THE VOCATIONAL COUNSELLING ROLE:

PERCEPTIONS OF SECONDARY SCHOOL STUDENTS.

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ABSTRACT

A Repertory test was constructed to determine the perceptions of 143 schoolchildren concerning people who gave them vocational counselling. A preliminary study elicited the constructs which they used to structure and order their interpersonal world. Each subject completed a version of the Repertory Grid consisting of 22 Role Titles and 22 supplied constructs. Grid responses were averaged and examined for the group as a whole as well as for sub-groups consisting of male and female, private and state school pupils, separately.

The pattern of relationships existing between all 22 Role Figures was determined by subjecting the data to both a multi-dimensional scaling and an hierarchical clustering form of analysis. Clusters of figures produced by these methods were examined and discussed in terms of their composition and the descriptive adjectives and phrases associated with them.

As predicted, it was found that the subjects made their discriminations between people on two major construct dimensions, an intimacy and a potency factor and that the vocational counselling persons appeared in two of the generalized figure clusters indicating that there are at least two distinct parts to the vocational counselling role. Different attributes in the counsellor are required for each of these different role functions. The composition and characteristics of other generalized figure clusters were also examined.

The 18 subjects who were unable to complete their grids were considered as a separate group. For all subjects their relative standing in their school classes on the last set of examinations was taken as a measure of intellectual capacity but there was no evidence that a relationship existed between this and the ability of subjects to complete the grid protocols.

Finally a number of possible extensions and refinements to the experiment were considered and an evaluation was made of the Repertory Grid technique as it was used in the present context.

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CHAPTER 1. INTRODUCTION

A great deal of emphasis is currently being placed upon supplying career information and providing vocational counselling to secondary school students who are about to leave school. In December 1968, a decision was made to accept a guidance and counselling service as a developing part of the New Zealand pattern of secondary education. Following this a working party, set up in July 1971 to study personal, educational and vocational guidance in New Zealand Secondary Schools stated that, "for the majority of the school population their most pressing problems will be in the educational and vocation areas .... . In order to make sound educational decisions at school and realistic vocational decisions on leaving school, pupils need to come to terms with a large amount of occupational information". (Panckhurst, 1974, p1)

Such guidance is traditionally offered by parents, teachers, careers advisors and others in the hope that the youngsters may make rational, realistic and effective decisions which will lead to job satisfaction, self-fulfillment and satisfactory work performance in their chosen careers. At the same time it is widely accepted that vocational choice is an on-going decision-making process (Dysinger, 1950; Ginzberg et.al, 1951; Beilin, 1955; Gesell et.al, 1956; Nelson, 1962) in which the child, adolescent and young adult gradually formulates his preferences in a series of stages until entry into his first job and even beyond (Super, 1953; Tiedeman and O'Hara, 1963).

Super (1953, pp189-190) for example, describes three distinct stages in the development of vocational choice; first the Fantasy Period in which the 3 - 7 year old child selects occupations on the basis of the intrinsic pleasure which the activity is presumed to afford, then the Tentative Period (approximately 10 - 18 years) when emphasis shifts to the satisfactions derived from the immediate outcomes of employment. The final stage is the Realistic Period leading to a rational decision, taking present interests and abilities as well as future goals and external restraints into consideration. In contrast, Hoult (1975, pp104,105) observes that at any point in time, the individual has settled on a relatively small number of choices and that

these choices are realistic from an early age. Either way, it is clear that much of the decision-making process has already occurred long before the 15 or 16 year old is encouraged to consult the vocational guidance counsellor or expected to make his first serious career choice.

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CHAPTER 2. LITERATURE REVIEW

2.1 Influences on vocational choice

Numbers of studies have emphasized the importance of non-school influences on career development (Endicott, 1931; Tiedman and O'Hara, 1963; Baldock, 1971; Thomas and Wetherall, 1974). These influences include family, peer and social class identification. For example, a survey conducted by Thomas and Wetherall (1974) in ten areas in England and Wales on 1733 boys in the 4th and 5th years of secondary education considered such factors as socioeconomic group, family size, income of head of household, home ownership status, parental education, parental attitudes and involvement in their sons' career progress.

In this study parental interviews (with the boy's father or father substitute in most cases) were conducted to investigate different aspects of home and family backgrounds and the findings may be regarded as a general description of their home environment. The following results were obtained:-

(1) Younger leavers (15 - 16 year old) tended much more than older ones to be members of families of manual workers.

(2) 16 year old leavers were much more likely than 15 year old leavers to come from small families and sixth formers were more likely still to come from families consisting of one or two children only.

(3) Fathers of older school leavers and pupils of grammar and technical schools earned more on average than those of younger leavers or pupils of comprehensive and secondary modern schools.

(4) Similar differences were observed in the pattern of family home ownership versus rented accommodation.

(5) There was a strong positive correlation between child's and parents' ages of leaving school.

(6) The relationship between parental knowledge and involvement in their son's career decisions and school leaving age was less direct and was mediated by such intervening variables as general attitudes and values concerning life and work.

The authors concluded that the relationship between these observed home background factors and the boys' employment related attitudes, values and behaviour, "might be mediated by corresponding differences in parental attitudes, values, etc., as transmitted to the boy within the family environment". (p89)

Baldock (1971) studied the vocational choices of 3773 male High School students in New Zealand together with the vocational aspirations held by 648 parents for their adolescent sons. She found that of the many factors which influenced occupational aspirations, parental rank, students' scholastic ability and educational aspirations of the respondents had the most crucial effect while race, family residence and school type had some independent effect. When the impact of parental rank, scholastic ability and education choice was compared, parental social rank, as measured by father's occupation emerged as the single most important variable.

Endicott (1931) noted that girls made an earlier choice than boys and were more influenced by the suggestions of parents. Such differences between the sexes may still exist to the present day.

It seems very likely, therefore, that the 15 or 16 year old school leaver has already acquired a variety of information and advice which has helped him to arrive at his present level of vocational maturity and that many job related attitudes are derived from influences surrounding his home environment.

2.2 Perception of Counsellors

In order to predict the adolescent's future behaviour in seeking vocational guidance and to provide the type of personnel (by selection and training) who can best fill this counselling role it becomes necessary to discover the impressions he has formed of counselling sources in the past and his previous behaviour in actively seeking guidance. A reading of the literature in this area reveals much disagreement between counsellors and clients in their perceptions of the roles of the counsellor working in educational institutions (Warman, 1960,1961; Anderson, 1970; Bartlett and Thompson, 1971; Resnick and Gelso, 1971; Wilcove and

Sharp, 1971). Over a decade ago Warman (1960,1961) found that subgroups of students, faculty and counselling staff had differing perceptions of the role of the counselling centre. Numerous further studies since then have revealed little change in this state of affairs. Resnick and Gelso (1971) noted that all groups perceived vocational choice problems as an appropriate area of concern but there was much disagreement as to the degree of importance attached to vocational choice problems within the total sphere of counselling activities. In a study of counselling at High School level Bartlett and Thompson (1971) found a similar level of discrepancy in opinions.

In the present study, by focussing attention on where a group of 15 - 16 year olds prefer to go to seek their vocational information and guidance in choosing a career and how they perceive these sources it was hoped to clarify some of this confusion. The general approach adopted was to ask a sample of secondary school students just how they perceive certain other people who might be expected to form a relationship with them involving counselling-type activities. These people may come from any part of the subjects' social environment and may include peers, family members, adult friends or school counsellors and teachers, some of whom are not generally regarded as occupying a vocational counselling role as defined by educational and other institutions.

2.3 Selection of a measure of perception

The problem which now presented itself was to find a suitable means of measuring these perceptions and a number of possibilities were investigated. In assessing the attitudes and perceptions of subjects most experimenters employ some form of questionnaire, attitude scale, interview technique or projective test, all of which have their own particular strengths and weaknesses.

Although a series of interviews would have been a flexible method to use to obtain data of the breadth and depth required and would, at the same time, have provided the opportunity to establish rapport and gain the confidence and co-operation of the youngsters being studied, it had two major drawbacks for this investigation. The first of these was the element of subjectivity inevitably introduced into the

interpretation of the subjects' responses. In the interview situation, the skill in eliciting the necessary information and the onus of interpretations rests heavily upon the competence and experience of the judge. It was felt that the discipline of using pre-determined categories for judgement would not entirely overcome the problem of subjectivity. The second objection to the interview method was the practical one of time constraints and the difficulties involved in conducting time-consuming individual interviews in a school situation.

The advantages of the standardized questionnaire in terms of ease and speed of administration and objectivity of scoring is outweighed for the present purposes because they fail to recognize or tend to minimize or ignore the relationship which inevitably exists between experimenter and subject. As an adult, conducting a study with groups of 15 - 16 year old adolescents it is essential to take the time and trouble to establish an atmosphere which will provide strong motivation and encouragement to produce honest and thoughtful responses on the part of the subjects. The present experimenter considered that the formal and in many cases inappropriate format and wording of most available questionnaires would erect barriers which might prevent the establishment of these desirable testing conditions. Further, any form of questionnaire which demands responses to pre-set questions necessarily limits the range of responses obtained and defines the context of the topic more narrowly than would an open-ended form of interview.

On the other hand, whereas projective techniques such as the Rorschach Inkblot Test and the Thematic Apperception Test allow subjects a maximum amount of freedom to express their private and personal orientations in considerable depth, the burden of interpretation is emphatically placed on the experimenter rather than on the person being investigated. Additionally, it was felt that the lack of face validity associated with ink blots or ambiguous pictures was likely to be unacceptable to a group of pragmatic 15 year olds.

2.4 The Repertory Grid and Personal Construct Theory

The main object of the experiment was to assess the relationships which the subjects had with other people within their experience and to discover the personal meanings which the subjects themselves attached to these relationships. It has long been accepted that each individual imposes his own unique structure on the world about him and to understand his conceptual structure one must discover those dimensions used by the individual. The use of the Repertory Grid technique offered the best means of accomplishing this and at the same time overcoming many of the difficulties associated with other methods.

The Role Construct Repertory Test and its adaptation in the form of the Repertory Grid (Kelly, 1955; Bannister and Mair, 1968) is based on the Personal Construct Theory of G.A. Kelly (1955) which has problems of interpersonal interactions as its central theme. As a dynamic theory of personality it accords man the special status of being responsible for the construction of his own implicit theories of personality. According to Kelly, human beings are in the business of predicting and anticipating future events. To this end, they are constantly construing and re-construing both other people in their interpersonal world as well as things or events, and putting their working hypotheses to the test of experience - "Experience Corollary" (Kelly, 1955, p72).

Thus their anticipations or hypotheses are successively revised in the light of unfolding events and their construct system, that is, their personal representation of people and events, undergoes progressive development. This philosophical position Kelly labelled "Constructive Alternativism" (Kelly, 1955, Chap.1).

A construct is a person's way of viewing sections of his world which enables him not only to discriminate and organize events but also to anticipate future possibilities - "Construction Corollary" (Kelly, 1955, p50). It is essentially a dichotomous representation of events which provides a basis for considering likenesses and differences and at the same time for excluding certain other things as being irrelevant to the contrast involved - "Dichotomy Corollary" (Kelly, 1955, p59). Kelly further classifies constructs into the Superordinate Construct - one which includes at least one other construct as an element in its

context and the Subordinate Construct - one which is included as an element in the context of another.

The Role Construct Repertory Test was devised by Kelly (1955) as a means of operationalizing construct measurement. The essential aim was to allow an individual to produce his constructs in a form which could be clearly examined, so that his cognitive world could be understood in his own terms.

2.5 Development of the Grid Technique

The Repertory Grid was originally designed for use on an individual basis in a clinical situation. Each subject was given a number of Role Titles, covering a wide range of people and relationships, important in his life. (In Kelly's original version they included, *self, mother, father, brother, sister, spouse, ex-flame, best friend, ex-friend, rejecting person, pitied person, threatening person, attractive person, happy person, ethical person*). He was then required to supply the name of a different person known personally to him who fitted each Role Title. These people became the elements of the grid. The names were either written on separate cards or simply listed beside the appropriate Role Title.

Following this, the subject was asked to consider three persons at a time and decide some important way in which two of them were alike and thereby different to the third. For example, he might say that two are stupid while the third is intelligent. The triads are chosen by the examiner in such a way as to enable the subject to make comparisons which will throw light on relationships important to the study. His aim is to extend the sampling range by using as many different triads as possible and asking the subject not to repeat any of his constructs. The resulting constructs are a sample of the individual's semantic and psychological space. Kelly suggested "sorts" which included triads subsuming Family, Intimates, Valencies, Authorities and Values groupings. This method of triads is known as the Minimum Context Form of elicitation since Kelly regards three elements as the smallest number from which similarities and relevant differences can be generalized. In other forms the subject may be given all the cards at once and asked to arrange them into groups of people who are alike and different.

A grid form is prepared on squared paper with numbers along the top corresponding to numbers on each of the Role Titles. When the subject has provided his first discrimination the examiner (or the subject) places a tick in the two cells of the grid indicating the two persons who are similar. This represents the emergent pole of the construct. The cell corresponding to the dissimilar person is left blank and represents to implicit pole. (In some cases this pole may be merely implied, the subject being unable to verbalize the actual discrimination he has made. When the implicit pole is outside the person's level of awareness in this way and is normally articulated in action and feeling, only, Kelly describes it as a submerged or suspended pole whose meaning may only be revealed by reference to other constructs in the grid.) The subject then considers all other persons named on the list and decides whether each belongs to the emergent or implicit pole, placing a tick or leaving a blank in the appropriate cells. The same process is repeated with other groups of three figures until 15 or 20 constructs have been elicited.

The completed grid of ticks and blanks represents the intersections of the repertoire of bipolar construct dimensions which the person uses to structure his interpersonal world. Once a number of figures have been categorized one begins to understand the pattern of relationships (the degree of similarity and difference) which exist between the subject's constructs as they function in his construct system. For example, if each person who has been described as stupid is also described as cunning then this tells something about the individual's view of these people.

Having obtained a sample of an individual's construct repertoire, the next problem is to order them according to the particular dimensions which represent the parameters of his construct repertoire. Kelly (1955, p280ff) devised a non-parametric method of factor analysis of Rep Test protocol which provided a numerical measure (but not a correlation) of the degree of association between constructs. Other conventional forms of factor analysis and cluster analysis have been utilized to extract the underlying factors from the large number of constructs elicited (Levy & Dugan, 1956; Fager, 1962; Bonarius, 1965; Slater, 1965, 1967 and 1972). Grid data can just as readily be subjected to analysis of

element relationships and interpretation is conducted on the basis of both construct and figure configurations.

A number of variations in the methods of element allottment may be employed including ranking and rating of persons on the original Role Title list. Instead of names of persons, photographs (Bannister, 1962a), films (Carver, 1967), paintings (Mair, 1966a), inanimate objects (Bannister and Salmon, 1966), emotions (Fransella and Adams, 1965), problem situations in a person's life (Kelly, 1955) and types of bread (Jones, 1963) have been used as elements in the grid and in many cases one or both poles of the constructs have been supplied so that a group of people may be compared along a common set of dimensions (Bannister, 1962a).

Thus the theory of Personal Constructs and the Repertory Grid Method, taken together, provide a framework for exploring how people give meaning to their interpersonal lives and then proceed to act upon and test out the validity of the models which they have erected. The analysis of grid data allows the experimenter to examine the structure of the system whether it consists of either a few major dimensions or a more diverse and complex discriminatory and predictive system. It also provides a means of conducting an analysis of content or meaning.

2.6 Assumptions of the Role Construct Repertory Test

The underlying assumptions of the Role Construct Repertory Test are outlined by Levy and Dugan (1956). They are summarized as follows:-

a. For each individual there exists a universe of persons which constitutes his social environment.

b. Each individual possesses a repertoire of constructs which is relatively stable over a period of time, and which he utilizes in structuring his social environment.

c. Constructs contained in a given individual's repertoire bear a relationship to each other such that they may be ordered to certain basic dimensions which define the parameters of his construct repertoire.

d. The structure of an individual's social environment may be duplicated by an observer through knowledge of the parameters of his construct repertoire.

2.7 Examples of the use of Repertory Grid Technique

Many writers have noted the remarkable flexibility of the Repertory Grid technique and the abundance and complexity of the data it provides (Mair and Boyd, 1967; Adams-Webber, 1968). Grids have been used on both normal and psychiatric patients (Bannister, 1960, 1962) to assess relationships between constructs and elements.

Part of the value of Personal Construct Theory and the Repertory Grid lies in its provision of two avenues of investigation, the content as well as the structure of a construct system. This is achieved by focussing attention on the verbal labels used to define the construct dimensions. Structural analysis of individual systems reveals the way in which a person interweaves the content of his constructs. Duck (1973, p55) remarks that previous work on Personal Construct Theory rests heavily on structure rather than content - "... perhaps because of its bias towards the clinical areas of psychology whence the theory was largely derived and where Kelly felt it to be most useful. In clinical studies, analysis of structural linkages between constructs in an individual's semantic space provides useful diagnostic information".
In studies such as the present one where the information gained might ultimately be used to produce descriptive profiles (for example, of counsellors) interest is partly transferred to the "content" side of the data.

Extensive use has been made of the Repertory test and grid measures to study cognitive complexity - simplicity in terms of the degree of correlation found between a subject's construct dimensions (Jones, 1954; Bieri, 1955; Bonarius, 1965, Crocket, 1965 and others).

Recently, job analysts and evaluators of training programs have developed grid forms which they consider have great potential, particularly in the assessment of managerial skills. Smith and

Ashton (1975) successfully used a Repertory Grid before and after a training program to detect changes in perceived relationships among co-workers. The reason given by the authors for their choice of the Repertory Grid was,
"It was chosen in the knowledge of its likely administrative complexity compared with ratings, because of the judgement that the latter would yield restricted and less certain data in the area of human relationships."

A number of researchers, including Vacc and Vacc (1973) and Ravenette (1975) have successfully adapted Repertory Grids for use with Primary School children. Ravenette, using the Grid for clinical purposes found it a "powerful technique for eliciting the child's own constructions".
Vacc and Vacc applied an adaptation of Bieri's Modified Repertory test (Bieri, et al, 1966) in a classroom setting to a group of children of Grade 3 reading level. They concluded that the Adapted Modified Repertory Test should provide a useful research tool for measuring cognitive development and personality functioning in young children.

2.8 Grid method - its strengths and weaknesses

In common with the interview and projective techniques the Grid method provides a climate of participation and interaction between subject and experimenter which may lead to greater cooperation and a willingness to give honest and well considered answers to the questions asked. On the other hand, it avoids the deceptive element present in many projective techniques by asking questions which the subject can honestly answer in his own terms about specific people whose characteristics and behaviours are within his actual experience. He knows that he can answer honestly without revealing any information which may be damaging to him because the personal list of names is not revealed to the experimenter and remains the property of the subject. Role titles only are used by the experimenter. However, Mair and Crisp (1968) classify it as an "indirect method" in that the person being examined is seldom aware of the main focus of interest. Therefore, it may be able to tap unconscious processes in a similar way to projective techniques.

Unlike most questionnaires, the Repertory Grid method invites the subject to actively participate in the construction of the scales used to describe the structure of his inner world of meaning by eliciting and using individual constructs. The experimenter may check the subject's meanings by comparing one pair of descriptive phrases with others but the mathematical analysis of construct dimensions does not rely on the interpretations placed on these meanings by the experimenter. It is only much later that the experimenter interposes himself and attempts to make sense of the subject's system of meanings by subsuming it into his own construct system at a higher level of generality. At this point, he must begin to rely on the common meanings of the verbal labels which he shares with his subject. The structured format of attitude measures (including the semantic differential) consisting of anchored scales tend to restrict responses to pre-conceived dimensions which may not reflect those of the respondent. It has been pointed out that both the existing role relationship and the internal state of the perceiver has an effect upon our perceptions of others (Bruner and Tagiuri, 1954, p640). Thus it is possible that an adolescent does not assess his parents in terms of the same dimensions as his friends and a pre-determined set of firmly anchored scales may not be applicable to both groupings of people.

Because of his involvement in the actual construction of the scales it is possible that the subject can provide deeper insights into his relationships than by means of other techniques. At the same time, because the data obtained from the grid is subjected to such a complex form of analysis before the results are obtained it is highly unlikely that a subject could either consciously or unconsciously bias his responses in any systematic way which would affect the picture of his perceptions which finally emerges. By the nature of the grid he is forced to concentrate on each element in turn and categorize that person in terms of a particular bi-polar construct dimension. Thus, the semi-structured format of the repertory grid protocol not only offers a certain amount of standardization and control over the subject's responses but also provides for complete objectivity of scoring, while at the same time giving freedom to the person to express something of his own personal means of structuring events and anticipating the future.

Proponents of the grid technique are critical of some projective techniques and questionnaires for failing to include items which are fully representative of the particular aspect of the subject's life that is being investigated or, conversely, using as stimuli inkblots or ambiguous pictures which have limited applicability to the subject's life experiences. Kelly himself insisted that the sample of elements used and the composition of the "sorts" should be an adequate representation of the total population of all relevant elements within that aspect of the person's world. Thus he places great emphasis on the careful selection of Role Titles. This can lead to extremely lengthy lists of Role Titles which present problems in terms of the time required to complete the test and the difficulty of the task which the subjects are asked to perform. Mair and Crisp (1968) in describing the use of the Repertory test in clinical practice concede that it is a time-consuming and difficult method not because of its outward form, administration, and scoring but because, by using it, the investigator has immediately acknowledged something of the complexity of human functioning.

One other feature of the grid which has both positive and negative implications is its ability to elicit highly idiographic data. This is a distinct advantage in a clinical situation and also in terms of Kelly's Personal Construct Theory which emphatically states that each person has his own unique way of structuring and giving meaning to his experiences and that no two sets of construct systems are identical. Kelly stresses the idiosyncratic nature of an individual's construct system and also the idiosyncratic iterrelations of constructs within the system.

To obtain normative data from Grids and to apply the inferences drawn from the results to classes of people rather than individuals requires an approach which utilizes the fact that despite different experiences people tend to construe events in a similar way. At least within a particular culture and subculture, there exists a fair amount of consensus on the way in which events are classified on the basis of a common language. Much of the validation process occurs by comparison with the opinions of others and perhaps the strongest method of validation is to find one's constructs shared with others (Byrne, 1969, pp36-39). Not only are interpretations imposed upon "objective reality" by the

individual himself but "social reality" (Festinger, 1954) is the product of a process of consensual validation. At the same time, it is important to retain the essential individuality of the grid technique.

The concepts of validty and reliability which are concerned with the stability of a measuring instrument, take on a somewhat different significance when applied to the grid technique. Bannister and Mair (1968, p177) take a critical view of the rather restricted and static concept traditionally defined as validity. They support Kelly's claim that a test is generally considered to be valid if the subject can successfully use the examiner's set of constructs rather than if it manages to reveal the subject's own constructs. (Kelly, 1955, p213). In the context of construct theory, validation and invalidation is a continuous process engaged in by the subject as well as by the experimenter and results in the modification and changing organization of one's construct system. Thus to speak of validation in a restricted or short-term sense is inadequate in that it is finally superordinate (rule-governing) constructs only that are stable and can be meaningfully assessed. This requires evaluation in terms of longitudinal studies. For example, in the case of the present study, the results of the grids need to be followed up after several months in order to evaluate the vocational guidance seeking behaviour of the subjects who took part.

However, in the limited sense of establishing the subject's meaning of events over a short time period an increasing number of studies show that valid inferences can be drawn from grid data. A variety of valid clinical prognoses concerning improvement in psychotherapy, and responsiveness to treatment have been reported (Bannister and Fransella, 1971) and, similarly, Fransella and Bannister (1967) successfully predicted voting behaviour of people from a knowledge of the relationship between evaluative constructs and their constructs about members of political parties. In the Smith and Ashton (1975) study where the Repertory Grid was used to evaluate management training, correlations between Repertory Grid measures of relationships and Likert-type scales used to measure the same relationships were consistently positive.

On the question of reliability Bannister and Mair (1968, p175) note that, "information on specific reliabilities for different types of grids in particular contexts in scarce", but that, "one practical rule must be that if the reliability of a particular grid in a particular context needs to be known, for either theoretical or practical reasons, then it will have to be specifically assessed as part of the experimental venture".

Kelly's fundamental postulate states that "a person's processes are psychologically channelized by the ways in which he anticipates events." (Kelly, 1955, p46) and he extends this notion further when he goes on to say that man is himself a form of motion (Kelly, 1955, p48). Therefore, one should aim to understand the meaning of change and to predict when to expect stability and when to predict change rather than to seek consistency over time within the measuring instrument itself. Despite the centrality of "change" to the theory of Personal Constructs, it can only be assessed by a re-application of the original grid. Nevertheless, some empirical work has supported the notion of consistency in various aspects of the grid.

Following Hunt's (1951) work on the consistency of elicited constructs obtained from psychiatric patients when he obtained a test-retest agreement of 70% of the constructs used, Fjeld and Landfield (1961) tested the equivalence of elicited personal constructs over a 2-week period under four different conditions of testing. They found that,

(1) Given the same acquaintances and the same constructs as used on the first trial, the subjects showed high agreement when reapplying these constructs to the original list of acquaintances. (Percentage of agreement on test - retest = 83%; χ^2 = 7119.3; df = 25, $p < .001$; contingency coefficient = 0.80).

(2) Given the same acquaintances but no constructs, subjects showed high agreement with constructs given on the first test (Pearsonian r = 0.79).

(3) Given neither the acquaintances nor the constructs used on the first trial, the subjects again showed high agreement between constructs used on the two tests and also high agreement on the acquaintances used. (Pearsonian r for constructs = 0.80; percentage of agreement on acquaintances = 72%).

(4) Given the original list of names and asked to use different acquaintances and to derive constructs from new combinations of these

different acquaintances, the subjects again showed high consistency in their use of constructs (Pearsonian r = 0.79).
They concluded that this high degree of reliability found under each condition supported the Role Construct Repertory Test as a reliable research tool. In terms of element consistency, Pederson (1958) and Mitsos (1958) both showed that subjects repeated a significant number of elements and related constructs when role titles were restricted by specific categories (family, intimates, etc.) but not when these limitations were removed. Although correlational measures designed to test the reliability over time of the pattern of relationships between constructs when assessed on the basic raw matrix data have tended to yield reliability coefficients in the 0.6 to 0.8 range, after the raw data has been subjected to some form of cluster analysis it becomes more difficult to estimate such reliability.

Finally, Smith and Ashton (1975) make reference to a theoretical problem associated with the Grid Technique. Because of its emphasis on rationality there is some danger that the emotions associated with interpersonal relationships may be neglected and the motives behind the choices made by the subjects will not be revealed. Thus it is not possible to draw conclusions concerning the causes underlying the subjects' responses to the grid stimuli. The present study is, in fact, seeking to determine the perceptions of the subjects concerning sources of vocational counselling and makes no attempt to answer such questions as how these perceptions determine their subsequent behaviour. To answer this latter type of question different experimental techniques would be needed.

CHAPTER 3. THE PRESENT STUDY

It may be assumed from Personal Construct Theory that the construct system of the individual concerning sources of career information will determine whether he is prepared to accept the vocational information as valid and useful for his purposes. This is more likely to be so if his constructs about vocational choices are part of a larger system which includes his attitudes towards counselling and his perceptions of counsellors. A young adolescent has already, through his interpersonal interactions, acquired a fairly stable scheme of expectations and anticipations about others. This cognitive scheme has been called an "implicit personality theory". (Bruner and Tagiuri, 1954; Cronbach, 1955; Hays, 1958). He will use this framework, with some modification, again and again in his judgements and comparisons of other people, including those who will guide him in his career decisions. By using the grid technique it was hoped to uncover these sources of vocational information and counselling. The subject was asked to identify people to whom he had turned, or would do so, in crucial situations during his life - particularly situations pertaining to vocational and educational problem-solving and decision-making. He was then encouraged to reveal how he construed the people whom he had chosen.

This experimental design not only seeks to discover the subject's constructs but also invites him to take part in the design of the grid itself. Kelly claims that statistical analysis of such a grid reveals the associations or structural links between the constructs involved which, in turn, reflect the psychological relationships which exist within the individual's construct system. Additionally, the verbal labels attached to the constructs used by the subject give some indication of the content or meaning of his system. As a secondary consideration it was hoped to test the suitability of the grid technique as an instrument for conducting this type of investigation. It was Kelly's intention that his grid method should be evaluated in terms of its usefulness with emphasis on examining constructs in action. (Kelly, 1955, pp204,214). In contrast to Kelly's non-parametric factor analysis method of analysis of the statistical relationship between constructs (Kelly, 1955) and various modifications some of which utilize computer programs employing a principal components factor analysis technique (Fager, 1962; Kelly, 1963; Slater, 1965,1967,1972) it was decided in

this study to use both multidimensional scaling and cluster analysis techniques to determine measures of distances between the role figures or elements.

