THE COGNITIVE WORLD STRUCTURE GAME:

A tool for occupational research

THESIS

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by

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SUMMARY

A pilot study (M.Sc. dissertation) had revealed inadequacies in methodologies for studying occupations and a model was developed composed of three parts: the Job, the Man, and the Environment. This study and a review of the literature showed that the definition and measurement of Man was the most important problem.

A new technique has been developed called the Cognitive World Structure Game, based on influences from existential philosophy, sociometrics and personal distance, and contributions from psychometrics and social psychology. The Game attempts to look at Man with fewer assumptions than the usual measures. It does not postulate the existence of traits or states, nor does it explore semantic weightings. It does, however, assume that subjects structure their environment or cognitive world using at least one of a number of ways and on one of a number of dimensions. The Game presumes to simulate the subject's cognitive structure, itself expressed in terms of his environment and the values he has allocated to its elements. This is done by asking the subject to arrange labelled blocks on a check board. The patterns are scored for type and composition via a computer programme.

The Game has contributed a much-needed alternative to traditional types of stimulus sets found in psychometrics and its use has led to new ways of understanding Man. Of prime importance is the fundamental assumption that the nature of Man, the way he is, is the way he interacts with his environment. Also, the Game deals more successfully with the problem of

consistency of personality.

Laboratory and field studies have been carried out to evaluate the Game and its underlying assumption using both normative and ipsative approaches. It was used to distinguish between members of different occupations, to understand an organisation's structure and dynamics, and also as an aid to occupational counselling. There are very strong indications that it could be a useful tool in a counselling situation, particularly where there are time constraints.

ACKNOWLEDGEMENTS

Many people have contributed towards the making of this thesis. Despite the social psychological approach it advocates, only a few of the most important individuals can be mentioned. I must begin by thanking Dr. W. G. Brown for his supervision, his guidance and experience, but most of all for his friendship. Next, I would like to thank Professor W. T. Singleton for his encouragement, guidance and the organisational "ambiance" and orientation he created, without which this work would have been very difficult. Thus, I am also indebted to my colleagues, students and subjects for their important contributions. My gratitude goes to Mrs. Mary Wilson and Mrs. Huguette Hébert who not only typed the manuscript but took an interest in the work. Finally, I must acknowledge the vital role played by my wife and daughter in the development and completion of this thesis.

CONTENTS

I.1.1 The aim of the research

The young man about to choose his first occupation, the experienced worker hoping to understand or change to another occupation, the occupational counsellor who may help them prepare for, understand and choose an appropriate occupation, the personnel manager about to select an employee from a number of candidates, or the occupational psychologist wanting to understand a subject's work-related behaviour, all have a need in common. They would all benefit from an organised body of knowledge, or at least a check-list of means to acquire this knowledge about occupations. These needs involve looking at the man, the job, the environment and their interactions. The diversity of needs of the users demand that this organised body of knowledge concerning occupations cover a standard and adequate range of information. It must also be comparable in its final form to that of different as well as similar occupations, i.e. be comparable both within and between occupations. Traditional job study techniques have been found more appropriate for analysing one level of worker or job. For example, Herzberg's technique has been criticised for its emphasis on white-collar workers (House and Wigor, 1961). Other techniques have stressed the understanding of manual work, either at the skilled or unskilled levels, but were not appropriate for the understanding of jobs at higher levels. It is important, therefore, to recognise as a prime objective of the study to be its ability to cope with jobs of all levels. It must include the work-related behaviour of the student, the manual worker and the manager. Such a methodology must deal empirically and theoretically with as many of these levels as possible. It is also assumed here that human behaviour cannot be fully understood when divorced from its context. Any

prolonged abstraction is detrimental to its understanding. Individuals are not composed of independent worlds or environment. Even when most alone, a man makes constant references to other people, objects and events. Jean Paul Sartre's "L'enfer c'est les autres", for example, portrays man as interacting/communicating even in death. This occupational methodology will therefore involve both a social-psychological and an environmental approach.

The purpose is to develop optimum methods of studying occupations. Since the basic unit of this taxonomy of methods is the behaviour of the worker, the research is set under the heading of Occupational Psychology. However, the approach is inevitably multi-disciplinary and involves social, environmental and organisational psychology.

I.1.2 A psychological methodology for occupational research

Stated simply, the objectives of this methodology are three fold. First, we are looking for a method of understanding the Man, the Job, and the Environment. It must, however, be concise enough to be a practical method. Secondly, the understanding of the Man/Job/Environment relationship should permit us to compare jobs or sets of occupations. This comparison may be done within a particular system such as a penal, educational, industrial or social system. It may be across such systems as between teacher and probation officer, or constable and prison officer. And it may imply similar or dissimilar occupational strata such as between a police sergeant and an army sergeant or between a manager and a teacher. Thirdly, the results of this method must provide information which may be used to improve existant Job/Operator/Environment relationships in order to maximize the objectives of the

system proper and the individual's search for job satisfaction.

A science is often defined by what it is not. This research does not aim to affect directly the man in his non-working life. That is in his adaptation and maturation vis-a-vis his family, society and himself. However, as a human being may not be separated from his milieux, nor can we study only one part of the Job/Man/Environment complex without considering the influence of the other parts. On a functional level, it must be clearly understood that this research does not "a priori" set out to redefine the areas it deals with. That is, it does not seek to replace existing theories concerning attitudes, motivation, perception or personality. However, from the field to the laboratory, from the applied to the theoretical, there is an inevitability of confirmation, rejection, or shedding of light on both old and new theories.

I.1.3 The pilot study

The aim of the pilot report was to study an occupation, that of the Probation and After-Care officer. In its introduction, the study emphasized a problem belonging to many occupational study approaches. Most approaches hope to be applicable to all types and levels of jobs, yet rarely are. For example, a skills approach such as Fleishman (1973) advocates is very well suited for the study of workers involved with manual and perceptual type tasks. However, the approach has yet to be successfully used in studying such occupations as teaching, investment consulting and psychology. For this reason, the pilot study employed a number of popular approaches and tools. The following are the most important areas covered by the study and to be found in the dissertation

proper. Other less relevant areas studied were not included but they can be found in departmental reports or obtained from the author. For example, such areas as Victimology or the development of a modified taxonomy of academic skills were found to have generally critical rather than occupationally informative value. The areas that the dissertation does report on are listed below:

- biographical data
- interests
- job analysis
- work motivation
- occupational choice
- job performance
- personality
- roles and models held (self and occupational)
- job satisfaction

Three methods were used to gather data. The most important of these was a semi-structured interview. This method was also controlled and evaluated by a questionnaire administered to a similar population. This interview was used to collect most of the data concerning the organisational structure and the individuals in the occupation, including job attitudes. The data not collected via this interview involved the personality profiles and biographical information. These were respectively gained from a Cattell 16 PF test and a specially prepared biographical questionnaire.

In addition to the pilot studies' general conclusions (Tivendell, 1971), a number of specific conclusions and hypotheses were made concerning the area studied. Some of these are summarized below. First, a short, manageable and valid biographical questionnaire was developed. This questionnaire

relied heavily on the work done by the Richardson Foundation in America. The resulting questionnaire is recommended as suitable and necessary for an in-depth occupational study. However, as the literature (e.g. Cooley, 1967) suggested, there was no justification for its inclusion in occupational studies in terms of the information it produced for the researcher or the organisation. The literature review and the pilot study's findings resulted in the exclusion of interest measures from any new methodology of occupational research. Nevertheless, in client-centered occupational counselling, its role is still an important one. For example, although a client's interests are most certain to change, they will affect immediate occupational decisions. The counsellor's role here is, perhaps, to clarify their structure and if necessary, use or minimise their influence to increase the quality of the occupational decision. Thirdly, a less popular concept in occupational psychology during this past decade, motivation, was also studied in the pilot study. Two important points were made in the pilot study concerning motivation. First, this term should not be confused with Herzberg's job satisfaction studies. Though proudly bearing the label of motivation, this latter technique deals exclusively with job attitudes. The pilot study confronted this problem theoretically as well as substantiating these claims with references to eminent studies in the field. Secondly, motivation involves the study of Man using a very different approach or level of meaning from the more behaviouristic concepts of attitudes, interests, skills, etc... In engineering, this would be analogous to dealing with energy rather than materials. This latter point has been elaborated in the following section of

Part I. Fourthly, the study had some comments to make concerning occupational choice. These conclusions were very important to the occupation sampled, but unfortunately, could not be generalised to other populations. It was thus found that occupational choice is not a differential approach which is necessary to the comparative analysis of various occupations. Its value may well reside in increasing the understanding of sub-sets of members from one occupation. This has been briefly discussed in the pilot study and in Section IV.1. One of the potentially more valuable approaches uncovered by the pilot research was that of analysing the cognitive models held by members of a given occupation. A content analysis model discussed below became the structure for the interview questions in this area. One set of questions dealt with the subject's perception of his job in terms of his expectations, the real situation, his duties and tasks and finally, the changes in the organisation of the job that he has seen or that he wished to see. A second set of questions dealt with the subject's perceptions and models of his environment rather than his specific job.

A third set of questions dealt more with his self-perception. This last set included questions, for example, about needs, role and personal assets and liabilities. Most important perhaps was the suggestion that this model-behaviour would contribute significantly to the study of occupations. This has been pursued in the following section. The pilot study also looked in detail at various means of evaluating performance in this and other jobs. Here, it emphasized the necessity for a multi-dimensional approach to satisfactoriness. It, therefore, included in its design, methods aimed at measuring an employee's self-evaluation,

the employer's evaluation of the worker and suggested the need, in appropriate occupations, for a client's evaluation of performance. The particular occupation studied here was that of probation officer. In the study of other occupations such as that of shoe-salesman or physician, the use of "client's evaluation" of performance is also feasible.

As mentioned above, the study also went into great detail in introducing, testing and discussing the role of job attitudes in occupational research. In particular, it dealt with the advantages of using the Herzberg model and method of researching job attitudes, i.e. job satisfaction and dissatisfaction. The emphasis and conclusions of this pilot study's use of job attitudes and the discussion in Section IV.1 of their role in an occupational research methodology should be kept in mind in the following chapters. This should serve to counter-balance the apparent focus on more consistent factors in behaviour, as to their importance to occupational research. Along with the content analysis mentioned above, the interview itself, and the personality measure used in the pilot study were the most influential components in terms of the present research. First, the content analysis procedure developed contained the essence of the Model in Section I.1.2 which is to be introduced. Secondly, the interview as an approach was also a fundamental influence underlying the development of the Cognitive World Structure Game. Unlike methods such as personality tests or questionnaires, the interview allows more freedom for a subject to express himself completely. The open-ended semi-structured interview, as discussed at some length in the pilot study, permits the subject to express himself in both verbal and non-verbal behaviour.

This is, for example, reflected in the difference in answers obtained by interview and questionnaire and will be reflected in the difference between what will be called the Game and more conventional personality measures. Thirdly, the problems unearthed in the research into personality and its relation to work behaviour certainly influenced this report. For example, there was the problem of the accuracy of the information received from a measure such as Cattell's 16 PF test. It was reported in the pilot study that biographical questionnaires tend to produce data with a reliability level of 98% or more. This level of accuracy in data collection certainly influenced many psychometricians to turn towards similar methods, i.e. questionnaires and inventories, to sample subject behaviour. Unfortunately, when changing from a biographical to a psychological/behavioural level, these same methods report reliability levels of 50% or less (e.g. Cattell, 1970). Next, the pilot study reported personality trait distributions (16 PF traits) that were not bell-shaped as the test's manual had led us to expect (Cattell, 1970).

In fact, rather than normal distributions, the majority of the scales were found to be skewed, some very distorted. With few exceptions, the pilot sample's average scores were found to be well within the expected range for a normal population. However, the skewness of these distributions suggested that other measures of central tendency should be used and, if such average scores did not reflect occupational differences successfully, more complex differential distribution analyses should be used as an alternative source of information. Finally, this personality measure seemed unable to adequately differentiate between attitudes, personality and environmental conditions as sources of variance. For example, the

Probation Officers were found to have only one significant characteristic as measured by the 16 PF test, that of being "dominant". As the report emphasized, this could equally be due to personal or environmental factors. Were Probation Officers fundamentally "dominant", this would have been reported in their non-work behaviour. On the other hand, "dominance" could be an environmental factor rather than a trait. It was noted that their clients were socially rejected people often exposed to some form of punishment and generally from a lower economic, societal and self-conceived status. Interaction with these subjects could perhaps cause most people to be rated as dominant. Faced with no collaborating evidence, the dominant trait could be due to environmental conditions or, at best, to a certain set of attitudes and not, as the test argues, caused by factors intrinsic to the officers' personality.

In brief, there was a need for a basic approach or model of areas pertinent to successful occupational research. Secondly, some tools were found to be important to such a task, such as the biographical questionnaire and a method for investigating job attitudes. Meanwhile, a number of needs were found inappropriate at least in their present theoretical state and/or operational form. Finally, it was both acknowledged that personality was a vital source of data for occupational research and that present tools were inadequate. These conclusions form the starting point of this thesis.

I.1.4 The basic model

The basic model stems from a consideration of the components involved in understanding, comparing and improving occupations (e.g. job enrichment). The model is simple and in

some form has probably been assumed in many studies. First, man is assumed to be an individual made up of or described in terms of attitudes, interests, motivations, personality structures, etc... This assumption of individual differences has been discussed very thoroughly in most text books on general psychology, and, therefore, need not be argued here. The interested reader can, for example, refer to such texts as Chaplin and Krawiec (1970) or Hall and Lindzey (1972). Because the focus here is on Man the worker, it is further assumed that we must look at his job or its task characteristics to get a more complete picture of him. Thirdly, it is also postulated that the Environment affects the Man and the Job (See figure 1). This Environment spans such factors as the influences from parental family through social, educational and cultural processes, and on to the particulars of the work environment itself such as the man/job interface.

A different approach has been suggested by the Minnesota studies (University of Minnesota, 1963). Pilot research attempted to use and discuss an occupational study in terms of their satisfaction/satisfactoriness model (Tivendell, 1971). The problem is, however, that there is an evident overlap between satisfaction and efficiency which makes independent non-tautological definitions impossible. This is fairly typical of models which stem from semantic rather than real differences. It is analogous in block diagrams to dealing with processes or links rather than properties or blocks. The Minnesota approach has evidently developed from the traditional model of matching Job and Man. It is, however, an over simplification to expect that each man was created for a particular job and that when professional help is available,

FIGURE .1 : the Model

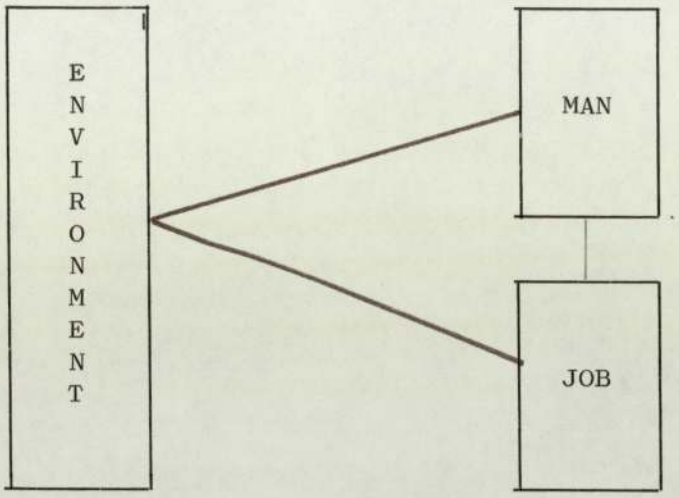
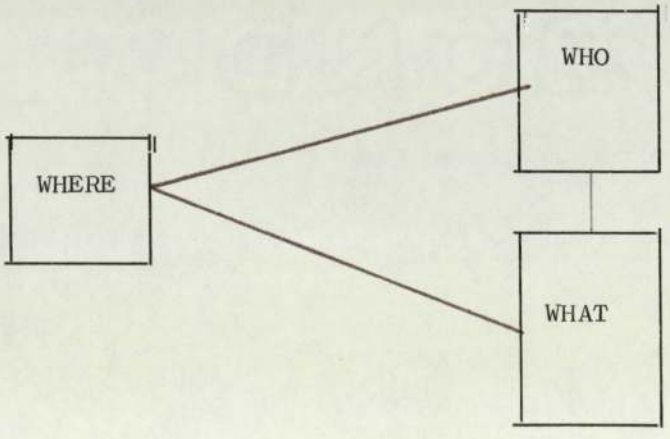


FIGURE .2 : the Model and three fundamental questions



there will be a glove-like fit. Man must work because of physiological, socio-cultural and personal reasons. Jobs, on the other hand, exist to answer the objectives of a macro-system, usually production and profit oriented. In addition to having different objectives, these two blocks, i.e. Man and Job, do not exist in identical and stable environments. For example, the probability is that electricians (Man and Job) will live in different countries, cities, organisations or even departments; in addition, these environments are in flux and do not affect each block in an identical manner. Unlike the model in Figure 1, the Minnesota approach can never simply answer the basic questions: who, what and where (See Figure 2).

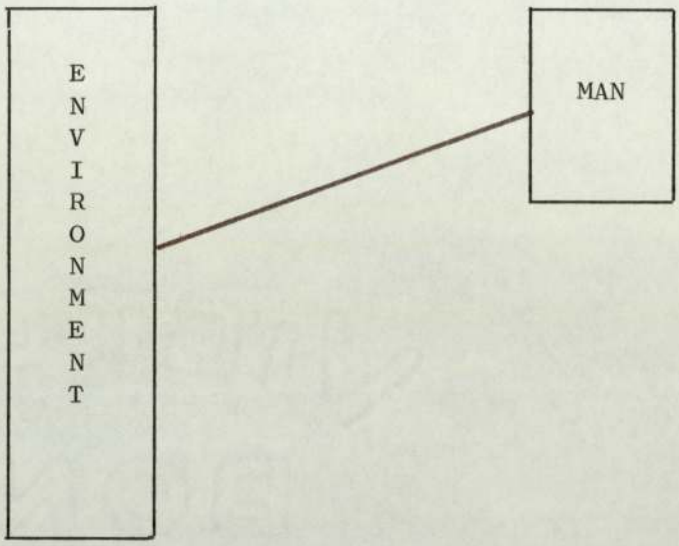
In philosophical terms, the subject matter of psychology is the interaction between Environment and Man (See Figure 3). However, for the purpose of occupational psychology, a third block has been added. It is made up of parts of the Environment and parts of Man which are labelled "learning". Similar subtractions from the two basic blocks can be made to study other aspects of this Environment-Man interaction. The following sections will often involve this more basic form of the Model.

The simple model in Figure 2 then circumscribes all the factors required for an occupational study. The next step is to subdivide, label and, hopefully, clarify each of the model's blocks.

I.2.1 The job or task characteristics

Industrial psychology began in America with Munsterberg (1913) but the two world wars can be said to have contributed most greatly to its establishment and development. It seeks

FIGURE .3 : the Model for psychology



to explain and predict the behaviour of man at work. The term occupational psychology is now preferred as the science concerns itself with problems of work at all levels, both inside and outside industry. It does not exclusively deal with increases in efficiency of satisfactoriness (Section I.1.4), but also involves the job-satisfaction of the worker. Schein (1965) has stressed this in his discussion of the field's concern for "economic man" and "personal man". The occupational psychologist is therefore involved in all the processes which the worker may experience; (Roger, 1971):

1) fitting the man to the job:

   i) occupational guidance
   ii) personnel selection and allocation
   iii) training

None of these can be undertaken with realism and conviction without understanding the job fully:

2) fitting the job to the man:

   i) Work Study
   ii) Equipment Design
   iii) Working conditions and rewards

Hackman (1969) suggested four approaches to task description:

1) task qua task
2) task as responses required
3) task as responses described
4) task as abilities required

He based his approach on two criteria for defining the task: (1) as it is defined by the management and (2) as it is defined by the operator. These criteria reflect the dual concern of the occupational researcher, i.e. whether he is "fitting the man to the job" or "fitting the job to the man". Just as the occupational psychologist's steps focused on the man undergoing certain processes, Systems Analysis focuses on the properties required. Hence, in very brief terms, this technology

deals with:

1) defining the System's objectives
2) separating and allocating functions
3) task analysis
4) skills analysis
5) evaluation of the system

Traditional occupational psychology therefore deals with the processes or procedures which a worker must undergo, such as occupational choice and training. Meanwhile, systems analysis deals with the properties required, such as objectives and skills. Though on different levels both approaches deal with the Job/Man/Environment complex. As Hackman suggested, both employer and employee oriented definitions of a job are necessary. For example, the employer or system may find that mental defectives are more satisfactory for a certain routine job. On the other hand, the employee may at times have a better idea as to the job requirements such as when a police officer has to adjust to new conditions of terrorism. Job descriptions, job analysis and job specifications can all be looked at from these directions. Job descriptions involve the purpose, scope, duties and responsibilities of a particular job in terms of the main tasks. Job analysis identifies the component parts and circumstances in which these tasks are performed. They lead to a job specification in terms of physical and mental activities which the worker needs to do the job and the knowledge and factors to be taken into account. Both approaches have devoted considerable effort in elaborating their techniques, some of which were describes in the pilot study (Tivendell, 1971).

I.2.2 The environment

The Environment is usually defined as all that resides outside the individual proper. However, this is an extreme

general viewpoint which had to be abandoned. Such factors as culture, community and family affect not only a man's attitudes, interests and overt behaviour, but also that which differentiates him from other men, his personality. Thus, the problem which existed in the previous discussion of the Job block can also be found here. That is, understanding the environment was easily confused with the understanding of Man and his perception of his environment. What then can be said about the environment as a source of influences on man? Typically, we would turn towards sociology. Unfortunately, even the most basic tests (e.g. Worsley, 1970) contribute little toward a list of the stimuli. The sociologist seeking information about Man may well find similar problems when consulting the appropriate science. This is certainly evident in the simplistic and often incorrect assumptions which are made. A review of the literature from this and adjacent environmental sciences, together with a brainstorming of the area did conbribute towards such a list . Table 1 is a first attempt at categorizing some of the sources of environmental influence on man. It does not, however, purport to be either exhaustive or completely homogeneous in its classification. The table tries to span the range of sources of environmental influences. In doing this, it elucidates the overlap between the categories. Some of the people involved may belong to two or more of these. For example, a workmate may also be a member of the same church. The table, however, does not deal with the processes by which the environment influences man. Society, for example, may use the processes involved in education, law-making and the media of communications to influence its members. On a more limited scale, the particular

TABLE 1 Some sources of Environmental influence

Culture and race	1) attitudes towards own and other colour, language etc.
Society and community	1) societies of similar political and ideological structures (e.g. like West politics, economic social conditions) 2) the country proper 3) area S "belonging" to (e.g. Wales; Scotland) 4) area S lives in (e.g. London) 5) neighbours*
Religion	1) religions of similar philosophies (i.e. Christian) 2) own religion (e.g. Baptist, Catholic) 3) local church* the people, the leaders
Family	1) parental family 2) siblings and their families if different from (1) 3) in-laws or relatives 4) own family; (wife and children)
Work : people and things	1) the system's policies and objectives 2) upper management 3) line management 4) peers* 5) general environmental conditions, e.g. noise, heat, lighting 6) work load and type of tasks (e.g. number of hours, the tasks repetitiveness) 7) man/machine (or job) interfaces (e.g. ergonomics and -ergonomics

* these are examples of possible overlap in categories due to similar people occupying various worlds.

community and religion to which a subject belongs also may use similar methods. Family upbringing is also known to be a potent force affecting man, especially in the early years of his life. These, by tradition, have belonged to the discipline of sociology. Nor does the table discuss the actual types of influence which affect man. For instance, having only three working days per week, and its effect on the standard of living of certain communities. These, it is also assumed (See Triandis, 1973), vary substantially across individuals. Finally a study of these sources of influence would need to consider objectives or "raison d'être". In brief, we have here a table of possible sources of environmental influences but need also to include the reasons for their existence (e.g. parent system), the processes by which they influence, and the types of influence they produce on man and groups of men.

Once again the problem of separating man from his environment appears. Just as his workmate may belong to a number of the above categories, the person himself belongs to various milieux. He lives, acts and thinks in a number of worlds and in a number of roles. And not only is there an overlap in the source and property of the stimuli belonging to each world, but the valence attributed to it is in great part determined by the man. The categories in the table suggest that in terms of actual influence and in terms of attributed valence, another classification may well be made though in less well defined terms. This is because some of the sources of influence are to the individual more remote while some belong to a more immediate environment. This concept of an immediate environment will play a key role in understanding Man as this thesis develops (See Section I.2.3).

The problem of drawing up a picture of the environment has been considered, but when considering the actual impact of the environment, we cannot divorce it from the study of Man, at least in the case of the immediate environment. As for the impact of the remote environment, in the shape of culture and race, we should gather a good deal of useful information from sociologists, economists and politicians. Information may also be acquired by looking at indicators of the presence and influence of the environment. For example, one product of the interaction of Man X Environment is stress (See Levi, 1970; Rake, 1972; and Theorell, 1972). In the case of the worker, stress may be expressed in a range of behaviours from such activities as smoking and absenteeism to accidents, alcoholism and suicide. This new dimension of the problem of understanding the environment must again be considered in conjunction with personality (Tivendell, 1973).

The focus of attention so far has been that we must look first at the Man, because to understand both the Job and the Environment we must look at the Man's interactions with these. Despite this emphasis on man, looking at the environment in which Man works is often necessary and useful. Some of the areas which are considered important have been listed and emphasized in Table 2. For example, the levels of noise and possibilities for social interactions on the job may give clues to the behaviour of the worker.

I.2.3 The Man

I.2.3.1

It is a truism to say that the study of this third block is complex. The behavioural sciences have had little overall success in circumscribing the area. Since the time of Hull,

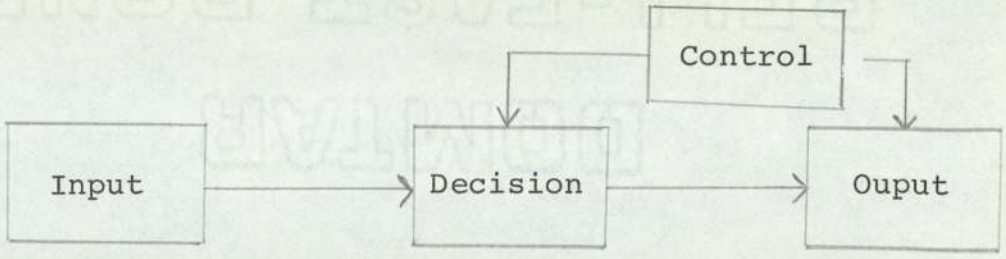
psychology has skillfully evaded general theories of man. This gives little comfort, however, for those in search of at least good operational definitions with which to begin their study. A dichotomy introduced in the above sections is however a promising starting point for developing an operational model of man. That is, he may be looked at in terms of both his properties and processes. Figure 4 and Table 2 are based on this dichotomy.

I.2.3.2

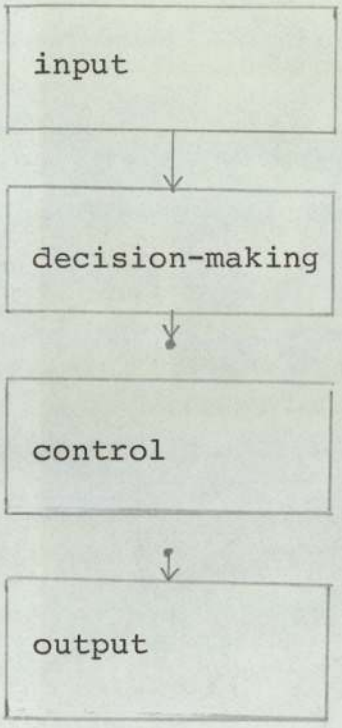
The first of these (Figure 4) deals simply with the processes involved in cognition. There are other "alternative" sequences in the literature, for example, Heckhausen and Weiner (1972) have a four stage "action sequence". However, this combines the properties of most of the others yet includes the simplicity of the S-O-R model (See Part II). This particular process sequence is based on the three-block man. The first part of Figure 4 represents the postulated sequence of the cognitive process. Only the main links have been supplied between the blocks. However, there are certainly many secondary links which can be drawn. Between the control block and the input block, there is certainly a link whereby attitudes, sets and perhaps even values affect the perception of an input or the attention the subject pays to his environment. For example, a motorway may involve a different mental set for certain drivers whereby the amount and type of attention they exercise can be said to be different than on a busy city street. Similarly, there is a link from the output block to the control block whereby schemes and templates are re-evaluated and experience stored. For example, when our driver enters a new city such as Naples, within

Figure 4 Man in terms of processes: cognition

(i)



(ii)



- attention
- perception

- information-processing strategies
- problem-solving strategies
- decision-making strategies

- learning
- memory: iconic, short-term, long-term
- concept-formation: schema, constructs, etc.

- organisation
- implementation (will), and persuasion, etc.

Table 2: Man in terms of properties: personality

aptitudes	- for learning languages - for spatial or verbal tasks
abilities	- intellectual level - creativity level - perceptual-motor coordination
interests	- caring for people - interest in art or science - about people: negroes are equal Italians are nervous
attitudes	- about objects: material things are important or art is inspired - about events: luck is important or God determines events
motivation	- (see discussion: is either a property or a process) - Needs and Drives

a short period there, his strategies for dealing with traffic lights must be re-evaluated, and in this case, altered. However, the general way for man to deal with his environment is to accept an input, make a decision and then respond, i.e. following the primary sequence of the figure. The second part of Figure 4 elaborates these blocks by ascribing to each the general areas of study associated with them. Understandably, there are again semantic differences which would be argued by some. For example, attention might in some circles be regarded as being more directly influenced by the control block than is represented here.

The cognitive process represented here is necessarily a dynamic view of man, as opposed to the following "properties" approach (Section I.2.3.3). It has recently become a rather popular area of investigation. Such people as Niesser, Gardner and Witkin are probably the best known researchers in the field. However, there have been people working in and around it for some time, such as R. L. Thorndike. More recently, the areas of cybernetics and cognitive styles have been in the forefront of the general area of cognition. For our purposes, this approach would need to assume that in some way that cognition is what differentiates man from the rest of the universe and may differentiate among individual men. Despite the prestige of the researchers, work on cognitive styles has not been successful in finding true and consistent individual differences (Warr, 1970). One reason may be that the analytical methods used generally involve looking at extremes of the population. For example, few people are found to be either truly field-dependent or field-independent, but generally belong to the middle of the distribution (Vick and Jackson, 1967).

Thus, cognitive processes are not necessarily unique to the study of Man. Furthermore, there has been limited success in discovering valid individual differences. However, three hypotheses leading to long and difficult research should ultimately be very useful to the study of Man. First, it can be hypothesized that the sequence represented in Figure 4, though perhaps not unique to man, is fundamental to all his behaviour. That is, the range of behaviour produced by man could be analysed using this model, including cognitive and reflex type behaviours. In the latter, decision-making could be seen to be carried out using the simplest sort of strategy, for example, at a pre-cortical level. Though it is usually assumed that no cognitive structure exists at this reflex level, experiments in classical (Pavlovian) conditioning may hint at the existence of a high level interference. Change in the subject's behaviour occurs at this reflex level despite the assumption that the mechanisms or neural pathways themselves cannot be changed without overt interference. If this change or conditionability occurs, it is possible that the scheme or structure that controls the behaviour is itself being changed. It is also possible that an overriding quality from a cognitive source is available over the biological mechanisms involved. Examples that come to mind are the "manipulation" of heart-rate, body temperature, and even neurological alpha-waves by trained subjects. The point is that all specific research, such as the study of the occupation of counsellor, should include a study of the underlying processes. In this example, it would mean studying the counselling process.

Secondly, some advances in the study of Man could involve cognitive styles. However, rather than attempting to describe

individuals in terms of independent (both theoretically and in practice) cognitive styles, research should be undertaken to produce a profile of these cognitive styles. This profile might well be unique to individuals along much the same lines as the profiles produced by Herzberg and Cattell (see below).

Thirdly, decision-making strategies rather than cognitive styles could eventually help in the study of individual differences. The approach involves a simple systems analysis method and indeed has been suggested in previous research (Tivendell, 1972). First, it would involve the quantification of information available to a decision-maker. Then, the amount and type of information used and the decision-strategies themselves are analysed. Next, the type of response is also analysed which necessarily involves so-called cognitive-styles and personality characteristics such as persuasibility, leadership, etc.

Finally, the whole process needs to be evaluated in terms of the success or satisfactoriness of the decisions taken and subsequent behaviour taken. A typical example would be the counselling process. The information available to the counsellor is multi-dimensional, including verbal, written and attitudinal. This can be categorized in numerous ways. Next the actual information used, and more important the way it is used by the interviewer to reach a decision, can be analysed using such methods as a card index of information bits or an actor-client whose range of stimuli is controlled. Thirdly, once a decision has been taken, counsellors may be found to vary in their style of feedback such as presentation and persuasibility. Finally, in the case of vocational guidance decisions, follow-up studies such as those done in the Birmingham studies (Smith, 1951) may be used to evaluate this

counselling process (See Figure 4). Despite these three hypotheses and their promise of a successful analysis of Man in the long term, still more applied approaches can be taken with at least equal if not more certainty of success.

I.2.3.3

The range of "properties" introduced in Table 2 belong to the denotive meaning of personality. In fact, personologists have almost exclusively studied man in these latter terms. The approach as presented here spans, with perhaps the exception of the term motivation, a kind of innate-dynamic continuum. There might be such arguments as whether abilities should precede aptitudes, or whether they should even be amalgamated. Basically, aptitudes were seen here as predispositions towards acquiring certain abilities. For example, hemispherical dominance of one part of the cerebral cortex might predispose a subject towards acquiring certain abilities. In one study, it was proposed that left-handed subjects were better able to cope in a spatial oriented environment. It was also proposed that hemispherical dominance was linked to many reading disabilities such as dyslexia (Newton, in preparation). Meanwhile, verbalizers might be expected to be predominantly right-handed people. People interested in manipulating verbal concepts such as teachers and writers might be expected to fall into this latter category, while occupations requiring spatially-adept people such as many types of engineers might be expected to fall into the former category. A predominant feeling in the field of laterality is that this is a hereditary or at least a physiologically caused phenomenon. However, other alternatives have been considered and with some success. For example, an aptitude for learning languages may

well be due to early environmental conditions. A child having been raised in a bilingual family environment may not fear learning new and foreign languages when he or she is an adult. This environmental viewpoint is a simpler alternative especially when physiology has failed to find centres in the cerebral cortex exclusively controlling these types of behaviours. The simpler environmental approach will usually be favoured throughout these sections.

Vernon (1940 and 1971) has been an important contributor to the field of human abilities measurement. Of relevance to this discussion is his criticism of the ascription of these abilities to, what he called, hypothetical faculties or traits of the mind. He defined an ability as "... the existence of a group or category of performances which correlate with one another and which are relatively distinct from (i.e. give low correlations with) other performances." Fleishman (1973) has, however, been the most systematic in his research into abilities. His work and that of his colleagues has permitted the enunciation and definition of numerous abilities. This work becomes vital to the fields of training and personnel selection in terms of predictors used and criteria measured. At the present time, some interesting work is being done (Atkinson, 1973 and another in preparation) involving the role of different abilities in different stages of learning a task. Thorndike (1959) hypothesized, in a modidication of Holland's theory of occupational choice (Holland, 1959), that different occupations are associated with different types of abilities. A corollary of this view is that a subject actually chooses an occupation so as to optimize on his own abilities. This in turn would minimize the stress from his interaction with his environment and particularly his job.

Note, these may or may not involve a conscious perception of his own abilities and the potential stress of interaction with job and environment. Alternatively, Thorndike's hypothesis could suggest that different jobs emphasize, or develop in a subject, certain abilities. For example, if a set of behaviours had been previously reinforced, the subject may wish to respond again in a similar fashion so as to be rewarded. This is based on the phenomena of the generalisation of stimuli and of responses. That is, what may have been rewarded in a school environment may again be repeated in a job situation. This might also account for a somewhat converse happening such as the dissatisfaction a recent university graduate might feel while working in industry. Having been led to expect certain rewards for certain types of behaviour, in the new situation these behaviours might not be acceptable and hence not reinforced. Eventually, it would be expected that this new system of rewards and lack of them would affect his self-concept and/or the attitudes and perceptions of his work environment. It would seem that abilities are not fundamental components of a man's personality, but as Vernon (1971) suggests in his definition, are performance or behaviour related phenomena. The continuum of innateness suggested above would be paralleled by a continuum ranging from fundamental (or what will later be said to belong to the cognitive structure) to the more changeable and behavioural components. Though at the moment our concern is with the search for a consistent and valid definition of man, in considering specific occupational studies (Job), abilities are very important.

The third group of properties included in Table 2 is that of interests. Like the above abilities, this area has attracted its own set of theorists, psychometricians and

researchers. Having been the subject of much wider discussion and research elsewhere in this thesis (See Section III.a.2), it is not expanded here.

Though less well circumscribed than the above areas, attitudes have attracted many researchers from various schools of psychology. Newcomb (1966) defined attitudes as "an individual's organisation of psychological processes..." which he adopts towards various aspects of his environment and which form a part of his personality. This process-type definition (see above) and Newcomb's subsequent "attitude" towards attitudes should not be overemphasized. Few psychologists, and personologists in particular, would attribute the major role in personality structure to attitudes. This is because of their rate of change both due to time and different environmental conditions. This organisation of psychological processes is at best a first order categorisation of similar behaviour patterns. In fact, the three main types of attitude measurement all involve rating techniques; that is, they depend on an observer's organisation of perceived behavioural consistencies in a subject rather than attempting (first hand) to analyse any organisation of psychological processes. As we shall see in subsequent chapters, attitudes are considered here as the property in a personality most liable to change and, except for actual behaviour, the least reflective of this personality.

So far, we have noted that the properties of personality presented are important in understanding behaviour, but have advanced rather little our search for a measure which differentiates a man from his peers. Intuitively, we would expect that there is something rather more fundamental which defines "me" than could be extracted from a combination of abilities

and attitudes. It is for this reason that researchers have sought and created such concepts as states, traits and personal construct hierarchies. Indeed, this "nirvana" of personality is called the cognitive structure. What traits, states and constructs attempt to analyse is this core of personality, the cognitive structure. However, before discussing how psychologists have looked at the cognitive structure, we must look at the phenomenon of motivation (See Figure I.4).

I.2.3.4

Wright et al (1972) rather understate the matter when they say that "the idea of motivation is ambiguous" (p. 206). Probably the most valuable analysis of the area has been done by Peters (1958). However, empirical research is not primarily concerned with philosophical analysis. It generally assumes that organisms are active, that this activity is caused by stimulation, and that this activity has both direction and intensity, which can be measured in terms of goals pursued and the persistence and vigour of this pursuit. But what are these instigating conditions? What is motivation? One way of explaining motivation is to think of it as <u>the reasons</u> for various behaviours. The use of the term motive as applied to certain crimes is a typical example of this type of explanation. This model of motivation is called functional (behaviouristic) and thus can be attached to the study of the properties of a person. The alternative is the dynamic psychological approach.

More typically, motivation belongs to "dynamic psychology". This term "dynamic" implies the concepts of "power", "energy", "force" or "action", and psychology is no exception. Technically dynamic psychology is the study of emotion and

motivation. As the etymology of the word suggests, motives are conditions which arouse, regulate and sustain behaviour. A number of psychological processes are traditionally related to this view of motivation. First, there is the concern with changes in physiological states which traditionally involved the popular concept of bodily needs and their associated drives. Second, psychologists have experimentally demonstrated that emotional states can act as drives. For example in learning, an emotional state such as anxiety can be found to affect a subject's strength of desire to attain the goal. Thirdly, Lewin discussed at length the importance of incentives and general environmental influences in his system of dynamic psychology (See Chaplin and Krawiec, 1970). Fourthly, the idea that habits can incite a subject to action is not new. They are particularly important to the concept of a number of different motives. Finally, sets, values and even attitudes have been associated with motivation. The first is defined as a temporary state of motivation which increases selectivity of perception and specificity of response. Values are more enduring cognitive processes which function as guides to conduct. Thirdly, attitudes are moderately enduring mental states which may be seen to predispose the individual to act in a certain way. Religious prejudices are a simple example of this definition of attitudes as a motive for behaviour.

Chaplin and Krawiec (1970, p. 392) have noted the evident retardation of the psychology of motivation. There is certainly the complexity of formulating a comprehensive theory of motivation. This is not only due to the great scope of the area. Motivational processes are states hidden outside the conscious awareness of the individual and therefore, must be inferred from his behaviour. This itself is not new, as

the same problem faces the researcher in the fields of perception, learning and intelligence. However, the problem is accentuated because of difficulties in establishing anchor points. Empirical psychology has evidently been linked with structuralism and motivation is less adaptable to such an approach. In particular, the atomistic approach of early behaviourists was directed towards externally observable behaviour. Just as the physical sciences have been unable to define the concepts of power, energy and force, psychologists who have borrowed these concepts have also had little success. Despite modern dynamic psychology, the problems of measuring such an elusive concept as motivation encourage a degree of scepticism towards this approach. What is needed is a method which will quantify the consistent individual differences ascribed to man. However, when this method is established, future researchers should then attempt to look at such areas as motivation and decision-making.

I.2.3.5

Another way of looking at Man which is finding increasing popularity among the behavioural sciences is the use of "abstract models". This is a measure which is derived deductively from a hypothetical population or estimated inductively from observed values of a finite population. This is not a particularly new approach, since such words as schemas, concepts and constructs, which in some way resemble the meaning of the word model, have been used for some time. It is predominantly a client-centered approach in that it relies on a person's perception of his environment. Models can be sought on a number of levels and, by implication, with different techniques. For example, a prison officer may be asked to

describe what makes up a prison. (i) He would possibly begin with a description of the physical parameters (walls, towers, etc.) that make up prisons today and the improvements to these which he would wish to see. This could be done by having the subject draw (visual dimension) this prison and/or have him write (verbal dimension) a paragraph on this prison. (ii) On a more abstract level, he may be asked to discuss his understanding of the objectives of the penal system, their order of importance today and what he believes they should be. He might then be asked to describe the functions needed to meet these objectives and to allocate these to such parts of the penal system as the police, the courts, the probation officers and the prison-staff themselves. (iii) On yet another level, he could be asked to describe the tasks involved in his own job or occupation stressing the role that he plays (See Section IV.2). A role can be understood as less individualistic than a style. That is, a role would be: "to befriend and sympathise with the alcoholic", whilst a style would involve more the way this is done, for example: "to attend football games together". (iv) The prison officer could be asked to describe the tasks and roles of his peers in complementary occupations, such as policeman, a probation officer. (v) Finally, this prison officer might be asked to hypothesize the personality characteristics which are necessary to the occupations in question.

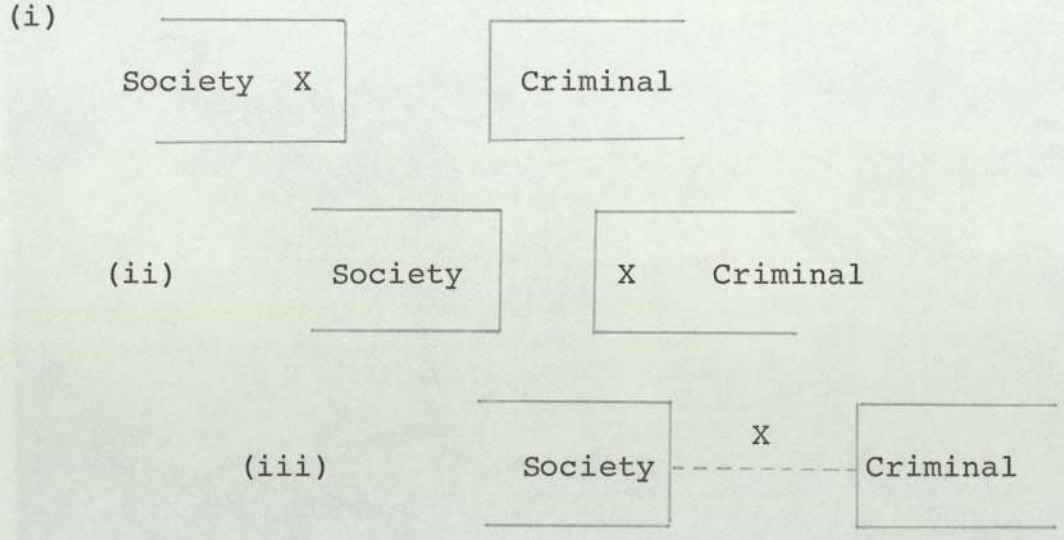
One hypothesis states that people in similar occupations tend to hold similar concepts or models of the various components in their environment. It has certain advantages which may make it important to the study of man. First, most models exist in, or can be easily translated into, a visual form. For example, the pilot study (Tivendell, 1971) did

reveal three basic alternative models to which probation officers subscribed. Some saw themselves as part of the penal system, albeit a more humanistic, less rule-bound version than perhaps the courts or the police. Some officers saw themselves as belonging to the "criminal" population rather than to society. That is, they saw themselves as fighting "the establishment" though unlike true criminals, their situation and environment had permitted them to escape the real path of crime and subsequent penal measures. A third model proclaimed the probation officer's lot to be analogous to a bridge whereby he belonged neither to the establishment nor to the criminal world. Figure 5 reproduced in a graphic form these three models.

In this visual form, the model approach can be easily compared to the systems approach as advocated in Section I.2.1 for understanding the job. Both could be seen to use a visual mode of communication such as charts and models. However, it was found in the pilot study that some people could not translate their viewpoint into a visual model. There was, it seemed, no way of comparing these verbal alternatives with any visual versions which would satisfy the subject.

A second advantage is linked to the fact that the origins of the systems methods are quite similar to those of "time and motion" studies (Barnes, 1970). A breakdown in terms of a percentage of total time a person spends on a certain task could help determine the perceived place of each task in terms of a hierarchy. The information gained from the "model" approach, at least the levels of models described above, could thus be compared with the results of this time and motion (M.T.M.) activity sampling. A third advantage of this model technique would be that it would permit comparisons

Figure 5: Three models of the probation officer's role



Note X denotes the probation officer's "role"

within and across occupations and organisations. For example, subjects within an occupation could be categorized according to their satisfactoriness (quality and/or quantity of performance) and the models of the subjects in each category scrutinized for similarities and differences. Similarly, models held by peers, supervisors, subordinates and clients of a particular occupation could be compared. This would give a picture of the whole organisation and, where there were greater discrepancies between sub-systems, faults or potential faults could perhaps be found. However, despite the usefulness of this technique, there are two major disadvantages. First, as we noted above, there is the dichotomy between verbalizers and visualizers. Secondly, the models which are often produced are rather simple. Both these may hinder the search for a method of understanding man in terms of individual differences yet facilitate comparing people across and within occupations. Models as described above are not basic enough, or sufficiently sensitive tools. However, very useful information concerning the job, the environment and the worker can be extracted. For this latter reason, the interview developed in the pilot study (See Section I.1.3) will be retained to help complete the battery of methods.

There are two fundamental approaches to model-research. The first involves the experimenter's gathering of the information and then producing a taxonomy of models explaining the behaviour of phenomenon. In this "post hoc" method, the experimenter acts mainly as a witness or historian. However, it is still he who makes the final taxonomy of the models. Ethologists, psychologists using observational techniques, sociologists and anthropologists, are typical exponents of this approach to model building. The latter two, in

addition, often use a participation-technique which the ethologist and psychologist attempt to avoid because of the difficulty in controlling the related variables. Logically, the second approach to model-research is the "a priori" approach. Here the experimenter determines beforehand the possible alternative behaviours. He then creates a taxonomy of these which he can test on his population, usually using observational or critical-incident techniques. There are certain difficulties with his approach to model building. First, the experimenter usually does not always benefit as completely as he should from the information available to him after his study. Note that he has already produced his categories and may not "see" in the data the need for additional categories or even an alternative type or level of categorization. Secondly, it is always rather difficult to hit upon the most valid and useful level of categorisation so as to produce homogeneous categories. This technique is usually preceded by systematic observation such as by activity-sampling and, when possible, numerous in-depth interviews. This latter approach to model-building does permit behavioural quantification to proceed much faster and, as we shall see below, the possibility of useful profiles emerging is enhanced. The following are good examples.

I.2.3.6

One intention discussed in the pilot study was that of collecting a series of profiles to help in understanding and comparing "man the worker" (See Section I.1.2). These profiles of an individual worker and of an occupation could perhaps be developed from tools already available. For example, there are: the semantic differential profiles as produced by

Osgood (1957) and Kelly (1955); job satisfaction profiles produced by Herzberg (1957); interest profiles such as those constructed by Strong (1943), and Rothwell and Miller (1968); perhaps even achievement motivation profiles as produced by McClelland (1951); and finally, personality profiles as produced by Cattell (1970). A survey of these types of profiles found Cattell's and Herzberg's better suited for the purpose of this investigation (Tivendell, 1971), and hence, were incorporated into the original study (Section I.1.3). However, only marginal success was achieved in terms of differentiation and increased understanding of the occupation. Following this study, an analysis of the occupational profiles available in the literature suggested a number of reasons for this lack of success.* First, Herzberg's (1957) job satisfaction profiles do not deal with motivation but with job attitudes as understood in I.2.3.3. The questions used by Herzberg may probe deeply into the causality of these attitudes, but the profile itself provides little of this depth and hence explains few of the revelations which are made. For instance, why are accountants, farmers and nurses all achievement-oriented? Despite the attractiveness of these scales, some (e.g. status, supervision-technical and service policies) are so little used as to be due to chance variables. A personnel manager might find little is contributed to his further understanding of a given occupation, by looking at a 16PF Personality profile of the same occupation (See in Cattell, 1970) in conjunction with the job attitudes profile (found in Herzberg, 1957). Part of this problem may be due to the different subjects sampled by then two authors to represent the occupation in question. It seems that the

*These profiles and a discussion of them are available J.T.

Herzberg method is not sensitive enough to deal with actual individual differences even when analysed in various ways (Tivendell, 1971). There is sometimes a considerable degree of consistency within an occupation, but this is not so for all studies, nor all occupations. Being job attitudes, they tend to vary considerably when faced with environmental changes. The Herzberg method is an "a posteriori" approach and, in experimental methodology, is thus not a very suitable tool for prediction. However, it is often useful to examine job attitudes which might otherwise be misinterpreted as fundamental personality characteristics or intrinsic to the models held within an occupation. For this reason, it is found to be a useful part of an occupational research interview and is being included in the battery developed here.

I.3 Traditional personality theories

Whenever psychologists undertake some research which must include a measure of Man, the first thought is usually to use a personality measure. Despite the thinking behind the model described in I.2.3, the writer's tendency was to do the same (See Section I.1.3). The first problem is to determine which measure to use. It would be utopian to hope that personologists had already answered the question. This is unfortunately not so, despite the apparent popularity of some of these personality measures. As Dodwell (1972) pointed out, there has been a plethora of tests and measures, many with similar characteristics such as in their scoring, reliability and validity. Many of these tests, sometimes constructed with the aid of factor analytical techniques, in fact did not further our understanding of man.

Chaplin and Krawiec (1970) give two reasons for

personality theory not being closely identified with the traditional schools of psychology. First, they point out that to do research into such areas as personality and intelligence is to adhere to the assumptions of the existence of individual differences, as opposed to seeking general laws of behaviour applying to all mankind. Their second reason is that personality must imply a study of the individual as a whole which, with the exception of the Gestalt school and Lewin's Gestalt-like theory, is contrary to the atomistic approaches which have dominated the rest of our science.

There are numerous textbooks devoting themselves entirely (e.g. Wiggins et al, 1971; Borgatta and Lambert, 1968; Hall and Lindzey, 1972; and Maddi, 1968) or in part (e.g. Chaplin and Krawiec, 1970; Mischel, 1968; and Warr, 1970) to the study of personality. Many of these books are the products of years of research and experience. The amount of space needed to do justice to even the most important ones would not warrant the amount of information pertinent to the development of this thesis. A separate report is being prepared which attempts to summarize each theory and discuss it in the light of the Cognitive World Structure Game (See Section V.3). Meanwhile, the reader is referred to Maddi (1968) as the most comprehensive of the sources available. The most popular textbook, however, is perhaps by Hall and Lindzey (1972) which deals with twelve of many exciting personality theories. Their approach involves concentrating on a particular theory's originator, and such men as Freud, Lewin, Sheldon, Allport and Cattell are the first that may come to mind. A different approach can be found in Wiggins et al (1971) where the theories dealt with are categorised under the following four headings: biological, social (and

learning); trait and psychometric; and individual/personal theories.

This latter book, like many other texts on personality, goes on to look at how each theory is able to cope with what are considered to be the perennial problems in personality, such as leadership and creativity. This step in fact helps pre-determine the outcome of any new theory and assumes a common evaluative criterion for all personality theories. It may be a very fundamental fault in most of today's theories, research and texts on personality. A corollary of this is that the existence itself of these constructs which are to be measured is not even questioned. These constructs may well be mere Kantian phenomena belonging predominantely to the theorist's model or methodology, rather than to the subject's cognitive structure of performance patterns. For example, these constructs may well be acquired from either old and popular models of psychological behaviour or from the language and culture in which they were conceived (See Mischel, 1968).

In addition to these general theoretical questions, disillusionment also exists with the specific models and methodologies of popular personality measures (Mischel, 1968). An example of this is found in the analysis of the assumptions rather than the statistics of Cattell's 16 PF test (1970). Cattell wanted to develop a theory of personality based not on speculation but on continuing research. He began by using (abnormal) subjects rated by psychiatrists and clinical psychologists on various personality characteristics and then matched these ratings with the subject's responses to a questionnaire. There are a number of problems with his original study as pointed out in the literature

(See Cronbach, 1955; Mischel, 1968 and Weiss, 1963). Weiss (1963), for example, found that sixty physical scientists could better predict behaviour than sixty psychologists given a great deal of information. Firstly, it is assumed that the psychiatrist raters in Cattell's original study knew what personality was. Next, it assumed that the intensity of these factors existed and could be measured by these raters. Finally, it assumed that their ratings of the degree of manifestation of each factor were both unbiased and reliable. This is just one example of how the traditional models of psychological man determine the findings and methods used.

Despite the dubious bases of these personality measures (Mischel, 1968), they are still involved in most behavioural studies as a measure of the personality of man. Typical of these measures are the following tests: the California Test of Personality (1953); Cattell's 16 PF (1962); Eysenck's E.P.I. (1963); the Omnibus Personality Inventory (1968); and many psycho-analytical tests of personality. The point is that field work in many areas is being done by experts, but they may be including a measure of man which is obsolete. This is analogous to a present day astronomer using a model with "the earth as the centre of the universe".

