



Examination of the change elements reveals that in all cases, except number 8, the element position was stable between observations 1 and 2 but some changes had occurred by observation 3, although this was largely in one particular area of activity. Elements 2, 12, 13, 14 namely "physiology lectures" "private study" and "taking examinations" are all academic work related elements and were seen more positively along component 1 at observation 3. Whilst elements 8 "people you feel at one with" and 9, "an influence from home" were each seen somewhat more negatively, the former along component 2, the latter along component 1.

The rank order correlations between element loadings, along components 1 and 2, across the three occasions confirms the stability of element organisation. (Component 1, 1 to 2, $r = 0.88$, 2 to 3, $r = 0.87$, Component 2 1 to 2, $r = 0.58$, 2 to 3, $r = 0.79$, where $r = 0.61$, $p < 0.01$, $r = 0.425$, $p < 0.05$, for $n = 16$.)

The elements fall into four groups. Sports (3, sports lecturers, 4, matches, 5, training, 15, life now and 16, life ideal) in the top left quadrant; P.E. and hobbies (1 P.E., 6 hobby, 8 people at one with, 10 home activity) top right quadrant, Work (2 physiology lectures, 12 private study, 13 assignments, 14 exams) bottom left and finally negative events (7 antagonistic people, 11 injury) bottom right.

The sports group is continuously seen as the most positive group being on the preferred pole on both components one and two of the P.C.A. P.E. and hobbies are positive on component 1 and intermediate on 2, whilst work is positive on component 2 and moving from negative to positive across occasions 1 to 3 on component 1.

In sum, combining the changes in construct dimensions with element prioritisation an overall perspective on work and sport meanings across the first 12 months of college life can be obtained for CS3.

Sports activities were continuously seen as the core of his life experience and were positively viewed at all times. Firstly at entry to college they were seen as very much intrinsically motivating and also about mastery, a source of fulfilment.

Subsequently at 6 months they were still concerned with intrinsic motivation which was now tied in with achievement and social satisfaction. They also required a conscientious and organised approach which was in conflict with the social satisfaction of sports involvement.

Later, on the third observation at 15 months, sports were being viewed seriously and sources of conflict had been eliminated. Sports were still about intrinsic motivation and mastery but no longer about friendship. Instead they required commitment and conscientious preparation.

Work on the other hand was moderate to low on intrinsic motivation on arrival at college, yet offered an opportunity for mastery, requiring a conscientious approach. Halfway through the year work was viewed as only moderately intrinsically motivating and mastery/success orientated but again required a conscientious organised approach. Also as a less sociable activity it was in conflict with friendship development, which was taking place in sport, the most important dimension of personal meaning.

After 12 months, however, work was now viewed as a more intrinsically motivating experience although not to the extent of sports, and offered opportunities for fulfilling achievement but even more so it required high levels of commitment and conscientiousness to produce mastery, even more so than sports.

Turning now to two key elements "life as it is" now and "life as I would ideally like it to be". The construct by construct comparisons taken from the raw grid data show that on grids 1, 2, 3 the mean difference scores between element ratings on constructs were 1.90, 2.30 and 2.0 respectively, suggesting that at all stages high student enjoyment of life and indeed

subjective enjoyment scores on the grids, were high ratings of 2, 1, 3 across the three grids. On grid one only a single construct reached a difference score of 4. That was the construct 'physiology related' which CS3 considered was excessive in his life activity. Whilst on grid 2 constructs 'feeling competent' 'lack of ease, self-confidence' and 'need for preparation' had difference scores of 6, 5, 4 respectively. This grid was the second observation and as previously noted was interpreted as a time of some conflict for CS3, which can now be seen as consistent with this self-report of lack of ease, feelings of low competence and excessive need for preparation stated by CS3 in his grid ratings. However, by observation three, grid 3, only a feeling of excess in preparation remained (score 4). As noted previously CS3 had seemingly resolved his conflicts and now viewed his life experience somewhat differently and in ways clearly consistent with the behavioural evidence presented earlier showing high well targetted time given to academic work therein lies his academic success.

SECTION E

INFERENCES

CHAPTER 13: REVIEW AND PREVIEW

Introduction

This chapter is in two sections. In the first section the question of whether L.A.G. is suitable for use in student counselling and education is addressed. A comparison is made of 'normal' student constructs (from this study) with those of students who volunteered for 'counselling' (Blackshaw 1982). Clear qualitative differences in construing between the two groups of students are identified. The differences are then related to other recent research into personal goals and psychological health. On the basis of the collated information L.A.G. is recommended for student counselling as an awareness raising process, which can facilitate effective use of personal goals and priorities. Furthermore, recommendations are made as to how to extend L.A.G. development so that it can be used in directive counselling and education.

In the second section of the chapter a statement of "the student experience" is made to concisely encapsulate the main features of the P.C.T. model of the personal meanings of activity events as developed in the present research.

L.A.G. in counselling and education

L.A.G. raises awareness: A long-term aim of the present research was to develop a body of knowledge and also an instrument and procedure based on P.C.T. with potential to indicate strategies for positive student counselling. To that end the L.A.G. was developed. Now is the time to assess the progress made towards realising that aim and to consider what there is left to be done.

Clearly the results presented in this report give strong grounds for optimism that a useful counselling and educational instrument has been developed. At the level of the individual the L.A.G procedures have been shown to reliably establish the personal meaning of life as it is experienced by a college student. The procedures enabled articulation of personal goals and action priorities for review by the student. L.A.G. includes a measure of psychological well-being, namely the degree of discrepancy between the current life experience and the ideal life experience as they are construed by the student. This measure correlated highly with subjective measures of enjoyment and happiness, and has diagnostic potential.

L.A.G. discriminates

It was also shown that using L.A.G. within a nomothetic framework it was possible to successfully discriminate between groups of students, specifically between more experienced and less experienced students and between academically successful and less successful students. The discrimination was in terms of qualitative differences in students' personal goals. This established the extra importance given to 'mastery/achievement' constructs in the construing of activities by more academicically successful and also by more experienced students. Furthermore, a specific behavioural link between personal goals and academic success was established. The availability of mastery/achievement constructs in a student's construct pool

correlated with the time that they allocated to 'private study on assignments'. Nomothetic information such as this provides a meaningful context within which to understand an individual's unique construing of activity events.

Blackshaw (1982) assessed a group of undergraduate students reporting voluntarily for counselling using very similar procedures to those considered on L.A.G., which enabled comparisons to be made with the present research and inferences to be drawn. His conclusion was independent of and, yet in broad agreement with those of the present writer, he recommended his procedure as a counselling intervention and said that the procedures

> facilitate discussion and recording of sensitive and delicate areas, worries and fears, communicating, when they exist, low levels of satisfaction.
> (Blackshaw, p.106)

Indeed he went on to strongly recommend his process as an effective single session counselling intervention. He justified this on the rather flimsy grounds that 75% of the students did not report for the further counselling sessions freely offered beyond the first session. As he acknowledged stronger support than this is needed before such a conclusion is justified, more extensive and systematic evaluation of the counselling outcome in appropriately designed studies is required.