Multidimensional scaling techniques employ a measure of distances (proximity measures) between both figures and constructs such that more similar figures/constructs will appear closer together when plotted on the Euclidean space than those which are dissimilar. The clusters which result portray groupings of similar figures/constructs which are separated in space from others, distance apart reflecting degree of dissimilarity.

The cluster analysis technique used here derives group similarities and dissimilarities by computing distance measures between figures as a first step and then by means of a weighted pair-group method, figure groupings are isolated which are maximally dissimilar to other figure groupings, as follows:-
The two figure points which are closest together are accepted as the nucleus of a cluster provided that the second point is not itself closer to any other figure point (in the latter case this pair of figures is rejected as a nucleus for the formation of a cluster). The next closest pair of points is then considered and so on until all possible pairs of figure points have been accepted or rejected in this way, that is, all pairs of figures of mutual similarity have been located. Following this, other points or clusters of points are added successively to these nuclei gradually building up the hierarchical nature of the structure of the entire group of figure points. This hierarchical structuring is then represented in pictorial form by means of a dendrogram (or tree diagram) illustrating both the groupings obtained and the network of linkages between them.

Factor analysis, in comparison, based as it is on vector correlations, produces a measure, not merely of distance between figures or similarity - dissimilarity between groups but it assumes a complex configuration between figures over all constructs (or constructs over all figures).

Breiger, Boorman and Arabie (1975) obtained similar results from both multidimensional scaling and hierarchical clustering methods of analysis while Todd and Rappoport (1964) note that factor analysis produced

very different descriptions of cognitive structure from a point-distance analysis, such as the multidimensional scaling method used with Hays' Implication model (Hays, 1958). In the same set of experiments Todd and Rappoport found that neither of these procedures (multidimensional scaling nor factor analysis) provided satisfactory dimensions for cognitive structures, nevertheless, their success in measuring and defining the fundamental relationships between constructs helped make explicit, the perceiver's "implicit personality theory" (Bruner and Tagiuri, 1954; Cronbach, 1955; Hays, 1958). In a similar way, hierarchical clustering may indicate group stereotypes.

It was necessary to decide which of the above techniques was most applicable to the cognitive organization involved in the judgemental task accomplished by subjects completing a repertory grid. Studies of cognitive complexity show that even those individuals who are capable of making fine discriminations between people (that is, capable of using more categories in their judgements) use relatively few distinct construct dimensions. The high degree of discrimination observed in actual judgement situations may be the result of a complex weighting and integration of constructs rather than the number and distinctiveness of constructs employed. Therefore, Todd and Rappoport suggest that it may be misleading to strive for orthogonality of dimensions. In fact, large individual differences may exist between people in the degree to which their cognitive space can be accurately represented by orthogonal axes. In addition to this, Personal Construct theory postulates that "a person's processes are psychologically channelized by the ways in which he anticipates events" (Basic Postulate, Kelly, 1955, p46) and, "a person anticipates events by construing their replication" (Construction Corollary, Kelly, 1955, p50). Thus, as the result of successive construing he evolves a set of reference axes which he can then impose upon subsequent events, enabling him to both distinguish between events and to group them. This results in the development of the individual's system of personal constructs which are composed of, "a finite number of dichotomous constructs" (Dichotomy Corollary, Kelly, 1955, p59). Kelly emphasizes that a construct is "a black and white affair, never a matter of shadings, or of grays". The discriminations made by an individual are basically discriminations of similarities and differences in terms of concrete objects (or persons). The construct employed is

a simple contrast perceived in the configuration of elements (figures) and is not a construct dimension consisting of a scalar representation of element points. The prediction which the individual makes on the basis of these perceived contrasts may then be successively tested and readjusted. At least at the level of subordinate constructs this provides a relatively flexible predictive system. Its development and subsequent validation or invalidation is the direct consequence of the individual's perception of stimuli (figures, in this case) and it is therefore conceivable that figure groupings should vary across situations and time as well as between individuals.

Because of these considerations, Kelly's original method of grid analysis was modified in this case first of all by rotating the grid data through 90° and analyzing it in terms of figure groupings rather than in terms of dichotomous constructs, since this type of operation seemed to be closer to the order in which the process occurs in practice. It follows from Kelly's explanation of the Construction Corollary that since events never repeat themselves our perception of similarities and differences in past, present and future occurrences is the result of a reconstruing of the present situation and anticipating future events in the light of past experience. This principle applies both in the early stages of the individual's life when the construct system is developing as well as while it is being maintained, up-dated and changed throughout life. By this means, the emphasis is placed on the clustering of elements rather than on the dimensionality of the bipolar constructs. The patterning of constructs may then be inferred to a degree from the outcomes, that is, the clustering of the figures with their associated descriptive adjectives.

Green and Rao (1972, p141) summarize the applicability of multi-dimensional scaling techniques to research into interpersonal perception as follows:-

"The basic substantive assumption underlying applications of these models is that people react to stimuli on the basis of their internalized organization of events, or 'perceptual map' as it were, and that a variety of judgemental or overt choice phenomena can be related to how the perceptual maps are used. Under this view, similarity and preference

judgements, categorizations, unidimensional scale ratings of various kinds, and other classes of behaviour can be represented as transformations of the respondent's perceptual map".
Thus, it was decided to adopt these more flexible models of analysis (multidimensional scaling and cluster analysis) for the purposes of the present study. It was decided to pool the results of a fairly large sample of subjects by combining their grid results rather than analyzing each grid separately as is usual in the clinical situation for which the original Kelly grid was designed. The grid form has frequently been used to generate group or normative data to discover general laws as well as idiographically to describe and characterize individual cases (Bieri and Blacker, 1956; Bannister, 1960, Smith and Ashton, 1975).

To this end, it was useful to employ, in the final grid test, a uniform set of constructs for all subjects. This was achieved by supplying the subjects with the constructs to be used in their allottment of elements rather than eliciting a separate set from each of the individuals in the sample. This also enabled the experimenter to administer the final form of the grid to whole groups of school students at one time rather than individually to each subject in turn.

Some research has been conducted into the effects of using supplied versus personal constructs both in the context of the Standard Role Construct Rep Test developed by Kelly and in Bieri's modified version used for measuring cognitive complexity-simplicity (Bieri, 1955; Kieferle, and Sechrest, 1961; Cromwell and Caldwell, 1962; Tripodi and Bieri, 1963; Isaacson and Landfield, 1965; Jaeckle, 1965; Mair, 1966a; Adams-Webber, 1968, Bannister and Mair, 1968; Stringer, 1972). Cromwell and Caldwell (1962) administered a shortened form of the Repertory Test to a sample of 44 students using both personal and supplied constructs. They gained support for their hypothesis that "people use their <u>own</u> Repertory Test personal constructs in a more decisive, rather than cautious, way in construing interpersonal relationships among people". In order to counteract the effect of these less extreme ratings obtained on supplied constructs, in the present investigation every attempt was made to elicit an exhaustive sample of personal constructs from a matched set of subjects. By obtaining this large sample of personal constructs at the outset,the experimenter could be reasonably confident that the final list of supplied constructs was a representative sample of constructs used by the particular group of

individuals being investigated. The overall consensus of opinion seems to be that while individuals do have functionally distinct personal constructs and the use of the person's own constructs is highly relevant in clinical situations, the judicious use of supplied or provided constructs is justified for research purposes.

To further ensure the relevance of the constructs chosen, care was taken to elicit and use, as far as possible, both poles of each of the constructs produced by the subjects. Mair (1967) criticizes the custom in grid measurement of using only one pole for grid sorts which could result in erroneous inferences being made about the implied pole and therefore mistaken inferences about construct relations. By specifying both the similarity and contrast poles there is less room for misinterpretation by both experimenter and subjects.

Many of the Role Titles in the present study were presented in a situational context, for example, *a person you think could give you the most useful information about the particular jobs and careers that interest you*, reducing still further the varying interpretations possible when making highly complex judgements about other people.

Mair (1967) and Mair and Boyd (1967) examined the results of two forms of the Repertory Grid, the Split Half method where subjects are required to allocate half of the elements to each pole of the construct and the Rank Order form where subjects place elements in order according to the degree to which they are characterized by one pole or the other. It was suggested that the Split Half method may force some subjects to categorize certain elements simply to make up the required number. The Rank Order form, while having the advantage of requiring fewer elements to provide a greater numerical range of scores, may force the subject to make finer discriminations between people than he is capable of making. This last objection likewise applies to the common practice of expecting subjects to rate elements on a five or seven point scale. These objections are especially pertinent in the present case where the sample consists of 15 - 16 year olds of average intelligence whose level of social maturity and cognitive complexity may place limitations on their ability to make such fine judgements. Consequently, it was decided to permit subjects to allott elements freely to either pole of the construct dimensions, without placing any restrictions on

them as to number or degree.

Kelly's "Commonality Corollary" states that,
"To the extent that one person employs a construction of experience which is similar to that employed by another, his psychological processes are similar to those of the other person". (Kelly, 1955, p90) Therefore, it appears that people tend to use social stereotypes and to use common sets of constructs to categorize and describe events (people and objects) within their experience. In order that an adequate sample of these constructs, most consistently used by the particular population under consideration could be elicited, it was necessary to conduct an initial study on a representative sample of this population immediately preceding the main study. The administration of a preliminary Repertory Test employing elicited constructs also enabled the experimenter to formulate more clearly the following hypotheses. (This parallels, in the research setting, the use of a similar test in a clinical situation for the purpose of providing material on which to form clinical hypotheses. (Bannister and Mair, 1968, p48))

Hypotheses

1. SCHOOLCHILDREN AGED 15-16 YEARS WILL PRODUCE AT LEAST TWO GENERALIZED FIGURES WHOM THEY PERCEIVE IN A COUNSELLING ROLE RELATIONSHIP WITH THEM.

   Generalized figures refer to clusters of functionally related figures (elements). These particular figure composites emerge on the completed plot of figures and constructs in the "socio-semantic space" (Kelly, 1955, p291).

   Kelly describes a role as
   "a psychological process based upon the role player's construction of aspects of the construction systems of those with whom he attempts to join in a social enterprise".
   This is interpreted by Bannister and Mair (1968, p42) as "a course of activity which is played out in the light of one's understanding of the outlook of at least one other person".

   A counselling role relationship refers to a relationship where constructs concerning vocational choice and career decision-making are shared between the subject and the other person.

The first part of the Repertory Test elicits the names of individuals known personally to the subject (in response to the Role

Titles). These form the elements of the grid. The use of Role Titles ensures that the subjects have an identical range of elements and each subject generates his own set of elements within the limits imposed by the experimenter according to the experimental requirements. Later, the subject is required to impose his own constructions on these elements.

2. THESE GENERALIZED FIGURES WILL BE DEFINED BY TWO OR MORE DIMENSIONS INCLUDING ONE CONCERNED WITH INTIMACY AND ANOTHER WITH POTENCY.

Intimacy Dimension: this is similar to Osgood's evaluative factor (Osgood, Succi and Tannenbaum, 1957, pp36-39) and is defined in the present case by such bipolar constructs as *Friendly - Unfriendly* and *Important to me - Don't mean very much to me.*

Potency Dimension: similarly, this resembles Osgood's (Osgood et al, 1957, pp36-39) second factor of the same name and is characterized in the grid by such phrases as *Know what they are talking about, have common-sense - Stupid, don't know much* and *Give me help with my school work - Do not help with school work.*

These two dimensions, as well as corresponding to Osgood's major nomothetic dimensions are also similar to those identified in the Ohio State Leadership Studies as "consideration" and "initiating structure" (Fleishman, 1953b). Similar factors have emerged in other studies such as Rupe's (1951) factors of "executive achievement" and "responsibility for subordinates and society", Prien's (1963) "job orientation" and "employee centredness" and Grant's (1955) two groupings of factors - "judgement, planning and efficiency improvement" and "interpersonal effectiveness and effective supervision". It would seem that these two dimensions may be examples of what Kelly refers to as "core constructs". These are particular groupings of superordinate constructs within the hierarchically organized system of inter-related constructs (Organization Corollary, Kelly, 1955, p56) which are relatively stable and resistant to change. These areas of relative stability in a person's system provide a framework for evaluating the behaviour of others.

A more precise knowledge of the content and meaning of the lower level subordinate constructs may be derived from the descriptive labels given in the subject's own terms. This may lead to a better understanding of the individual's method of organizing his interpersonal world and suggest ways of bringing about desired changes in his perceptions. Such reorganization may occur in a number of ways including a cognitive shift

from one pole to the opposite ("slot changes") or the "loosening" of "tight" constructs. "Tight" constructs are defined by Kelly as ones which are very closely interrelated with other constructs and which lead to unvarying predictions.

3. ONE OF THE GENERALIZED FIGURES WILL INCLUDE SELF, FATHER, MOTHER AND OTHER INTIMATES AS WELL AS PERSONS WHO ARE PREFERRED IN COUNSELLING RELATIONSHIPS, CONCERNING MORE PERSONAL AND EMOTIONALLY-LOADED TOPICS.

Many of these people are comprised of the subject's primary social group who have been instrumental in the development of his self concept, and have been the natural and most readily available counselling figures in his life thus far. By the age of 15 or 16, the adolescent is moving beyond this first circle of intimates into a wider field of social contacts and influences including teachers and school counsellors, peers and persons from the surrounding community. Thus the process of emancipation which begins in chidhood is greatly accelerated during these early adolescent years. Ausubel (1958, p300) refers to this as the process of "desatellization".

4. A DIFFERENT GROUPING OF ELEMENTS WILL BE PRODUCED WHEN FACTUAL KNOWLEDGE AND EXPERTISE IS REQUIRED.

5. VOCATIONAL COUNSELLING FIGURES WILL BE INCLUDED IN BOTH GENERALIZED FIGURES FOR THE REASONS STATED ABOVE IN HYPOTHESES 3 AND 4.

6. MALES AND FEMALES WILL PROVIDE DIFFERENT GROUPINGS OF ELEMENTS WITHIN THE GENERALIZED FIGURES.

7. DIFFERENT TYPES OF SCHOOL SITUATIONS WILL PRODUCE DIFFERENT ASSORTMENTS OF ELEMENTS WITHIN THE GENERALIZED FIGURES.

CHAPTER 4. METHODS

4.1 Design

The independent variables in the experiment consisted of a set of Role Titles and a set of provided constructs (Bannister and Mair, 1968, p202). The Role Titles were presented to the subjects who were required to construe a corresponding set of persons (elements) personally known to them, on a series of provided constructs. By analyzing the subjects' responses to these stimuli, the pattern of relationships between elements and constructs gave a descriptive measure of the subjects' perceptions of those persons who fitted the Role Titles.

The focus of interest was the information-seeking and help-getting behaviour of secondary school students as they seek to make vocational decisions and choices. Therefore, their perceptions of those people in their social environment who are potentially in a supportive and counselling role relationship with them are relevant to the situation.

The following assumptions were made concerning the dependent variable (the subjects' responses to the grid):-

(1) The respondents' verbal behaviour on the grid is a valid representation of their underlying perceptions and attitudes towards these people.

(2) These perceptions will be reflected by the subjects' subsequent vocational guidance-seeking behaviour.

(Both of these assumptions remain untested in the present experiment.)

4.2 Subjects

The subjects who took part in this study were selected from seven secondary schools. (See Table 1.) The schools included six city schools, two of which were coeducational State schools, two were separate boys' and girls' State schools and a further two were Roman Catholic Church schools (the latter two schools, while sharing adjoining campuses, maintained segregated classes for boys and girls up to and including 5th form level). The seventh school was a coeducational State secondary school situated in a nearby semi-rural area and was classified as an Agricultural High School.

TABLE 1

Classification of all subjects who took part in the Repertory Grids

	School Type	Total No. of Ss M	Total No. of Ss F	No. Ss who completed grid M	No. Ss who completed grid F
Preliminary Study	1. Semi-rural Coed. High School	4	18	3	2
	Totals	22		5	
Pilot Study	1. Urban Boys' High School	22	0	20	0
	2. Urban Girls' High School	0	17	0	10
	Totals	39		30	
Main Study	1. Semi-rural Coed High School	14	10	13	9
	2. Urban Coed High School	16	16	15	14
	3. Urban Coed High School	9	11	7	7
	4. Boys' Private School	28	0	23	0
	5. Girls' Private School	0	39	0	37
	Totals	143		125	
	Totals	93	111	81	79
		204		160	

Many of the influences on vocational aspirations (family background, parental education, parental social rank) mentioned by Thomas and Wetherall (1974) and Baldock (1971) may be reflected to some extent by the choice of secondary school attended. In addition to this, it is likely that different school climates may produce different attitudes towards authority figures. Following Endicott's (1931) suggestion that boys and girls exhibited different vocational choice behaviour possible sex differences were also examined.

The aims of the project and the procedures to be used were discussed in advance with the principals of the schools concerned and with other interested teachers. Selection of the fifth form classes which were to take part in the experiment and time-schedules were also negotiated ahead of time so that administration of the grids could be fitted into the normal school routine. The grid was administered to complete classes of students in the schools. This was done so that the sample would be random and representative. An alternative method would have been to obtain a smaller group of volunteer subjects which may have resulted in a self-selected group consisting of the more interested, more cooperative or less studious students. Any other form of selection, for example, by the teacher in charge may have introduced other biases over which the experimenter had no control. From a practical point of view also, it was more convenient for the schools concerned to make available a complete class of fifth formers for a one hour period rather than a sub-group of any class. The subjects themselves were given the option of either taking part or not in the experiment but only one student declined to participate. The specific aims and procedural details were not revealed to the subjects prior to the time of testing.

4.3 Development of measuring instrument - Repertory Grid

The first step was to develop a Repertory Grid which would allow the subjects to express (verbally) their perceptions of certain people within their social milieu. The stimuli would be a list of meaningful statements (Role Titles) describing various role relationships including both significant persons, for example, *mother*, and functional relationships, that is, counselling-type figures such as *someone you'd ask for help and advice about your favourite hobbies, projects and interests.*

Requirements of the Repertory Grid

1. The number of elements should be kept within the capacity of the subjects, remembering the limitations in social experience and development of the average (15-16) year old school child. Similarly, it is important to avoid the adverse effects of boredom and fatigue in the testing situation.
2. The content domain should be as heterogeneous as possible so as to cover a wide variety of relationships.
3. Titles should be representative of those experienced by the subjects themselves.
4. Titles should be specific enough to allow subjects to name particular persons who fit that role in their lives but general enough that, in the case of counselling titles, subjects would not be confined in their choices to specifically designated school counsellors, teachers and others.
5. Descriptions should allow subjects to discriminate clearly between various functional relationships.
6. Role title descriptions should be derived from the subjects' own descriptions of the functions of the roles.
7. The Grid should be presented in a standardized, quantifiable format.

The Repertory Grid went through the following four stages of development:-

1. (a) Generation of Role Titles
   (b) Construction of first Repertory Grid.
2. Preliminary Study
   (a) Pretesting and generation of constructs
   (b) Construction of second Repertory Grid.
3. Pilot Study of final grid form
   (Pretesting of second Repertory Grid.)
4. Main Study - application of final Grid form.

4.3.1 Generation of Role Titles.

The experimenter engaged in an initial exploration of the topic in an effort to discover how school children used counselling sources in practice. Separate informal interviews were conducted with five adolescents (who were not included in subsequent stages of the experiment) aged between 14 - 18 years. (See Table 2.)

TABLE 2

Age and sex of the five subjects who participated in initial Role Title interviews

Subject	Sex	Age (in yrs)
S_1	M	15
S_2	M	15
S_3	M	16
S_4	F	16
S_5	F	18

The interviews were loosely structured around the following two requests:-

(i) Describe problem situations of various types which have arisen or could do so in your everyday life for which you might seek help or advice from others.

(ii) Name the people or other sources of help or information that you would choose on such occasions.

It was found that,

(1) The older adolescents gave much longer and more comprehensive lists than the younger.

(2) The girls produced longer lists than boys.

(3) The two younger boys easily became disconcerted by the suggestion that they may have problems worthy of such attention, indicating that care should be taken in subsequent stages of the experiment to avoid embarrassment to the subjects which might produce

resistance to the task. It was emphasized that any problems which might give them some concern were acceptable. It was noted that most of the problem situations produced by these younger boys were of a very mundane and concrete nature and that their information-seeking behaviour was highly pragmatic, for example,

Problem: "I want to learn about motor-bikes."

Source of Help: "I'd ask my brother who is a mechanic."

(4) The problem situations produced by these 5 subjects appeared to fall into four main categories:-

(i) Social-sexual problems

(ii) Parental control problems - freedom conflicts

(iii) Time-scale problems - scheduling of work, personal interests and other activities

(iv) Problems of a strictly practical ("How to") nature.

A subjective assessment of the content of the respondents' answers to the two questions provided a descriptive list of situations and a descriptive list of sources of counselling. Overlapping items were elimiated and others were re-written staying as close as possible to the subjects' wording. The result of this process of generalization and summarization was a single list of Role Titles which, together with Kelly's original list of twenty-two, provided a basis for selecting a final fourteen role descriptions expressing the full range of choices made by the five subjects questioned and including additional Role Titles judged to be of particular importance in this study. For example, *The person who could give you the most useful information about the jobs and careers that interest you.*

4.3.2 Construction of first Repertory Grid.

An independent judgement was sought from an expert experienced in the use of Grid technique concerning the representativeness of the final list and this second subjective opinion was found to support the experimenter's own choices.

In Kelly's original list of Role Titles, it was felt that some of his elements were not adequate for the present study nor were they relevant to present-day 15 year old secondary school students.

In addition, the actual wording of the Role Titles required some revision. A further modification of Kelly's grid resulted from the experimenter's intention to include a situational aspect in many of the roles presented, for example, *The person you would choose to discuss problems about sex, and making friends of your own age.*

It was decided to include other stressful situations not directly related to vocational decision-making, for example, relationship problems, interests and hobbies since the theory of vocational choice formulated by Ginzberg et al (1951, p185) asserts that many of the pressures which are associated with vocational choice are the same as those which emerge as a result of the individual's general development, for example, sexual, parental strictures and present-future orientation. There is an interesting similarity here between these pressures and the problems mentioned by the five subjects interviewed in this study. The final set of fourteen Role Titles (see TABLE 3) were chosen for the following reasons:-

(1) they included all role figures named by the five trial subjects.

(2) they fulfilled the requirements of this particular study without duplication or redundancy.

(3) it was decided that a larger number of elements (for example, the twenty-two in Kelly's original grid) could not meaningfully be handled by 15 year olds of average intelligence in a grid procedure using elicited constructs.

TABLE 3

Role Title list used for the first Repertory Grid

Self

1. Your own name

Family Grouping

2. Your mother's name or the name of someone who has filled that role (played that part) in your life.
3. Your father's name or the name of someone who has filled that role (played that part) in your life.
4. A brother or sister who is nearest you in age or someone who has seemed like a brother or sister to you.

Social Contacts

5. A very good friend of your own age and sex - someone whom you would describe as your "best friend".
6. A person who makes you feel uncomfortable and ill-at-ease.
7. A person you don't know very well, but would like to get to know better.
8. An adult you admire and whose opinions you respect e.g. your soccer or netball coach, a club leader, your favourite teacher.

Counsellors

9. Someone who you would go to for help, if you had problems regarding school work, choosing school subjects, homework, etc.
10. A person whose advice you would seek about choosing a career or finding a job when you leave school.
11. The person who could give you the most useful information about the jobs and careers that interest you.
12. Someone you would go to for help about difficulties at home, getting on with parents, brothers, sisters, etc.
13. The person you would choose to discuss problems about sex and making friends of your own age.
14. Someone you'd ask for help and advice about your favourite hobbies, projects and interests.

These fourteen Role Titles fall into four distinct groupings, namely,

I. Self (1)

The centrality of an individual's constructs about himself in situations involving perception of others has been confirmed in a number of experiments, particularly those concerned with Cognitive Complexity - the degree of differentiation and integration of an individual's system of superordinate and subordinate constructs (Bieri, 1955; Adams-Webber, 1968). It is found that those people who have a more unidimensional (simpler) structure, tend to assume that others are similar to themselves (assimilative projection). For this reason the inclusion of the element *self* in this Repertory Grid is important in that the subject may then identify and describe other people whom he construes as either very similar or very dissimilar to himself.

II. Family (2, 3 and 4)

Many theories of vocational choice stress the influence of the immediate environment on vocational choice. Of these, the family is considered to have the most direct and significant impact of all. This particular grouping, therefore, is a crucial one (Crites, 1969, pp230-239).

III. Social Contacts (5, 6, 7 and 8)

As the child and young adolescent begins to detach himself from his family and to interact with a wider circle of associates, their influence too, becomes increasingly important in the decisions he will make (Crites, 1969, Chap 6). The list of Role Titles, therefore includes, peer-members, teachers and other adults.

IV. Counsellors (9, 10, 11, 12, 13 and 14)

These roles are of particular interest in this study. In our society such people are likely to become important influences on adolescents as they develop educational and career interests in preparation for making their vocational choices. They may be either formal or informal roles.

These group labels are the experimenter's own constructions and they differ slightly from those used by Kelly, namely, Self, Family, Intimates, Situationals, Valences, Authorities and Values. There is little evidence to suggest that Kelly himself grouped his elements in any other way than for his own convenience. It is recognized that, as arbitrary groupings they are not necessarily the way in which the subjects themselves would group them in all cases. The "Counsellors" grouping is a critical one for the purposes of this study and is therefore the largest, attempting to cover all possible areas of the subjects' advice-seeking behaviour - as judged from the original lists obtained from five subjects. Members of Situationals, Valences, Authorities and Values were included in other groupings.

The wording of the Role Title descriptions was chosen with great care so that their meanings should be
(1) readily interpretable by all subjects,
(2) identical for all subjects, as far as this is possible.
Alternative wordings were chosen in some cases so that meanings could be clarified in a standardized manner (2 and 3, above) during administration of the Grid.

The experimenter next decided on the composition of the triads needed to elicit twenty-two construct dimensions. Kelly arranged "sorts" based on "within groupings" comparisons and "between groupings" comparisons. These appeared to be chosen to suit the specific purposes of his Grid. Since it is clearly an arbitrary decision, the justifications for the triads used in the present experiment are outlined in TABLE 4. A total of twenty-two "sorts" was chosen as this provided ample opportunity for subjects to fully interpret the relationships under consideration and was a convenient number for the analysis to be used later.

TABLE 4

Justification of Role Title triads chosen for "sorts".