Today the most popular tests of personality are perhaps Cattell's 16 PF in America and Eysenck's Personality Inventory (E.P.I.) in Britain. However, for a long time, psychoanalytically based tests were more popular and many are still being used. For example, there are the Rorscharch test ("ink blots") and the Thematic Apperception test (T.A.T.). Today they are mainly used in individual counselling settings such as in schools or in hospitals. Some applied research such as McClelland's work on the training of salesmen also

uses these tests. In the first quarter of this century, behaviourism increasingly began to force researchers to improve their models, control their studies and generally become more scientific. Researchers who had based their models on plagiarized or modified psychoanalytical ideas now began to hide these under more acceptable mathematical and pseudo-objective methdologies. In the latter part of the century, the pendulum has begun to move away from the behaviouristic and mechanistic approaches such as psychophysics. Perception and decision-making are just some examples of the increasing interest in man's higher processes. This and the lack of scientific precision of these personality theories and measures ensures a cyclical reappearance of psychoanalytical concepts. Freudian-influenced theories have been notoriously elusive to experimental testing and direct field observation making scientific precision and definition impossible. Unfortunately for their disciples, the mere reoccurrence of an approach or theory does not ensure its validity. Until it is possible to scientifically prove their worth, these theories, it is felt, should not be used in applied research.

Before introducing the Cognitive World Structure Game, two areas which might, in the future, be most important to personality theory must be discussed. First in the biological sciences, there are advances being made which influence such subjects as neuropsychology and physiological psychology. For example, the role of parts of the cerebral cortex and the biochemical and electrical mechanisms in man are the object of much enquiry. The work done by such men as Harlow (1958, 1962a, 1962b and 1965) has similarly affected the models and theories of authors such as Bandura and Walters (1963),

Berkowitz (1969) and Dollard and Miller (1950). This area still needs further refinement before it can significantly affect new theories of personality. In addition, the research in this area will be increasingly hindered by complex and difficult problems. These include ethical committees, professional bodies, state laws and social pressures which will increasingly demand that researchers develop more "humane" methods and models. Secondly, there are a few theories which, perhaps because of a lack of popularity, have yet to be adequately studied. Two such theories are those put forth by Lewin (1936, 1939, 1941 and 1946), and Sheldon (1940, 1942, 1949 and 1954). Sheldon's problems in promulgating his theory of personality are quite well known. However, perhaps it is now mostly time and fashion which have amputated the growth of his "constitutional" theory of personality using body shape and proportion. Similarly, few undergraduates and perhaps still fewer graduates remember Lewin's principles of topological psychology. It does seem that fashion and vocabulary rather than hard facts has helped shift emphasis away from these theories.

In summary, there was dissatisfaction with the popular trait and state theories which dominate the field of personality. Any new method of its assessment should not rely on ratings from a small highly specific population, such as trained introspectionists. Nor should it be based on artificial and complex scales which are sentitive to semantic and other socio-cultural influences (Kelly, 1955) rather than to differences in cognitive structure. Many of these problems which have been mentioned will be discussed at greater length in the following sections, including the preliminary manual for the Cognitive World Structure Game (Part II).

II Development

SUMMARY

The Game attempts to look at MAN based on fewer assumptions than usual personality, attitudes and other psychological measures. It does not postulate the existence of traits, states, nor does it explore semantic weightings given on a number of differential scales. It does, however, assume that subjects structure their environment (Cognitive World) using, at least, one of a number of ways and on one of a number of dimensions (time, importance, etc.). Finally, it is assumed that the resulting Game-behaviour reflects the cognitive world structure held by the subject.

CONTENTS

II.1 The background: personality and the Cognitive World Structure Game

II.1.1 The general background

The parent project which gave rise to the Cognitive World Structure Game was the development by the author of an occupational research methodology. The methodology was in need of a simple efficient and valid tool or set of tools to assess individual differences.

Psychometrics usually covers two main areas of research: (1) the search for general laws of behaviour as in intelligence and aptitude testing; and (2) the quantification of individual differences as in personality assessment and sometimes attitude research. Though much work is being done, little progress has been made, especially in the area of personality assessment (Mischel, 1968). For this reason, a new technique has been devised which incorporates ideas from existential philosophy, the awareness of the importance of environmental factors and the increased sophistication of experimental psychology and psychometrics. The technique is based on the Cognitive World Structure Game (or "the Game"). This involves the subject (S) arranging cubes, upon which certain theoretically and empirically determined concepts are printed, into a pattern that is meaningful to him.

II.122 Popular Personality Models

Psychologists' dissatisfaction with current measures and models of personality has already been discussed (Section I.3). Numerous texts are devoted completely to lengthy and adequate discussions of the pros and cons of the various theoretical models put forth by personologists. (For example, Hall and Lindzey, 1971; Maddi, 1972; Bischof, 1970). Other texts, in particular those by Anastasi (1961), Mischel (1968),

and Guilford (1954), discuss at length the methodological drawbacks of current personality assessment itself.

In brief, the Game attempts to look at Man based on fewer assumptions than the usual personality, attitudes, and other psychological measures. It does not postulate the existence of traits (Allport, 1937), states (Freud, 1955), nor does it explore semantic weightings (Kelly, 1955) given on a number of differential scales. It does, however, assume that subjects structure their environment or cognitive world using at least one of a number of ways (for example, patterns) and on one of a number of dimensions (for example, time or importance). The Game indeed presumes to simulate the S's cognitive structure (Warr, 1970), itself expressed in terms of his environment and the values he has allocated to its elements.

II.2 Refinements

II.2.1 The Stimulus

Not unlike other personality tests, one of the most important distinguishing factors in the Game is the stimulus-set and the theoretical and actual context for these stimuli. Most inventory-type personality tests use a weighted stimulus-set. For example, the very popular measures produced by Cattell and Eysenck present to the subject a purposefully biased stimulus, i.e. a stimulus whose inherent valence has been determined by the test's author much before it has been persented to S. An example of such a stimulus would be the question "Do you frequently suffer from headaches?" This in theory permits the S to respond freely according to his actual behaviour. It is however, hard to imagine intelligent subjects admitting to neurotic behaviour or socially unacceptable

thoughts (See Kelly's "Man the scientist", 1955). As an alternative, we may present the subject with an ambiguous stimulus-set such as found in some psychoanalytically based personality measures. For example, the Rorscharch ink blots and the Thematic Apperception test's pictures, as stimuli, have no inherent meaning. They are just ink blots and pictures. The valence or meanings recorded by the tester are believed to be a function of the subject's response. In other words, rather than have the experimenter weigh the stimulus and expect the subject to answer appropriately, the idea is to have the subject himself weigh the stimulus. The theory behind most ambiguous stimuli measures is based on the Freudian phenomenon of projection. Most texts dealing with the study of personality will provide an adequate exposé of the phenomenon and its relation to personality assessment. For more complete information, one may consult Murstein's "Handbook of projective techniques" (1965). Finally, Liebert and Spiegler's chapter on the "Methods of Personality Research" (1974) is recommended for those just being introduced to personality assessment.

Before resuming this discussion, the following is presented as a possible model for evaluating stimulus sets and their theory. The model is based on the simple behaviouristic concept of S-O-R (See Kendler, 1963). According to the behaviourists, having once circumscribed the parameters of both the stimuli and the responses, a certain response can be predicted by giving a defined stimulus. A similar logic can be used in developing inventory-type and attitude-model personality measures. For instance, the responses to the set of stimuli proposed are first recorded for a number of populations. These responses, whether in terms of frequency,

intensity or other, can then be considered as norms. Next, the responses of an experimental population, to the standard stimuli, can be matched with the above norms and their behaviour predicted (See Section III.3.1). To short-cut the research process for developing a differential stimulus set, and albeit doing empirical statistical research on the final version of the test, the inventory approach usually asks questions about the subject's actual behaviour. For example, you would ask a subject a number of questions about any neurotic behaviour he might have, and from his answers (including type, frequency, intensity, etc.), you would begin to hypothesize whether or not he was a neurotic. The use of ambiguous stimuli presumably prevents this short-cut and leaving the more lengthy correlation study approach. For example, in stimulus terms, the ink blot has no neurotic component. Therefore, first of all, the authors must discover how neurotics respond to their text, before a set of stimuli which will differentiate neurotics from other subjects can be developed. Interestingly, this latter approach does not "logically" prove (predict) that certain subjects will behave in a certain manner, just because their scores match a population norm that has so behaved. Here the advantages and disadvantages of correlational techniques as opposed to more "powerful" analytical techniques as t-tests, Anova's, and factor analyses must always be considered in the light of the research strategies (See Liebert and Spiegler, 1974).

An additional note concerning projection tests is needed when discussing the Game. The title "projection" relates to an underlying theory that a subject will alleviate his psychic stresses by ascribing to others certain thoughts or desires which belong to him. For instance, in Freudian theory

sex was believed to be a major source of such stress. Thus, many subjects were understood to be projecting their sexual fantasies onto others so as to reduce this stress. The Game is a projection measure only in the denotative meaning of the term. That is, the subject must project onto a matrix the items in his environment with which he interacts, and how he interacts with these. However, the Game is not a projection test in the connotative meaning of the term. That is, the subject is not projecting onto the matrix a something that does not exist. The game's matrix is not ambiguous; it is just plain blank! The subject is rather simulating his environment or cognitive world. The playing of the Game is not a mechanism of defence, but a response to the tester's instructions. The subject is reproducing as faithfully as he can, his interactions with his environment. Whether certain types of interactions are defensive or not is hypothetical and certainly not so for all types of interactions patterns.

Finally, it could be argued that projection measures of personality are not completely dependent on the psychoanalytical theory of projection, but are investigating the EINSTELLUNG as in the psychology of perception (Levine et al, 1942; Prostansky and Murphy, 1942; Schafer and Murphy, 1943; Postman et al, 1948; Bruner and Goodman, 1947; Bruner and Postman, 1948). That is, the subject's set will be expressed in his test behaviour when faced with ambiguous stimuli or arguably, any stimuli (See Warr, 1970). Allport had proposed an explanation for such a viewpoint when he hinted (See Berg, 1967) that the newer concept of "perceptual defenses", advanced by those arguing on favour of the "Einstellung" explanation, was not so very different from that of "defense mechanisms", this latter concept being the one proposed by the

traditional dynamic school(s) of personality research (Liebert and Spiegler, 1974).

Briefly, two basic alternatives have evolved in the development of standard stimulus sets. Either one starts with an ambiguous stimulus set, and unfortunately depends on the statistically weaker correlational techniques in the search for predictors and causal explanations, or one starts with a weighted stimulus set which, though statistically sounder, often relies upon the S's willingness to admit to socially deviant and disapproving behaviour. The Game introduces a third alternative to the psychometrics of personality. The term coined is a "universal" stimulus set and is derived both from the technique and the theoretical origins of the Cognitive World Structure Game. As with the advantage of projection techniques, the aim is to have the subject place the value on the stimulus. However, rather than use an ambiguous stimulus origin, the theoretical framework of the Game demands that this origin be anchored in the S's own environment. Stimuli common or universal to all S's are presented. Note that in radically different cultures, such as certain Eskimo or African cultures, new stimulus sets for the Game may need to be evolved. The S is then able to select from the stimulus-set those items which are part of <u>his own</u> environment. Via the conceptual and physical manipulations of these items which he has selected, the S gives them weightings or values. Finally, one may substitute for "environment" such terms as biosphere (Angyal, 1941), life-space (Lewin, 1951) or personal space (Sommers, 1967).

In playing the Game, a differential value is accorded to each stimulus by its relative position to either a certain key stimulus (anchor point), a group of stimuli, and/or the

whole pattern (complex) of stimuli. For example, particular concepts, attitudes and values can be allocated to the whole environment via the pattern or positioning of items as well as the subsequent verbal description in the interview. Pilot studies helped delimit the stimulus items used (See Appendix A). In addition, five blank blocks permitted Ss to express any other part of their environment which they might believe was absent.

The simple and experimentally tight orientation in which the theory was developed at first sought to confine the definition of the Environment to people and objects. Most people when looking around will see that they are surrounded only by individuals and things. For example, their present environment may include their wife, child, mother-in-law and tables, chairs and pens. However, a further reality in the environment of Man is the category Event. This third category is not homogeneous with a people/things taxonomy, but is still well in the realm of experimental and, more important to the S, psychological assessment. Here, Peters' (1968) "Man the rule-maker", rather than Kelly's (1955) "Man the scientist" model, is perhaps the most explanatory. Next, religious, philosophical, and more recently, sociological and psychological influences, among many others, have introduced to Man's environment many immaterial and hypothetical constructs. These intellectual "machinations" cannot be touched, seen, and adequately measured. They have, however, been the cause of wars, religious dissensions, family arguments and innumerable love affairs. They have no material or phenomenological existence as do individuals, objects and events. They are at best constructs, albeit socially accepted, which are used to "explain" feelings, thoughts and actions. They have no

objective and universal description and no apparently consistent value either within a given individual or even within a given culture. Nevertheless, measurement of these is attempted via techniques such as semantic differentials and repertory-grids. They are now inextricably a part of language and in this capacity, are vehicles of logic and culture. Thus, a fourth category, which would have been omitted had it been possible, was included to complete the stimulus-set of the Game. This category includes such concepts as privacy, marriage, (as opposed to getting married), education and love.

A matrix in the form of a checkerboard was designed to help Ss to express their environment, the relative position/values of the composite parts of this environment, and to place individual items within the above framework. Pilot studies substantiated the use of blocks upon which the above-described stimulus-items were printed. These studies also suggested that in using blocks, as opposed to using Q-sort techniques or semantic scales, the S could then physically manipulate the environment as well as conceptually manipulate it. An interview was used to evaluate and confirm this hypothesis. In addition, the range of ages (from 9 to 55 years old) and the use of the Game with, among others, clinical populations, help underline the effectiveness of this move. It was hoped that verbalizers would neither be helped nor hindered by the physical properties of the Game, a point little researched in verbally-heavy assessment methods such as inventory and simple interview techniques. This and its converse hypothesis were to be researched (See Section IV.b.2). Appendix "A" lists the blocks included in the four categories presented above. The code which is found alongside each item

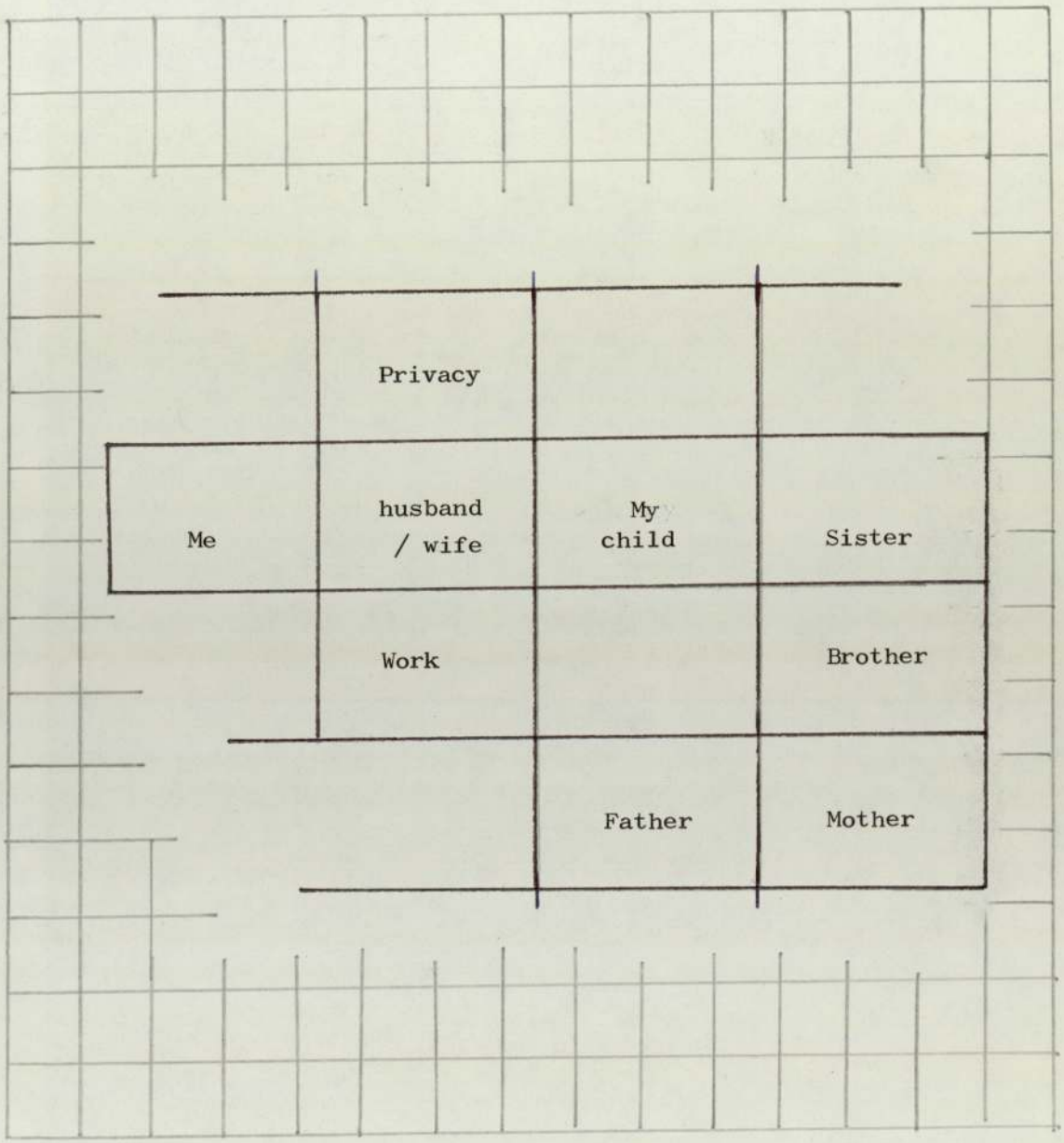
(Appendix "A") and which is printed on the underside of the blocks was created to facilitate computer scoring (See below) and to remove it from possible use by Ss forming their pattern. In this capacity, it replaces the original version's code, for example, I^{10} represented husband/wife, whilst O^{6} represented television. In addition, there are five blank blocks which the subject may use to represent other items in his environment. There is no limitation placed upon the use of these blocks other than that provided by the subject himself, such as the range of his vocabulary and his degree of cognitive complexity (Warr, 1970). These blank blocks contribute greatly to the open-ended nature of the Game. They provide an aspect of flexibility to the stimuli which, with the exception of interview methods, is unique to personality assessment.

II.2.2 The response and R-set

The response, or test behaviour in the case of personality assessment, is the subject's vehicle for expressing himself and the goal of the test-situation. The stimulus-set, the model's theory and the test-method are all aimed at producing this response. In the case of the Game, the response sought is the final matrix-pattern which best represents the subject's environment. Both normative and ipsative information concerning the Game can be found in more detail in parts III and IV. Diagram 1 is an example of such a matrix and is discussed at length in Section IV.4

A very important factor in looking at a test's response is the problem of set. The problem of set or bias is not new and can be found in numerous situations. When asked to call "heads" or "tails" after a coin toss, eighty percent of people

DIAGRAM 5.1 : subject No: 1 (a female)



call heads to the toss. Seventy-five percent of people on entering a theatre in search of a seat turn right; and in choosing between a true or false answer on a test, seventy-five to eighty percent choose the "true" or "agree" alternative! Lee J. Cronbach's (1946) article on test-taking behaviour has probably been the major cause of renewed activity in the research of the response-set. Unlike the majority of social scientists who used it, Cronbach saw the response set as a nuisance variable in psychology and one that should be eliminated. Irwin A. Berg has reviewed in his book the major theories of response-set in personality assessment (Berg, 1967). Berg has predictably separated these theories into three main areas: (1) social desirability variable; (2) acquiescence set; and (3) the deviation hypothesis. Eysenck's E.P.I. manual only discusses the first two of these. This is despite his having divided response-sets into four categories: the endorsement of extreme answers; the endorsement of "no commitment" answers; the lie-scale and the desirability response set; and an acquiescence response set. Eysenck has discussed these in more detail elsewhere, especially the acquiescence response set (See Eysenck, 1962, a and b; Eysenck and Eysenck, 1963; and Eysenck and Eysenck, 1964).

Berg (1967) considers Edwards' social-desirability variable which is the set to endorse favourable traits, as the best designed of the three theories though having the narrowest application since it deals only with test-taking behaviour. The other two categories are the acquiescence set and the deviation hypothesis. They deal respectively with the set to respond positively (agree; yes; like; true) to a variety of stimulus conditions and with its converse, that is, the

set to respond counter to popular expressions of bias.

A number of hypotheses dealing with the Cognitive World Structure Game and response-sets have been suggested. The Game's instructions (Appendix B) give an idea of the Ss probable set or AUFGABE (Watt, 1967) a key theoretical issue in response sets. Here the points concerning the Game not being a test and it being impossible to increase or decrease one's score are relevant. The instructions theoretically protect the subject from the need to have such sets prior to presentation of the stimuli that are important in his test behaviour. The philosophical and psychological implications of instruction items should be investigated. That is, what parts do subjects remember, recognize, consider (in decision-making) and use. Learning theory would be important here. Variations in type of presentation of instructions should also be investigated. As most subjects pointed out, perhaps the task is so interesting that it is able to fill their channel capacity. In this way, it is reducing the effect of certain response-sets and other variables. The Motivational distortion experiment does in fact look at a number of these points (See Section III.5).

Briefly, it was hypothesized that not being a test there would be no outward reason for the subject to seek social approval. In addition, the simplicity of the stimuli and the flexibility of dimensions and patterns available to the subject permit him to hide whatever he wishes from the experimenter yet respect the instructions. Any set that remains will not be a response-set but indeed part of his cognitive structure.

II.2.3 The structure of the Game Situation

Three points have been briefly introduced in the above sections and should be made explicit here. First, the Game assumes that individual differences do exist. The measurement of Man based on this assumption then became an objective in constructing the Game (See Part I). Next, the expression of these individual differences are of concern.

Mathematically, the possible permutations and combinations of a S's manipulation of the forty-one labelled blocks, the five blank (open-ended) blocks, and the fifteen rows by fifteen columns matrix are enormous. The raw data (Appendix G) contains a number of graphs representing the distribution of these blocks, their total number, and the number per each category, over rows and columns for a random sample population. Subsequent matrices recorded follow similar patterns. The normality of these distributions is very evident. The only partial exception is the "event category" distribution of blocks which, being the least used category, is evenly distributed across rows and columns. Briefly, Ss have available a large number of ways and means to express their individuality. In over a thousand Ss tests, no two matrices were alike. Individual differences are easily expressed in the Game and are quantifiable. Part III will deal both with similarity between groups of Ss and particular uses of the ipsative aspects of the Game, e.g. Section IV.4.

Thirdly, the Game and its theoretical framework break away from the old British empirical philosophical concept of a dichotomy existing between man and the world. It is unjust to place the blame completely on the British school, for this duality has been a corner-stone of many other religious and philosophical theories. However, empiricists are to blame

for its continued presence, especially in the Anglo-saxon language and culture. The Game adheres rather to the fairly recent philosophical phenomenon called existentialism. It puts forth a viewpoint held by many psychologists including numerous counsellors and clinicians. Until the advent of the Game, it had not yet had an adequate, respectable, or widespread formulation and certainly no standardised vehicle of measurement. This viewpoint is based on the assumption that the way you interact with the environment, which is inextricably linked with the way you perceive the environment, is the way you are. Different people relate or perceive their relationships with the environment, in different ways. Indeed, each person's cognitive structure can be expressed in his responses to the Game. This cognitive structure has been to date an elusive concept of ultimate importance to personality models, yet whose nature is simple (Warr, 1970). The Game's responses are in terms of the pattern produced by the blocks, distances between these items, the parts of the environment chosen by the subject, and his verbal description of these in the following interview.

II.3 The preparation

II.3.1 The hypotheses

Certain hypotheses relative to the actual design and construction of the Cognitive World Structure Game were tested via the interview. As mentioned previously, the cubes or blocks used were preferred to mere labels. This was systematically confirmed in pilot study interviews. In many cases, the possibility of physical manipulation stressed the relationship which Ss wish to express in their matrices. Many Ss were found to "feel" the right or wrongness of relations

between certain blocks. For example, some Ss might not "feel" that "child" or "wife" could be more than a certain distance away from the "Me" block. Similarly, the closeness of a concept like "police" or "education" would not feel right if placed near this "Me" block. This was especially so for certain Ss (See Section IV.3). The block "attractive male/(or) female" was often used for just such a "physicalness" concept. For example, a person in a train with whom a subject interacts non-verbally might be important to the subject's self-concept. Though this relationship is temporary, it may feel better when placed close to "Me" because of its importance. This "feeling" concept found in the Game has been included in the work of other authors, notably Lewin's field theory (1961) and Sommer's observational studies (1967).

One alternative to the use of blocks is a computer interaction technique. Mr. Malcolm Lee of Sussex University is presently experimenting with a computer teletype being used as a clinical tool to help Ss express their illnesses and accompanying symptoms. The use of the Game's stimulus words rather that the illness/symptoms stimulus-set was tested with architects (Tivendell, 1973). Mr. Lee has not formulated any theoretical model of the process. Evidently, because of greater interest in developing the tool, certain theoretical implications have escaped notice. Most important is that the technique intrinsically involves the Freudian use of sentence-completion, word-association and projection. Few experimental studies using these techniques are available.

The hypotheses surrounding the board and grid of the Cognitive World Structure Game were tested in pilot studies and stated that the grid would help Ss to structure his environment and form his matrix. In fact, the grid's initial use

was in this manner, but its later presence was often ignored by the subject. According to most interviews, the actual relationships to be expressed soon dominate the session. Interrupted sampling techniques where the test's process was interrupted by the experimenter questioning the subject were later used to substantiate the Ss claims that the grid had initial value only. It should be noted that though the grid is used in the analysis and recording of the Game matrix, the Experimenter (E) could easily super-impose a grid after the matrix was completed on a blank board (See below), had this been the grid's only "raison d'être". Pilot studies involving other versions of the Game included a number of blank boards. The size and shape of the board also followed from pilot studies. Other versions of the Game are available (See below) and will be the object of systematic research (See Part V). Briefly, these are the following:

1) Three dimensional versions

A three dimensional version of the Game has been the subject of recent pilot studies. The experimental version consists of seven shelves made of transparent plastic and supported at the corners by four copper tubes in a vertical position. The plastic is one quarter of an inch thick and the copper tubes are five-eighths of an inch in diameter. Each shelf has a seven by seven matrix, similar to the Game's original version outlined in black lines a quarter of an inch wide. There is a one-inch border around each shelf through which the four copper posts are fitted. A 5 x 5 x 5 version was first built and non-grid versions of both the 7 x 7 x 7 and the 5 x 5 x 5 were also used but with less success. It would seem that these three-dimensional versions tend to restrict and often detrimentally affect all but a few

subjects. These few remaining subjects would seem to belong to a group of highly intelligent people who enjoy intellectual exercises. Population comparisons might suggest a similarity with people preferring the more experimental versions of chess, naughts and crosses and chinese checkers games.

2) Two-dimensional versions

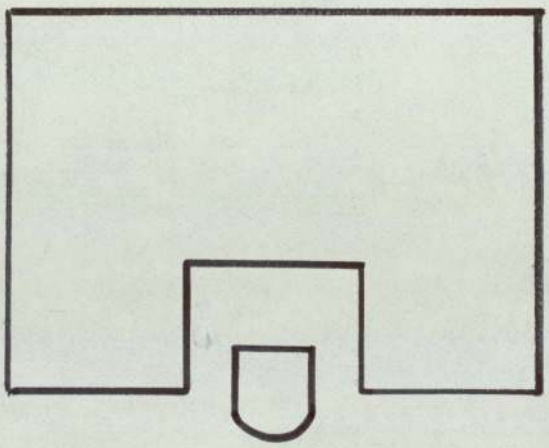
A number of other two-dimensional versions of the Game were attempted. First the basic version of the Game's board, that is a square of $22\frac{1}{2}$ x $22\frac{1}{2}$ inches, was tested without the grid. Next, two circular boards, with and without a grid, were developed. The size of these circular boards may vary in that they may attempt to duplicate the number of squares in the original version (15 x 15) or duplicate the size of the original board with a diameter of $22\frac{1}{2}$ inches or more.

3) Unconventional versions

Finally, a number of more unconventional boards were designed. Several modifications are perhaps of more interest for future researchers. One was the designing of a board which would surround the subject on a little more than three sides. This would permit the subject to use more fully spatial dimensions. For example, a subject may wish to hoard certain concepts away from the centre of his matrix or separate some items from others. Figure 6 represents a top-view of this board and the subject's seating position. A second modification involved attributing values to the blocks themselves or groups of blocks. One example was that of ascribing different values to different faces of a block. One face would have a positive value, another a negative one, and a third an indifference value. No measure of intensity of these values is attempted in this version, but the dimension sought would be manipulated by moving or changing the

Figure 6: An alternative version of the Game's board

desk-top:



block face. Another example or version would be the use of coloured and transparent plastic circles and ovals. These would be placed beneath the blocks or groups of blocks to represent fields of force or value. Variations in colour would represent different types of valences. The size of these plastic circles and ovals would be dealing to some extent with intensity of relationships (See above).

No pilot studies were carried out using these latter versions of the Game. These versions undoubtedly have a certain amount of interest in terms of understanding the Game's make-up and its ipsative use. It may be recalled that the prime objective for developing the Game was that it be at least an operational or applied measure. It was assumed that if the more basic version of the Game could meet this objective, this would permit us to meet the overall objectives set out in Part I. Once the value of the Game had been firmly established, further research using these alternatives or modified versions could then proceed (See Section V.3).

II.3.2 The Method

II.3.2.1 Apparatus:

1) forty-one labelled blocks
2) five blank blocks
3) one felt-tipped pen (black)
4) board, with 15 x 15 matrix
5) instructions set
6) data (record) sheets)

The version of the Game we are concerned with here involves the following apparatus: (1) forty-one wooden blocks; one and a half inch cubes, having one white-faced

side which is labelled (See Appendix A for list of labels used), using an upper case IBM scribe "delta 12" type face; (2) five white-faced blocks with one face covered with a plastic surface permitting the subject to write on them (See instructions set No. 8 in Appendix B) using, (3) a black felt-tipped pen; (4) the board used is a twenty-two and a half inches square white surface with a three-quarters of an inch border. There are fifteen column and fifteen rows drawn on this surface resulting in matrix squares with one and a half inch sides; (5) one page of instructions (See Appendix B) which excludes instructions numbers nine and ten is secured to a cardboard backing (See Procedure). Finally, the resulting matrix produced by S is recorded on the (6) data sheet (Appendix C).

Two points are relevant here and need more research. They involve the ergonomic and stimulus content of the test room. First, it is important that the seat/desk size ratio should be great enough to permit the S to look down (or over) the board. The best seating arrangement in ergonomic terms should be retained though the seat should be slightly higher than in the usual desk/seat arrangement. The second point concerns the room. It is imperative that the amount of irrelevant stimuli should be reduced. For the studies quoted here, a small 12' x 10' foot room with neither shelves nor wall decorations was used. Only one table was present and the S's chair. A carpet, of a neutral rust colour covered the floor. If the room contains large amounts of electronic equipment or books, and is noisy, most subjects will be affected. For further discussion of this, see Section II.3.3.

III.3.2.2 Procedure

The Cognitive World Game is an individually administered personality measure. In pre-experimental contact, the subjects were merely asked to help in an experiment which consisted of their completing a Game (See Appendix D for introduction to subsequent studies involving the Game). When the subject appeared, he or she was taken to the appropriate desk (See below, on the social psychology of this experiment) upon which the matrix board was horizontally laid immediately in front of him. When seated, the subject had to his right the forty-one labelled blocks arranged randomly in a tight cluster and with the labels pointing towards him. Immediately above these were the five blank blocks and the felt-tipped pen.

The experimenter then stood to the right of the subject, minimally behind him yet still in his peripheral vision permitting the subject to adequately inspect the labels whilst the experimenter read the instructions (See Appendix B). Natural speech requirements, e.g. half pauses at commas and full pauses at periods, were observed during the instruction period. The experimenter read the instructions at a slower than usual speaking rate, omitting the numbers by each instruction, taking care to minimize fluctuations in intonation and stressing only the appropriate word in instruction number nine. When he had finished instruction No. 9, the experimenter propped the card containing page one only of the instruction set (instructions numbers one to eight inclusively) up against the wall in front of S beyond the far edge of the board. This permitted Ss to read these again. While doing this, E asked the subject (instruction number ten) if there were any further questions. In the studies, questions

from subjects were rare, most probably due to the placing of instructions in front of S for his further reference. When they did occur, they were answered by E's repeating the appropriate section in the instructions and thus keeping the usual paraphrasing to an absolute minimum (Anastasi, 1961; Mischel, 1968).

The subject was left to complete the Game in his own time. When he showed signs of having finished, the experimenter held a short interview (See below). Following this, the experimenter explained the purpose of the exercise and in some cases, the idea that lay behind the experiment. Enquiries were sometimes made as to the S's willingness to take part in a further session, and, in all these cases they answered positively. The matrix was then recorded on the date sheet (Appendix C) using the code for the blocks (See Appendix A). An example of this resulting matrix has been presented (Diagram 1).

II.3.2.3 The interview

After S had completed his matrix and indicated so by his verbal and/or non-verbal behaviour, he was asked to explain his pattern. The actual interview that followed was based on a semi-structured approach with probes added as sub-sections to each question.

The two main questions were:

1) "Well, can you explain to me how this pattern works...?"

probes: - negative or positive areas?
- structure or dimensions used?
- any block clusters very important to the pattern?

2) "Is there one block or more blocks which are more important than any others?"

probes: - anchor point, if any

- how are blocks linked

If other questions were needed, they were always added towards the end of the interview. For example, a pilot study sought a greater understanding of the tendency by some subjects to place sub-groups of blocks in a corner of the matrix. One of the questions asked here was:

"Are you right-handed, left-handed, or ambidextrous?"

As this thesis is concerned primarily with occupational research, questions directly concerned with this field can be substituted for the above question. Two studies which have used the interview in this manner are found in Sections IV.1 and IV.2. Other examples of actual studies may be found in the report dealing with some correlational studies using the Game (See Tivendell, 1973).

II.3.3 The Test Situation

Subjects about to enter an experimental session are faced with anxiety beyond what some may have as their usual everyday level. Moreover, this is probably accentuated in the case of a psychological experiment. This anxiety is not unlike the emotional experience which a subject is faced with, prior to and at the onset of an important social interaction. Experiences of waiting for a selection interview, for a possible reprimand, or for a novel experience such as talking to a group of people or the joining of a new team are frequently occurring examples. In these situations, a subject's worth, reputation, abilities, that is his Self, has yet to be known and accepted fully by the others. No

attempt is made to define this Angst, motivation, tension or stress. The phenomenon may involve either a "positive" anxiety as when faced with an attractive woman, or a "negative" anxiety such as in a fear-situation. However, most people have had one or other of these experiences regardless of their level. The experimenter's introduction of the measure as a "game" begins to alleviate this anxiety. For examples of this rapport period, see Appendix D. It is possible that other events important to this process belong to times still further in the past. These might include, for example, the knowledge at the very onset of the day that this was the day of the experiment, and so on up to the time just prior to the experimenter's entrance. However, for reasons of simplicity and efficiency, it is sufficient to subsume all of these pre-experimental sources of stimuli under one heading. That is, the first period is calculated from when the subject enters the psychology department and includes that time spent waiting to be called by the experimenter. The second period or event begins with the actual appearance of the experimenter, and it can be safely assumed that this event does indeed cause the subject to re-organise his expectations. For example, if the experimenter fits one of the subject's stereotypes of say, a scientist, then this anxiety may be increased. On the other hand, if the experimenter does not appear any smarter, taller or stronger than the subject, he might be seen as less of a threat or cause for anxiety, and this might even reduce the level of anxiety to below that of the previous period. Regardless of the experimenter's precautions, subjects still summarize the situation in terms of personal expectations before and while they are brought in front of the apparatus. There is then a reorganisation of

these expectations which will affect the level of anxiety. It is from this time on that the skillful experimenter can hope to control many more of these variables or instruction period. Here, the subject is "told" of the experimenter's expectations, the apparatus and its functions. The subject seeks to match to these his present and future behaviour so as to minimize anxiety and maximize rewardable performance.

The instruction "this is not a test" should begin to tell the subject that he is not to be measured. i.e. that the object is not to do better on the Game than do others and in this way prove his worth. However, this objective is certainly never completely achieved due to pre-experimental tests and to the relative importance of verbal instructions. There are also non-verbal instructions, in terms of the experimenter's behaviour, as well as the apparatus and the whole experimental setting which tend to somewhat contradict this instruction. The experimenter's actual behaviour should try to convey to the subject that it is he, the subject, who ultimately controls the experiment.

After the instruction period, the experimenter should leave the room so as to underline this. It permits the subject also to concentrate on the task and task-related items. Finally, the experimenter's interviewing technique should continue to put the subject at ease. Here, he should reassure the subject of the absence of any mystical powers which psychologists or the Game might possess and indeed that he, the subject, alone can validly interpret his own life.

The social psychology of the Game's methodology is far from perfect. It is, for example, based on too many assumptions about the subject's feelings and behaviour. However,

even a man freely completing a questionnaire at home is subject to such influences. Though an interview may be subject to influences from a greater number of sources than an inventory-type test or a questionnaire, when the interview is carried out on the interviewee's own territory (Mann, 1969) such as his home or office, certain aspects of the research situation (e.g. anxiety, stress, self-confidence) may be better controlled (Tivendell, 1971). For instance, a man filling in a questionnaire may imagine the answers being scrutinized by a clairvoyant scientist. On the other hand, the interview limits the subject's imagination by confronting him with the actual stimulus. Most laboratory experiments, the so-called controlled milieux, are inevitably subject to many more influences than either of these situations, especially if carried out in conditions as described above. Even well-designed laboratory studies in terms of social psychological variables can be more subject to nuisance variables and bias than field studies. From this aspect, the case studies described in Part IV are more important than the laboratory studies found in Part III in terms of developing and understanding the Game. Finally, this section on the social psychology of the test situation goes beyond Rothenthal's (Mischel, 1967) persistent and usually ignored statements concerning experimenter bias. It is believed that these viewpoints can be analysed and evaluated regarding their role in the total process.

II.3.4.1 Scoring

When the interview has ended and S has left the room, the experimenter turns all the labelled blocks over, exposing the number printed on the opposite side of the cube. The blank blocks are not turned over since they must be

categorised according to their title and meaning. The meaning of these unlabelled blocks is determined in the interview following the Game's administration. The labelled blocks have numbers (See Appendix A) corresponding to their particular stimulus word and category. For example, block "3" refers to "sister", obviously an individual. In the pilot studies, the blocks were numbered with both letters and numbers. The letters (I, O, S, E) referred to the category, whilst the number referred to the block in that category. In this example, "sister" would have been I^3. Though no S was suspected of, nor did any report, using the letters as possible guidelines in forming their pattern, the use of numbers was substituted for preventive reasons. Meanwhile, if any of the blank blocks were used by S, they were categorised by E (Section II.3.2.3). For example, an "uncle" would be called "14" if it referred to a real person, whereas "God" would be labelled "51". The actual block number given depends only on the number of blocks in that category. If a certain S were to use "uncle", "aunt", and "grandmother", these would be labelled respectively, "14", "15" and "16" in order of appearance. An expectancy set on the part of the scorer may exist for the use of blank blocks. The interview is important to help determine that only real individuals, events and objects may be so labelled, whereas the social-constructs category is used as an "or else" category. For example, however religious a subject or the experementer may be, Christ is not an individual in the same sense as is "mother", and hence, exists in the S's world as a construct. The S's matrix is reproduced on a data sheet as shown above.

The following section (II.3.4.2, "Analysis") deals with the various ways the Game can be used. These are often

subsumed under the scoring section in many manuals. Most important of these are the P and P/N values* and the distances of blocks from an anchor point. Typically, the following chapters will deal with these scores though Section IV.4 uses a different level of information in its discussions. Finally, it is important to know that computer programs for scoring the matrices are available. These deal with the most important scores only (See below). These programs have been developed for the P.D.P.9, P.D.P.15 and I.C.L.1905 computers (See Appendix E).

II.3.4.2 Analysis

The following are some of the means available for analysing the Game. Certain of these are more important, but all are being further investigated and modifications being suggested. Other suggestions have been made by researchers using the Game (See Tivendell, 1973). Basically, the needs of the user should dictate the analytical procedures to be used. For example, in a counselling situation, the counsellor may want only the face value or information which the Game provides (See Section IV.4). On the other hand, the researcher into occupations may wish to match an individual's matrix with some group norms. In this case, a number of "scores" may be used, notably relationship values such as the P/N, P and N scores. Part III deals more appropriately with normative aspects of the Game.

1) Frequency Analysis

This type of analysis is very common and needs little or no introduction. Most inventory techniques use a

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*Psychometric constructs whose numerical value is determined by the number of items (blocks) touching a given item (See Section II.3.4.2, No. 5).

standardized frequency of response method of analysis. For example, there is Herzberg's job attitudes study (1957) which used either frequency or percentage frequency of categories chosen. Many personality measures, though, were often developed using complex factorial analyses relying on the simple frequency of choice of items by the subject to develop the score; for example, Eysenck's E.P.I. test. Cattell's test also uses such a procedure though he turns raw scores into standard scores based on the score distributions of his original populations. The Personality Inventory (Bernreuter, 1938) also uses this method though a weighting of each response possible is made in addition to the use of a standardisation via norms. The development of these tables and their use in changing raw scores into standard scores involved rather simple but extensive research using many different (stratified) samples. The more recent development of the Game would mean restricted and possibly biased norms at this stage of its development and would undoubtedly hinder future research using the Game. This is discussed in more detail in Section III.3. The following are some of the frequency-analyses which have been used (Tivendell, 1973).

First, the total number of blocks (N) used in the matrix should be recorded. This may be calculated for each subject and in terms of an average N-score for the total sample. Section IV.5 gives an interpretative analysis of the measuring of this score. It should also be noted that this and the following frequency analysis may be worked out in terms of percentage frequencies. In the first case, the total number of blocks used by S in his matrix would be a fraction of the total number of possible stimulus items (either 41 = 100% or 46 = 100%). In the case of the frequency analysis

discussed below, the total number of blocks used in a matrix could be made equal to one hundred percent. The number of object blocks used would then be equal to a fraction of this, e.g. NO = 32%.

At least as important is the frequency of blocks used per category. That is, the following four scores may be determined:

i) NI, i.e. the number of individuals used

ii) NO, i.e. the number of objects used

iii) NS, i.e. the number of social constructs used

iv) NE, i.e. the number of events used

Factorial studies are being carried out to determine the meaning of each score (Section V). These two analyses are now a standard part of the scoring technique for the Game, and are a very important means of understanding Man (See Section IV).

Finally, a total frequency of blocks used (N) and the frequency of blocks per category (NI, NO, NS, and NE) have been calculated per row and per column. These were used for experimental purposes, to look at the use of the matrix in the Game as well as to verify the use of blocks and categories. The graphical presentation of these distributions is available in the raw data, Appendix G. They include the following:

i) the total number of blocks (N) distributed across columns

ii) the total number of "individual" blocks (NI) across columns

iii) the total number of object blocks (NO) across columns

iv) the total number of social constructs (NS) across columns

v) the total number of event blocks (NE across columns)

vi) the total number of blocks (N) distributed across rows

vii) the total of "individual" blocks (NI) arross rows

viii) the total number of "object" blocks (NO) across rows

ix) the total number of "social construct" (NS) across rows

x) the total number of "event" blocks (NE) across rows

Because of the number of blocks involved and because of the different use of each category of blocks, the distribution of these scores were found to vary. All, except the NE distribution, are normally distributed around the centre. The distribution of the NE blocks is of a much flatter type of distribution, both across columns and across rows. The use of event blocks is first of all less frequent than the use of the other three categories of blocks. In addition, the use of the event items is different for males and females (See Section III.4). These distributions were from data obtained from testing a randomly selected sample of students from various schools in and around the city of Birmingham. Subsequent studies with the Game have looked at their respective subject samples in these terms, but little additional information was provided by this type of analysis.

2) Quadrant Analysis

This has been a less successful method of analysing the Game. However, since matrix analysis is still unsophisticated, quadrant-analysis is a usual first method used. Here the matrix is divided into four equal parts. This means dividing column eight and row eight into halves, with the center block

being divided into four sections. The scores in each quadrant may be summed or their percentage values calculated. In particular, the scores usually used in the quadrant analysis are N (the total number of blocks) and the total for categories, i.e. NI, NO, NS and NE. A number of other scores may be used such as the P scores (See 5). In addition to this quadrant analysis, two quadrants may be added together to form "hemispheres". This latter approach has not been tried in the correlational studies already cited in this section.

3) Ranking analysis

Subjects may be classified according to their particular permutation of the categories: individuals (I), objects (O), social constructs (S), and events (E). These permutations may be determined by the rank order of importance of the four categories: Individuals, Objects, Social constructs and Events. For example, the number of blocks used in each category may be tabulated. The permutation would depend on the order of usage, in terms of frequency of blocks per category. If ten individual blocks (NI = 10), five object blocks (NO = 5), six social construct blocks (NS = 6) and seven event blocks (NE = 7) were recorded, that subject's particular ranking would be I E S O. Other scores could be used to determine the rank order of the categories as well as the use of weightings or controls. Finally, a sample rank order of categories could also be determined and each individual within the sample checked for closeness of fit. As of yet, neither the quadrant analysis nor this ranking method has shown differential qualities in either ideographic (See Section IV.4) or nomothetic (See Section IV.1) research. More detailed research especially with the former might make a useful contribution.

4) Pattern Analysis

Despite the frequency with which this term is used in psychological literature, some of it specifically dealing with pattern analysis, little of this knowledge has been useful in analysing the Game. For example, the method of pattern recognition developed by Sutherland (1972) is not adaptable to such complex matrices as the Game's 15 column by 15 row matrix. It was for this reason that the following taxonomy was developed (See Appendix F for examples of these):

(i) Cluster pattern. This is composed of only one tight structure, usually central to the environment matrix. It often has fewer blocks than pattern No.(ii). The word "tight" means a high P value per block (i.e. high contact with other blocks).

(ii) Groupings pattern. This is not as simple a structure as pattern No. (i). It is a tight structure in comparison to the following patterns, yet may be less so that pattern No. (i). It may be composed of a low number of tight structures or it may have a few "free blocks" which are close but not touching the main group of blocks. This is certainly the most difficult pattern to judge, since its extremes look similar to pattern No. (i) and to pattern No. (vi). Originally, this pattern was divided into two. The first dealt with the existence of only one tight structure or grouping, evidently larger than a cluster by the number of blocks used and the spread of these blocks. The second pattern dealt with the case where more than one group existed, though generally one group of these evidently played the role of a core (See Maddi, 1972). With this amalgamated version, this pattern must still have one core cluster, though it may have more than one grouping. Therefore, it is much larger than

pattern No. (i), losing this latter's essence of simplicity. Meanwhile, it must also have a core and by this be definitely different from pattern No. (vi). Section IV.3 and Section IV.1 contain very good examples of this type of pattern. It could be argued that these abnormally simple patterns might well belong to pattern No. (vi).

(iii) The Star pattern. This structure has a very small core, usually only one block. However, in rare cases this core might have up to four or five blocks which usually represent the same concept. For example, the core might be composed of a subject's family and she has arranged such blocks as I^1 (father), I^2 (mother), I^3 (sister), I^4 (child) and perhaps S^{44} (family) so as to maximize their P value. More important in recognizing this pattern are the evident strings or tangents to this core. The pattern thus imitates a star with three or more arms or tangents to it. The blocks in these tangents are typically arranged using a P = 2 value per block. Naturally this excludes the first and last blocks belonging to the tangent or arm of the star. This pattern cannot be confused with pattern No. (ii) as the core is much smaller. The following "pattern" (hierarchical) may sometimes be confused with this star.

(iv) The Hierarchy. This category or structure is certainly ill-labelled at present. Only its fairly consistent use by subjects has forced it to be considered as a pattern in its own right. However, for the student of taxonomies, it is conceded that in its present form it is not homegeneous with the other categories developed here. It may be argued that this pattern resembles a modification of pattern No. (iii). The concept of a hierarchical pattern is that one block or a small group of blocks evidently is being used in a

causal manner. This block is usually, though not exclusively, placed at the top of the structure. From it, a number of worlds or concepts are developed which will make up the structure. This hierarchical pattern is almost always found to develop vertically downwards. The pattern evidently is much more complex than either patterns No. (iii) or No. (v). That is, the P values of the blocks which follow from the key block have a greater value in these two alternative patterns. In addition, there is often a conscious use of the time dimension (See 9) which is not exclusive to this pattern, but may be found to be more frequently used with a hierarchical structure. It is believed that further research using in-depth interviews with S, interviews with acquaintances of the subject and other techniques such as semantic differentials will clarify the role of this pattern. Perhaps it may be possible to redefine it in terms better related to this taxonomy of patterns, even to the extent of re-classifying it among other patterns.

(v) Uni-dimension or linear pattern. This structure is marked first of all by the complete absence of a core. The subject has placed his blocks in a left-to-right sequence. There may be a number of rows used especially in the more complex of these patterns. That is, sometimes rows are used here as another means of dividing the concepts or worlds in which the subject functions. Necessarily, the linear origin worlds are formed from a less complex differentiation and they also represent less complex and usually less deep interactions with these worlds. More frequent in these uni-dimensional patterns is the use of one row with blocks placed in a perpendicular fashion along this row. That is, there is one sequence, perhaps beginning with "Me" with items placed

in a decreasing order of importance as they move away from "Me" and towards the right of the matrix. Blocks which are of equal value to each other are usually placed along the same columns, thus still respecting the sequence. Examples of both these types of uni-dimensional patterns are found at the end of this section.

(vi) Scatter of random pattern. This is a structure with no evident pattern. In over one thousand subjects tested, only one subject admitted to a conscious attempt at creating a random pattern. In fact, his test behaviour resulted in his attempting to space the items or blocks away from each other. He had been concentrating on spacing these blocks along the rows, but many blocks had P values due to their position in terms of columns. More typical is the situation where the subject has no overall or intended structure and is trying to faithfully reproduce the type of interactions belonging to individual items. Examples of this type of matrix are found in Appendix F.

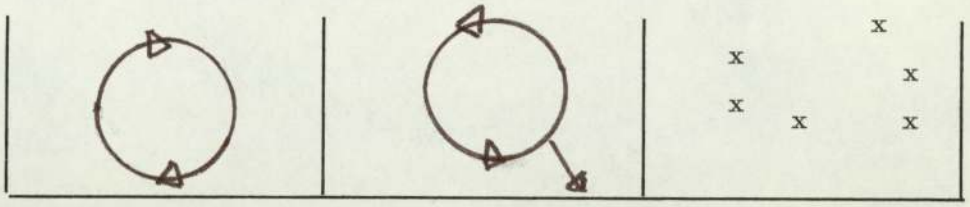
(vii) Adolescent pattern. This pattern cannot be distinghished in simple pattern recognition terms (Sutherland, 1972). Only when the actual block labels are considered can this be seen as a separate category. This same situation can be said to apply to the labelling of a matrix's pattern as hierarchical. Whereas both adolescent and hierarchical patterns may rely on the block labels to be confirmed as separate types, only the hierarchical pattern has been judged as a separate pattern in terms of pattern recognition, i.e. it can be spotted usually. Most important in determining the adolescent pattern as a separate category was the difference found in patterns which corresponded to differences in age. In Section III.4, there is a discussion of the development

of Game patterns with maturation. It is evident that certain subjects have yet to solidify or organize their self-concept and thus have produced a more random-like matrix. Despite this evolution of the self-concept as represented by the Game, it is feasible that many patterns will never develop into clusters and groupings. This lack of structure is believed to be linked to creativity and will be the subject of future research. In fact, pilot studies are already completed and suggest that this hypothesis may be correct (Tivendell, 1973). Other taxonomies have been suggested though they have not yet been studied very closely. These can be found in the correlational studies cited previously. Two hypotheses connected with this pattern analysis have attracted the interest of researchers now using the Game. The first is that of building a continuum of patterns. For example, it may be found, as suggested in Section III.4, that different patterns correspond to different stages or levels of psychological maturity. Figure 7 represents three possible continuums of patterns which could be applied to future research. These future studies would need to involve a longitudinal aspect and therefore have been excluded from this review.

A second hypothesis of interest to pattern analysis is the possibility of representing these patterns in terms of distances. This method has become very important in differentiating "leaders" from other subjects and in developing a new concept of leadership. For a further discussion of this, the reader is referred to Section IV.5. However, attempts to differentiate patterns other than clusters, in terms of distances, have been less successful. Data are now being analysed with this hypothesis in mind but alternative definitions

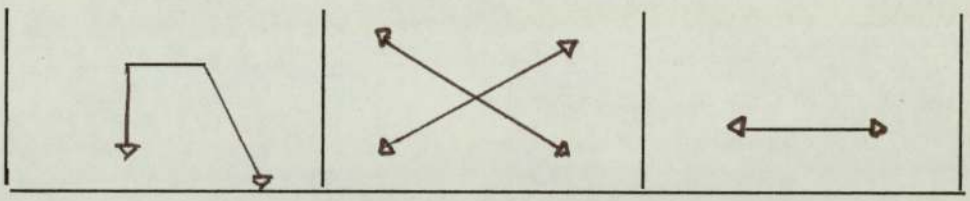
Figure 7 : Three possible continuums underlying the Game's different patterns

1.



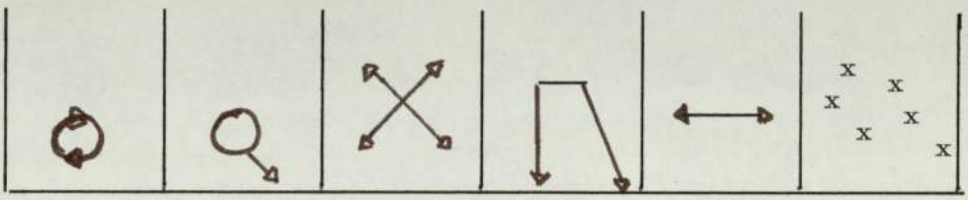
cluster; grouping; random;

2.



hierarchy; star; linear;

3.



cluster; grouping; star; hierarchy; linear; random

of axies may ultimately be more rewarding. Distance values using other anchor points and various combinations of blocks, such as those belonging to authority, work, the family, etc. are being explored.

Finally, Appendix F gives real examples of the patterns just introduced. These are amenable to the use of information theory in pattern recognition analysis. For example, a first-order analysis could look at one block at a time. A second-order analysis could look at overlapping pairs.

5) The P Value

This is certainly the most promising way of analysing the Cognitive World Structure Game. The scores developed here are relationship values which have been found to be psychologically relevant to the way people interact with their environment. The following chapters will all use and explain in greater detail this analytical technique. In particular, the reader is referred to Section IV.4 (ipsative use of the Game). The full extent of the meaning of P values is still to be examined. Many of the on-going research and future research projects will contribute to our understanding of it. The discussion will deal with only the basic or first-order relationships, yet will in many ways be relevant to second, third and other relationships.

In this analytical technique, each block used in a subject's matrix is given a numerical value. The value that a particular block receives depends on the number of other blocks actually in contact with it. Figure 8 gives two examples of part of a matrix with these values placed on the blocks themselves in lieu of labels. The value attributed to any individual block may range from 0 to 8. The more blocks touching a certain block, the higher its P value.