To see whether construct theory procedures when used to examine the meaning of activities can effectively discriminate between the 'normal' and 'counselling' student groups, a comparison of the constructs elicited from Blackshaw's 'counselling' subjects and the 'normal' subjects in the present study is now presented. It is acknowledged that differences between the two sample groups other than on the 'counselling-normal' dichotomy, such as 'U.S.A. - British', 'majoring in P.E. - not majoring in P.E.' will prevent an unequivocal conclusion that any observed differences are solely attributable to the 'normal' counselling student dichotomy. However, being

able to reveal such differences through L.A.G. is a necessary if not sufficient condition for L.A.G. to meet if it is to be effective in the counselling situation.

The constructs elicited by Blackshaw from his subjects and listed in the appendix of his study were classified using the content analysis schema developed in the present study. It was noted previously that the constructs of 'normal' student sample were mainly from a restricted number of construct types. The same phenomenom applies to the constructs of the 'counselling student group'. The first six most frequently used construct types contained 81% of 'normal' student's constructs and for the counselling student constructs the comparable percentage was 79.5%. However, the six construct types most used by each group were different (Table 54). Only Types 1, 2, 4 and 6 appeared in the top six for both sets of subjects. Types 6 and 10 also appeared in the top six construct types of normal students and Types 8 and 5, of counselling students.

Table 54: The rank order of the six construct types according to the frequency of usage for Blackshaw's 'counselling' subjects and Savage's 'normal' subjects.

		FREQUENCY by RANK					
		1st	2nd	3rd	4th	5th	6th
Construct Types	Counselling Subjects	8	6	4	2	5	1
	Savage Subjects	4	1	2	6	7	10

These results show that the students for counselling had more constructs of types 8, 6 and 5 which suggested that they placed a much greater emphasis on developing personal relationships, seeking autonomy and self-actualisation than did the normal students.

Table 55 presents the results in more detail, showing the average number of constructs of each type used by normal individuals and counselling individuals.

Table 55: The average number of times constructs of each type are included in a respondent's construct pool. Blackshaw's voluntary counselling subjects (n=40). Savage's 'normal' students (n=24) (12 at entry, 12 in their third year of studies.)

Construct Type	1	2	3	4	5	6	7	8	9	10	11	12	13	15	16
Blackshaw	1.4	2.1	0.4	2.1	1.9	2.2	0.6	3.0	0.6	0.3	0.3	0.6	0.5	0	0.5
Savage	3.8	3.3	0.2	4.5	0.7	1.5	1.1	0.8	0.6	1.1	0.3	0.2	0	0	0.6
Difference	2.4	1.2	0.2	2.4	1.2	1.7	0.5	2.2	0	0.8	0	0.4	0.5	0	0.1

Clearly personal relationships, as indicated by constructs within the category 'affiliation' (8) were the dominant type of construct for the 'counselling' student sample. They occurred much more frequently than for the 'normal' students, on average 2.2 extra constructs of this type per student. The construct types 'autonomy' (6), and 'self-actualising' (5) were also more frequent in the counselling group, (1.7 and 1.2 constructs extra, respectively).

The normal students on the other hand were more likely to construe activities in terms of 'interest' (1), 'achievement' (4), and 'physical' (10) than were counselling students. (2.4, 2.4 and 0.8 extra constructs respectively). Both groups frequently used 'emotion' (2) constructs.

These differences suggest that the counselling students main focus in activities was more likely to be on relationships and independence than the 'normal' students who were more task focussed, wanting to maintain interest, enjoy the activity and achieve mastery. Each group achieved states of positive affect in their own way reflecting their distinctive personal goals.

The constructs of the 'counselling' group also indicated that constructs such as 'feeling self-confident' might usefully form a distinct category separate from the general category of 'esteem/recognition' where such constructs had previously been placed by the content analysis schema. The new category would include 'self-esteem', 'feel good about myself', 'accept who I am' and so on.

It can be reasonably concluded that the P.C.T. methods were able to successfully discriminate between the two subject groups considered, in a meaningful and useful way. According to Blackshaw (1982) the counselled students were experiencing high negative affect due to not achieving their autonomy/relationship goals. Help with these particular problems may be recommended to increase their life satisfaction but also they could consider reducing the importance they placed in their activities on relationships and autonomy, that is make qualitative changes in their construing of activities. Other non P.C.T. research gives initial support to these recommendations and several recent studies are now presented to show this.

L.A.G. consistant with non P.C.T. studies

Ruff (1989) is the first study considered. He explored the concept of well-being and suggested that "old" measures used in researching this domain such as 'affect balance', 'overall life- satisfaction', 'self-esteem' and 'depression' were used for pragmatic empirical reasons rather than because they had any defininte links to psychological theory. He suggested that the psychological concepts of well-being developed by theorists such as Maslow and Rogers should be operationalised, taken as 'new' measures, and compared with the 'old' measures of well-being. This he did for such concepts as 'personal growth', 'self-acceptance', 'positive relations to others', 'autonomy' and 'environmental mastery'. He operationally defined them and created self-report rating scales to measure them.

A factor analysis of his subjects' ratings of their life along the 'new' and 'old' scales showed that the 'old' measures, plus two of the new measures, 'self-acceptance' and 'environmental mastery' loaded on the first factor which accounted for 51% of variance in the data. Two other factors accounted for 8.5% and 7.3% of the remaining variance, and were each defined by only the 'new' measures of well-being, that is for the second factor 'social relations', 'personal growth' and 'purpose in life' and for the third factor 'autonomy/control'.

The present author would suggest that the three factors reported have a strong resemblance to the discriminations by construct type between 'normal' and 'counselling' students described above. Normal students had more indication of 'purpose in life', and 'interest' constructs, Ruff's Component 1 measures whilst 'counselling' students were seen to construe life more in terms of his component 2 and 3 dimensions,'self-acceptance', 'social-relations' and 'autonomy/control'.

Of course the Blackshaw subjects were not only more particularly concerned with this type of personal goal than were 'normal' students, but they perceived themselves as failing to achieve success in relation to those goals.

An area of theorising and research which seems to have much in common with this insight is the work on sociotrophy and autonomy within the rubric of cognitive therapy, two terms first proposed by Beck (1983). Robins and Lutens (1990) stated that sociotrophy subsumes three related constructs: 'concern about pleasing others', 'what others think of the self', 'dependancy on others for material or emotional support'. Autonomy they said also subsumed three related constructs, 'need for control or freedom from others', 'perfectionism/self-criticism', 'avoidance of intimacy or defensive separation from others'.