Sorts (1 - 5) - Likely to produce similarities and contrasts suggested by the titles within the particular grouping (intragroup)	
Sort 1	(5, 6, 8 - Intimates) An attractive peer, an adult and someone who produces an avoidance-type of reaction
Sort 2	(2, 3, 4 - Family) The immediate family group consisting of parents and a sibling close in age to the subject
Sort 3	(9, 10, 11 - Counsellors) The three people most involved in the educational and vocational decisions of the subject (other than family members)
Sort 4	(10, 12, 13 - Counsellors) Two people involved with personal problems versus one involved in counselling about vocational choice
Sort 5	(9, 11, 14 - Counsellors) Two people giving counselling and guidance versus one supplying mainly information
Sorts (6 - 12) - One element from each group. Likely to produce more obvious intergroup similarities and differences	
Sort 6	(2, 6, 13) Someone for whom the subject has negative feelings and mother together with someone with whom subject will discuss personal problems
Sort 7	(2, 5, 10) Mother, peer intimate and person seen in a vocational counselling role
Sort 8	(3, 7, 14) An attractive person and father plus another person who is attractive because of interests in common with the subject
Sort 9	(4, 7, 13) Someone subject knows well (within the family) and someone he would like to know better (outside the family) and a third who has much to offer the subject in the area of his special interests.

continued

TABLE 4 (continued)

Sort 10 (2, 8, 12)

Mother and someone whom he chooses to consult on problems of family relationships plus an adult outside the family circle with whom subject has a good relationships and who also has a good deal of influence

Sort 11 (4, 6, 14)

A well-known person of similar age, a little-known person (of any age) and dissimilar interests plus a person of similar interests

Sort 12 (3, 7, 9)

Father compared with an attractive but little-known person and someone subject would approach for immediate educational problems

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Sorts (13 - 22) - Two people from one grouping with another from a second grouping. These ask more searching questions concerning inter-group similarities and differences some of them involving the self

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Sort 13 (1, 3, 10)

Father (who could be a source of career advice) and self as well as a person whom subject chooses to approach to acquire this advice

Sort 14 (1, 5, 8)

Self, person of similar age, interests and viewpoints and an admired and respected adult

Sort 15 (1, 11, 14)

Self, source of career information and another person who can supply information in areas pertaining to the subject's own particular interests

Sort 16 (2, 3, 10)

Mother, father and someone from whom subject would seek help in making decisions concerning career choices

Sort 17 (5, 6, 9)

Person giving advice on immediate school problems, an attractive person similar to self and an unattractive person

Sort 18 (7, 8, 14)

Two attractive persons (one well-known and the other little-known) and someone who can supply help with the subject's interests

continued

TABLE 4 (continued)

Sort 19	(6, 11, 12)	Unattractive person and two people who can give different types of advice (one practical, the other very personal)
Sort 20	(5, 8, 9)	One peer and one adult (both attractive) and a person concerned with educational and school problems
Sort 21	(4, 9, 10)	Family member and two persons who might advise on school versus vocational decisions
Sort 22	(8, 10, 12)	An admired adult (outside the immediate family), an advice-giver on career problems and an advice-giver on intimate family relationship problems

4.3.3 Preliminary Study - Pretesting and generation of constructs.

The subjects for this part of the experiment were a separate group of twenty-two secondary school students (from a single school class) who were similar in terms of age, sex and level of achievement to the main sample. They consisted of a fifth form class (boys and girls) of average ability range in a co-educational State school located in the same general area. (See TABLE 1)

One of the purposes of this preliminary experiment in the field setting was to perfect the techniques to be used in order to gain good experimental control as well as to practise the necessary manipulations and to test the measuring instrument. For this reason, it was decided that the experimenter should maintain a fairly high level of participation throughout the administration of this first grid. Role Titles would be read out verbally one at a time while the subjects responded by listing the name of the particular person known to him who best fulfilled that role. By this means immediate clarification of the wording could be achieved, and it was possible for the experimenter to monitor the amount of time needed for this task and to detect where the greatest difficulties arose.

For the same kinds of reasons the instructions to the subjects were presented verbally with opportunity provided for queries to be answered immediately. The basic format of these instructions, together with the Repertory Grid are shown in Appendix A but the tester offered further clarification when requested by re-phrasing the original instructions and taking note of any changes in wording needed to make them easily understood by the subjects.

Procedure

This preliminary grid was administered to the class of twenty-two Fifth formers at the end of the second school term. After a brief introduction, Sheet 1 was distributed and the prepared instructions were read out to the class. The subjects then responded to each Role Title in turn by writing down the name of the particular person in his life who best fulfilled each role, a different person for each Role Title. Sheet 2 was distributed and subjects were instructed to turn their own list of personal names sideways. They placed this list immediately below the first row of cells in the grid. Each name on the list would

then correspond to a similarly numbered column in the grid. The subjects were asked to consider the three people indicated by circles in the first row. They placed a cross in two circles denoting similar persons leaving the third circle blank (dissimilar person). Following this, they were asked to describe, in a word or a phrase, in what way the two were similar to each other and different from the third. This description was written at the right-hand side of the grid in the space provided, labelled "Important Similarity and Difference". The subjects were urged to describe both the similarity and the difference, if possible, thus providing their first bipolar construct. The next step was to indicate by a cross or a blank how each of the other people on his list rated on the construct he had provided. The list of names was then moved down till it was immediately below the second row of the grid and the step by step procedure was repeated using the next triad and a second elicited similarity and difference. After three rows were completed thus, most subjects were able to proceed independently at their own rate. By asking the subjects to consider one construct at a time in this way, and allocating all members on their list, it was hoped to reduce any "halo" effect produced by successive constructs. The grid was complete when twenty-two different constructs had been produced and when each person on the 14-member list had been judged on each construct (indicated by either a cross or a blank in each of the cells in the grid). (See Figure 1.) The experimenter halted the session after a total time of 70 minutes.

Figure 1. A completed section of the first Role Construct Repertory Test Form

Role Titles

Constructs

Important Similarity and Difference

Own name	Mother	Father	Brother or sister	Good friend	Uncomfortable	Know better	Admired adult	School work	Career Choice	Job information	
1	2	3	4	5	6	7	8	9	10	11	
X	X	X	X	⊗	○	X	⊗		X		Both respect my opinion - don't
	○	⊗	⊗		X			X		X	Both knowalls - humble
					X			⊗	⊗	⊗	Get into bad moods quickly - happy-go-lucky
X	X			X		X			○		Self-confident - shy

Subject's list of relevant people corresponding to Role Titles placed sideways along grid rows. Circles indicate triads of figures for eliciting constructs.

Analysis

If the subject's list of construct dimensions is regarded as a set of reference axes which he uses to plot the behaviour of his acquaintances as Kelly says (Kelly, 1955, p279), then, his test protocol provides a complex representation of his "psychological space" in terms of these reference axes. By applying conventional methods of factor analysis to Repertory test protocols, Levy and Dugan (1956) found that, regardless of the variety of words used by the subject, they could be readily simplified in most cases to a very few factors. Kelly developed a non-parametric solution to the problem which gave similar results by counting the number of matchings of crosses and blanks between any two rows (this procedure is based on dichotomies, rather than parameters or scales). Kelly's test protocols were scanned by hand and first, second and subsequent general factors were extracted, by computing loadings on each of the twenty-two construct variables.

By rotating the whole grid through 90^{o} and scanning the protocol column by column instead of row by row, a similar analysis can be performed in terms of hypothetical generalized figures (Kelly, 1955, p291).

Such a procedure was carried out on each of the five fully completed protocols (see TABLE 1) produced by the present subjects using Easterbrook's (1976) modification of Kelly's hand-scanning method. This method takes into account the varying probabilities associated with the unequal allottment of elements to opposite poles of the construct dimensions. When the independent generalized figures had been identified by this method, the results were plotted on a graph. (Figure 2.)

The next step in the analysis was to discover which of the original constructs were significantly associated with one or other of the generalized figures by scanning row by row and building a pattern from the high versus low positive values of the loadings on each generalized figure. This method supplies adjectives for describing the generalized figures.

In those cases where only the emergent pole was produced, the nature of the opposite pole frequently became clear from the subjects' short answer descriptions and subsequent element allotment and also from the way in which they handled the opposite pole in their dealings with other constructs in the grid.

Each of the original constructs was then plotted in the semantic space on a second set of dimensions parallel to the first. In the case of analysis by constructs it is frequently necessary finally to rotate the axes in order to make the constellations of constructs psychologically meaningful (that is, to subsume the subjects' reference axes within the experimenter's own personal construct system) but in figure analysis there is less need for such rotation since it is possible to construe any figures as similar to others. The only stipulation is that, since both figure and construct clusters come from the same basic data a hypothesis referring to figure groupings should be consistent with construct clusters. For example, a finding that the *admired adult* was linked with other valued figures, for example, a person whom he would choose for various types of counselling and *self*, but disassociated from *father*, would be consistent with some ambivalence in the subject's mind concerning his relationship with his father.

The interpretation of the resulting plots is objective in two respects.

(1) The number and nature of the figure groupings and their associated descriptive constructs reveal the similarities and differences which the subject perceives between the people in his socio-semantic space and the important dimensions he uses to discriminate between them.

(2) The degree of importance attached to the differentiation is measured by the number of constructs which are linked together. Thus a large number of constructs within one cluster reveals a high degree of redundancy in the person's thinking. For example, where such descriptions as *understanding, friendly, easy to talk to, help me out a lot, close buddies* constitute the largest and most concentrated clustering of constructs it may be assumed that this subject is particularly concerned with "intimacy". The explanation as to why these patterns of figure and construct constellations appear is much more speculative in nature.

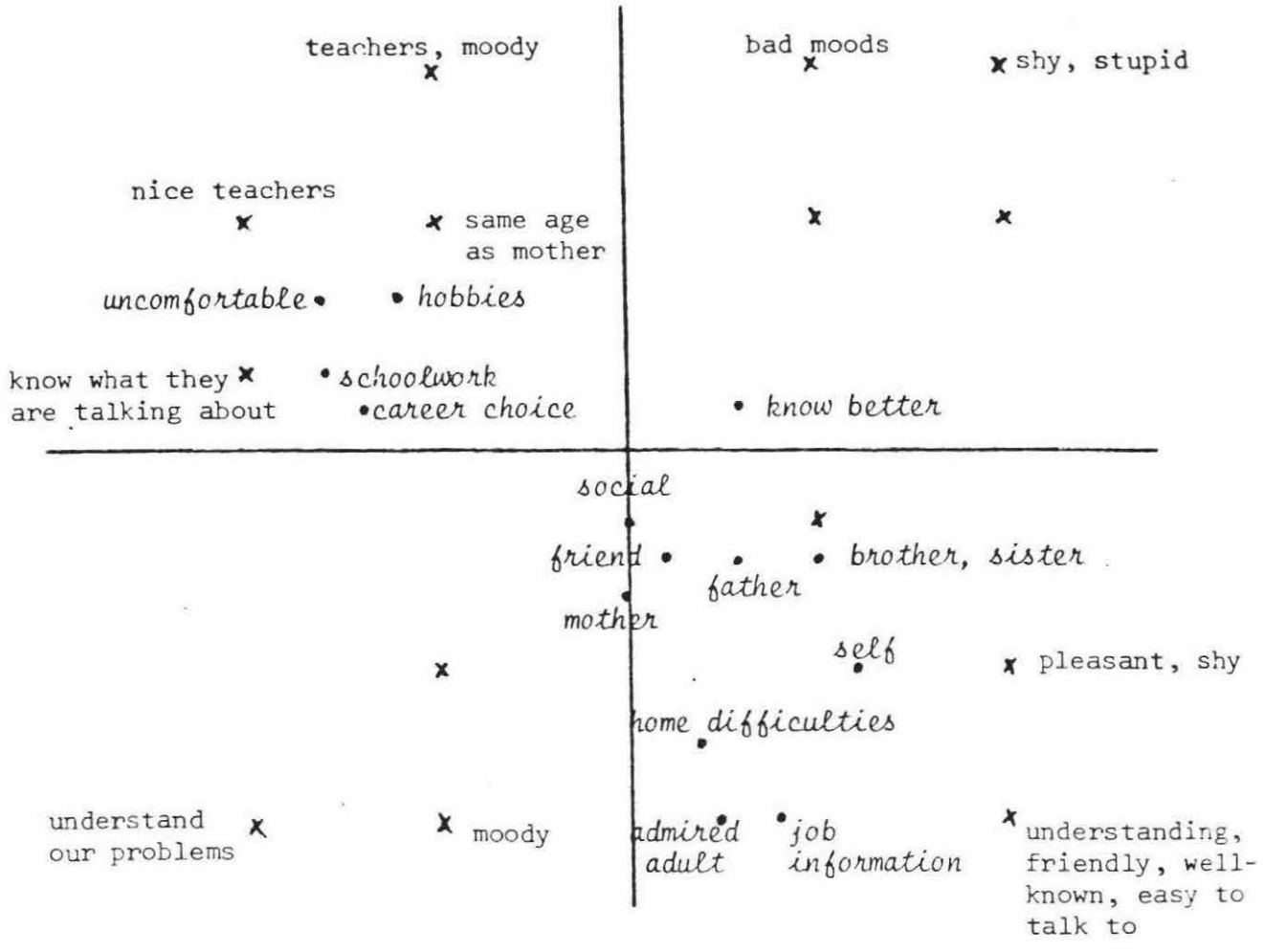


FIGURE 2a - Subject 1

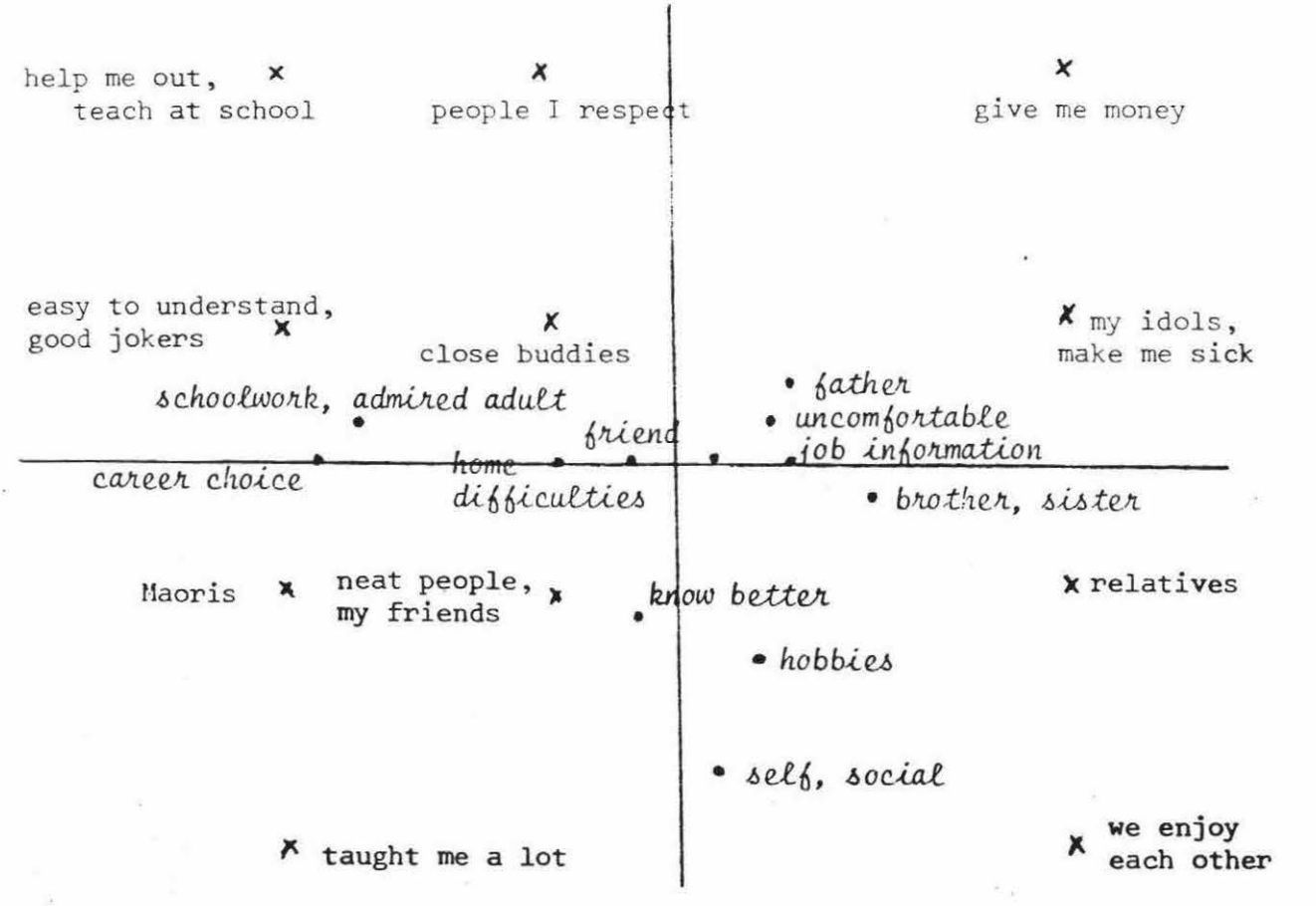


FIGURE 2b - Subject 2

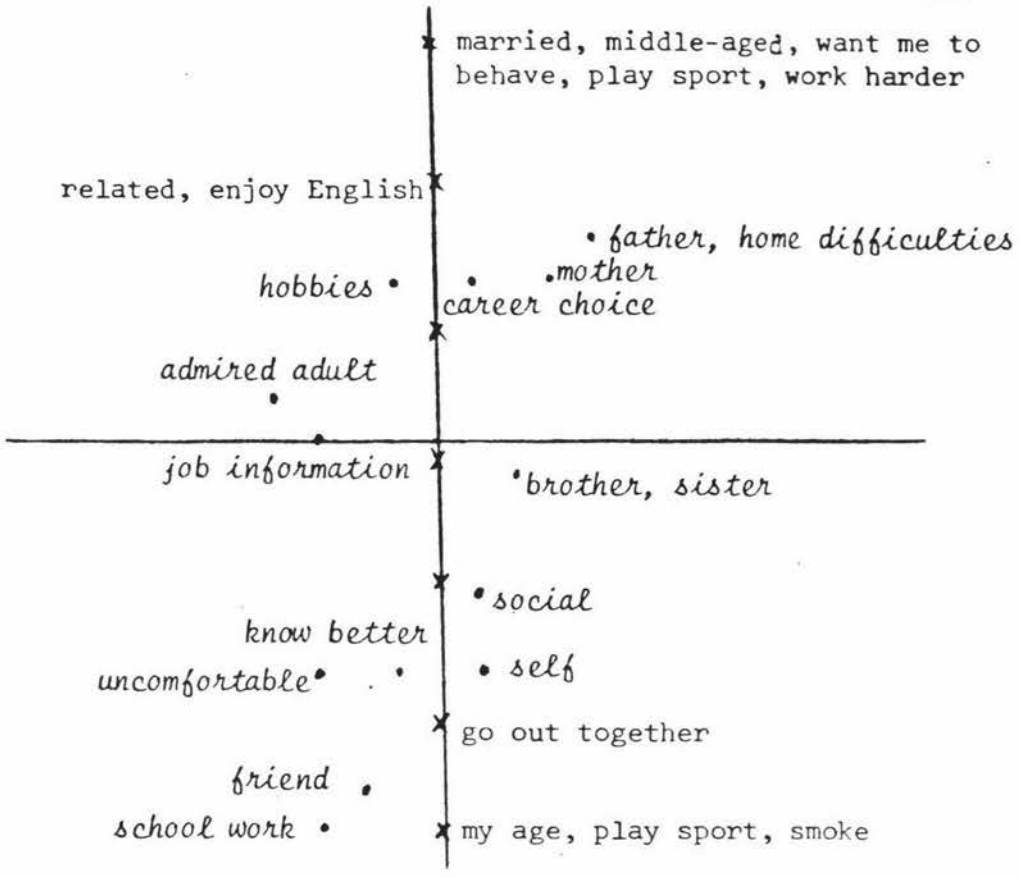


FIGURE 2c - Subject 3

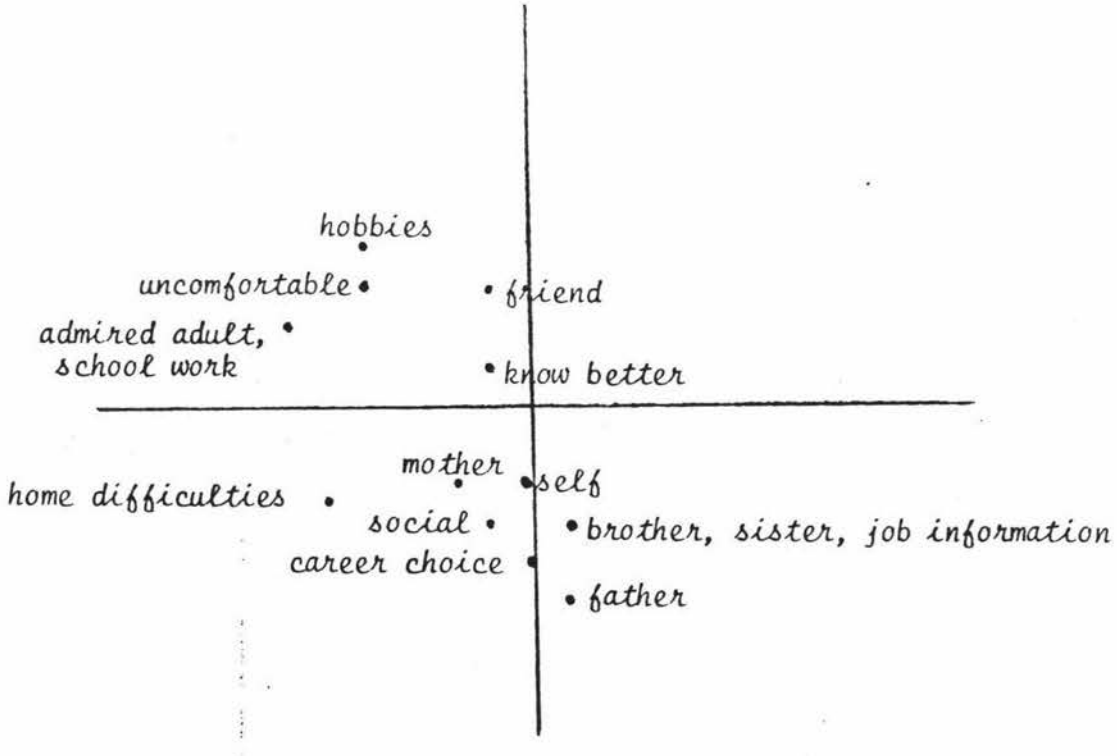


FIGURE 2d - Subject 4

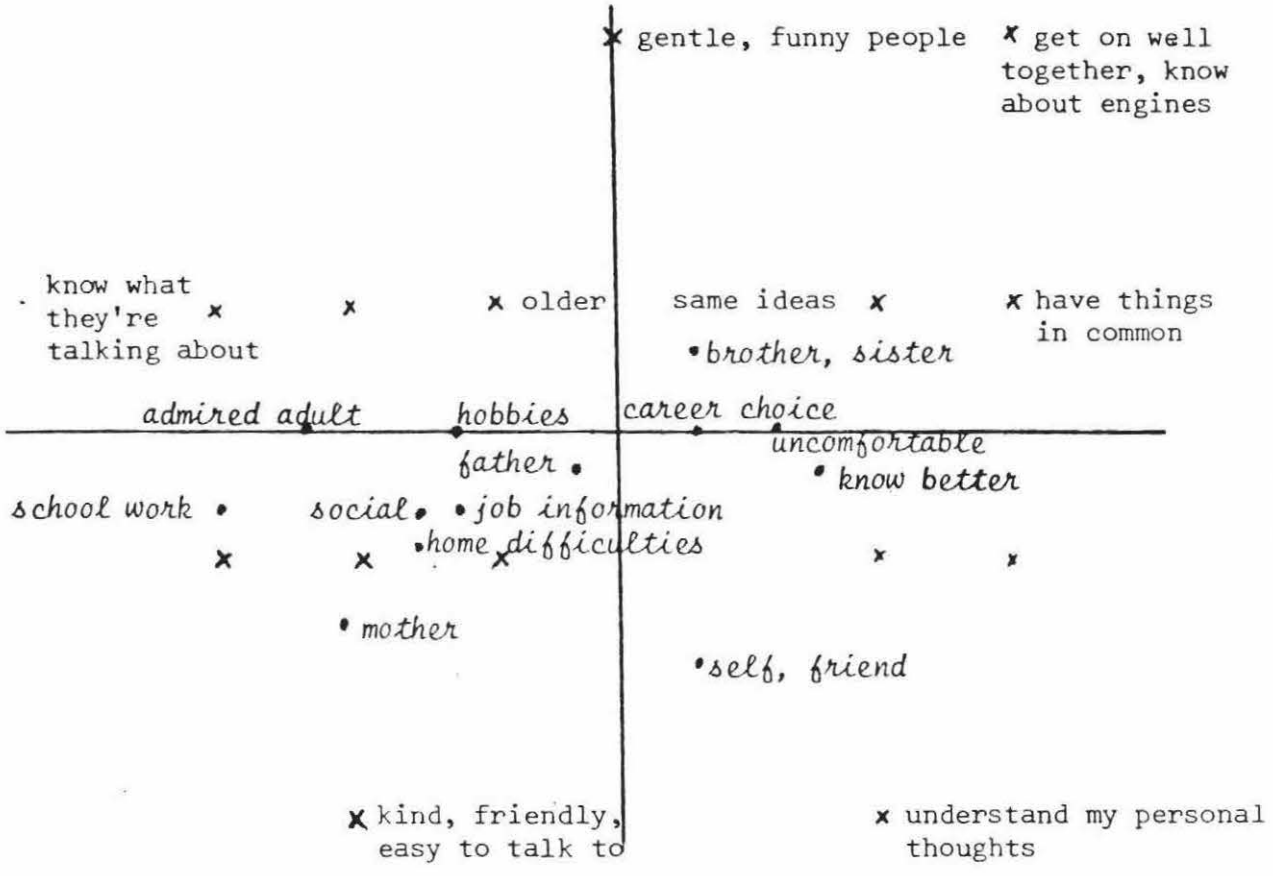


FIGURE 2e - Subject 5

Key to Figures

Elements •

Constructs ×

Figure 2. Socio-semantic space in two dimensions (not rotated) of five individual subjects

Results

The configurations of figure and construct clusters as they appeared on the resulting plots are presented for each of five subjects. (See Figure 2.)

S_1 - Female

A large cluster of figures surrounded *self* and included *mother, father, brother or sister, friend* and slightly further out *social-problems* and *don't know well, would like to know better.* A further cluster close to *self* but further from the others included figures involving *difficulties at home, admired adult* and *vocational information source.* The constructs in the vicinity of these figures referred to *understanding our problems, easy to talk to, friendly, well-known, pleasant, shy, moody.*

A second group consisted of *help with school work, choosing a career, interests and hobbies, feel uncomfortable* and descriptions referred to *know what they are talking about, nice teachers, same age as mother.* This subject's only major dimension for discrimination seemed to be a combination of an intimacy-potency factor, and there were no other obvious figure groupings or isolates on her plot.

S_2 - Male

Again the intimacy-potency factors were not well differentiated but both were clearly present in the wording of the constructs used. In this case, the only other figure closely linked with *self* was *social-problems*, with *interests and hobbies* and *don't know well, - would like to know better* being the next closest to these. *Father, mother, brother or sister* and *vocational information source, feel uncomfortable* formed another closely linked cluster while *help with school work, admired adult* and *choosing a career* were similarly linked together. *Friend* and *difficulties at home* fell between these latter two groups. Constructs such as *help me a lot, teach at school, easy to understand, good jokers* appeared in the vicinity of the last group mentioned while *my friends, we enjoy each other, maoris*, were associated with the *self* grouping. The family cluster had such inconsistencies as *my idols* and *make me sick somtimes* associated with them.

S_3 - Male

The clusters in this case were very loose with *self* surrounded by *don't know well, would like to know better, social-problems, feel uncomfortable, brother or sister,* and *friend. Help with school work* and *vocational*

information were further afield and further still a group including *mother, father, difficulties at home, choosing a career, interests and hobbies* and *admired adult.* The constructs in this particular case were all of a very factual nature and were mainly concerned with sporting prowess and school matters. However, a large group of constructs adjacent to the cluster containing family members included such descriptions as *middle-aged, married, want me to work harder at school* and *want me to behave.*

S_4 - Male

This subject produced a very undifferentiated set of figures and constructs and it was not possible to determine any meaningful clustering effect for the elements nor any significant construct loadings. In fact, it appears that he responded in a more-or-less random manner to the task of completing the grid protocol. Consequently, the figure points are scattered fairly uniformly about the origin in the two-dimensional space.

S_5 - Female

Although the Intimacy and Potency dimensions did not appear to be independent there was a clear distinction between those people who were described as *kind, friendly, easy to talk to, understand my personal thoughts* (*self, friend* and more distantly *mother*) and those people who had wisdom and power and who earned respect (*admired adult, interests and hobbies, father, vocational information, social-problems, help with school work*). They were described by such terms as *know what they are talking about* and *older.* Another distinct cluster of figures included *brother or sister, choosing a career, feel uncomfortable* and *don't know well, would like to know better.*

Further observations

(1) The grid technique proved to be an absorbing and rather difficult task, however the subjects appeared to approach it in a cooperative and serious manner.

(2) From the start, it was found that many subjects experienced difficulty in thinking of fourteen different people to fill the Role Titles especially towards the end of the list but they were all able to complete the task when permitted to choose a second preference in some cases.

(3) After the first three grid rows most subjects understood how to form constructs and to generalize over elements but one or two needed some additional individual instruction from the experimenter who remained available throughout the testing period. (The class teacher also remained in the room but took no active part in the procedure).