Figure 8 : The calculation of P-values

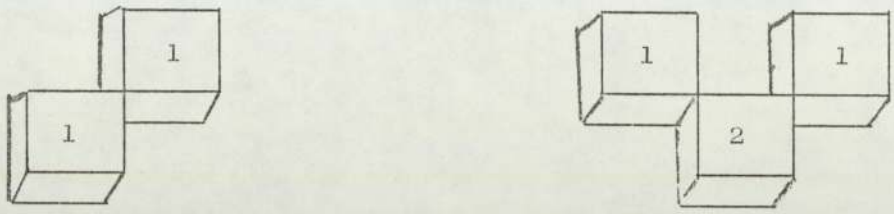


Figure 9 : Two equated examples in the calculating of P-values for the Game

(i) (ii)

The maximum value any one block may have is 8 as this is the maximum number of blocks which can touch it. Note that in this first-order analysis, the P value which is attributed to a block does not depend on the part of the block touching the other blocks. The same P value is attributed whether two blocks are touching each other at full face (See Figure 9, part (i)), or on their corners (See Figure 9, part (ii)). If this analysis is developed further, a P value of 2 could be attributed to two blocks touching each other at full-face, whilst a corner relationship may be given a value of 1. Similarly, second-order analysis may attribute differential P scores. For example, two blocks separated by only one blank square on the Game's grid could also be given a P value, but one which is less than if the blocks were actually touching . A still more complex analysis might incorporate the concept of distance. However, it was hypothesized that this first basic analysis would determine the extent to which a subject's cognitive world structure could be quantified. Other researchers will need to investigate techniques based on their own research needs.

Of greater importance are the present uses of this basic P value. First, each matrix is interpreted in terms of an overall P value. This is simply determined by summating the P values for each individual block. Similarly, a P value may be calculated for each category. These values are then respectively PI, PO, PS and PE for the categories of individuals, objects, social constructs and events. Next, scores were developed which could cover the number of blocks used. Here the total P value for a matrix was divided by the total number of blocks used by that subject. This was called the P/N ratio. Similarly, P/N values may be calculated for each

category: PI/NI, PO/NO, PS/NS, and PE/NE. These ten separate scores in addition to the above five N scores may be calculated for the individual matrices as well as for a sample population. Section III.2 contributes to the understanding of these scores in terms of personality characteristics.

6) Distance

The above analytical technique involved the quantification of concepts such as Angyal's biosphere (1941) and Lewin's "personal space" (1951). Another concept very similar to these is the idea of "personal distance" (Sommers, 1967). This is the basic idea underlying the use of a distance score in the Game using Pythagoras' theorem, through which distance of all blocks from a given block may be calculated. The computer programs developed for "scoring" the Game calculate these distances (See Appendix E). The block chosen as the "given" is called an anchor point and is discussed below. When comparing two individuals or two samples of subjects, similar anchor points must be used. Because not all subjects use similar blocks, a hierarchy of these anchor points is made so as to systematize such analyses. The following is a typical hierarchy used:

1. the "Me" (I^{13}) block
2. the calculated pivot
3. the anchor point given by the subject
4. the top left-hand most block in the matrix
5. the first block used by the subject for example

For example, two subjects may be compared on their Game scores. One subject may have used the I^{13} block (Me), whilst another may have used I^{10}, as meaning both himself and his wife. If so, these two anchor points would be used to calculate the distances. In another example, one subject may not

have used either a Me or I^{10} block in that fashion. Then the matrix' calculated pivot (See 8) is used. Note that other hierarchies beginning with the calculated pivot may be used. A distance value can be calculated for a subject or a sample. For example, the average of the distances for the matrix can be used rather than individual blocks' distances. The distances per category may also be calculated. These would respectively be DI, DO, DS and DE (See Section III.2).

7) Cluster Analysis

The results reported in the following studies might be analysed using a standard cluster analysis statistical package. The technique used is very simple in terms of information retrieved, though the statistical treatment is quite complex. The treatment's grouping of items and subjects has not revealed any useful information in pilot runs, but a computer programme is being prepared for the purpose of analysing the whole matrix in these terms. This programme is being developed at the University of Essex and is not yet available.

8) Anchor Points

This is the simplest analysis which has been carried out and has contributed useful information. Basically, a focus point is either chosen subjectively such as I^{13} (Me), I^{10} (husband/wife), or calculated from the Game scores. Often, subjects begin to build their cognitive world structure around such a point. The typical anchor points chosen by the subjects are I^{13} (Me), I^{10} (husband/wife), S^{44} (family), and so on. In a study of members of a bible class for example, many subjects used a blank block upon which they wrote such words as: "God", "Christ", "Religion" or so on. However, in terms of P values, the centre of gravity or focus of the matrix is not always that anchor point chosen by the subject.

An example discussed in Sections IV.1 and IV.4 is the matrix of a middle-aged manager who had to face an occupational decision. Despite his overt assurances that he was worry-free and quite decided on what to do, the calculated pivot showed his concern for his health. Meanwhile, his proclaimed anchor point was I^{13} (Me). A second matrix is from a subject who sought the advice of an occupational counsellor (See subject No. 66, Diagram 2). Here, an interview revealed that she was very dependent on her boss. That is, the uneasiness she felt in her life was in fact linked to this dependency and not to her actual occupational situation. In this matrix, the calculated pivot is circled in red. The subject was above average in intelligence and had manipulated her self-concept so as to have the real centre of her cognitive world structure (I^{12} "boss") very close to her professed centre, i.e. I^{13} (Me) as the anchor point. For other anchor points, the reader may consult the hierarchy developed in Section II.6. The present routine is to calculate the pivot by using the P values. The maximum P value per row and per column determine the focus point of the matrix. When this focus point meets on an occupied block in the grid, the result is called the calculated pivot. Other researchers may wish to modify or determine new anchor points depending on their particular needs. These anchor points are of particular use in counselling-type situations where ideographic analysis is preferred.

9) Dimensions

It is often important to verify on which dimensions the subject has built his cognitive world structure. Almost all subjects use a type of "importance" dimension. This is quite closely linked to the concept of personal distance (See above). And this is what would be normally expected from the

DIAGRAM 2

Subject No: 66 (a female)

					26	23	47	63	64					
			42	50	49	46	I_{12}	44	I_{11}	I_7	I_6	I_8		
						I_1	I_{13}	I_2	45	24	I_9	67		
					66	65	I_3		27					
									22			48		
											61			
											29			
											21			
											25			

instructions (See instruction No. 9, Appendix B). However, a few subjects have used a "time" dimension. Some, for example, have wished to structure their environment along this time dimension. They generally begin with their parents (I^1 and I^2) or their parent's marriage in the case of the younger and/or more religious of these subjects. Some subjects merely structure their own world in terms of past, present and future. As the number of subjects who did use this alternative dimension has been quite limited, no systematic study has yet been done.

II.3.5 Reliability

Most psychometricians would accept a definition of reliability such as the one given by Wright and Taylor (1972). In essence, it says that a test is considered reliable if it always measures the same characteristics even when the subject populations or the experimenters are different. The following summary describes the types of reliability:

1) Test-retest reliability or repeat reliability

Here the procedure is to test two groups of S, randomly selected from a normal population as follows:

Repeat reliability

Subjects	time 1	time 2
Group X:	test a...	(time elapsed)... test b
Group Y:	test a...	(time elapsed)... test b

A high correlation between results of tests a and b are taken as indicating a high degree of reliability. There are certain faults in this simplistic model. The experimenter must state the interval between the test-retest situation. If it is too short, this increases the possibility that the Ss will remember and hence their performance will be affected. On the other hand, if the interval is too long, this will

increase the "error variances". Factors such as new learning, health, life events will produce random, time-to-time fluctuations.

2) Equivalent-form reliability

The evolution of this type of reliability testing has also come from psychometric models. Inventory-type measures lend themselves well to this technique which demands that two forms or versions of the test be available and that these should be as similar as possible. In an experimental paradigm similar to that in (1), the convariance of the two forms is calculated and if it is substantial, the test is considered reliable. Two basic disadvantages are the fluctuations occuring between form A and form B and from time of test (a) and time of test (b). Note that two forms are equivalent only if the means, standard deviations and inter-item co-variance are the same. Inventory measures dealing with the S's general attitudes, behaviour, emotions and so on can more easily have a duplicate stimulus set to elicit the responses. For example, to find a S's attitudes towards authority, one may ask him to describe his feeling and behaviour towards a number of people and in a number of circumstances. Similarly, projection tests may use this type of test reliability, though the production of equivalent forms can be quite difficult. How does one assess the "equivalency" of two ink blots? The production of two stimulus sets for the Game, both representing the S's (whole) cognitive world, is impossible. Unless a brother could be equated to a sister, a mother to a father, a television to a car or, on the other hand, if each subject had two of everything such as wives, jobs and mates, both of which are equivalent in all respects, reliability cannot be measured in this way.

3) Delayed-equivalence procedure

This procedure is a combination of the first two methods, and it has similar disadvantages. That is, any correlation found between the two forms of the measure which have been administered in sessions separated by a time interval is decreased by both the changes affecting an individual and the differences between the forms and their items.

4) Split-half reliability or coefficient of reliability

There is a fourth method which has been developed to overcome some of the disadvantages described above. This method uses only one form of a test; half of the test is correlated with its other half for the same subjects. The usual procedure is to correlate the odd numbered items of the test with the even numbered items. If this correlation is high, the test is considered reliable. Again, the Game cannot lend itself to this procedure basically because it does not contain items as such. The nature of the whole matrix is that of an indivisible "Gestalten".

A number of other points should be mentioned. First, the reliability measures available for use with the Cognitive World Structure Game are limited in nature and number. From their descriptions given only the test-retest method can be used. Next, the origins of these methods of testing reliability developed from the need to explain recorded variations in scores. Thus, to some extent, the better the test, the more reliable it is, despite these "nuisance" variables. Also, the origins of these tests of reliability are linked to the type of tests they were designed for, i.e. traditional inventory measures. The determinism that traditional models impose on new measures is again obvious. Despite the preferences for present inventory models with these types of

reliability measures, Section III.2 will underline the low levels of reliability recorded by some popular tests of personality. Mischel (1967) also has argued this point quite extensively and pointed out that this happened even though their authors took pains to control all the extraneous variables they could in their reliability studies. The Game, on the other hand, has been in existence for less than three years. Its reliability studies show that the Game has been influenced by the same variables that previous experimenters have attempted to control. It is also important to note that most of the traditional tests permit the subject to choose from two (yes or no) or three (yes, no, don't know) alternative responses. The Game, on the other hand, has a 15 x 15 matrix into which an item can be placed. As with inventory tests, previous answers often affect a subject's "degrees of freedom" in answering the next question. That is, it would seem much easier for a subject to repeat himself when certain alternatives have been excluded from his repertoire. In the case of a three-alternative-responses inventory, test behaviour and reliability study results are certainly made more predictable. This determinism is also affected by the type of stimuli used in inventory tests (See Section II.2.1). For example, an intelligent subject attempting to hide his neurotic behaviour during a test will certainly be able to hide it again on most retest items because of the cues he will recieve from the stimuli. The Game, on the other hand, has too many alternatives available to the subject. If the subject does repeat himself on a retest, it is due to other factors than the determination such as described above. A 15 x 15 matrix with forty-one labelled blocks together with the open-endedness of the five blank blocks constitutes the

basis for an extremely high number of possible patterns and scores. In this context, demonstrated reliability with the Game must mean a special degree of accuracy.

The following are examples of the reliability of the Game in a simple test-retest paradigm. These examples have test-retest time intervals ranging from two weeks to over two years. (Table 3 is a summary of the data)

Subject No. 26 has a test-retest interval of exactly two weeks. Both her overall pattern and the matrix scores show a high degree of consistency. This is unusual due to her age. Unlike the other subjects, she was not specifically asked to return for a retest. However, other circumstances forced her to return to the department and only then was she asked to participate in the retest. She, therefore, did not have the opportunity to review her test behaviour for the express purpose of a retest; though the power of the Game probably did cause a certain amount of review to be carried out while she was away. The pattern, matrix scores and other information concerning this subject are reviewed in detail in Section IV.4. In summary, quite identical patterns and matrix scores are found in a test-retest interval which is very short. (See Diagram 3)

Two matrices produced by an experienced psychologist have been included here (No. 32). This is just one example of what might be termed "immediate reliability". If a subject were to complete an identical form of the E.P.I. immediately after answering a previous one, we should expect identical scores. It is known that subjects can, at will, manipulate the E.P.I. (See Section III.2) so as to either change or reproduce their personality profile. However, the Game is intended to examine the subject's cognitive structure rather

TABLE .3 The test-retest scores for seven subjects. This also includes their interval period for the two sessions.

SUBJECTS SCORES: (test=a ; retest=b)

No: 5

Valences

	a	b
P	82	48
PI	25	5
PO	31	15
PS	14	14
PE	12	14
P/N	2.73	1.60

Number

	a	b
N	30	30
NI	9	7
NO	9	8
NS	7	9
NE	5	6

Calculated pivot : a) 13
b) 63

Time interval : 2½ years

No: 15

Valences

	a	b
P	46	30
PI	19	12
PO	9	10
PS	13	5
PE	5	3
P/N	3.54	3.00

Number

	a	b
N	13	10
NI	4	3
NO	4	3
NS	4	3
NE	1	1

Calculated pivot : a) 10
b) 13

Time interval : 6 months

TABLE .3 (continued) The test-retest scores for seven subjects. This also includes their interval period for the two sessions.

SUBJECTS SCORES: (test = a ; retest = b)

No: 27

Valences

	a	b
P	20	18
PI	1	3
PO	7	5
PS	12	10
PE	0	0
P/N	1.18	1.06

Number

	a	b
N	17	17
NI	4	4
NO	5	5
NS	8	8
NE	0	0

Calculated pivot : a) 24
b) 14

Time interval : 12 months

No: 29

Valences

	a	b
P	152	150
PI	50	62
PO	38	19
PS	52	43
PE	12	26
P/N	4.22	4.55

Number

	a	b
N	36	33
NI	13	12
NO	8	7
NS	9	9
NE	6	5

Calculated pivot : a) 23
b) 44

Time interval : 2 years

TABLE .3 (continued) The test-retest scores for seven subjects. This also includes their interval period for the two sessions.

SUBJECTS SCORES : (test = a ; retest = b)

No: 44

Valences

	a	b
P	88	96
PI	17	26
PO	18	10
PS	41	38
PE	12	23
P/N	2.67	2.53

Calculated pivot : a) 50
b) ø

Time interval 2 years

Number

	a	b
N	33	38
NI	10	9
NO	8	9
NS	11	11
NE	4	8

No: 41

Valences

	a	b
P	60	56
PI	28	20
PO	3	8
PS	19	16
PE	10	12
P/N	2.22	1.93

Calculated pivot : a) 6
b) 23

Time interval 18 months

Number

	a	b
N	27	29
NI	9	9
NO	3	5
NS	9	8
NE	6	7

TABLE .3 (continued) The test-retest scores for seven subjects. This also includes their interval period for the two sessions.

SUBJECTS

SCORES: (test = a ; retest = b)

No: 26

Valences

	a	b
P	78	64
PI	51	35
PO	14	8
PS	9	17
PE	4	4
P/N	3.71	3.20

Number

	a	b
N	20	20
NI	10	9
NO	5	4
NS	3	5
NE	2	2

Calculated pivot : a) 13
b) 13

Time interval 2 weeks

Diagram 3

S 26 Test (Matrix "a")

						42	10							
						8	2	1						
						7	13	4	3	14				
									15					
									21	22	47	62		
											27			

Diagram 4:

S 26 Retest (Matrix "b")

							6							
					42		7							
				8	2	1	13	4	3	14	21	62	22	
							23		15					
							46							
							63							
							47							
							28							

Diagram 5:

S 32 Test (Matrix "a")

9	67	65	66	41	49									
				13	61	43	10	5	51	52	21	48		
				1	2	68	3		7					
				46	47	11	12	63	64					
				8	6									
				45	26	24								
				28	62	22	27	23	25	29				

Diagram 6 :

S 32 Retest (Matrix "b")

9							8							49
						10	5							
							13							
				61	43	51	52	21	48					
					1	2	68	3	7					
				46	67	11	12	63	64	8	6			
		28	62	22	27	23	25	29	45	25	24			
41			66							65				67

than attitudes and is more reliable. Subjects who play the Game sometimes advance the hypothesis that they could have structured their matrix in a completely different manner. In this case, an experienced psychologist (No. 32) made the same claim. A brief scrutiny of the test-retest matrices reveals a high degree of similarity. First, the patterns are very similar; both are fundamentally hierarchical yet each section uses a linear sequence. In the test version, the uppermost blocks have negative valences and in the retest, they are also separated from the main groupings. Similarly, the least important, though still positive items, are grouped in both matrices. That is, blocks Nos. S^{45} (leisure/hobbies) to O^{29} (savings and investments) in matrix "a" are quite similarly placed in matrix "b", see blocks O^{28} (privacy) to O^{24} (family). The other rows are also very similar in both matrices. It should be remembered that the subject was an experienced psychologist, yet his cognitive world structure was not modified substantially.

The next subject, No. 5, is the least reliable of all the subjects tested, including pilot studies. He is a young man in his early twenties. At the time of the first testing (matrix "a"), he had just experienced a dramatic change in his career pattern. Not only did he change fields, but he also changed occupational status, i.e. from the role of a teacher to that of a student again. His changed circumstances affected his self-confidence in a positive way. Note particularly the P/N (test a = 2.7, test b = 1.6) and P (test a = 82, test b = 48) scores. As a student, he was permitted a much more extensive amount and different type of interaction with people (PI). Similarly, he acquired the interests of his student friends (PO) which include for

Diagram 7 :

S 5 Test (Matrix "a")

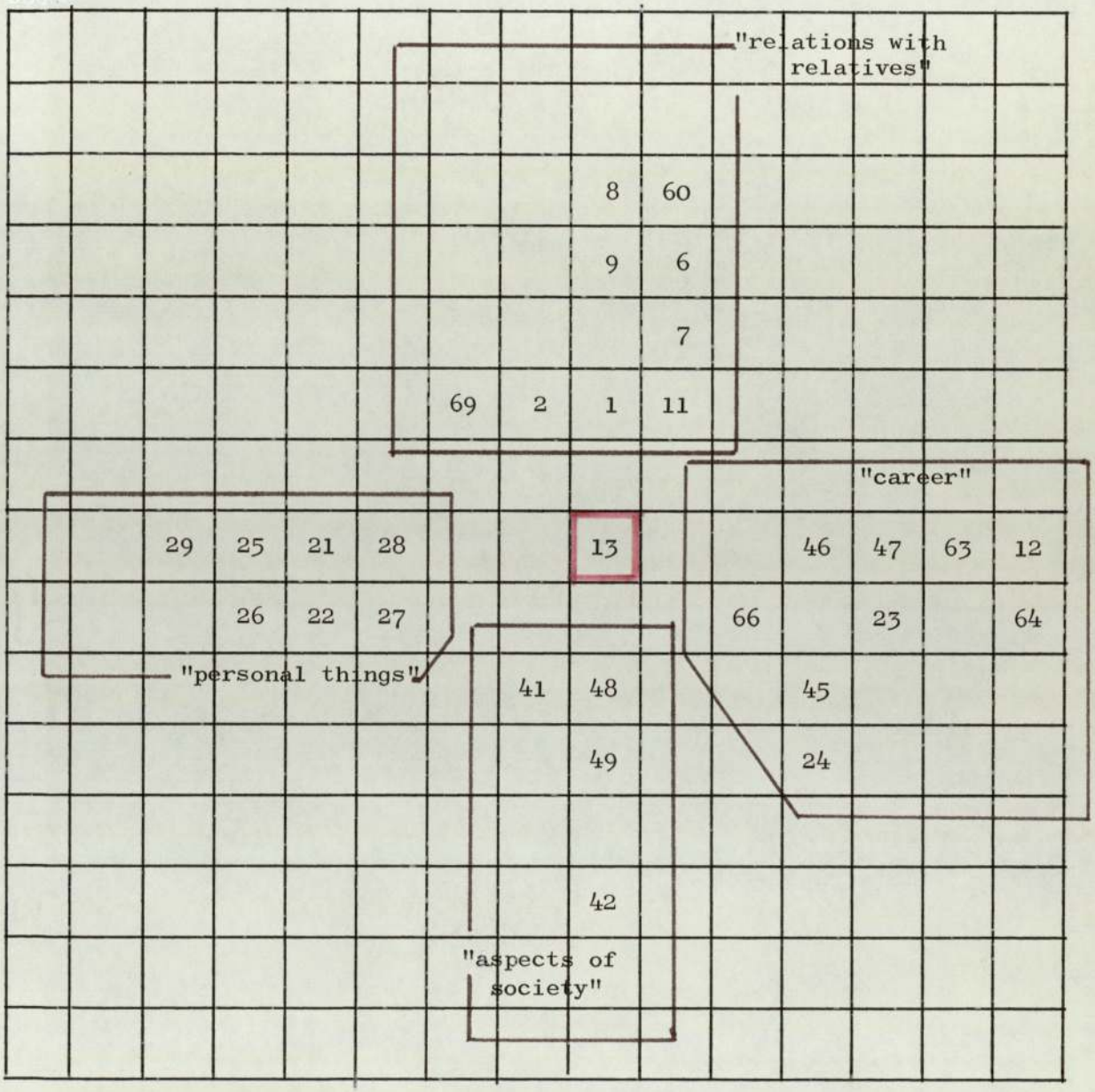
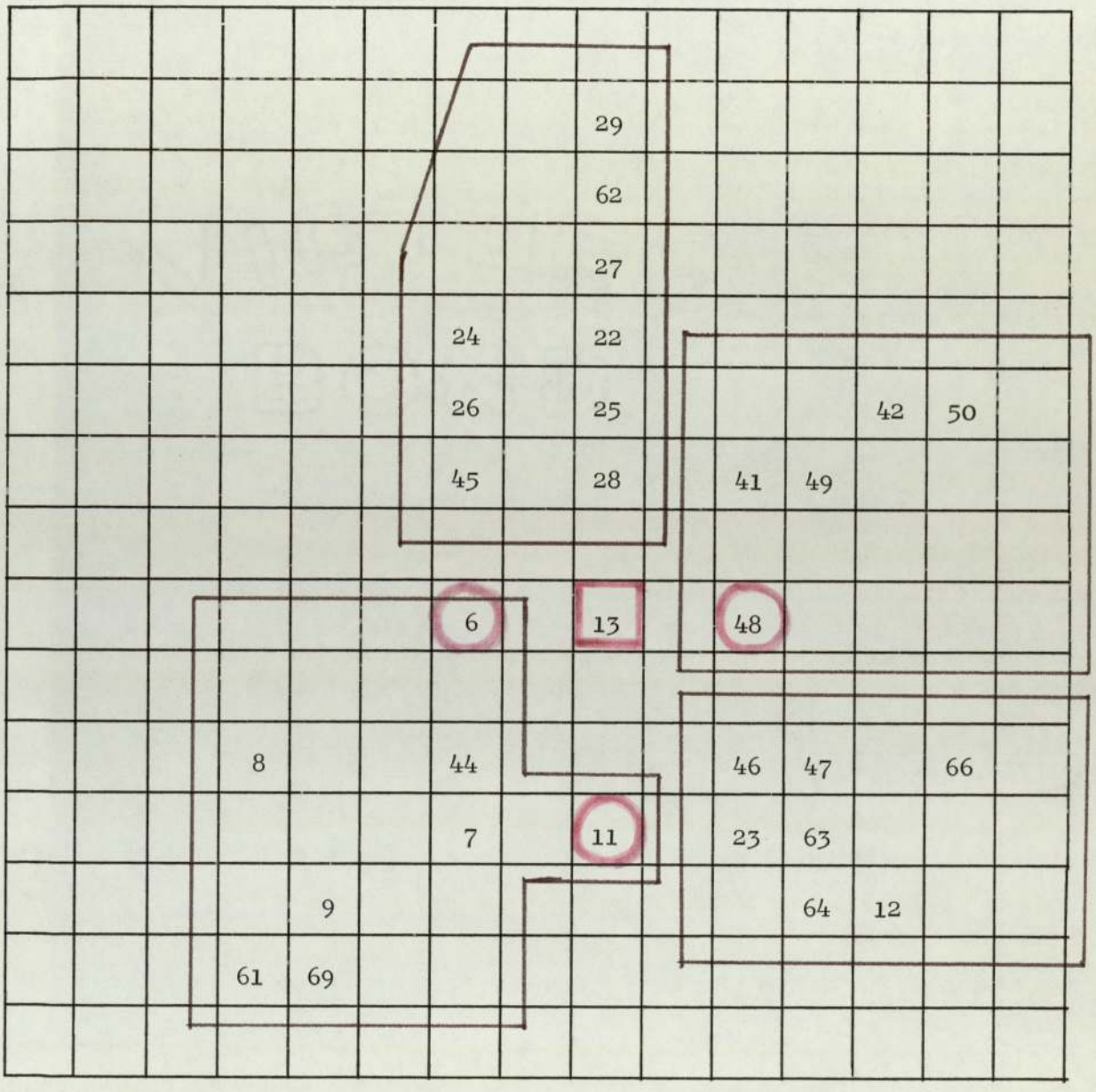


Diagram 8 :

S 5 Retest (Matrix "b"



instance their electronic and stereophonic equipment. Subject No. 5's retest took place just over two years later (matrix "b"). Since then, he had graduated from his university course. He had held two minor jobs since graduation, neither in his newly-chosen field. At the time of retesting, he was unemployed and had no firm idea or hope as to when and what his next job would be. He had also lost touch with all his student friends, as they had dispersed all over the country. This is reflected in his lower PI (test a = 25, test b = 5) and NI (test a = 9, test b = 7) scores. Similarly, his interest in the material aspects of his world had diminished (PO: test a = 31, test b = 15). Also, the minor increase in the number of social constructs used is noteworthy. Sections follow which will refer to the social construct as an attempt of the part of the subject to adopt extrinsic structures so as to attempt to stabilize his cognitive world structure. The most marked of all changes is to Subject No. 5's self-concept as represented by his P/N and P scores. Despite these rather drastic changes in valence, and remembering that this subject's self-concept may not yet be fully "crystallized"*, the patterns produced are remarkedly similar. The major groupings of items in both patterns have been circumscribed to facilitate the reader's task (the titles are the subject's own). Two notes may be of interest here. First, the subject took a much greater amount of time and effort to try and structure his retest-matrix. Thus, blocks Nos. I^{6} (new friend), I^{11} (workmates), S^{48} (privacy) and to some extent S^{41} (law/police) (matrix "b") have been

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*See Super, 1953; he hypothesized that a person's self-concept and integral part of personality increased in definition as he matured and eventually became fixed or crystallized.

used to link the various groupings. This "linking" or overt attempt at structuring did not take place in the first testing (matrix "a"). Secondly, the reader may wish to speculate on the overall neatness of the structures as well as their internal consistency and credibility. Has the subject indeed matured over time or is he now fighting to regain his "old" self?*

The next subject to take part in the reliability study is No. 15, a young married woman in her mid-twenties. The writer's experience as a psychologist, particularly in face-to-face relationships in educational counselling, led to the idea that there may be a connection between a particular Game pattern and psychological stability. For example, it is believed that when faced with a traumatic event such as the removal of one of the key individuals in the matrix, this type of pattern would tend to change more dramatically. This is in keeping with the common experience of people with less flexible personalities, who in everyday circumstances, cope very well, but who in times of abnormal stress show rigidity and a low adaptation level. This should become the subject of further research (See Section IV.4). At the time of the first testing, the subject had just been married (S^{43} marriage and S^{51} future). She was also very worried as to her father's future (S^{51} future and S^{52} future) as he had just lost his wife (I^2) and was now "losing" his only daughter through marriage. There were also more peripheral yet

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*Professor C. H. Patterson of the University of Illinois, a specialist in the fields of counselling and psychotherapy, suggested that the Game would be very useful in the field of psychotherapy and personality change. For example, have the subjects in a psychotherapettic or behaviour modification treatment group undergone merely attitudinal or real personality changes?

Diagram 9 :

S 15 Test (Matrix "a")

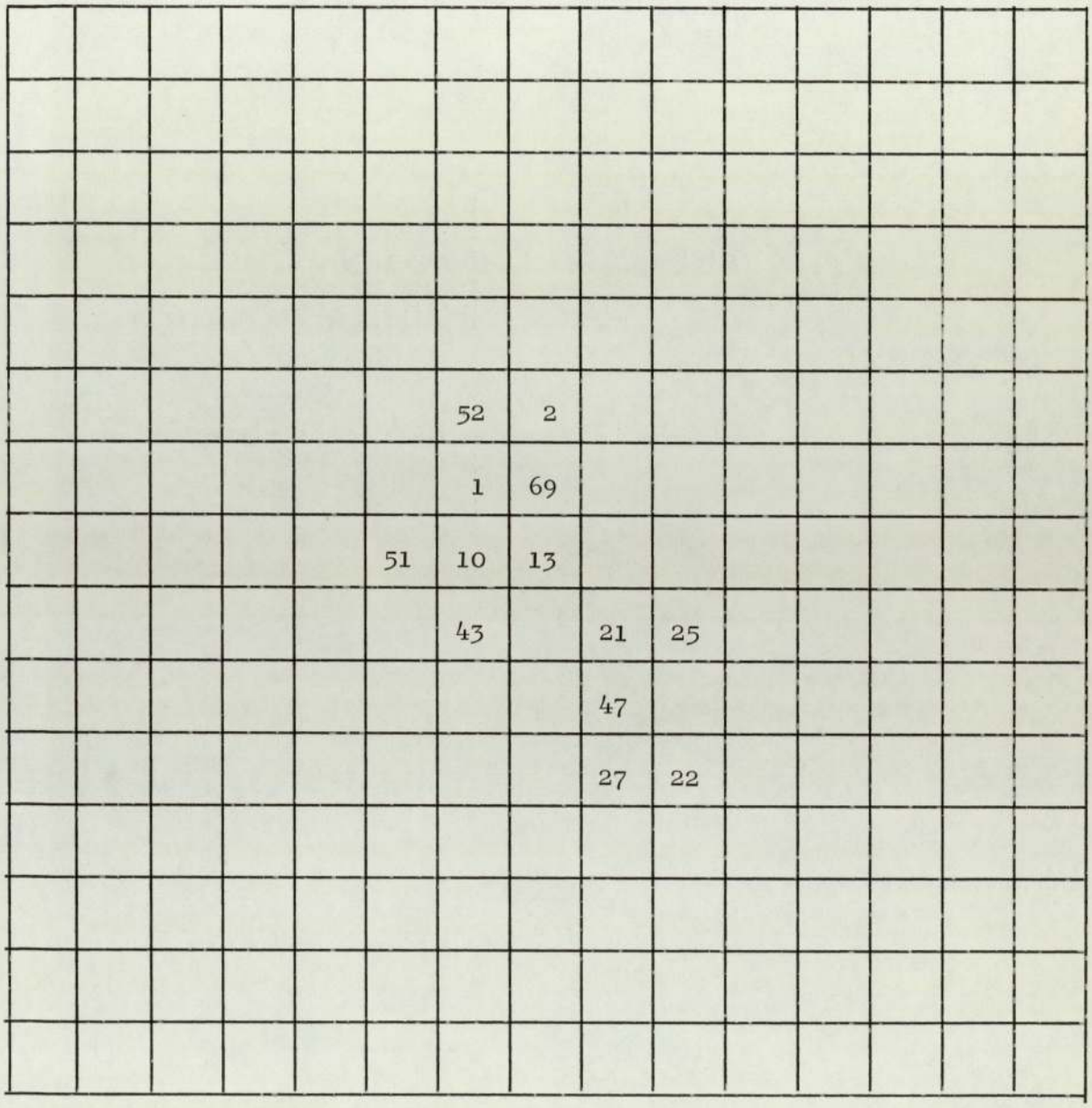


Diagram 10 :

S 15 Rêtest (Matrix "b")

							51							
						69	1							
							13	10	45					
								21						
						47	27	22						

still important considerations as to the place of work (S^{47}) and the organizing of her newly acquired house. For example, she is very interested in interior decoration. Note in the retest some six months later, certain alterations were predictable. The role of marriage (S^{43}) was now simply incorporated into the relation of I^{13} (Me) and I^{10} (husband). Her father was found in fact to adapt quite well to his new life and, therefore, one of the "future" blocks (See S^{52}) was removed. Similarly, I^{2} (mother) has dropped since the death of her mother and the loss now felt were no longer separate concepts. Thus, block E^{69} (death of close relative) now amalgamates both. Perhaps in a similar fashion the concept of O^{25} (personal possessions) became redundant. The world described by this subject has remained rather similar in its simplicity. Predictably, the ties belonging to her pre-marital world are being eroded and the marital ones becoming more prominent. Finally, her father, whose situation and health has since improved, has moved closer to the core while still remaining quite a separate part of her world. It seems in retrospect that the timing of the first testing session, i.e. following the death of her mother and her marriage, along with the role and importance of her husband, (I^{10}), has helped to stabilize the existing pattern.

Unlike subjects No. 15 and No. 41, Subject No. 27 has not had any major problems in her family life, though since the test session, she was obliged to give up her job. She is a lively woman in her mid-thirties and happily married. She also has young children of school age. A few months prior to the first test session, she had begun a full-time job which re-vitalized her self-concept in terms of interests and social contacts as well as enabling her to make a

Diagram 11 :

S 27 Test (Matrix "a")

B = children

10	B	48												
21	29													
44														
45	24	23	46	51										
50	42	49												
47	27													
9														

Diagram 12 :

S 27 Retest (Matrix "b"

B = children

10	B			21	48	29								
			52											
45	24	46	23		51									
49	50	42												
47	9			27										

financial contribution to the home. A month prior to the retest session, her husband and children were always more important in her life. However, the past year had taught her the increased value of her new friends at work in terms of her self-concept. It is not unusual, therefore, to see the structure becoming tighter, less widespread and marginally affecting the matrix scores. For example, there is an increase in the PI score and indeed a marginal decrease in the valence attributed to the material side of her world. In summary, with these subjects, scores are very reliable even when faced with rather important changes in life events. The interval between the test-retest sessions are reasonable in terms of psychometric methodology, except for subjects No. 26 and No. 32 who had respectively test-retest intervals of two weeks and immediate or none at all.

The next subject, No. 29, is a young male in his early twenties. At the time of the first session, he had been working as a technician for a few years. He was still working for the same organization two years later at the time of the retest session. Naturally, the subject had increased in maturity as well as age. The prospect of marriage had rendered him much less carefree. He was holding down a job which was relatively uninteresting for him, satisfying only the more basic needs of territory and income. He was often absent from work and the quality of his work was often reached at the expense of other tasks. An important source of stimulation and self-definition had been his political interests and activities. At the time of testing, his life was more consistent and politically active. He still held certain political views about socialism, but his activities were less frequent. He was even contemplating a job as a

Diagram 13 :
S 29 Test (Matrix "a")

						21	44	8						
					3	2	10	1	4					
							13							
					9	6	46	7	67					
			41	50	49	45	23	24	42					
				25	28	27	47	11	12	66				
				62	29	22	61	64	63	48	5			

Diagram 14 :

S 29 Retest (Matrix "b")

			49											
			6				11							
			24		22	5	7		46					
			23		43	61	13	47	12	41				
			45		8	42	44	66	62	29				
			67		25	10	1	28	21					
			9			48	2							
							3							
							65							

teacher which would have meant returning to college for training. Such long-term projects had never been contemplated earlier. There is thus a new aspect to his perception expressed in a tightening of his pattern or cognitive structure. Events and individuals are attributed more valence in his cognitive structure. Meanwhile, the subject's ideas on materialism and his tendency to over-verbalise these were being amended with a corresponding decrease in PO and PS scores respectively.

Subject No. 41 is the subject of extensive discussion in Section IV.4. Not only has her pattern changed, but her overall behaviour has become more introverted. Of special interest here is the general move towards the upper left-hand corner, a sort of "coward" or "fear-reaction". On an item basis, this is reflected in a number of ways. For example, many of the blocks found at the very bottom of the matrix were, in the second version, turned around (i.e. the labels read by turning the whole matrix). Another example is a block which was labelled "help" and another "a place to go" in this second matrix (b). The subject's high intelligence and her increased dependence on a behaviour style of being afraid, used to attract attention and "sympathy", make the actual conclusion of "neuroticism" doubtful. This is further emphasized by the hierarchical-type pattern found, usually a sign of a well-ordered though not deeply intellectual type of personality. The reliability of her Game's scores and pattern is rather high. This will be still more apparent when considering some of the events which happened since the first test session (Section IV.4). The time interval between the sessions was eight months.

The last subject discussed in this reliability section is

Diagram 15 :

S 41 Test (Matrix "a")

			13											
		1	2											
			44	45	48									
			3		46									
			65		23									
					47									
					11									
		12		7	6	9	67	51						
		B			63									
					52									
					66									
21		43		61		28		64						

B = end

Diagram 16 :
S 41 Retest (Matrix "b")

13		47	46											
1	2		23	25		45	48							11
	44													
65														
3			12	9	67	6								
	69		62											
			51		7									
			52											
	61		21		5		43							
											29	63	28	64

51 = Help

52 = place to go

Subject No. 44. He is a male in his early thirties. He looks and acts in a lively, young sort of way, is married with two children, and is a technician in a Midlands organisation. The test-retest interval was of exactly two years and 6 days. Keeping in mind the possible range of values that can be found for the Game's scores, this subject's own scores are remarkedly similar, although at first glance the test-retest patterns are rather dissimilar. That is, although the type of pattern and, to some extent, the pattern's form, are similar, the contents do not seem to be; particularly the fact that I^{13} (Me) is not central to the test matrix (a). However, the subject expressed in the first interview that he felt "as if (he was) two different people". That is, the main anchor point was I^{10} and included both himself and his wife. This is a ploy used fairly frequently. The other side of the subject's self was represented by I^{13} (Me). Among other things, this second self is the type of role that he plays whilst in his world of work. This divided self will be seen to be, in a moderate way, a means of dividing the environment into separate worlds.

The simpler and more peripheral groupings in his matrix (a) should then be analysed for both similarities or dissimilarities. The most peripheral group of blocks is the pair composed of I^{15} (baby) and I^{3} (sister). The subject wished to express a rather well-hidden wish of his that he too could have a baby girl (I^{15}) like his sister (I^{3}). In the retest matrix (b), the overt wish has disappeared representing his sister returned to a place nearer his parental family (I^{1}, father). A second pair of blocks which was linked to a recent event in the test session was "returned" to a different place in the retest matrix. That is, I^{14}

Diagram 17 :

S 44 Test (Matrix "a")

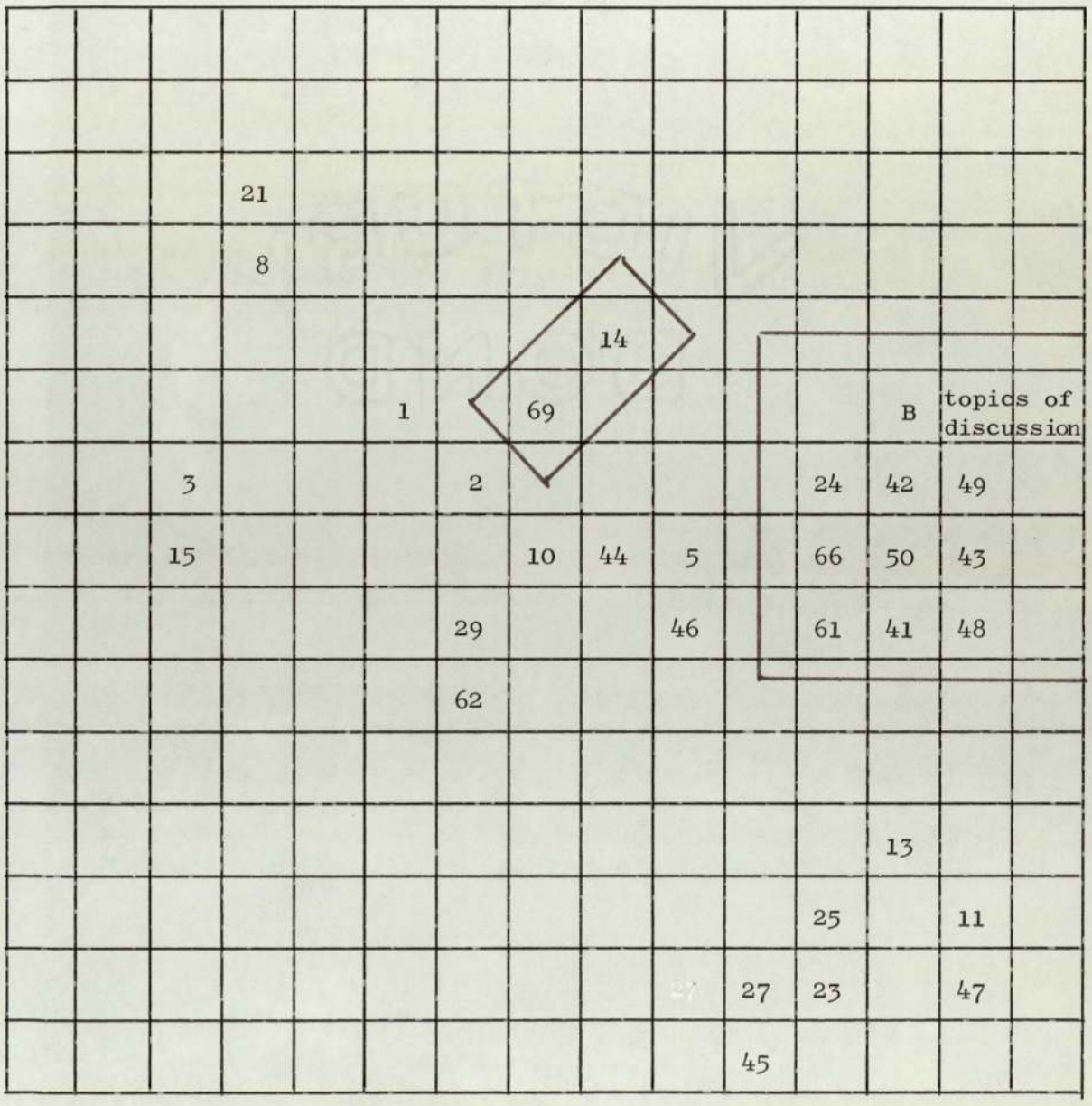


Diagram 18 :

S 44 Retest (Matrix "b")

		51												
		64	65											
		67	68									22		
			63								26			
								8		62				
					3	1			10	5	46	23		
							44	43						
						2	13	45						
		69					47		27					
							11			9	25			
							6					24		
							29						42	
										50				49
									48		28		41	
								66				21		

and I^{69} (death) at the time represented two concepts which were linked. He had just lost an uncle (I^{14}) who had been quite important in the family and particularly to the subject. Secondly, the death of the relative emphasized to the subject the possibility of soon losing one of his own parents (I^{1} and I^{2}). This was important at the time since he believed that he had not had the kind of relationship that he should have had with his father. Two years went by but, as expected, he was not able to change this relationship substantially. For example, note the similarity of position and distance from I^{13} (Me) that I^{1} (father) has in matrix (b). However, the position of E^{69} has been changed in this second matrix. In fact, it was returned to what was previously a peripheral position in his matrix, i.e. where he had placed a fanciful wish of his concerning having a third child. As with Subject No. 15, the deceased person must eventually be removed from the matrices of most subjects and so I^{14} was also removed.

An interesting change has occurred in the role played by the subject's daughter (I^{8}). Two years ago, he was planning to buy a new house and both I^{8} and O^{21} (house) were in his mind. However, due to the death of his uncle (above), he had, understandably, put this plan into the "background" for a while. In the second matrix two years later, the neighbour has become an important person, though still evidently not as close as other members of his world. Note in particular the separation of this I^{8} block from the rest of his world in terms of the Game's grid.

Fourthly, we note that a group of blocks labelled in the test session (matrix "a") as "topics of discussion" again reappears in a similar though somewhat extended version in

the retest matrix. As the second matrix does not rely on a division of the self, we find these "topics of discussion" relegated to the bottom right-hand corner. Via the interview an experimenter might wish to subdivide again such a grouping as this. For example, the position of O^{27} and O^{25} in the matrix (a) might warrant this subdivision, as their position in matrix (b) is rather close to I^{13} (Me). The most important group of blocks remains those linked to the family such as S^{44} (family), I^{10} (husband/wife), I^{1} (father) and I^{2} (mother), etc. In both matrices, they are both centrally placed and very close to I^{13} (Me) or, in the case of matrix (a), I^{10} (husband/wife). The second matrix, however, sees an extension of both this world and the world of work, i.e. S^{47} (work) and I^{11} (workmates) as opposed to their structure in matrix (a). In addition, a "personal" world was created and found in a peripheral position at the top left-hand corner. In this latter group, we find events such as "being unemployed", "being promoted" and "achieving recognition". Just as the split in the self found in matrix (a) was indicative of some underlining though temporary problem or conflict in the subject (See Section IV.4 and the social interaction problems which other subjects have had and shown in the Game), so may this last group be indicating that the subject is thinking of a change of occupation.

On a more general level, this last subject has helped demonstrate the importance of having an interview after the Game. Here, a number of facts have been uncovered which might have been overlooked had another measure been used. The Game is not intended to replace the counsellor, particularly in terms of gathering information concerning a subject's personality. Much as Gough Intended his California

Psychological Inventory (1956) to be used, the Game is expected to complement the psychologist's abilities.

Finally, it is concluded from the results reported in this section that the Game is reliable. First, the test-retest scores were shown to be very similar. This is underlined by the wider range of Game scores possible as opposed to, for example, forced choice inventories. For instance, there are over forty blocks which the subject can choose in playing the Game and most of these blocks can each be attributed a P value of up to 8 points. This provides a range of some 300 scores which a subject can use in creating the matrices. Next, the test-retest patterns have also been shown to be very similar. This is made all the more evident when the Game's interview is taken into account. It may be expected that future research will add still more evidence for reliability (See Section V.3).

II.3.6 Validity

A test's validity concerns what the test measures and how well it does so, i.e. its accuracy. It is important to note that the validity of a measure cannot be reported in general terms (Anastasi, 1966). It must be determined with reference to the particular use for which it is being considered. There are two fundamental ways of determining the validity of a test or measure. The first involves the question of whether it fits the predictions made in a more general theory. The second demands that what is measured by the test is indeed the same as that which would be assessed by independent means. For example, if a test that purports to distinguish between introverts and extraverts can adequately distinguish between groups which have been independently judged

as such, it is considered a valid test. Three kinds of validity can be extracted from these two methods. These are: (1) content validity, (2) empirical validity, and (3) construct validity.

1) Content Validity

Content validity involves using a criterion which is internal to the test to determine whether in fact it measures what it purports to measure. There are two types of content validity: (a) face validity and (b) factorial validity. Face validity asks how appropriate the test appears to the user and to the subject himself. A typical example may be taken from the vocational guidance field. If an aptitude test purported to look at mechanical abilities yet its items dealt with only electrical problems, this test would not be considered valid. It is precisely this type of validity which is used to look critically at the traditional concept of intelligence. Factorial validity is a sophisticated type of content validity. Here, statistical techniques of factor analysis are used to derive factors to which psychological values can be given. This technique is the basis of Cattell's construction of his traits (Cattell, 1970). A comparison of factor loadings is used to determine the test's validity.

2) Empirical Validity

Empirical validity involves the use of actual behaviour or performance of a subject and relates this to his performance on the test concerned. That is, the test scores are correlated with some external criteria. The two types of empirical validity are: (a) predictive validity and (b) concurrent validity. Simply, predictive validity involves a paradigm illustrated below:

A predictive validity paradigm

1. 2.

Test predictor.....(time interval).....Performance measure

Here, concurrent validity is rather the converse. That is, when the criterion scores are already available, or when performance measures are taken at the time of testing, this is an example of concurrent validity.

Empirical validity is the most obvious and direct test of ability. The major limitation, however, is that the performance measure or criterion must itself be valid. Probation officers, for example, might argue that re-conviction rates should not be used to evaluate their performance. Perhaps they would rather see the actual feelings of their clients as the measure of their satisfactorienes. On the other hand, some people may find little comfort in this alternative and prefer more mechanistic criteria of validity. That is, the officer may be seen as part of the penal system and thus, the criteria would be his contribution to its meeting the objectives of reducing crime rates and protecting society. This example illustrates the psychometrician's "concurrent" problem of assessing the validity of his criterion as well as that of his test.

3) Construct Validity

Construct validity demands that the parent theory explain the test's predictions. Therefore, the first need is that of having a theory within which the trait to be measured fits as a hypothetical construct. Then, the test, as an operational measure of the construct, is used in experiments where it is one of the measures. For example, the E.P.I. must be seen as part of Eysenck's theory of personality.

The major limitation to construct validity is in fact to know when to stop (Wright and Taylor et al, 1972). The theory may often generate many predictions, some of which are in fact alternatives. Whenever a negative result is met, this demands the modification of the theory, whereas, when a positive result is met, it cannot be seen as a total confirmation of the theory. This problem will be met often in Part III.

The Game was used primarily to quantify individual differences. Both Part II and Part III have shown that in this respect, the measure is appropriate. On the other hand, the Game, like the California Psychological Inventory (Gough, 1956), makes no claim to factorial validity. For those interested in this topic, Section III discusses the phenomenon of factorial validity as it concerns the 16 PF (Cattell, 1970). The Game is claimed (above) to have content validity based on the concept of face rather than factorial validity.

More important, it is argued that the Game has empirical validity, i.e. based on the actual behaviour of the subjects tested. Many previous test designers have relied on the use of raters to validate their hypotheses. For example, a personality test might rely on the assessment of subjects made by clinical psychologists to validate their test results. This type of validity is based on the following assumptions. First, the traits or categories used by the rater are assumed to be themselves valid. Next, the raters are expected to be able to accurately classify individual subjects according to these scales. Thirdly, neither the scales nor the evaluations made can be expected to vary significantly in time nor between different individuals. Logically, if the Game can find differences between individuals and that individuals are indeed a priori different (Chaplin and Krawiec, 1970), the

Game is, therefore, an empirically valid measure. In the strict experimental sense, the Game has not yet been tested for predicative validity. For example, those who were found to have less structured (more flexible) patterns could be expected to be more "creative". Their subsequent performance on a test of creativity (Tivendell, 1973) could later be tested. Predictive validity would be established for this hypothesis if indeed such subjects were more creative. Section V.3 suggests studies that will involve this kind of empirical validity. The concurrent validity of the Game was, however, tested. For example, Section IV.4.3 deals with the Game's validity as an ipsative measure. Here, the subjects' actual behaviour was shown to be reflected in their cognitive world structure. Also, the validity of the Game's normative uses was studied and discussed in Sections III.4, IV.1, IV.2 and IV.3. For example, the Game was able to differentiate between members of a number of occupations. Similarly, the Game confirmed differences found between sub-groups of members within the same organisations and within the same occupation. Thus, the empirical validity of the Game's ipsative and normative natures was established in terms of meeting the research's primary objectives. Further research will be needed to test the predictive validity of a number of hypotheses generated by work on the Game.

Thirdly, the Game's construct validity is dependent on its underlying theory of personality. It is proposed that Man's interactions with his environment are unique. In other words, the way a person interacts with his environment is the way he is, and the assumption that this theory is valid is obviously fundamental. It is also claimed that the Game is able to test this definition of Man. The important question

is, "Does this definition explain the fundamental difference between ourselves and other individuals?" Does it also establish the thread of consistency which makes us what we were as children, what we are now as adults and what we will be like in the future? The following sections have studied and attempted to validate both this theory and the Game's testing of it. The aim is to demonstrate that the Game has face validity, concurrent validity and construct validity.

II.3.7 Conclusions and Applications

Faced with the need for an operational measure of Man (Part I), the Cognitive World Structure Game was developed. Three particular refinements were made in this approach to the psychometrics of personality. First, a new stimulus-set was introduced as an alternative to traditional loaded or ambiguous-type stimuli. This new stimulus-set was called "universal" because subjects have a common understanding of its items, though the valences they attributed to these could be unique. Next, both the responses elicited in the Game and its basic structure were discussed. As with the stimulus-set, these too were shown to be theoretically and operationally different to other measures. Section II.3 described the necessary requirements of a test, for example, hypotheses, method, scoring, etc. (See Anastasi, 1966). The social psychology of the test situation was also introduced and a new definition of personality was suggested, which will be more extensively discussed later.

A number of applications of the Game, especially in terms of user-needs, have already been suggested, but no clinical or diagnostic applications were contemplated here. Future research may wish to study the Game is such situations.

Section IV.4 focuses on the ipsative nature and value of the Game. The ability of the Game to distinguish between individuals was a fundamental objective of its development. On the other hand, a second objective was its ability to distinguish between groups of subjects. In particular, Section III.4 look at the effect of three nomethetic variables on the Game's results. These are age, sex and occupation. Occupational and organisational field studies were also carried out and reported in Sections IV.1, IV.2 and IV.3. The Game is a new measure of personality which fulfils the methodological and operational expectations set out in the Model (See Part I). Parts III and IV report on a number of laboratory and field studies which look at more specific aspects of this measure, in order to continue its evaluation.

Section III. Pilot Studies

CONTENTS:

therefore be taken into consideration when interpreting or evaluating the results of these studies. Secondly, these Ss were part of a number of pupils who volunteered to partake in studies done by the university's psychology department. Discussions concerning volunteer subject characteristics may be found in Rosenthal and Rosnow (1969). In brief, the Ss belonging to the inter-test relationship studies were randomly chosen from pupils who had volunteered their services. Two of the subject samples, belonging to the studies on nomothetic variables reported here, were not chosen from this school population. Those Ss whose scores were analysed in terms of their sex (Section III.4) belonged to a randomly selected sample from the general population and were tested individually, using only the Cognitive World Structure Game. Those Ss whose scores were analysed in terms of occupation (Section III.4) belong either to samples reported in Tivendell (1973a) but whose scores were not analysed in terms of their occupation, or to samples reported in Section IV of this research.

The Ss belonging to the inter-test studies and to the analyses by occupation were tested in spring and early summer. All Ss were met by the experimenter and briefly told about the test situation. It was explained that the purpose of the session was indeed to increase our understanding of a number of measures and tasks. After being assured about some of the typical facts concerning a test situation which might interest a S and affect his or her performance, the Ss were told they could return after the study to learn about its results and/or their performance. The Ss were scheduled to appear in pairs. They were guided into a plain well-illuminated classroom (12' x 12') which contained three tables and three straight chairs. One of the tables contained the

materials while the two other tables were centrally placed so as to minimize communication during the test session. Following the instructions, they were presented with the test(s) and supervised (See Section II) until they had completed their task.

Though the Ss were tested in pairs, they can be operationally divided into groups of fifteen. That is, each group of fifteen Ss, roughly half of whom would be female, was administered the Game and one other different psychometric test, in an ABABAB type experimental design (Underwood, 1949). As is common in the development of certain test norms, e.g. the 16 PF test (Cattell, 1962) and E.P.I.'s norms for students (Eysenck, 1968), the results do not differentiate between male and female Ss when referring to inter-test relationships. (Section III.4 does report on intra-Game variance due to sex, among other variables.) However, within each pilot study, testing for the possible effects of such variables as sex and presentation order was carried out involving non-parametric analytical methods. Differences due to these variables proved to be insignificant.