They measured these two dimensions, using a personal style inventory. Taking a sample of depressed subjects, they were able to show that each construct related to characteristic clincial features. Sociotrophy was associated with, thoughts of loss, feeling unlikable, crying, reactive mood feeling like a failure, and self-blame. Autonomy was associated with features such as feeling like a failure, loss of interest in people, feeling at fault, responsible for current problems, and anger, also feeling unlikable.

There was a modest correlation between sociotrophy and autonomy which "suggests that it would be inapprorpiate to consider depressed patients as belonging only to categorical sociotropy or autonomous types and it may make sense to think of these as nonorthogonal dimensions" (Robins, Lutens, p.12) They also report that they

> are aware of no published study that has yet examined the relations of sociotropy and autonomy to psychotherapy.

Clearly, the constructs of sociotrophy and autonomy provide some insight into symptoms of depression, they also appear to the present author to map closely to the construct preferences of students reporting for 'counselling' (Blackshaw, 1985) but not to those of 'normal' students reported in this study, therefore, P.C.T. based psychotherapy might prove helpful to persons experiencing sociotrophy or autonomy induced depression.

In sum it seems reasonable to suggest that students who use constructs very similar to the sociotropy and autonomy constructs may if these are their primary constructs when 'going to college' find this life change more threatening, anxiety provoking and less satisfying than other students. Such students may be more prone to seek counselling but they will not necessarily do poorly in academic work.

The mechanisms by which sociotrophic or autonomy related constructs (or very similar constructs) have the effects they do can be suggested on the basis of research by Zirkal and Cantor (1990). They investigated the "consciously accessible goals that people care about at a given point in time" which they termed "life tasks". They said that these are important, affectively charged, self-relevant concerns which people are working on in their lives and reflect their way of seeing the world. The consciously accessible goals (life tasks) fall under more general concerns such as achievement, affiliation, power, personal growth, identity and so on. These 'life task' behaviours seem to have much similarity to the activities explored in the present research and the general concerns correspond to the types of motive constructs present in the construct content analysis schema. The subjects in Zirkal and Cantor's investigations were undergraduate students and it was assumed that their 'life tasks' would be reflected pro-actively in their choice of specific life activities and situations (echoing hierarchical structuring of activities in their reasoning here).

For example they hypothesised that some students upon arrival at college would be particularly absorbed with the life task "being on my own away from family" and autonomy motives. Furthermore, they stated that those students would invest academic activities with some special significance, in comparison to non-absorbed students, suggesting in effect that absorbed students will see academic events such as doing academic activities as a test of their efficacy in relation to the life task "being on my own away from family" and hence also testing their ability to be autonomous. Support for these hypotheses came from two related investigations. In the first Zirkal and Cantor asked students to generate a list of daily life activities which they perceived as personally important. Absorbed students embraced more general activities than did 'non-absorbed' students, for example, 'being top all the time', rather than 'doing well on an assignment', which

supports the pro-active nature of 'life tasks' and showed that the two sets of subjects behaved differently as a consequence of their different perceptions.

Zirkal and Cantor also showed that absorbed students did perceive academic work as an area in which to impress others such as parents, peers and tutors, seeing it as more important to themselves than did less absorbed students, and they found also that it was more challenging, difficult, demanding on time and stressful.

It was also shown that absorbed students focussed more on independence and self-reliance in their 'life tasks' and gained lower satisfaction from them than did non-absorbed students. The academic success level of the two student groups were not different, which supports the findings of the present study that psychological well-being is not necessarily a correlate of academic success, but that the experience of becoming academically successful is unique to each successful individual.

Further elaboration of constructs similar to those under discussion and how they effect behaviour and affect comes from a study by Elliot and Dweck (1988). They compared the response to failure of students with "performance goals" (seeking favourable judgement from others) to that of students with "learning goals" (seeking for mastery/competence). The goals difference was hypothesised as the critical determinant of achievement behaviours. They said that one may consider each goal as generating its own set of concerns and creating its own framework for processing incoming information. Performance goals create concern for ability measurement and failure information as indicative of low ability, in contrast the the learning goals create concern for development of skill levels over time and failure information leads to changes in task strategy. An experimental approach was

taken in their research with manipulation of relative goal value to the subjects prior to presentation of a pattern recognition task. Children were the subjects and perceived ability was also manipulated.

The results supported Eliot and Dweck, showing that both groups of children, high or low ability, who had the "learning goals" highlighted, responded to failure by trying to increase their competence, they opted for challenging tasks following their failure and their problem-solving strategies became more sophisticated and they did not forego learning opportunities on new skills where failure would lead to public display of errors. In contrast for subjects having the "performance goals" highlighted, if they believed their ability was high they responded to failure in the mastery manner as described for "learning goal" children except that they passed up the opportunity of learning tasks open to public display of errors. Where low self-perceived ability was combined with the "performance goals" orientation, failure feedback was responded to with negative affect and low confidence, attribution of failure was made to an uncontrollable cause (low ability), subjects gave up making attempts to find effective ways of overcoming mistakes despite having a perceived "ability to learn" and avoided opportunities to increase their skills on tasks that entailed public mistakes. Elliot and Dweck said that what was particularly striking was the way in which the latter subjects showed the same pattern "found in naturally occuring learned helplessness".

It is now evident that the L.A.G. procedures have high potential for revealing students who invest their life activities with personal meanings which will leave a student open to experiencing transition from home to college as difficult and who when faced with failures in work tasks will be vulnerable to experiencing negative affect and coping problems, particularly

if they also perceive themselves as having low ability. L.A.G. may be useful as an awareness raising procedure and helpful to students experiencing difficulties at college.

The above statement requires further systematic research to support it, before it can be fully accepted, and the relationships suggested between the studies reviewed require empirical validation.

L.A.G. in directive counselling

Consideration is given here to how L.A.G. procedures might facilitate interventions which go beyond awareness raising, becoming more directive in nature, either in educative (before problems arise) or counselling (after problems arise) contexts.

Firstly it is suggested that L.A.G. potential in education and counselling would be enhanced by placing it within a 'learning conversation' framework (Thomas Harri-Augstein, 1978, 1985, Savage 1979, 1982).

> 'Learning conversatons' consist of 5-steps (the first four taken from Thomas, Harri-Augstein, 1978, the fifth from Savage 1982):
>
> (1) negotiating the purpose;
> (2) eliciting and agreeing the elements;
> (3) eliciting the constructs;
> (4) assigning elements to position on constructs;
> (5) discussion of the action implications of the construct organisation.

Steps 1 through 4 are essentially awareness raising steps. Step 5 is awareness raising too, but it may also be a step where more active intervention takes places, depending on how it is carried out, it can be a directive step.