(4) Some of the subjects complained that they had difficulty in allocating certain elements definitely to one pole or the other of a construct dimension. However, all but one finally managed to do so. This latter subject produced a grid with an intermediate rating in a few of the cells (3). This suggests that some form of rating scale should be considered as an alternative form of element allotment.

(5) It was learned afterwards that one subject, a Maori girl, had difficulty with the *mother* and *father* Role Titles since she had been reared entirely by other relatives. This point should be kept in mind in the wording of future grids especially when working in a multi-racial situation.

(6) On the whole, the wording of the instrument proved to be appropriate and subjects appeared to find the Role Titles intelligable and meaningful.

(7) When the testing session was terminated after the subjects had been working on the Grid for approximately one hour, it was found that of the twenty-two subjects, only five had fully completed the grid (see TABLE 1) and a further fourteen had managed to complete fifteen or more construct dimensions. It is important in the main study to stay within a 50 minute time limit for administration, not only to minimize disruption to class timetables but also because the interest and motivation of the subjects is likely to deteriorate beyond that period thereby reducing the validity of the Grid as a measuring instrument.

Discussion

The information gained from this preliminary study and the results of the analysis of data obtained from the five subjects provided useful guidelines for constructing the final measuring instrument.

1. Two dimensions emerged on which subjects chose to discriminate the people suggested by the Role Titles. One dimension which the experimenter labelled INTIMACY was described by such phrases as *understand our problems, close relations, friendly, can talk to them, good friends.*

   The other, a POTENCY dimension, bore such descriptions as *taught me a lot of things, people I respect, stupid, don't know what they're talking about.*

   These dimensions did not appear to be entirely independent but this

may have been partly due to the limitations imposed by the repertoire of available Role Titles. It was therefore decided to retain the original fourteen Role Titles but to add further ones to the list to allow subjects the opportunity to clarify their meanings and further differentiate between people. These additional Role Titles would have to be chosen carefully in order to accomplish this while at the same time taking care not to over-tax the subjects' ability to produce the names of additional acquaintances.

2. At least two figure clusters were produced by each of the five subjects. As might be expected, there was considerable individual variation between subjects regarding the membership of these separate clusters. Nevertheless, there appears to be a clear trend, one group consisting of a circle of close relatives and intimates whose advice was sought on many personal problems and another group of figures who were respected for their common-sense, expertise or greater experience. Sources of vocational counselling appeared in both groupings being differentiated according to the particular requirements of their role.

3. Although only the five completed grids were used in the analysis, the remaining seventeen were included to provide a large pool of personal constructs from which to choose a representative selection of bipolar descriptions for use in the main study.

Item analysis procedures were used for selection of the constructs to be used in the final Grid form. These constructs were selected on the basis of the following criteria:

(1) They should include the entire range of constructs offered by the subjects in the preliminary study.

(2) They should clearly discriminate between people (elements).

(3) They should be relevant to the content of the study, that is, they should pertain to particular characteristics and behaviour of persons in the counselling role rather than being, for example, merely physical characteristics.

The experimenter examined the entire pool of constructs from the previous study and employed a frequency count to determine those which were most consistently used, after eliminating any constructs which appeared to be irrelevant to the study, for example *likes big cars.* A subjective judgement had to be made regarding ones which were simply duplications of one pole or the other of previously encountered constructs. A total of seventeen constructs were derived in this way. An additional two were included by the experimenter on the basis of their utility in this experiment,

don't understand people of our age - understand how we feel
give me help with my school work - do not help with school work.

Although the constructs produced by the twenty-two subjects in the sample provided a good idea of the type of discriminations commonly used by this particular group, it was recognized that, because of the small size of the sample, the list might be somewhat biased in content. Therefore, the next step was to consult the various published lists of adjectives commonly used for describing other people (Osgood et al, 1957) and a further three constructs were added to the list

honest - dishonest
friendly - unfriendly
care about other people's feelings - inconsiderate.

Since the selection of constructs was largely subjective in nature, three independent judges were also consulted. One other adult with wide experience in the construction and use of Repertory Grids inspected the list for adequacy of coverage, discreteness of meaning and wording and a few minor changes were subsequently made. In addition, two other teenagers were presented with the original constructs produced by the twenty-two previous subjects and asked to perform their own analysis involving a frequency count and elimination of redundant constructs. In both cases a list of constructs resulted which bore close resemblance to the experimenter's own seventeen both in terms of wording and content.

4.3.4 Construction of Second Repertory Grid.

A further eight role figures were now added to the original list to introduce some additional negatively valenced figures and authority figures. These were selected from Grids used by other experimenters (Kelly, 1955, p274; Bieri, 1966, p191) in order to enable the subjects to interpret more clearly the similarities and differences in his role relationships. It was therefore decided to see if these new figures elicited different constructs from those already produced. When these additional elements were presented in triads to a single subject it was found that the additional elements did not produce any new construct dimensions thus supporting the finding that the original set of fourteen comparisons had exhausted the subjects' repertoire of construct dimensions concerning other people in this sphere of their socio-semantic space. The wider range of Role Titles however, did allow more contrasts and comparisons to be made between counselling-type and other figures and they were retained for this purpose.

As far as possible, the bipolar descriptions reproduced the actual wording used by the original twenty-two subjects. For about half of the constructs a judgement had to be made concerning the implicit pole of the construct in order to supply both the description and the contrasting description. In all cases this was derived from the subjects' own treatment of other constructs in the grids. By this means maximum uniformity of response format could be achieved without sacrificing meaningfulness. (An exhaustive sampling of construct dimensions therefore had been obtained from a set of subjects similar in all respects to the subjects who would take part in the main study.)

It was decided to continue to use a simple bi-polar response format (rather than a rating scale) since previous research indicates that, many subjects find a scalar response format more difficult to handle, it takes considerably longer to administer and does not produce significantly better results to warrant the extra time and effort involved (Mair and Boyd, 1967). Consideration was given to the possibility of providing an intermediate "Don't know" response category to fall back on but because of the danger of this category being overused by the subjects, it was decided to continue the practice of requiring subjects to polarize their decisions. Furthermore, the large number of element and construct

stimuli used here would elicit adequate judgements for analysis to be performed on the data despite the simple binary response data obtained.

By retaining, as far as possible, the actual wording used by the subjects, it was found that most construct dimensions were expressed in phrases rather than single adjective descriptions. This represents a departure from Kelly's original method but is a necessary modification when dealing with subjects of this age and ability range. Their vocabulary and facility with the English language in many cases, is such that they are unlikely to use single adjectives in their descriptions of others - Vacc and Vacc (1973) emphasize the importance of adapting the wording of Repertory Grids for children to their particular comprehension and reading level. The danger of using descriptive phrases is that they may present or be interpreted as conjunctive constructs, that is, constructs which combine more than one idea and involve the use of more than one construct in any given comparison. There is no guarantee, however, that subjects will not interpret a single adjective description as a conjunctive construct and unless some method of checking on each individual's personal usage is employed, this remains an uncontrolled variable. In order to reduce "halo" effect and to ensure that each comparison being made on separate constructs was a separate judgement the order of constructs was randomly assigned to the list. In addition, a number of constructs were reversed so that the effects of a personal response style might be reduced to a minimum.

Since the goal was to define the subjects' perceptions of a wide variety of people, it was necessary to place some constraints on the ordering of Role Titles. This was done by placing family and other intimates first. They were followed by counselling figures since the subjects' perceptions of a wide variety of people were being sought in this experiment. In this way, they were forced to go beyond a very restricted circle of acquaintances and make a larger number of discriminations between people. For a similar reason, subjects were required to evaluate the twenty-two role figures on each construct in turn in the order in which they appeared on their list. As well as knowing the sex of individual subjects it was also necessary to record the sex of the figures being evaluated and this was built into the Grid. Deaux and Farris (1975) point out that

interpersonal judgements differ with respect to sex of the stimulus person being judged as well as to the sex of the individual judge.

It was clear from the preliminary study that the initial instructions to subjects should be carefully worded so as to avoid producing a response "set". The subjects were very quick to pick up cues concerning the types of judgements which the experimenter was seeking and therefore, it was decided to offer only the essential instructions in the early stages and to make suitable explanations about the purposes of the experiment and to answer any general queries after the Grids had been completed.

The length of time taken for administration of the Grid and the possible danger of biasing subjects' responses, made it necessary to refine the set of instructions to a minimum length while ensuring that the subjects would understand the exact method to use. The pre-testing procedures adopted enabled the experimenter to modify the written instructions to achieve optimal efficiency and clarity.

The final form of the Grid was constructed of the basis of the above findings and was pre-tested prior to the main study.

4.3.5 Pilot Study of final Grid form.

Subjects

This Grid was first pre-tested with a group of 22 Fifth form boys at a City High School. (See TABLE 1.) The subjects were again a middle stream of pupils covering an average ability range.

Instrument

The Grid consisted of two parts, a list of Role Titles to which the subjects responded by supplying personal names and a 22 x 22 matrix of cells with a bipolar description supplied for each of the 22 cell rows. Since the constructs were provided in this case the section of the Grid procedure requiring Role Titles to be presented in triads was no longer necessary.

The major differences in format between the first and second Grids were that the number of Role Titles had been increased to 22 and the

bi-polar constructs were now supplied to the subjects under the heading of "Description" and "Contrasting Description".

Procedure

The written instructions were read to the pupils and the step-by-step procedure followed through as before. This time after writing their list of 22 names against the Role Titles, the subjects again aligned their element names with the 22 columns of the Grid and proceeded to allot a binary rating to each of the names on their list considering each supplied construct in turn. A cross placed in the appropriate cell of the Grid indicated that the "Description" pole applied to that particular person and a blank indicated that the "Contrasting Description" applied. The whole procedure took one hour and although subjects again found the task quite demanding they complied readily with the instructions.

Comments

(1) Of the 22 subjects, on this occasion, 20 produced fully completed grids.

(2) Two of the subjects gave partial ratings instead of firmly deciding between "Description" and "Contrasting Description" as requested, suggesting that this point must be further emphasized in the instructions.

(3) Eight of the subjects left blanks in all the cells of one row. Thus it was difficult to determine whether the subject judged that all persons on his list belonged to the contrasting description or whether he had inadvertently omitted that particular construct row. It was therefore decided that for future trials subjects would be asked to designate the "Contrasting Description" by a circle (O) in that cell. In this way it would be possible for the experimenter to quickly check with the subjects at the end of the session if they had completed all of the cells.

(4) Following the suggestion of the teacher present during administration an enlarged cardboard replica of a part of the Role Title list and the Grid would be made to visually illustrate the steps in the procedure and augment the clarity of the verbal instructions.

(5) Because of the length and complexity of the procedure it was necessary to maintain a supportive and encouraging atmosphere if the subjects were to successfully complete the task, while at the same time, taking care not to influence the subjects' responses in any way. For this reason, it was found useful to move about the classroom two or three times once the subjects had begun working on the Grid in order to answer individual queries simply by repeating the original instructions where necessary. It was also important to personally collect the Grids at the end of the sessions so that a rapid check could be made on the completeness and legibility of the responses. Apart from this, the experimenter, after reading out the necessary instructions, (and the teacher, if she or he was present) remained quietly seated throughout the procedure. For the sake of one or two subjects who clearly found the task completely beyond them for one reason or another the experimenter was careful to convey that their efforts were appreciated and that their Grids were an acceptable and valuable contribution to the experiment.

The above points of procedure illustrate the difficulties of administering the Repertory Grid in a group situation, difficulties which can only be counteracted by the experimenter's first-hand practical experience in repeated Grid administration.

After these modifications had been incorporated into the procedure, the Grid was again pre-tested, this time with a class of 17 girls at another City High School. (See TABLE 1.) Ten completed grids were obtained on this occasion. (Throughout the analysis, it was decided to accept as "complete" any grids in which subjects had omitted less than three cells out of the 484. Since responses in each cell were to be pooled over entire groups the omission of no more than two cells would not substantially alter the results obtained.)

The data from both of these groups were analyzed for figure clusters and related constructs using a multi-dimensional scaling procedure and the results are presented below.

Results and Discussion

As a means of estimating the internal consistency of this Grid technique both the boys and girls Grids were randomly divided into two separate groups and subjected to multi-dimensional scaling analysis to check the correspondence between the two halves of the same set of data.

The two halves of the girls' sample did reveal a basic similarity in clustering of figures and constructs. The coordinates of the points are recorded in Appendix B. Figure 3 illustrates the corresponding points as they appear when plotted in two dimensions. While the first half of the random split produced two main clusters plus one isolate figure (*someone who seemed to take a dislike to you*), the second half revealed the beginning of a breakdown of the large main group (consisting of family, counselling figures and authority figures) into two separate sub-clusters. In both halves *self* and *best friend* seem to form their own small cluster, while *someone who seemed to take a dislike to you* was somewhat isolated from all other figures. The first half of the split showed family members, counselling figures and all authority figures as a tightly knit cluster with *sister*, *ex-friend* and *disliked teacher*, *social-sexual problems* and *difficulties at home* being slightly detached. However, the second half of the analysis further dispersed this cluster so that some family members, most counsellors and *admired adult* remained close together while authority figures who were either neutrally or negatively valenced (*headmaster*, *minister*, *someone with job information*, *disliked teacher*, *person you feel uncomfortable with* and *counsellor with whom you disagree*) as well as *successful person* and *mother*, tended to form another cluster. There is some indication also, that *difficulties at home* and *social-sexual problems* demand a different type of counsellor.

It must be remembered that the scaling process is basically concerned with clustering, rather than dimensionality and it is very difficult to attempt to name construct dimensions. It is clear, however, that the largest group of constructs (the right-hand pole, only, emerges in this analysis) including such descriptions as *unfriendly*, *not important to me*, *not easy to talk to*, *inconsiderate* and *stupid* occurs in the two-dimensional space closest to less attractive Role Figures. A number of

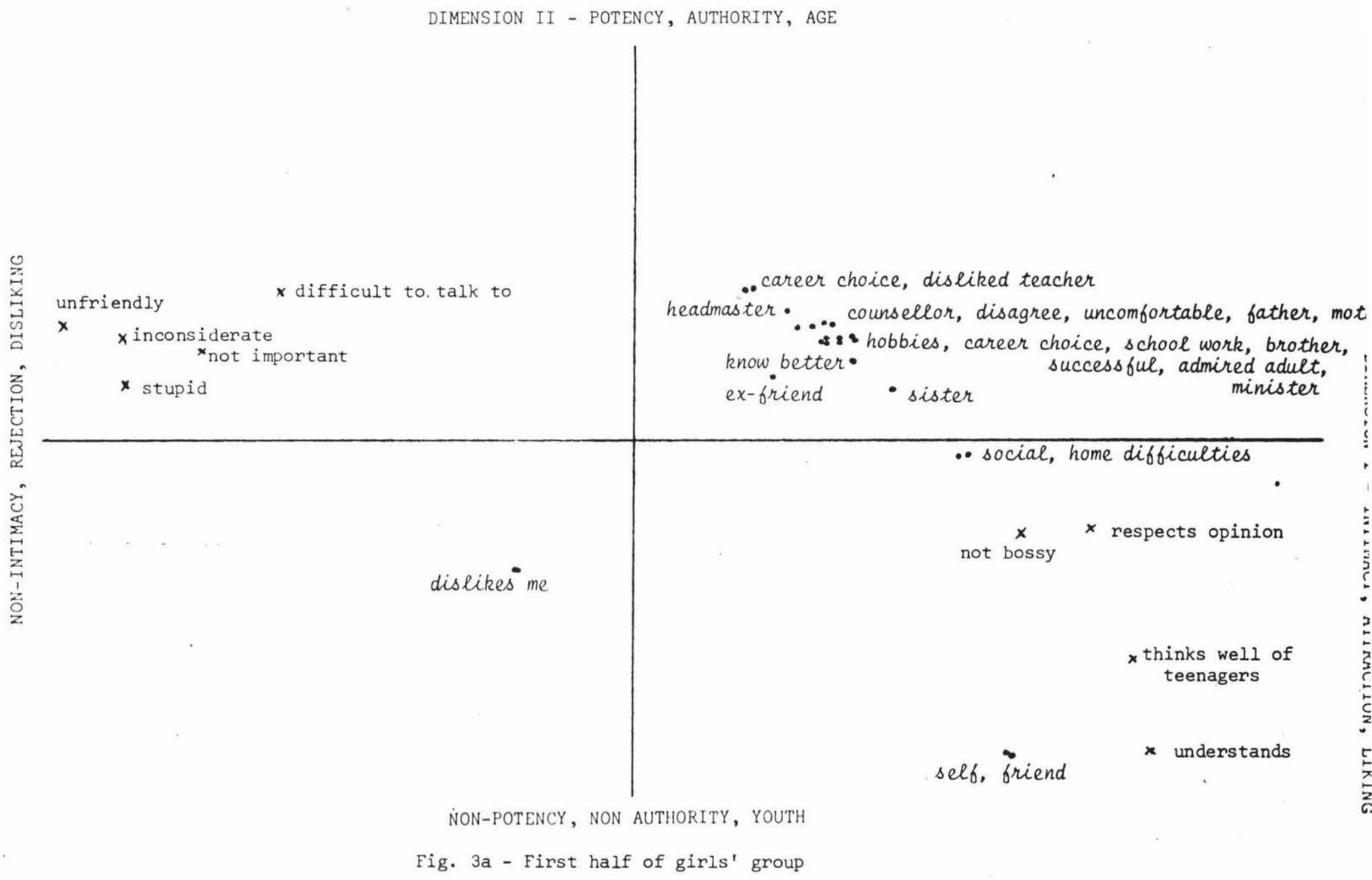


Fig. 3a - First half of girls' group

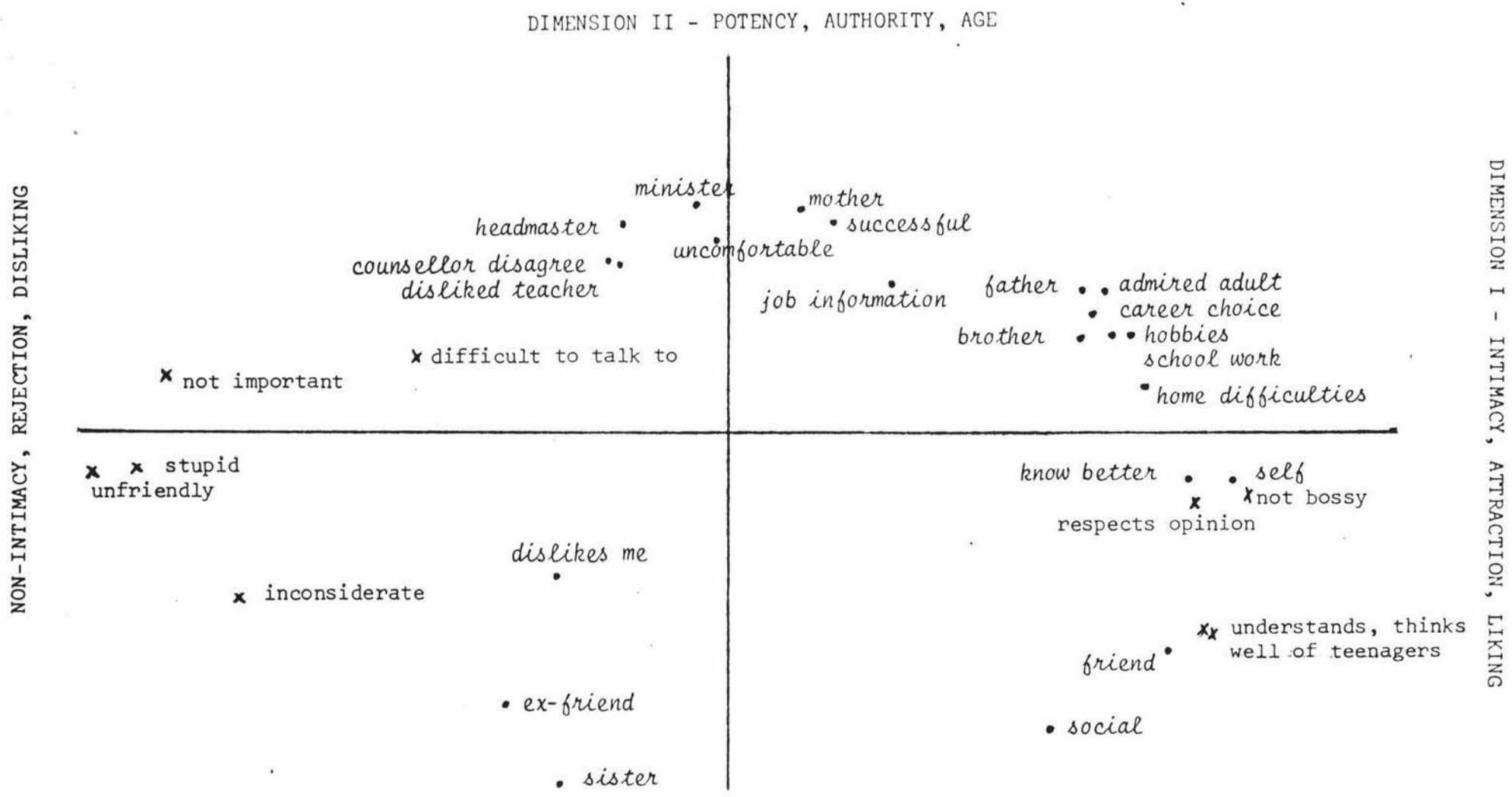


Figure 3. Configuration of figure points in the two halves of the girls' group - Pilot Study

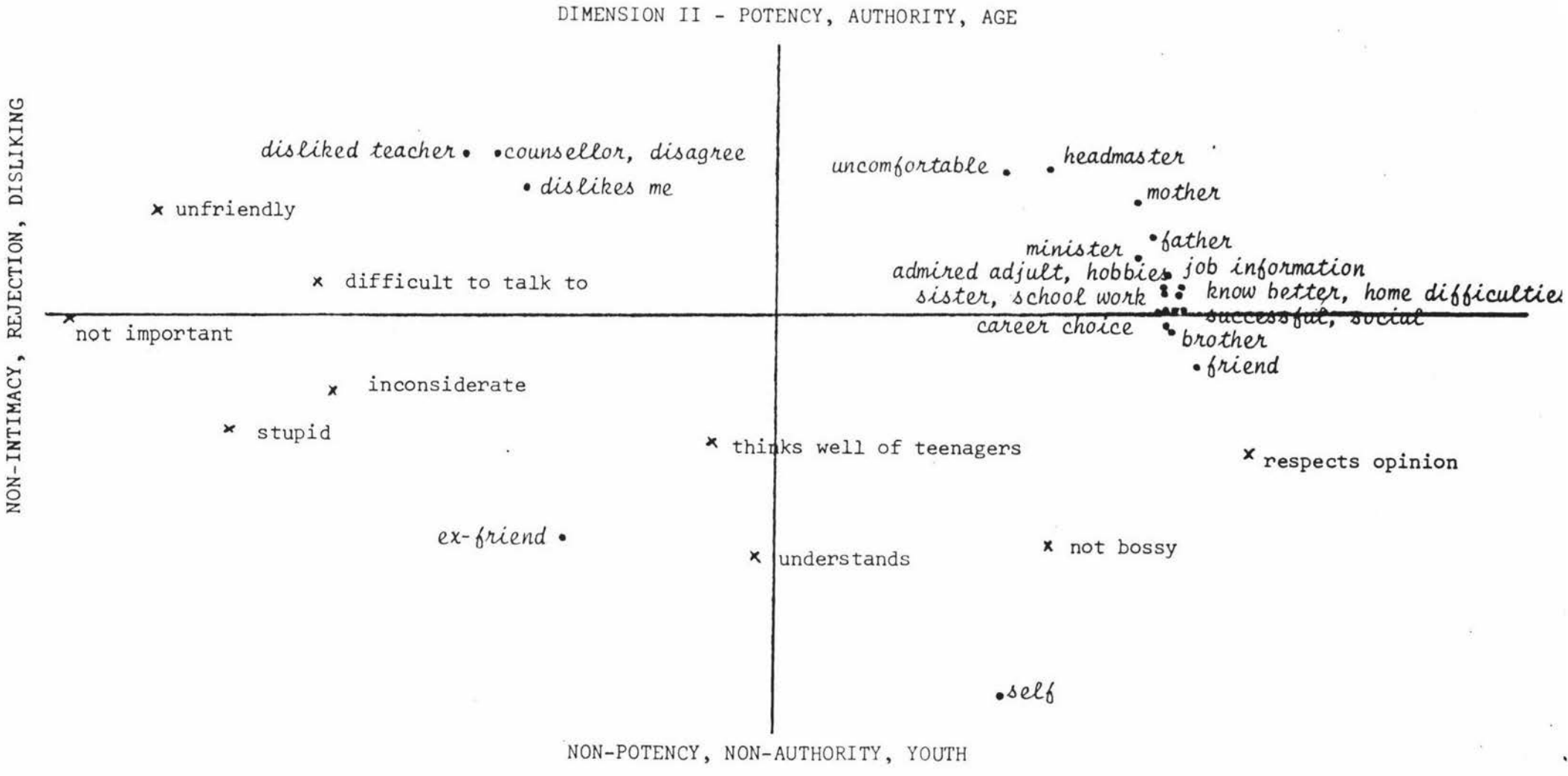


Fig. 4a. First half of boys' group

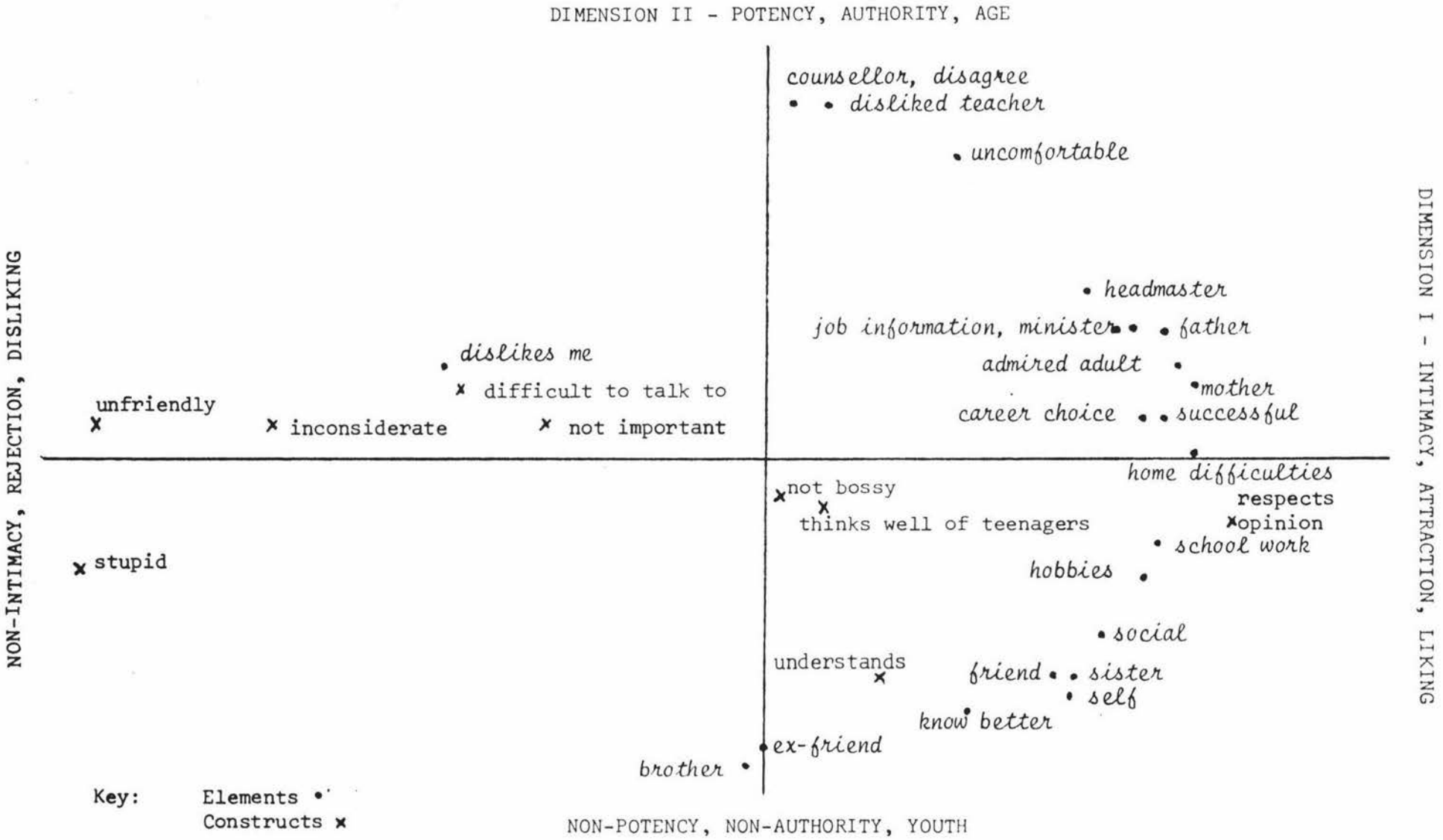


Fig. 4b. Second half of boys' group

Figure 4. Configuration of figure points in the two halves of the boys' group - Pilot Study

descriptions were also scattered among the *self - best friend* and *social-sexual problems - difficulties at home* pairs and were also in proximity to the main counselling cluster. These constructs included *understand us, think well of teenagers, respect my opinion* and *not bossy*. The logical consistency in meaning between these descriptions which do, in fact, appear right beside one another in the plots offers some support to the validity of the procedure used here. Similarly, the internal consistency evident between the types of people who appear as cluster members is encouraging especially when it is remembered that each Role Figure represents an entirely different acquaintance to the person making the judgement in the first place.