It has been emphasized throughout this introduction that the investigations to be reported on are merely pilot studies. In a similar vein the type of analysis used have been"low key". Though factor analyses were done on the data, because of the low number of Ss, the large number of scores involved in inter-test relationships and the controversial interpretation of some factor analysis programs, these results were considered to be lacking in information content. The type of analysis reported here was usually a parametric "r", the Pearson product-moment correlation test. However, studies are being prepared which will surmount the above limitations and will use the more

sensitive analyses. It also seems relevant to reiterate that the measures used in the Game, for instance, the P values, are rather uncomplicated. More complex analytical versions of the Game and/or of its scoring are possible. It has been argued (Section II) that some of these would be more sensitive to individual and group differences. If indeed significant results can be obtained with simpler measures, the more sensitive and complex measures should duplicate these. On the other hand, had the more complex versions of the Game been used initially, significant results could not necessarily be generalized to situations where the simpler analytical methods were used. The usefulness of the Game in counselling or clinical settings, for example, depends in part on easy and thus simple analytical procedures.

Finally, it should be recalled that the Game attempts to deal with a more fundamental aspect of the human being than to do personality studies based on attitudes and behaviour. This aspect is often called the cognitive structure. It is assumed here that the way a person interacts with (for instance) events has certain consistent characteristics which are common to his interactions in all situations from getting married or being promoted, to losing a close relative. Similar assumptions are made with reference to objects, individuals and even social constructs. This latter category poses certain new problems both in terms of meaning for S (e.g. is it a generalization of the I, O and E categories?) and of interpretation (e.g. what <u>is</u> an interaction with God, or privacy?). Being much more obvious (recognizable), studies involving attitudes and behaviour needed to rely upon a much simpler methodology. Behaviour is often quite consistent for a given individual with discrepancies environmentally explained.

Attitudes, meanwhile, are usually quite rigid (frozen) at any moment of time such as when they are specifically elicited via a questionnaire. Yet both behaviour and attitudes are known to change in time. Laws of cognitive dissonance may be said to act upon any continually elicited attitude, such as a white man's attitudes towards black criminality in Newark, thus obstructing change. A white Canadian's attitudes towards black people may be changed more easily due to a lack of continued exposure to the problem (See Aronson, 1973).

Such phenomena as behaviour and attitudes are relatively superficial in terms of the cognitive structure, the underlying continuum reflected in inter-personal differences (Warr, 1970). Thus, they have proved to be fairly poor bases for the reliable measurement of personality. If the Game is indeed a better measure of the cognitive structure of an individual in practice only, trivial relationships should be found between it and attitudional measures of personality, interests, etc. However, extensive studies investigating the Game's validity and reliability over long periods of time should be the ultimate basis of its evaluation and that of other tests (See Cooley, 1967).

III.2 Personality

The Game and the Sixteen Perfonality Factors Questionnaire

Six of the sixteen personality "source traits" belonging to the test formerly known as the 16 PF (Buros, 1970) were found here to be significantly correlated ($p < .05$) with certain Game scores belonging to our student population. These were:

B a general ability ("g") or intelligence factor

G a measure of ego-organisation (Adcock, 1970) or of

super-ego strength (Cattell, 1962).

I a tender versus tough continuum not unlike William James' measure; also called "projected emotional sensitivity".

N shrewdness versus naivety; it has been hypothesized (Lubin, 1970) that this scale is clinically linked to the measurement of free anxiety ("anxious insecurity").

O a scale purporting to look at levels of variety, both intra and inter personal.

Q_1 a radical (also called "liberal" or "experimenting") versus conservative continuum of temperament.

Prior to looking at these, it is necessary to comment upon two aspects important to their relationships. First, though Cattell adamantly argues that these 16 factors are unitary and independent, many theoreticians disagree (e.g. Mischell, 1967; 1968). Whether or not these factors are independent of each other, it is at least known that they are not uncorrelated (Adcock, 1970; Tivendell, 1971), a fact reaffirmed in the present study's intercorrelation of pupils' 16 PF scores (significant coefficients ranging from .52 to .68). In other words, the Game is not measuring what the 16 PF is attempting to meausre (i.e. they are not identical tests), though their interrelationship should contribute to our understanding of both measures. This suggests that further and more complete analyses are needed such as factorial rotations of these axes, albeit larger populations and different probability levels may be warranted.

The 16 PF's factor B was found to be positively correlated with the number of social constructs (NS) which the subjects of this particular sample used in their matrices

($r = .61$). Lesser but positive correlations were found with the number of objects (NO) and the number of events (NE) which the Ss used in their Game matrices. Both these latter coefficients were of the order of $r = .56$ ($p < .05$). According to Cattell himself (1970), though factor B is linked to a person's intellectual ability, it is not a true measure of the more complex g factor. It would seem that part of factor B which is linked to the Game represents the more intelligent person's need for or interest in being surrounded by and manipulating social constructs such as privacy, education, God, etc. It may be that the high scorer on factor B has attitudinally linked the use of such constructs with the role of being intellectual. That is, he says: if I'm intellectual I should be interested in social constructs; therefore, I shall include these in my cognitive structure. The implication here is not that S is doing this at the level of the Game, that is either to impress the tester or to persuade himself of his role, but rather than this process has been intrinsic in the development of his cognitive structure over time. This first hypothesis, that S has perceived intellectuals as preferring to deal with certain types and number of items, is intrinsically linked with the very nature of intelligence. The problem seems to be that to define being intelligent has traditionally involved being interested in certain academic areas such as mathematics, languages and, to some extent, physical sciences. To be called intelligent, a subject had to hold certain attitudes, causing him not only to prefer certain academic subjects but also to behave in certain ways and assume certain roles. These were certainly distinct from other non-academic abilities such as communicating ideas and opinions, accurate person-perception, prediction of

forthcoming events from minimal contextual cues, etc. The item-content of Cattell's B factor reveals that he has correlated certain attitudes ("I could happily live alone...") with, it is presumed, a subject's performance on the traditional verbal measures of intelligence. The question is do all people who are better able to adapt, and adapt to, their environment hold these attitudes "per se"? That is, are they adequate predictors of intelligence, or do Ss merely hold these attitudes "ipso facto" because of their social perception of intellectuals as a reference group? Note the reverse argument, that certain Ss may wish to voluntarily reject this group's values and attitudes, is a corollary.

On the other hand, it is also feasible that the more intelligent S needs and actively seeks stimulation (the neuropsychological model of man interacting with his environment), one means of which involves increasing the number of items or bits in his cognitive environment. This second hypothesis is supported by the type of item sought by this person. Social construct items, being imaginary (constructs) and often ambiguous (semantics), probably have more stimulation properties. The generalisation of this search to augment the number of "bits" in one's cognitive structure may also cause S to include more objects and events (NO and NE). The fact that we are dealing with the number of items (N) rather than the value one attributes to these items (P), lends still further support to the need-for-stimulation hypothesis. However, because this latter hypothesis has a more overt psychological nature (information-processing type model), it is quite possible that evidence for it would be more readily available.

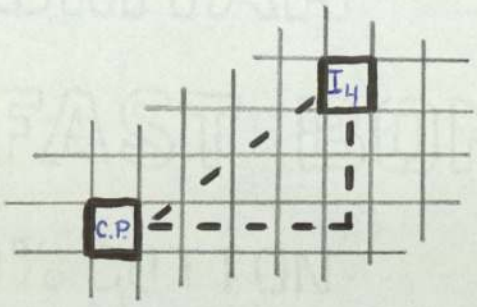
In brief, factor B is positively correlated with the number of social constructs (NS) used in one's Game matrix, and

to a lesser degree to NO and NE scores. Two (not necessarily exclusive) explanations were proposed. First, intellectual ability may be linked to willingly taking certain attitudes and positions towards certain constructs such as love and religion, towards certain objects such as T.V.s and cars, and towards certain events such as getting married or losing a close relative. Secondly, it was hypothesized that intelligence may be functionally related to a need or search for more sources of intellectual stimulation and accomplished by increasing the number of certain items in one's cognitive structure. Because one explanation deals with properties (attitudes) and the other with processes (cognitive stimulation), future research must be cautiously undertaken and systematically documented in terms of objectives, hypotheses, criteria, and so on.

The 16 PF's factor G deals with weakness of character and "super-ego strength". It was found to be positively correlated ($r = .62$, p .02) to the Game's DS score. The DS score, like other distance scores, is the average (Mean) distance social construct blocks are placed from the center of the S's cognitive world matrix or "calculated pivot" (Section II). Each block's distance from the center of the cognitive world is calculated according to the hypothenuse, which in turn is a product of the forming of a hypothetical triangle based on the row and column positions of the two blocks concerned (See Figure 10).

In brief, increased distances between the centre or fulcrum of a S's cognitive world structure and the placing of social construct blocks in that structure are related to this person having high scores of factor G. This high scorer is described as "strong in character, persevering, responsible,

Figure 10: The calculating of distance scores



determined, consistent, planful, energetic, cautious and well-organised" (Cattell, 1962). Thus, the well-organised, conscientious person with high moral standards in fact puts less importance upon traditionally held social structures. Though he does not personify such constructs as work, religion, love, i.e. give them motivational or emotional value in his cognitive structure, he does, however, give them a certain degree of organisational value by placing these on the periphery of his pattern. The relationship between factor G and the Game's DS score lends some support to Adcock's relabelling this factor "ego-organisation" (1970) rather than a measure of super-ego strength (Cattell, 1962). This latter definition implied that S has a certain respect or even awe for a living Society, much as Freud envisaged it or with whom some of the younger generation tend to associate their ills, i.e. The Establishment. The behavioural descriptions which Cattell himself has deduced for high scorers would indeed suggest that this person is rather cognitively well-organised, probably using though not depending on available standards and structures.

Two factors belonging to the 16 PF were found to be correlated with the attribution of valence to events. Factor I was negatively associated both with PE/NE and PE scores. Meanshile, factor N was also found to be negatively correlated with PE. All these coefficients were of the order of $r = -.57$ ($p < .05$).

Factor I purports to be a tough versus sensitive scale. The Ss who score low on this scale are described as being "practical, realistic, independent, responsible but 'uncultured'" (Cattell, 1962). Thus, this hard, self-reliant person was also found to attribute more valence to events such as

getting married, being promoted or buying a house. Unlike the more sensitive person who is also impatient and impractical according to this I scale, it may be that the high scorer is more willing to take on the responsibilities associated with these events. The I scale may also be linked with a S's degree of conservatism in that traditional "realistic" attributes are reflected in one being able to face up to common life events. This is in part supported by the negative correlation of this 16 PF scale with the number of items used in one's cognitive world matrix (i.e. factor N; $r = -.51$, $p < .05$). Further studies should concentrate on first unravelling the possible overlap between certain hard, cynical or tough attitudes and the realistic, conservative aspects of certain cognitive strategies. This again implies consideration of the properties/processes dichotomy mentioned above. Such research must study in greater detail the type of items found in Cattell's test, i.e. their mathematical, theoretical and even perceptual inter-relationships. Cattell (1970) also reported, though he did not adequately explain, a relationship existing between low I scores and group performance. It may have been noted that the event items found in the Game implicate people other than the S, either as co-decision makers or as recipients of any subsequent behaviour. The results here would lend some support to the tough-minded person's better group performance. However, it is plausible to assume that the tough-minded person is also conservative. Therefore, we may be describing a task-oriented as opposed to a people-oriented participant (Fiedler, 1975). The former type of participant would indeed have to be a hard, "no-nonsense" person, relying on traditional concepts to assure successful

performance in the kind of situations described by Fiedler and his co-workers.

Though factor N of the 16 PF test was also found to be negatively correlated with PE ($r = -.57$, $p < .05$), the situation here is more complex. Usually, it could be assumed that a certain amount of overlap exists between Cattell's I and N scales. After finding the behavioural correlates that are common to both scales, the task would involve testing the Game's validity in these terms. For our sample, factor N was not found to be significantly correlated with factor I, but significantly correlated with four other scales of this same test. These four scales were A, F, H and Q_2. Their respective inter orrelation coefficients were .65, .53, .57 and .59 (all with a $p < .05$). The first three scales have been linked (Lubin, 1970), indeed deduced according to Cattell's development of the test (Cattell, 1970) with mental illness. A and H (schizothymia and shyness) are two factors in schizophrenia, while (seriousness) purports to differentiate manic hysteria from anxiety neurosis and depression conditions. Q_2 scale deals more simply with self-sufficiency. Based on the range of behavioural correlates suggested by these psychological categories, and to some extent found by Cattell as reported in the manual (1962), it would seem that the N scale is neither independent nor homogeneous in nature. In fact, a more satisfactory picture can be drawn, in terms of the Game, when N is not considered to be an independent factor. When the sample's N scores are understood to be associated with the described behaviours rather than summarized under a simple sophisticated scale of temperament, the data can be found to be consistent with previous findings such as the I scale's correlation with PE. The unsophisticated, simple and even

awkward type of behaviour associated with low N scores is congruent with a person being perceived as tough-minded. In addition, being hard, cautious, smug, etc. are common descriptions to all low scorers of A, F, H and I scales. The relationship between I and N underlines some of the problems found in the construction of tests using factor analysis (Buros, 1972). That I and N are not significantly correlated did not mean they were independent variables but only that the items used were not dependent. Apples and oranges, for instance, belong to one variable, fruit, but they are evidently different "items".

According to the 16 PF manual factor O is a confident/insecurity scale of temperament. The low scorer is described as free from anxiety, placid, calm and with unshakable nerve. "He has a mature, unanxious confidence in himself and his capacity to deal with things. He is resilient and secure." (Cattell, 1962). Low scores on this scale were found to be associated with having greater distances between the centre of their cognitive world and the items used in the pattern (D; $r = .68$, $p < .01$). This more resilient or flexible type of pattern is especially noticeable in the use of event items (DE; $r = .06$, $p < .02$). Life-cycle studies (Brown, 1972; Levi, 1970; Theorell, 1972; and others) have assumed that life-events are a major source of stress and anxiety. It is not surprising, therefore, that the events found in the Game should be linked with anxiety and strategies for reducing anxiety. The correlation of this trait with the general D score, however, shows that the properties involved in these events, i.e. the individuals, objects and the type of abstract constructs used in shaping one's cognitive world, should not be omitted from stress research. In brief, some support

has been provided for the assumptions made elsewhere (Sections II and IV) that certain types of cognitive structures are better equipped for dealing with stress or anxiety. A note of caution has also been directed at life-cycle studies which might focus entirely upon the events that are associated with stress while neglecting other aspects of the person's cognitive environment. For instance, these results show that the insecure, worried, lonely person seems to need a closer relationship with all items in his cognitive world. Being scrupulous, fussy, perhaps hypochondriacal, this S prefers to brood over certain events. (Note that keeping things closeby need not be confused with attributing valence to these.)

Factor Q_1 of the 16 PF test was also found to be significantly correlated with one of the Game's scores. This was the number of events (NE) included in a S's cognitive world structure ($r = -.56$, $p < .05$). Those interested in and willing to experiment with intellectual matters and fundamental issued are also those who tend not to include life events as part of their cognitive structure.* It would seem that those who consider the possibility of such events happening, as getting divorced, losing a loved one or even getting married and buying a house, are also those who are more conservative and traditionally minded. Again a sort of pragmatism or realism has been found to be associated with thinking about life-events. However, unlike the low I scorer who actually attributed valence to these life events, the conservative overly cautious thinker merely includes these events as possible happenings, perhaps to curb or moderate any radical

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*Note, all these Ss were young pupils and, therefore, most of these events were in part fantasies rather than actual experiences.

plans he would have. This explanation fits quite well into the behavioural descriptions provided in the 16 PF manual (1962). As opposed to needing more parts to his cognitive structure so as to act as possible sources of stimulation (See above), the conservative S is using some of these items to moderate or limit analytical 'intellectual' thought" (Cattell, 1962). This is supported in part by a similar correlation between O and the Game's N score ($r = -.52$, $p < .05$).

The Game and the Bernreuter Personality Inventory

The Bernreuter Personality Inventory (Bernreuter, 1938) is one of the oldest objective personality tests. Despite its seniority, it has been rather critically viewed by many (Buros, 1970, 1972). Leona E. Tyler (1970) describes its main advantage as being linked to over twenty years experience of its use and to the more than two hundred and fifty recorded references to it. Along with the MMPI and the 16 PF tests, this is rather impressive for a personality test (Buros, 1970). It is composed of the following six scales: neurotic tendency; self-sufficiency; introversion-extroversion; dominance-submission; confidence; and sociability. The first four scales belong to the original 1938 version. The latter two were added by John C. Flanagan's revision of the test, and we are led to believe (Becker, 1965), represent a factorial explanation of the first four. Preliminary correlational analyses uncovered no significant relationships between the Bernreuter test and the Game. With the exception of studies directly concerned with self-confidence and sociability, further correlational studies between the Game and this test are nor urgent. This is in great part due to the very high intercorrelation of scales as reported in its manual and

repeated for our fifteen Ss here. Interpretations and hypotheses concerning the relation between the 16 PF and Bernreuter tests have been reported elsewhere (Tivendell, 1973b) but would contribute little to our present objectives.

The Game and the Eysenck Personality Inventory

A third test was used to study the possible correlation between personality measures and the Cognitive World Structure Game. This was the Eysenck Personality Inventory or E.P.I. The E.P.I. has become a research tool similar in popularity with British researchers as the 16 PF enjoys in the U.S.A. Many experts (Buros, 1972) consider the E.P.I. to be a very well constructed test with a well written manual and its perhaps overly simple two-factor explanation of personality makes it an attractive measure to use. Research using the E.P.I. and its predecessor, the M.P.I. has repeatedly confirmed the independent nature of its two factors. These are an introversion-extroversion scale and neuroticism-stability scale. Having only two scores makes this approach to personality assessment a simple method of obtaining significant differences between populations studied. Nevertheless, it also makes it easy to understand and interpret the meaning of E and N scales. In the context of this particular research, the existence of British norms gives this test a further advantage. A third scale exists, which some believe to also be implicated in the measurement of personality. This is a motivational distortion measure, the L scale. Great caution, however, must be taken when using the L scale as intended, i.e. as a lie or distortion scale (See Berg, 1967 and Section III.5).

The E.P.I.'s scale, a measure of extroversion, was found to be negatively corrrlated with the Game's NS score

($r = -.56$, $p < .05$). It may be recalled that the Game's NS score deals with the number of social constructs a person has included in his cognitive world structure. This NS score is significantly associated with intellectual interests and attitudes (i.e. 16 PF's B factor and the RMIB's social service interest category). Therefore, it is not surprising, due to the association between "intelligence" and introversion, that NS would be correlated with the latter (See Vernon, 1970). Ss who are shy, quiet and whose work is always prompt, neat and well-done for fear of reprisals, such as being interrogated publicly in a classroom situation, are often seen as "intelligent". Conditions of personality such as introversion, rather than certain mental abilities, may be at the root of behaviour which is judged as intelligent. In this light, the high NS scores being linked with introversion supports the prior hypothesis that attitudes linked to intellectual behaviour, rather than intellectual behaviour "per se", are being measured by Cattell's B factor. This naturally revolves around the assumption that the mathematical bi-polarity of these scales and scores, i.e. the 16 PF's B scale, the E.P.I.'s E scale and the Game's NS score, is reflecting or at least artificially causing their interpretation to be also bi-polar.

Future research must begin by operationally separating the measurement of intelligence, attitudes, and extroversion. A more stringent definition of intelligence would need to consider capabilities for adapting, and adapting to, one's environment(s). Thirdly extroversion must also be redefined so as to differentiate, if possible, between goal-determined extroverted-interverted behaviour and such behaviour being

caused by fundamental personality differences. It is hypothesized that the cognitive world structure is predominantly linked to personality-based differences and only marginally to attitudinal and motivational (situation-specific) factors. Motivation here is seen as situation-specific or goal-directed behavioural factors rather than fundamental differences in cognitive processes. On a different level, the relationship between extroversion and the Game should be studied in more detail using an item-analysis of the Game. Later, different versions of the Game, including extended versions of its social construct category, should be used. If indeed a purer from of the extroversion factor, in terms of its definition and items, is acknowledged as intrinsic to the cognitive structure, modifications to the NS scale could be suggested to promote our prediction and understanding of personality.

According to the literature, The E.P.I.'s N scale is positively linked to anxiety and highly negatively correlated with tests of Well-Being, Tolerance, and Intellectual Efficiency (Buros, 1970). The high N scorer in particular shows less self-awareness and less self-acceptance. This aspect of the N factor will be useful in understanding its association with the Game. Reviewers have cautioned, however, that the Inventory has certain characteristics which might discourage the use of the E.P.I.'s N scale. First, Bursill's review (1970) demands a high degree of caution when interpreting population differences based on the positioning of samples in relation to each other as in Figure 2 of the American mauual (1968). But more important, Bursill (1960) suggested, and Rump and Court (1971) later confirmed, that the N scale is affected by social desirability response sets,

even when used with normal Ss for research purposes. One reason for this is that all items dealing with neurotic responses are scored in the affirmative (YES). Other reviewers have been less critical. Nevertheless, some caution seems warranted when examining these more positive reviews; such as Foulds (1960): "The Neuroticism scale seems to be of much more certain value..." (p. 185).

The E.P.I.'s N scale was found to be significantly correlated with a number of Game scores. Uncharacteristically, most of the Game's P scores were found to be significantly correlated with the N scale. Respectively, PI, PO, PS had the following correlation coefficients: .55, .64, and .51. The P score itself, which is the amount of valence attributed to the blocks in the matrix regardless of their category (Section II), was correlated at .62 ($p < .02$). Two related characteristics of the measurement of the E.P.I.'s N scale can be found to underline this generalised but still low correlation between the Game and N. First, there is the fact that E and N, as second order factors, were found to explain the sixteen primary or source traits found in the 16 PF test (Cattell, 1970). This means that N is a more comprehensive factor which includes a number of traits or characteristics of personality. Secondly, any two-factor explanation of such a complex entity as personality would be expected to be associated with a number of traits, states, or, in the case of the Game, environmental interaction patterns, belonging to more differential measures. It is the multi-facet or generalised nature of the E.P.I.'s N scale that seems to be at the heart of these associations.

According to these results, the unstable and more anxious person tends to give high valence to most of the items in his

cognitive world structure. This results in a tighter grouping or Game pattern (Section II). This grouping involves attributing valence to Individuals, Objects, and Social Constructs. No relation was found between the attribution of valence to Events (PE) and this measure of instability. It should be noted that when corrected for the number of items used in the Game (e.g. P corrected for N is P/N), these significant relationships were not found, with the exception of PO/NO. First, this supports the definition of the patterns produced by emotionally less stable Ss as "groupings" rather than "clusters" (a tighter version of the former). That is, there is a component which is significantly related to the neurotic or highly anxious type of personality and which is found in the Gestalt-like association or interaction between valence attribution (P scores) and the number of items used per matrix (the Game's N score). Mathematically, this component does not exist in the "pure" form of P/N nor in the simple frequency of items (i.e. the Game's N score) but indeed is found only when P and N are associated as in the P scores. (P is determined by the number of blocks touching a given block. P/N makes this attribution of valence comparable for matrices using different numbers of blocks.) It may be that this component or factor is best reflected in the attribution of valence to objects (PO correlated with the E.P.I.'s N scale in the order of .64, $p < .01$). However, it is plausible that this component is the attribution of valence to objects (PO/NO is also correlated, $r = .58$, $p < .05$) and is merely being generalised to the other categories I (individuals) and S (social constructs). Once again, more complex factorial analyses should be carried out in addition to

experimentally more complex studies. In brief, two aspects of these results should become the object of future study. First, there was the relationship found between the generalisation of the attribution of valence process and the over-reactivity of "neurotic" Ss. Secondly, future research might well involve looking at why value attributed to event items is not a factor in emotional instability. The absence of a significant correlation between the E.P.I.'s N scale and the Game's NE score, either positive or negative, further complicates matters, probably demanding varied approaches to traditional suggestions such as item analysis, increased complexity in the Game analysis of the use of different versions of the Game. The commonly held notion that life events, stress and anxiety are interrelated may be subsequently re-evaluated. Eysenck does suggest (1968) that neuroticism involves an inability to return "to a normal state after emotional experiences" rather than the mere potential for attaining a certain level of instability. Perhaps it is the unavailability of certain cognitive strategies rather than an intrinsic fundamental flaw in the "neurotic" S's cognitive structure?

The E.P.I.'s L scale was intended to tap a social desirability response set. This lie scale looks at only one kind of test-taking attitude, that of putting oneself in a socially favourable light. It was adapted from the M.M.P.I. and partly because of its origin, Lingoes (1970) writes:

> "Although this is a commendable addition in principle, it is strongly suspected that such a scale will prove neither more or less effective in this test than it has been in the MMPI, the clinical consensus being that the more sophisticated and intelligent examinee can easily avoid this obvious form of deception and that the L scale is probably more useful as a personality measure than a validity scale." (p. 1021).

The possible usefulness of this L scale as a personality measure is an interesting comment. A correlation coefficient of .60 ($p < .02$) was found between it and the Game's NI score. Thus, Ss who wish to be viewed in a socially more desirable light increase the number of people in their Game matrices. This aspect of the Game is simple and obvious, thus demanding little true sophistication on the part of the S who wishes to distort his matrix. This does lend support to Lingoes's definition of social desirability distortion as an aspect of personality in its own right. However, the area of motivational distortion is rather more complex than Eysenck would lead us to believe (See Berg, 1967). The study of motivational distortion and the Game (Section III.5) shows that Ss believe they can distort the Game but that their "distortions" are neither fundamental nor can they be done covertly. In brief, a following section will deal more completely with the field of test distortion. Meanwhile, results indicate that the E.P.I.'s lie scale tells more about personality than it helps solve the problem of test distortion.

III.3 Occupational Interests

The Game and Occupational Interests

Interest questionnaires are perhaps the most widely used tool in vocational guidance with the exception of the interview itself. There have been many interest measures, the most popular being perhaps:

1) Spranger's (1928) "Types of Men"
2) Kuder's (1948) "Preference Record"
3) Strong's (1943) "Vocational Interest Blank"
4) Connolly's (1954) "Occupational Interest Questionnaire"
5) Crowley's (1970) "Occupational Interest Blank"

6) Closs's (1969) "A.P.U. Occupational Interests Guide"

7) Rothwell-Miller's (1958) "Interest Blank (RMIB)"

The literature reveals many different interpretations of the term "interest". Excellent reviews are found in Super and Crites (1962) and in Darley and Hagenah (1955). Briefly, an interest is expected here to have two main characteristics: a concentration of attention well above average and an accompanying feeling of pleasure. Such a view was suggested by John Dewey as early as 1913. More specifically, an occupational interest will involve satisfaction derived from the job in question.

To further define what is meant by satisfaction derived from "the job in question", it is necessary to look very briefly at the methodology of occupational interest measurement. For any in-depth discussion and comparison of various methods, it is useful to refer to the research surrounding the different interest measures available and texts such as Darley and Hagenah (1955), Strong (1943) or Super and Crites (1962). Though there are many different methods of interest measurement, for our purpose these may be divided into two approaches. Perhaps the more popular approach is to present a subject with a list of activities or situations and from these responses, extract the S's preferences. The paired comparison of job activities as found in the A.P.U. test (Closs, 1969) is just one of the many methods subsumed under this approach. The second approach is typified by the ranking of job titles method found in the Rothwell-Miller test (Miller, 1968). Essentially, it involves extracting from the S's stereotypes of jobs, his particular interests.

In a previous report (Tivendell, 1973b), a number of

theoritical aspects of occupational interest measurement were touched upon. First, reasons were given as to why the Rothwell-Miller test (RMIB) and the A.P.U. guide were chosen. Secondly, the bases for the no-relation hypothesis were explained. In brief, a lack of predictive validity of interests for occupational success (Cooley, 1967) and the unreliable nature of interests (their change over time can be linked to changes in the self, in self-concept and in environments) helped to qualify the relationships expected between the Game and these two measures. Thirdly, the role or lack of it that personality has played in occupational guidance settings was touched upon. Fox (1970) has discussed why personality is not believed important in occupational choice. He gives two major reasons: the assumption that the man component is seen as infinitely adaptable and the bi-polar categorisation methods which dominated the assessment of personality. The Game, being a measure of cognitive structure (the consistent core of personality) and using whole distributions rather than extremes of distributions to "label" Ss, was introduced as a workable alternative in such fields as guidance.

Three further points would be made prior to analysing the inter-test correlation coefficients. These concern the S sample, the preliminary report and the interpretation of results. Ss involved in the study were two samples (one per interest measure used) of fifteen upper-from students from the greater Birmingham area. These volunteer Ss were tested in an ABABAB type of test paradigm. Secondly, in the preliminary report (Tivendell, 1973b), two methodological improvements were put forth. One involved the development of a method of analysis that would increase the interpretability of inter-test results, called a controlled factorial approach.

In the other, a method of labelling the Game's scores was advanced. Neither of these are necessary to the present correlational-level analyses though their role in future studies of occupational interests was noted. Finally, it is emphasized that the results in this section are based on student occupational interests and not on samples from various occupations. Conclusions are confounded by such variables as those described in the introduction. Any relationship found or suspected between an interest category and the Game should become the subject of further study involving that occupation, for instance a sample of foresters and their cognitive world structures.

The intermediate version of the A.P.U. occupational interests Guide (Closs, 1969) consists of a booklet containing pairs of job-activity descriptions. There is a form available for each sex. All the S has to do is to indicate which activity in the pair he or she prefers. Scoring is basically "ipsative". The activities chosen cover eight main job areas which in fact make up the guide's scales. These are: (1) scientific; (2) social service; (3) clerical/sales; (4) literary; (5) artistic; (6) computational; (7) practical; and (8) outdoor. Only one of these scales was found to be significantly correlated with the sample's Game scores. This was the artistic job-activities category. Its correlation with the Game's PE score was of the order of .53 ($p < .05$).

At first glance, it is difficult to understand why Ss with higher artistic interests tend to attribute more valence to events rather than objects or, in certain cases, individuals. Turning to the literature, a number of possible sources of explanation habe been expresses. Campbell (1972), in his critique of the Guide, enumerated many disadvantages,

most of which could be concerned here. Important among these is the guide's authors' dealings with sources of bias such as response sets, position sets and good impression biases. Campbell also notes that the reliability scores for the guide are at least ten points lower than they should be, a fact he blames on the scoring system and not on item content. Finally the reviewer showed that the A.P.U.'s approach to measuring occupational interests rendered impossible the interpretation of normative data, a point vital to our own interest study. Hawkridge (1972) questioned the validity of the test itself and its definition of interests. Two related points made by this author continued to underline some of the disadvantages of the A.P.U. guide. According to Hawkridge, the answers recorded on the test seek to reflect test-retest reliablity rather than any predictive power of the guide. He also puts into serious doubt the "generalisability" of the test's results. Two conclusions based on an integration of these disadvantages seem particularly helpful in furthering our understanding of the A.P.U.'s relationship to personality. First, there seems to be a certain loss of power in the inventory when comparing it with other interest measures. Secondly response sets, including good impression biases (Campbell, 1972) seem intrinsic to the test situation. With this in mind, the relationship found between the guide and the Game's PE score could perhaps be best explained in terms of another association. That is, it could be explained in terms of the association found between the attribution of valence to events and motivational distortion (See Section III.5). However, at this stage, no firm conclusions concerning the relationship or lack of association between the A.P.U. Guide and the Game are warranted from the results.

The Second Interest Methodology

The Rothwell-Miller Interest Blank (RMIB) seeks to assess interests using the attitudes and stereotypes that an individual has concerning certain occupations. Like the A.P.U. Guide, there are two separate forms of the test, for males and females. The items consist of job titles rather than activities and are set out in nine blocks of twelve items, each block consisting of one job representative of the twelve interest categories. The S is asked to rank jobs within each block starting with the rank of one for the most preferred, down to a rank of twelve for the least preferred. A glossary is provided for those jobs less familiar to him. Response bias, based on the favouring of certain positions within the block, is controlled. Because of the number of rankings made for each category, it was assumed that at least across the total sample of Ss, the date could be used as if of interval level. A brief study of the interest blank itself and the experience related by the author in the manual (Miller, 1968, p. 4) tended to support such a step. However, when interpreting individual S scores, as in an occupational guidance context, this step is neither justified nor required.

Four of the twelve interest categories were found to be significantly correlated with scores on the Game. The first relationship found was between the RMIB's scientific interest category and the Game's PS score ($r = -.57$, $p < .05$). In brief, the S who is interested in such jobs as lab-assistant and astronomer shows a significantly lower need to attribute valence to social constructs in his cognitive world structure. Giving high valence to such constructs as privacy and love indeed would be expected more of a teacher than of a laboratory assistant. The wide range of status and pay found

in each occupational group and the "substantial" overlap of stereotypes possible between categories (Heim, 1972) certainly begin to explain this coefficient. This was further supported by the intercorrelations found between RMIB scales. For instance, the scientific category (4) was found to be correlated with the following categories: persuasive ($r = -.55$); musical (-.68); clerical (-73); and medical (.65) with a significanee level of $p < .05$ for them all.

The second RMIB category to be significantly associated with Game scores is the "persuasive" interest category. Unexpectedly, this occupational interest category was found to be negatively correlated with PI/NI ($r = -.61$) and PE/NE ($r = -.54$). Surely, this RMIB category should have been rel related to the number of people (NI) in one's cognitive world and certainly not te negative valence being atrributed to people already in the pattern. Both the blank's authors had intended "persuavive" to mean personal contact: "An interest in talking to people in persuading and discussing, arguing and mixing with others. Confidence in making personal contacts of all kinds." (RMIB manuals, 1958, 1968). However, Alice Heim (1972) pays particular attention to the arbitrariness of the choice of jobs and occupational interests and uses this particular category to make her point. Though it is intended to mean personal contacts, seven out of nine persuasive jobs in the male form and six out of nine in the female form are strongly flavoured with finance and money-making. It is, therefore, not ususual that our particular sample of upper-form students had very "flavoured" stereotypes concerning the types of jobs used in the blank. In fact, the low PE/NE correlation suggests that they might have over-reacted somewhat to make their point (See Section III.5).

The third occupational interest category to be significantly related to the Game was "social service" interests. It was found to be positively correlated to the number of social constructs (NS) found in the game matrix ($r = .68$, $p < .01$). A lesser but still significant correlation with PS ($r = .61$, $p < .05$) was also found. This relationship was considered to be playing a supportive role in that NS is an intrinsic part of the uncorrected PS score (See Tivendell, 1973b). Note that NS had been found associated with Cattell's B factor and Eysenck's E.P.I. measurement of Introversion.

Both intelligence scales and introversion scales rely somewhat on the image of a retiring rather high academic achiever. This person is interested in academic rather than technical subjects, in private leisure behaviour rather than in an expanded social life. This image of the intellectual introvert is held by many and the reader himself certainly has examples he can refer to from his own experiences. It is not improbable that developers of introversion and "g" scales were similarly influenced when making up their tests. This was given some support in the correlation found between Cattell's B factor (1962) and the Game's NS score. This problem can be looked at from another level. For instance, it is known that introverts are perceived as being more intelligent than their peers (Cattell, 1970). If judgements by teachers can be influenced so that they rate certain people as more intelligent than others because, for instance, these Ss may be wearing glasses, it is not unlikely that teachers have in part caused certain introverts to become academically more proficient. This showed that certain patterns of cognitive functioning were preferred and indeed rewarded in academic settings. It is proposed here that these sociological

preferences are carried across in some form, beyond the academic institutions into the world of work. It is for this reason that certain occupations both prefer and attract certain types of people (Holland, 1959; Cattell, 1962; Tivendell, 1971; etc.). The interest certain types of people show in social service occupations is just one instance of this. Men and women who are in these occupations often, but not exclusively, are more introverted than extraverted, preferring intellectual or pseudo-intellectual structures to pragmatic no-nonsense ones of the real world. Tautologically, the introvert-intellectual is characterised by a greater interest in manipulating social constructs such as privacy, education, god, etc. (See Section III.2).

The amount of variance explained by socially accepted stereotypes is important but not exclusive in such traits as intelligence (Cattell's B scale) or introversion (Eysenck's E scale). That is, though it is included in the measurement of these traits, it cannot explain the complete trait. Nevertheless from the evidence here and in the literature, it can be concluded that the cognitive structure of a person is, in part, reflected in some of his occupational interests.

The fourth and last RMIB scale found to be correlated with the Game was the medical interest category. It was significantly but negatively correlated to PE ($r = -.53$, $p < .05$). It is interesting that this relationship is similar in magnitude to the one found between PE score and the A.P.U. guide's artistic scale. Reviewers (Buros, 1970) have noted that both the A.P.U. and the RMIB correlate well with other interest measures such as the S.V.I.B. (Strong, 1943). From this knowledge and that of the definition of interests, it is not unexpected that the RMIB medical category should be

equated to the converse of the A.P.U. guide's artistic category. That is, despite the differences in their methodologies, these two scales are evidently dealing with opposite ends of a similar stereotype/interest continuum. Next, it may be assumed from correlation coefficient magnitudes and the "equality" of their scales in terms of interests measured that PE is related to a common factor in both these scales. Thirdly, PE has a somewhat similar relationship with the 16 PF's I scale (toughminded and no-nonsense) and its N scale (artless and unpretentious; Cattell, 1962). The question raised is, what is common to I, N and the two above interest scales, the A.P.U.'s No. 5 and the RMBI's No. 12 scales which is involved in attributing valence to events (PE)? In other words, what is common to: (a) being perceived as toughminded, practical and realistic; (b) also being perceived as simple, artless, unpretentious and sometimes crude and awkward; (c) yet showing some interest in such artistic occupations as photographer; (d) but finally showing negative interest in medical occupations such as nurse and surgeon? Could this be describing a person such as an "ornementalist"? That is a man who would put an ornamental "twirl" on a spoon handle yet not spend weeks painting on canvas either for the money or art's sake. Rather than a student of fine arts, this type of person would be an industrial designer. He is primarally interested in the object's use but is also interested in its beatuy. Such an interpretation would hypothesize that PE is linked here to a functional or utilitarian interest which has associated with it a secondary unobstrusive aspect, to give aesthetic pleasure. This possible characteristic of PE would need to be studied specifically and with many controls before any validity could be attributed to the hypothesis.

Note that PE is not a pure score, such as a constructed factor could be in a mathematically-oriented "objective" test. The reason for this lies primarily in the objectives for the development of the Cognitive World Structure Game (Section II). This score, like the Game itself, is an attempt to quantify a more underlying and fundamental cognitive structure to behaviour. That is, the way S interacts with events in his environment is of concern rather than the more surface aspects of behaviour and "personality" as found in attitudes. Nevertheless, attitudes and interests are believed to be reflected in a S's differential cognitive behaviour, in this case towards such events as getting married, being promoted, losing a relative and so on. According to the correlational results here, all which should be said is that students showing interest in medical professions attribute less valence to life-events such as death, marriage, and promotion. Any hypotheses put forth would need controlled research before being described as valid.

In the preliminary report on these studies (Tivendell, 1973b), and in particular in the section dealing with occupational interests, qualifications were made concerning the no-relation hypothesis. The cognitive structure is, in personality terms, the origin of behaviour including attitudes and interest. However, the cognitive structure's independance of interests was not the basis of this no-relation hypothesis. It was rather that interests are subject to change and this inconsistency over time makes them less than important factors in cognitive structure. Next, the occupational guidance model which contends that personality is largely unimportant in this field (Fox, 1970) was disputed. The traditional schizoid model of man the worker was

rejected (Section I). The worker is a complete person carrying with him the influences and schemas he has from interacting with his worlds. A Gestalt-like entity, he is the sum of his various environmental interactions; with his family, friends, personal thoughts and desires, and including the most casual non-verbal interactions that occur, for example, when travelling to work. In other words, Man is the sum of his interactions with his worlds. It is for this reason that the cognitive structure is crucial to his occupational choice as postulated by Holland (1959). The cognitive structure should, therefore, be reflected though not duplicated in a S's occupational interests.

In summary, the relationship between the Game and these interest categories was expected to go beyond the mere two characteristics suggested by Fox (1970) but only moderately significant in size and over time to be much less consistent than the cognitive structure itself. The correlational relationships reported lend some support to criticisms of the traditional occupational guidance model for its neglecting the important role of personality in occupational choice (Cooley, 1967; Tivendell, 1973b). In particular, the results lend support to Holland's basic theory of occupational choice (1959), and the defining of personality in terms of the importance of the immediate cognitive environment. Though some researches might wish to pursue the study of inter-relationships between interest measures and personality, a more important conclusion seems to concern the need for differential personality profiles of occupations. Section III.4 includes a report of such a study.

III.4 Nomothetic Variables

The Game and Certain Nomothetic Variables

Introduction

The main objective in developing the Cognitive World Structure Game was to contribute to the proposed occupational research methodology (Section II). This requires the Game to deal validly with both ideographic and nomothetic facets of occupational research. The ideographic facet has been introduced in Section IV and, due to the nature of its research approach, it can be evaluated in terms of several case studies. On the other hand, the approach necessary to evaluate the Game's nomothetic contribution cannot be done by means of a case study. For example, Section IV.1 does begin to look at various occupations within an organisation. However, there are occupations and indeed types of people in these occupations which cannot be found in such organisations. It is necessary, therefore, to present similarities and differences across a much wider range of occupations than can be found in any one organisation. This particular section was introduced for this purpose. Other aspects of nomothetic research are also deemed important. For example, two important questions are whether there are any differences due to age or sex in Game scores. Still other studies have looked at the date of birth (Zodiac) and physical make-up (Sheldon-type study) of Ss, but their results were of a less practical nature and were not included here.

The three nomothetic variables reported on here are respectively age, occupation and sex. Of the 166 Ss belonging to the age-study, the first group (lower-form) belonged to a different sample of students than the second group (upper form), although both groups belonged to a student population from schools in the greater Brrmingham area. The third group

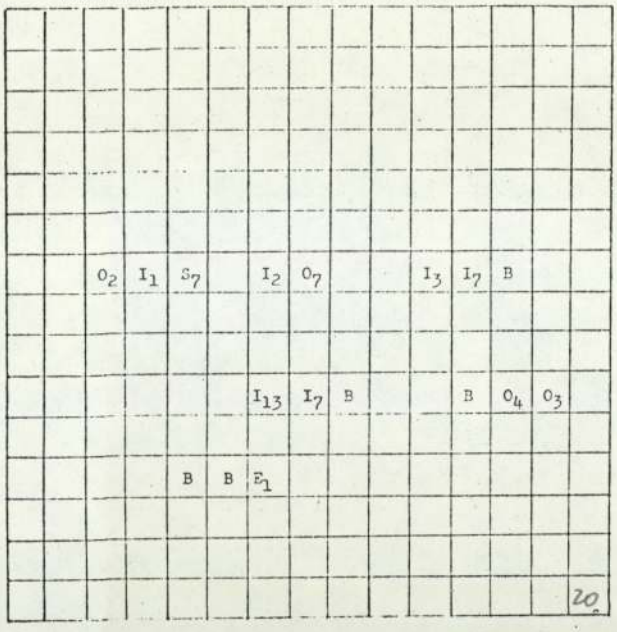
in this study (university) included undergraduates from two local universities with none of the Ss belonging to psychology departments. As reported in the introduction, the Ss in the second study (occupations) were sampled from different occupations. These are either described in Tivendell (1973a) or, in the case of the computer and social worker occupational samples, are reported in Section IV. Thirdly, the Ss involved in the sex-variable study were sampled from a general population whose age ranged from nine to late fifties.

Age Differences

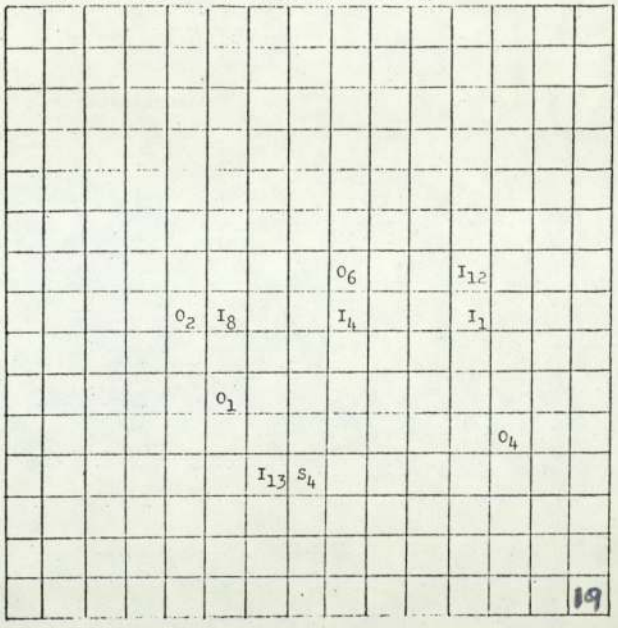
Graphic plots in terms of the percentage frequency distributions of Game scores were made for three distinct populations of young people. The sex make-up of the groups were similar, approximately fifty percent being male Ss. The Ss belonging to the first populations were pupils whose average age was thirteen. There were thirty-five pupils in this first sample labelled "lower form". The second sample were upper-form pupils from the same region and whose average age was sixteen. These latter Ss have already been mentioned in an earlier section (III.3). There were forty three pupils here and they were labelled "upper form" on the graphs (Tivendell, 1973b). The third group was composed of university students sampled across the various departments and course levels belonging to two universities. A number of hypotheses, some of them only alternatives to each other, were formulated to explain the results. For the purpose of this report, however, only a few need be mentioned.

Six Game matrices are presented in the following diagrams (No. 19 to 24). It can certainly be argued that these belong to six Ss, two in each age group, not all of whom are typical

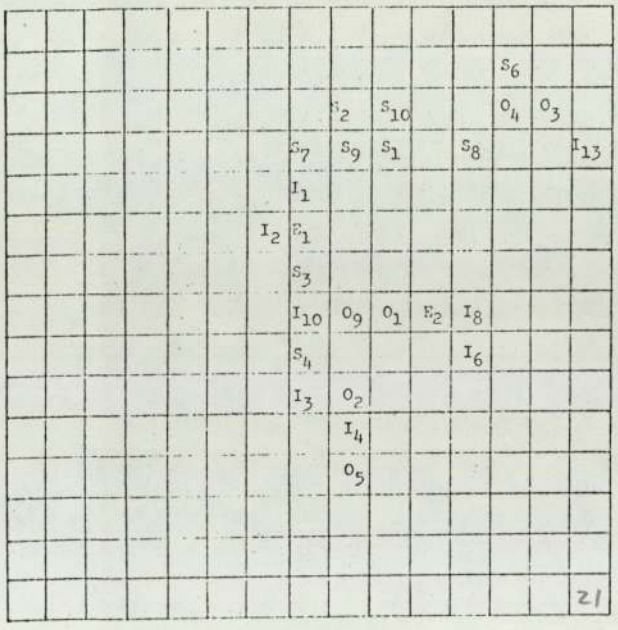
Subject no: 17 (a nine year old boy)



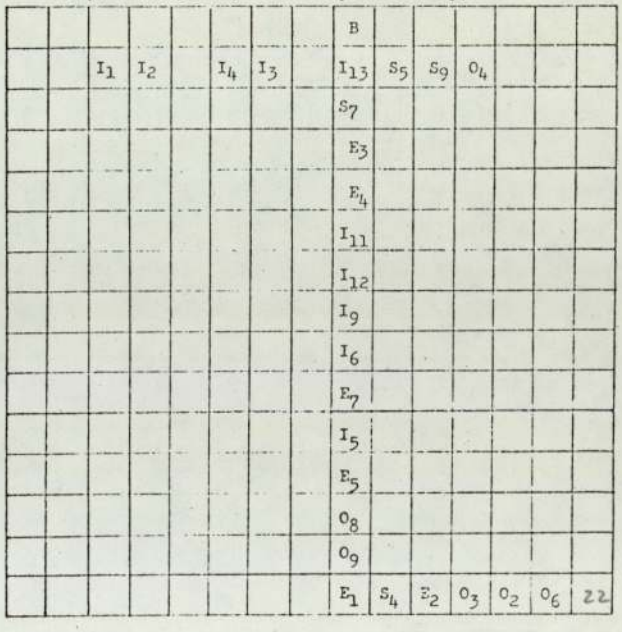
Subject no:18 (a nine year old boy)



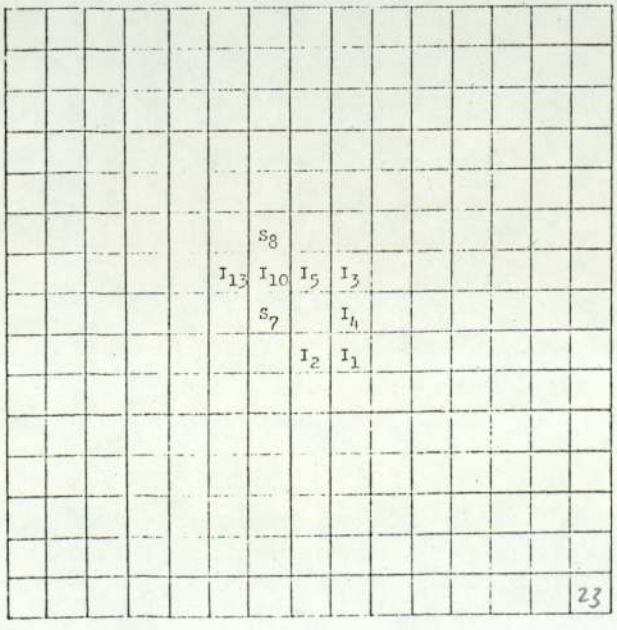
Subject no: 58 (a fifteen year old boy)



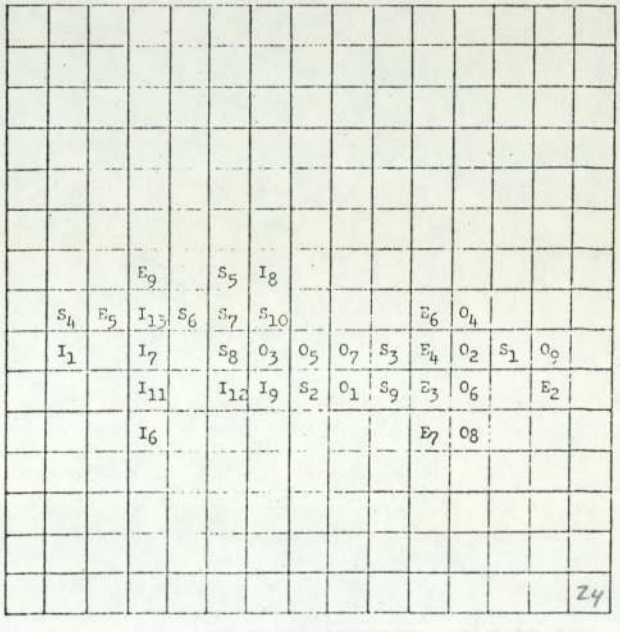
Subject no: 59 (a fifteen year old boy)



Subject no: 1 (an adult female)



Subject no: 14 (an adult female)



of their age group. Nevertheless, they help explain the concept of the development of patterns with age (maturity and/or experience), in particular the increase in structure and simplicity* with age.

S No. 18 (Diagram 19) was a nine-year old child. There is a rudimentary breaking up (categorisation; Witkin, 1965) of the cognitive environment in terms of worlds. These six separate worlds will probably not exist as such or in a more elaborate way in, say, ten years time. Nevertheless, the differentiation of the S's interactions with different parts of his environment and more important interacting with these in different ways is the basis of his future cognitive world structure. Perhaps these worlds should even now be more complex and developmental research should look into such aspects. A combined figural-verbal version of the Game is being prepared to help in such cases. Next, it may be noted that S No. 58 has a more complex cognitive world structure. This matrix is still in fact lacking in "structure" in that there is rather a lot of flexibility in the S's worlds. Blocks could conceivably be added or removed without destroying the overall structure, pattern or dimension(s) used. A more direct example of flexibility is the use of free-blocks, i.e. blocks not touching any other block. It the near future, we might expect changes in this pattern. For instance, as the self-concept crystallizes (Super, 1953), I^{13} (Me) should become more central to the structure than it is now. Similarly, certain blocks dealing with authority, family, and the world of work should also change in both position and valence.

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*i.e. less clutter as it were; lower N, D and P scores and the pattern and dimension(s) of the structure become clearer (Section II).

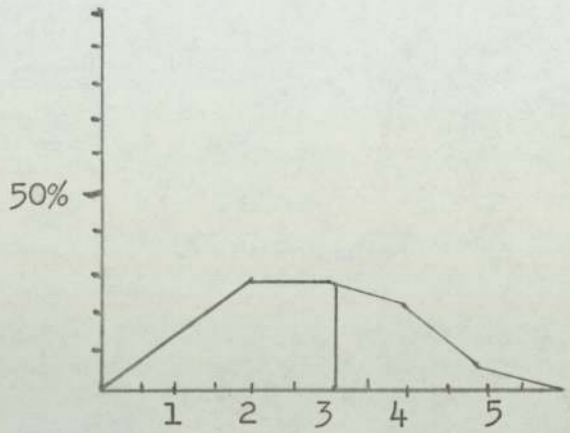
Is is presumed, however, that this S will never modify his matrix to the extent that it would resemble that of S No. 1 (See Section IV.4). This latter S is not typical of most adults, nor is her matrix similar to many other Ss' sampled in the course of developing the Cognitive World Structure Game. S No. 1's pattern has been introduced as an example of a very stable and mature type of structure which the self may long to attain. Examples of abnormal or stunted development of a S's cognitive world have been introduced in Section IV.3. In most cases, the "abnormality" was due to environmental deficiency during early and middle childhood. The remaining diagrams are more straight-forward in their portrayal of increased differentiation and structure with age.

The three samples were found to vary significantly ($F = 4.50$, $p < .01$) in terms of the number of objects (NO) included in their Game matrices. Across the three groups, there is a widening of the standard deviation (about the mean) with age. Respectively, these standard deviation values were 2.05, 2.40 and 2.84 for the lower-form, upper-form and university Ss. This suggests that the number of objects important enough to be included in one's cognitive structure is fairly similar for most younger Ss. With the advent of early adulthood, there is a somewhat greater variety of possibilities, always in terms of the number of items in the matrix. Perhaps the increase in number and/or type of responsibilities demand the consideration of fewer or greater number of objects. As will be noted below, this was found to differentiate between many occupations, which lends sume support to this hypothesis. Meanwhile, the average score per group was found to be significantly different for the university sample. Respectively, the means were

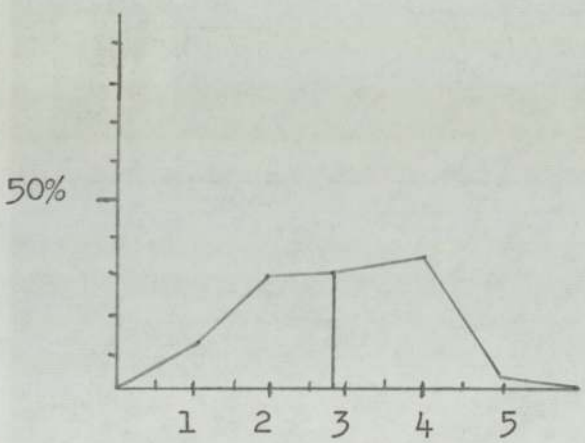
6.7, 6.7 and 8.2 for the lower form upper-form and university Ss. If indeed there was some factor linked to the attribution of valence to objects such an increase in self-centeredness (occuring after the age of the lower-form Ss), this was not revealed here and doesn't implicate the number of object items found in one's cognitive world structure, In brief, the changes in NO have been linked with occupational differences (See below) and with changes due to age - in particular, to that age when occupational choices are being implemented. These aspects of "age", or maturity, or development with which NO is concerned are perhaps better studies in terms of: category usage in concept formation; structural characteristics of cognition; and psychological differentiation and cognitive styles (Warr, 1970). Differences due to age and in particular their possible relationship with this aspect of the cognitive structure's development should generate a great deal of research. It is, however, important that this new research should include more detailed item analyses and an increase in the range and size of Ss sampled.