Savage (1982) gives an example of step 5 being used directively, a case study in which a Physical Education tutor discussed the construing of teaching with a subject who was a student PE teacher at the time of interview. The tutor was considered to be an 'expert' within the student's area of construing. The tutor's role on this step 5 example was:

> essentially that of a catalyst, he must empathise with the student's construing and in so doing

> help the student to understand the area under discussion in a more complete way than he is able to on his own.
>
> also
>
> The tutor uses his experience of P.E. environments to reflect on possible courses of action which seem to him compatible with the students constructions, but which do not occur independently to the student.
> (Savage, 1982)

Thus at step 5 the educator/counsellor may raise awareness in the subject by helping him to (i) understand in a technical manner the information provided by a grid analysis; (ii) develop implications for action, based on his (the educator/counsellor's) understanding of the subject's construing; or be directive by (iii) suggesting implication for action to the subject but using his own construct system in addition to those of the subject; (iv) presenting new experiences to the subject which will help the subject to develop new and more effective constructs.

There may be more possibilities within step 5 of a 'learning conversation' but this is not the place for an extensive elaboration, so only one more of a particularly interesting nature developed by Forster (1989) is considered. He has presented an innovatory counselling technique to facilitate for the subject awareness of the action implications of their construing. He builds on the work of Markus and Nurius (1986) to articulate qualities of the individual that can be used for positive self-constructions. He developed the Dependable Strengths Articulation Process-Short Form (D.S.A.P.) and proposed that when "a person's strongest assets or qualities are being used to bring about that person's most valued goals" they are "people who are effective and making very good use of their potential" and have positive self-constructions.

Clearly the D.S.A.P. objectives may well be fulfiled by the 'expert' at stage 5 in the 'learning conversation' but D.S.A.P. has the merits of (a) having strengths developed by the subject not the 'expert', (b) being made an explicit step and (c) being open to systematic evaluation.

A pilot evaluation study has already been completed by (Forster, 1989). The correspondence between the goals and Dependable Strengths of fourteen teachers and counsellors were rated by a doctoral student. The ratings of correspondence correlated 0.57 with the subject's work satisfaction scores and 0.47 with their self-confidence scores. These results are clearly encouraging.

It might also be useful to evaluate personal weaknesses as they constrain the possible pathways to achieving desired goals.

Differences between 'good' and 'less good' students construct pools have been shown in this research particularly in relation to achievement mastery constructs. Raising the 'less good' students awareness of these differences and finding ways to appropriately change their construct pools should they wish to, must be considered. A direct strategy for use in promoting such qualitative change would be Fixed Role Therapy, Kelly (1955).

It is recommended that studies to extend the understanding of student construing be undertaken and the potential of procedures developed in this study for counselling and personal education be evaluated.

Strengths and Weaknesses

The general approach to the research adopted in this thesis (chapter 1) has been within the Kellyan tradition.

Adams-Webber and Mancuso (1983) described the basic assumption of Kelly's approach to applied research as follows:-

> Kelly was a strong advocate of ecological validity and psychological research should focus primarily on problems that represent 'real' issues in the lives of people in contrast to formal issues derived directly from theoretical principles through a-priori analysis (p.5)

Kelly did not, however, advocate an a-theoretical approach to research but that the research have the primary purpose of

> increasing our understanding of human action and the personal context of experience from which it springs rather than having the goal of theory testing for its own sake. (Adams-Webber, Mancuso, 1983, p.5)

The results suggest that the present research has increased our understanding of human action, within a particular context of higher education. It was a case study at the institutional level in which a relatively small number of subjects were investigated, and possible gender based differences in construing were not able to be investigated, as such generalisation of the results to other subjects and contexts, should be conservative. Understanding, for example, of human action has been increased through validation of the notion that behaviour can be meaningfully described as hierarchically structured (chapter 5). This was shown to have implications for how learning new behaviours should progress. It was also shown that qualitative aspects of the meaning of behaviour experiences can influence study behaviours and thereby, academic success. This was shown particularly in terms of achievement/mastery construing which was seen to heighten the time spent on assignment-related study for good students.

Pluralism of theory and method in applied psychological research was cogently advocated by Swift, Watts and Pope (1983) and was a feature of strength in the present research. Pluralism of techniques for grid analysis was also used to investigate the subjects' personal meanings of behaviour and is advocated for future research using repertory grids. Pluralism of theory in this research was referred to as selective eclecticism with the proviso that basic assumptions of theories and methods used are consistent and compatible with philosophical basis of P.C.T. A point also in concert with Swift et al.

One example of the benefits of the pluralism in research was the understanding of the functions of super-ordinate constructs within strategic planning of behaviours, which came from consideration of the implications for construing of behaviour in terms of hierarchical structures of behaviours. This arose out of the theorising of Miller, Galanter, and Pribam (196o).

In this exploration of the students' personal meanings of life at a tertiary college, the main key used to gain entry into 'their personal worlds' was the repertory grid. The grid design and interpretation techniques were carefully and systematically explored (chapter 7) to enhance the validity of grid interpretation, in the sense expressed by Yorke (1985) "the potential of the grid to capture accurately the construing of a respondent" (p.385). Attention was taken to consider the reliability of the grid and the consistency with which qualitative and quantitative data were produced. This aspect of the investigation produced three useful developments for use in grid interpretation. Firstly, the super-ordinate constructs as identified by laddering were located within the P.C.A. of L.A.G. The highest loading constructs on component 1 reflect super-ordinate construing, although not all super-ordinate constructs load

highly on this component. This information enabled this aspect of P.C.T. theory to be partially retained in interpretation of grids. Secondly, component 2 of the grid was identified as an area of transient meaning and component 3 as unreliable, largely reflecting measurement error. Thirdly, the pluralacy of interpretive techniques was developed. The interpretation of the L.A.G. using two procedures, a schematic diagram of construct relationships by correlations coupled with P.C.A. of the grid showed that no single interpretation of the grid data can fully and accurately capture the personal meanings of a respondent. Each technique has its strengths and weaknesses. Some of the worst distortions of meanings which can occur due to transformation of grid data by numerical procedures can be avoided by pluralacy of interpretation (see Appendix 3 for an example).

Insight into the students' worlds have been gained perhaps with considerable validity as far as is possible when they are interpreted by the investigator without the involvement of the respondent subject. Opportunities to explore the respondent's view of the world more fully, interestingly and usefully have, however, been missed due to the respondent's exclusion from the interpretive process. Pope (1981) has for example commented that completing a grid can block awareness raising, if it is used in too formal a manner and Leitner (1988) has said that using grids in a mechanical way can be rather an empty experience for the researcher. By including the students equally in the process of interpretation, a richer awareness and understanding of the students' worlds could have been gained to the benefit of both subjects and researcher. The decision for researcher only interpretation of grid information in this research was taken on the grounds that to discuss the information with the subject would be catalytic in bringing about change in their construct systems, beyond that normally occurring due to college experience (Thomas, Harri-Augstein,

1985, p.333). The minimum intervention was chosen so that findings could most reflect influences on construing of normal college experience. It was hoped to conduct a parallel study in which joint student researcher interpretation of grids took place and comparison between those results and the results in the reported study to test the efficacy of the conversational interpretation as a catalyst for change in this area of construing. This research was beyond the constraints of the present investigation and remains to be done.