The two parts of the boys' pilot study sample was similarly analyzed and the correspondence between the two halves of this sample appeared to be even more pronounced. (See Figure 4.)

Because such visual estimates of consistency tend to be inaccurate a statistical measure of correlation was applied to the data by calculating first the distances between *self* and each of the other 21 Role Figures in turn. This calculation was made for each half of the boys' and girls' samples separately. These distances were then rank-ordered and a Spearman's Rank Order Correlation Coefficient was computed between the two halves of the boys' and the two halves of the girls' sample. Table 5 shows the results of this calculation. For the boys' sample the Spearman's Rho of 0.865 was significant ($\rho < 0.002$) for a two-tailed test confirming the high degree of correlation and internal consistency within the boys' responses to the Grid.

The correlation coefficient for the girls was 0.396 and marginally significant ($0.05 < p < 0.10$) for a two-tailed test, reflecting the discrepancy between the two halves of the girls' sample already mentioned. It must be remembered that the boys' and girls' samples when each are broken down into two random halves in this way, consist of four very small samples (10, 10, 5 and 5 respectively) and individual differences within these samples are likely to have a very large effect on the results. Thus correlations of the magnitudes obtained are especially noteworthy.

TABLE 5

Rank ordered distances between *self* and each of the other 21 Role Titles - Boys' and Girls' Pilot Study groups.

Girls

Roles	1st half Distance from A	Rank	2nd half Distance from A	Rank
B	1.682	15	1.404	13
C	1.687	16	0.756	9
D	1.651	10	0.651	6
E	1.443	5	1.797	21
F	0.027	1	0.640	5
G	1.580	7	1.769	20
H	1.610	8	0.592	3
I	1.370	4	1.477	15
J	1.618	9	0.720	7
K	1.571	6	0.089	1
L	1.185	3	0.421	2
M	1.652	11	1.319	12
N	1.811	20	1.633	19
O	1.680	14	1.084	10
P	1.172	2	1.169	11
Q	1.745	19	1.528	16
R	1.657	12	0.742	8
S	1.711	18	1.420	14
T	1.885	21	1.561	18
U	1.675	13	0.605	4
V	1.702	17	1.552	17

In this case r_s = 0.396, lies between the critical values at the 0.05 and 0.10 levels of significance for a two-tailed test (N=21)

Boys

B	1.899	17	1.092	12
C	1.778	15	1.241	16
D	1.480	4	0.749	8
E	1.477	3	0.063	2
F	1.309	2	0.054	1
G	1.107	1	0.694	7
H	1.549	6	0.503	6
I	1.815	16	1.736	18
J	1.561	9	0.958	11
K	1.567	11	0.233	4
L	1.509	5	0.849	9
M	1.560	8	0.915	10
N	2.047	19	1.339	17
O	1.644	13	1.240	15
P	1.555	7	0.199	3
Q	1.701	14	1.239	14
R	1.569	12	1.093	13
S	2.013	18	1.778	19
T	2.400	20	2.044	20
U	1.564	10	0.391	5
V	2.401	21	2.085	21

Since r_s = 0.865, is greater than the critical value at the 0.02 level of significance for a two-tailed test, then H_0 is rejected (N=21)

4.4 Main Study - application of final Grid form

4.4.1 Procedure.

The main study was conducted over a period of five weeks in the second half of the school year. The subjects consisted of 20 and 32 pupils from each of two urban coeducational High Schools, 24 pupils from the coeducational Agricultural High School (a different sample from those used in the preliminary study), 39 pupils from the Catholic Girls' School and 28 pupils from the Catholic Boys' School. The breakdown of subjects by school and sex is given in Table 6.

Average streams of 5th formers were again chosen and the Grid was administered to whole classes at a time. The following changes in the Grid, suggested by the Pilot Study were incorporated into the final Grid form:-

(1) The twenty-two elements were construed on the twenty-two bipolar descriptions using an X and circle response system.

(2) Written instructions which were read out to the subjects were illustrated with the aid of the prepared material. The instructions to subjects and both pages of the Repertory Grid are illustrated in Appendix C.

The procedure was carried out as before. The experimenter found that the procedural changes made and the skill acquired during preceding trials proved to be of benefit. The return rate of fully completed grids improved so that of the 143 grids administered, a total of 125 were suitable for multidimensional scaling analysis (87.4%). The remaining 18 grids were examined separately.

The last step in the procedure was a letter sent to all subjects, thanking them for their participation and requesting volunteers from among them for further follow-up studies. (Possible types of questions for validity studies using an outside criterion would include asking subjects subsequently from whom they sought advice, who influenced them most, who gave them the most useful information and the occupation they finally chose as a career). The following additional information was also obtained at this time:-

(1) the marks they had gained in all subjects in their last major set of tests at school. (In this way, a rough estimate of their

TABLE 6

Classification of subjects who took part in Main Study

School	School Type	No. Ss		No. Ss who completed grid	
		M	F	M	F
1	Semi-rural Coed High School	14	10	13	9
2	Urban Coed High School	16	16	15	14
3	Urban Coed High School	9	11	7	7
4	Boys' Private School	28	0	23	0
5	Girls' Private School	0	39	0	37
Totals		67	76	58	67
		143		125	

current academic achievement and intellectual performance level could be gained.)

(2) their plans for the following year - either to return to school, engage in some other type of study or training or take up some form of employment.

(3) what they considered to be their most likely choice of jobs at that particular point in time.

(4) their preferred job if they were given a completely free choice in the matter.

4.4.2 Method of Analysis.

Multidimensional scaling has been documented by Smith and Siegel (1967) as "an extremely practical technique for the classification or ordering of complex data. The method has been demonstrated to produce results which agree with those obtained through other techniques (Helm, 1959)." Assuming a basic commonality among a set of elements, multidimensional scaling can be used to determine the degree of similarity (or dissimilarity) between these elements as measured by a formal metric representing distance between elements, that is, a measure of Euclidean distance. (The coordinates of the points obtained are illustrated in Appendix B.)

The resulting clusters correspond to groupings of similar figures which are separated in the Euclidean space from other groupings, the distance apart reflecting the degree of dissimilarity. The process involves rotation of axes to orthogonality or simple structure. A satisfactory fit for the 44 points (elements and constructs) in a two-dimensional space is evaluated by examining stress measures. These can vary between 0 and 1.00 with the lower values indicating a better fit. Using Kruskal's criteria a stress value of 0.100 is the cutting point separating good and fair solutions (Anderson, 1970). Table 7 contains the stress indices for the final configurations obtained in the present analysis.

Ball and Cocker (1976, p8) using a similar type of analysis reported that the analysis of separate grids produced results which were too unwieldy to interpret and consequently they likewise decided to analyse grouped scores for each subject sample. Individual grids are

TABLE 7

Stress indices of final configurations
obtained for the multidimensional scaling analyses

Pilot Study

Group	½ Girls	½ Girls	½ Boys	½ Boys
Stress	0.076	0.204	0.136	0.265

Main Study

Group	Whole	Girls	Boys	State Schools	Private Schools
Stress	0.160	0.184	0.168	0.234	0.196

highly subject to the idiosyncracies of the subjects' concerned (for example, someone who has a special aversion for his father). Whereas the usage of individual grids is very useful in a clinical setting to detect individual differences in particular cases, it is not particularly useful for making generalizations to the group. Similarly, as the focus of this study was on group judgements rather than on differences between the perceptions of individual subjects, the data was aggregated over groups (sex and school type) so that the hypotheses could be examined. The practicalities of this aggregation involved the use of an overhead projector. Transparencies were ruled up into grids which were replications of the original, so that these could be placed on top of each of the completed grid protocols in turn. Different coloured markers were used to tabulate the number of responses per cell of the 22 x 22 grid and these were summed and then divided by the number of subjects within the sample. Subjects' responses thus averaged within

the sub-groups were then subjected to a scaling procedure using KYST program (Kruskal, Young and Seary, 1973).

Configurations were obtained for the total sample and for various sub-groups. Anderson (1970) found that aggregation did not produce a configuration which was very different from those obtained by analyzing each subject's configuration separately. Some individual idiosyncracies are to be expected and individual judges will naturally differ in their perceptions, placing elements at different positions within the stimulus space. The resulting plots consist of the configurations of the twenty-two elements in the two-dimensional space. A further set of twenty-two points represent the right-hand pole only of the twenty-two construct dimensions.

Assuming that the members of various subgroups have a common dimensionality for their perceptions of Role Figures, then an "ideal point" (Egan, 1971) may be obtained for each Role Figure as it is construed by a particular group. In effect the 22 construct points obtained are the ideal points for each Role Figure averaged over judges (these consist of the individual members of each of the subgroups).

The limitations imposed by the results of the multidimensional scaling analysis are due to the fact that a very large number of points (44) have been plotted in the two-dimensional space. When a three-dimensional analysis was attempted, however, it was found that there was little improvement in the stress values achieved, in addition to which the exercise of reconciling the three resulting plots and producing a satisfactory visual representation in three dimensions did not materially improve the comprehensibility of the existing data. Hence one is left with the problem of a configuration of 44 points which are not as widely dispersed as one would wish for maximum clarity of interpretation. That is, particularly at the outer boundaries of adjacent groups, there was ambiguity concerning the relationship of some figures to particular clusters of figures. It was therefore decided to apply a clustering technique to the data to supplement the information obtained by the multidimensional scaling. This had the advantage of providing an independent check on the clusters obtained since the numerical

taxonomic technique described here (Davis, 1973) utilizes a different approach to deriving the figure clusters from the raw data. Although a distance coefficient is again the measure of similarity in this approach, once the matrix of distances (see Appendix D) between figure points has been obtained (by the square root of the sum of the squares of differences between points computed over all 22 construct rows) these distances are used to construct the clusters and the hierarchical relationship within and between clusters.

This method of analysis has the added advantage of providing the actual distances between figure points (either a distance matrix or a correlation matrix must be specified in advance by the programmer). The KYST Programme, on the other hand, produces only the coordinates of the points which must then be converted into distances if these are required. However, whereas the multidimensional scaling analysis incorporates the right-hand poles of the constructs as well as the figures in its two-dimensional plot, the cluster analysis does not reproduce directly any information regarding how the constructs are used by the subjects in making their judgements and this information is therefore no longer available as soon as the distance matrix has been derived. Thus there is a very real sense in which one form of analysis supplements as well as verifies the information supplied by the other.

For descriptive purposes also the two methods of analysis are complementary, the multidmensional scaling providing some indication of those dimensions upon which the judgements are made while the cluster analysis simulates the structuring of the groups and the way in which the groups are formed. It is important to remember that any such statistical analysis is but a mathematical or geometrical representation of the outcomes of a cognitive process which has already occurred and one has no basis for assuming that these representations are in fact what actually occurs in human thought processes. By applying such a statistical analysis we may merely explain, albeit in a rather clumsy way, not so much how the subjects arrived at a certain point in their thinking but rather describe with some precision the current state of affairs (in this case the categorizations imposed by the subjects on these particular people in their social environment).

CHAPTER 5. RESULTS

Multidimensional scaling and cluster analysis results for the whole sample

Hypothesis 1.

SCHOOL CHILDREN AGED 15 - 16 YEARS WILL PRODUCE AT LEAST TWO GENERALIZED FIGURES WHOM THEY PERCEIVE IN A COUNSELLING ROLE RELATIONSHIP WITH THEM.

As predicted there do appear to be four distinct clusters of figures (generalized figures) some of which include counselling persons among their elements. Both the point configurations of the multidimensional scaling analysis and the dendrogram of the cluster analysis revealed basically similar cluster composites. (See Figure 5.)

Hypothesis 2.

THESE GENERALIZED FIGURES WILL BE DEFINED BY TWO OR MORE DIMENSIONS INCLUDING ONE CONCERNED WITH INTIMACY AND ANOTHER WITH POTENCY.

Previous research studies conducted for the purpose of determining the dimensions of interpersonal perception have resulted in the identification of two major factors, sensitivity to the feelings of other people and directing or controlling the behaviour of other people. The dimensions have been referred to by various names, for example consideration and initiating structure. The findings of the present research while specifically directed towards the vocational counselling situation are also related to these major factors. Although the analyses are concerned primarily with the identification of figure composites or clusters of elements rather than with the determination of construct dimensions, examination of the plots produced by the scaling procedure suggests two and only two clear dimensions, one being a distinction between liked, intimate, attractive individuals on the one hand and disliked, remote or unattractive individuals on the other. These latter include *ex-friend, someone who seemed to dislike you, headmaster, person you feel uncomfortable with, counsellor with whom you disagree* and *disliked teacher* and the construct dimensions occurring in the same region in the space as these people include *different interests, humourless, difficult to talk to, bad moods, unfriendly, inconsiderate, dishonest, stupid* etc. (See Figure 5. The second dimension is an equally clear potency or authority dimension although it is scarcely distinguishable in this case from an "age" factor, the construct pole *older* (in contrast to *my own age group*) having an

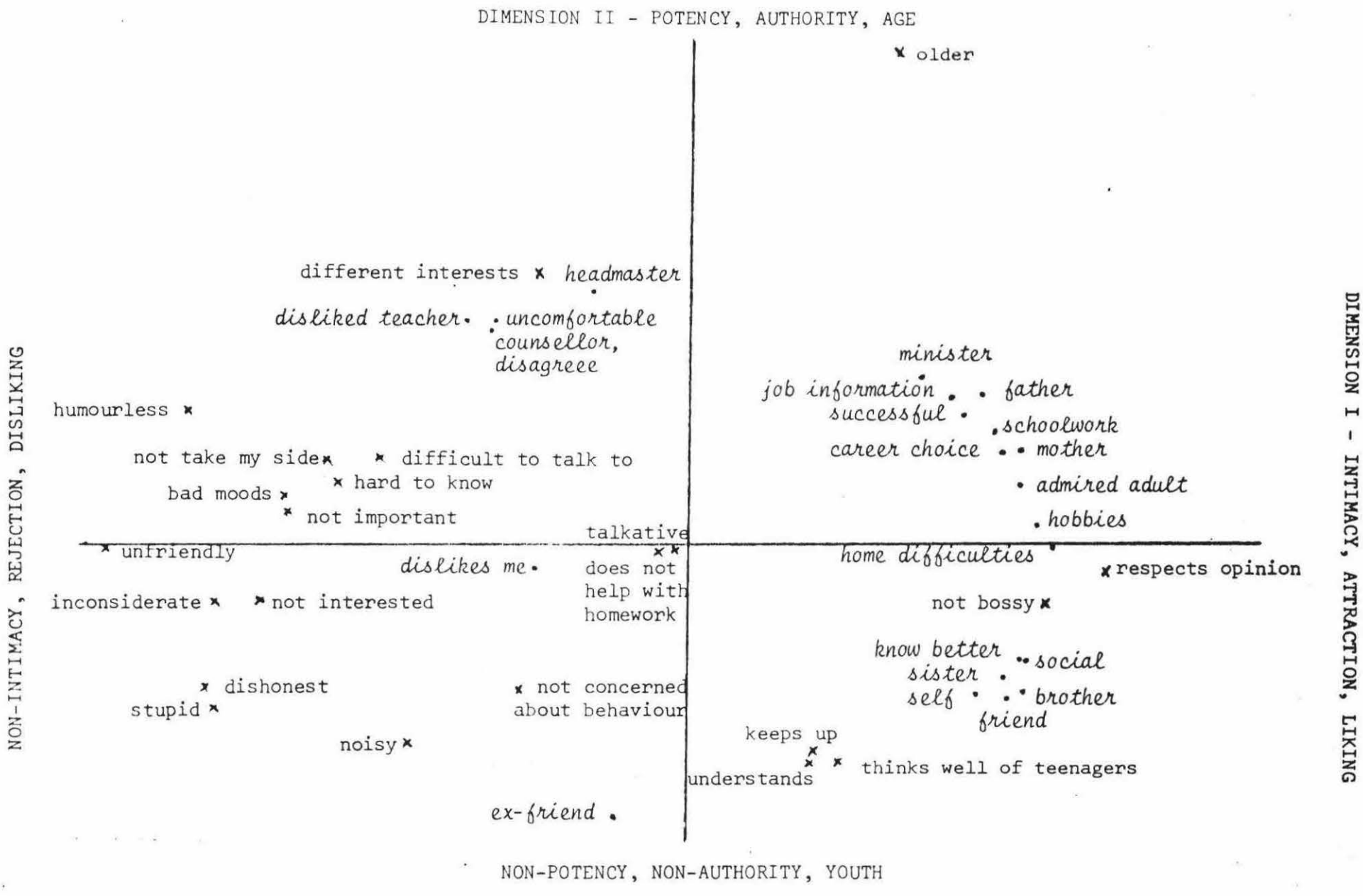


Fig. 5a. Multidimensional scaling plot for whole group

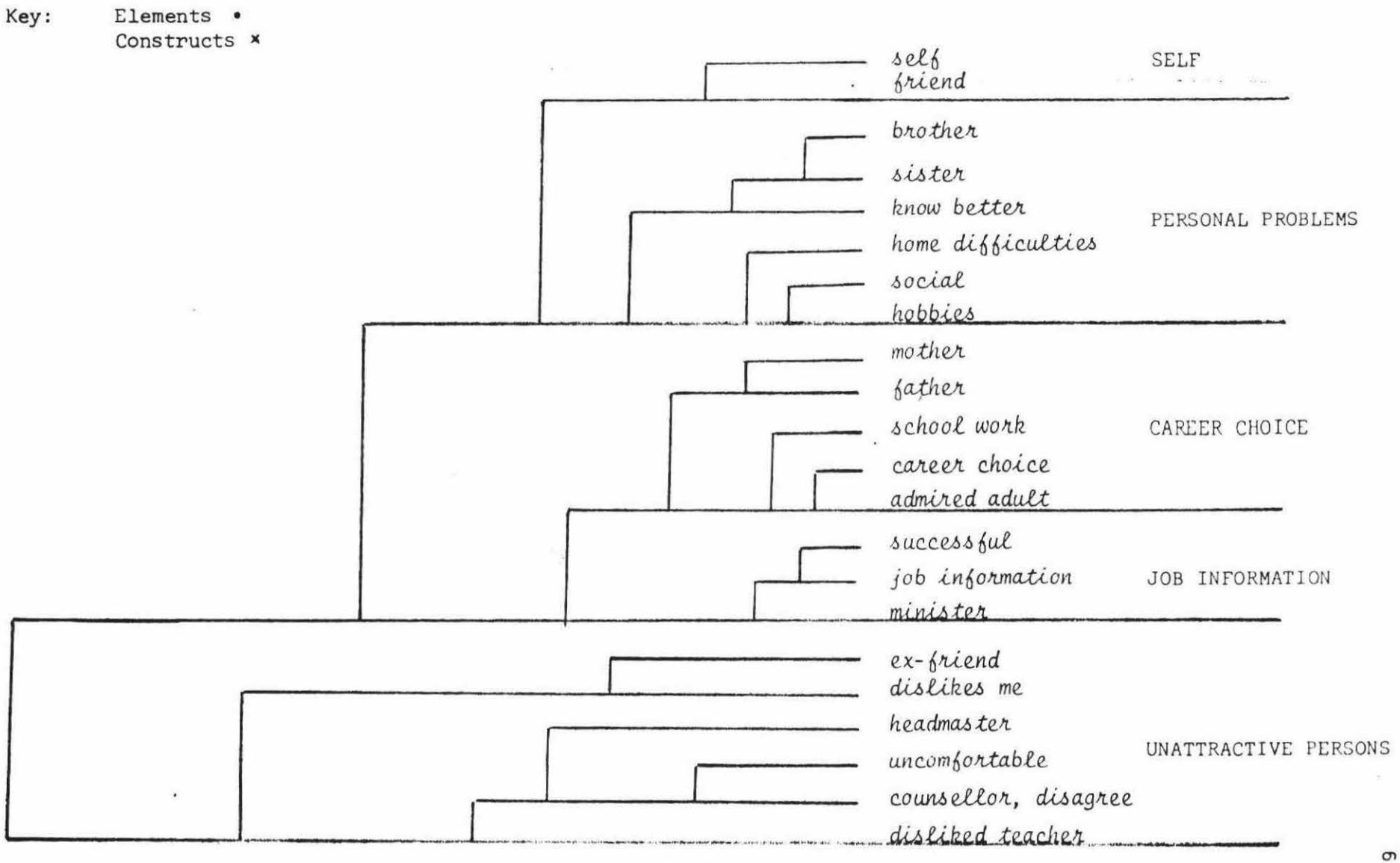


Fig. 5b - Cluster Analysis dendrogram for whole group

68a.

Figure 5. Configuration of points and dendrogram for the whole group.

extreme position in relation to this factor. Thus adults or older folk (*headmaster, minister, successful person, father,* for example) may be almost synonymous with persons having power or authority for these 15 - 16 year old students. In fact, persons who appear at the opposite pole to these figures are *like to know better, sister, brother, close friend, social-sexual problems* all of whom may be assumed to be relatively close in age to the subject himself. *Ex-friend* thus appears towards the young and powerless end of this dimension and the disliked pole of the first dimension while *counsellor with whom you disagree* and *disliked teacher* both are older but equally disliked. The cluster analysis suggests that of these unattractive persons there are two subgroups, one being a genuinely disliked group (*ex-friend* and *someone who seemed to dislike you*) and the other being merely authority figures who may have assumed this position simply by virtue of their special role as more remote individuals within the child's school and social environment. These latter persons consist of *headmaster/mistress,* and *person you feel uncomfortable with.*

Hypothesis 3.

ONE OF THE GENERALIZED FIGURES WILL INCLUDE SELF, FATHER, MOTHER AND OTHER INTIMATES AS WELL AS PERSONS WHO ARE PREFERRED IN COUNSELLING RELATIONSHIPS, CONCERNING MORE PERSONAL AND EMOTIONALLY-LOADED TOPICS.

In contrast to the first part of hypothesis 3, *self* is not included as part of any larger group but together with *best friend,* they form a somewhat isolated pair but one which is not very far distant from members of the immediate family as well as other intimate and generally attractive persons. At the positive extreme of the intimacy dimension one can distinguish two major groupings as well as several subgroupings within these. This hierarchical arrangement of smaller and smaller clusters within the major ones only becomes apparent when one refers to the cluster analysis results as the configurations on the multidimensional scaling plots do not provide a picture of the finer structural details within any particular cluster. One of these major figure groupings include *brother, sister, like to know better, difficulties at home, social-sexual problems* and *advice about hobbies and interests* and are described by such phrases as *respect my opinion, understand us, keep up with the times, think well of teenagers* and *not bossy.* It is to be noted that from a

counselling point of view these are the people who might be expected to be approached for advice concerning many of personal adjustment problems encountered by this age group. Neither of the vocational counselling figures are part of this cluster - this appears to be a separate function as far as these subjects are concerned.

Hypothesis 4.

A DIFFERENT GROUPING OF ELEMENTS WILL BE PRODUCED WHEN FACTUAL KNOWLEDGE AND EXPERTISE IS REQUIRED.

Hypothesis 5.

VOCATIONAL COUNSELLING FIGURES WILL BE INCLUDED IN BOTH GENERALIZED FIGURES FOR THE REASONS STATED ABOVE IN HYPOTHESES 3 AND 4.

The other major grouping of figures is large and includes all of the following persons:- *mother, father, school problems, choosing a career, admired adult, successful person, someone with job information, minister or priest.* However, within this large cluster may be distinguished two separate subgroupings at the next hierarchical level as demonstrated by the cluster analysis. Here lies the answer to hypotheses 4 and 5, for in association with *choosing a career* we find *school problems* and *admired adult* as well as *mother* and *father* while the second subgroup contains *successful person* and *minister or priest* together with *someone with job information.* Thus there is a group of people who as a result of their superior knowledge, expertise and proven success are considered to be more worthy of providing the sort of information pertinent to the task of selecting one's career. The other half of this function, i.e. assisting the teenager with the decision making process of choosing a career, is more relevant to a group of people including *mother, father, school problems, choosing a career* and *admired adult* all of whom may be seen to have a more supportive and warmer relationship with the young person. It is interesting but not surprising to note that *mother* and *father* although clearly included within this total group of advisors are perceived as somewhat unique and in a special relationship with the youngster.

Multidimensional scaling and cluster analysis results for the male - female subgroups of the total sample

Hypothesis 6.

MALES AND FEMALES WILL PROVIDE DIFFERENT GROUPINGS OF ELEMENTS WITHIN THE GENERALIZED FIGURES.