Figure 11 (taken from Tivendell, 1973b) summarizes the relationship between age and the Game's PS/NS score. As with the other distributions (Tivendell, 1973b), these are in percentage frequency per Game score, thus facilitating inter-group comparisons. From the graphs, it may be noted that despite the dissimilarity between distributions the range and mean of scores were similar. Tests of significant differences based on measures of central tendency may not always be adequately reflecting possible differences between samples. In fact, an analysis of variance reported these differences as statistically insignificant ($F = 2.55$) had a non-rarametric

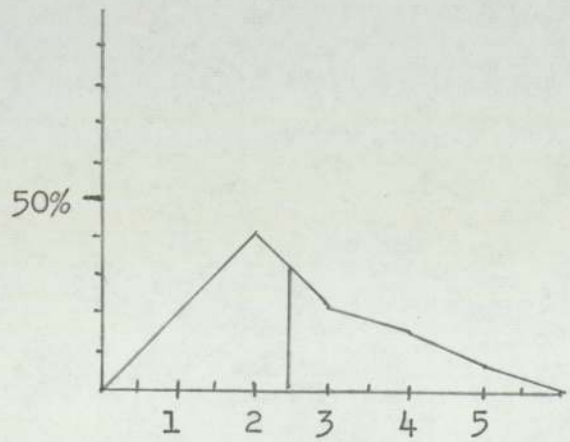
Figure :11 The Game's PS/NS scores as distributted among three age groups sampled.



lower form (N=35)
PS/NS scores



upper form (N=43)
PS/NS scores



university (N=48)
PS/NS scores

test been used, such as a median test for k samples, significant differences between the distributions would have been reported ($X^2 = 11.8$; $p < .05$). In view of this, hypotheses could be advanced albeit based on these "insignificant" trends.

The PS/NS score has been linked to the preference for verbal structures in helping to organise a person's cognitive world (Sections II and III.2). In particular, verbalizers are seen as people who borrow types of sequential structures, as are available in languages and related cultures, to structure their cognitive world. According to the distribution of PS/NS scores, the Ss in the middle group (upper-form) are seeking such exterior means of structuring their environment. In the younger child and to a lesser extent for the lower form sample, the focus of one's cognitive environment and indirectly the source of its structure was the family and (perhaps a little later?) the social environment. By the age of sixteen, or so, there seems to be a need to re-organise or review the basis of the self-concept. Note too, there is a parallel increase in contact with intellectual ideas and possible sources of structure. Perhaps due to a bias in the sampling of the older group or due to the increased differentiation linked with occupational and personal decisions, there is a trend for this university group to rely less upon such intellectual-type structures than even existed during early adolescence. However, these are questions not answers.

The need for future research is again made quite clear. It may be assumed that even the most fundamental aspects of the cognitive structure have evolved with a person's increased awareness and interaction with his environment.

Theoretically, to organise one's ego in terms of social constructs is an area potentially more dynamic (subject to development) than other categories of interactions involving individuals, objects and events. But what does a reliance upon sequential structures mean? How are these Ss different from others such as spatializers? Are these groupings of Ss distinguishable in the general population? How and why do these develop and change with age, if indeed they do as the data here suggest? Once again, future research, specifically interested in such changes in cognitive structure, must involve larger samples, more frequent sampling intervals and better discriminant analyses.

Significant differences were found between the three age groups' PE/NE scores. Respectively, these were of the order of: $F = 3.87$ ($p < .025$) and $F = 3.56$ ($p < .05$). These group differences will be discussed in turn, beginning with the NE distributions. How were the number of event items per Game matrix (NE) significantly different for these age groups? The younger Ss characteristically had many event items in their cognitive world structures. The mode was 8 items, the mean 6.1 items. The next group (upper-form) were found to be bi-modally distributed. The modes here were 4 and 8 items per matrix, the mean for the sample was 4.5 items. This bi-modal distribution suggests that the cognitive structure undergoes a fundamental and significant change in or around this age, when it is compared to the above distribution. Indications are that this change concerns the acquisition of a different basis for the cognitive differentiation of events. Certainly, this involves "seeing" events such as getting married, being promoted, and losing a parent, in a different

light as one grows older. The younger Ss were probably crowding their cognitive world with events which might, at a later stage in their lives, either become the object of their attribution of valence or be used to structure their cognitive world. The significant reduction of event items, occuring in or around sixteen years of age, shows that many of these events could no longer be conceived as vital to the ego. This more realistic basis for cognitive differentiation seems to be integrated into most adult personalities if we can judge from the NE scores for the university samped. Note that it is possible that this occurs only with an intellectual elite, and future research is indeed necessary here to clear up the point but experience suggests that this increased differentiation is very probably an aspect of the general development of the cognitive structure. Secondly, this different basis for cognitive differentiation has only marginally affected the mean valence attributed to these events.

The PE/NE scores were found to decrease significantly with age (Tivendell, 1973b). Respectively, the means were 2.74, 2.40 and 1.97 for the lower-form, upper-form and university samples. The PE/NE score has been associated with motivational distortion of test scores (Section III.5). In that section, it was recommended that future research be carried out, as the exact nature and the process of distortion were not yet fully understood. It was evident that the type of distortion studies was one of "personal" or subjective enhancement*, as opposed to a desire for (unwarranted) social approval (Berg, 1967). In other words, the Ss were

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*This is not equivalent to Berg's definition of "personal desirability" (1967, p. 35).

attempting to show a slightly better version of themselves on the Game; what they themselves would like to be (personal enhancement) rather than what others may want them to be (social approval). It is hypothesized here that the differences found between age groups are linked to the S's self-actualisation. In a cognitive animal, this must include a personal enhancement set among the numerous variables affecting the development of personality. In brief, PE/NE was known to be associated with a particular type of motivational distortion. It was assumed that these Ss had no unnatural nor atypical reasons to distort the test. This assumption can be justified in terms similar to Thorpe et al's argument for not including a distortion measure in their own test (1953). Therefore, if Ss were not distorting their own matrix scores, there was indeed a development of the cognitive world structure's event-interaction system associated with growing older and which involved development in terms of self-actualisation or personal enhancement. The Ss in our sample, if indeed they can be compared, are becoming what they would want to be. Future research must take care to match S samples using a much wider set of criteria: biographical, cultural, sociological, psychological and perhaps even physiological. Moreover, such studies should increase the sample size and the number of age groups samples; and the analytical techniques used should be more discriminatory.

In summary, three Game scores were associated with the development, with age from about 13 to the early 20's of the cognitive world structure. These were the Game's NO, PE/NE and NE scores. The results may have been biased by the size of the samples and/or by sampling errors (See introduction to this section). For this reason, the distribution of other

Game scores were looked at though emphasis was placed upon statistically significant aspects of cognitive structure development. Though restrictions were always considered, some hypotheses were put forth and examples of changes in pattern were included.

Occupational Differences

This section is likely to be particularly disappointing to the manager and personnel officer in charge of, for example, recruitment and selection. They, like others who have to do with manpower research, might prefer a simple bi-polar score which would show the optimal match of man and job. However, it was found that there was a distribution of scores, often with a substantial standard deviation, most of which belonged to satisfied and satisfactory workers. There is a wide variety of tasks and jobs within an occupation which certainly need different skills, attitudes, interests and, especially important to this study, different cognitive structures or personalities. For example, a police organisation may need officers with very different abilities, interests and personalities to do a number of jobs. The men doing the following may all need to be police officers: those doing the general office work; those working at the reception desk; the patrol and beat officers; the men who investigate and capture certain types of law-breakers; and men who organise and introduce ("put live") complex systems such as electronic traffic surveillance. They are, however, tasks which require different factors. These may be respectively: clerical and manipulative abilities and interests; for meeting, listening and helping clients they may need to be high on people-persuasive characteristics; next,

perceptual and monitoring abilities; the C.I.D. man may need to be high on information processing, decision-making and experimental intuition; and finally, officers with managerial and organisational efficiency. As the above example emphasized, there are a number of factors which must be considered in addition to aptitudes, abilities and interests. As Holland (1959) has stressed, personality is one of the most important of these. This is even more so when considering the differences in environments which these examples suggested. That is, the Game's emphasis on the physical, personal and social environments is a necessary step to take in any serious occupational study. If, for a given occupation, cut-off scores (Schein, 1965, p. 21) are realistically determined, a simple yet tedious trial-and-error research could produce the wanted predictors of optimal-level performance on the part of the worker. For example, if policemen between score X^1 and score X^2 on a certain Game variable are seen as the type of worker desired, a search for a predictor of this range of scores can be undertaken. It would then be unnecessary to administer the Game to every future applicant. It is probable that a certain interview or questionnaire item could predict the performance wished. It may also be desirable to periodically select beyond the criterion range so as to re-evaluate the criterion and introduce "new blood" into an occupation. In brief, personality is at least as important a factor as any other in a worker's satisfaction and satisfactoriness. Thus, research could be carried out to determine the distribution of Game scores for an occupation or aloocation within a broad occupational group. Periodic re-evaluation of personality distributions in terms of worker satisfaction and satisfactoriness should then be undertaken.

The distribution of Game scores for any occupation may need to vary in time despite the reliability of these for each individual. In determining levels of satisfaction and satisfactoriness, allowances must be made. Performance may be affected by situation-specific environmental and attitudinal conditions. Here, the term "attitudes" is taken to include belief systems, interests and needs (Herzberg, 1957) which can change without changing the S's cognitive structure fundamentally.

A number of aspects concerning the occupational samples should be mentioned. First, it is important to note the limited number of Ss sampled per occupation. Secondly, the samples were not selected randomly from all possible Ss in that occupation, in the country. Generally, the Ss were operating in a particular area such as the Midlands. The random selection of Ss from a given area and belonging to a given occupation makes the sample representative only of those belonging to that occupation in that area. Thirdly, in the case of the architectural students, all the Ss available at the time of testing were sampled. In brief, it had been operationally hypothesized that these Ss reflect the general trend for their occupation. However, any conclusions need to be re-tested before they may be considered valid for that occupation. Similarly, a more extensive study, involving more occupations, larger samples of each occupation and a better stratified-random selection technique, is necessary. Finally, for ease of comparison, the samples' distribution of Game scores were presented, as above, in terms of percentage frequency of the sample to use each score per Game category. In addition, graphic plots of the ranges and modes for each occupation were presented per Game score. These graphs

have not been included here due to limitations of space but they have been presented elsewhere (Tivendell, 1973b). The following is a list of the occupations samples: architects, bible class students, computer occupations (See Section IV.1), librarians, police, secretaries, social workers (Section IV.2), and teachers.

An analysis of variance was carried out upon the data for each Game score, across the eight occupations. This revealed two Game scores, the number of individuals (NI) and the number of objects (NO) included in a matrix which were successful in differentiating between these occupations. Respectively, the F values found for NI and NO were 3.08 and 3.50, both with a significance level of $p < .05$. As a point of interest, it was decided to re-analyse the data for the occupations while attempting to correct for the low number of Ss in two of the samples. It was argued here that the size of the sample might make it less representative of its occupation. The two samples which were subtracted from the group were the architect students and the teachers. This meant reducing the original number of Ss by sixteen, to one hundred Ss. This re-analysis, though not experimentally correct, found five Game scores to significantly differentiate between occupations. These were:

N the total number of items per matrix
$F = 3.48$, $p < .05$

NI the total number of individuals per matrix
$F = 4.23$, $p < .01$

NO the total number of objects per matrix
$F = 5.23$, $p < .01$

NE the total number of event items per matrix
$F = 3.02$, $p < .05$

P the total valence per Game matrix uncorrected for N
$F = 2.68$, $p < .05$

PO the total amount of valence attributed to objects in the matrix

F = 2.27, not significant

PE the total amount of valence attributed to events, uncorrected for NE

F = 2.01, not significant

Two scores were not significant at alpha = .05 but were very near to being so. These were PO and PE. However, all three P scores (P, PO and PE) are considered to be playing supportive roles due to their high N component content.

Sex Differences

The Game scores of over two-hundred and fifty Ss were comparatively analysed for differences due to sex. Ha the Game been considering attitudes, interests and so on, differences in the scores of men and women would be expected to concern their interactions and values with people, events, objects and social constructs. However, the Game als with something more fundamental to a person's uniqueness or cognitive structure. It is for this reason, it is believed, that only three Game scores were found to have significant differences due to sex. These were not evidently chance relationships but were indeed duplicated in previous pilot studies. Table 4 presents the means and standard deviations for the one hundred and twenty-six females and one hundred and thirty males analysed. The three significant scores were N, NS and NE. By definition, the differences found in the N scores are due to the two latter scores. It should also be noted that even within a uni-sexual sample, there is a wide range of possible scores. This point is important when trying to relate this NE variable to a score on a masculine-feminine trait (Tivendell, 1973b). It was hypothesized that

TABLE 4 :differences in Game scores due to sex

Game scores	Females $\bar{X}$	Females s.d.	Males $\bar{X}$	Males s.d.			
P/N	2.67	1.02	2.59	1.02			
P	72.08	40.34	78.69	41.72			
PI	23.68	13.25	24.27	13.21			
PO	18.18	11.26	18.54	10.88			
PS	19.38	11.92	21.78	12.74			
PE	10.56	9.68	12.67	9.95			
N	26.00	9.03	29.39	8.54	+ = -3.08	p	.01
NI	8.22	3.41	8.92	2.91			
NO	6.47	2.55	7.05	2.68			
NS	7.11	2.34	8.21	2.52	+ = -3.60	p	.002
NE	4.20	2.93	5.28	2.83	+ = -2.99	p	.01
PI/NI	2.86	1.10	2.70	1.25			
PO/NO	2.71	1.40	2.64	1.32			
PS/NS	2.64	1.18	2.64	1.28			
PE/NE	2.18	1.43	2.24	1.27			
distance	4.51	1.94	4.93	1.61			
completion time	14.56	5.19	14.55	5.40			

Females (N = 126)

Males (N = 130)

the reasons why males use more blocks than females is linked to the differential status (role) of men and women in most societies. Women are less likely to use many social constructs and intellecuual-type structures. The educational system in general, including parental and social attitudes, has notoriously hindered the intellectual development of women, thus affecting their status and role in societies' institutions. For example, males would get preferential treatment when a family had to choose between siblings on who should be permitted to continue for higher education. There are certainly more males than females in universities today, though this is slowly changing. On the other hand, it is the sexual role rather than status which is blamed for the female Ss' less frequent use of event blocks. Family training directly influences a person's adopted sex role. It is this which finds women taking, and needing to take, fewer responsibilities in face of a number of events. Many of the events recorded in the Game happen to, rather than being precipitated by or at least contained by, the female in the family. For example, when a close relative dies, the responsibility for arrangements are given to a male member of the family. Similarly, women accept or reject marriage proposals but rarely, if ever, make them. In brief, the culturally determined roles of the female are seen as main explanations for the significant differences found.

The three above sections looked at the Game in nomothetic terms. Severe limitations on the two first studies, age and occupations, make conclusions rather dubious. Nevertheless, it was argued that the Game has a dynamic component which reflects personality development. This type of study needs extension especially in terms of design and sample

size. The results dealing with occupational differences are more important in terms of the support they lend to Holland's theory (1959) and the Game's ability to distinguish between these occupationally different samples, than in respect to the individual occupational analyses and the hypotheses generated.

To evaluate the Game in terms of the variable sex, it seems pertinent to look at how another test fared, the 16 PF by Cattell (1962). In addition to its pertinence to the nomothetic variable sex, this should also help in understanding, even evaluating, the Game vis-à-vis the other two variables discussed here. Based on a much larger number of Ss tested, Cattell (1962) found significant differences between males and females on only one of his sixteen traits. This trait was the I scale, a tough versus tender scale of attitudes very similar in nature to William James' continuun (See above). But unlike the Game, the I scale was purposely designed for this function. It attempts to distinguish between the sexes by measuring different stereotypes held, or attitudes and behaviours proper to each sex. It does not truly answer the question of whether Ss of different sex have different personalities but rather asks whether a given S is willing to hold certain attitudes or to behave in a manner ascribed to the other sex. The "loadedness" of these items must be evident to all but the most naive Ss. The Game, it has been argued throughout this thesis, evidently attempts to measure something more fundamental and more elusive (Fiske, 1971) than attitudes, i.e. the cognitive structure. Moreover, the Ss tested did not have any "a priori" stereotypes or mental sets upon which to pattern their Game behaviour. This was possibly due to the Game's novelty but

probably also due to the complexity of its functions. Nevertheless, it was able to find significant differences in this more complex area, the cognitive structure's measurement. Though data are not available to evaluate the 16 PF's performance in distinguishing between occupations (Cattell, 1962), reviewers have placed some doubt upon its ability in this area (Buros, 1972). In brief, the Game has indicated, in simple but crude experiments and when using its simpler version, that it satisfactorily deals with certain nomothetic variables. Future research is absolutely necessary not only because the results need to be clarified, better defined and validated, but also because some of psychology's elusive concepts may have been uncovered.

III.5 Motivational Distortion

Introduction

The Cognitive World Structure Game was expected to be hard to distort because of its theoretical structure, its methodology and its novelty. The problem of slanting answers has little significance in counselling and therapeutic situations (e.g. Baker, 1945; Thorpe et al, 1953). People are often anxious to unburden themselves about their problems and their lives even when they are not encouraged to do so and distortion would be counter-productive. From experience, the concept of motivational distortion or faking and especially the techniques to measure this have been found to be misunderstood. Often, with little more than the layman's understanding of faking, psychologists using tests attribute to them omnipotent introspective powers when a lie scale is available. The lie scale seems for some researchers to remove from their study the need for even the most basic

Table 5 : three alternatives for a model of faking test results

(i) faking-good for impression purposes:

this includes the patient faking certain psychiatric symptoms for the benefit of the terapist.

(ii) answering a personality measure as would a well-adjusted and happy individual:

such a model was used by Kimber (1947) in his study of subjects' insight into test items.

(iii) answering a test as would a more perfect version of the self:

that is be yourself except in the areas or characteristics in which you know others to be better than you. One modification of this approach is to answer tests as would your hero.

experimental controls. It should be noted, however, that many tests of repute do not contain lie scales, for example, the California Test of Personality (Thorpe et al, 1953), the California Personality Inventory (Gough, 1957) and the Bernreuter Personality Inventory (Bernreuter, 1938).

A two-conditions, repeated-measures design study was deemed the most appropriate way to look at the problem in view of the Game's high individual-expression component. The two conditions were labelled as (i) true, and (ii) false. A "three alternatives" model of faking conditions was proposed (Table 5). This specifically excludes the case of the inconsistent or "mixed-up" S which is a phenomenon of personality and not a serious attempt at faking. Many personality tests have unfortunately based their lie scales on this latter model (e.g. the MMPI, see Berg, 1967) even when such an explanation was available (Eysenck and Eysenck, 1963). The third alternative model found in Table 5 was the one used here. This was because the first model was too situation-specific while the second model was a difficult concept to define in operational terms. To circumvent the problem of model two and thus help create a more consistent faking condition, a specified psychological atmosphere was considered necessary to precede the false condition. Thus, to help Ss to understand what the experimenter meant by a perfect version of themselves, the "false" condition was preceded by the following statement:

> "I want you to tell me the names of the two of three people who you admire. These could be members of your family, be of your friends or from your friends' families, someone you know of or have met with, or be well-known persons such as an actor, a real or fictional hero or indeed anyone else. You probably admire them because of some part of their personality or their behaviour in certain situations as

opposed to their physical appearance alone. (Pause) Can you tell me their names? (Pause) What is it you admire in them?

To Ss really unable to answer, a short list of actors was suggested verbally. It was, however, emphasized that this list reflected particular tastes and culture patterns of the experimenter. The list contained four names, two of each sex, when S was a girl (as the experimenter was male). When the S was a boy, the list contained only three names of male actors. Though a number of lists were available, only two Ss, one male and one female, required this extra assistance. No differences on the test scores were noticed. The part of this instruction dealing with physical appearances was an attempt to get Ss to imitate or assume a real personality. However, it was not emphasized, as the S's imagining himself to have the appearance of a well-known actor probably involves the S's assuming the personality of one of the characters portrayed by that actor.

To help assess performance under the two conditions as additional psychometric test was introduced. Advantages such as popularity in Britain, simplicity of administration, brevity were considered. It was decided to include the E.P.I. measures because of the purported reliability of its own lie scale in detecting individuals "faking good" (Eysenck, 1959; Gibson, 1962; and Eysenck & Eysenck, 1964). The manual notes that a score of four or five on the scale exposes the likely occurrence of faking and that "E and particularly N scores" are hence placed in considerable doubt. Eysenck and Eysenck (1964, p. 14) report the following data concerning usual L scores:

Average scores found for the E.P.I.'s L scale (forms A and B)

	(i) Form A	Form B	(ii) Form A
Mean	2.3	1.4	4.5
s.d.	1.6	1.4	1.8
Sample size	651	329	482 (apprentices)

Note: (i) L scores belong to a general population

(ii) L scores found in a selection context

The first section (i) was not part of any one particular experiment but we are told these figures belong to a general population sample. Section (ii) of these results were extracted from a selection situation where the authors assumed that the Ss were trying to fake good. The mean is above the 4.5 mark, and the standard deviation (s.d.) indivates that most Ss scored quite close to this mean. Meanwhile, test-retest reliability for the L scales of both forms of the E.P.I. (1964, manual) are reproduced below:

Reliability coefficients of the L scale (Eysenck & Eysenck, 1964, p. 14)

Form A	$r = 0.78$	sample size: $N = 50$
Form B	$r = 0.74$	sample size: $N = 50$

From this, it would seem that we can expect quite high levels of reliability. Experience, however, recommends a lower reliability level for most experimental situations.

The Ss were again chosen from a number of Midland schools. It was operationally assumed that these upper-form Ss reflected a general population sample, albeit possibly a slightly more intelligent group. This assumption that the Ss represent the range of a general population is perhaps more plausible in America's regional school system but still basically accepted here because of the compulsory nature of school attendance. It can be hypothesized that other more specific

S samples would seek to distort their Game results in particular ways. For example, social scientists and social workers might seek to distort their expressed cognitive structure by decreasing the use and especially the valence attributed to objects (See Cattell, 1973). They are by stereotype less materialistic, more radical and fanciful. People in occupations described as "literary", such as philosophers and novelists, might on the other hand increase their use of social constructs, being verbalizers subject to intellectualisations and to borrowing verbal structures or schemas. It was always possible, though unlikely, that we had chosen a specific population such as these. A .05 level of significance was chosen to help reduce the chance introduction of such nuisance variables.

An ABABAB type experimental design (Underwood, 1949) was used involving respectively, the four following conditions:

a) a true Game

b) a false Game

c) a true E.P.I.

d) a false E.P.I.

Each S would partake in each of the four conditions. Each test used was separated from its own repeated measurement or retest by the second psychometric measure to minimize any immediate recall effects. The Ss were individually tested and the false condition was preceded by the previously discussed statement. It was assumed that this general atmosphere aimed for and the specific instructions (below) concerning distortion were sufficient to produce the desired performance. Any further emphasis was considered unnecessary and liable to produce artificial results. The specific instructions to fake the appropriate test always followed the

above statement and these instructions were:

> "I want you to do this (test or Game) as if you were better than you are. Remember the characteristic which you admire and would like to posses at least to a greater degree. This is to be a more perfect version of yourself."

Finally, it should be noted that both forms of the E.P.I. were used, one to each condition per S, in alternative order per S (See Table 6).

Even though some Ss might have anticipated that they could manipulate the Game at will, the theoretical structure of the Game, its novelty and especially its reliability suggested otherwise. This particular study focuses on the possible distortion of more familiar Game scores, though a similar hypothesis of difficult-to-fake could be extended to include such "scores" as patterns, anchor points and calculated pivots and distance. Pilot studies and experience suggested that it would be very difficult to deliberately distort particular Game scores in such a way as to distort the analysis of personality. Previous studies involving psychometric tests containing lie scales did suggest that the Game's PE/NE score was affected by distortion and could perhaps be considered as a control or, upon further development, a scale able to detect motivational distortion. The important point arising from these pilot data and post-Game interviews was that this was not evident to even the most sophisticated Ss. That is to say that PE/NE might emerge as a score able to detect desirability distortion but few if any Ss would be aware of this function and thus be unable to control it. Specifically, it was hypothesized that distortion cannot be voluntarily undertaken by a S to the extent that the scores of the Game will reflect a different personality profile than would have otherwise been found. It was further

Table 6 the experimental sequence and conditions in the motivational distortion experiment

conditions:	true Game	true E.P.I.	false Game	false E.P.I.
subjects:				
1	1	2(form A)	3	4 (B)
2	4	1(form B)	2	3 (A)
3	3	4(form A)	1	2 (B)
4	2	3(form B)	4	1 (A)
5	1	2(form A)	3	4 (B)
6	etc.			

hypothesized that Ss who, voluntarily or not, distort their personal cognitive world structure should have higher PE/NE scores. There are settings, such as the selection interview which Eysenck suggested, in which Ss will try to change their profiles to be seen more favourably. This particular study undertook to create such a setting and to investigate the resulting change. It was expected that Ss would, according to the context suggested by the instructions, attempt to increase their P/N and PI/NI scores in the false condition. That is, the Ss would attempt to suggest more stable profiles by increasing the P/N scores and to a lesser extent reduce the number of blocks in their environment, i.e. decrease their N score. In addition, Ss would attempt to show more love or concern for other individuals belonging already to their world by bringing the valence attributed to these blocks. This increased love/concern for others is quite probably a part of the increased stability of profile response. This increase in P/N and PI/NI as well as the decrease in N is not expected to distort the S's personality profile beyond recognition, even though these changes over the whole sample are expected to be significant. This is not the case regarding PE/NE, as this score is expected to be changed in the individual's profile.

The basic reason for including a second psychometric test was to verify the validity of the experiment's instructions. The Game deals with personality assessment; hence, any other type of test would have been purpose-defeating. Because of the very nature of the E.P.I., it was hypothesized that this latter test would change substantially following the instructions to fake. The E.P.I. N score was expected to decrease because of the type of instructions used. Very

few people today wish to project an image of themselves which is unstable and neurotic. High L scores were also expected. The corollary that additional feedback would decrease the L scores was not studied. No specific hypothesis was made as to the direction of change in E scores. The Ss might wish to project more extraverted-type personalities expressing more self-confidence and altruism. On the other hand, for the last generation or so, it has been popular for people in general and cultural heroes in particular to be considered introverted, self-reliant, independent and of higher intellectual ability.

It is unnecessary to restate the hypothesis that the instructions will be successful in causing Ss to distort. The introduction of the E.P.I. into the experimental design was done to verify this. A change in scores should support this, though a significant difference would assure that the change was not due to the E.P.I.'s low reliability. Minor checks on the possible differential effects of the instructions, such as on males and females, were carried out. It was expected that the instructions had been adquately designed and hence, no differences should be recorded.

Results

Table 7 summarizes the Game scores across the two conditions. The means and standard deviations of both conditions and the differences between the two conditions are presented first. A parametric t-statistic for correlated data was calculated and presented here with its level of significance. Similarly, a Pearson r-statistic examines the Game scores in the two conditions. It should be noted that the first statistic, i.e. the Student-t, emphasizes

TABLE 7 : Comparing Game scores under the two experimental conditions

	P/N	P	PI	PO	PS	PE	N	NI	NO	NS	NE	PI/NI	PO/NO	PS/NS	PE/NE
$\bar{X}$: true	2.5	66.5	21.2	15.9	18.8	10.6	25.3	7.9	5.8	7.3	4.7	2.7	2.7	2.6	2.3
s.d	0.8	33.3	11.8	9.9	9.6	7.6	8.1	2.9	2.8	1.8	2.7	1.0	0.9	1.1	1.1
$\bar{X}$: false	2.8	68.1	22.1	15.4	20.6	10.0	24.1	7.2	5.8	7.3	3.9	3.2	2.7	2.8	2.7
s.d	0.8	30.4	12.7	8.4	7.6	7.3	8.3	3.6	2.6	1.5	2.7	1.0	0.7	1.0	1.3
t (rel.)	2.3	x	x	x	x	x	1.9	x	x	x	1.9	2.8	x	x	0.95
p	.05	x	x	x	x	x	.10	x	x	x	.10	.02	x	x	x
r	.75	.92	.80	.93	.76	.66	.95	.91	.87	.49	.84	.82	.70	.55	.05
p	.01	.01	.01	.01	.01	.01	.01	.01	.01	.05*	.01	.01	.01	.05	NS

differences in central tendency. In other words, it emphasizes differences in the whole sample. On the other hand, the correlation statistic looks at the differences between each individual's scores. That is, it emphasizes individual differences rather than group differences across the two conditions.

Table 8 presents the results of the E.P.I. scales across the two conditions. Similar to the pattern in the above table, a mean and standard deviation for the difference between the conditions are given. A parametric t and a Pearson r were calculated.

Basic checks via the second psychometric measure included differences due to the sex of the Ss, the condition the S started in, and a check on the instructions themselves. Table 9 compares male and female sub-samples within conditions. A parametric t-statistic for uncorrelated data was calculated and is presented here with its level of significance. The particular hypothesis tested, it will be remembered, is that the instructions do not affect Ss differentially according to sex. Table 10 compares Ss who started with a false condition with those starting with a true or real condition. Due to the sample size, it was meaningless to include which psychometric measure was first used in this comparison. To check whether Ss did change their personality profiles following the instructions to fake, Table 7 is to be considered. The Game scores across conditions supported the hypothesis that it would be hard to distort these. From Table 8, we note that the two E.P.I. scales show significant differences. The differences in the three scales indicated that the E-score was in fact changed though not significantly so. Similarly, the instructions did not have differential

TABLE 8 : E.P.I. scores for the sample, across the two experimental conditions

True :	E-scale	N-scale	L-scale
Mean	12.26	14.46	1.33
s.d.	4.72	4.70	1.04
False:			
Mean	13.00	6.93	4.86
s.d.	3.58	5.96	2.66
differences:			
Mean	- 0.85	8.50	- 3.53
s.d.	2.41	5.11	2.72
t - statistic: *	-.66	4.35	-.5.02
significance :	NS	p .002	p .002
Pearson - r :	.49	.23	.14
significance :	.05 **	NS	NS

Note the following scores were those expected from the Manual of the E.P.I. (N = 50 sample); the E and N scales belong to students whilst the L scale was only available for an apprentices sample who were "faking good"

Mean	12.26	10.52	4.529
s.d.	4.37	4.913	1.803

* for related samples

** approximate

TABLE 19.34 : comparing male (N = 7) and female (N = 8) subjects' E.P.I. scores within experimental conditions

E.P.I. scores:

condition:	E		N		L	
	Females	Males	Females	Males	Females	Males
true						
$\bar{x}$ real	12.87	11.57	14.37	14.57	1.50	1.14
s.d. real	4.70	5.02	4.95	4.79	.92	1.21
t (between sexes)	.51		-.07		.64	
sign	NS		NS		NS	
false						
$\bar{x}$ false	13.25	12.91	7.62	6.14	4.62	5.14
s.d. false	3.10	4.70	6.04	6.25	2.55	2.96
t	.27		.46		-.36	
sign	NS		NS		NS	

(note: correrated t's for each sex indicated that male and female Ss changed their E.P.I. scores in an identical way. For instance, males were not inclined to raise their L scores. E and L increased and N decreased for both sexes.)

TABLE 10 : comparing subjects who started the experiment in different conditions (true: N = 9; false: N = 6)

	Subjects started in:					
	true	false	true	false	true	false
Real: condition	results					
$\bar{x}$	13.55	10.33	13.00	16.66	1.33	1.33
s.d.	4.90	4.08	5.22	2.94	1.00	1.21
t	1.32		1.55		0.0	
sign	NS		NS		NS	
False: condition	results					
$\bar{x}$	13.22	12.66	6.00	8.33	4.55	5.33
s.d.	3.66	3.77	3.87	8.47	2.40	3.20
t	.28		-.72		-.53	
sign	NS		NS		NS	
E.P.I. scores:	E		N		L	

effects according to sex nor did the above check on the experimental design show significance. Finally, although factorial analyses were available, they would have contributed little to the above evidence.

Discussion

From Table 7, it was noted that the Game is very difficult to fake. The significant differences that do emerge are increased scores on the P/N and PI/NI variables in the false condition. The thirteen other scores show insignificant differences, substantiating well the above hypothesis.

As predicted, Ss attempt to make more stable patterns showing less diversity in their interests and more continuity in their worlds. The increased stability is particularly related to the P/N score. There was also a marginal decrease in the total number of blocks used (N). This decrease in N is a corresponding way of increasing stability to moving the blocks together and helps decrease the diversity of interests and preoccupations. The increase in PI/NI was also as predicted. Interviews following the completion of the Game's false condition substantiated the hypothesis that Ss faking-good seek to express more concern for individuals in their worlds.

Few cues were available to the S which could point to the experimenter's expectations and possible means of interpreting the resulting matrix. This, it is believed, was due to the theoretical structure of the Game as well as to its novelty. Though in interviews in preceding studies, Ss sometimes reported thinking that they could change their matrix drastically when told to do so, Ss had little success. Having only their own concept of what the Game entailed,

these Ss could only "fake" the test using their own personal dimensions. A S's interaction with his own environment is seen as very personal and especially internal. Feelings about people, events, etc. are not believed to be part of their overt behaviour. Ss do not think that these feelings ever show and, thus, there is no need to hide them. This personality approach says that these feelings are overtly manipulated in the Game. That is, the Game is indicative of the way Ss interact with their environment! As mentioned above, interviews following the Game's "false" condition indicated that the Ss consciously focussed their faking-good behaviour on manipulating the position of individuals in their environment as well as a more general tightening of the pattern. The strategies only indirectly involved Game scores. The Ss were not aware of the meaning or the existence of the Game scores.

More important than the difference in central tendency across conditions are the correlation coefficients between these conditions (See Tables 7 and 8). As should be expected from a repeated-measures technique, most scores are highly correlated. Only one Game variable shows a correlation coefficient "significantly" below .50*. In this experiment's context, i.e. a repeated-measures paradigm, it can be deduced from the formula for "t" that significance means Ss are fairly uniform in the direction that they change their scores. A significant correlation coefficient simply means that the Ss themselves have not changed. That is, the personality profiles of all Ss are basically the same though the scores

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*The PE/NE variable still has a non-significant correlation coefficient when S No. 13, the most deviant S, is not considered.

might have changed in a similar direction and similar size (consistency of scores). A low correlation coefficient would mean that the Ss themselves have changed, i.e. their personality profile is different. (The whole point of the argument will be that it is the measure which is different, not the personality.)

When told to distort their profile, the Ss all chose to increase PI/NI and P/N. However, the high correlation between the scores means that their personality profiles did not change. Had these results been obtained in a clinical or field situation, the two personality profiles for this test would still have been considered similar, i.e. belonging to the same person, as indeed they should be. This interpretation would not occur had the other test (E.P.I.) been used in such a setting. Meanwhile, only one of the Game's scores did not follow this trend. A statistically significant "t" was not found when comparing PE/NE scores across the two conditions. This was the only score having a non-significant correlation across the two conditions. This suggests that many of the Ss did change this aspect or characteristic of their personality profile. On the other hand, the results showed that the E.P.I. profiles were systematically changed by all Ss both in a similar direction and to an extent which, in another situation, would suggest that their personalities had changes! Both scientific and common sense indicate that it was the measure and not the personality that changed. However, had these scores been analysed independently of the knowledge that these Ss had deliberately distorted their scores, only interpretations based on the Game would have produced recognizable profiles of the Ss. In brief, when distorting the Game, Ss will deliberately increase their P/N

and PI/NI scores. The PE/NE scores should indicate the presence of such a motivational distortion factor, albeit further knowledge of the process is required. Moreover, experience based on post-Game interviews and results such as found in this study suggest that the Ss are unaware of the changes they might bring about in their PE/NE scores.

From the above results, it may be noted that the instructions to distort were successful in producing the required type of response. Table 9 assures us that there was no component in these instructions which would affect either sex differentially. That is, both male and female Ss responded to these instructions in the desired fashion. Table 10 looks at a further control which was placed on this study, the condition with which the Ss began the experiment. Because of certain extraneous variables such as the need to have an equal number of each sex in each starting condition, the number of Ss allocated to the two starting conditions is different. It was noted, however, in Table 10, that there are no differences in E.P.I. scores due to the Ss having started with either the true or the false condition. One of the basic reasons for including the E.P.I. was to carry out such checks on the experimental design. A number of similar analyses of the Game scores were also carried out, but showed no important influences acting upon these.

From Table 8, it is important to note that the E.P.I. can very easily be faked and not merely in an unstructured way. On the other hand, the Game could be systematically varied in only two of its fifteen scores. In addition, only one score was found to be correlated with the false condition and the Ss were unaware of its change and especially of its link to faking. Perhaps because of the questionnaire method

itself but probably helped by the transparently simple underlying theory, the Ss were able at will to increase or decrease their E.P.I. extroversion and neuroticism scores. These Ss, it is emphasized, are not sophisticated personologists but normal upper-form students.

In brief, the distortion was mainly focussed around a significant decrease in N scores resulting in a more stable personality picture. From the Ss' ability to do literally what they wish with the E.P.I., it may be assumed that the Ss' (as a group) found their E scores socially adequate, this being the reason for their stability. The E.P.I.'s L scale is probably able to detect desirability distortion sets, though in many situations where the E.P.I. has been used this should be suspect. Unlike Eysenck who limited his warning to selection for employment contexts, the above results should make L very suspect as a tool. If the E.P.I. can be manipulated so easily and show such great differences in scores, it may be suspected that, if anything, the test does not deal with personality but probably with the more transient stuff of attitudes. The Cognitive World Structure Game is proposed as a more valid and certainly different alternative measure of personality.

Summary

The concept of a test-distortion scale is often misunderstood both as to its structure and necessity. To study this phenomenon in relation to the Cognitive World Structure Game, a two-condition experimental design was employed. A second personality test was used to control for the instructions, the performance and the experimental design. Unlike most personality tests, the Game was found to be difficult

to distort. Most important though was the finding that the distortion which did occur did not reflect a change in personality as did the control test used. Finally, one score in the Game was found to be linked to distortion and was suggested as a possible future lie scale. Future research should seek to develop this concept of PE/NE score into a workable lie scale. Then research into the reasons why distortion in test situations is related to the valence attributed to events will be interesting as an academic exercise but might be found to have important applied uses, for example, in psychotherapy and rehabilitation. Lastly, there might be useful ground for philosophical speculation within the science as to the "relation" of PE/NE to motivational distortion and NE to differences between the sexes.

IV RESULTS - FIELD STUDIES

IV. 1 An Industrial Organisation Sample

IV. 2 A Sample of Social Workers

IV. 3 An Assessment Centre

IV. 4 A Sample of Clients for Occupational Counselling

IV Results - Field Studies

So far a model for occupational research and in particular a measure of one of its parts, i.e. the measurement of Man, has been developed. In part III we looked at two assumptions belonging to the Cognitive World Structure Game's method. That is, the use of the Game as a measure of personality (individual differences) and its ability to distinguish between occupations (See Holland, 1959) have been looked at in a number of pilot studies. The following sections will test some of these same properties of the Game, this time using real situations or case studies.

IV.1 An industrial organisation sample

IV.1.1 Introduction

In any organisation there are a number of different problems which arise when moving from a study of its material environment to that of its workers. In as much as they deal with materials and machines, engineers and operations-research men, for example, have a finite number of variables to contend with. Steel rods can only be of a certain length and size if they are to be moved by a certain mode of transportation; only a limited number of chocolates can be put into a one-pound box, and at best only a certain number of tea-bags can be produced by a given machine. On the other hand the recruitment, selection, training, allocating, motivating and dismissing of workers, on all organisational levels, involves many more variables and therefore, many more problems. For example, a bad sale manager can make even a Rolls Royce sell like a horse-cart, or a labour walk-out can turn a profit making industry into a parent company's albatross. Both these situations can be caused by a multiple of personal, environmental or work-related

variables. One reason for the seemingly limitless number of variables involved when dealing with manpower, is that Man carries with him his whole environment. That is, the worker is not only an electrician or cost-accountant but he is also a father, a husband, a gardener, a traveller, etc. His past upbringing, his present thoughts and his future plans are an intrinsic part of him. When discussing the matching of the Job and the Man, all of these worlds must be taken into account. To attempt to increase a worker's job satisfaction will, for instance, affect his wife, his home life and even his plans for the future. The idea that the worker is not a simple economic-minded man but indeed carries with him his whole environment is implied in Schein's concept of the worker defining his job in his own terms (Schein, 1965). The study of the variables in this sample will rely heavily on both the occupational research interview (Tivendell, 1971) and the Game's own interview for its information.

IV.1.1.2 The organisation involved in this study was an important international manufacturer of metal products. The study was carried out at the headquarters of one of its divisions. Here two groups of subjects were looked at. The larger sample involved thirteen members of the company's computer department, while the smaller one included four members of the division's top managerial staff. No detailed analysis and evaluation of the organisational and departmental environment was undertaken. Facilities such as telephones, canteens, washrooms, job aids, furniture, tools and general equipment were all typical of other offices. No outstanding characteristic or omissions were observed. Similarly, no particularities concerning working conditions were noted such as heating, lighting, air-circulation, noise, work loads and

supervisory techniques. With one or two exceptions discussed below, there were no anomalies in the interrelation and communication between supervisors, peers, subordinates and clients. Attention was therefore, turned towards the organisational structure of the environment.

IV.1.1.3 This is a brief description of the company's promotion structure extracted from the information gained in interviews with members at various job levels. It is not an attempt to exhaustively analyse the organisation's structures, but to give a rudimentary and schematic view of its usual promotion avenues. It is assumed that for in-depth research, one has access to more elaborate analyses of the responsibility, status, monetary and information-flow structures in addition to these promotional ones via, for example, system analysis (See Part I).

The company's compter department is divided into sections based on the functions that it must perform, to meet its objectives. Figure 12 is an organisational chart of these which stresses promotional avenues. It is implied that the careers of most subjects follow the vertical lines. For example, girls in the control and punch sections, if they remain in the department, will aspire to the role of supervisor of their section. There is in these two sections, little possibility of entering the management stream which is represented by the horizontal direction on this chart. There is therefore, a form of hierarchy of functions, or more precisely of jobs, which affect a subject's chances of promotion. For example, if operators do not (soon) become chief operators, their chances of promotion to the management stream is limited. According to the chart, programmers have a second chance of entering this stream if they are unable to become chief programmers. It is simple to

determine the promotional probabilities (statistically) of any given job via a study of the organisation's records. In this way the hypothesis that half of the remaining non-promoted programmers (Figure 12) will become systems analysts if they show creativity in program design and other general aptitudes can be verified. This department not only permits but fosters this step by a purposeful overlap between the two jobs. Meanwhile, the other half, though still good programmers, will go no further. Systems analysts can also aspire to a supervisory position as indicated on the chart. There are other variables which affect a member's prospects of promotion. For example, it is possible to be recruited into the department at almost any level. There is also a rather high turnover in the computer field in general. Thus if a person cannot meet his ambitions in one company, he can contemplate a change of employer. As one gets further up the promotion hierarchy there are naturally fewer positions to be filled and more competition from peers. To become the second in command there are a number of avenues, four of which were represented in this study's sample. In this department the job of chief systems analyst and that of assistant deputy were held by the same man (See Figure 12). The way to becoming departmental head usually, but not necessarily, follows the line indicated. However, the company's executive may, for example, find it necessary to "parachute" someone into a certain position. This could be done if the "next in line's" ability was in doubt. Nevertheless, for most subjects the avenues already traced are those they must follow. Beyond the role of head of the department, there are possible horizontal job changes which can help fulfill personal ambitions, and in this company, one vertical promotion avenue, i.e. the job held by subject no: 1. (Figure 12).

IV.1.2 The organisational analysis

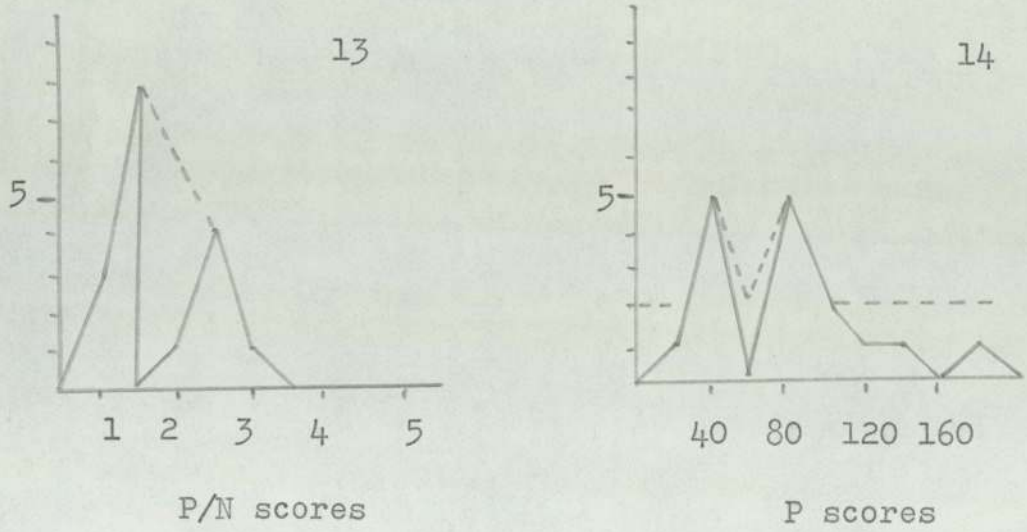
IV.1.2.1 The first part of this section looks at the sample's subjects with particular reference to their Game scores. The process first involved grouping the subjects according to their Game scores. Next the characteristics pertinent to their Game score, as suggested in Part III, were matched to the information concerning the subject. This information was obtained primarily from the occupational interview carried out after the Game, but also included data from the environment such as peer and supervisory "ratings" (volunteered) and from their jobs, the tasks and duties these involved. The following discussion will be limited to only a few Game scores, for three reasons. First, this is because the method of focusing on Game scores has been used elsewhere in Part IV. Secondly, the sample's Game scores often approximate a normal distribution and this is based on a very small number of individuals. Finally, the information available in Section IV.1.2.2 will elaborate and even repeat many of the points included here.

The P/N score

The P/N score, like the distance variable, is clearly linked to the definition of the matrix's pattern (See Section II.3.4). There is even evidence that it may be a predictor of leadership potential (Section IV.4.2). The P/N variable is therefore assumed to be describing personality in Gestalt-like terms rather than breaking it down into sub-sections as with the trait-approach. For this analysis the subjects were grouped according to their P/N scores (See Figure 13). The projected curve based on the mode of scores suggests that most subjects in the organisation had a P/N score of around 2.0. The actual curve drawn was basically bi-modal, pointing to a group of eight subjects whose scores were approximately 2.0 and four

subjects whose scores were approximately 4.0. Three subjects had lower scores than the mode for the group, i.e. approximately 1.0. Finally, two subjects will be looked at who scored quite differently to the rest of the sample.

Figures 13 and 14 ; Respectively these are the industrial sample's P/N and P scores. Sample size is N= 17.



----- hypothesized curve

——— real distribution

note these are in terms of frequency of Ss per Game score.

Based on the concept of leadership, a management-factor can be hypothesized to link the four subjects whose scores were approximately 4.0. This size of P/N score indicated that the blocks in the matrix were closely grouped. High valences were attributed to each item even when controlling for the number of blocks used. The most informative loading came from subject No: 1, who was the key person in the organisation analysed. His role in the organisation has been described as analogous to a keystone position in a roman-arch (Section IV. 4.2). His presence is not only important, as is that of any leader, but it is crucial to the organisation's efficient functioning. The second high scoring S was subject No: 10. It was discovered from the interview with him, and indeed pointed out earlier by the departmental head, that he was of management potential. Because of these reasons, a Fiedler-type enquiry into leadership (Lindgren, 1974) was carried out. It will be recalled that this approach was a description of the worker's least preferred colleague (LPC) to help define the style of leadership most suited to S. The description involved concepts of efficiency, i.e. work performance in both routine and critical operating conditions, and responsibility towards the job, the organisation and fellow workers. Though previous interview questions elicited an adequate concern for the job satisfaction of peers and subordinates, the S's preferences for a task-oriented leadership style were evident.

The next two subjects were more indirectly linked with management. Subject No: 6 for example, was in fact unsuccessful in social interactions within his present department. The pattern he elicited was similar to the matrix-patterns of subjects found to be suffering from interactive problems with people in one of their milieux (See Section IV.4.4). Despite

the "schizoid" type pattern he produced, there was evidently a high P/N value, i.e. the tight structure found with successful managers described earlier. The interview exposed a high degree of expediency in addition to a detachment from reality, in this case the ratings of satisfactoriness made by both peers and supervisors. This detachment from reality was evident in his matrix pattern which, because of it being composed of two distinct groupings, has been called "schizoid". No strict clinical interpretation of the term is intended. The interviewee was evidently aware of the type of self-concept he wished to project, the probable models of satisfactoriness that the organisation would have, and the means available to match these successfully in the interview situation. Without a psychometric tool such as the Game and/or experience of psychological conditions such as his, most personnel managers would rate this subject's satisfactoriness quite highly even if able to detect his high degree of expediency. These hypothetical interpretations were supported by other scores. For instance, a fairly high PE/NE* score suggested that S was attempting to take the Game results (See Section III.4). This was in turn supported by a high PI/NI score. In view of the interactive problems S had, this high valence attributed to individuals would not have been perceived as unusual without the PE/NE score. The "shizoid" Game pattern and his behavior during the interview suggest that the subject is aware of what his interactions should be with the work environment, but unaware of what they really are. The subject (No: 6) had a number of specific and personal conditions, some beyond his control, which caused his

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*Distributions of this and other Game scores were made but, with a few exceptions mentioned in the text, these were normally distributed.

home structure to be a viable alternative. The subject was born and raised in a different country, one which permitted and favoured the development of a certain cognitive structure. However, his new milieux had caused his behaviour to be inconsistent with the old cognitive structure (i.e. a traumatic event). In addition tight, high P/N type structure such as his are believed to be less adaptable. This would explain the "schizoid" reactions to "hostile" milieux, the unacceptability of his behaviour patterns, and subsequent satisfactoriness and interactive problems.

Subject No: 3, on the other hand, cannot entertain management or leadership roles in her present job. She is secretary to a department head and thus has some status due to this. However, the job does not have a leadership component, as she is the only clerical member of the staff. There is a finality, in terms of promotion avenues, attached to this type of occupation. Though often vital to the efficient running of an organisation, few secretaries become managers or directors in their own firm. It was assumed, however, that if she had such a potential it would be expressed in her behaviour. The interview showed that due to her age, sex and occupational limitations, she had been unable to channel this potential for taking responsibility into her occupational world. On the other hand, circumstances at home did permit an expression of this potential. Though unmarried, she is nevertheless in charge of a household (a people-oriented leadership task) and further analysis of this world would probably disclose many examples where responsibility, leadership and stability were expressed. Had the opportunities, both personal and environmental, been available she would probably have developed the necessary cognitive styles, attitudes and skills to be a competent and suc-

cessful leader.

Subject No: 7 (a programmer) had also scored higher than most of his departmental peers. However, the test situation did raise some doubts as to the results obtained. At the onset of testing, the subject was unable to begin to play the Game. It is usual for many subjects to wonder, for a few minutes, first about the expectations of the tester and the meaning of the Game's items, and secondly, as to how to best describe the environment. Beyond this hesitation, subject No: 7 was still unable to play the Game. The level of instructions needed to produce a suitable test response was similar to that used in the assessment-centre study (See Section IV.3). That is, various possible dimensions and approaches to playing the Game had to be suggested. Out of more than one thousand Ss tested, including children and adults, such an approach had been used only with certain Ss belonging to the assessment centre sample. Except for this difficulty in playing the Game and a subsequent sample matrix pattern produced, further parallels between this subject and those from the assessment centre are unwarranted. In brief, many of the boys had only one or two categories in their matrix (cognitive complexity), for example "like" and "dislike". Their similar structures were probably due to the impoverished nature of their early environment. In terms of personality, this resulted in simpler cognitive structures and low level or problematic interactions with the environment. Though an adult, subject No: 7 also had a simple pattern, composed of four categories. Like the boys' shallow, sometimes aggressive, and problematic interactions with their worlds, subject No: 7 was found to be low in ergic tension and occupationally dissatisfied. His four categories were, in order of appearance: (i) interests (these were mainly objects: car, books, music, art; but in-

cluded: attractive female and best friend); (ii) items which he called "vital" (these being predominantly events: trouble in my family, me unemployed, death of wife, death of close relative; but included: wife, child and Me); (iii) next were "important items" (such as mother, sister, boss, work, house); (iv) and finally items considered "hardly important at all" (which included people: father, brother, new friend, Neighbour; events; getting married, house bought, achieving recognition, being promoted; social constructs: law/police, religion, privacy, politics; and objects: television, clothes, savings). Like the assessment centre boys (Section IV.3) this subject emphasized that there was no distinction intended within each cluster. It is nevertheless proposed (See Section IV.2) that the choice of blocks is not a truly random process, and this should be reflected in the response. Meanwhile the subject's job history and his general attitudes towards work suggest no outstanding occupational interests or skills (no interest measures were given). A "magic wand" question, which allows the interviewee to fulfill any occupational fantasy for a brief moment, found the subject unable to describe any job, work-environment or role in which he would be satisfied. The subject suggested in the interview that his self-concept was not "crystalized" (Super, 1953), which is rather unusual for a thirty year old employee in a sympathetic work-environment.

Subject No: 16's score (P/N = 3.49) lies between the mode of scores for the department and the rather high scores of the "management" sub-set described above. From his P/N score it seems that he is capable of leadership. Future research into the relationship between this P/N score and leadership potential may permit the prediction of an optimal level of organisational responsibility for a given S. However, the department was

having problems allocating this S to a suitable job. They were interested in certain qualities and potentials but could not quite match these to a given job. In brief, his level of "organisational efficiency" was being used as a predictor of his "decision making" potential (See Part V.3). The interview revealed that S was satisfied and satisfactory in his performance of his present tasks, but that this might not necessarily be so in those tasks belonging to higher level jobs. The concept of a competent middle-managerial level of leadership seems to summerize his potential. One alternative would be the case of subject No: 1 who is suitable for the highest level of organisational responsibility and leadership. A follow-up evaluation of this subject No: 16 will be possible and should be very interesting. It is presumed that the margin of reservation held by the department's executive in promoting this subject, is common to any re-allocation decision involving a subject nearing the upper level of his satisfactoriness.