The most significant information lost due to the research decision not to involve the subject in interpretation procedures was information about why specific changes in construing identified took place. In the longitudinal study for example (chapter 8), changes identified in student construing were centred on the rising importance with increasing experience of achievement/mastery construing of behaviours. Information about why those changes occurred between grid presentations could have been gained through discussion with the respondent and to not discuss why they occurred, leaves a gap in understanding of the dynamic nature of personal meanings which is central to P.C.T.

If such investigations are to be most effective consideration in future work would need to be given to communicating of grid information back to the student. More accessible interpretations beyond the P.C.A. graph format used in this research, would be advisable. Consideration of the procedures developed for this by Thomas, Harri-Augstein (1985) should be explored.

The information on reasons for changes in construing would be practically useful to a tutor. It could help in development of strategies useful and effective for enabling students to change their construing towards a mastery/achievement emphasis. Discovery of ways of

understanding how change in student meanings in relation to activity experiences comes about should be the focus of future research, and methods of pursuing this would stretch beyond that indicated above and might include such methods as a grid investigation of student significant learning experiences, or exploration of construing by use of in-depth interviews. Research may also focus on the tutor, for example exploring how they structure the students' learning experiences to take advantage of their achievement/mastery construing and equally importantly considering if and how tutors attempt to develop this type of construing within the students' motivational systems.

The awareness that motivation is not fixed but open to change is an important consideration for both tutors and students alike and research as indicated above may enable planned, rather than unplanned change to take place, thereby creating more effective changes in directions beneficial to the student.

There is also a-priori question to consider, that is whether achievement/mastery construing identified in the present research as contributing to academic success is neccessarily the only or most desired and worthwhile educational objective to pursue. Other qualitative changes in construing might be aimed for and consideration given to what that implies for students and tutors. Since it has been found here that student enjoyment and happiness are not correlates of academic success, it might be argued that in enabling students to develop lifestyles which enable their personal goals to be achieved, even when that is not consonant with high academic success, is a worthwhile educational objective. This area of student adaption to college environments is a further area of future research worthy of pursuit in which both student and tutor perspectives need to be developed.

A. P.C.T. understanding of action

Kelly explicated his model of human behaviour in his 'fundamental postulate' which asserts that a person's processes are psychologically channelised by the ways in which he anticipates events.

The 'events' examined in this research effort are those which involve a person's volitional behaviour (actions). The anticipations are of the quality of experience consequent upon carrying out the chosen behaviour and of the outcomes emanating from that behaviour.

Kelly employed the metaphor of 'man the scientist' to characterise human endeavour and encapsulate his axiom that people are constantly experimenting through their own behaviour which is in effect the 'independent variable' in their personal experiments. Their hypotheses are their anticipation of events and for volitional behaviour those anticipations may be termed personal goals.

But what is one to understand by the pivotal term behaviour in Kelly's metaphor? It is almost totally ignored as an entity within P.C.T. theorising. It needs to be considered. A fundamental assumption made in this research was that behaviour can have long-term, abstract connotations such as 'being at college', and also other more short-term concrete connotations such as 'doing a college assingment' and 'taking part in recreation', which in their turn can imply even further more detailed behaviour elements. The relationship between the broader more abstract behaviours and the relatively narrower more concrete ones is hierarchical, that is behaviour is organised with several concrete behaviours nesting under each broader abstract behaviour. Continuing with the example above, 'doing a college assignment' and 'taking part in recreation' may both be subsumed under the broader behaviour category 'being at college'. Since the broad life choice establishes in a general sense the time place and purpose of the more specific behaviours, to have made a different broad life choice

such as 'to take a job in a bank' would lead to specific behaviours other than "doing a college assignment". The broader choices are associated with super-ordinate constructs such as achievement, or affiliation, whereas more specific behaviours will additionally involve more sub-ordinate constructs such as 'a learning experience', 'sharing', in addition to the super-ordinate constructs.

Within construct theory the process by which a single behaviour is chosen from amongst a range of alternatives is the C-P-C cycle, circumspection-pre-emption-control. Circumspection is the point at which personal constructs are used in a propositional manner to construe a life situation and generate possible actions such as, 'to go to college' or to 'work in a bank' and so on. Pre-emption is narrowing of meanings placed on the situation to the point where one is preferred and a single action is selected, e.g. 'to go to college'. This is termed the point of control, and subsequently validation or invalidation of the construct based hypotheses, anticipations of college life, takes places in the light of experience and will lead to change in subsequent construing.

The student anticipations of "life at college" can be examined by looking at their construing of the element 'college life as a whole' and an understanding of their choice gained.

Once a major life choice such as this has been made, as noted above further choices follow, each requiring a C.P.C. cycle to be completed, involving additional constructs sub-ordinate to those used for the broad life-choice yet related to them. The sub-behaviours are chosen to realise 'life as a whole' as the person would anticipate they would 'ideally like it to be'. The success or otherwise of these behavioural experiments determines the level of psychological well-being experienced by the person experimenting. Well-being is operationalised as the discrepancy between how 'life as it is' and 'life as it ideally would be' are construed.

The present research effort examined behaviour at three levels of organisation, whole life (e.g. 'life as it is now') major life spaces (e.g. work, sport) and sub-activities within those life spaces (e.g. private study, attending lectures and doing assignments, as the work activities).

Time-allocation to sub-activity experiences consistent with realising an anticipated meaning of 'life as a whole' is an aspect of action explored in this research.

Qualitative differences in construing were shown to be the most significant indicators of differences in time allocation patterns, more achievement orientated students tended to allocate more time to doing work assignments than other students and less time to recreational activities.

The development of P.C.T. so far suggests that super-ordinate constructs are needed to maintain a long-term course of action, but it would be wrong to assume that all behaviours are thus controlled, some behaviours may be of a more impulsive hedonistic nature and not related to any broader course of action.

The specific outcomes of the processes described above are that different types of action patterns may be predicted from the presence or absence of qualitatively different types of super-ordinate constructs in a persons construct system.

Relative priorities of activities can be established according to the tendency of each activity experience to be construed at the preferred pole of constructs.

Such priorites may suggest, at one extreme, that a person will choose to take part in only a single activity namely that activity which is construed as most like their 'ideal life as a whole'. This does not happen partly because priorities change with the passage of time, for example, a

physical activity may be chosen because it is construed as 'interesting', and 'healthy' and is terminated after some participation time when it is construed as tiring.