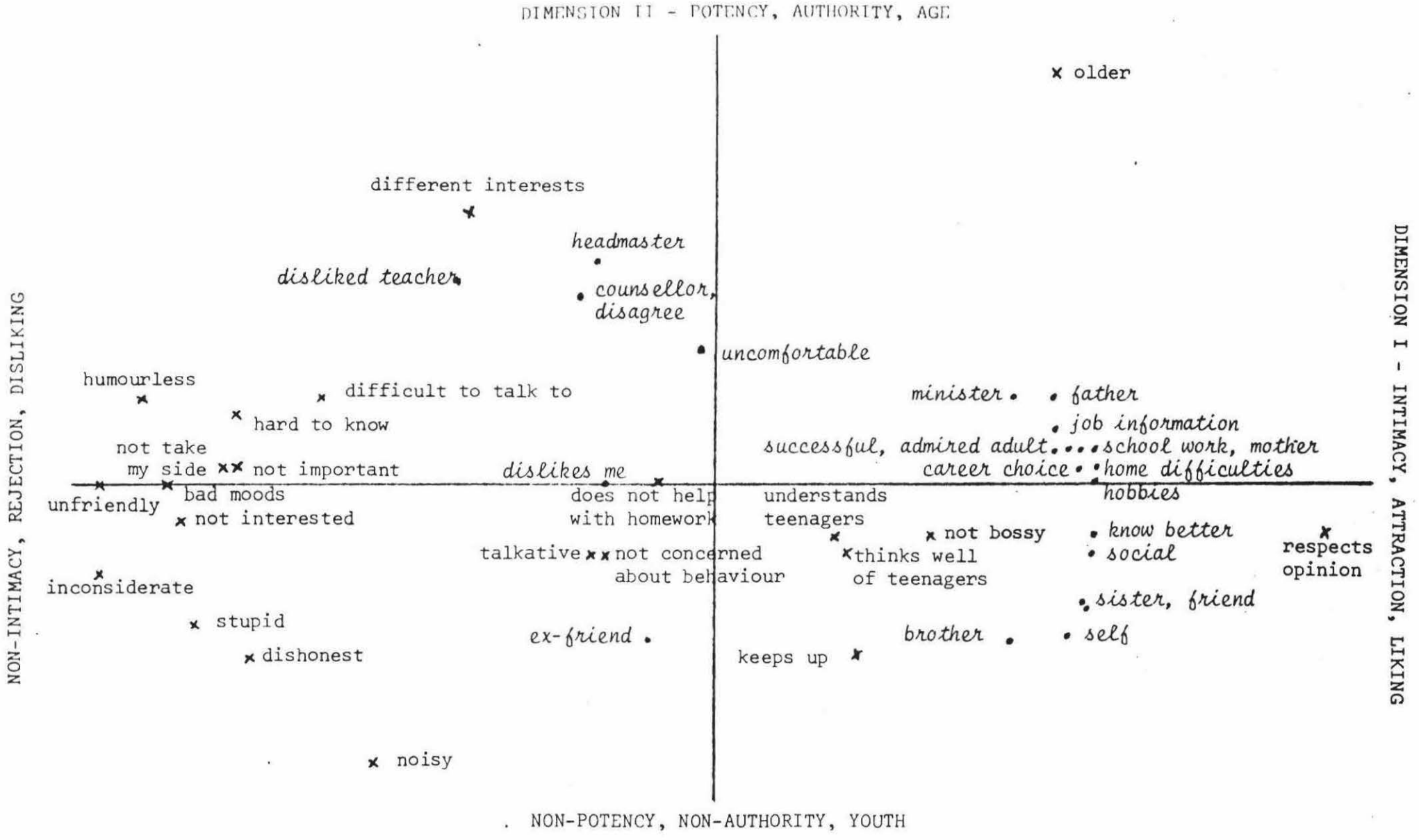


Fig. 6a - Multidimensional scaling plot for boys' group

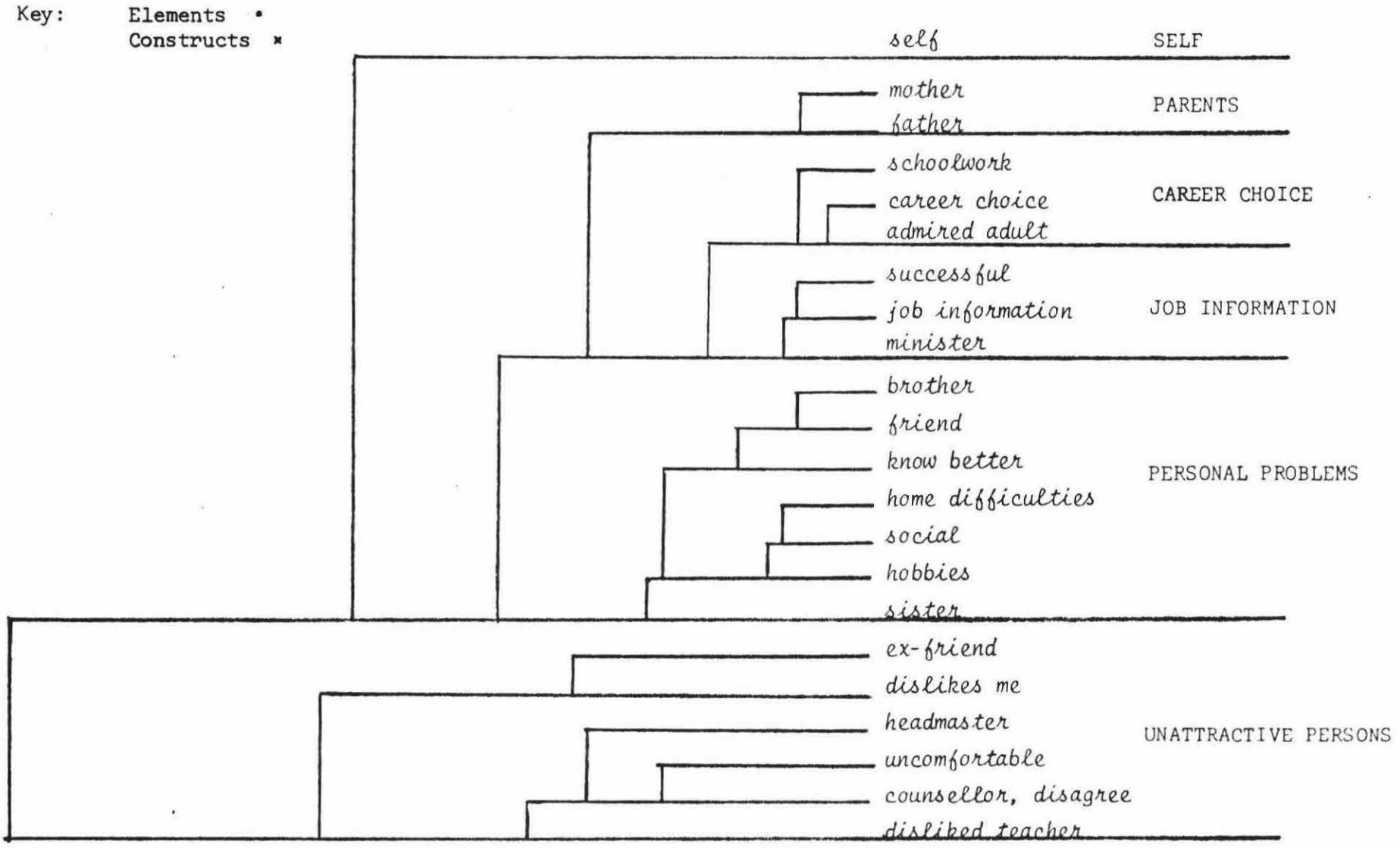


Fig. 6b - Cluster analysis dendrogram for boys' group

Figure 6. Configuration of points and dendrogram for boys' group.

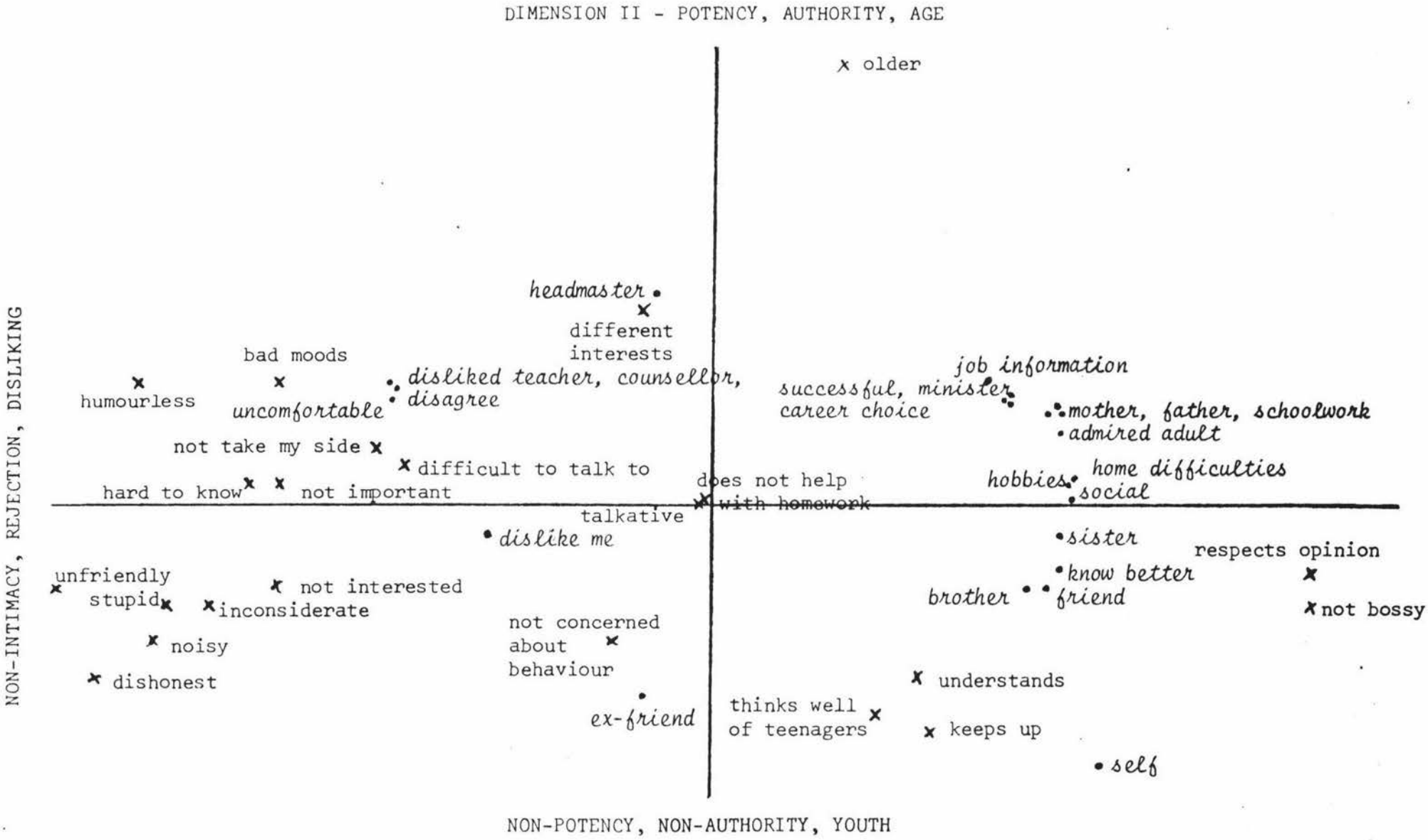


Fig. 7a - Multidimensional scaling plot for girls' group

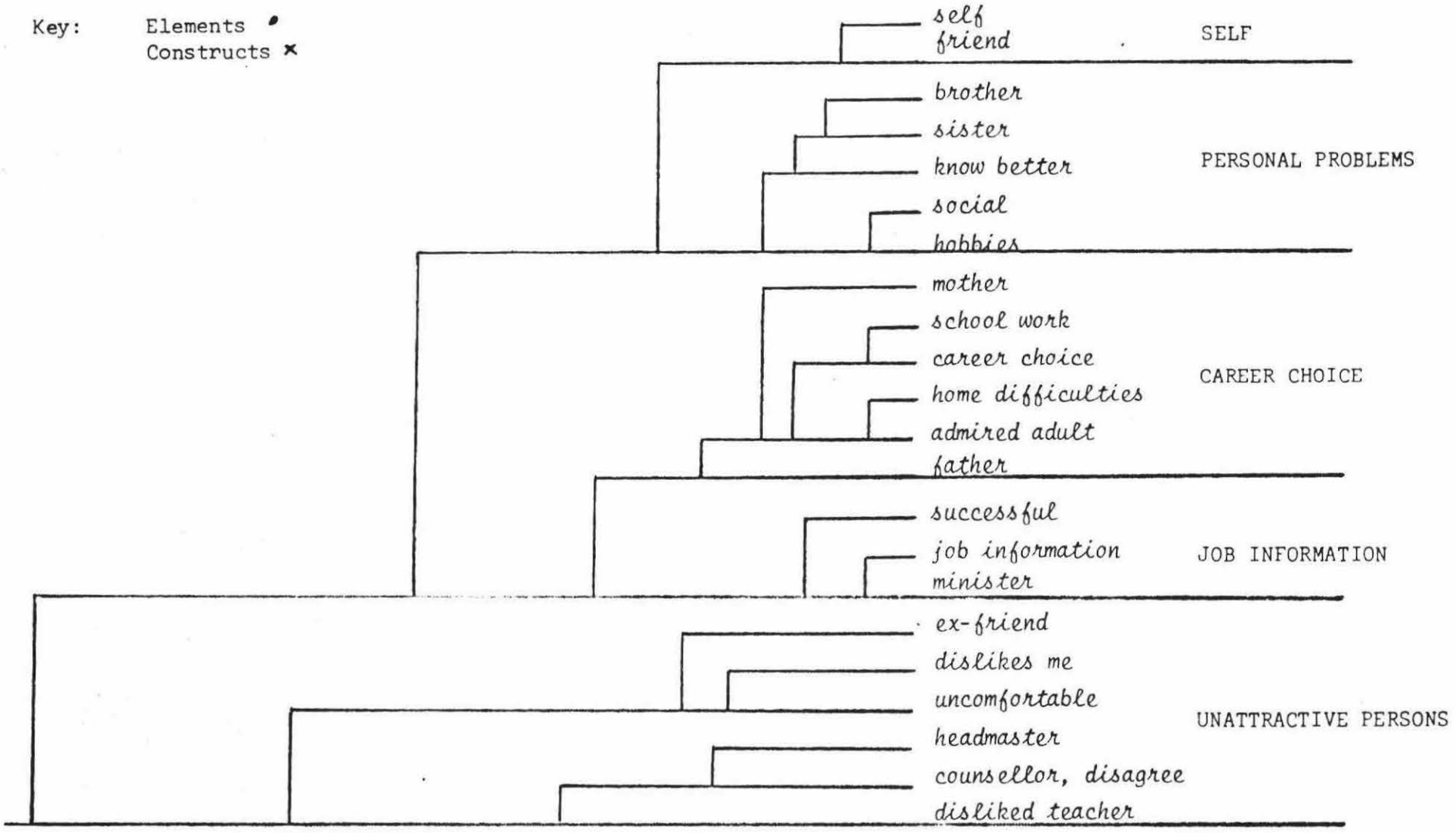


Fig. 7b - Cluster Analysis dendrogram for girls' group

Figure 7. Configuration of points and dendrogram for girls' group.

The main differences between the perceptions of the males and females in the sample are as follows (see Figures 6 and 7):-

(1) The boys made only one primary distinction and that was on the basis of an attraction and rejection factor so that all figures (including *self*) fell into one very large cluster while *ex-friend, someone who seemed to dislike you, headmaster, person you feel uncomfortable with, counsellor with whom you disagree* and *disliked teacher* comprised the second major cluster. The girls, on the other hand, clearly distinguished the four major groupings mentioned earlier as well as various subgroupings. Within the positively valenced group for the boys, however, the same generalized figures of parents, advisors concerned with career choice, advisors concerned with job information and personal problems counsellors, appeared at the second and third hierarchical level in the cluster analysis. The negatively valenced figures were broken down again in a similar way as previously described. Whether this difference between boys and girls reflects a difference in level of social development at this particular age is a point worthy of further investigation. Indeed, both casual observation and the evidence of a number of investigators tend to support this idea. Bieri (1955) observed that "females may be less conservative than males in their categorizations where more interpersonal domains of experience are being judged", while Brierley (1967) found that girls used more personality constructs than boys. At age thirteen they were using more personality (psychological) constructs while boys were using more behaviour constructs.

(2) A further point of interest is the difference between boys' and girls' perceptions of the role of *mother* and *father*. Although included within the total cluster of attractive figures for the boys they seem to form a separate subgroup apart from the generalized figures associated with either vocational guidance or general counselling, which casts some doubt on the role of parents in this capacity. For the girls, however, *mother* is part of the *choosing a career* generalized figure while *father* stands somewhere between *choosing a career* and *someone with job information.*

(3) The other difference shown here between the sexes is the position of the figure *difficulties at home.* Where girls see this as an element of the *career choice* generalized figure, together with

mother, *school problems*, *choosing a career*, and *admired adult*, the boys include *difficulties at home* in the younger, non-authoritative person problem oriented cluster.

Multidimensional scaling and cluster analysis results for the state school - private school subgroups of the total sample

Hypothesis 7.

DIFFERENT TYPES OF SCHOOL SITUATIONS WILL PRODUCE DIFFERENT ASSORTMENTS OF ELEMENTS WITHIN THE GENERALIZED FIGURES.

As circumstances dictated that the only single-sex schools available for the main study also happened to be the church affiliated schools as well, the effects of these two variables were confounded and it seems likely that the Private - State distinction probably overrode any differences due to the mixed or segregated nature of the schools concerned - particularly since these particular schools were actually on the same campus and therefore not as completely segregated as they might have been. The most obvious discrepancy between the two school types was a broad discrimination on the part of the private school group on the basis of authority (older) figures and non-authority (younger) figures, these latter being the people preferred for counselling on personal problems. (See Figures 8 and 9.) All the usual groupings appeared for both types of school at other levels of the scheme. The only difference pertained to a slight ambiguity for the Private School group in the role of *headmaster/mistress* who appeared somewhere between the *job information* category including *minister* (or priest, in this case), *job information* and *successful person* and the more remote and less attractive group of figures. On reflection this is to be expected as, in fact, the *headmaster/mistress* in both the boys' and the girls' Private Schools was also a member of a religious order and therefore they probably fulfilled a dual role in the eyes of the students concerned.

Finally, the remaining 18 incomplete protocols were examined separately. One possible explanation as to why certain subjects were unable to complete the grids is associated with the concept of cognitive complexity-simplicity. Various authors have noted that individuals differ not only in the number of constructs which they characteristically use (dimensional differentiation) but also in the variability and complexity of the hierarchical structuring of their construct systems for any

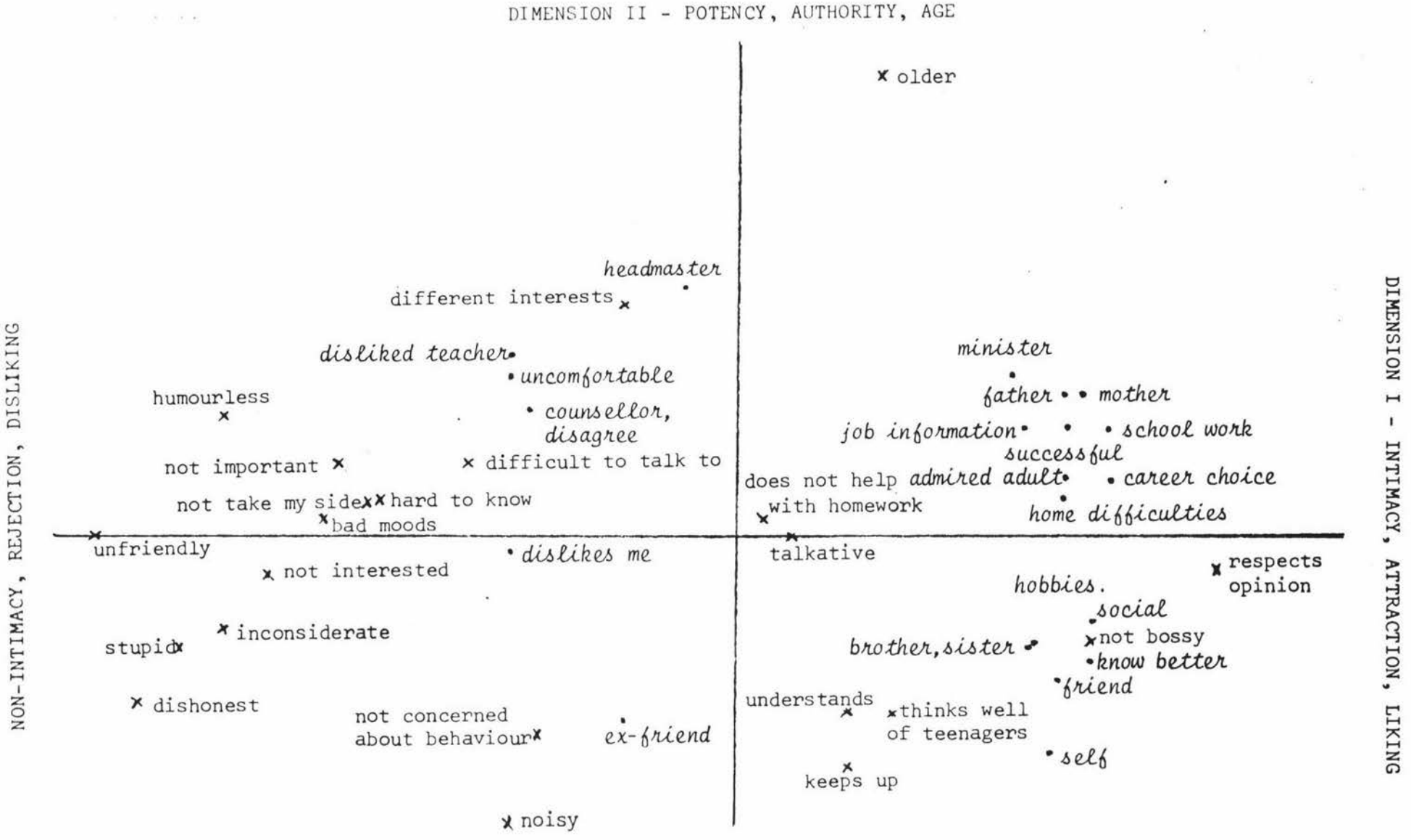


Fig. 8a - Multidimensional Scaling plot for State Schools' group

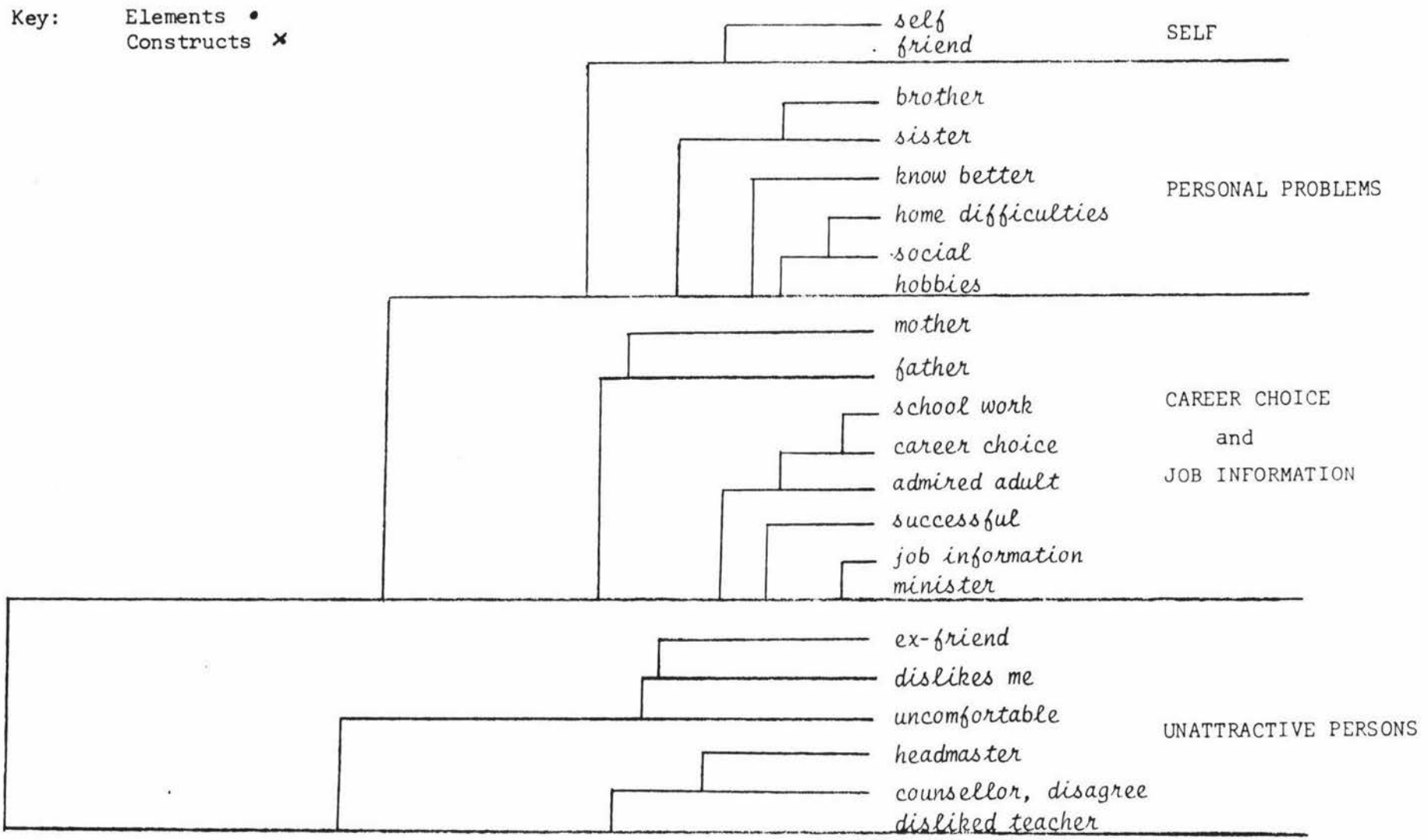


Fig. 8b - Cluster analysis dendrogram for State Schools' group

Figure 8. Configuration of points and dendrogram for State Schools' group.

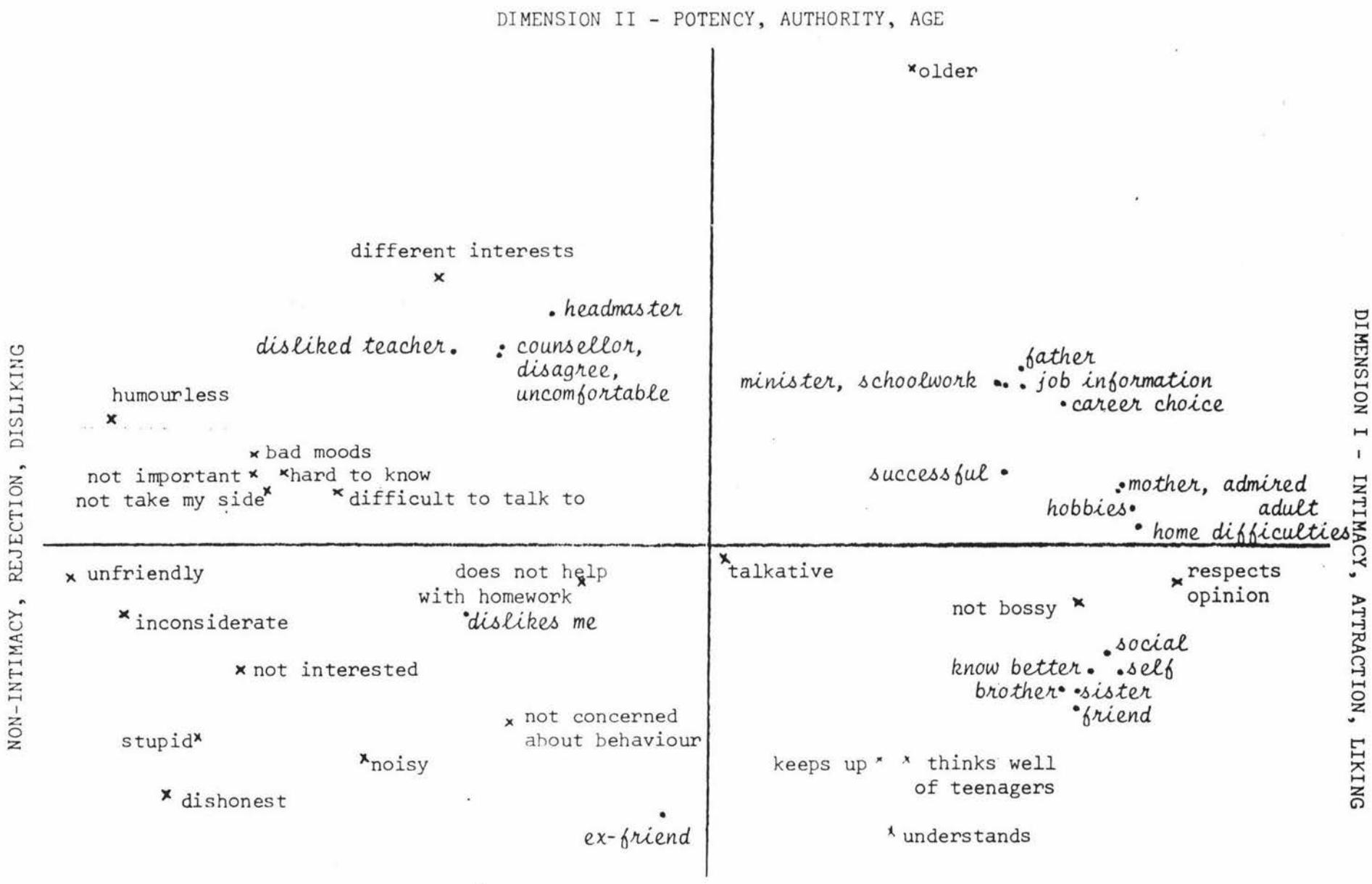


Fig. 9a - Multidimensional scaling plot for Private Schools' group

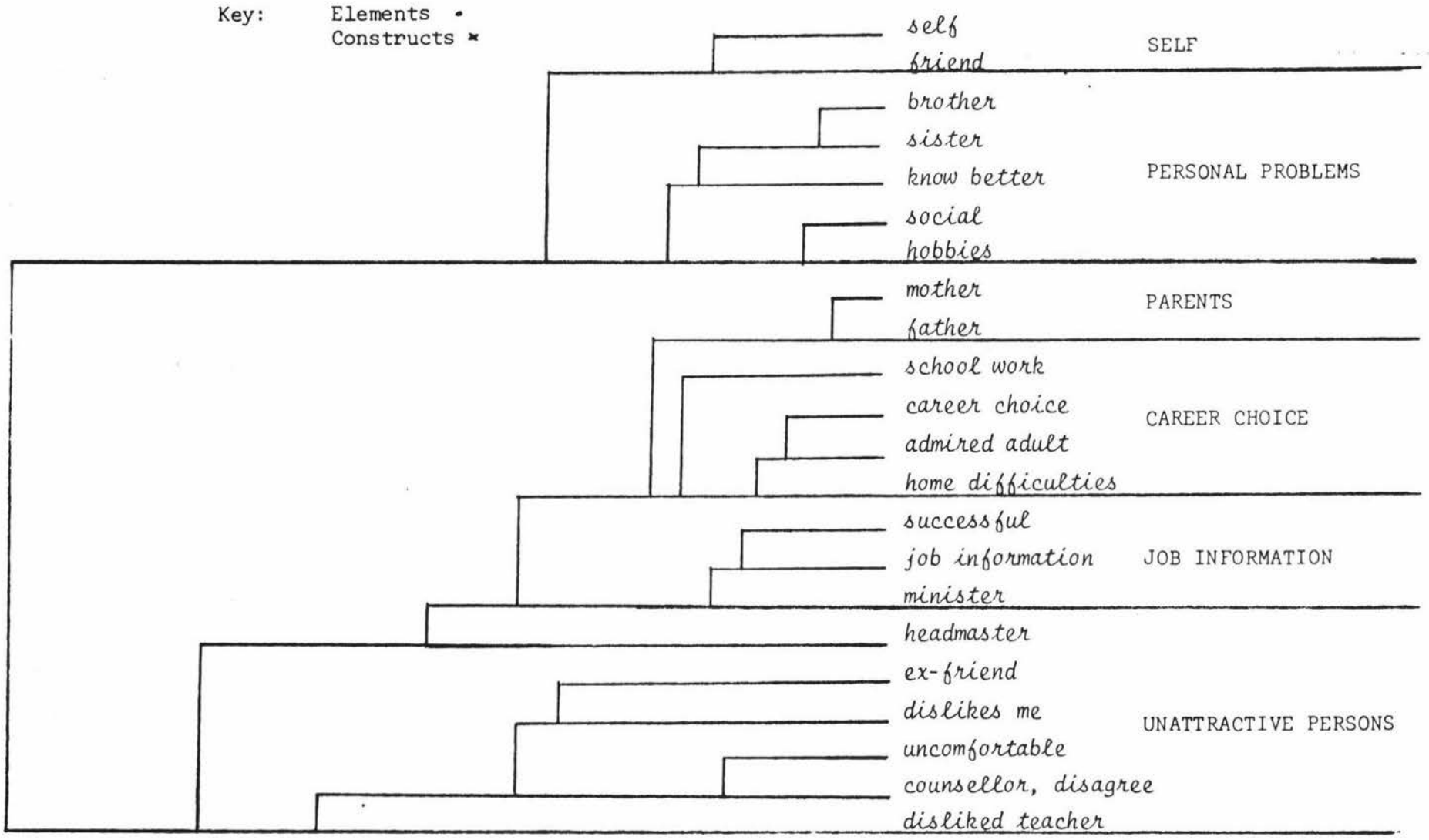


Fig. 9b - Cluster analysis dendrogram for Private Schools' group

Figure 9. Configuration of points and dendrogram for Private Schools' group.