Figure 13 indicates that a group of Ss had low P/N scores. Though their type of work and work-environment included many interactions with and for people, these S's P/N and PI/NI scores were lower than those of their colleagues. Of these, subjects Nos: 4 and 5 had nearly identical Game patterns, scores and items. These are discussed in Section IV.4.3. In brief, they are a very successful team, i.e. a departmental head and her personal secretary. They are both female, interested in similar things, and they interact with their environment in much the same way. It is of particular relevance that theirs is a personnel department. Subject No: 9 on the other hand, is a newly promoted systems analyst. He had recently been instrumental in securing promotion for himself and two other employees in the face of a number of obstacles. He did

not reveal any ambitions or abilities for management, in the interview. In fact, his recent success seemed due only to persistence and strong convictions. Another explanation for his low P/N score is his ultimate ambition (based on the interview's "magic wand" question) to be a small independent shopkeeper. This type of occupation would provide the necessary stimulation, via customers etc. (note his high N score), yet his stressing the independent nature of this shop and his not needing many close contacts helps explain the low relationship values such as his P/N score in the Game.

The remaining eight subjects form the bulk of the distribution (Figure 13). The interviews and the scores uncovered similarities among the subjects. Though competent, none of the Ss showed any outstanding ability or potential for leadership and responsibility. This was expected from their P/N scores. The group included two women supervisors, an efficient departmental secretary, two programmers one of which was a candidate for the post of assistant deputy, the main candidate for the post of deputy of the department, and finally the head of a less important department. Only one of the above eight Ss had ever been proposed for a managerial post beyond the departmental level. This S was now being discouraged from taking either horizontal or vertical steps in his career (Figure 12). (An ambition to become involved in a personnel department, which was already being discouraged by his superiors, seemed incongruent with his low PI/NI score, i.e. valence attributed to individuals). These subjects were nevertheless eight typically successful and satisfactory workers. Any dramatic overload on their leadership abilities might upset the possibility of their gaining job satisfaction notwithstanding their ambitions. Despite many social and economic models of man, it is not

unusual to expect a stable and realistic proportion of "chiefs to indians" to ensure the success of an organisation both in terms of productivity and worker satisfaction. Against a background of Holland's model of occupational choice (1959), and Schein's organisational model of Social Man (1965), evidence so far would seem to indicate that the Game has a role to play in the fields of personnel selection, allocation and training. More research will be needed to define this role.

The P score

The Ss' P scores were distributed in a bi-modal fashion, though a possible third category may be deduced (See Figure 14). The first group consists of seven low scoring subjects, with P scores below 50. A number of points common to this group of subjects were uncovered by the interview. First, all seven showed a degree of self-insight and an ability to analyse and understand their colleagues. For example, subject No: 1 often acts, with success, as a "trouble shooter" for problems with his (top) personnel. He often consults with subject No: 4 in these matters, a person for whom he had a high degree of respect and with whom communication was not only frequent but fruitful and of considerable depth. In addition, most of these feelings were reciprocal. Note that this subject No: 4 and subject No: 5 (her secretary) have a very similar relationship which is discussed in Section IV.4.3.

Next, subjects Nos: 11 and 14 were two women in charge of their respective sections. In addition to responsibilities to their personnel, such as helping them maximize their job satisfaction, these two women have in common with the other five low scorers (P) their responsibility as to the efficiency of their section's work-output. That is, along with being responsible for job satisfaction, they were also responsible

for the satisfactoriness of their own work and that of their subordinates. Meanwhile, subjects Nos: 5 and 12 were both secretaries who were in charge of their respective departmental offices and of other secretaries. Subjects No: 1 and No: 4 were respectively divisional and departmental heads, similarly responsible for other people's satisfactoriness and satisfaction. Finally, subject No: 9 was a systems analyst and was therefore responsible for the satisfactoriness of the work done by the programmers he had been allocated to work with. He was also aware of a responsibility for the satisfaction these programmers gained from their work. All seven subjects had proved their skill at understanding both themselves and their fellow workers. All had been cited by their peers and/or supervisors as having the qualities of self-insight and perceptiveness. In addition to this peer-rating, their behaviour in many events also substantiated these skills. For example, subject No: 4 had led a successful campaign to have his work and that of some of his peers recognized and rewarded by the company in terms of promotion.

Figure 14 may be said to be bi-modal in its destribution of P scores, if the three highest scoring Ss are excluded, i.e. Ss Nos: 7, 10 and 11. The second portion of this figure thus has a range of thirty-two points, from P = 72 to P = 104 with a mean score of 84.8. This is in contrast to the first group of Ss discussed above, whose mean was P = 36.5 and whose range was of 18 points. The Ss in this second portion of Figure 14 form a rather diverse set. First, subject No: 2 was the head of a small department. He was then facing an important decision concerning his career. This situation was caused by his dissatisfaction with his present duties and his performance of these. Subject No: 3 was this departmental head's secretary. They did

not appear to form a close and successful team, as did subjects Nos: 4 and 5. Probably because her full potential was not being exploited, subject No: 3 had shown only a minimum of interest in her present job, as opposed to her other outside interests. In these latter situations, such as in her parental family, she was considered a particularly responsible and competent person. Subject No: 6, it was noted above, was from a different culture of his relations with superiors, subordinates, peers and clients. His self-concept reflected a schizoid interpretation of his world and his subsequent behaviour and attitudes. Subject No: 8, on the contrary, was found by his colleagues to be hardworking, persevering and dedicated. He was in search of achievement in his job, attempting to grow (self-actualize) whilst being satisfactory in his work. Subject No: 13 was a tense, frustrated young man who had recently been overlooked for a promotion. He admitted to sometimes being hardworking but, at other times, fickle and prone to opting out. Because of problems of attaining a suitable level of job satisfaction, he was considering changing organisations. Subject No: 15 also reflected the range and diversity in this group of subjects. He was energetic, hard-working and a fairly intellectual type of person, possibly headstrong but certainly satisfied in his job. According to his superiors, he was next in line for promotion to deputy department head. Finally, subject No: 17 was considered to have a rather high management potential, but his interests and work patterns did not match his managerial abilities. He was, for instance, more of a perfectionist than a hard and persevering worker. He was more satisfied when his job demanded of him a clerical-type perfectionism as opposed to a progmatic approach such as one conditioned by production time-limits. An example of this would

be the task of collating and writing-up reports on computer maintenance, operational and fault-finding programmes. In summary, these subjects with high P scores (Figure 14) seem to have little in common except a diversity of skills, interests and behaviour patterns.

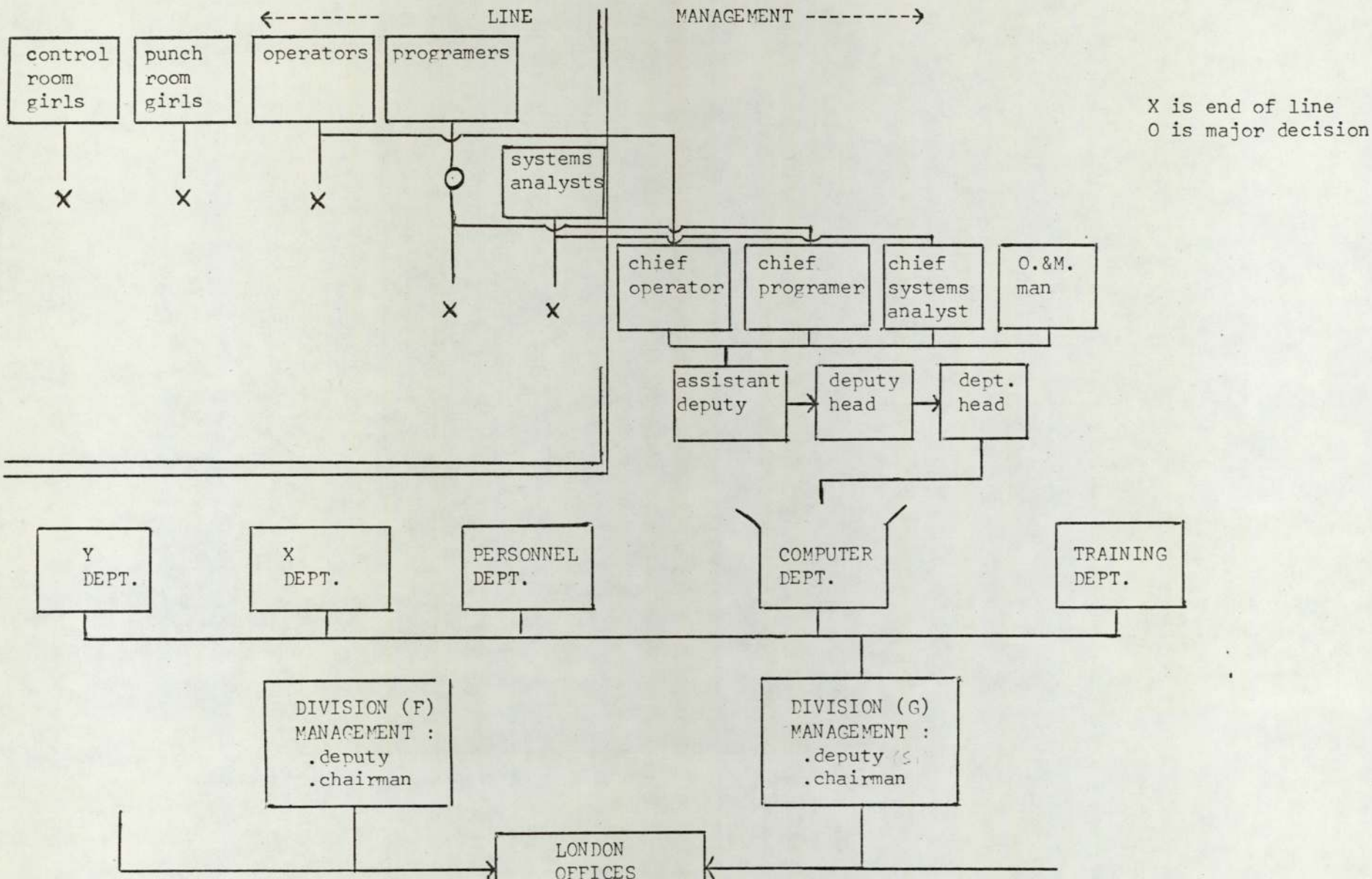
A third group might be said to be made up of the three highest scorers: No 7 (P = 186), No 10 (P = 128), and No 16 (P = 136). Their respective interviews revealed an hedonistic philosophy of life, somewhat more "pragmatic" than the protestant ethic of hard work for a good boss, security and salvation (satisfaction). However, nothing else seemed to be held in common by these three Ss. For instance, subject No: 7 seemed to be more naive and less well adapted to his work environment than his two more intellectual colleagues in this group.

In summary, the P score was able to differentiate the low scorers from the rest of the group or a number of personality and behaviour aspects. This Game score was certainly less successful in contributing to the understanding of the high scores. The remaining P scores, PI, PO, PS and PE were not particularly informative and therefore have not been discussed.

The N score

This score represents the total number of blocks used in the matrix. Most of these subjects used between twenty-five and forty Game blocks in their matrix. Only three subjects used fewer blocks. They were respectively, subjects No: 1 (N = 11), No: 11 (N = 16) and No: 12 (N = 20). First, there is subject No: 1 who is literally the head of the organisation as it was studied here and who, via a content analysis of the interviews, was found to be the most influencial person in this organisation. Subject No: 11 occupies the leading role in the control section, an essential though lower status part of the department. Unfor-

Figure . 12 The Organization's promotional structure.



tunately, this section is less likely to produce candidates for the management stream. The jobs proper to this section require less sophisticated personality attributes and abilities. It was thus usually staffed by women. The repetitive nature of the tasks along with the socio-economic forces acting upon a female labour force produced a situation of high turn-over of staff. Nevertheless, anyone who remained in the section for some time and who showed people-persuasive abilities and overall job satisfactoriness could aspire to the job of supervisor of that section and indeed become indispensable. Thirdly, subject No: 12, as the chief secretary in the department, also occupied a rather indispensable role.

It could be argued that these Ss were more organisationally minded than their peers. For instance, the main source of job satisfaction (See Section IV.1.2.2) involved "work itself" items and the responsibility intrinsic to the job. The main source of dissatisfaction seemed to be "company policy and administration" rather than either particular individuals or work conditions. Moreover, their NI scores (the number of individuals) and NE scores (the number of event items, which most often involve other people) were lower than those of their peers. In brief, the N scores might eventually help differentiate between the organisation man and the people-oriented worker (See Section III.1). However, this hypothesis has been deduced from a very small number of cases and needs a great deal of serious research.

Finally, and very briefly, the PI/NI, PO/NO, PS/NS and PE/NE scores were found to be normally distributed. The only exception was subject No: 7 (a programmer) who had initial difficulty in using the Game and whose resulting matrix was very simple. His high PE/NE score suggested that caution be taken

in interpreting his matrix (See Section IV.4) though the simple type structure he produced would help explain his high score.

IV.1.2.2 The following section is discussed in the light of the Game scores but concern itself primarily with information received via the occupational interview. The questions and underlying model, including content analysis, have been discussed in the pilot study (Tivendell, 1971).

Job expectations

The first interview question concerned the S's expectations upon application for his present employment. Only one S admitted having no expectations concerning his job. Predictably, he was now interested in it, but still contemplating future job changes. This subject (No: 2) showed a lack of self-insight and certainly no clear, stable self-concept. It was noted above that this S had difficulty in expressing himself on the Game much as did the environmentally deprived youths of the assessment centre (Section IV.3). The job expectations of the remaining sample can be divided into positive and negative expectations, with two subjects only contributing to the latter set. The first of these two subjects is a highly unsettled, slightly dissatisfied man. He is nevertheless seen as management potential, probably more because of his experience than due to an objective rating of his personality and interests. The second subject contributing negative expectations was a young lady who moved directly from school to the world of work. She expected this new environment to be hard, cold and a source of stress and pressure.

Another way to categorise these job expectations can involve using the Job/Environment/Man model (Part I) and the Herzberg/Maslow terminology (Tivendell, 1971). Let us begin with the positive or "Motivator" type expectations. Of these

the expectations involving the self or "Man" category are the most frequently cited. Subjects here discussed their prospects of promotion, the possible challange available to them in terms of achievement, responsibility and personal growth (self-actualisation), the increase in status gained upon entering the field of computers, and finally, the more adequate utilisation of their assets or abilities. Next there were expectations involving the "Job" or work itself. The job was seen as a source of stimulation, via novelty and change, which would cause them to be interested in working. Unlike the above catagory, this Job orientation stresses sources outside the self. It is suggested later that job content has a similar meaning. Thirdly, there is a set of expectations which involve the work conditions of "Environment". Most prominant of these was the belief that the size of the department would affect the number and kind of interpersonal interactions (atmosphere).

The second set of expectations were negative ones similar to Herzberg's hygiene factors (Tivendell, 1971). In the Herzberg approach the self is rarely seen as a dissatisfaction or hygiene factor. The occupational choice process and the choice of an employing organisation rarely involves negative self-expectations. The subject has usually tried to choose a field within the range of his probability of success (satisfaction and satisfactoriness). Rarely is he willing to engage in activities crucial to his self-concept unless he believes he is able to cope. The data supported this, i.e. no negative expectations were recorded concerning this "Man" category. The second category involves negative expectations concerning the work itself. Only subject No: 16 had negative expectations concerning job content. He had twice been in companies which had subsequently closed down, Making his job no longer neces-

sary. Understandably, he still had negative expectations towards his job. Finally, there is the "Environment" or work-conditions category. One subject expected more discipline as he moved to a more important department. Because the subject did not see this discipline as making the work environment more attractive, this was not considered a positive expectation.

Occupational choice

The following two questions dealt with occupational choice. The first question dealt with the reasons why other people might choose a career such as his. The second question looked at possible early influences of his career choice. In the first case, S was concentrating on the field of computers rather than on his job alone. It was assumed here that many subjects would project some of their reasons for choosing this area. Because of the difference in the form of the two questions, similar categories of answers were not expected. It was assumed that the answers to the question of why other people choose to work in this field, would concentrate on internal psychological phenomena. Such categories as educational, social-systems, and peer influences were not expected to emerge with any regularity. Table 11 lists the "a posteriori" categories extracted via content analysis of the answers. In theory, each category could have been used by all eleven subjects in the interview sample. References to a person's interest in the mystique of computers were allocated to the first category. References to job security and promotion prospects were included in category two. Any reference to salary was included in the fourth category.

The range and distribution of the Game scores ruled out the possibility that subjects using a particular category were significantly different from their departmental peers. Inter-

estingly enough there no correlation was found between a particular job attitude held and the use of these categories (See IV.1.2, job attitudes). It is obvious that the subjects perceive fairly well what influences an individual when choosing such a career. As many subjects explained, novelty, status and salary are convincing arguments. However, it is shown later, these same subjects were less insightful as to the influences operating when they themselves chose this career.

TABLE 11: why people choose this occupation

Novelty of area	9*
Future benefits (promotion, security)	6
Status (glamour)	9
Salary	8
Qualifications needed (low)	1

*Frequency of category's use by sample

The second question looked at possible early influences on career-choice, such as the family environment. Only five out of eleven subjects interviewed, acknowledged some parental influence. Two of these discussed the development of their personality as parent-influenced and thus influencing their choice of career. This is surprising, in that nine of these eleven subjects had referred to personality and its role in their occupational decision. Parents are not acknowledged as important determinants of personality, thus explaining their perceived "role" in occupational choice. Based on a content

analysis of the second question, Table 12 summarizes the most important determinants of occupational choice. Note only a few subjects saw a single major influence in their choice of career.

TABLE 12: Determinants of career choice

categories	most important factor (1 per S)	independent factors mentioned
peers	1	2
social system	2	2 (versus sex-role; socio-economic system)
personal environment	2	9 (self; parents; environmental changes)
educational system	3	4 (abilities in school)
chance	3	6 (unrelated events)

One of the most frequently used categories (Table 12) is that of chance. Subjects Nos: 12, 13 and 15 had job histories which tended to substantiate their claim that chance was the most important influence in their career development. For instance, their previous type of job or their length of stay in that job might seem best explained in terms of a random rather than consistent set of variables. There was, however, an "a posteriori" sequence of events which could be said to explain S No: 15's career. His interview responses and Game scores (high NE score, i.e. number of event items used) revealed an above average awareness and interest in his life-events. Moreover he was found to be very masculine, energetic and responsible in nature (See Section III.4).

The educational system and its curriculum was also seen

as an important influence in occupational choice. Subjects Nos: 7, and 9 believed their particular abilities in school had determined their choice of career. Little else, however, seems to be held in common by these three subjects. All three (Table 12) hold very different views as to the importance of their work to their lives. For instance, subject No: 7 was dissatisfied with his job and disappointed with his expectations as to the role it would play in his life. This was reflected in the dispersion of work blocks and their distance from the centre of his simple cognitive world pattern. "Promotion" and "recognition" were events placed in the periphery of his world. Subject No: 9 was interested in the sport and social aspects that his job provided. Though recently promoted, he still felt that he gained only some satisfaction from the work itself. This dichotomy in his work-related world, i.e. being socially active and recently promoted while still having doubts concerning the job being able to provide sufficient satisfaction, was reflected in his playing the Game. The idea of some day becoming an independent shop-keeper, reported in the post-Game interview, seems to explain the remoteness of the E^{63} block (achieving recognition) in the matrix. Finally subject No: 10, a competent section head with definite leadership potential (note he has a high P/N score, See Section IV.4.2), acknowledged that his school had been a major influence in his choice of career as it enabled him to discover his ability and interest in science. In addition, this subject (10) saw "chance" and "personal ambition" as a secondary influences. In his Game matrix there was a very tight and separate grouping of work-related blocks. This grouping being very near the centre of his pattern (C.P., See Part II) represents a vital self-defining world. It may be

hypothesized for the benefit of future research, that this pattern is typical of ambitions and determined workers, i.e. in terms of the relationship of the work blocks to the anchor point of the pattern.

Only five subjects used the remaining three categories (Table 12). Few conclusions can be drawn from the use of these categories. For example, subjects Nos: 8 and 6 acknowledged the self to be an important but not exclusive factor in their career choice. However, subject No: 6 was raised in a different culture and underwent a drastic change in his environment. Because of the difference between his parents' world and his adopted one, it is not surprising that he acknowledges the self and the environmental change to which he needed to adapt, as the major influences. On the other hand, subject No: 8 accepted the importance of his parents in determining the development of his personality, but he understood that it was his personality, rather than his parent's contribution, which was the main influence on his career choice. In brief, Table 12 acknowledges the importance of personality in vocational choice and that its operation is sometimes very complex.

Future changes suggested

Whereas the first question involved the past, i.e. the time prior to the employee entering his job, the second question involved the future. The question asked: What changes, if any, does the employee think are necessary. The first possibility is that the person does wish for and see the need for change. This change may involve the self (MAN), the work (JOB) or the work conditions (ENVIRONMENT). The second possibility is that the person sees no need for change. It was found that six subjects did not wish for change. Three Ss believed that they themselves were not only responsible for, but actually capable

of changing things pertaining to their job. Taking a more passive stance, i.e. accepting things as they are, three more subjects saw no necessity for change. Of the latter Ss, subject No: 7 was unsure of his career, himself and, as the Game illustrated, also unsure of his environment. Subject No: 12 on the other hand was herself contemplating a change of job for purposes of enriching her environment and self-satisfaction. Finally, subject No: 13 too saw no need to change the job itself nor its environment. This subject had been frustrated in his quest for promotion and was therefore, unsatisfied with both the job and the work environment. His search for another job indicated that he blamed the work environment rather than attempting to change the situation as subjects Nos: 8 and 15 did (above).

The changes which were suggested can be placed into the categories Man, Job and Environment. Very few changes in the subject (Man) were seen as desirable. The changes that were suggested involved "self-actualisation" (Herzberg's "personal growth category"), increased efficiency and organisation. The Job category changes were the most popular. These included changes that would increase variety, reduce work-loads, add job enrichment programmes, modify the tedious nature of documentation (of computer programmes and work in general), and in one case called for increase in the amount of documentation. Finally there were changes called for which involved the work conditions and work environment specifically. A planned move of the entire department to another locality entailed a number of suggestions for changes. Similarly, the more gentle environment of a competitor's offices was suggested. This included new office equipment, including desks and chairs, carpets and wall decorations. Only one subject (6) suggested that changes

involving the basic objectives and policies of the department could be made, though he underlined that attitudes need not be changed.

Assets and liabilities

The next two questions in the interview were concerned with the subject's self-insight. He was asked to first list his main assets, i.e. what he brought to his job which was of use to it, and then list his liabilities, perhaps the way in which he would like to change. There is here a probable link between the subject's answers and his conceptual differentiation ability (See Section V.3, Performance studies). However, a more important aspect involves the matching of the perceived assets with their objective evaluations by supervisors, peers, subordinates, etc. (See pilot study; Tivendell, 1971). Cost-efficiency terms however forbade an in-depth study of his real/perceived match of the subject's assets and liabilities. Therefore an interviewer rating only was used to evaluate the degree of self-insight reflected in the answers' match with reality. That is, an attempt was made to evaluate the degree of a subject's self-insight in terms of the specific content of his answers, rather than based on a general expression found from the whole interview, (the subject's projected image). However, the knowledge of possible biases (halo effects, etc.) and a sincere attempt to avoid these problems, cannot be equated with objectivity. For this reason a simpler form of answer-categorisation and a nominal scoring method were used, but caution must still be exercised in interpretation. A three-category classification exhausted the range of answers given by the subjects. This classification was developed posteriori to the interviews (Tivendell, 1971). Tables 13 and 14 summarize the results.

TABLE 13: the subject's perceived job assets

	number of subjects using category	number of independent job assets named
Experiencial :	5	5
Psychological :	10	17
Physiological :	1	2

TABLE 14: the subject's perceived job liabilities

	number of subjects using category	number of independent job liabilities named
Experiencial :	1	2
Psychological :	10	12
Physiological :	0	0

The first category (Table 13, job assets) involved subjects discussing three types of experience which they believed pertinent to their jobs. Only subject No: 6 who was found to have an unrealistic perception of his environment and unsuccessful interactions with many of its parts, suggested that his academic experience was a specific asset. Another type of experience discussed was of the practical and technical sort. The stress here was that a person could better understand computers and the job, having worked for some time in the field. A third type of experience was unique to subject No: 15. He had, in fact, been a consumer of the very services he now dispensed and could thus "better understand user needs".

The second category of assets listed were of a more psychological nature. Though subsumed under the terms aptitude and abilities they involved a rather wide range of topics. Two subjects, Nos: 7 and 11 mentioned the ability to "understand".

This meant they were describing their main tasks as an asset to their job. The second type of ability mentioned was that of "logical thinking" meaning "common sense" or organisational ability. A third type of aptitude listed was an amalgamation of two related subordinate assets. The first was described as perseverance and ability for hard work. The second was described as enthusiasm and interest in the work. There is little in common among the three subjects using this latter set of assets. However all three subjects describing themselves as persistent and hard-working, saw their work environment as being under their own control, yet their opinion of themselves was still rather low and their self-concept lacked integration. For example, subject No: 12 listed as one of liabilities her dependence on her husband for her career-choice and self-definition. It was noted that I^{10} (husband) and I^{13} (Me) were very close in her Game pattern, (Section II). Two subjects referred to such miscellaneous abilities as "an eye for design" and able "to switch off" after work. The first ability for interpretation or translation, e.g. from a computer language to English. The second ability concerns a "detachment" or lack of deep concern for work. Finally, seven job-assets were concerned with inter-personal relations. Four of these subjects believed they were capable of better understanding and adapting to people. These Ss had only their NO scores in common (a moderately high number of object items included). This correlation, as it were, contributes little to our understanding of either measure. The third category of assets and liabilities is the "physiological" one. Only one subject used it. He introduced age and maturity as a possible assets. However in most occupations, human factor and physiological conditions such as height for a policeman, weight for a pilot

or a jockey, physical features and appearance for jobs in communications media, are assets and liabilities.

It is interesting that only one subject noted the need for more qualifications and experience in the job as a liability. All other liabilities were psychological in nature. Six of the liabilities stated in this category stressed deficiencies in the self. These subjects talked of "being idle", "switching off", "not being able to study or to write reports" and "not being interested in tidying up after a problem". A few of the liabilities involved dealing with people. For example, subjects talked of wanting to be more able to delegate responsibility or to dominate, i.e. be hard with their peers and subordinates. Finally, a few liabilities involved other people but stressed the role of the self. For example, subject No: 12 talked of wishing independence from her husband where career was concerned, whilst others discussed their shortness of temper.

The questions therefore, dealt with self-analysis and self-insight. Most answers dealt with the self in psychological terms. None of the answers showed particularly deep insight into the nature of the self. This was not unexpected due to the type of work and kind of department it was. Only two answers were slightly out of the ordinary and they described phenomena whose causality was independent of the self. These involved assets dealing with user-needs and the advantage of age. This assets/liabilities question is of use when unusual emphasis is placed on the self, the material environment, or the people in the environment (Tivendell, 1971). This emphasis might reflect such conditions as feelings of guilt, blame, even paranoia and schizoid tendencies. For example, subject No: 6 was known to be deficient in his overall satisfactoriness and

his interrelations with people in particular. Had he discussed his ability to understand peers, subordinates or clients, this would have indicated a mismatch between reality and his perception of it. No such data was reported. More detailed and controlled study of these answers in terms already outlined would not, it is felt, reveal any such mismatches. However, a content analysis of the whole interview might reveal such mismatches, expecially in the case of subject No: 6.

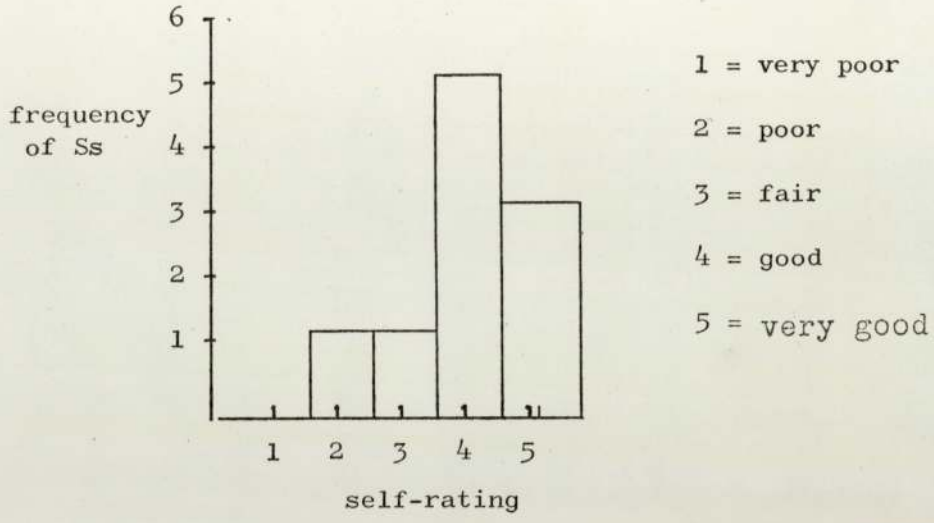
Self-rating and comparison of satisfactoriness

There is a time in an in-depth organisational analysis when the objective and subjective evaluations of the worker must be compared (Tivendell, 1971). In view of the present research's purpose and the many implications which enter such performance measures, the end did not seem to justify the means. Without the information concerning job satisfactoriness, these interview questions deal with the subjects' self evaluation of their own performance and of their estimated degree of satisfactoriness. Whereas the preceding two questions (assets and liabilities) looked at Man in terms of the interviewees' insights into their own nature, these two questions deal with the Job, i.e. a self-rating of satisfactoriness. It is emphasized that self-evaluation is only one measure of satisfactoriness, albeit an important one.

The first question dealt with the subject's evaluation of his work-performance in comparison with his peers doing similar tasks. The pilot study had found that interviewees tended to evaluate themselves rather highly forming a positively skewed distribution. A similar distribution was found for these subjects (See Figure 15). The two lowest self-ratings were produced by the subjects having the simplest Game patterns. The three subjects who rated themselves as "very good" (5), imply-

ing that there was little room for improvement, had more complex Game patterns (groupings). There was also some commonality between their PS scores, with respective scores for subjects Nos: 12, 13 and 15 being PS = 17, 15 and 16. This would explain the emotional nature of their response (See Section III.2).

FIGURE 15 : distribution of self-rating of performance



The second question dealt with a subject's estimate of his performance and what he believed his superiors expected it to be. With the exception of subject No: 16, all subjects said that their performance compared favourably with their expected performance. A three point, "a posteriori", categorization of their answers is found in Table 15. Though subject No: 16 stated that his performance was not as expected ("below"), two qualifications must be made. First, it is an unwritten departmental and organisational policy to permit a worker to seek a job level which will maximize his work-performance and job satisfaction. This subject was being particularly cared for in view of his possible management potential. His was one of the positions eligible for promotion to assistant deputy (See Figure 12). Thus it seems that, despite subject No: 16's

performance not comparing as favourably as it might to his superior's expectations, his aptitudes were considered valuable to the company and worth channelling. On the other hand, subject No: 6 estimated that his performance was well above that expected of him, both in terms of quality and quantity. However, as discussed previously, his work behaviour and his Game matrix suggested that he was unaware of the reality of the situation. That is, not only did the organisation feel that his work was unsatisfactory, but he was about to be dismissed and had been ostracised for some time by his peers. In the schizoid type pattern of his Game matrix, the four work-related blocks that he used were in a different section (world) to that containing the anchor point (calculated pivot, C.P.) of his matrix. These blocks included, naturally, his boss and workmates.

TABLE 15 : the comparing of work expected and produced

categories	no: of Ss
above expectations	5
average expectations	5
below expectations	1

Table 15 indicates that five subjects estimated their performance to be above that expected of them by their superiors. Subject No: 6's illusions have been discussed (above). Subject No: 8 believed that he and not his environment was responsible for his present level of satisfactoriness. In addition to being very interested and satisfied in his job, this programmer has a further ambition, that of becoming a

systems analyst. His hardwork and successful performance was both a product of his self-actualization, in terms of enthusiasm for the job and career ambitions, and of his work milieux. Subjects Nos: 11 and 14 also stated that they believed their performance to be above that expected of them. They had both reached the top level in their section. Despite being responsible for the work done in the section and being indispensable to the system, they were not eligible for further promotion (to management). Their job satisfaction and quality of performance do not depend on ambition for further promotion. Finally subject No: 15 also believed his performance to be better than expected of him. His forthcoming promotion seemed ample proof. He was also unashamedly ambitious and would necessarily discuss his level of performance in these terms. The importance of his work related items in his Game matrix did substantiate his personal ambitions and his estimation of his performance level.

Nothing unusual was reported in the remaining subjects' estimates of their performance. For example, subjects Nos: 7 and 13 were only marginally interested in their jobs, the first because of the lack of stimulation he received from his work and the second because of his recently frustrated hopes for promotion. Subject No: 9 had recently been promoted to his post and thus would be expected to admit to having room for improving his job performance. Finally, subject No: 12 was quite simply inderestimating her performance. Her career ambitions revealed a very modest degree of job satisfaction. Her performance was reported by peers as being above average, but her job attitudes must have affected her estimation of this performance.

Main duties

This question dealt with the main duties involved in doing

the job. There were three reasons for this question. First, it is a simple way of obtaining information concerning the tasks and job researched. From the answers of a number of subjects in the same occupation, a picture emerges of the tasks and objectives for each job. Table 16 is a sample outline of the jobs researched in terms of their main tasks or duties. Secondly, this question provides a means of verifying the subjects' matching of real and perceived objectives of the organisation, the job and its tasks. That is, the real objectives of the parent system (Part I). These objectives are consistent, i.e. less subject to changes caused by attitudes and events, and are therefore a good criteria with which to match the perception or interpretation of these objectives by the subjects. Because of the brevity of the analysis and the level of complexity required in their answers, little deviation from reality was expected here. Finally, information concerning a subject's emphasis on certain parts of the job and indeed information concerning his general attitude towards work, can be extracted via content analysis of this question. In summary, there is information to be gained about the Man, the Job and perhaps even about the Environment in which they work. Information about the Job can be retrieved from the summation or rather generalisation of the answers of those in the sample. Information concerning the Man can be deduced from the differential perception of objectives and emphasis on certain aspects of the job.

The main duties of the subjects interviewed (N = 11) were outlined in Table 16. A more detailed breakdown and classification of these is evidently necessary if this were to be used for any other purpose. Numerous texts are avaible which discuss the required expertise (See Part I). There is also an analysis

TABLE 16 : a brief task analysis of some of the computer department jobs

1)	Control room girls	(no line-members were interviewed. The subject was in charge of documentation both prior to and following operation processes)
2)	Punch room girls	(i) to punch data (quantity; neatness and accuracy (ii) to complete on time (scheduled by operators) (iii) verification of work (speed and accuracy) (iv) supervisor (only) must allocate work according to its complexity, speed of girls, and specific situations
3)	Operators	(i) get data punched (ii) run data (iii) get results to users
4)	Programmers	(i) write programmes (ii) test programmes (iii) implement these, including: a) training user b) liaison with client
5)	Systems analysts	(i) define system (ii) test programmes (iii) implementation, including: a) teaching b) liaison with client
6)	Secretaries	general clerical and secretarial duties

of skills for each task which would be necessary to complete any organisational analysis. It is sufficient here to note a slow increment in the type and number of skills required for each of these jobs, somewhat parallel to the responsibility and wage structures in this department. For example, the punch room tasks involve primarily manipulative and perceptual skills. There is naturally an increased complexity in the skills required to operate the computer. The programmers are also dealing with a still more complex set of skills. They need, for example, fewer manipulative and more perceptual and decision-making type of skills. The systems analysts must, in turn, process decision-making skills and have organisational-efficiency skills (See Section V.3) to an even greater extent.

Some interesting data emerged from the differential emphasis by subjects of the tasks and objectives of their jobs. Subject No: 16, for example, discussed his own duties in terms identical to the department's description of his job's task sequence. He had been having difficulty in finding a job, within the department, in which he would be satisfied and satisfactory. His previous job had been discontinued and, because it was a usual policy, he was receiving help from the department for this purpose. It is interesting that this search for a suitable job, i.e. his "trying out" of various jobs in the department, was in fact increasing his unrest. The idea that the job helps to define the man (See Part II) is an extension of Schien's hypothesis that man redefines his job in personal ways (1965). The more subject No: 16 was permitted to sample jobs the less likely he felt he was to find one. This does not imply that this type of junior-management training is not suitable. However, it is suggested that for some types of people it may be preferable that the organisation be seen as stable,

understanding and authoritarian. Further research using the Game could help distinguish between these types of individuals, understand their psychological needs, and help the organisation to choose the more suitable policy. Perhaps subjects such as this one (16), with moderate P/N and P scores, are more satisfied in the authoritarian type of organisational structure. Meanwhile, potential leaders (Section IV.4.2) with high P/N scores, might prefer the more flexible organisational environment.

Table 16 lists the three main tasks of a systems analyst as: (a) defining the system to be studied and its needs; (b) the design of the system so that the computer links input and output; and (c) implementing the newly tested system. From previous information it was not unexpected to find subject No: 6 having a different view of the tasks necessary to his job. For example, he emphasized the design and implementation tasks while omitting the need to define the system as a key task. His view of his role in the implementation of a system was also unlike that of his colleagues. Rather than being a simple supervisor role, subject No: 6 obtained status, responsibility and achievement via the teaching and training aspects of his job.

Of the three programmers sampled, only subject No: 8 was evidently satisfied in his present job, although he hoped eventually to become a systems analyst. Certainly linked to this occupational ambition and unlike his colleagues, S included an additional task to his job description, that of "solving" problems. The two other subjects (7 and 13) who professed very little interest in their job borrowed terms from the job specification. A difference in job attitudes using the Herzberg method (1957) can be found between these three programmers.

For example, all three subjects talk of achievement being a motivator but only subjects Nos: 7 and 13, the less satisfied subjects, sought this same satisfaction in the nature of the work itself. On the other hand all three subjects discuss "work conditions" as hygiene factors, but subject No: 8 does not agree with his colleagues that "company policy and administration" is an important source of dissatisfaction. It may recalled that this subject alone, saw himself as the major cause of change in his work environment. These Ss' Game matrices were fairly similar in their patterns and NI and NO scores. These scores were moderately high suggesting the shy but practical nature of these three programmers. They were also found to be a little naive and lacking self-sentiment and integration in their interview behaviour. This latter description is evident in the type of pattern that subject No: 7 produced which was similar to those patterns found in the sample of boys from the Assessment Centre study (Section IV.3). Though no pattern produced was complex, subject No: 8 had a hierarchical pattern which is more complex than those of his two peers. The low degree of integration and structure is evidently the cause of the dissatisfaction of subjects Nos: 7 and 13. Experience with the Game suggests that the hierarchical pattern (subject No: 8) provides stability of self-concept and helps S adapt to and integrate his (work) environment.

The remaining four subjects, i.e. Nos: 10, 11, 12 and 14, belong to separate sections of the department. All four, however, were in charge of their section. In the case of subject No: 12, this seniority is not acknowledged by herself though it is by her peers and superiors. Her main tasks were described as efficiently serving the clerical needs of her boss and then, those of the general staff. No mention was

made of the responsibility for satisfactory performance and job satisfaction of her one subordinate, though this was assumed by her. The remaining three subjects also should deal with both satisfactoriness and satisfaction of their subordinates. Subjects Nos: 10 and 14 referred to both, yet placed satisfaction of workers second in importance. Meanwhile subject No: 6 did not mention any responsibility for the satisfaction of the workers in his section. Interrelations with other sections was understood to be a more important task. It was also believed subordinate to the task of scheduling and quality-regulation of the work. There thus seems little evidence for the type of social-concern which might impede industrial objective!

Subjects Nos: 10, 11 and 14 had a near identical number of Game blocks specific to the world of work. These "work-blocks" were: I^{11} (workmates), I^{12} (boss), S^{47} (work), E^{63} (recognition), E^{64} (promotion), E^{66} (unemployment - the only "negative" block found here). Each subject used only one of the two individual blocks available in this sub-set. As would be expected, the two subjects concerned with the job satisfaction of their fellow workers included I^{11} (workmates). Only subject No: 11 did not. On the other hand, this subject placed I^{12} (boss) in an important position in the world-structure matrix. The subjects included only one of the three possible event blocks. Subjects Nos: 10 and 11 had stated their deep concern with supervision and the Game had reflected a similar concern with promotion which is a related concept to supervision. Subject No: 14, because of her job-role and personality, was more concerned with her boss's needs than, for example, supervising her subordinates work output. "Unemployment" was the only event item with which she was concerned in her cogni-

tive world structure. The number of subjects involved does not permit statistical conclusions. Nevertheless, the use of the Game as a tool in organisational research and support for the extended version of Holland's theory of occupational choice, has been underlined.

Interests and hobbies

This question in the occupational interview dealt with the interests members had outside their work. The theoretical role of interests has been discussed in Section III.3. Here, the object was to supplement information concerning the answers to the other questions in the interview. An obvious way to categorize the answers is to separate individual interests and activities from those activities requiring interaction with other people. Even so, most people have a wide range of interests belonging to both categories. Table 17 is a list of interests mentioned by the subjects in the study (N = 11).

TABLE 17: List of interests held by the sample (N = 11)

	Number of subjects
sports: watching only	2
team sports practiced	7
individual sports practiced	5
music	4
homecrafts: gardening	5
mending things	4
social gatherings	3
books	2
artistic activities	2
country drives	1
world affairs	1

No important relationships were found, either with the Game results or the other interview questions. This lends some support to the theoretical position argued previously concerning the relation of the Game to such psychological constructs

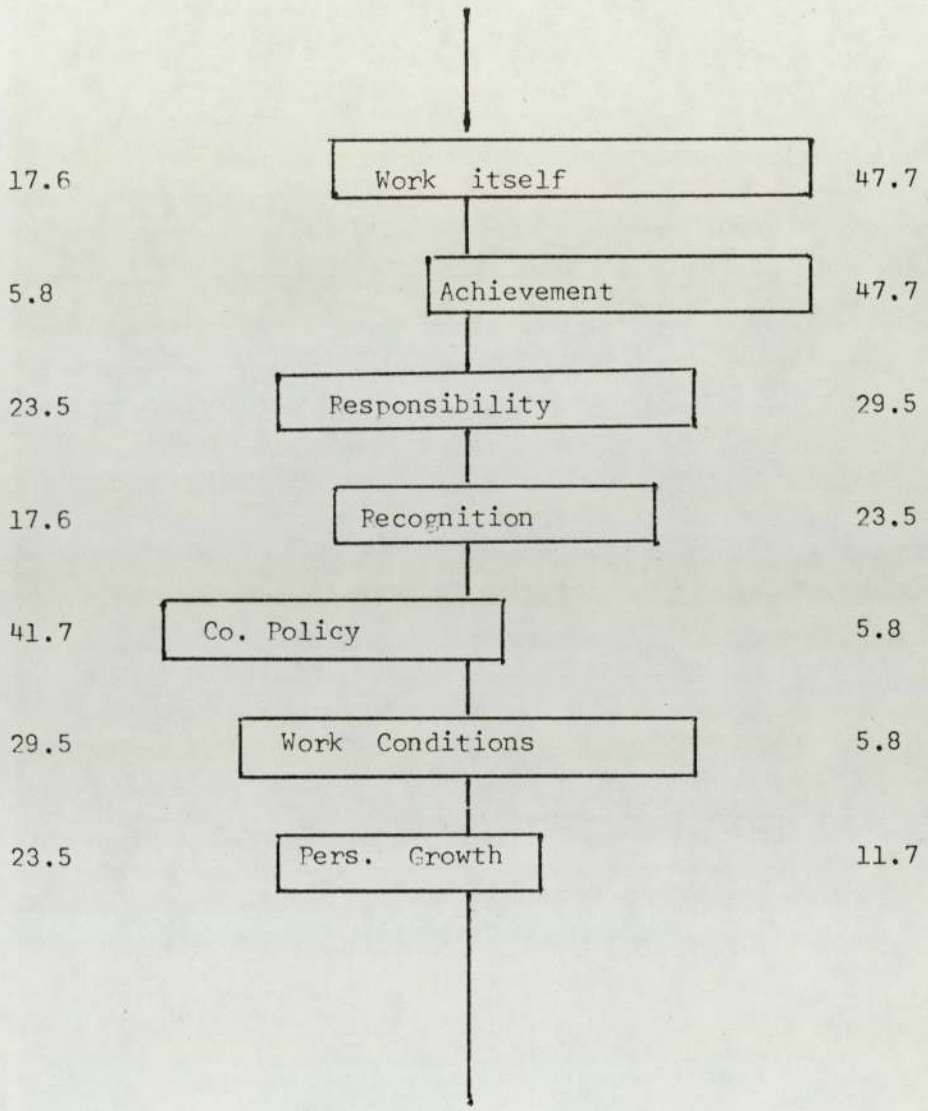
as attitudes and interests (Section III.3). No other hypotheses were tested such as the degree of pragmatism and S's interest in mending things, or intellectual ability and interest in art.

Job attitudes

The next two questions dealt with job attitudes, specifically those linked to the satisfaction a worker may obtain from his job and work environment. The questions were developed by Herzberg as part of his theory of motivation to work (Herzber, 1957). The theory and techniques have been frequently criticised in the literature, and were discussed in relation to occupational research in the pilot study (Tivendell, 1971). Briefly, a profile of job attitudes is produced, specific to the occupation studied. As determined by the bi-polar theory of job satisfaction, two back-to-back frequency histograms are produced. They respectively deal with job satisfaction and job dissatisfaction, described as motivator and hygiene factors. Various modes of presenting the results have also been discussed in the pilot study, one of which was used here.

Figure 16 can be considered the "job-attitude profile" of the computer department sample. The following discussion deals with this information, using three evaluative approaches. First, subjects using a certain category can be compared to those who do not. For example, achievement and non-achievement motivated subjects may be compared. Next, outstanding subjects may be looked at, i.e. those unique to a certain category. For example, the two main hygiene factors used by the sample were company policy and work conditions (See Figure 16). Subjects Nos: 9, 11, 12 and 16 who used only the first category could be compared to subjects Nos: 8 and 10 who used only

Figure 16 Percentage of sample to use each category



the work conditions hygiene factor. Thirdly, an individual subject approach could be used which discusses the whole subject, i.e. Game patterns, Game scores, job held, etc., in relation to their personal job-attitudes profile. The latter approach has already been undertaken to an extent in the above sections (IV b.1.2). A combination of the first two approaches will be used, though because of the small sample size (N = 11) and the type of data in Figure III 16, the emphasis will be placed on comparing users and non-users of each category. Before analysing the results, it is important to make clear certain points about personality and job attitudes.

The two interview questions dealt with the attitudes a subject has about his job, his work environment and himself in this environment. Many personality methodologies such as the Cattell and Eysenck inventories, have dealt with general sets of attitudes. It was thus feasible to expect that personality and job attitude questions might be related. Some attitudes certainly reflect and some might even have their source within the cognitive structure. However, most attitudes are caused by peculiarities of the present situation which affect perception or elicit such coping behaviour as cognitive dissonance. For this reason, when the situation changes and new information is available, changes in attitude are a rather common occurrence. If a man changes his 1955 car for a 1965 version his attitude towards his car will certainly change. But can we say because these attitudes have changed, that he has changed? It should be emphasized that the Game does not purport to look at attitudes. For this reason, and unlike previous personality measures, there is no expected co-relation between personality (cognitive structure) and job attitudes. The

attitudes of a mature individual towards his specific situation and his interactions with his whole environment are not expected to be identical. Perhaps a previous boss evoked certain attitudes, but having experienced a number of such superiors a pattern of interaction may be now apparent. It is this pattern of interactions with which the Game is concerned. It is this interaction with the environment which differentiates between individuals (Part II).

First, the Game scores of achievement motivated Ss, as determined by their answers to the above questions, was compared to those of non-achievers. As was expected from the theoretical relationship of attitudes to personality, few Game scores were found to be related to these two categories. However one exception, the Game's distance score, was found to be somewhat higher for achievers (mean score = 5.8) than for non-achievers (mean score = 3.9; sample's mean distance score = 5.1). That is, the average distances between their matrix's blocks and the calculated pivot was substantially greater for achievement motivated subjects than their non-achievement motivated peers. Achievement motivated subjects seemed indeed to be more resilient, imaginative and enthusiastic (Section III. 2). They should make good middle-management candidates capable of adapting to changes and crises, although being somewhat fretful. In brief, this set of job attitudes provided some validation for the correlation found between Cattell's O factor and the Game's distance score. In this sense future research may use a distance score such as this, as a tool in the selection of potential management candidates and in the constructing of more personalized job enrichment programmes based on personality characteristics.

Whether or not Ss identified the "work itself" as being

a "motivator" in job satisfaction, also bore little relationship with their Game scores. As above, only one Game score was found to be linked to this job attitudes. It seems that Ss finding satisfaction in the work itself (PS/NS = 2.3) attributed less valence to social constructs than those Ss not mentioning the job as a source of satisfaction (PS/NS = 3.2; sample mean score = 2.5). This difference in Game scores may be partially due to the relationship between the use of social constructs and extraversion scores (Section III.2). In brief, this attitude towards the work itself and the above achievement-motivator together represent the major attitudes said to provide job satisfaction for these workers. However, in both cases their relationship with the Game seemed to underline a previously held hypothesis. That is the Game is purported to be measuring personality (cognitive structure) and not attitudes.

The remaining "factors" important in this sample's quest for job satisfaction, continued to support this lack of a general relationship between the Game and job attitudes. Individual Game scores were occasionally found to be related to these factors. For instance, the distance scores suggested that Ss not concerned with responsibility were indeed more imaginative and enthusiastic than their peers. Nevertheless in view of the number of attitude categories and Game scores, these were indeed exceptions to the rule.

The second question dealt with negative job attitudes. Of the sixteen factors found by Herzberg, only two are fairly important here. The lesser of the two involved work conditions. This set of attitudes had a relationship with only one of the Game's scores, i.e. the number of object blocks found in the matrix. Subjects finding dissatisfaction caused by work conditions tended to have higher NO scores (8.2) than

the average (NO = 7.5). Meanwhile subjects not using this category were found to score lower than the mean (NO = 6.8). Since the company was contemplating moving to another part of the city, this situation may have been the reason for dissatisfaction in the job. Those finding physical conditions important are indeed those that include more objects in their cognitive world, i.e. pay attention to them.

The second more important factor involved dissatisfaction being due to company policy and administration. In brief, the Ss using this category scored lower on certain Game scores (mean scores were NI = 8.7, NE = 4.7 and PS/NS = 2.2) than the Ss not using it (NI = 12.5, NE = 6.0, PS/NS; while the mean sample scores were: NI = 9.5, NE = 5.3, and PS/NS = 2.5). The above mean $\bar{X}$ scores show those subjects not dissatisfied with company policy and administration, score rather higher than their colleagues. Indeed, they score higher than the average of the department on these Game scores. Subjects Nos: 8 and 10 are the outstanding subjects not dissatisfied with the rules of the establishment. They saw themselves as in charge of their careers. Perhaps they were also acting in the more socially desirable ways (Section III.2). From this job dissatisfaction attitude's link with the NI score, it seems that to blame the establishment and its rules is not necessarily synonymous with concern for people. Subjects finding dissatisfaction with company policy might be using this as a scapegoat for more personal shortcomings. Subject No: 13, who recently was rejected for promotion, did not blame the company and its administration and was among the high scorers. Rather than blame the establishment he may wish to seek a different work environment, more ameniable to his particular ambitions. This does not imply that it is the company's policy that is

hampering his self-actualisation, perhaps it is time or specific circumstances. In any case his coping reaction was not to profect blame but to re-evaluate the self/environment interaction. This rather high-minded even intellectual approach is reflected in the labels attributed to high NE and PS/NS scorer (Section III). It would seem then that workers finding dissatisfaction with company policy and administration, are probably similar to the people with general anti-establishment and anti-tradition attitudes. The people holding such attitudes were seen as more outspoken, more fanciful, perhaps more flexible and field-independent.

IV.1.3 Summary

This field study attempted to look at an organisation based on a sample of subjects taken from one of its department. In addition a second but smaller sample involved members of the division's top management (See Figure 12). The procedure included the administring the Game and undertaking a short semi-structured occupational interview with the first sample only. Because the purpose of this study was that of evaluating the Game in the field, data collection neglected the two other blocks in the Model (Part I), i.e. the analysis of the Job and the Environment. Only a brief summary of these was attempted. In a more client centred research situation, great care and detail must be taken as suggested in the pilot study (Part I). In terms of the study of Man, the process was carried out in more detail. As mentioned, two approaches were taken involving the Game and the occupational interview. In many instances these were complementary but the interview, it was found, did not always study the individual in as much depth as did the Game. The descriptions of the subjects were often collaborated by reference to Section III. On the other hand, the different

depth involved in the interview method did uncover some interesting data which could be of use in helping the organisation reach certain decisions. Much of the data extracted via the occupational interview, such as the information concerning job attitudes, should be used only to understand and help the individual and should not be the basis for decision-making. Despite these restrictions and the very small sample size, the Game was shown to be a useful analytical tool and could possibly be used as a criterion for selection, allocation etc., if further organisation-specific studies were carried out.

IV.2 A sample of social workers

IV.2.1 Introduction

There were three motives for undertaking this particular study. Firstly, this was an attempt to look at teams of social workers so as to improve understanding of the occupation. Secondly, this study was to attempt to look differentially at two groups of scientists; the physical scientists and the human scientists. Experienced social workers were to compose the human scientist sample and this was discussed in part in Section III.3. Thirdly, this study was undertaken to observe any differential effects the Game might have on verbalizers as opposed to visualizers. Despite the popularity and experiencial validity of this verbalizer/visualizer dichotomy, neither an adequate method of measurement nor population distributions could be found in the literature. Two methods were attempted to differentiate between these. The first method involved extrapolating from the Stanford-Binet Intelligence scale (Truman and Merrill, 1961) those items belonging to the "orientation: Direction I" section. The subjects involved in this particular pilot study were fifteen fifth-form students. Written and oral versions of the questionnaire did not differentiate between

the two hypothetical groups even when more complex items were tried. The second method involved testing a sample of social-workers as well as a sample of sixth-form subjects. Their task involved giving a stranger directions to a point across the city. In theory the visualizer would have relied heavily on the construction of a visual map to help direct the stranger. Meanwhile, the verbalizer would write out extensive (verbal) directions in the task. Both samples overwhelmingly used verbal rather than spatial sets in giving directions on paper and no pertinent conclusions could therefore be made. This section will then be dealing with the first motive, understanding inter-team differences.

Four groups of social workers were looked at, all of whom work in the greater Birmingham area. Operationally, the social worker attempts to understand the problems of his client, and offer advice or sometimes direct help. By definition they deal with many people and by implication should be more concerned with people than most other occupations. People are the raw material and the focus of the occupation. The interest here was in the internal differences and similarities of the sample. Two categories of subjects were acknowledged, the seniors and the regular social workers. The former were defined mainly by their status and responsibility, but many appointments must be based on experience, training and special tasks belonging to their role.