A second reason that a range of activity experiences are chosen is that for the broader activities to be fully realised it is necessary for a range of sub-activities to be undertaken.

Differences in time allocation to an activity, can influence externally quantifiable outcomes of that activity such as the level of academic success achieved by a student.

More successful students construe 'being at college' in a qualitatively different manner to that of less successful students, and this applies to their construing of sub-ordinate activities hence their time allocation to work activities and recreative activities is different, in particular they give extra time to private study and assignments.

To extend the argument further they will do different things during that private study, which may include such things as using planning techniques, concentrating for longer periods of time, but such differences were not the focus of this research.

A persons behavioural experiments are open to validation or invalidation, that is confirmation or disconfirmation of anticipations. There are many simultaneous experiments going on during volitional activity and validation (or invalidation) of anticipations will reflect this fact.

The college culture and sub-cultures provides validational information as does the experience gained by the person in carrying out the chosen behaviour. Peer groups, tutors, and parents or other significant others are all sources of information which can confirm or disconfirm anticipations and thus direct the change in a student's construct system.

Construal of work related behaviours can be influenced by peer comments such as "you work too hard", tutors comments, instructions and evaluations of set work are also potent sources of validational information.

It is suggested but not validated in this study that some students can be expected to change their construal of 'work activities' to bring about an increase in similarity of their construing to that of the college tutors, which is concerned with mastery and achievement of excellence, and this will heighten their chances of academic success. The students who construe work activities in a similar manner to their tutors upon entry to college, particularly at super-ordinate levels of construing, will be the students most likely to be academically successful at college work, utilising their time most appropriately for this purpose. Their construct systems frequently receive validation from tutors and their super-ordinate constructs are permeable in relation to new work experiences.

However, it is the degree to which constructs used across all the students life-spaces create an 'actual life' with minimum discrepancy to an 'ideal life' which will determine the psychological well-being of the students, and the levels of enjoyment and happiness experienced.

APPENDIX ONE: LIFE SPACES QUESTIONNAIRE

PATTERNS OF STUDENT LIFE AT _____ COLLEGE

Some information concerning the purpose of this questionnaire

The questions which follow are related to your general lifestyle at college, that is what and why you take part in various activities. The questions fall into one small and two larger sections. These are related to your reasons for coming to study at Chester College, your leisure activities whilst at college and finally those activities centred around working for a degree.

Students vary considerably in both what and why they do things and as such there are no right or wrong answers to any of the questions. The questions are based upon the viewpoints expressed in interviews with many previous students of the college. It is hoped that you find it possible to fairly represent your own viewpoint by answering these questions.

By knowing more about what being a student means to you and other students like you, it is hoped, in time, to be able to match the college environment more closely to student needs. ALL INDIVIDUAL DATA WILL BE TREATED WITH THE STRICTEST CONFIDENCE.

How To Answer

The questions require you to place a 'tick' in the boxes given next to the response which most fairly represents your own personal viewpoint.

SOME DETAILS ABOUT YOU

NAME _____ SEX: MALE FEMALE

AGE: Under 21 21-25 Over 25 COURSE: BA B.ED. Common Year

1. Why did you choose to read for your degree at Chester?

Rate the relevance or irrelevance for EACH of the influences listed below on a 4 point scale.

Please tick the most appropriate response

		Highly Relevant	relevant	little relevance	irrelevant
(i)	Personal recommendation from school, friends or family				
(ii)	You thought the course relevant to your career intentions				
(iii)	There was a specialist P.E. course offered				
(iv)	The city of Chester is attractive to live in whilst studying for a degree				
(v)	You were influenced by reading the prospectus				
(vi)	It was the only college to accept you				
(vii)	Please list and rate any other influences affecting your decision				
	_____				
	_____				
	_____				

2. Why did you choose P.E. as a main subject?

Rate the relevance or irrelevance of the possible influences on your decision as listed below on a 4 point scale.

Please tick most appropriate.

	Highly Relevant	relevant	little relevance	irrelevant
(i) You liked playing sport				
(ii) You wanted a career involving sport				
(iii) It seemed an easy degree to get				
(iv) A lot of interesting people study P.E.				
(v) An opportunity to widen your knowledge of theoretical studies in P.E. such as physiology, psychology, history of P.E.				
(vi) P.E. offered a good opportunity to play a lot of sport				
(vii) Other reasons, please specify and rate				
_____				
_____				
_____				

In many of the questions that follow reference will be made to the terms 'work' and 'leisure'. For the purpose of this questionnaire these two terms are defined as follows :

LEISURE: *Any activity, apart from work activities, which one freely chooses to participate in which can produce pleasure and satisfaction for you.*

WORK: *Those activities which are an integral part of reading for a degree, such as attending lectures, completing assignments and private study related to your course.*

3. How frequently do you go home on average during a college term? Tick the most appropriate response.

(i)	Not at all	
(ii)	Once	
(iii)	Two or three times	
(iv)	Most weekends	

4. How frequently on average do you use the following facilities during your leisure time?

Tick the most appropriate response.

	Never	less than once each week	Once a week	2/3 days a week	Daily
(i) De Bunsen Centre					
(ii) T.V. Rooms					
(iii) Common Rooms					
(iv) Gymnasium					
(v) Swimming Pool					
(vi) Games fields					
(vii) Library					
(viii) Bar					
(ix) Chapel					

5. To which clubs at College, if any, do you belong?
Tick 'yes' or 'no' as appropriate.

	Yes	No
Musical		
Physical		
Religious		
Others (please name)		

6. To which non-college clubs do you belong during term time?

Please specify _____

_____

_____

_____

7. How interested or uninterested are you on the following areas of life?
Tick the most appropriate box.

	very interested	mildly interested	uninterested
Politics			
Religion			
Current Affairs			
Sport			

8. Indicate how important or unimportant the following activities are in your leisure time.
Tick the most appropriate response in each instance.

	unimportant	mildly important	important	very important	extreme importa
car maintenance					
playing board games					
visiting friends					
listening to music					
spectating at sport					
watching movies					
watching T.V.					
general reading					
going to 'discos'					
going for a drink					
driving					
eating out					
photography					
shopping					
making things					
playing an instrument					
painting					

9. How satisfied overall are you with your non-sporting leisure activities, i.e. those activities you indicated in the previous question.

very dissatified	fairly dissatified	just satisfied	fairly satisfied	very satisfied

10. Below is a list of sports. Consider how often during your leisure time you participate in each of them and tick the appropriate column? Where a sport is seasonal, such as soccer or tennis, respond for "in season" participation.