particular content domain (Bieri, 1955; Bieri and Blacker, 1956; Tripodi and Bieri, 1963, 1964; Crockett, 1965; Bonarius, 1965; Smith and Leach, 1972). In the realm of interpersonal perception, then, it has been shown that some people are able to make finer judgemental discriminations (and possibly more accurate judgements) about their acquaintances than others (Bieri, 1955; Leventhal, 1957; Plotnick, 1961; Sechrest and Jackson, 1961). The fact that of the eighteen subjects in the present sample nine omitted between 1 and 4 and four omitted between 9 and 13 role figure columns on the grid, two did not finish construing all of the 22 elements named and another three subjects omitted a large number of cells overall, suggests that even given the constructs to be used in making their judgements these people were less able to perform this cognitive exercise than the majority of their group. (See Table 8.) Several indices of cognitive complexity have been employed but none of them have proved entirely satisfactory nor able to incorporate both the differentiation and integration aspects of the complexity-simplicity concept (Bonarius, 1965; Vannoy, 1965). Bieri (1955) and Smith and Leach (1972) have used measures based on a modified form of the Repertory Grid but utilizing a Likert-type rating scale form of element allotment rather than the polarized form employed here. A second grid administered to the present subjects and incorporating similar modifications in format could be used to test the hypothesis of difference in cognitive complexity between grid completers and non-completers.

None of the previous research on the Repertory Grid has suggested that intelligence plays a large part in determining whether or not individuals are able to handle the Repertory Grid and studies have indicated that there is no direct relationship between cognitive complexity itself and intelligence in its more limited sense. For 13 of the 18 subjects who were unable to complete the grid and 99 of the 125 subjects who were, it was possible to obtain average scores obtained on their last set of school examinations just prior to administration of the grids. (See Table 9.) To the extent that these averages may be taken as a measure of their current intellectual ability, it is possible to test the relationship between general intelligence and performance on the grid for these 112 subjects. The examination averages permitted the students to

TABLE 8

Extent to which subjects were able to complete the grids

	Complete (No. of Ss)	Incomplete (No. of Ss)
All 484 cells complete	118	
No more than 2 cells incomplete	7	
Omitted (1-4) roles		9
Omitted (9-13) roles		4
Failed to finish construing		2
Omitted many cells overall		3
	125	18
TOTALS	143	

TABLE 9

Average examination scores for grid completers and non-completers

Subjects	Schools in the Main Study				
	2	3	4	5	
				80.0	
				78.7	
				76.8	
				75.4	
				72.4	
	68.6			70.5	
	64.8			70.4	
	62.2		85.2	69.8	
	60.7		83.8	*68.2	
	60.5		81.4	67.3	
	59.8	70.4	*79.0	66.6	
	59.6	69.4	71.8	63.8	
	59.0	56.4	70.0	62.2	
	58.8	56.1	66.2	61.6	
	58.8	51.4	63.6	60.2	
	*58.1	47.4	61.0	59.6	
	58.0	47.25	57.25	58.4	
	*57.7	47.2	*53.8	58.2	
	57.3	46.25	52.75	58.0	
	--55.5-------	*41.5------	50.2------	55.8----------	median score
	54.2	41.2	49.2	*55.25	
	53.3	39.6	47.8	55.0	
	53.2	38.6	47.6	55.0	
	52.5	*38.1	46.0	53.0	
	49.5	34.75	44.5	52.6	
	49.0	34.4	40.75	52.0	
	47.8	*33.8	*40.0	50.2	
	46.8	*33.0	39.3	49.5	
	45.2	*27.5	35.6	49.0	
	42.0		34.8	46.2	
	*38.0		30.8	45.8	
	37.2		27.5	45.2	
	34.5			44.6	
	31.4			44.6	
				44.2	
				43.4	
				43.2	
				43.0	
				42.8	
No. of Subjects	29	19	25	39	
(a) Completers	26	14	22	37	
(b) Non-completers	3	5	3	2	
Totals			112		
(a) Completers			99		
(b) Non-completers			13		

* Average examination scores of grid non-completers

be rank-ordered within their own school classes and the number of grid completers and non-completers was computed for both the upper half and the lower half of the classes. These results were combined over the whole sample and a Chi-square test was applied to the four-way contingency table which had chance expectancies in the 4 cells of 49.5, 49.5, 6.5 and 6.5. (See Table 10.) This chi-square was not significant indicating again that those subjects who were not able to complete the grid were not necessarily intellectually inferior to those who did.

TABLE 10

Relationship between examination scores and ability to complete the grid

	Above class median	Below class median	
Grid Completers	50.5	48.5	99
Grid Non-completers	5.5	7.5	13
	56	56	112

$\chi^2 = 0.348$ (not significant)

CHAPTER 6. DISCUSSION

6.1 General

It must be recognized that this is an exploratory study both in terms of the methodology used and the hypotheses examined and should therefore be interpreted with caution. Furthermore, Fiske (1971) points out that the use of clustering techniques of analysis are most useful in the context of discovery and that fluctuations in structure which occur from sample to sample are additional arguments for exercising restraint in making generalizations from the results obtained. However, the emergence of the above trends indicate that there is scope here for deeper study.

This research has been concerned with identifying those persons who may fulfill a vocational counselling role for secondary school students (15 - 16 year old, fifth formers) and determining the impressions which the students have of them. The results obtained suggest that there are at least two separate parts to the vocational guidance role. One group of counsellors consists of adults who have gained the admiration and respect of the students because of certain competences, skills, knowledge or prestige which they possess. Consequently, they are recognized as important sources of information regarding the jobs and careers the young people are considering. They may be members of the community or of a wider circle of acquaintances outside of the home or school situation as well as within.

The other part of the vocational counselling role calls for another type of person, often a parent but also other adults who by their understanding, warmth and concern are valued for their ability to help him make good decisions. Their advice is sought if they are prepared to listen with understanding and respect. Commonsense and humour are probably important attributes of this group.

Problems such as relationships with their friends or family are not so readily discussed with either of these groups but are generally reserved for peer group discussions.

6.2 Refinements and Extensions

During the course of this study a number of modifications to the Grid technique used were determined. Such refinements might well be incorporated into future trials with Repertory Grids used for similar purposes.

1. The method employed here to select those construct dimensions for use in the final Grid form was basically a subjective and global evaluation by the experimenter and three other judges. A more satisfactory approach to the task of eliminating dependent construct dimensions would be to devise an objective set of evaluative criteria, for example,
   (1) The optimal number of constructs required should be decided.
   (2) The content domain should be heterogeneous.
   (3) Items should be reliable (determined empirically).
   (4) Constructs should be a balance of specificity and generality.
   (5) Constructs should arise directly from subjects' own descriptions.
   (6) Constructs should be able to discriminate between various role groupings (determined empirically).
   (7) Constructs should include both those occurring most frequently and those judged most important in the perceptions of Role Figures.

   Several independent judges would then be required to make objective judgements on the basis of these criteria and a statistical measure of degree of agreement would be computed to enable a final selection of constructs to be made.

2. One of the methodological difficulties encountered in the administratic of the grid is the elicitation of construct dimensions. A series of cards each with a separate Role Title to which can be added personal names has been used in the past (Kelly, 1955, p220). Subsequently, the presentation of triadic sets of these cards are used to elicit the construct dimensions. Ball and Cocker (1976) preface this procedure by presenting three small objects to the subjects, a wooden block, a small ball and a small round tin lid. This enables the experimenter to clarify to his subjects the meaning of the next question - "In what way are two of these alike and yet

different from the third". When administering the Grid to a large group of subjects at a time the problem arises of providing explanations and instructions which are meaningful to each member of the group. Adoption of a form of the above procedure may facilitate group administration particularly with younger and less able children as subjects.

3. If grids are used which have fewer construct dimensions then some form of rating or ranking scale could be considered. Such decisions should be based upon a knowledge of the maturity and capabilities of the subjects concerned, and the way in which the data is to be used.

4. It was found in analyzing the multidimensional scaling data that the cluster of roles containing various types of counselling figures showed signs of differentiating into two separate figure composites. In addition to this, some of the stress values for the multidimensional scaling were not as low as one would have liked indicating that the large number of points (44) placed considerable strain on the analysis for presentation of the proximity data in a two-dimensional space. However, when a three-dimensional analysis was attempted, only marginally better stress values were obtained in addition to which the results became much more difficult to interpret since a whole series of configurations would have to be considered at once. An alternative procedure would be to take a sub-sample of the elements (those from the "counselling" figure composite) and use a separate multi-dimensional scaling analysis in order to spread the points plotted and discover any further differentiations in clustering of role figures.

5. Analysis of the sex and school-type subgroups in this study was implemented by simply partitioning the total sample of fifth form school children, the result being that the subgroups studied were not independent of each other. Thus it is likely that the results may be somewhat confounded. This problem could be overcome by designing an experiment which makes use of entirely independent samples or employing a factorial design to detect main effects and interaction.

6. Eighteen out of the total of 143 subjects here were not able to complete their grids. A follow-up question enabled the experimenter to gauge the degree to which inability to complete the grid correlated with academic achievement. The measure of achievement used, however, provided only a very rough estimate to be made on a relatively small sample. Although the Repertory Grid has been extensively used with psychiatric patients (Bannister 1960, 1962) as well as young children and normal members of the population, in most cases these studies have involved individual administration and records of those subjects who experienced extreme difficulty or who were unable to complete the grid have not been reported. Completing the grid without the benefit of the personal attention of the experimenter in a large group situation possibly places greater emphasis on the capabilities of individual subjects. Further explorations of the relationship between intelligence and the ability to produce fully completed grid protocols are warranted.

7. Working on the assumption that cognitive-complexity is a function of both the number of separate constructs available to the individual and also the degree of integration or patterning of those construct dimensions it could be hypothesized that cognitive simplicity in the realm of interpersonal perception could be related to the subject's difficulty in coping with a Repertory Grid consisting of Role Titles as elements. The Smith and Leach (1972) hierarchical measure of cognitive complexity offers a promising possibility for the purpose of investigating a possible relationship.

Further extensions necessary in a full-scale research project would include extensive reliability and validity studies following on from the primary experiment. Reliability in the sense of permanence is not a concept on which Kelly and other proponents of the Grid technique place a great deal of importance. Since change rather than stability is a central tenet of Personal Construct Theory and the Repertory Grid is to be considered a technique adaptable to each individual situation rather than a formally structured test any measure of consistency should be regarded as relatively short-term and specific to the particular grid and

the particular situation in question. In the present case, there is a noticeable similarity between the results obtained from similar subjects in the preliminary and in the main study despite the fact that completely different forms of analysis were used in each case - on the one hand, a manual factor analytic approach and on the other, a multidimensional scaling distance measure. Further, the configurations produced by each of the groups suggest a high degree of consistency. A more systematic approach to the reliability of the present Grid could be carried out along the following lines:-

(1) Test-Retest Reliability

Administer the final grid form to a sample of subjects consisting of members of the main study after a time interval and correlate the degree of matching of scores (+'s and 0's) between the two administrations. It is noted that such matrix pattern consistency has generally been applied to the basic raw data scores since measures of consistency became much more difficult to obtain and compare once the original responses have been subjected to some form of cluster analysis. For example, in the present study, the distance measures between *self* and the other figures were rank-ordered and the Spearman rho coefficient calculated between pairs of rank orderings.

(2) Consistency of elicited constructs

Using a different set of elements (Role Titles) but ones which are equated in some way, elicit another set of personal names and constructs from a number of individuals from the first sample and compare them with the original set of constructs obtained in the first study.

(3) With the same set of Role Titles as those used originally elicit constructs and again compare the two sets obtained as well as the matching scores for responses to the grid. Hunt (1951) found that the same or an equivalent set of role titles elicited constructs which were in agreement with each other (69% agreement with a standard deviation of 6%) however, Mitsos (1958) found that when the Role Titles were a homogeneous set of "personal friends" rather than persons filling more specific roles the agreement between the two sets of elicited constructs was not significant. He concludes that there is a direct relationship between the "representativeness" of the Role Titles and the consistency of the construct labels and that the subjects are responding to the types of people described on the role-title list in addition to the particular people named. In terms of Personal Construct theory, people show a

higher degree of consistency in their use of superordinate constructs than in their use of more subordinate constructs. However, the results of a study by Fjeld and Landfield (1961) suggest a high degree of reliability can be expected in both cases and that people employ the same axes of meaning even when the element objects change.

(4) Element Consistency

Lists of personal names produced by subjects from one administration to the next could be compared. Pedersen (1958) found a 77% agreement between figures produced a week apart in response to the same list of Role Titles.

Because of the high degree of subjectivity inherent in the interpretation of the type of data derived here it is especially important to validate the findings against other criteria, for example, measurable aspects of the subjects' vocational choice behaviour. Follow-up studies could be conducted to discover where they actually obtained their most useful vocational advice, their ultimate occupational choice and subsequent job satisfaction. Teachers and other guidance personnel could be asked for their opinions on how secondary school students perceive them as sources of vocational counselling.

Cross-validation procedures need to be instituted and the present study should be extended to other groups of subjects. The great value of having subjects participate in the construction of scales (for example, scales for the evaluation of counsellors) in this way is the possiblities it provides for further studies. It would be possible to draw a sample of people from the same population as the original sample and administer an identical grid or a newly designed one for the purpose of detecting changes in perception. Using the same grid a new sample could be drawn from a different population so that the effectiveness of the technique may be extended to a new group of people thus enabling wider generalizations to be made. The present results should be compared with results from other measures of perception using any of the tests, interview techniques or attitude scales commonly employed in the collection of such data.

The reasons which lie behind these perceptions cannot be ascertained from a single study. To explore the factors of causality further, one approach would be to relate the grid data to other data collected with

specific theories in mind (for example, motivational or developmental theories). On the other hand, Kelly would prefer to examine changes in grid performance brought about by successive stages in the subjects' experience, since he believes that the need to anticipate new events provides the person with sufficient motivation and directionality, in itself. Such an approach suggests that the work should be pursued in a developmental and longitudinal context. Following the example set by Thomas and Wetherall (1974), one should compare younger and older school leavers. While separate groups of boys and girls and types of schools were examined here other subgroupings could be selected. One could investigate the effects of differing home environments, child-rearing practices, parent-child relationships, intelligence and school climate on students' perceptions. The relationship between perceptions and ability level was discussed here briefly but one could seek other correlates using various personality attributes, self-concept, social maturity or school adjustment as independent variables.

6.3 Evaluation of the Grid Technique

Throughout this research the problems encountered during the application of the grid have been reported as well as the advantages which the experimenter considers are associated with the technique. These strengths and weaknesses are now summarized to provide an evaluation of the Grid Technique as a means of collecting and analyzing interpersonal data and in particular the perceptions of secondary school students concerning people within their social environment.

Bannister and Mair (1968) have given an account of the advantages of this technique over more conventional forms of tests and scales, one of the most important being its emphasis on the uniqueness of the individual and the highly personal nature of the perceptions which it is able to elicit. This aspect has been used to advantage in the first stage of the present research when the aim was to construct a test designed specifically for a particular subgroup of the population. The input of the subjects themselves provided the basis on which the subsequent stages of the study was built, and it would be desirable as well as possible to continue to benefit from such input by eliciting further constructs during subsequent stages of an on-going research project.

A second strength which often receives attention is the fruitfulness of the technique and the abundance of data produced. This has been amply borne out in the present study where it is evident that a great deal of information is still available from the grids. This includes a wide variety of information covering a range of personality characteristics from aspects of self concept, to attitudes concerning all manner of interpersonal relationships. Moreover, the data can provide clues to the mechanisms which lie behind such processes as socialization, family relationships, group and individual identification patterns. This versatility is matched by the variety of statistical treatments which can be utilized for the analysis of the data.

Thirdly, the unusual depth of the data obtained is frequently mentioned. The number of unexpected insights gained by a deeper study of the configurations of persons and constructs testifies to the truth of these remarks. The indirectness and subtlety of the approach which permits this sort of versatility and depth is conducted within an overall framework which allows for complete objectivity of scoring and analysis up until the point at which the experimenter begins to draw inferences from the data.

There are a number of practical problems associated with the administration of a grid particularly in a group situation. It is a time-consuming, demanding procedure and the limitations imposed by these characteristics may make it an impractical solution in certain testing situations especially where subjects cannot readily be persuaded to offer their cooperation and complete attention to the task. Since it tends to be an individualized approach even when the aim is to extract normative data, much time must be spent in the preparation and pretesting of the final grid. In the same way, some experience is necessary on the part of the tester in order to develop facility in administration, so that the testing period can proceed smoothly and efficiently without unduly extending the time involved.

The other major drawback is the fact that the data collected portrays a picture of "how things are" - the perceptions, attitudes and opinions of the subjects as they exist in the present and only

provides clues concerning how these attitudes arose in the first place. It is therefore necessary to relate it to other data in order to begin to answer questions of causality. In Kelly's view, an evaluation of the Grid technique can best be conducted in terms of its "usefulness" when it is applied to the situation at hand.

The information derived from these types of studies could have many applications in the Vocational Guidance field. Knowledge of the preferences of school-leavers who are seeking guidance would permit the necessary vocational information to be placed in the hands of the appropriate people. In many cases, it may be that parents, teachers and others can best assist by helping to direct the young person's search and putting him in contact with suitable people in the community. The identification of such people would be facilitated by the descriptions produced by the Grid method.

The development of profiles of effective counsellors (in terms of characteristics and/or behaviour) as they are perceived by different groups of students could assist in the setting of training objectives for vocational guidance personnel. The scales thus produced would then be subjected to further empirical validation using other groups of counsellors already functioning in a practical setting, until a version is produced which successfully discriminates between successful and unsuccessful counsellors. However, because of the changing role of vocational counsellors over time as well as the changes which occur within individual counsellors as they develop in such roles, the criteria for evaluation and therefore the scales used in measurement, can never be regarded as firmly fixed once and for all. The use of successive Repertory Grids provides a method of capturing the dynamic character of the criterion dimensions. Research has shown that the development of such criterion dimensions leads to the formulation of strategies for prediction, selection, training and performance evaluation. Smith and Siegel (1967), Smith and Ashton (1975) and Tornow and Pinto (1976) have all used a similar approach for the development of a system for describing, classifying and evaluating executive and managerial positions. The factors or clusters derived from such techniques could be used as a basis for developing unidimensional scales for the assessment of counselling personnel. The quality of the Vocational Counselling service offered to the community depends to a large extent on the availability of criteria which are as reliable, free of contamination, relevant and

comprehensive as possible, for evaluating the performance of those people who will provide the service, and the Grid method could enable such a taxonomy to be derived.

6.4 Conclusions

The discussion throughout attempts to answer the general questions posed at the beginning of this study. Some qualitative support of the stated hypotheses has been provided by the results obtained. Arguments, for and against, based on strictly quantitative data and supported by statements concerning statistical signficance must be reserved for future studies and experimental designs of a different sort. However, as more and more sets of grid data emerged, the pattern of relationships and the complex network of preferences of the subjects became clearer. Basic similarities and differences between different groups of counselling and other figures emerged with some clarity but as the grid data is studied more intensely, it is the more subtle variations that begin to capture the attention. Slight variations in the composition of the clusters produced by the perceptions of different subgroups of the total sample (boys, girls, State Schools, Private Schools) raise fascinating questions which warrant more intensive study. For example, one might ask what are the implications of the finding that boys perceive their parents differently to girls in the counselling situation and what are the effects of the age-authority dimension on the students' behaviour. In fact, there are many such questions which could profitably be followed up at a deeper level. Many of the "whys", as Smith and Ashton (1975) point out, are left unanswered by this method of investigation.

The value of these subtleties which are first revealed by the Grid Technique are particularly appreciated in the clinical setting where much of the vocational guidance work is accomplished. For those situations that call for a short test which can be rapidly processed to give a few simple numerical scores, the Repertory Grid is obviously unsuitable but as an exploratory tool in ascertaining either individual or group perceptions (and changes in perception), it provides an abundance of information which can continue to reveal more and more insights as the data is viewed from fresh perspectives.

APPENDIX A

Instructions to subjects and first Role Construct Repertory Grid

This is a type of questionnaire asking you to describe how you think about people that you know quite well.

Hand out Page 1 - "Your List of Names"

1. I will read to you a list of Role Titles of different types of people and I would like you to write down, for your own use only, the first names or nick-names or any other identification of the particular people who occupy that role for you.

   Example: No.1 "Your own name"

   Each of you will produce a different set of names and after the session is over you may keep or destroy your list. No-one, other than yourself will ever need to see it.

   I want you to give your own personal preference and opinion in each case.

2. Do not write any one person's name more than once. Choose someone else, instead, who fits that role.

   Read the Role Title List, one by one, allowing time for S's to write the appropriate names.

   Hand out Page 2 - "Grid Form"

3. Now, place your list of names, sideways, underneath the first row of cells in the Grid.

   Illustrate exact method to S's

   Make sure that the numbers match; 1 with 1, 2 with 2, 3 with 3,etc.

4. Notice that three of the cells have circles drawn in them - numbers 5, 6 and 8 on your list of names.

5. Think carefully about these three people named on your list and decide in what one important way two of them are alike and by the same token (measure) different from the third - Try to think of the most important way.

   Try to avoid obvious reasons like,

   "two are females and the third is a male",

   and concentrate on the sort of people they are, and how they come across to you as people, e.g."Both are easy to talk to". *Allow time*

6. Place a cross in the <u>two</u> circles opposite the two people who are <u>alike</u> and leave the third circle blank (this is the person who contrasts with the other two)

Allow S's time to do this

7. Now, on the right of that row of cells, write a short phrase explaining <u>how</u> these two similar people are alike and different from the third.

Allow S's time to do this for the first row of cells

8. Finally, starting from the beginning of that first row of cells, i.e. yourself (with your own name), think about each person in turn, on your list, and put a cross in each cell where the person fits the description you gave. Leave the cell blank if he or she belongs to the "contrast" pole (is an "opposite")

Allow time for S's to do this

9. Now, move your list of names down one row of cells so that it is immediately below the second row of cells, *Pause*, find the three circled this time, *Pause*, and follow exactly the same procedure again, thinking of <u>another way</u> in which two of <u>these</u> people are alike and different from the third. *Pause*. Place the two crosses. *Pause*. On the right, describe the similarity *Pause* and again assess every other person on your list, placing a cross for people who are similar to the first two and leaving a blank for the opposite person. *Pause*.