The first group was labelled the I-group. Briefly, this intake or I-group received all new "cases" which came to them. Whenever there were any indications that it was to be a long term case, the team referred the case to other teams. They literally made a first assessment of all cases and dealt with shorter-term problems. There should have been a greater number

of experienced workers in this team because the initial assessment is critical to the client in terms of satisfaction and to the organisation in terms of its performance. However, the relatively more experienced social workers tended to deal with long term cases and thus belong to other groups. This phenomenon is certainly due to difficulties in the objectives of the whole process of social help and to problems stemming from the adequate statement of these objectives. There is some parallel in the teaching occupation where the more qualified, experienced and skillful are permitted to choose the less complex tasks. It is arguable in both occupations whether the easiest tasks belong to one end or the other of this sequence. The next two groups were teams which dealt with long term cases. They were the A and B groups, as labelled in the result section (IV.2.2). Despite the above aspect of the organisation's functional structure, these two groups seem to have only a marginal increase in their average age. Neither experience nor age was systematically studied, though these variables could account for some of the differences found. It should also be noted that age and experience are not necessarily linked in this type of occupation. The fourth group of subjects, the T-group, should not be strictly called a team. It is composed of two sets of subjects both involved in teaching social-work theory and methods. Their particular task specialities may distinguish them somewhat but they all taught in the same institution, interacted quite frequently and naturally had a common goal. Thus, there were four groups of subjects whose respective sample sizes were I-group = 10; A-group = 5; B-group = 7 and T-group = 7. They were all administered the Game and asked to complete the task described above.

IV.2.2 Results

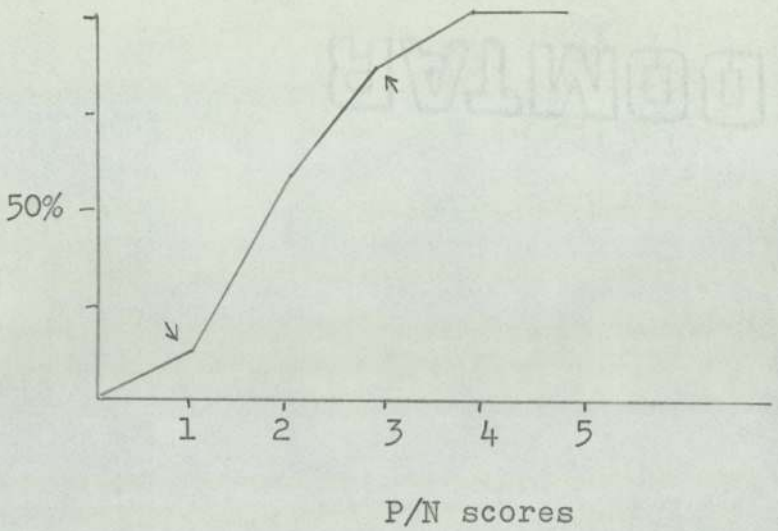
The overall sample's distribution of P/N scores was plotted and the position of the senior staff member's scores studied. No specific portion of the P/N distribution belonged to this sub-set or administrative sample of social workers. In terms of personality they were not any more stable or less so, than the rank and file members of the occupation. The lack of high scorers can possibly be explained by the labour turn-over and expansion aspects of the occupation. If there was a high labour turn-over based on a dissatisfaction with promotional aspects in the job for example, differences between sub-sets of the sample population would be linked to job attitudes rather than fundamental personality characteristics. Similarly, if this occupation can be said to be expanding rapidly and a criterion of experience in the job rather than of personality was being used for determining promotion, there would be no expected differences in the distribution. The distribution of NI scores also found that the senior staff were not different to the regular staff. That is, the number of people belonging to the immediate environments of both sub-samples were not radically different. The PI/NI distribution showed the senior staff to be scoring marginally higher on this Game variable than the mode of the total sample. It would seem that if the labour turnover hypothesis was correct, the senior staff have a marginally greater concern for their clients. This might be influencing their perseverance in the job, i.e. the second hypothesis above.

A corollary of these results is pertinent to the selection process for the occupation. Figure 17 has plotted the P/N scores for the total sample in terms of a cumulative distribution. Typically a selection officer attempts to hire new

members which resemble the average experienced worker. In the interview, the selection officer may be in search of, for example, a fairly flexible person who is independent of his own environment and thus capable of quick decisions and actions. If indeed his selection criterion is a personality characteristic which is dealt with by the P/N variable, he would seek cut-off points, (Schein, 1965), such as those represented by the arrows in Figure 17. Seventy-five percent of social workers sampled had P/N scores which fell between these two points. If such a criterion had been used, nearly half of the senior staff members would not have been selected for the job! Thus it is important for any organisation to carefully research the type of men needed and to not inadvertently bias its future composition. This point was again emphasized when the cumulative distribution of P/N scores was plotted for each team. Note that different teams require different skills and different people. A simple model for determining selection criteria, as introduced above, would seriously affect the make-up of these teams. This it should be remembered is only one characteristic (the P/N variable) which might be important in doing the job. Previous bi-polar models of personality characteristics, especially in reference to their semantic descriptions may have hindered in this way, personnel selection research. For example, if the opposite of being stable is not considered to be flexibility, but rather instability, the latter's connotation of abnormality would seriously affect an organisation's selection process. All companies would want young, intelligent, motivated, skillful and stable workers irregardless of their job and work-environment. In brief, previous models of personality may have affected even pragmatic fields such as occupational research. So as to increase the satisfaction of its workers

and the quality and quantity of their performance, organisations must begin with an analysis of their needs in terms of Man. This not only concludes an attempt to understand how one occupation is different from the next, but just as important there is a need to understand differences within occupations.

Figure 17 : P/N scores, cummulative percentage frequency for total sample (N= 29)



A basic premise in the development of the Cognitive World Structure Game was that each individual belong to a number of environments or worlds. The subject's family and his job are just two of many parts of his environment with which he interacts. An organisation is one such world supplying or capable of supplying a wide range of the needs of its members. For instance, a job can provide many of the psychological needs of an individual. In a work environment, the boss, the secretaries, the peers and the tasks may be respectively (additional) sources of authority, sexual-affinity, recognition and intellectual stimulation. Certainly different job environments may better cater to certain needs than others, but most of these

are worlds in their own right. Thus work-environments are different to each other and necessarily the individuals within these can be expected to be somewhat similar in as much as they are defined by their interaction with their worlds. Similarly, samples of individuals across work-environments are expected to be different. The following results substantiated that different teams with naturally different environments in fact had different distributions of Game scores. In other words this substantiated Holland's theory (1959), on a micro-level (teams), that personality factors are involved in occupational choice.

First, Table 18 presents the means and standard deviation of their respective P/N scores. Note that A and B groups were not significantly different to each other. This was not unexpected as the teams resemble each other in terms of tasks and purpose. On the other hand, I and B groups were significantly different ($t = 2.66$; $p < .02$). It is quite probable that a selection procedure has been at least an intrinsic (unconscious) cause of this difference. That is, the type of tasks undertaken by the two groups may differentially suit certain personalities and thus, by attracting and keeping these, affect their membership.

TABLE 18: Comparing the P/N scores for four teams of social workers

Teams	Mean	Standard deviation
I-group	3.02	0.87
A-group	2.35	1.20
B-group	1.88	0.51
T-group	2.16	0.98

The I-group was different to the other teams in terms of its PI/NI scores. The Ss here demonstrated more concern for the people in their immediate environment. The difference was only significant when comparing I and B groups' scores ($t = 2.54$, $p < .05$). It is appropriate that the I group also had higher NI scores (mean number of individuals included was 9.0). It may be remembered that this group indeed met many more "cases" than the other groups (See Section IV.2.2). This difference was however only significant when comparing I and B groups.

The second set of scores were those dealing with the Object category of blocks. Once again there was a similarity between A and B teams but a difference between I and B teams, in their degree of materialism (PO/NO). This difference was significant ($t = 2.57$; $p < .05$). There was also a statistical difference between the I-team and those Ss now teaching, i.e. the T-group ($t = w.74$; $p < .02$). It seems that the T-group was less materialistic than their field colleagues in the I-group. A simple occupational explanation, such as the difference between academics and field workers, cannot be entertained due to the difference between I and B teams. An in-depth analysis of the I team, which in view of this research should be undertaken by the Ss themselves, would probably shed more light on these results. The NO score distributions (Figure 18) were more complex and still rather difficult to explain. The above mentioned difference between I and T-groups was certainly apparent. The latter group was quite willing to have many objects, such as cars and houses, in their cognitive worlds, but the valence they attributed to these was different. Because of methodological reasons, these two distributions were not found to be significantly different despite the bi-modal aspect of the I-group's scores. This bi-modal type of distribution

Figures 18 I,A,B,and T
comparing percentage frequency distributions, of the teams.

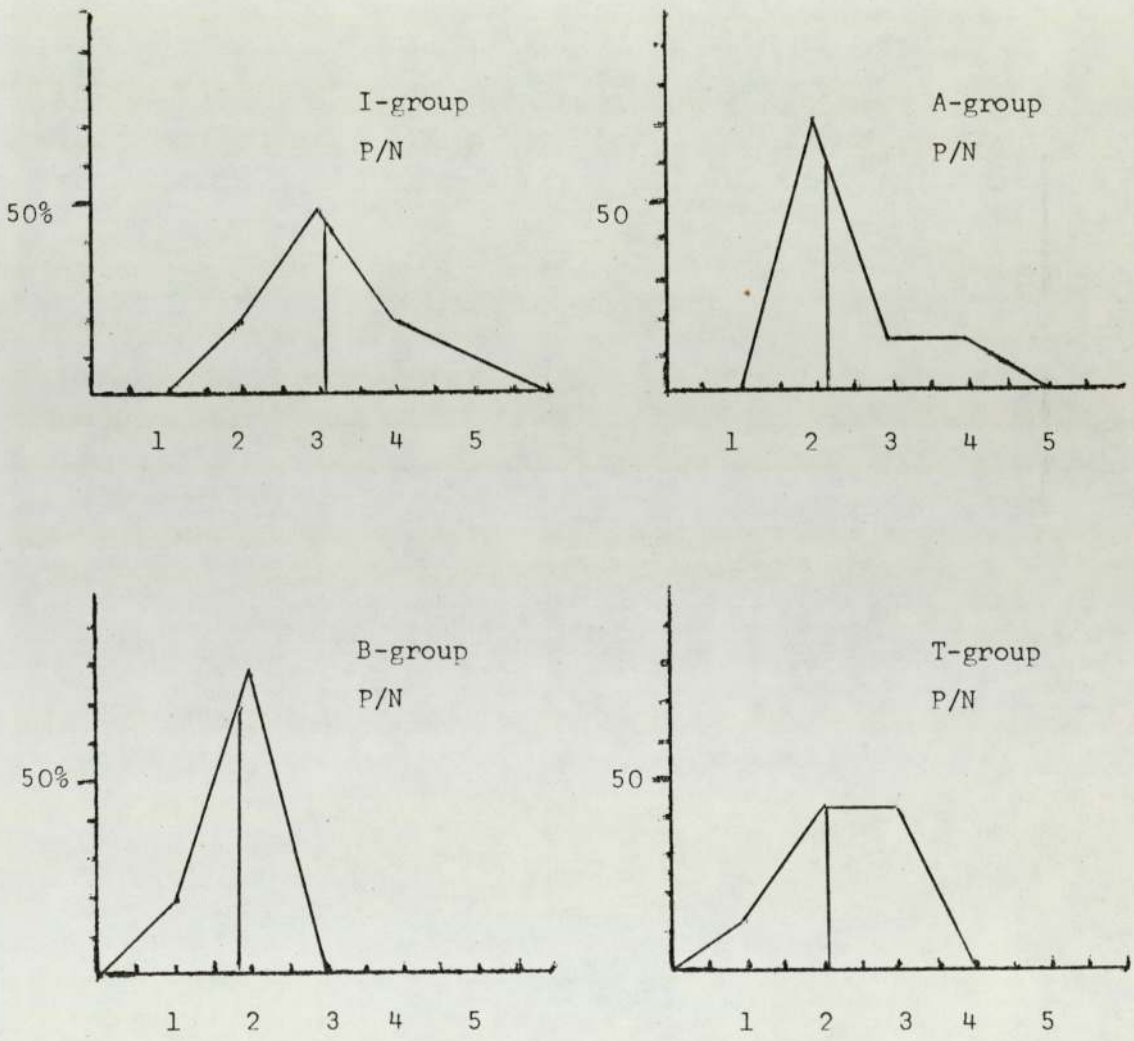


TABLE 19 : comparing the N scores for four teams

Teams	Mean	standard deviation
I-group	6.20	2.89
A-group	4.28	1.97
B-group	2.40	0.87
T-group	6.71	2.36

significance of the difference between B-group and other teams

	t-score	significant level
I-group	2.81	(p .02)
A-group	1.97	(p .05) *
T-group	3.84	(p .001)

* a t = 2.15 is needed for a p .05

was repeated in A-group. A and T-groups were however significantly different mainly because of the former's sub-set whose mode was 4 ($t = 2.08$; $p < .05$). The B-group had found most of its members scoring low, in a fashion similar to one of the sub-sets in the I and A distributions. As would be expected from a unimodal distribution, it was significantly different from the three other teams (Table 19). Finally groups I and A were also significantly different ($t = 2.81$; $p < ,02$). Though the two teams had bi-modal distributions, their respective emphasis was different and this affects the central tendency of their scores significantly. Whereas A and B teams had previously been generally similar, this variable has differentiated between them. Similarly, I and A have also been found to be significantly different, a point not witnessed in previous Game scores. Section III.4 will help label these differences, though this will be more helpful to the subjects themselves than to our purpose (Section IV.2.1). In brief, the Game scores have differentiated between the teams, although no one score was responsible. An in-depth study including a per item analysis should follow this to further our understanding of these differences.

Finally the N and NS distributions also differentiated between most of the teams despite the uni-modal nature of all but one of these distributions. It will be remembered that the NS variable indicates an increased use of social constructs, in essence reflecting the use of extrinsic or borrowed sources of cognitive structure.

Table 20 presents the average NS scores for these teams. These means are more reflective of the true picture, due to the uni-modality of the distributions. Briefly, the teacher-sample had as expected scored much higher on this NS score.

TABLE 20: Comparing the NS scores for the four teams

Teams	Means	Standard deviation
I-group	8.00	2.40
A-group	5.28	2.21
B-group	6.40	1.67
T-group	8.71	2.05

It was rather closely followed by the I-group, in terms of high scores. It is interesting and difficult to explain why both A and B groups scored significantly lower than their colleagues. That is, I and A teams were significantly different ($t = 2.36$) at a .05 level of probability. Similarly A and B teams were significantly different to the T-sample (respectively, $t = -3.00$, $p < .001$; and $t = -2.06$, p approximately $< .05$). A more in-depth analysis, such as undertaken in Sections IV.3 and IV.4 would be necessary to explain the differences more accurately. On the surface it would seem that the long-term field workers were less philosophical (sophomoric) in their interpretation of their environmental interactions, resulting in more reality-oriented items. However the N distributions (Figure 19 do not fully substantiate this view. Once again, the average scores (Table 21) found I and T groups scoring higher whilst A and B teams scored low. This time A and B teams were significantly different from both high scoring teams (Table 22). The N score it will be remembered is linked to a general stimulation level, with the more creative and perhaps more intellectual subjects scoring higher. This does not mean that A and B were more realistic but just less stimulated by the range of items in

Figures 19 I,A,B,and T
comparing percentage frequency distributions for four teams.

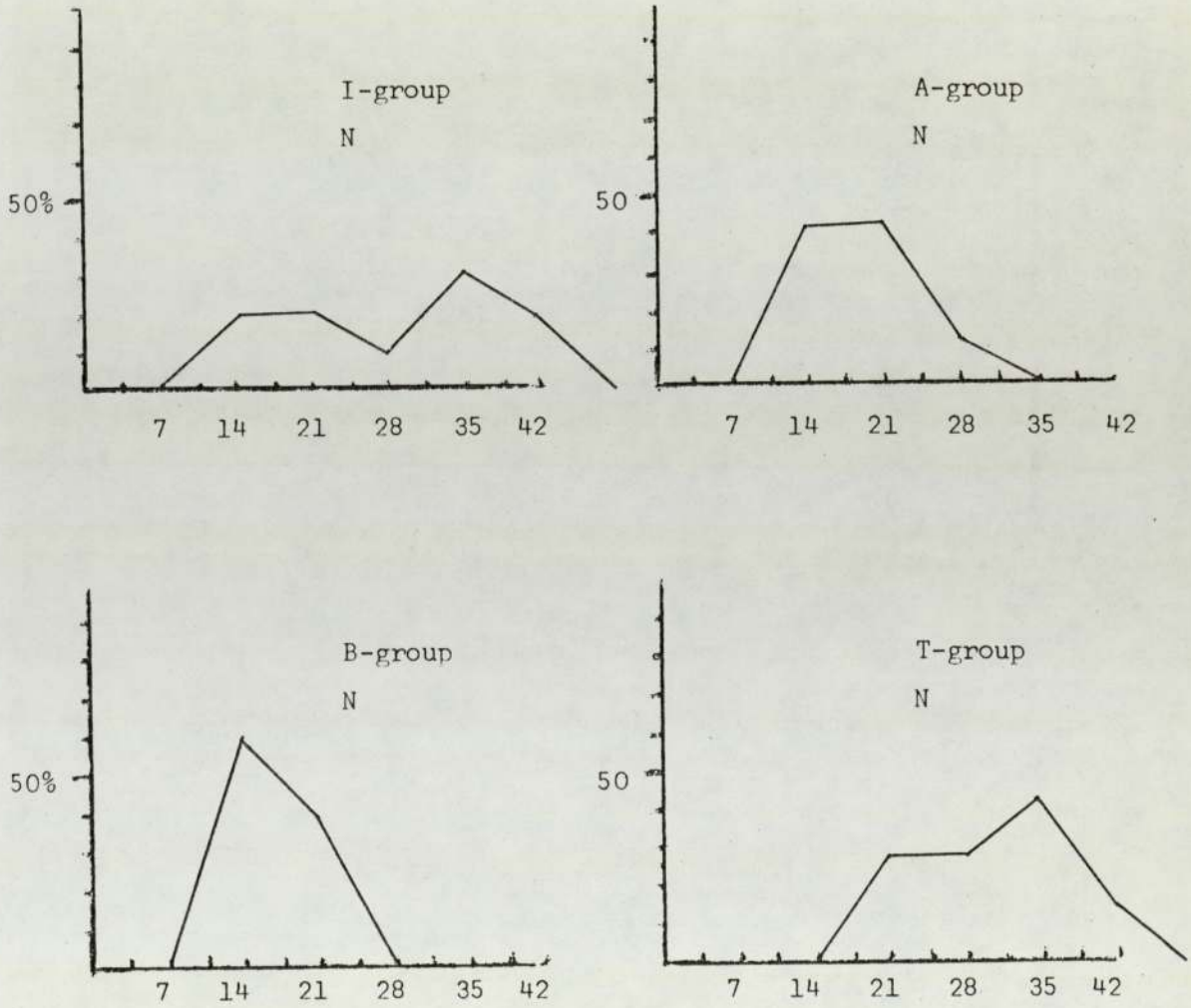


TABLE 21 : comparing average N scores for the four teams

Teams	Means	standard deviation
I-group	27.90	9.25
A-group	18.28	5.25
B-group	14.80	4.52
T-group	30.00	8.32

TABLE 22 : significant differences between teams based on their N scores

Teams	t-value	significance level
I and A	2.46	$P < .05$
I and B	2.96	$p < .02$
T and A	- 3.14	$p < .001$
T and B	- 3.70	$p < .001$

their environments. For example, new friends, siblings, books, or events such as recognition and promotion, were not sought by the subjects as possible influences in their self-concept. That is, they do not feel they are defined by many and varied sources of influences in their worlds, thus resulting in lower N scores, including NS.

IV.2.3 Summary and conclusion

In summary there were three reasons for undertaking this study. First, the study attempted to look at the possible difficulties and disadvantages verbalizers might have in being assessed by the Game. It was believed that the occupation of social worker might attract more verbalizers, whilst the more general population sample, i.e. the school children would include a number of visualizers. Unfortunately, neither past research nor our operational definition permitted the finding, let alone comparing of these two groups of people. Secondly, the study was undertaken to provide an adequate sample of social workers to compare with the other occupational samples. This portion of the study is necessarily discussed in Section III.4.

Finally, the last reason for this study was to see if the Game could differentiate between sub-sets, or in this case teams, within an occupation. Certainly the Game was sensitive enough to differentiate between individuals but could it find sufficient commonality to permit the study and eventual understanding of sub-sets of organisations? The results presented in this section have undoubtedly substantiated this. No in-depth attempt was made to explain the differences found though some suggestions were put forward which would need to be interpreted by the particular organisation and the teams themselves, in the light of other non-personality data. An in-depth study is necessary for any evaluative conclusions to be pertinent to the

organisation.

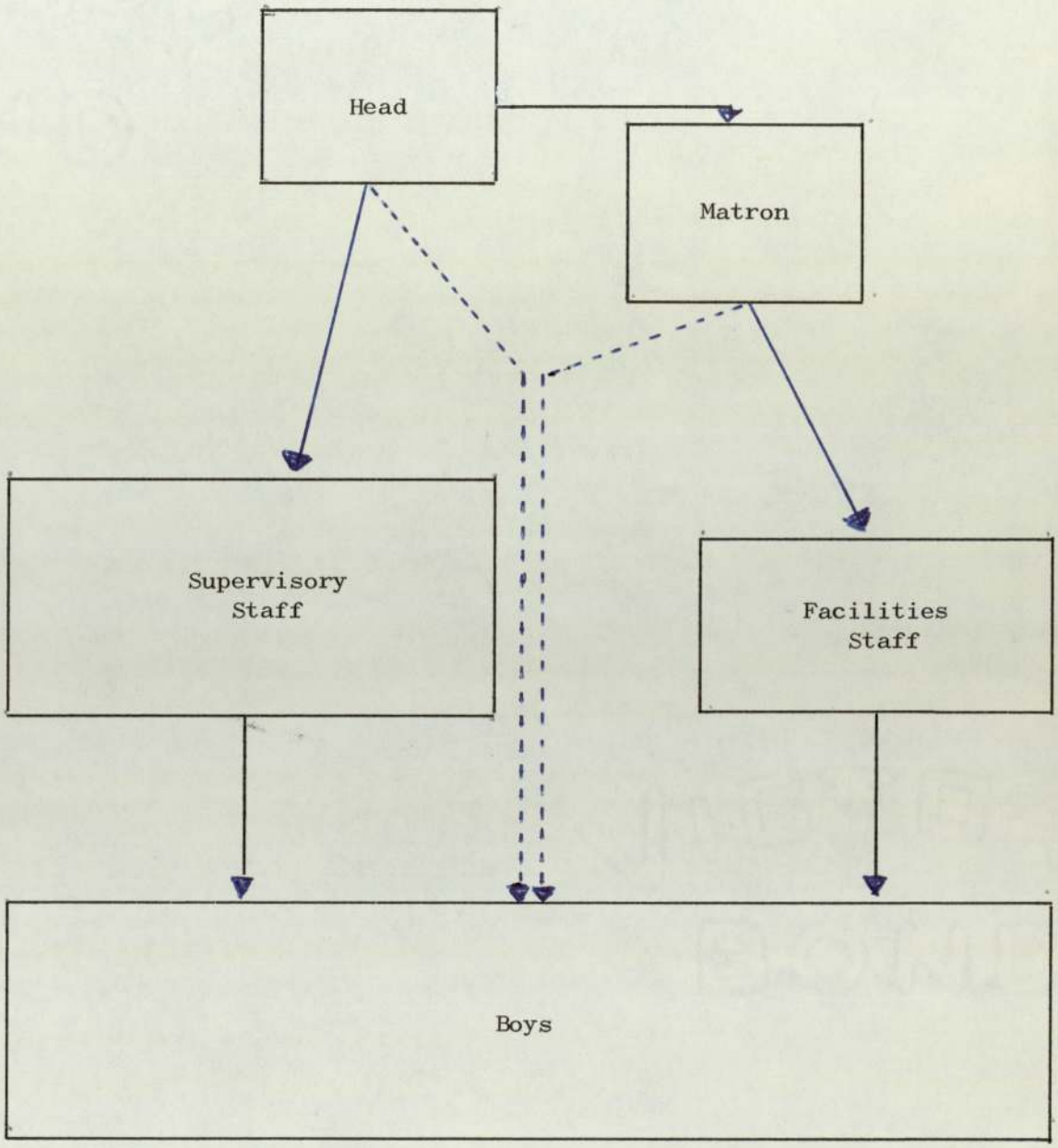
IV.3 An assessment centre; an organisational analysis

IV.3.1 Introduction

There were a number of reasons for undertaking this case study. First there was a methodological reason, that of using the Game in a group-testing situation. Up until then, the Game had been administered under controlled individual test situations (See Section II.3), particularly concerned with isolated conditions due to the power of the test (See Section IV.4.4). A second reason for this study which was functional in nature, was to increase the range of types of subjects sampled. For example, the age and intellectual abilities of these subjects were of interest. Until then the Game had successfully been used with intelligent nine year olds (See Section IV.4.4) but never extensively with very young adolescents. Thirdly, the sample gave the opportunity for a study of a complete organisation. There are advantages in studying organisations that may be called closed systems, as discussed in the pilot study (Tivendell, 1971). Finally, there were a number of applied hypotheses, concerning the similarities (and differences) between the staff and the boys in this remand home, (now called an assessment centre) which were of interest. The following discussion involves some of these objectives.

The structure of this remand home is quite simple and graphically portrayed in Figure 20. It is fairly typical of remand homes for boys; there is a Head and his wife who acts as matron. She is generally in charge of the catering and cleaning staff who are usually local middle-aged women. The Head on the other hand is in charge of the supervisory staff and any other auxiliary staff, such as the gardener. The supervisors are a hybrid of the social worker, often working

FIGURE 20 : graphical picture of the Centre's structure



the solid lines represent the official channels of responsibility and power. Because of the size and actual structure of the Centre, two other channels, the dotted lines, have been added to complete the picture.

with no qualifications and less financial reward. Finally, the boys come from numbers of reference sources. Some are appointed by the courts to a full one or two year stay. Some are allowed to return home at weekends and holidays, but must remain during the school week away from their overburdened and under privileged environment. Some of the boys are there to await court appearance or sentencing.

The subjects were tested over a period of two days. Pilot studies with different types of subjects had suggested that a limited discussion of the Game between subjects did not affect the test results. Nevertheless, particular attention was paid to control for these variables. As a result, all the boys, except three who had absconded from the home, were tested during the first day. As they were already divided according to work groups within the centre, this class-type structure was followed. Hence, three groups of five subjects were tested, one group following the next without benefit of contact and discussion. The three remaining subjects who belonged to the same informal peer-team, were tested the next day. They had been kept in their room for a few hours following their "return" to the centre. The staff were all tested on this second day with the exception of SI who had done the exercise on the first day. Finally, it should be noted that subject No: 28 is not a staff member of the centre, but is the Head of a similar local girls' assessment centre. She is, however, responsible to subject No: 1.

IV.3.2 Results

The most striking phenomenon recorded in this study is the type of matrix produced by many of these boys. Diagram 25 is an example of such a matrix. Many subjects had only three, or in some cases, two categories, i.e. "things" they liked and

Diagram 25 (subject AI4)

BOOKS	FAMILY TROUBLE	HOUSE	EDUCATION	SISTER	RACE	MATES	TOWN THINGS	HOBBY	CHILD	MUSIC	MOON	T.V	MARRIAGE	HEAD
COOK	NEIGHBOUR	BROTHER	NEW FRIEND	DAD	FAMILY	WORK	RELIGION	CAR	HOUSE BOUGHT	CLOTHES	BEST FRIEND	ME	MONEY	SUPERVISORS
SAVINGS	RECOGNITION	PROMOTION												
				MARRIAGE	SET MARRIED	AN AFFAIR	UNEMPLOYED	PRIVACY	WIFE	NICE FEMALES	DEATH	BOSS	WIFE'S DEATH	LAW

"things" they disliked. Unlike high P/N scorers in other samples, there is little conscious inner structure to the "worlds". In terms of cognitive style, their matrices involved very little conceptual differentiation (Gardner and Schoen, 1962). It is always possible that leaders, i.e. high P/N scorers, have come from impoverished backgrounds but this difference in internal structure and the (more) usual uni-category matrix of the leader (See Section IV.4.2) would suggest otherwise. That is, information is needed in addition to that provided by the P/N score to differentiate between subjects with leadership potential and those coming from impoverished backgrounds. This further information may be taken from the pattern and the interview.

Tables 23 and 24 compare the Game scores produced by the staff and the boys in the centre. There is a consistent trend for the boys to score higher on all the Game scores. However, an individual subject analysis will both explain this trend and point out some similarity between the personalities of certain staff members and many of the boys. The results are discussed in terms of frequency and percentage of the sample for each score.

In these tables it can be seen that the PI and NI scores are the subject of the greatest difference in use by the two samples, i.e. the boys and the staff. This is probably in part due to a methodological alteration in the stimuli used by the boys. This alteration was carried out to help capitalise on the opportunity of studying a whole organisation. It had been previously suggested that the block labels could be altered according to the need of the study. Moreover the use of blank blocks by most subject-populations was always infrequent and the addition of a number of new blocks, i.e. N greater than 46, was experimentally unjustified. So as to minimize inter-

TABLE 23 : (Sample N = 28) Unconnected samples compared per Game score

	Staff(N = 10)		Boys(N = 18)		+ -	
	mean	s.d.	mean	s.d.	statistic	sign
P/N	2.48	1.29	4.04	1.31	- 3.01	.01
P	74.40	43.59	158.11	62.23	- 3.75	.001
PI	24.70	12.25	61.72	24.52	- 4.45	.001
PO	18.70	13.47	37.05	15.17	- 3.23	.01
PS	19.30	12.38	33.66	14.91	- 2.58	.01
PE	12.00	9.22	26.72	18.01	- 2.40	.05
N	29.50	6.91	37.94	7.95	- 2.11	.01
NI	9.40	2.75	14.83	2.30	- 5.57	.001
NO	7.30	2.21	8.55	1.58	-	NS
NS	7.80	1.75	8.27	2.32	-	NS
NE	5.00	2.44	6.27	3.04	-	NS
PI/NI	2.71	1.30	4.11	1.46	- 2.51	.02
PO/NO	2.32	1.47	4.20	1.53	- 3.15	.01
PS/NS	2.56	1.24	3.93	1.34	- 2.65	.02
PE/NE	2.14	1.30	3.89	2.07	- 2.39	.05

TABLE 24 : (Sample N = 27) comparison of samples per Game scores but corrected for visiting Head of girl's centre

	Staff(N = 9)		Boys(N = 18)		+ -	
	mean	s.d.	mean	s.d.	statistic	sign
P/N	2.71	1.13	4.04	1.31	- 2.58	.02
P	81.55	39.51	158.11	62.23	- 3.34	.01
PI	28.00	11.18	61.77	24.52	- 7.69	.001
PO	20.44	12.54	37.05	15.17	- 2.82	.01
PS	21.75	12.27	33.66	14.91	- 1.97	.10
PE	13.33	8.70	26.72	18.01	- 2.07	.05
N	30.22	6.92	37.94	7.95	- 2.47	.05
NI	9.33	2.91	14.83	2.30	- 5.35	.001
NO	7.77	1.71	8.55	1.58	- 1.17	NS
NS	7.66	1.80	8.27	2.32	- 0.69	NS
NE	5.44	2.12	6.27	3.04	- 0.73	NS
PI/NI	2.94	1.15	4.11	1.46	- 2.09	.05
PO/NO	2.58	1.30	4.20	1.53	- 2.71	.02
PS/NS	2.75	1.16	3.93	1.34	- 2.24	.05
PE/NE	2.38	1.13	3.89	2.07	- 2.02	.10

ference with the Gestalten of environmental interaction and yet capitalize on this re-labelling process, pilot testing suggested four of the five blank blocks were to be re-labelled. These were:

I^{14}	Head
I^{15}	Supervisors
I^{16}	Matron
I^{17}	Cook

In brief, this had the effect of reducing the degrees of freedom in using the Game, i.e. its open-ended quality, from five (blank blocks) to one. However, caution must be taken in the evaluation of the boys scores because of this methodological alteration in the number of individuals (and indeed the comcepts themselves, e.g. that of "supervisors"). This is important for all comparisons and analyses, but most important to the PI/NI and NI scores.

Three models of analysis were used in this section. This first analysis compares the Game scores produced by the two samples, i.e. the boys and the staff in the Centre. Table 23 presents their respective means ($\bar{X}$), standard deviations (s.d.), t-statistic and level of significance. According to this there is a consistent trend for the boys to score higher on the Game. This is due to the type of pattern used, see Diagram 25. An individual subject analysis will, however, show that there is some similarity between the staff (certain members only!) and many of the boys. This mode of analysis will be discussed later. To facilitate this and a more general analysis, graphs representing the comparative distributions of scores for the two samples were plotted. These distributions were in terms of percentage frequency (for ease in comparative analysis) and in terms of frequency of subjects (to facilitate individual

analysis).

IV.3.3 Discussion

IV.3.3.1 Unchanged scores: The only Game scores which could not be affected by the change in stimuli (for the boys only) are the NO (number of object blocks used), NS (number of social constructs) and NE (number of event blocks used). All other Game scores may be said to be affected by the new stimulus set though with the exception of I scores, this may be a rather minimal interference. However, because these three scores, i.e. NO, NS and NE, do not show any significant differences between staff and boys (See Tables 23 and 24), any comparative analysis must be interpreted cautiously.

Because of the experimental introduction of NI stimuli, the first step is to see whether the PI scores are merely out of place with each other. For example, the maximum P value attributable to the four new I items introduced is: 8 x 4. That is, each new I block could have a PI value of a maximum of 8 (See Section II.3: scoring). By correcting the boys' distribution of PI scores by some 30 digits it may be noted that the percentage frequencies are now more comparable (Figure 21). However, even the added four I blocks do not account for the higher scores of some boys and the lower scores of certain of the staff. Correcting for the four extra items available to the boys made the percentage frequency of the two sub-samples for NI scores capable of comparison. We still found subjects Nos: 23, 19, 15 and 14 scoring rather above the staff's scores with the exception of subject No: 8.

IV.3.3.2 In-phase approach: Another way of comparing the corrected and uncorrected differences in staff and boys is to compare individual subjects who are matched according to their Game scores. The corrected PI scores showed the following

subjects to be "comparable":

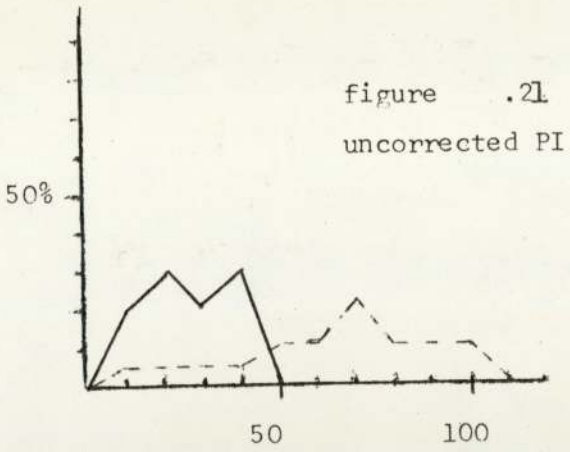


figure .21
uncorrected PI

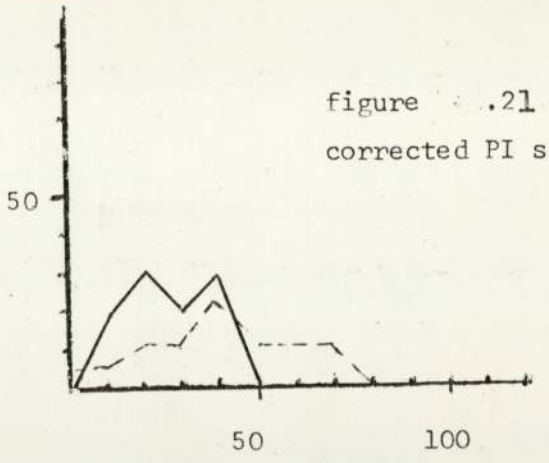


figure .21
corrected PI scores

Here the corrected and uncorrected PI scores (absissa) are ploted in terms of percentage frequencies for each sample (staff and boys).

Though subjects Nos: 4, 5 and 9 are members of staff (See above), all three had simple Game patterns. For example, though subject No: 4 had five groupings of blocks or worlds in his matrix*, they were independent of each other in terms of content and had little internal structure in each grouping. The most important grouping was simply placed slightly above the others, and so on in decreasing order of importance. Subject No: 5 had a six-category matrix whose overall pattern was a star. This is understood to be a rather simple pattern, but the internal structuring of each grouping or spoke suggested that it was of a higher level of complexity than most star patterns. Finally, subject No: 9 had eight or more categories in his matrix, which "a priori" would seem more complex than either of his peers. His was, however, a linear pattern which is not a complex pattern type. Complexity in this situation could have been increased by an internal structure to each group (See Section IV.4).

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*See Warr, 1970; cognitive complexity increases generally with number of categories.

When compared with the Boys' sample, the uncorrected relationship (See above) with subject No: 11 seems a closer fit. Subjects Nos: 15 and 24 (the corrected relationship) had only two categories in their pattern, and these had only minimal internal structure. Their approach to the Game was to attempt to include as many blocks as possible (all the blocks in the case of subject No: 15) with only the briefest consideration as to the meaning and the implication of these items to the overall pattern. Subject No: 11, on the other hand, had a simple linear pattern but had five categories in his matrix pattern (i.e. increased cognitive complexity as opposed to subjects Nos: 15 and 24). Furthermore there were signs of his having internally structured these categories: "dad" was linked to "work"; "mother was linked to a family nucleus. There were also signs of his interpretation of their relationship in the environment, i.e. introspection. For example, he separated his family into two parts and he also detached his role in the remand-home from these two parental worlds.

A similar comparison can be made between subjects Nos: 8 and 7 of the staff and (i) in the corrected situation with subjects Nos: 23 and 13 and (ii) in the uncorrected version with subject No: 12. Subjects Nos: 8 and 7 have respectively nine and five categories to their matrix. It is suggested (Gardner R.W. and Schoen R.A., 1962) that the greater the differentiation in terms of number of categories is synonymous with a higher level of cognitive behaviour and by implication higher mental ability. Though subject No: 9 has a linear pattern which is a somewhat simpler than the "star" of subject No: 7, the number of categories he has is somewhat higher. Subjects Nos: 23 and 13 have dissimilar patterns, category width and internal structure. Only one of the two categories of subject No: 23 can be

said to have any inner structure, yet this is still a rather limited one. Subject No: 13, on the other hand, had a linear pattern with six separate categories. The pattern was rather simple yet the internal structure, though still rather simple, was more complex than subject No: 23's. There is a greater similarity between subject No: 12 and the two staff members mentioned. The pattern he produced was similar to that of a star. This subject created only three separate categories (spokes) but there was more structure within these. For example, the subject had ranked and separated his "dislikes", such as police and sister.

Comparative analyses could be carried out to include other subjects and other Game scores. However, there was little evidence in these to support the hypothesis that the introduction of a new stimulus set was the only cause of the differences between staff and boys reported in Tables 23 and 24. That is, the use of the above 'in-phase' approach does not automatically prove the similarity between these subjects' distribution of Game scores. As mentioned in the introduction to this organisational study, the general approach that the boys had in playing the Game is another possible causal interpretation of the results. It is believed that these boys generally came from psychologically impoverished environments, often in the form of deprived, unstable home backgrounds. Many of their families might have attributed unusual valences to objects, events, cultural and sub-cultural traditions (e.g. social constructs) and even to people. The need for parental affection and guidance, their search for surrogate sources of these in either peer groups or even the remand-home's structure and staff, and, for many boys, their general behaviour, are indications of their impoverished environment. They have little

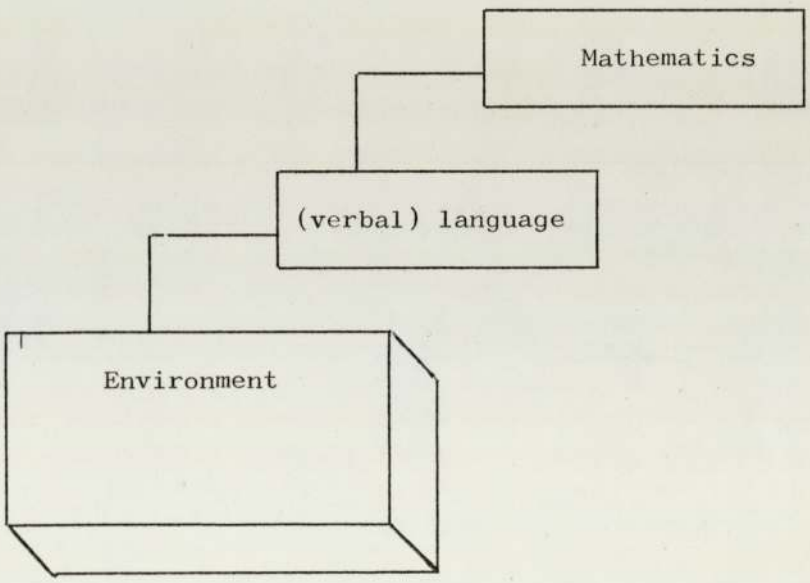
chance of receiving adequate guidance or proper sources of limitation and learning. For these reasons their interactions with their environment are often superficial, simple (naive) and, as they will increasingly realise in their social and physical development, often inadequate.

IV.3.3.3 Analysis via Game scores: The following is a very brief analysis concentrating on the distributions of Game scores. The purpose is to provide further information concerning the subjects and possible some understanding of their present milieux, the assessment centre. Particular emphasis will be placed on the use of percentage-frequency distributions of Game scores as opposed to the frequency distributions.

Mathematics is a method of studying perceived relationships between parts of the environment. It uses a set of symbols belonging to a language which is a level of abstraction once removed (second order) from the usual verbal languages. For example, sabre-toothed tigers and men, were parts of the pre-historic world. To help warn those around him of a tiger's approach, man developed a verbal language. When man began assessing the number of other men needed to defeat a certain number of tigers, he developed mathematics. This example is a fictitious and simple introduction to the concept of degrees of abstraction (Figure 22). The argument in this figure is not whether mathematics is an abstraction of verbal language or of the environment, but only that it is more abstract than both the environment and the average verbal language. Languages, verbal or methematical, may be the reason why psychometricians use a linear interpretation of psychological phenomenon. Wherever the blame may lie, the important point is that the move away from "introspection" in psychology coincided with the increased use of linear solutions in the science. For instance,

bi-polar trait factors (e.g. Cattell) and job-attitude factors (e.g. Herzberg) are products of this use of linear mathematics. It was emphasized in Part III that its use was not based on a fundamental assumption but on the need for an expedient solution. In this section the Game scores based on a form of the P-value are not necessarily considered linear in nature and may even have a circular or multi-dimensional nature. In previous studies involving "normal" subjects, the distribution of these scores fit a bi-polar continuum. However, many of the boys and even some adults, for example subject No: 6 in this section and subject No: 7 in Section IV.1, had scores which did not fit this simple bi-polar continuum.

FIGURE .22 : order of abstraction



The P/N score

The P/N scores for these two samples were plotted in terms of percentage frequency and actual frequency. The percentage frequency was determined for each sample, the boys and the satff, so that the resulting distributions could then be compared despite the differences in sample sizes. The boys sample's P/N distribution was almost bi-modal in nature. It emphasized high scores (mode P/N score = 5). The staff-sample's

distribution was uni-modal. The distribution in fact formed a plateau with the mode being shared between 2 and 3 (P/N score).

Diagram 27 represents these Game scores in the form of the organisational hierarchy of responsibility. Diagram 26 is the schema for this organisational structure. Subject No: 1 is the Head, subject No: 2 the matron; subject No: 28, the head of the remand home for girls and is subordinate to subject No: 1, and so on including the supervisors (and sub-sets of: oldest, acting deputy and subject No: 6, who it will be noted is a special case) and the boys (of which there are four groups). The matron, subject No: 2, was in charge of the domestic staff of which only subject No: 3 was sampled. Furthermore, subjects Nos: 1 and 2 are husband and wife. Thus the roles of leader, counsellor and lieutenant within the organisation, were certainly shared, respected by staff and boys, and possibly exchanged depending on circumstances. Subject No: 7 has been placed above the other supervisors (Diagram 26) and labelled "acting deputy head". His satisfactoriness had often been emphasized. When delegation of the responsibilities and duties of the head were in order, he was the man chosen. Of the remaining supervisors two are outstanding. First, subject No: 8 is the oldest but not the most experienced of the supervisors. Secondly, subject No: 6 was recognised as the least satisfactory by the system (in terms of output), his peers and subject No: 1.

Of all the subjects tested with the Game, very few attempted to construct their matrix pattern using the third dimension. In these cases, usually only two or three blocks were placed on top of each other. In the interview following each testing session, a two dimensional alternative was sought.

Diagram 26 (schema)

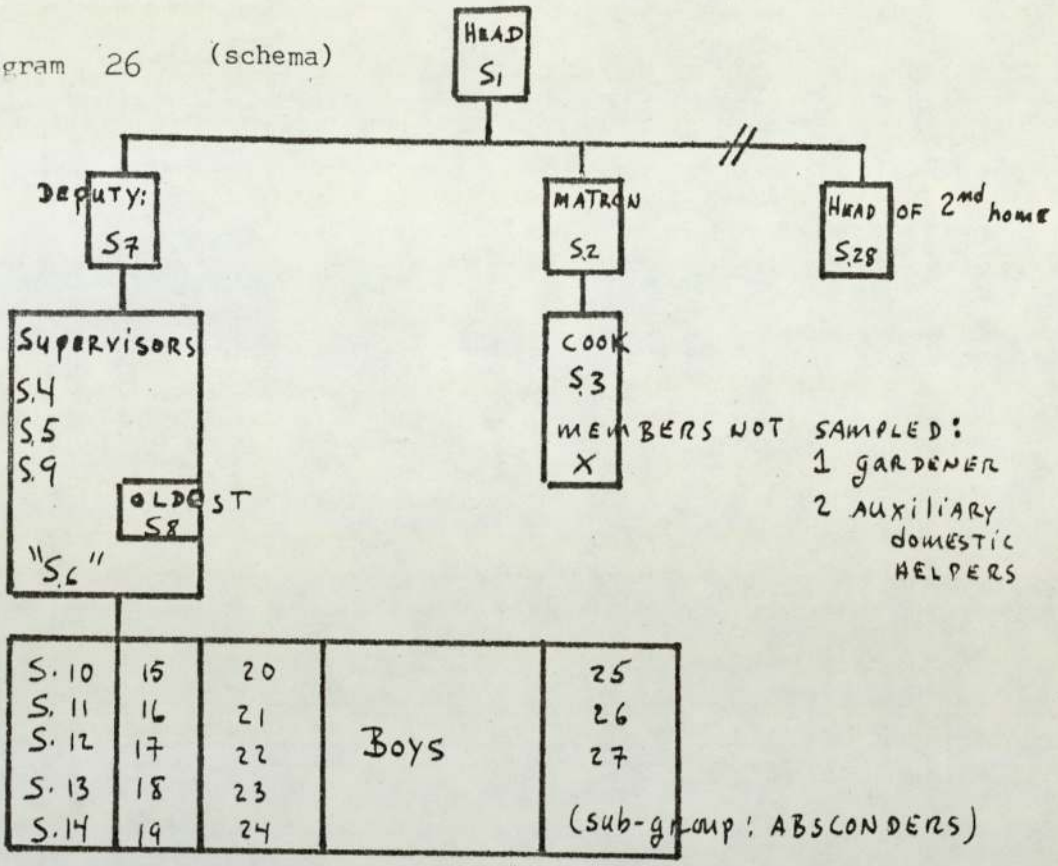
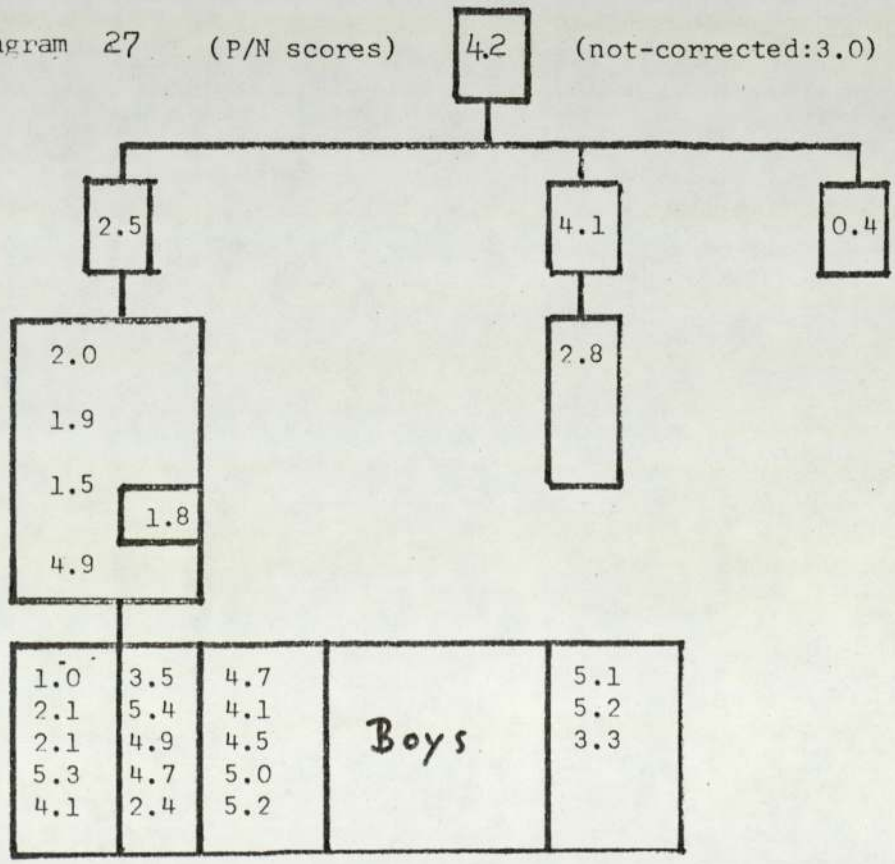


Diagram 27 (P/N scores)



This not only permitted computer scoring but also facilitated any comparisons with normative data. Subject No: 1 had such a matrix. Subject No: 1 also added two blocks to his matrix during the interview, thus forming the arm or "tail" at the bottom right of his pattern. The post-Game interview was (unusually) carried out in the presence of a second psychologist, who was well known to the subject. The new "tail" may be considered a result of coping behaviour in view of this increased stress. If this latter tail-formation was disregarded and the relationship-values due to the third dimension were used, the P/N score rises to 4.2. These circumstances had not previously arisen in test situations. For the purposes of this study the computer version of this subject's scores were used.

Although the computer version was used, subject No: 1 has a tight cluster type pattern with relatively few blocks (N). As described in Section IV.4.2, this type of pattern is believed linked to a potential for leadership. With two exceptions, all other staff members' P/N scores were smaller. These exceptions were subject No: 2, i.e. wife of subject No: 1, and subject No: 6 who had a simpler pattern rather similar to many of the boys. It is possible that subject No: 6 is similar to subject No: 2 in Section IV.1. According to the organisational structure (Diagram 27) subjects Nos: 28 and 7 were found to have lower P/N scores than subject No: 1. This would be expected from a leadership hypothesis (Section IV.4.2) as these subjects were subordinate to subject No: 1. A similar relationship was repeated in the scores of subjects Nos: 2 and 7, and their own subordinates. That is, subject No: 3 had a lower score than subject No: 2 and with the exception of subject No: 6 all the supervisors had lower scores than subject No: 7. Assessment centres attempt to reproduce a stable authoritarian environ-

ment, rather like the type of parental home believed vital to the acquiring socially precise behaviour, and leadership is an obvious focus point.

The lower portion of Diagram 27 presents the boys' scores. They are sub-divided into the teams or classes to which they belong. With the exception of the second team (from the left), the subjects were placed in rank order of estimated intellectual ability. This ranking of intellectual capacity was done for each team, following the test situation and prior to the recording of the Game results. The data consisted of a subjective ordinal estimate by the experimenter, reviewed during the post-Game interview and finally matched to rankings made by a number of staff members in informal discussions. The matching process was not undertaken for team II and the results based solely on the experimenter's estimates were not used. The three teams were not identical in either age or type of delinquency. The first team's Ss (bottom left, Diagram 27) were both the least delinquent and the youngest (see below). The subjects of team IV, on the other hand, had just been apprehended for absconding from the home. This being the only delinquent behaviour recorded for some time, it was assumed that they were the more delinquent team. It is not suggested here that the P/N score is a measure of delinquency. However, the pattern of a subject's interactions

Boys sample:

team:	age mode:
I	12
II	13
III	14 (except S23 = 12 years old)
IV	15

with his environment is understood to be a measure of his adaptation to this environment. For example, the Prime Minister of Canada once remarked in an interview that, faced with a problem, violence was always an alternative which he considered but the one which was first rejected. The delinquent, on the other hand, has few coping strategies or alternatives and often must rely on violence. Moreover, the cognitive structure "crystallizes" in time and cannot be readily changes (Ward, 1970). Because it is possible to discover which personality structures have more difficulty adapting to their environment, it should be a matter of training the subject to seek, perceive, choose and use alternative coping behaviours to violence. Finally, team IV's leader was not understood to be intellectually the most capable of the trio. In most groups whose members are still rather young, physical characteristics are often more viable bases of leadership. Subject No: 26 who is considered the most intellectually developed of the trio had a lower P/N score and, interestingly, is subject No: 25's lieutenant.

In brief, these P/N scores do not clearly differentiate between the staff and the boys. However individual hypotheses, including leadership potential and the non-linearity of relationships, received some support.

The P scores

Figure 23 deals with the relationship variable P which does not control for the number of blocks used. The distribution is bi-modal with one mode predominantly representing the staff and the other the boys. The difference between the two modes was one-hundred and twenty points. This difference was too great to be due to the boys' use of extra I blocks alone, i.e. of the order of 4 x 8. The P scores are marginally better at differentiating between the staff and the boys. Only

Figure 23 Percentage frequency distribution of P scores

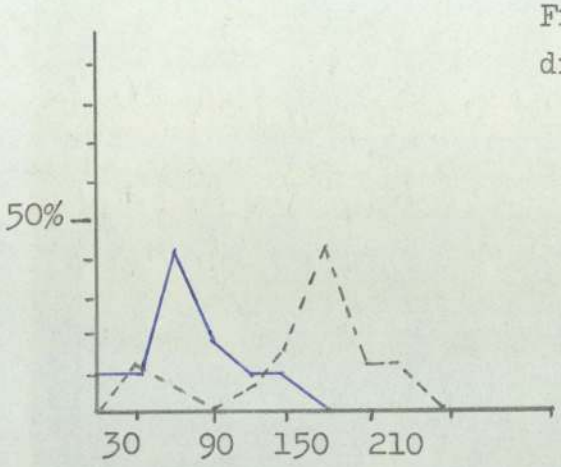
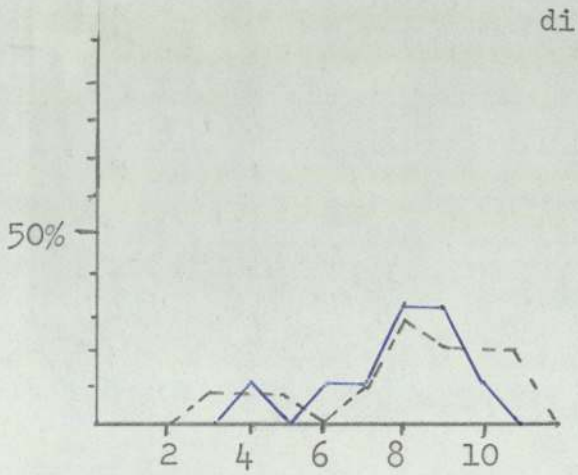


Figure 24 Percentage frequency distribution of NS scores



——— the staff

– – – – the boys

three boys had scores below one hundred. Meanwhile, two of the staff had scores above this level. These two subjects, it will be found, had many other Game scores similar to those of the boys. In the case of subject No: 6 this is understandable in terms of the simplicity of pattern and inner content or structure of his cognitive environment. Subject No: 2 on the other hand was of above average intelligence and, from the complexity of the internal structure in her pattern, she was successful at interacting with her environment. The scores belonging to the boys defied the bi-polar continuum analysis used with previous subjects. All, except subjects Nos: 10, 11 and 12 of the first team, had scores similar to subject No: 6. This is to say that with the exception of these three boys but including the two staff members already mentioned, the Game was found to be consistently distorted in terms of relationship values. There is a normal, somewhat linear, usage of the Game which applies to normal populations. However, not everyone reproduces his cognitive world structure in this manner. Those who do not, seem to have come from parental and (sub-)societal environments which were certainly different. These subjects have a cognitive structure which does not attribute valence to (and perhaps even select: see the use of N) the parts of its environment in the usual way. It would seem"a priori" that this is divorced from the usual theories of maturity and intellectual development. Note, for example, the difference in cognitive structures that these boys have with other children of various ages (See Section IV.4.4).