Sport	Very Regularly	Regularly	Occasionally	Rarely	Never
Football					
Rugby					
Cricket					
Gymnastics					
Swimming					
Hockey					
Basketball					
Water-Polo					
Netball					
Badminton					
Volleyball					
Trampolining					
Golf					
Squash					
Tennis					
Orienteering					
Skiing					
Dance					
Athletics					
Fitness Training					
Weight Training					
Sailing					
Canoeing					
Camping					
Mountain Leadership					
Climbing					
OTHER SPORTS *please specify and rate* a. _____ b. _____ c. _____					

11. How satisfied overall are you with your sporting leisure activities?

very dissatisfied	moderately dissatisfied	just satisfied	moderately satified	very satisfied

12 How many of your friendships if any were formed largely out of a shared participation in sport

(i) Friends before coming to college

None	a few	about half	a lot all of them

(ii) Friends at college

None	a few	about half	a lot all of them

13 To what extent, if at all, might sporting considerations influence your choice of career. Tick the appropriate response?

not at all	a little	neutral	a lot	very much

In some of the questions that follow the abbreviation P.E. will be used. Its meaning here is the *academic subject* of Physical Education.

The terms practical and theoretical studies refer to sub-units of P.E., namely those studies necessarily involving practical physical activity in conjunction with cognitive learning experiences e.g. sports and those which do not e.g. the History of P.E.

14. If you were to pursue a career involving sport to what extent might the following areas of study be considered important components to include in your undergraduate P.E. studies?

a) Theoretical work

	Unimportant	mildly important	important	very important	extremely important
History of P.E.					
Biomechanics					
Applied psychology					
Sport in society					
Applied physiology					
Other Theory - please name _____					
_____					

b) Practical work. Please *tick* the one box which most represents your viewpoint.

No practical sports work at all	
Only a very few sports studied in depth	
A limited range of varied sports, some studied in depth some new experiences	
As many sports as possible	

15. To what extent in your course, if at all, are concepts within the following theoretical studies of P.E. shown to be relevant to practical work in P.E.?

Tick the most appropriate response for you.

	not at all	a little	more than a little	very much	a major emphasis
History of P.E.					
Biomechanics					
Applied Psychology					
Sport in Society					
Applied Physiology					

16. Please consider which activities you think are important to (i) obtain a degree (ii) have most influence on your overall lifestyle?

	unimportant	mildly important	important	very important	extremely important
(i) PASSING of My Degree					
Theoretical studies					
Practical studies					
Sports leisure					
Non Sports leisure					
(ii) Influences My Life Style					
Theoretical studies					
Practical studies					
Sports leisure					
Non sports leisure					

17. Consider what balance of time spent studying P.E. as an undergraduate subject should be maintained between theoretical work and practical work.

Tick the most appropriate response.

all theory	mainly theory	even balance	mainly practical	all practical

The amount of study time needed and the prefered place for study varies considerably between students. The following questions are about your own personal preferances. Please be as accurate as possible with your estimations.

18. Where do you do your private study i.e. work outside of lecture time? Tick the most appropriate response.

mainly College Library ☐

mainly own accommodation ☐

fairly even mix of college library and own accommodation ☐

mainly elsewhere, please state : _____

_____

19.. Please estimate how long you work on average, at a single sitting, without a major break (more than 5 minutes)

less than ½ hour	
½ hour - 1 hour	
1 hour - 2 hours	
More than 2 hours	

20. Approximately how much time on average each week do you spend on private study, a) for doing assignments b) for other reading etc.?

Place a tick in each column i.e. 2 ticks are needed

	(a)	(b)
less than 4 hours		
4 - 8 hours		
8 - 12 hours		
More than 12 hours		

21. Some students report that they experience some difficulty in balancing the demands of work and the need to develop adequate leisure interests. Others find that the difficulty occurs when a rich leisure time distracts them from adequate attention to the demands of work.

To what extent, if at all, do you experience difficulty balancing work and leisure demands?

work seriously affects leisure	work affects leisure	there is no difficulty	leisure affects work	leisure seriously affects work

22. How satisfied overall are you with your work?

very dissatisfied	fairly dissatisfied	just satisfied	fairly satisfied	very satisfied

APPENDIX 2

Case Study 2: Elicitation of Constructs by Triads Procedure

	Similarity Pole	Contrast Pole
1	Having fun	Nervous, under pressure feeling
2	Relaxation, with Achievement	Formal, critical
3	Involved in sport	Not involved in sport
4	Social life Socialising	Professional life
5	Involves Personal Life, Relationships with others	Independent, no relationship with others
6	Goal orientated	Nothing to do with goals
7	Doing Academic Work	Leisure Time
8	Exam Related Work	Course work, doing assignments
9	Tangible Results	Emotional Satisfaction
10	Seriousness	Remminising, Chatting, Not Serious
11	Institutions, Narrow View	Outlook, Beyond College
12	Being a College Student, A Role	Lecturer
13	Enjoyment	Not at East, Not Enjoyable
14	Physical Activity	Injured
15	With Other People	Individual
16	Own Choice/Independent	Compulsory, Have a Go
17	Achievement, Sense of Achievement	Non Self Satisfaction
18	Do Theoretical Work at College	Practical Lessons At College, Physical
19	Frustrating	Relaxing

	Similarity Pole	Contrast Pole
20	Competition, Challenge	Free Activity No Performance Needed
21	Broadening Life's Experiences, Developing	Not Lived
22	Pleasing, Happy	Unhappy

Case Study 2: Laddering of three constructs

Laddering was up the left-hand side in each instance, i.e. his preferred pole.

(1)

enjoyment.....depressing

↑

achievement.....sense of failure

↑

self satisfaction.....no self satisfaction

↑

competition, challenge.....no challenge

(2)

accomplishment, &

achievement of these aims.....no self satisfaction

↑

leads to success.....failure

↑

goal orientated.....nothing to do with goals

(3)