10. Complete the rest of the grid in exactly the same way.

Page 1. YOUR LIST OF NAMES

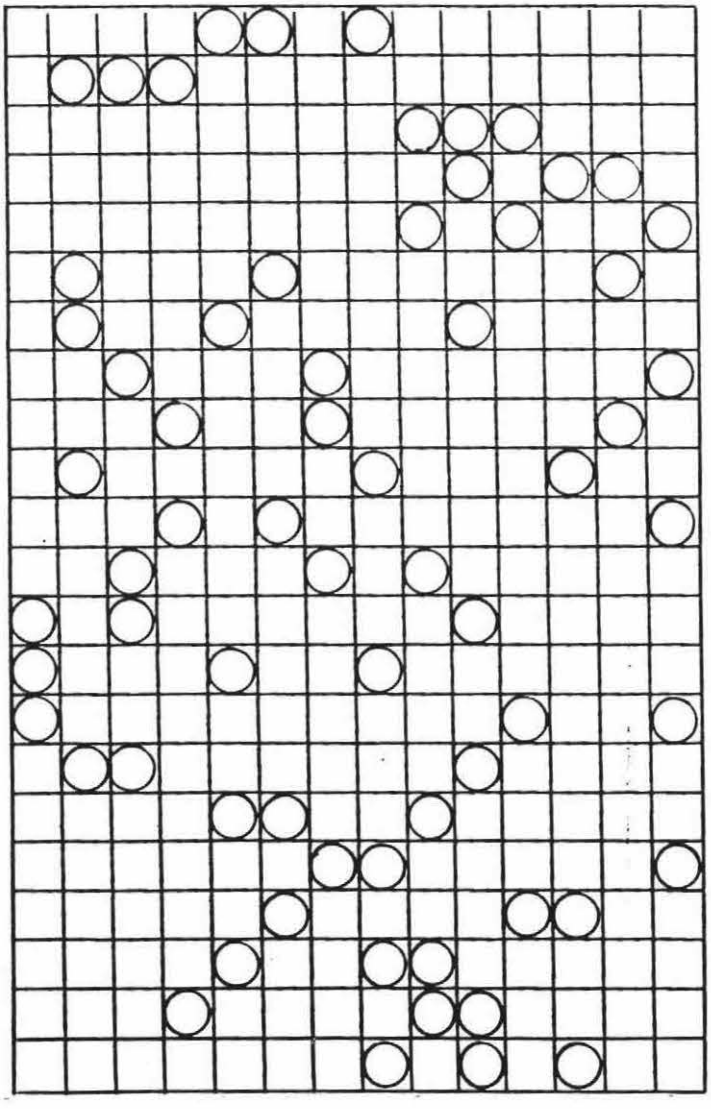
1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____
9 _____
10 _____
11 _____
12 _____
13 _____
14 _____

Page 2. GRID FORM

NAME: _____

AGE: _____ SEX: _____ FORM: _____

1 2 3 4 5 6 7 8 9 10 11 12 13 14



IMPORTANT SIMILARITY AND DIFFERENCE

APPENDIX B

Coordinates of figure and construct points produced by the multidimensional scaling analysis

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a. The final configurations of 44 points in the two dimensional space, rotated to principal components

		PILOT STUDY GROUPS							
		1st Half Girls		2nd Half Girls		1st Half Boys		2nd Half Boys	
		1	2	1	2	1	2	1	2
Elements	A	-0.90	-1.21	1.06	0.20	-0.49	1.47	-0.65	0.78
	B	-0.47	0.41	0.14	-0.84	-0.77	-0.40	-0.91	-0.27
	C	-0.47	0.41	0.75	-0.48	-0.82	-0.27	-0.85	-0.43
	D	-0.50	0.38	0.74	-0.36	-0.85	0.04	0.03	1.08
	E	-0.62	0.20	-0.33	1.33	-0.84	-0.03	-0.65	0.72
	F	-0.90	-1.19	0.92	0.83	-0.90	0.23	-0.62	0.74
	G	-0.35	0.26	-0.48	1.06	0.42	0.86	0.00	1.02
	H	-0.51	0.34	0.82	-0.33	-0.85	-0.03	-0.85	0.32
	I	0.28	-0.52	-0.35	0.59	0.51	-0.51	0.68	-0.31
	J	-0.51	0.35	0.76	-0.44	-0.84	-0.04	-0.81	-0.15
	K	-0.53	0.31	0.97	0.19	-0.86	0.01	-0.42	0.85
	L	-0.77	-0.03	0.87	-0.16	-0.85	-0.05	-0.90	-0.02
	M	-0.48	0.38	0.20	-0.79	-0.83	-0.04	-0.85	-0.10
	N	-0.36	0.51	-0.20	-0.81	-0.58	-0.56	-0.69	-0.55
	O	-0.46	0.40	0.33	-0.59	-0.83	-0.13	-0.75	-0.44
	P	-0.77	-0.05	0.68	1.16	-0.84	-0.04	-0.71	0.59
	Q	-0.40	0.45	-0.05	-0.83	-0.79	-0.19	-0.78	-0.44
	R	-0.48	0.38	0.78	-0.48	-0.85	-0.05	-0.87	-0.28
	S	-0.43	0.42	-0.03	-0.69	-0.50	-0.53	-0.41	-0.97
	T	-0.29	0.56	-0.23	-0.64	0.64	-0.63	-0.13	-1.18
	U	-0.47	0.40	0.84	-0.35	-0.87	-0.04	-0.82	0.43
	V	-0.39	0.40	-0.23	-0.63	0.59	-0.66	-0.07	-1.21
Constructs	1	-0.33	1.37	0.34	-1.62	-0.68	-1.88	-1.04	-1.24
	2	1.28	-0.92	-0.99	0.54	1.34	0.40	1.33	0.29
	3	1.39	0.43	-1.34	0.12	1.31	-0.46	1.42	-0.14
	4	0.98	-0.86	-0.26	0.38	1.18	0.21	0.93	0.64
	5	0.95	-0.59	-1.28	-0.05	1.30	-0.39	1.00	-0.97
	6	0.74	0.55	-0.89	-0.26	0.06	0.03	0.68	-0.25
	7	0.83	0.53	-0.64	-0.28	0.97	-0.13	0.67	-0.22
	8	-0.92	-0.35	1.09	0.24	-0.59	0.95	-0.04	0.11
	9	1.20	0.21	-1.23	0.13	1.16	0.45	1.45	0.40
	10	1.23	0.46	-1.04	0.67	0.92	0.26	1.05	-0.15
	11	0.87	-0.83	-0.08	1.03	0.21	0.49	1.20	0.70
	12	0.67	-0.75	0.01	0.26	0.04	0.04	0.36	-0.13
	13	-1.22	-1.17	1.00	0.76	0.04	0.96	-0.24	0.73
	14	0.79	0.68	-1.01	-0.55	1.20	0.02	1.10	-0.12
	15	1.04	0.28	-1.20	-0.19	1.49	-0.00	0.47	-0.12
	16	0.57	-0.68	-0.34	0.09	0.07	0.05	0.47	-0.09
	17	-1.18	-0.78	0.93	0.83	0.11	0.52	-0.13	0.20
	18	1.19	0.31	-1.10	0.21	1.11	0.16	0.98	-0.11
	19	0.40	-0.70	0.20	0.42	0.12	0.55	-0.23	0.87
	20	-1.07	-0.29	0.97	0.28	-1.01	0.58	-0.98	0.24
	21	0.46	0.31	-0.11	0.38	0.90	-0.44	0.57	-0.18
	22	0.97	-0.84	-0.97	-0.37	0.73	-0.77	1.05	-0.61

b. The final configuration of 44 points in the two dimensional space, rotated to principal components.

		MAIN STUDY GROUPS									
		Whole		Girls		Boys		State Schools		Private Schools	
		1	2	1	2	1	2	1	2	1	2
Elements	A	-0.86	-0.54	0.88	-1.10	0.80	0.67	0.79	-0.75	-0.89	-0.43
	B	-0.86	0.30	0.78	0.34	0.86	-0.14	0.85	0.51	-0.91	0.19
	C	-0.75	0.50	0.76	0.37	0.79	-0.36	0.83	0.48	-0.70	0.60
	D	-0.76	-0.55	0.72	-0.38	0.70	0.65	0.75	-0.39	-0.79	-0.50
	E	-0.81	-0.49	0.78	-0.11	0.83	0.49	0.82	-0.47	-0.81	-0.51
	F	-0.80	-0.57	0.75	-0.36	0.84	0.52	0.82	-0.51	-0.81	-0.55
	G	0.18	-0.98	-0.16	-0.77	-0.16	0.64	-0.29	-0.63	0.08	-0.91
	H	-0.80	0.36	0.73	0.38	0.85	-0.13	0.91	0.36	-0.77	0.49
	I	0.40	-0.13	-0.50	-0.14	-0.23	-0.01	-0.57	-0.08	0.53	-0.25
	J	-0.83	0.31	0.75	0.35	0.81	-0.17	0.93	0.20	-0.77	0.48
	K	-0.84	-0.41	0.78	-0.25	0.86	0.22	0.88	-0.42	-0.85	-0.45
	L	-0.91	-0.01	0.81	0.06	0.87	-0.04	0.83	0.09	-0.94	0.08
	M	-0.71	0.41	0.65	0.44	0.79	-0.15	0.81	0.40	-0.64	0.24
	N	0.25	0.87	-0.11	0.83	-0.27	-0.92	-0.15	0.85	0.33	0.80
	O	-0.67	0.52	0.62	0.48	0.77	-0.24	0.72	0.37	-0.69	0.57
	P	-0.86	-0.41	0.82	-0.00	0.86	0.31	0.89	-0.34	-0.88	-0.36
	Q	-0.61	0.58	0.66	0.45	0.68	-0.34	0.66	0.57	-0.66	0.59
	R	-0.85	0.20	0.78	0.25	0.84	-0.09	0.80	0.21	-0.90	0.20
	S	0.50	0.73	-0.70	0.43	-0.03	-0.55	-0.57	0.54	0.48	0.66
	T	0.56	0.77	-0.72	0.51	-0.58	-0.83	-0.55	0.60	0.57	0.66
	U	-0.89	0.05	0.81	0.08	0.86	-0.01	0.94	-0.20	-0.92	0.12
	V	0.50	0.76	-0.70	0.47	-0.32	-0.08	-0.55	0.46	0.47	0.71
Constructs	1	-0.52	1.72	0.28	1.81	0.79	-1.71	0.34	1.64	-0.43	1.71
	2	1.33	-0.77	-1.38	-0.69	-1.06	0.70	-1.49	-0.55	1.18	-0.85
	3	1.51	-0.04	-1.48	-0.34	-1.42	0.00	-1.60	0.00	1.41	-0.11
	4	0.71	-0.74	-1.23	-0.55	-0.77	1.13	-0.56	-0.97	0.73	-0.75
	5	1.29	0.42	-1.28	0.50	-1.31	-0.32	-1.28	0.41	1.32	0.41
	6	0.39	0.90	-0.14	0.81	-0.54	-1.13	-0.29	0.83	0.58	0.91
	7	0.77	0.22	-0.68	0.13	-0.91	-0.36	-0.69	0.22	0.80	0.21
	8	-0.92	-0.27	1.34	-0.43	0.50	0.23	0.89	-0.39	-0.81	-0.20
	9	1.22	-0.61	-1.22	-0.42	-1.17	0.58	-1.40	-0.39	1.12	-0.71
	10	1.23	-0.26	-1.13	-0.41	-1.40	0.38	-1.29	-0.28	1.27	-0.22
	11	0.44	-0.54	-0.21	-0.57	-0.24	0.26	-0.51	-0.68	0.42	-0.65
	12	0.04	-0.09	-0.02	0.01	-0.27	0.31	0.13	0.01	-0.04	-0.03
	13	-0.31	-0.81	0.46	-0.73	0.29	0.24	0.28	-0.61	-0.41	-0.99
	14	0.87	0.21	-1.02	0.06	-1.08	-0.28	-0.89	0.15	0.94	0.27
	15	1.04	0.05	-0.98	0.07	-1.09	-0.05	-1.00	0.22	0.98	0.24
	16	0.06	-0.07	-0.02	0.01	-0.12	0.02	0.08	0.05	0.27	-0.13
	17	-0.38	-0.79	0.37	-0.83	0.30	0.28	0.38	-0.63	-0.43	-0.74
	18	1.12	-0.24	-0.98	-0.32	-1.22	0.16	-1.19	-0.14	1.04	-0.43
	19	-0.32	-0.80	0.48	-0.90	0.33	0.68	0.27	-0.82	-0.38	-0.75
	20	-1.08	-0.15	1.35	-0.27	1.39	0.24	1.22	-0.11	-1.04	-0.11
	21	0.92	0.24	-0.76	0.18	-1.13	-0.07	-0.94	0.13	0.97	0.17
	22	1.02	0.13	-0.98	0.53	-1.26	-0.01	-1.03	0.07	0.98	0.32

APPENDIX C

Instructions to subjects and final form of the
Role Construct Repertory Grid

INSTRUCTIONS TO SUBJECTS

I am going to ask you to answer a type of questionnaire which I will explain to you in detail.
If you have any questions about the procedure or what you are supposed to do please ask me at any time to clarify the points that puzzle you.
If you have any other questions about the aims and purposes of the project, I will be happy to answer these too at the end of this session.

DISTRIBUTE ROLE TITLE LIST

On this first sheet is a list of "Role Titles" of the kinds of people you know in everyday life. On the line beside each title I want you to write a first name or a nick-name or some other identification of a particular person you know, or have known in the past, who fits that title. For example, number 1. is "Your own name".
* IMPORTANT: Do not name any person more than once. Think of somebody else instead.
The list of 22 names you produce are for your own use only and they will not be seen by anyone else. You may keep the list and destroy it at the end of the session.
Work as quickly as you can and do not spend too long on any one name.
Try to finish in about 10 mins.
Any questions?
Go ahead.

ALLOW Ss TIME TO COMPLETE THEIR LIST

Check that you have 22 different names.
Make sure that you can identify between individuals on your list.
Now, detach your list of names from the Role Titles by tearing off along the dotted line. Use a ruler.

DISTRIBUTE GRID SHEETS AND COLLECT ROLE TITLE LISTS

Please fill in the details at the top of this second sheet - Name, School, etc. (circle M or F)

ALLOW Ss TIME TO DO THIS

On the right of this sheet are 22 pairs of words or phrases. They are ways of describing the people on your list.
The Description and Contrasting Description in each case represent opposite poles of a single description. For example, "Friendly" and "Unfriendly".
The Grid form at the left is divided into 22 rows and 22 columns.

ILLUSTRATE

Turn your own list of 22 names sideways and place it along the top of the Grid so that the numbers 1. through 22. correspond.

ILLUSTRATE (Using prepared diagram)

Step 1: Indicate whether each person named on your list is male or female by circling the letter which applies.

ILLUSTRATE M F. ALLOW Ss TIME TO DO THIS

Step 2: Now, move your list of names down till it is immediately above the first row of empty cells in the Grid, keeping the numbers correct.

ILLUSTRATE (Using prepared diagram)

Read the pair of descriptions revealed at the right of this row. ("My own age group" - "A lot older than me, adults")
Think of each person on your list in turn (starting with person number 1.) and place an X in the cell if that person seems to you to fit best the first Description. Insert a O in the cell if that person seems to you to fit best the Contrasting Description. N.B. You must decide between the Description and the Contrasting Description in each case and use only an X or a circle in each cell.

ALLOW Ss TIME TO COMPLETE ROW 1.

When you have decided for all 22 persons on your list, move your list of names down to the next row of empty cells (keeping numbers correct) and read the second pair of phrases at the right ("Honest" - "Dishonest"). Again, starting with person number 1. insert an X or a O in each cell depending on whether the Description or the Contrasting Description best describes him (or her).

Continue in this way for each row of the Grid for the whole 22 pairs of descriptions.

Are there any questions?

Go ahead, working as quickly as you can.

Ss COMPLETE GRID

---

* Finally check each row carefully to make sure that you have not omitted any of the 22 rows.

-tear off-

1 Your own name

2 Your mother's name or the name of the person who has played the part of a mother in your life

3 Your father's name or the name of the person who played the part of a father in your life

4 A brother who is nearest you in age or someone who has seemed like a brother to you

5 A sister who is nearest you in age or someone who has seemed like a sister to you

6 A very good friend of your own age and sex - someone who you would describe as your "best-friend"

7 A person who was once a close friend but later proved to be a disappointment to you

8 The person you would prefer to go to for help if you had problems regarding school work, choosing school subjects, homework, etc.

9 Someone who seemed to take a dislike to you for no apparent reason

10 If you could choose anyone you wished, whose advice would you seek about choosing a career or finding a job when you leave school?

11 A person you don't know very well but would like to get to know better

12 Someone you would prefer to go to for help about difficulties at home, getting on with parents, brothers, sisters, etc.

13 The most successful person you know

14 A Headmaster (or Mistress) or Senior Teacher, in a school which you have attended

15 A person you think could give you the most useful information about the particular jobs and careers that interest you

16 The person you would choose to discuss problems about sex, your own relationships with the opposite sex & making friends of your own age

17 A minister or priest or someone in the community who is regarded as a person of high morals

18 An adult you admire and whose opinions you respect

19 A person in whose presence you feel very uncomfortable and ill-at-ease

20 A disliked teacher

21 Someone you'd like to ask for help and advice about your favourite hobbies, projects and interests

22 A counselling person who has opinions you strongly disagree with

Role Title list - Sheet 1

NAME: .....

SCHOOL : .....

FORM : .....

AGE: ..... years ..... months

SEX: M / F

MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	MP	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
																						1
																						2
																						3
																						4
																						5
																						6
																						7
																						8
																						9
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																						20
																						21
																						22

Grid Form - Sheet 2a

DESCRIPTION CONTRASTING DESCRIPTION

(sheet 2b is attached here)

(continued)

DESCRIPTION	CONTRASTING DESCRIPTION
My own age group	A lot older than me, adults
Honest	Dishonest
Friendly	Unfriendly
Calm, quietly spoken	Noisy, excitable, talk a lot
Good sense of humour, enjoy a good laugh	Glum, humourless
Have similar interests to me	Very different interests
Easy to talk to, can discuss anything with them	Could not talk to them about important personal problems
Bossy, strict, give me a hard time	Allow me to make my own decisions
Know what they are talking about, have common sense	Stupid, don't know much
Care about other people's feelings	Inconsiderate
Want me to behave myself	Not too concerned about how I behave
Shy and quiet	Talkative and outgoing
Don't understand people of our age	Understand how we feel
Easier to get to know	Harder to get to know
Important to me	Don't mean very much to me
Give me help with my school work	Do not help with school work
Have a poor opinion of teenagers	Think well of teenagers
Give advice, try to help when necessary	Don't take much interest in other people
Set in their ways, old-fashioned	Keep up with the times
Do not respect me	Respect my opinion as a person
Take my side in an argument	Never stick up for me
Easy-going, take life as it comes	Get into bad moods quickly

Supplied bipolar constructs - sheet 2b

APPENDIX D

Distance coefficient matrices for figures: input data for cluster analysis

a. Whole group similarity data matrix

Figures 1-22

Figures 1-22

0	27	31	22	19	10	41	27	53	30	21	23	32	49	35	16	38	28	46	62	21	50
27	0	9	26	24	26	42	11	51	12	25	12	21	33	21	18	21	12	39	49	17	40
31	9	0	26	25	28	39	10	47	12	25	15	17	27	17	21	18	13	34	43	18	34
22	26	26	0	6	13	23	20	35	20	10	18	17	35	22	13	25	20	28	47	14	34
19	24	25	6	0	11	28	19	40	19	9	16	18	37	23	10	26	19	32	51	13	38
10	26	28	13	11	0	33	24	45	25	12	19	25	43	29	10	32	24	38	56	15	44
41	42	39	23	28	33	0	33	14	33	27	36	26	33	29	33	32	36	16	37	31	23
27	11	10	20	19	24	33	0	42	6	19	11	12	25	12	16	14	9	30	42	13	31
53	51	47	35	40	45	14	42	0	42	39	46	34	32	35	44	38	45	15	29	42	20
30	12	12	20	19	25	33	6	42	0	18	10	10	25	10	15	11	6	30	42	12	31
21	25	25	10	9	12	27	19	39	18	0	15	16	36	20	9	23	18	31	50	11	37
23	12	15	18	16	19	36	11	46	10	15	0	15	33	17	9	17	7	35	50	8	38
32	21	17	17	18	25	26	12	34	10	16	15	0	22	7	18	10	12	22	38	13	25
49	33	27	35	37	43	33	25	32	25	36	33	22	0	17	37	18	29	19	20	32	15
35	21	17	22	23	29	29	12	35	10	20	17	7	17	0	21	7	13	22	35	17	24
16	18	21	13	10	10	33	16	44	15	9	9	18	37	21	0	23	14	35	52	7	39
38	21	18	25	26	32	32	14	38	11	23	17	10	18	7	23	0	13	25	37	19	26
28	12	13	20	19	24	36	9	45	6	18	7	12	29	13	14	13	0	33	47	11	35
46	39	34	28	32	38	16	30	15	30	31	35	22	19	22	35	25	33	0	23	32	11
62	49	43	47	51	56	37	42	29	42	50	50	38	20	35	52	37	47	23	0	48	16
21	17	18	14	13	15	31	13	42	12	11	8	13	32	17	7	19	11	32	48	0	35
50	40	34	34	38	44	23	31	20	31	37	38	25	15	24	39	26	35	11	16	35	0

b. Girls' similarity data matrix

Figures 1-22

Figures 1-22

0	27	33	24	15	9	44	26	54	30	23	22	32	53	35	14	39	29	48	65	20	50
27	0	13	27	24	26	45	10	51	13	25	12	21	36	20	20	22	13	42	52	16	38
33	13	0	28	28	32	43	13	47	16	29	21	21	28	18	27	21	18	37	43	22	30
24	27	28	0	10	19	26	22	36	22	12	21	17	39	23	15	27	22	30	50	17	33
15	24	28	10	0	10	33	21	43	22	10	17	20	44	25	8	29	22	37	56	13	39
9	26	32	19	10	0	40	25	50	27	16	20	26	50	31	10	35	26	44	63	15	47
44	45	43	26	33	40	0	39	14	38	30	41	31	38	33	36	36	41	17	40	36	27
26	10	13	22	21	25	39	0	45	8	21	12	15	31	13	17	17	11	35	47	13	32
54	51	47	36	43	50	14	45	0	44	40	49	37	35	38	46	40	47	13	31	44	24
30	13	16	22	22	27	38	8	44	0	19	12	11	31	10	19	13	8	35	48	14	32
23	25	29	12	10	16	30	21	40	19	0	17	14	40	20	11	24	19	33	53	12	36
22	12	21	21	17	20	41	12	49	12	17	0	17	40	19	11	21	8	41	56	9	39
32	21	21	17	20	26	31	15	37	11	14	17	0	28	8	19	12	13	28	44	14	26
53	36	28	39	44	50	38	31	35	31	40	40	28	0	23	44	23	35	24	21	39	14
35	20	18	23	25	31	33	13	38	10	20	19	8	23	0	23	8	15	27	40	17	24
14	20	27	15	8	10	36	17	46	19	11	11	19	44	23	0	27	17	39	58	8	41
39	22	21	27	29	35	36	17	40	13	24	21	12	23	8	27	0	16	29	41	22	25
29	13	18	22	22	26	41	11	47	8	19	8	13	35	15	17	16	0	39	52	12	36
48	42	37	30	37	44	17	35	13	35	33	41	28	24	27	39	29	39	0	25	37	15
65	52	43	50	56	63	40	47	31	48	53	56	44	21	40	58	41	52	25	0	53	20
20	16	22	17	13	15	36	13	44	14	12	9	14	39	17	8	22	12	37	53	0	37
50	38	30	33	39	47	27	32	24	32	36	39	26	14	24	41	25	36	15	20	37	0

Appendix D continued

c. Boys' similarity data matrix

Figures 1-22

Figures 1-22

0	29	29	22	25	15	38	29	53	30	20	26	34	45	37	20	38	29	44	59	24	52
29	0	7	27	24	28	40	14	51	14	24	15	22	30	24	16	22	14	37	47	19	44
29	7	0	24	23	26	36	12	48	11	23	13	18	26	20	16	18	12	33	43	16	40
22	27	24	0	12	8	20	21	35	20	10	18	19	32	23	13	25	20	27	46	13	35
25	24	23	12	0	16	24	18	38	18	13	16	19	31	23	14	24	18	28	46	16	38
15	28	26	8	16	0	25	23	40	23	11	20	24	37	28	14	29	23	33	51	15	42
38	40	36	20	24	25	0	28	17	29	25	30	23	28	25	29	28	31	18	35	26	23
29	14	12	21	18	23	28	0	40	7	18	12	12	19	12	15	12	9	24	37	14	33
53	51	48	35	38	40	17	40	0	39	39	43	33	30	33	43	37	42	19	29	40	18
30	14	11	20	18	23	29	7	39	0	17	9	10	20	11	13	10	6	24	38	12	33
20	24	23	10	13	11	25	18	39	17	0	14	19	32	22	10	23	17	29	48	11	39
26	15	13	18	16	20	30	12	43	9	14	0	14	26	17	8	15	8	29	45	9	38
34	22	18	19	19	24	23	12	33	10	19	14	0	16	8	18	9	13	18	33	13	26
45	30	26	32	31	37	28	19	30	20	32	26	16	0	12	30	14	23	14	20	27	19
37	24	20	23	23	28	25	12	33	11	22	17	8	12	0	21	8	14	17	31	17	26
20	16	16	13	14	14	29	15	43	13	10	8	18	30	21	0	20	12	31	47	8	40
38	22	18	25	24	29	28	12	37	10	23	15	9	14	8	20	0	11	20	33	17	28
29	14	12	20	18	23	31	9	42	6	17	8	13	23	14	12	11	0	27	42	12	36
44	37	33	27	28	33	18	24	19	24	29	29	18	14	17	31	20	27	0	21	27	14
59	47	43	46	46	51	35	37	29	38	48	45	33	20	31	47	33	42	21	0	44	16
24	19	16	13	16	15	26	14	40	12	11	9	13	27	17	8	17	12	27	44	0	36
52	44	40	36	38	42	23	33	18	33	39	38	26	19	26	40	28	36	14	16	36	0

d. State Schools' similarity data matrix

Figures 1-22

Figures 1-22

0	26	33	24	21	12	43	29	54	30	21	21	33	53	36	16	39	29	46	65	23	54
26	0	15	28	24	26	44	14	53	14	24	12	21	39	23	18	23	13	41	54	18	44
33	15	0	28	26	30	40	11	46	13	28	19	17	28	17	24	19	17	33	42	21	33
24	28	28	0	9	14	22	22	33	22	13	20	20	37	24	16	27	23	25	48	16	36
21	24	26	9	0	13	29	19	40	20	11	15	20	40	25	12	26	19	31	53	15	41
12	26	30	14	13	0	33	24	45	25	11	17	25	46	30	10	32	24	37	58	16	47
43	44	40	22	29	33	0	34	14	34	30	37	30	34	30	35	33	37	15	39	32	28
29	14	11	22	19	24	34	0	43	7	20	12	11	28	13	18	14	11	29	44	14	33
54	53	46	33	40	45	14	43	0	42	41	47	37	32	36	46	39	46	15	31	42	24
30	14	13	22	20	25	34	7	42	0	19	12	9	28	10	17	11	8	29	43	13	32
21	24	28	13	11	11	30	20	41	19	0	13	18	40	23	9	24	17	32	54	10	41
21	12	19	20	15	17	37	12	47	12	13	0	17	38	20	8	20	9	36	53	9	41
33	21	17	20	20	25	30	11	37	9	18	17	0	25	9	20	11	11	24	41	13	29
53	39	28	37	40	46	34	28	32	28	40	38	25	0	19	42	21	33	20	18	35	12
36	23	17	24	25	30	30	13	36	10	23	20	9	19	0	24	7	16	22	35	18	25
16	18	24	16	12	10	35	18	46	17	9	8	20	42	24	0	25	15	36	56	9	44
39	23	19	27	26	32	33	14	39	11	24	20	11	21	7	25	0	14	25	38	19	27
29	13	17	23	19	24	37	11	46	8	17	9	11	33	16	15	14	0	34	49	11	38
46	41	33	25	31	37	15	29	15	29	32	36	24	20	22	36	25	34	0	26	31	16
65	54	42	48	53	58	39	44	31	43	54	53	41	18	35	56	38	49	26	0	50	14
23	18	21	16	15	16	32	14	42	13	10	9	13	35	18	9	19	11	31	50	0	38
54	44	33	36	41	47	28	33	24	32	41	41	29	12	25	44	27	38	16	14	38	0

Appendix D continued

e. Private Schools' similarity data matrix

Figures 1-22

Figures 1-22

1	0	29	29	21	18	10	39	26	52	29	23	27	31	45	34	17	38	29	46	59	20	47
2	29	0	5	25	24	27	40	12	49	13	26	14	21	26	20	19	20	13	38	45	17	37
3	29	5	0	25	24	28	39	12	48	12	25	14	20	25	19	19	19	12	36	44	17	36
4	21	25	25	0	6	14	25	20	38	20	10	19	17	34	22	12	26	19	32	47	13	33
5	18	24	24	6	0	11	28	20	41	19	10	18	18	35	23	9	27	19	34	49	11	35
6	10	27	28	14	11	0	32	24	46	25	16	23	25	41	29	12	33	25	40	55	14	42
7	39	40	39	25	28	32	0	33	16	33	26	35	24	33	28	31	32	35	19	36	30	19
8	26	12	12	20	20	24	33	0	42	7	20	13	15	22	14	15	16	11	31	41	14	31
9	52	49	48	38	41	46	16	42	0	42	38	45	32	33	35	43	37	44	15	28	42	17
10	29	13	12	20	19	25	33	7	42	0	18	9	13	23	11	15	13	7	31	42	13	31
11	32	26	25	10	10	16	26	20	38	18	0	17	14	33	19	11	23	19	31	47	12	33
12	27	14	14	19	18	23	35	13	45	9	17	0	15	28	15	12	16	7	35	47	10	36
13	31	21	20	17	18	25	24	15	32	13	14	15	0	20	8	17	11	14	22	36	14	23
14	45	26	25	34	35	41	33	22	33	23	33	28	20	0	17	32	16	25	20	23	30	20
15	34	20	19	22	23	29	28	14	35	11	19	15	8	17	0	20	9	13	24	35	17	24
16	17	19	19	12	9	12	31	15	43	15	11	12	17	32	20	0	23	14	35	49	6	36
17	38	20	19	26	27	33	32	16	37	13	23	16	11	16	9	23	0	14	25	36	20	26
18	29	13	12	19	19	25	35	11	44	7	19	7	14	25	13	14	14	0	33	45	12	33
19	46	38	36	32	34	40	19	31	15	31	31	35	22	20	24	35	25	33	0	20	33	9
20	59	45	44	47	49	55	36	41	28	42	47	47	36	23	35	49	36	45	20	0	47	19
21	20	17	17	13	11	14	30	14	42	13	12	10	14	30	17	6	20	12	33	47	0	34
22	47	37	36	33	35	42	19	31	17	31	33	36	23	20	24	36	26	33	9	19	34	0

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