pleasing.....unhappiness

↑

happy.....miserable

↑

involving personal relationships.....independent

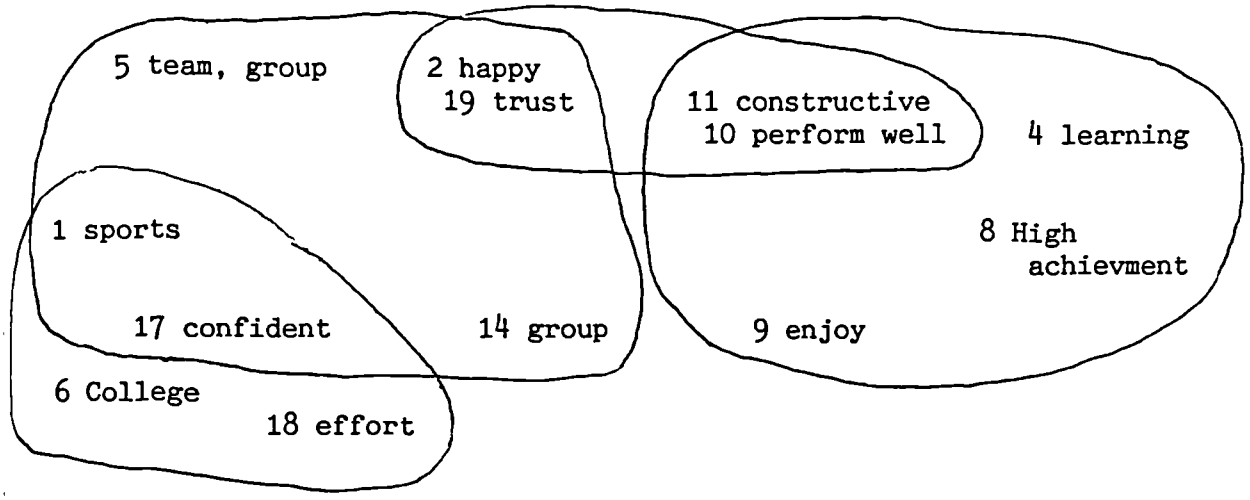
Case Study 3: Grid

THE LIFE ACTIVITIES REPERTORY GRID SHEET

			CONSTRUCTS																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
			Having Fun	Relaxed	Sport Involved	Socialising	Personal Relationships	Goal Orientated	Academic Work	Examination Work	Tangible Results	Being Serious	Institutional	Being A Student	Enjoyment	Physical	With Other People	Own Choice/Independent	Achievement	Theory Involved	Frustrating	Competitive Challenge	Life Experiences	Happy/Pleasing	Accomplishments
	1.	School P.E.	2	3	2	4	4	3	9	10	2	5	3	5	3	2	4	5	3	7	8	3	2	3	3
E	2.	Physiology Lecture	5	7	5	7	7	4	3	2	2	2	2	2	4	4	6	3	4	4	3	4	3	4	4
	3.	Sports Lecture	3	4	2	5	4	3	5	5	2	3	3	1	3	3	3	3	4	5	8	3	2	3	3
L	4.	Sports Match	2	4	1	3	4	2	9	10	2	3	4	3	2	1	3	3	2	10	8	1	2	3	1
E	5	Training Session	2	3	2	3	4	3	9	10	2	2	4	3	3	1	4	3	3	10	10	2	3	3	2
	6.	Hobby	1	1	3	1	2	4	9	10	2	10	5	3	1	2	3	2	4	5	9	5	1	1	4
M	7.	Antagonistic Group	8	6	7	7	8	8	7	8	4	3	3	5	7	7	2	9	5	4	1	3	4	10	9
E	8.	Compatible Group	2	2	3	2	2	7	7	9	3	4	7	2	2	4	1	2	3	3	8	3	2	3	2
	9.	Person of Influence	3	3	4	3	1	3	6	8	10	4	8	4	3	3	2	2	2	6	7	5	1	3	4
N	10.	Outside Activity	7	4	3	7	5	10	9	10	1	8	10	6	3	8	7	3	10	9	3	10	10	5	10
T	11.	Injury Experience	9	6	4	7	5	5	10	9	2	3	5	4	6	3	3	10	5	5	2	5	3	8	8
	12.	Doing Private Study	8	6	8	9	8	2	2	2	1	2	3	3	8	8	8	1	2	2	2	2	3	8	2
S	13.	Doing Assignments	9	8	9	9	8	2	1	2	1	2	2	3	8	8	8	2	1	1	2	3	3	9	1
	14.	Doing Examinations	10	10	10	10	10	1	1	1	1	1	1	3	10	10	10	2	1	1	2	3	2	10	1
	15.	Life As It Is Now	3	5	3	3	3	4	3	4	3	3	2	10	4	3	3	3	4	3	4	3	3	4	3
	16.	Ideal Life	1	1	3	2	3	5	9	10	3	9	5	7	2	2	2	2	2	8	8	4	1	2	2

APPENDIX 3

A Schematic Diagram of a Construct Correlation Network which is not appropriately summarised by a P.C.A.



The central dimension of meaning is on relationships, (2 happy, 19 trust) but they are of a particular kind, that is they are constructive, (11) since they enable activities to be performed well, (10). Relationships are also in team (5), and sports (1) contexts thereby offering a sense of group satisfaction (14). On the other hand being constructive and performing well requires learning (4) and can be enjoyable (9). Finally, sports and confidence are college based (6) and require effort (18).

The question now arises as to how a P.C.A. analysis can possibly adaquately represent the organisation of the subjects constructs. Where will the first component go? Where will the second component go and so on?

The statistical solution is given in the table over page does it distort the data?

	C.N.	F.L.	C.L. P.P.
C1	19	93	trust
	2	90	happy, relaxed
	13	85	sharing, togetherness
	14	84	satisfying group effort
	10	75	perform well
	5	72	team group
	15	71	exciting involvement
	8	66	high achievement
	9	63	enjoy competing
	17	53	confident
	4	53	learning experience
C2	1	80	academic involvement
	3	76	concentration
	7	73	mental effort
	12	68	reason to live
	11	65	constructive
	17	60	nervous
	4	55	learning experience
	9	56	enjoy competing
	15	20	exciting involvement
	8	50	high achievement
C3	18	60	hard, requires effort
VARIANCE C_1 C_2 C_3, total 66% (38,28,9)			

Table:- Components I, II, III of P.C.A. analysis of CS grid.
C.N. = Construct Number in the grid. F.L. = Factor Loading.
C.L.P.P. construct label, positive pole.

Component 1 fairly well represents the largest construct cluster from the line drawings solution (trust,team,happy etc) but doesn't show its relationship throught the learning achievement cluster. However component 2 is much less satisfactory. This component has constructs loading on it such as academic involvement (1) and anxious (17) along side others such as constructive (11) and enjoy competing (9) which are not inter-correlated at all. This is an unsatisfactory solution which distorts the underlying psychological meaning the subjact gives to events as shown by the line drawings. Note also that components one and two only retain 66% of the grid variance, (split 38%, 28%) whereas for CS1 the comparable figures were 79% (48.6%, 31.3%) (In each study the third component accounted for less than 10%of grid variance).

Clearly any understanding of grid elements based on the labelling of principal components given above would be highly suspect, notably in relation to component 2

In Conclusion

A PCA analysis of grid data is inevitably in statistical terms a compromise solution but the more complex *the construct correlations* matrix upon which it is based, the greater the compromise which is likely. The schematic construct correlations diagram helps investigators avoid making the more gross misinterpretations which may arise out of P.C.A. Furthermore, in using P.C.A. to examine element meanings, in this case activity experiences, the limitations described above will inevitably circumscribe the understanding gained. Clearly only a partial "truth" is possible from a P.C.A., interpretation is partly science partly an art, and this must be acknowledged and accepted

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