Moreover, it is hypothesized that subject No: 2 is duplicating this abnormal cognitive structure because of a completely different reason than are the sixteen boys. The pattern and internal structure which she produced was far too complex to

be equated to theirs. For this reason, and because of the stable interaction she has with her environment, the following interpretation is believed relevant. Having lived with and care for this type of individual, a marriage of form (theirs) and content (hers) has occurred. Attempting to understand, and perhaps more important to be accepted by them, she has developed a cognitive world structure which is sympathetic to theirs in terms of form. Further studies should be undertaken to verify whether this form or pattern is merely a behavioural phenomenon for coping with a strange radically different environment. It is more likely that a true personality change has occurred over time. Questions like the following need be studied: how long does it take to undergo such a change and is it related to the type and degree of difference required? Is this a frequent occurring phenomenon and is it more specific to one sex rather than to the other? How necessary is this change to successfully promote in others alternative coping behaviours? That is, is this similar to the so-called psychotherapeutic process? Does it occur in other areas such as with those teaching young children or working in rehabilitation for the physically and mentally handicapped, and is there a difference in satisfactoriness with colleagues not undergoing radical personality changes? The occurrence of this sympathetic internalisation of a personality pattern is certainly infrequent and situation specific. As far as it can be estimated, only one person's Game behaviour, of the thousand or so subjects tested, has suggested such an explanation. It is possible that the cognitive world structure was such at a very early age and hence this is not a personality change. However, the parental history, the complexity of the present cognitive structure, the type of work done, the tenure of the job and psychological

commitments needed, all point to the previous explanation. There is then a dual explanation for this type of cognitive structure. Usually (16 out of 17 Ss) it is due to upbringing in an impoverished parental and societal environment. The remaining times it may be due to a sympathetic change in the personality itself.

Four scores make up the P variable. They are PI, PO, PS and PE. With only two exceptions, i.e. subject No: 3 scoring high in PI and subject No: 2 scoring less than usual in PE, the differentiation of the staff and boys was observed in these four scores. Interpretation in terms of traits using the information found in Section III.2 can only be made with the scores belonging to the staff. For example, a high PI score is indicative of a shyness or anxiety as well as a concern for the people referred to in the matrix. The actual patterns used by subjects Nos: 3 and 8 support this description. These was confirmed in the post-Game interview as it also emphasized the attention they paid to the people in their immediate environment. Subject No: 3 adheres rather closely to a christian religion which stresses love and attention to the family. In her matrix there was a large number of individuals who were concentrated near and around the centre of her star pattern. Subject No: 8 also had a simple pattern, as opposed to the groupings and clusters found in other studies. In addition to living with his family in a house owned and occupied by his mother, he pays a good deal of attention to her. Both these subjects were very attentive to the members of their respective family, though for different reasons. One had a philosophical need to commit her life and work, whilst the other is still, despite his age, fighting for personal and financial independence.

In terms of the PO score, i.e. the valence attributed to material aspects of one's environment, subject No: 7 has the highest score among the staff. The involvement and commitment he has made to his job is supported in his grouping of the work blocks in his matrix and their nearness to the "Me". The "marriage" block which is juxtaposed to the ME block is the calculated pivot of the whole pattern. His interest and dedication to his job make him an ideal man in whom to entrust responsibility. This interpretation has been verified in terms of his satisfaction and satisfactoriness. Only subject No: 28 has a PS score which is different from the staff belonging to the home. The stereotype of the typical social worker is that of a shy, quiet, intellectual who sometimes becomes highly emotional in discussions, and displays a naive nature. On the contrary this subject displays a happy, outward and especially practical nature. Unlike the typical background of the above high PS scorers, this subject's reasons for and circumstances of occupational choice are based on a pragmatic assessment of personnel and environmental conditions. It may be noted that this assessment centre is situated in an area where trained social workers are not easily available. This S's satisfactoriness supports the argument that an organisation must constantly review its selection criteria. Perhaps social services would all benefit from selecting "a typical" personnel (Schein, 1965). Finally, it is interesting that subject No: 6 evidently has a higher PE score than the rest of the staff. There is certainly some relation between this score and the PE/NE variable (Section III.5, distortion). This subject was perhaps dominated by his feelings of jealousy and was thus unaware of the distortion of his matrix. Previous unsucessful social interactions seem to be at the root of this.

The N scores

The last set of Game scores deals with the frequency of blocks used. With the exception of NI, these scores were not distorted by the alteration to the Game's methodology. Regardless of this, the rather simple approach to the Game used by the majority of the boys in this sample demands a certain amount of scepticism in the interpretation of their scores.

The highest N score possible lies between 41 (labelled) and 46 (in addition the five unlabelled) blocks. Experience with the Game has led us to expect few Ss will use all the blocks. Here, both the staff and the boys were found to have high N scores. The boys however managed to have a majority of their scores fairly close to the maximum number of blocks possible. Because of the relationship between intellect and the number of blocks used (Section III.2), it is assumed here that the boys-sample's high scores lend support to the non-linear aspect of Game (see above). From the pilot studies we could have expected linear relationships between personality characteristics and Game scores. However in the case of a fundamentally different sample such as these boys, the mathematical laws need modification.

The NI distribution of scores is noteworthy because of the range of scores, respectively for staff and the boys 4 to 14 and 10 to 18. If the four extra NI blocks available to the boys are subtracted the two distribution become quite similar. In terms relevant to the staff, the high NI scores should be socially minded. This would find support in their having chosen a social rather material dominated environment. As social workers, they would be expected to be people (I) minded. However, as it was suggested in Section IV.2, there is in reality a wide range of personality types in the occupation. For

this boys-sample the wide range of scores reflects the range of types of boys belonging to this population. The more delinquent may indeed be scoring high on this NI score. This might be due either to this score's link with social desirability (See Section III.5), or to a sociological phenomenon of identity with a sub-culture.

The NO scores (number of objects used in the cognitive world) were similarly distributed for the staff and the boys. Like the two following Game scores, it could not be greatly affected by the alteration (above) to the methodology. This lends some support to the hypothesis (Section IV.b.3.1) that these two samples are probably similar in certain aspects of their personality. Future research, of the type described in Section III, must be undertaken to provide an adequate explanation for this similarity.

The NS scores (number of social constructs used) also had very similar distributions for the staff and boys. The increased use of NS is related to an increased use of verbal structures to define certain points of one's environment. It was found in Section III.2 that the high scorer is shy, critical and independent. The scores in these distributions are not exceedingly high but a definite positive skewness is recorded. (Figure 24). Those scoring ten or above on the NS variable might well fit this definition of high scorer. What is interesting is that no individual scored so low on this NS variable so as to be rated as an introverted individual. The reality of the delinquent problem seems to attract staff who by their background and personality can show empathy with the boys.

In dealing with the NE scores we may wish to refer to Section III. It was noted that this is the set of blocks which was used sparingly by subjects of both samples. To use four

or five NE blocks is a sign of high-mindedness, self-reliance etc.; in short, the stereotype of masculinity. Once again many of the boys and some of the staff scored quite high, somewhat above the usual scores found in other samples. The research into life-cycle labels such items as stressors, i.e. sources of stress for the individual (See Part II). Perhaps these subjects do have more sources of stress in their worlds? Or perhaps they have fewer coping behaviours (defence-mechanism) as suggested previously?

The PI/NI, PO/NO, PS/NS and PE/NE scores

Of the remaining four sets of scores, three have different distributions for the staff and the boys. Albeit there is some overlap between the samples, there is an underlying trend for the boys to score significantly higher than the staff. It is assumed that with high PI/NI describe a scorer as having more concern for the people in his immediate environment. One may note that concern is different to respect and that both those individuals we hate and those we love can be the subject of our concern. The humanistic psychologist would discuss inner needs of love and attention and thus deduce that these boys "love" all the individuals with whom they interact. Regardless of the reader's preferred interpretation, the two points raised in this section may be said to play a major role in the scores. First, the alterations to the Game may have affected the scores even though there is a mathematical control for these, i.e. dividing PI by NI. The fact that subject No: 6 (and to an extent subject No: 2) had scores which were identical to the boys' mode, despite not being subjected to the alterations in methodology, points to the possible success of the mathematical control. Secondly, the boys and some staff members have consistently scored well above the range for other population

samples (Section III.4). It is most probably wrong to assume that the Game scores belong to a simple linear continuum.

A similar dilemma exists in the interpretation of the PO/NO scores' distributions. Perhaps delinquents can be seen as bold, expedient and non-conforming in terms of their social behaviour. Humanists might also see the delinquent as basically friendly, wishing to meet people and show off the self. More concretely they are continually ascribing high valence to material things like cars and televisions. In terms of coping-behaviour, the possession of this wealth is undoubtedly seen as the panacea for their troubles.

The previous discussion of Game scores had implied a possible linear interpretation. However, the high scores of the boys on the PS/NS variable would not seem to substantiate this. Despite the high valence they attributed to these social constructs, the boys cannot be called "verbalizers". The definition of a verbalizer arose from the high scorer's tendency to internalise verbal rather than spatial structures. The very simple patterns the boys produced may be sequential in structure. Once again the need for a thorough semantic-type study of the Game is found to be necessary. Perhaps linguists might shed light on the hypothesis that the boys' patterns are of a rudimentary of sequencial-type structure. If so the psychological implications are important. For example, the basis of teaching and training in terms of coping behaviours could reside in the verbalizer/visualizer dichotomy.

Very little can be said about the distribution of PE/NE scores. Unfortunately the measure does not yet easily differentiate between distortion and abnormality of Game scores (Section III.5). Most of the subjects had moderate PE/NE scores. As expected, subject No: 6 had the highest score for

the staff. Because little information was gathered concerning the boys, little can be said about subjects Nos: 24 and 18 who scored well above the normal range found. The answer probably lies in their too simple approach to the Game and in the non-linearity of their Game scores.

IV.3.3.4 seating arrangement and group testing

The following is a minor point related to group testing in this study and relevant to the discussion concerning the social psychology of the Game (Section II.3). Social psychological research into small group behaviour has linked variables such as seating arrangement with personality. For example, one study showed that the choice of seat was an important variable affecting leadership (Tivendell, 1969). Most group testing situations do not control for seating preference or choice. At best, some form of random allocation may be used but the seating arrangements even in this situation may be determined by such variables as order of entry into the room, the initial direction taken by the subject towards a certain set of seats, or by the subject's perception or anticipation of the experimenter's position in the room. This latter variable, for instance, may be determined by the immediate position of the experimenter when the subject enters the room (fearing E, the subject sits in a far corner; attracted to E, the subject may sit near or in a visually advantageous seat). Meanwhile, another subject may be anticipating the long term position of the experimenter in the test room during the period of contact. There are certainly a large number of variables which might contribute to a subject's test behaviour, and this may be of particular importance in personality assessment (See too Mischel, 1968).

In this case study the boys in the first three teams

(Diagram 26) were allowed to choose any seat they wished (Figure 25). No instructions were necessary concerning seating arrangements, due to the size of the room, the number of seats available and the small sample size per test-group ("teams"). The intention in the study was to permit the subjects themselves to choose their "preferred" seat, i.e. to express their own individual differences in adapting to the environment, including their searching for clues as to the experimenter's expectations and motives. Figure 25 summarizes the seating positions (and their respective labels) used by the subjects. It is assumed that the door (the same for entry and exit) is an important determinent of seating behaviour. This is an important variable in all cases, but perhaps accentuated for this particular sample population. In terms of coping strategy, the door is a subject's ultimate escape path.

Table 25 translates the subject's number (See Diagram 26) into seating position according to Figure 25. This should facilitate the testing of any new hypotheses concerning Game scores and seating positions. Table III.63 summarizes the significant results, based on a Kruskall-Wallis one-way analysis of variance (Siegel, 1956) of the scores for seating position. The significance of the relationship between choice of seating position and the use of event items in one's cognitive structure, underlines the caution which must be taken in interpreting psychometric information and personality scores in particular. This has been discussed by Rosenthal (1963) and Mischel (1968), and mentioned in Sections II.3 and III.5. The subjects seated closer to the door are in positions 4 and 5. That is, in psychological terms, they are nearer the only real escape route as opposed to the subject in seat number 1 who must for the test materials belonging to the experimenter (authority).

FIGURE 2 5 : seating arrangement of boys in this sample; position and direction

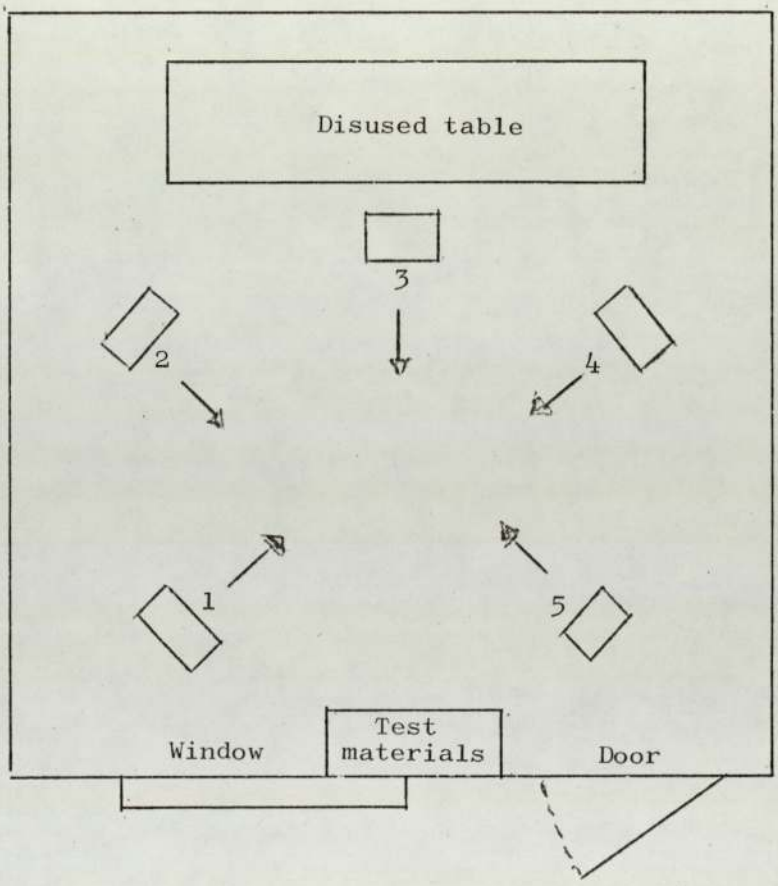


Table 25 : seating positions chosen by the boys in this sample

seating	subjects
1	10 ; 15 ; 20 ;
2	11 ; 16 ; 21 ;
3	12 ; 17 ; 22 ;
4	13 ; 18 ; 23 ;
5	14 ; 19 ; 24 ;

Table 26 : a Kruskal-Wallis analysis of seating arrangement

Game score	significance level :	highest scoring S :	lowest scoring S :
N	.10	4	2
NS	.10	5	2
NE	.05	5	3&2
PE/NE	.01	4&5	3&1
PE	.004	4&5	3&2

What is particularly disturbing is that in group testing situations the fact that some subjects are in (choose or allocate) certain seating positions, in this study seats 4 and 5, and this seems to be affecting their test scores. The significantly higher PE/NE scores underline the peculiar influences to which some testees are subjected. This type of environmental variance has been found in other studies (Mischel, 1968) and is not particular to group-testing with the Game. This does, however, lend support to the need for being aware of and defining the social psychology of the test situation (See Section II.3).

IV.3.3.5 Study-specific alterations to the Game

One of the most consistent suggestions made by people using the Game has been that the Game's blocks could be relabelled to suit particular studies. For example, the careers advisor might wish to develop block labels which concentrate on aspects of the work environment. There are, however, methodological, theoretical and logical reasons for not arbitrarally undertaking such alterations. This particular study's change in methodology can help illustrate these.

Because of the attractiveness of the Game's test materials and the interests the playing of it engenders, the use of a new methodology was considered. That is, the development of another "Game" was suggested for more specific research. For example, an occupational study would suggest the development of blocks labelled with specific job-related events, objects and necessarily individuals with whom the worker interacts. An experiment identical to this one was carried out in an industrial organisation (Section IV.1). After the Cognitive World Structure Game had been administered, the subject was presented with a second set of blocks, specific to his personal

work environment. The new blocks included names of people with whom the subject worked, constructs relevant to their obtaining job satisfaction, events specific to their work situation, and so on. The number of blocks available in this second task was not greater than fifteen, including three blank blocks. Though the subject attempted to concentrate on the new task, the resulting matrix was unsatisfactory. That is, it was unsatisfactory to the subject in terms of its representation of work specific interactions, and to the experimenter attempting to deduce information concerning the subject's world of work. Enquiries were carried out to find suitable lapse of time between the playing of the Game and the administration of the second task, and into particular environmental or personality influences which might affect the test situation. The reason for the failure of this second method is suggested below.

It has been assumed that the way a man interacts with his environment is the way he is. The Game is said to deal with the "Gestalten" of the person, i.e. it assumes that he is more than the sum of his worlds. To exprapolate a portion of the environment is understood to give a distorted, therefore less valid and less reliable, picture of the self. The way a man interacts with <u>one</u> of his worlds does not give a serious picture of the individual as a whole. The worker takes with him his whole environment and he is never completely divorced from, for example, his parental home, his own family, or his hopes for the future. Once the subject has been asked to discuss his whole self, to put the items in his environment into their correct perspective, it is psychologically difficult for him to distort one part of it. For instance, some subjects interact with their boss and job in one dimension, but with

certain workmates in another, and perhaps interact with such concepts as "promotion" and "achievement" in a third way (e.g. subject No: 3 in Section IV.1). That is, first, the job may be a financial necessity akin to Maslow's first two levels of needs. Secondly, workmates may become neighbours or friends and thus be involved in another world, i.e. home, in addition to the world of work. Finally, the possibility of promotion and achievement may be linked to a very personal (internal) world similar to a need for self-actualisation. If a researcher is interested in both measuring a subject's personality and in discussing in-depth with him one of his worlds, similar methodologies should not be used.

Therefore, there is first a simple methodological reason for not altering the Game. Subjects are unable to easily deal with only one, limited, and more important, not autonomous (dependent) portion of their environment such as their world of work. This was found to be especially difficult when attempted after the subject has been asked to interact (symbolically) with his whole environment as in playing the Game. Secondly, there is the theoretical reason that to look at only world gives a skewed view of this particular world, and by implication, its place in the real environment. The analogy of a wide-angle camera lens can be used, where distortion of slope and size occurs to both that upon which the camera is focused and to the surroundings. In addition to the problem of distortion, there is the fact that a picture of the whole environment is not being presented in tasks such as this second type of "Game". That is, despite its attractiveness, the way a man interacts with his world is not necessarily the same as his interactions in his world of "home". This argument has been elaborated in sections dealing with, for example, the con-

cept of projection (See Section II.3) and the equating of various attitudes held to the phenomenon of personality (See Section III.2). Finally, there is also a logical reason for not introducing a second Game-like measure. Most research in psychology not only assumes but deals with individual differences. With the exception of certain studies in attitudes change and differential abilities measurement, many of these studies do or should involve the measurement of personality. To not take into account the parts of the Model (Section I.3), means neglecting often pertinent sources of information and variance. There is, moreover, an increasing concern in psychology to control for differences due to environment if not personality (lateral thinking), in addition to the more study-specific variables. The study of man at work in particular must control for differences in personality (Man), place and conditions of work (Environment), as well as tasks (Job). From this it is argued that there is a need for a picture of personality in most studies. When comparing and understanding of subjects is needed, a measure such as the Game should be used. However, methodologically, its use as a measure of Man excludes the use of another measure of a similar nature. Experience suggests that an interview is a suitable complementary method of data collection (for example, see Sections IV.1 and IV.4).

IV.3.4 Conclusions

This study had three types of objectives which it attempted to meet. The first was the use of the Game in a group-testing situation. This has evident cost-effectiveness advantages and is therefore common to many psychometric tests and measures. A corollary of this, perhaps, was the possibility of re-labelling items or blocks according to the particular needs of a piece of research yet still depending on the general Game methodology.

The second objective was more functional than methodological in nature. This was simply to increase the range of populations sampled using the Game, so as to include less general ("normal") subject samples such as these "delinquent" boys. This would also increase the number of subjects sampled belonging to younger age groups (See Sections III.4 and IV.4). Thirdly, as should be expected from the applied orientation of the parent research, this was to be an organisational study. This particular assessment centre presented the opportunity of assessing the whole organisation, due to the availability of subjects and the size of the population. One hypothesis belonging to this organisational objective, was the study of the similarities and dissimilarities between the staff and the boys in terms of personality.

One of the most important results found from this case study was the very different matrix patterns produced by the boys, compared to either the staff of the results of previous pupolations sampled. With only very few exceptions, such low levels of abstraction and cognitive differentiations had not been previously encountered in research with the Game. In terms of cognitive style, many of the boys had very few categories in their patterns, usually about two, with no internal structure to them. It was assumed that this phenomenon was due to impoverished environments, especially when first developing their cognitive structure. This term impoverished environment implies that the child's sources of psychological stability, security and guidance (i.e. the effective reward of socially approved behaviour) were of low quality and not financial poverty.

A substantial proportion of the results covered the significant differences in Game scores between the boys and the

staff. Because of the additional stimuli (NI) in the case of the boys sampled, an "in-phase" approach to their comparative analysis was developed. This approach found that the introduction of the new stimuli did account for some of the difference in scores. However, it was impossible to estimate the true effect, both in mathematical and psychological terms, of this increase in I (individual) blocks on Game scores. It seems that the number of categories used, i.e. cognitive differentiation, is a more important source of variance between the two samples. The case of subject No: 6 (staff) was especially noted for the similarity of scores and pattern with the boys. An in-depth analysis of both his present circumstances and his background, though unwarranted in this type of case study, may find great similarity with the boys in terms of his background as was found in his cognitive world interaction patterns. In brief, the difference between the boys and the staff was probably due to their different approach to playing the Game, i.e. expressing their personality.

It was emphasized that a linear or bi-polar interpretation of Game scores is not intrinsic to the Game's theoretical background. In fact this interpretation is due more to the mathematical foundations of its analysis. It was implied that a non-linear interpretation of the data, as attempted in the pattern analysis found in Section IV.4, is probably more suitable and this is especially so for certain populations such as groups of boys like these.

In a section whose analysis was based on the Game scores, the P/N score was again linked to the concept of leadership (See Sections IV.1 and IV.4.2). It was also suggested that radical scores on this variable could also be sympathetic of interactive problems such as in delinquency or, as suggested

in Section IV.4.4, non-clinical forms of paranoia and schizophrenia. By implication this score could be used to assess the treatment of certain "mental" disorders, such as behaviour modification sessions and varied forms of psychotherapy and counselling. The other Game scores contributed to the analysis of phenomenon such as certain sources of stress, the sympathetic internalisation of some of the personality patterns of others as a possible source of empathy with and understanding of them, and that the satisfactoriness of teams of social workers might depend on their atypical (range of) personalities.

Finally, two so-called minor points were made concerning methodology. First, though the age and type of subjects sampled were of special interest to the general development of experience with the Game, the alterations in methodology introduced in this study rendered the results strictly non-comparable to other populations. In addition, a discussion concerning such alterations in stimuli suggested that in most cases a methodology based on the Cognitive World Structure Game should not be used, unless information concerning a subject's personality was unnecessary.

IV.4 A sample of clients for occupational counselling

IV.4.1 The introduction

So far in this thesis the Cognitive World Structure Game has been discussed in mainly nomothetic psychological terms. That is, the quantitative side of occupational research, which deals with population norms and differences, has been emphasized. The discussion of the methodology in general and the organisational studies in particular has however uncovered a second need, that of conducting ideographic research with the Game. Thus, there is a second facet to the Game which must be

explored. This is the value of the Game as a tool in the study of the qualitative aspect of occupational psychological research.

In the last two and half years, approximately one thousand subjects have been given the Game. In most cases, care was taken to restrict their discussion of their Game results to very general explanatory terms. This was usually accomplished with some difficulty due to a number of reasons. First, there is a typical willingness on the part of most subjects to speak about themselves. Secondly, this may often be the subject's only meeting with a psychologist and he therefore tends to seek advice about himself and his environment. Thirdly, the majority of subjects acknowledged the power of the Game to promote introspection or self-analysis. There are also ethical principles which bind the research-psychologist. For example, in addition to protecting the rights of the participants these include the duty of the experimenter "to explain all other aspects of the research about which the participant enquires" (C.P.A., 1973). Finally there is the unwritten obligation to the science which transcends any short-term research objectives such as cost-effectiveness and time constraints. That is, there is an obligation for a researcher to make available to his peers knowledge which all advance the science and benefit society. It is arguable whether or not the field of counselling has been stagnant in the past decade or so. However, despite the state of this area of applied psychology, it has been implied in Part II and Part III of this thesis that the Game can contribute theoretically and technologically to this field of counselling.

What is counselling and when is a situation to be considered a counselling situation? Bordin (1955) contends that

therapeutic theory is one application of personality. "Counselling and psychotherapy" he says "are terms which have been used to apply interactions where one person, referred to as the counsellor or therapist, has taken responsibility for making his role in the interaction process contribute to the other's personality development". Patterson, perhaps the Maddi of counselling and psychotherapy, emphasizes that the distinction between counselling and psychotherapy is quantitative rather than qualitative. Such areas as educational, remedial, marriage and religious counselling may be subsumed under the unbrella of psychological counselling. The goal of counselling we are told, "is not (the) solution of the particular problem, but the personality development of the client through removal of underlying obstacles to psychological growth" (Patterson, 1966). For our purposes the range of the definition of a counselling situation is not only meant to cover the therapeutic side dealing with disturbed individuals, but also the more casual, less obvious side of individual interactions. Whenever a person (E) interacts over a period of time or in a particular situation with someone who attributes to him a status equated with knowledge and this knowledge is used to promote the personal growth of this person, the situation is considered to be one of counselling. For example, a psychologist in a laboratory study who discusses in some depth certain phenomenon with a subject who then uses this knowledge to channel his personal development, the situation is one of counselling. This is a wider though still complementary definition of counselling to that given by Patterson (1966).

The following sections will investigate some ipsative aspects of the Game. Most important a section will look at a sample of clients for occupational counselling and how the Game

can help the counsellor better understand and therefore contribute to his client's personal growth. A related section will look at the use of a second source of information about the client, the California Psychological Inventory (Gough, 1956), and its complementary relationship with the Game, However, two other problems will be considered first.

This thesis has emphasized that the world of work is more complex than that implied by the simple model of "Economic Man" (Schein, 1965). Indeed it has been implied that each organisation may be regarded as a small community with all the complex interactions between its members and with their environment. Two areas of particular interest to organisational psychologists are those of leadership and teams. The following two sections will look at these areas, describe some of the problems, and especially look at how the Game might contribute to their understanding.

IV.4.2 Leadership

Since the turn of the century, interest in the concept of leadership has grown steadily. World War II naturally increased this interest, The two principle approaches to the study of leadership are known as the trait approach, and the behavioural and situational approach. These reflect the historian's dilemma of whether history made the man (leader) or whether the man made history. Certainly there are advantages and disadvantages to both approaches and the truth probably resides somewhere in the middle. Most of the work on leadership has been done in America but a few notable studies have originated in the U.K. Eysenck (1960), for example, has discussed differences in personality between leaders and non-leaders. He used the stability/neuroticism and extroversion/introversion dimensions to study successful businessmen and

business students. Though he uncovered some stimulating results, the trait approach generally has not been very successful. There are a number of reasons for this, such as the difficulty in defining and measuring traits and the possibility that different combinations of traits might be important in different leadership situations. It is for these reasons that many researchers are turning towards the behavioural and situational approaches. These consider the interaction with external factors, such as subordinates and task requirements, when studying leadership. Satisfactoriness of leaders cannot be distinguished without also referring to the circumstances in which they function. Investigators such as Blake (1956, 1961) and Likert (1956, 1958 and 1961) have focused on a leader's interaction with his subordinates in terms similar to the well-known "tough and tender-minded" bi-polar trait. Blake talks about "concern for production" and "concern for people". Meanwhile, Likert calls these "task-centred" and "employee-centred". Certainly the most important research now being carried out in this field is influenced by Fiedler (e.g., 1973). His focus is on a leader's style of interaction. He relates the tough/tender behavioural characteristics to three situational characteristics, i.e. task-structure, power invested in the leader, and leader-subordinate relations. The wide variety of work-groups studied were distinguished as to those in which the task was loosely or tightly structured, those in which the leader was weak or strong in terms of invested power, and finally leader-subordinate relations which were either good or bad. Fiedler and his colleagues have been contributed greatly to the study of leadership and cannot be neglected.

There are a large number of definitions of leadership. For example, Fiedler (1965) deifned it as "a personal relation-

ship in which one person directs, co-ordinates and supervises others in the performance of a common task". The connotation that the leader is a type of guide to that group to which he belongs, is common to most definitions. Here the leader is consciously acknowledged as the most influential person in his group. The study in-depth of two organisations (See Sections IV.1 and IV.3) proposed a new definition of leadership. The new denotative concept was to restrict the definition of a leader to that of a key person in the group. Table 27 compares this to two more common definitions of leadership. This definition equates the leader to the key-stone in a Roman arch. His removal would change the fundamental character of the group and this would not only be felt in group's attitudes but the group's objectives and methods too. The removal of subject No: 1 in Section IV.1 would, it is contended, change the organisation to the extent that even members who have no contact with him would feel the difference in their job. For example, the tasks and attitudes of even a programmer would be altered. Similarly, if subject No: 1 of Section IV.3 was removed, the "home" would change. Because of the different sizes of these two organisations, the time and amount of change involved might be different. What is important is that this change would be fundamental in both organisations. The difference advocated in the definition of leadership is one of degree. Leadership here is dealing with dominance rather than the milder forms of influence and guidance. Experience suggests that the Cognitive World Structure Game can differentiate (predict) in terms of personality make-up, the persons with a potential for leadership such as this.

The two above examples have been discussed in their respective sections. The extent and depth of the leader's influ-

TABLE 27 : a taxonomy of leadership

descriptions	examples
1) informal gathering where one individual emits and receives more (positive) communcation	• one member of a committee's workshop or from a particular table at a dinner engagement may play such a role. The other members are usually left unchanged and the next workshop he leads may be very different in purpose and means.
2) the head of the group consciously guides and influences the members towards the group's purpose	• this may be the head of a department or an elected leader of a county council. He may slowly introduce changes but his personality or character is not equivalent to that of the group's.
3) the man is a key person in the group. His removal would radically alter the objectives and approaches of this group	• two examples have already been given and will be discussed in this section. These two individuals are not merely influencing the group's objectives and approaches but indeed directing these by their personality and charisma. The group's purpose is the leader's purpose.

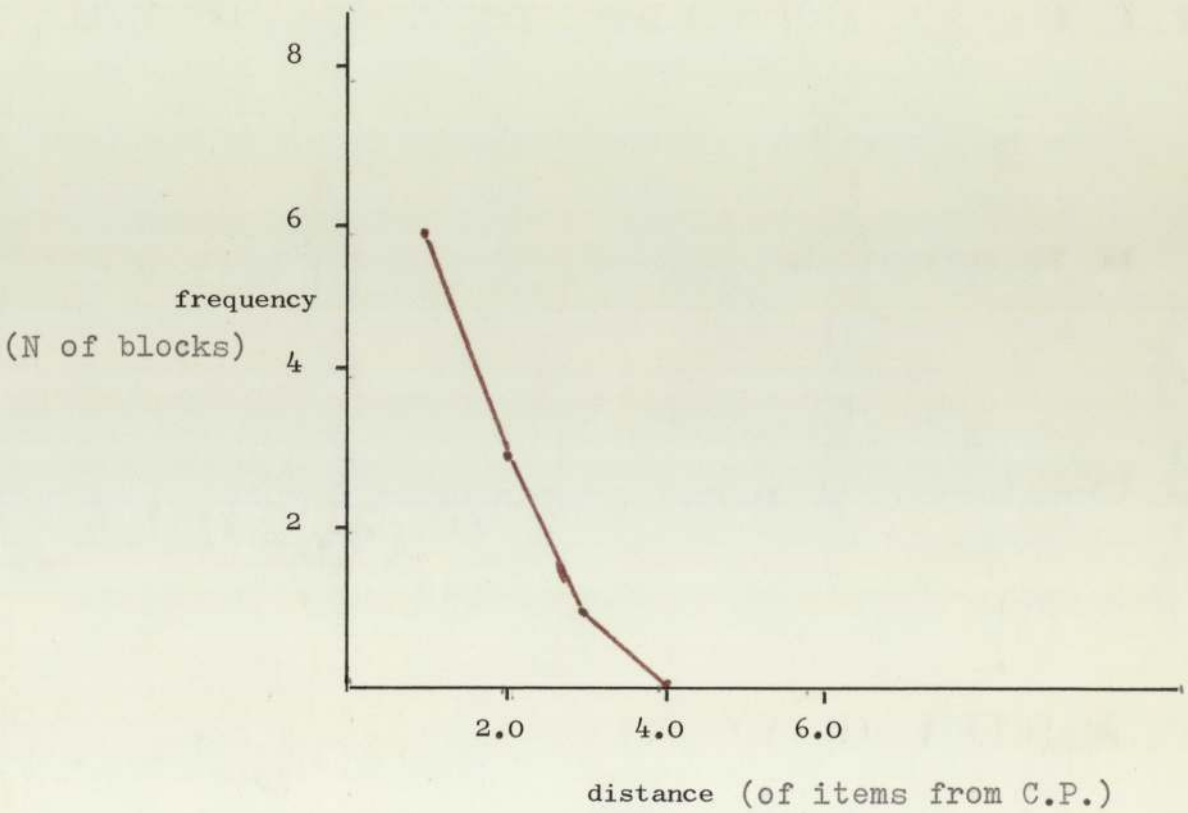
ence was evident in both organisations tested. In brief, the Game results found that the distances of the blocks from the core, the valences attributed to the central blocks and the patterns used were different for these Ss. In particular the patterns were of a tight, cluster nature and thus the valence attributed to the items were higher than in other patterns. Another way to differentiate these Ss from others is to plot a frequency distribution of the distance of the items from the calculated pivot. Figure 26 is an example of such a distribution.

A sample of two Ss is too small a base from which to argue for a new definition of leadership. Moreover we cannot deny the possible usefulness of Fiedler's approach, although no systematic study has yet irrefutably predicted the type and satisfactoriness of the leader to emerge, the circumstances which would create this leader, nor whether certain leaders would be satisfactory despite circumstances. In brief, all the Game has found is, in an "a posteriori" analysis, a great resemblance between two subjects who already occupy a position of leadership as defined above. The rather specific type of pattern produced and its very infrequent occurrence throughout the range of subjects tested suggests the importance of this concept. That is, the chance of reproducing similar Game patterns to those two subjects and the fact that the only two subjects were observed to be key determinants of the characteristics of their respective organisations, is certainly noteworthy and probably "significant".

The type of leadership studied by previous researchers was not limited to the key-man definition used here. The Game results do not contradict the idea that certain men may be task-oriented or people-oriented, or indeed that certain situ-

III.b.4.2 Leadership (continued)

FIGURE III.206 : the distribution of distance scores: an indication of leadership potential



ations need one type or the other. It is hypothesized that certain individuals whose personality is similar to the two above subjects, when in a position of power, will perform satisfactorily as leaders and will determine to a large extent the characteristics of the organisation which they lead. It is the interaction of the environment with the man which creates the form of leadership (history) and the type of personality involved (man). This leadership hypothesis will be the subject of further research within an English police department.* Pilot studies using both Fiedler's L.P.C. (least-preferred-colleague) technique and the Game, so far have not proved very informative. That is, based on a limited sample the L.P.C. technique has not revealed any major differences due to personality between task-oriented and people-oriented leaders. Contrary to the new definition based on the Game results, the L.P.C. technique does not attempt to predict the emergency of a leader. It is rather concerned with the predicting of the satisfactoriness of an established leader, based on knowledge of his orientation (task or people) and the type of environment in which he will function.** That is, it is important that we should be able to predict who will make a "good" leader, and not just accept that a given social/organisational position, is equivalent to being a leader (Moreno, 1934).

IV.4.3 Teams

IV.4.3.1 Introduction

An area rather close to that of leadership is the team. Section IV.2 and Section IV.3 considered very briefly groups

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*D. Sharp (A.P.D.), Aston University.

** Thus future leadership studies may be more successful if they concentrate on critical incident and observational techniques rather than simply on an interview technique, as does Fiedler's work.

of people working and living together. A connotation of the word team is that two or more people are rather closely linked in some way. This team may have been formed as a matter of choice, as in friendship or marriage, or it may have been imposed upon the members, as in the case of work-team or a sibling relationship. Unfortunately, this section (teams), and the latter section dealing with leadership, were not done from "a priori" experimental designs, but were suggested from the results of studied included in the thesis. This absence of a hypothetico-deductive framework and the samples size considered makes statistical prediction impossible. The analysis of the data nevertheless revealed some stimulating ideas, which were included here.

IV.4.3.2 Teams by choice: (a) Friends

It is understood that for two people to be called "friends" they must get along well with each other. Two men fighting in a street are not generally considered to be friends. In other words, friendship suggests compatability. But what does this compatability imply in terms of personality? Two alternative assumptions are suggested here. First, many would contend that friends must be similar to each other, particularly in terms of personality. Most people have known friends who were physically dissimilar and the world of entertainment has used popular concept of a team. However, the advocates of the similarity-theory would argue that it is their personalities (attitudes) which are similar. On the other hand, compatability may be understood by some to mean complementary. This second explanation might also use show-business analogues. The physical dissimilarity would be seen to underline the more important differences in personality. The task-oriented leader and the people-oriented deputy, is an example of the complementary-theory of teams and friend-

ships (See Section IV.4.1).

Seven pairs of friends were looked at here (Table 28), and the first four pairs had been friends for a number of years. More important perhaps, their friendship originated in school. The social contact available in schools is found in an amount and form which is rarely duplicated elsewhere in society. In a school there are a great number of alternative friends one may choose from, despite the idea of classes and grades. Few organisations outside of school permit social contact to last that length of time. In many cases, students are together for six or more hours a day, for eight months of the year, and sometimes for quite a few years. On the other hand, the last three teams or pairs were rather arbitrally ascribed the label of friends. The first pair of these (No: 5) had worked briefly together for the same organisation and since then had met approximately once a year on business. However they did loosely call themselves the term friend, though certainly not "best friend". The second pair (No: 6) had known each other for about three years. They worked together and recently had tried some team-teaching. However only occasionally did they meet socially outside of work. They were perhaps most closely associated because of their common fears and interests at work, than because of a complementary nature. The third team is one of a temporary relationship of supervisor and subordinate. The relationship existed for only a few months during which one of the two was a trainee in the company. There were signs indicating that the friendship was no more than a meeting of points of view in their work and it excluded social meetings outside of work. The terms "friend" did not arise in either of the post-Game interviews concerning their relationships.

Table 28 represents the differences in Game scores for

Teams by choice : (a) friends (continued)

TABLE 28 : differences in Game scores for pairs of friends

scores	pairs of friends: 1	2	3	4	5	6	7	
P/N	0.4	1.2	0.5	0.5	2.0	3.0	1.6	≥ 2.0
P	22	62	12	14	0	102	68	≥ 40
PI	8	20	5	10	9	6	0	≥ 20
PO	4	15	3	3	6	30	20	≥ 20
PS	10	25	9	0	1	39	32	≥ 20
PE	0	2	5	1	4	27	16	≥ 20
N	8	10	13	7	20	1	2	≥ 10
NI	1	3	0	6	6	4	0	≥ 5
NO	2	3	1	0	4	0	0	≥ 5
NS	5	4	8	0	7	1	1	≥ 5
NE	0	0	4	1	6	1	1	≥ 5
PI/NI	1.1	1.3	0.7	0.4	2.9	1.5	0.0	≥ 2.0
PO/NO	0.1	0.9	0.3	0.8	0.9	3.2	2.3	≥ 2.0
PS/NS	0.7	1.6	1.4	0.0	4.1	3.7	3.1	≥ 2.0
PE/NE	0.0	0.6	1.4	1.0	2.7	3.8	1.5	≥ 2.0

each subject's calculated pivot:

S No: 1	21	27	61	2	62	64	29
S No: 2	2	7	1	4	5	ø	27

total number of "significantly" different scores per pair:

1	4	2	1	8	8	5

each pair of friends. The arbitrary cut-off points for differences in scores, listed at the right of the Table, suggests limits of "significance" for these differences. For example, the P/N scores ranged between 0.00 and 7.00, although very few scores were above 6.00 (See Section III.4). Thus a difference in P/N scores which is greater than 2.0 should not be important. Similarly, there are a maximum of 46 blocks, thirteen I blocks, and nine or so for each of the other categories (Appendix A) suggesting cut-off points of N = 10; NI etc. = 5. The P scores cut-off points were more difficult to determine because of the very wide range of possible scores. Here a cut-off point of 20 scores is perhaps too low.

There seems to be two distinct types of friendship (Table 28), rather similar to the two theoretical alternatives presented above. It is, however, unusual that the two pairs which have the most important differences, i.e. Nos: 5 and 6, are of three pairs least appropriately labelled as "friends". Of the two pairs with more moderate differences (Nos: 2 and 7) approximately one third of their scores were dissimilar. Very little was known of the second pair (No: 2, i.e. subjects Nos: 38 and 39). They participated in an experiment discussed in Section III.5, and their "friendship" was only mentioned by one of the pair after the experimental session. The remaining three pairs had very little difference in their Game scores. Only pair No: 2 and pair No: 7 had come to the testing sessions together. Being tested simultaneously in different laboratories, they could not have had prior knowledge of the test. Therefore disregarding telepathetic explanations, similarity of environments and especially interactions with these environments implied in the similarity theory seems an adequate explanation. Finally, the patterns for all seven pairs were very different

(individual), as was the content of each structure. The obvious conclusion would be to say that deep and lasting friendships are probably best explained by the similarity theory, whilst the more expedient type friendships are best explained by the complementary theory. Naturally, future research should explore the area more thoroughly and increase the size of teams sampled.

Teams by choice: (b) Marriages

Another type of relationship that should be looked at, involved analysing the scores of a sample of married couples. It may be argued by some that marriage is one extreme form of friendship. However, marriage certainly involves more than the sexual act and the creating of a family. For instance, many married people are attracted sexually to individuals other than their marriage partner, but only a few wish to be involved with these other people to the same degree as they are with their present partner. Only two married couples were tested using the Game. Such a sample size is not large enough to permit to be made here.

Table 29 presents the scores for each individual in the pair, and the differences recorded within the pair. The second part of this Table is therefore comparable to the results found in Table 28. If there is a similarity between friendship and marriage, this was not expected to be reflected in the patterns produced by the pairs. This hypothesis was substantiated (for example, see Section IV.3, subjects Nos: 1 and 2). Two parts of Table 29 are of particular interest. The first concerns the distribution of the differences in scores within each couple. This can be emphasized by drawing a rectangle around figures showing some consistency across categories of Game scores. (i.e. P/N; P; and N), for particular couple. For example, the differences in P/N scores is rather constant for each couple.

TABLE 29 : married couples and their differences in Game scores

	Game scores:				Differences within the pairs:	
Pair No:	1		2			
Sex :	M	F	M	F	1	2
P/N	2.9	4.1	1.5	0.8	1.2	0.7
P	56	126	54	14	70	40
PI	13	38	28	5	25	23
PO	17	38	14	4	21	10
PS	16	36	9	5	20	4
PE	10	14	3	0	4	3
N	19	31	36	17	12	19
NI	4	9	13	2	5	11
NO	5	9	9	7	4	2
NS	6	8	10	8	2	2
NE	4	5	9	0	1	9
PI/NI	3.3	4.2	2.2	2.5	0.9	0.3
PO/NO	3.4	4.2	1.6	0.6	0.8	1.0
PS/NS	2.7	4.5	0.9	0.6	1.8	0.3
PE/NE	2.5	2.8	0.3	0.0	0.3	0.3

The mean differences for these P/N scores are respectively, 0.5 and 1.0 for couples 1 and 2. It would seem that the partners have adapted their behaviour and indeed cognitive structure to each other, such as in their concern for people. (PI). This, in a limited qay could suggest that personality is dynamic, as argued by Gough (1956). The alternative would be that an individual chooses a partner who is similar to himself. This implies a more complex process whereby perceptual and analytical abilities are vital to the satisfactoriness of the marital decision, and not influenced by subsequent change in their environments.

The second set of facts of importance involves the P/N scores. In Table 29 it may be noted that none of the P/N scores are "significantly" different between the married partners. For instance, the amount of valence attributed to people and objects is similar to both parties. That is, the couples are attentive to people and materialistic in much the same way. This effect may be reinforced by the similarity between items in a couples' environment. For example, a number of individuals and objects belong to both their worlds. It is important not to overgeneralise this point. The members of their respective parental family, for instance, are not identical nor do they automatically receive the same degree of valence. Another variable, in this case a sample-specific one, contributed to the similarity found within the couples' scores. The first couple had been married for quite a long time and they were both social workers. The second couple were much younger and were both school teachers. The occupation which they share with their partners is probably an important factor influencing the similarity of their scores (See Section III.4). This is not an unusual situation in that one's occupation may be an important determinant of

the choice of marital partner. A corollary of this, of particular relevance to these two couples, is that the similarity of the PS/NS scores might be linked to the type and amount of education the individuals have had (Section III.2). The problem of whether the similarity of scores within couples is due to the dynamism of personality or to the sophistication in marital choice has not been answered. Despite the popular concept of "people growing closer together" the difference in average age of the two couples does not lend much support to this dynamic view of personality. The idea of growing closer together still seems quite attractive when defining personality in social psychological and environmental terms.

IV.4.3.3 Obligatory teams: (a) Work teams

The following types of teams have to some extent been imposed upon their members. First, teams were allocated to the category called "work teams".

A manager and his personal secretary, a boss and his subordinate, or two peers working together, are the kind of pairs to be found here. Table 30 summarizes the differences between the scores of the members of each pair. Two of these pairs were also found in Table 28. The data extracted from these two teams created by choice, in addition to suggesting the reclassification of the two pairs just mentioned, have suggested the need for alternative explanations for teamanship. (a) the similarity theory seemed to best explain the formation of dyad-teams where little difference in scores were expected. Meanwhile (b) if the complementary theory had been correct, very high differences in the members Game scores would have been expected. These two theories were in fact found to oversimplify the situation. The only consistent finding seems to be that work-teams have little difference in their N scores,

Obligatory teams : (a) Work teams (continued)

TABLE 30 : Differences between the scores of the members of five work teams

Game scores:	Teams: 1	2	3	4	5
P/N	1.4	0.1	2.9	1.6	3.0
P	18	0	6	68	102
PI	11	1	3	0	6
PO	3	2	0	20	30
PS	11	4	13	32	39
PE	7	1	10	16	27
N	7	2	23	2	2
NI	2	1	7	0	4
NO	1	0	7	0	0
NS	1	0	2	1	1
NE	3	1	7	1	1
PI/NI	1.8	0.2	3.1	0	1.5
PO/NO	0.7	0.3	4.4	2.3	3.2
PS/NS	1.7	0.6	3.0	3.1	3.7
PE/NE	0.5	0.3	0.4	1.5	3.8

note: if pairs are similar, differences = 0
if pairs are complementary, differences = high
if pairs have accepted each other on a number of levels, differences = consistent

suggesting similar types of interest.

The first team was composed of a department head and his secretary. The difference in their sex accounts for the variation in the NE scores and to some degree its complement, the PE score. The union is not a very close one between these two members, as was emphasized by both members independently (Section IV.1). The scope of their interests based on the N scores does have some similarity. However, neither member reported the team as a possible source of job satisfaction or satisfactoriness. Their relationship was observed (pre and post testing) to be detached. It was neither complementary nor antagonistic. For these reasons, no similarities were expected in their Games. It is important that future research should develop a taxonomy of teams, and this may well be similar to some of Fiedler's ideas (Section IV.4.2). Differentiation of teams based on concepts of satisfactory performance, satisfaction of its members, friendship, etc., seems inevitable.

The second team's members performance was very satisfactory. Little stress was ever produced because of its existence, and camaraderie and respect had been achieved. In addition to the great similarity in their scores (See Table 30), the similarity between their patterns was striking (See Section IV.1). What is also important us that the members dealt with each other as equals, a position facilitated perhaps because they were both women in a male-dominated world. This mutual equality had not been achieved in the other teams with the possible exception of the fifth pair. Of these five teams only this one found both its members emphasizing the equality and teamanship which they shared. Like team No. 1, this team was also composed of a department's head and her personal secretary.

The third team here was also quite different. It was com-

posed of a top executive and, the department head belonging to the second team (pair No. 2)!* Interestingly it is this team's scores which show the greatest amount of difference or incongruity. The explanation must lie in the difference in status between its members, as well as their difference in sex. The director believes he enjoys a Platonic relationship with his department head, respecting and seeking her advice on many occasions. Despite his egalitarian nature, she quite probably retains in their interactions, a degree of respect. The satisfactoriness and indeed satisfaction of both its members would suggest a complementary model explanation.

The remaining two teams were introduced in the previous section (IV.4.2). The first of these two pairs involved two social workers who were interested in caring for people and understandably interested in academic psychology. This helps to explain the identical PI, NI and PI/NI scores. It would seem from the difference in other scores, that these two members would never enjoy the degree of teamanship that the second pair does. The fifth pair was composed of the teachers who share an office and their classes (team-teaching). Their difference in scores was both great and consistent. This has an obvious relation to the complementary theory of teamanship (above).

The type of the sampling and the number of apirs observed limits any conclusions that could be made. Nevertheless, the results suggest that work-teams need not be made up of either similar or complementary cognitive world structures. In terms of Table 29 there are three types of results that are of interest. (1): If the similarity theory is correct we would expect

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*Note one S is being analysed twice.

little or no difference in Game scores within a work-pair. (2): If the complementary theory is a better explanation we would expect the differences across scores to be very high. (3): If the results are consistent it would suggest that the members of the team have accepted each other on many levels. The data lends slightly more support to a similarity explanation. For instance the second team, which was the most successful of these work-teams showed very little difference in Game scores (Table 29) and general matrix patterns (See Section IV. 1). Future research into the structure underlying of the N scores a promising step. This is suggested by the consistently low differences in N scores found across the five teams.

Obligatory teams: (b) Slibling pairs

Table 30 presents the difference in Game scores for three pairs of siblings. The first pair involved two young adults discussed in Section IV.4.4 (See subjects Nos. 41 and 6). They were brother and sister, and belonged to a family with a history of psychological disturbances. For example, the mother and another sister suffered from mental instability (psychoses). Though of a more limited nature, both the subjects were prone to emotional upsets. The second pair of siblings were male monozygotic twins, discussed in Sections III.2 and IV.4.4. They were both fifth-form students but were not allocated to the same class in school. Their family background was understood to be normal and no further information was solicited. The third pair were brother and sister. They too have been discussed in Section IV.4.4 (See subjects Nos. 3 and 4). Their family background, like the twins, was understood from the post-Game interview to be quite normal. The data in Table 30 concerning these three pairs of siblings does not substantiate the use of either a similarity or a complementary model, as an explanation

of"teamanship". There was no indication in the background of the subjects nor in their test behaviour (including the post-Game interview) that either type of pair got along better together. For instance, pair No. 2 were similar in terms of their Game scores while pair No. 3 could be seen to conform to the complementary model of teamanship, nevertheless both pairs of sibling showed a high degree of mutual concern. (See Section IV.4.4).

What do these results mean in terms of an environmental definition of Man? Allport had stressed the overwhelming importance of the present, in terms of personality development (Bischof, 1970). This was a significant step away from the Freudian and neo-psychoanalytical theory that childhood and heredit were the prime sources of explanation for personality and behaviour. The environmental definition goes even further, when it assumes that every individual belongs to many worlds and that the cognitive structure includes the influences from each of these. That is, besides the parental family, subjects have been influences by their contacts in school, their peers, their occupational decisions, etc. Each person is a product of multiple interactions with individuals, objects and events of many types. Family background and genetics are just a few of the many influences on the formation of one's cognitive world structure. For example, genetic models of the formation of personality are believed to be a combination of influences from the medical and scientific technology, and Freudian concepts of libido and super-ego. They impose for example, upon the DNA molecule, the responsibility of millions of years of cultural and physiological evolution in addition to the psysionomy and personality of the parents. It seems unfounded and unnecessary to attribute to such a microscopic entity the duty

to transmit high-order psychological information in addition to any physiological characteristics. A psycho-genetic theory of personality would demand identical cognitive world structure from these subject-pairs, especially the monozygotic twins (pair No. 2). The similarity of the Game scores found in Table 30 do not favour such a psycho-genetic theory. An environmental model's explanation of the development of personality in terms of unique interactions with an individual's cognitive worlds seems more appropriate. Here, each man is the way he interacts with his environment. That is, the environment is differentially perceived an acted upon by the individual producint a unique personality. Teams are made up of these "unique individuals" and are themselves unique. Nevertheless, future research may indeed find general trends for their formation, based on the similarity and complementary models.

IV.4.4 Experience with the Cognitive World Structure Game: a sample of subjects for occupational counselling

A number of subjects have helped to build a bank of experience from which more valid deductions may be made with the Game in a counselling-type session (Section IV.4.1). The following are a few of the subjects who contributed to this experience by playing the Game. The purpose here is to attempt to give a view of the breadth of this experience with the Cognitive World Structure Game, and therefore may sometimes suffer in terms of its depth. The information collected in all these interviews ranged from simple biographical to introspective data. This is in part due to the power of the Game and the willingness of most subjects to discuss themselves and their environment. Finally, it may be necessary for the reader to refer rather frequently to both the appropriate matrices and the list of items in Appendix A.

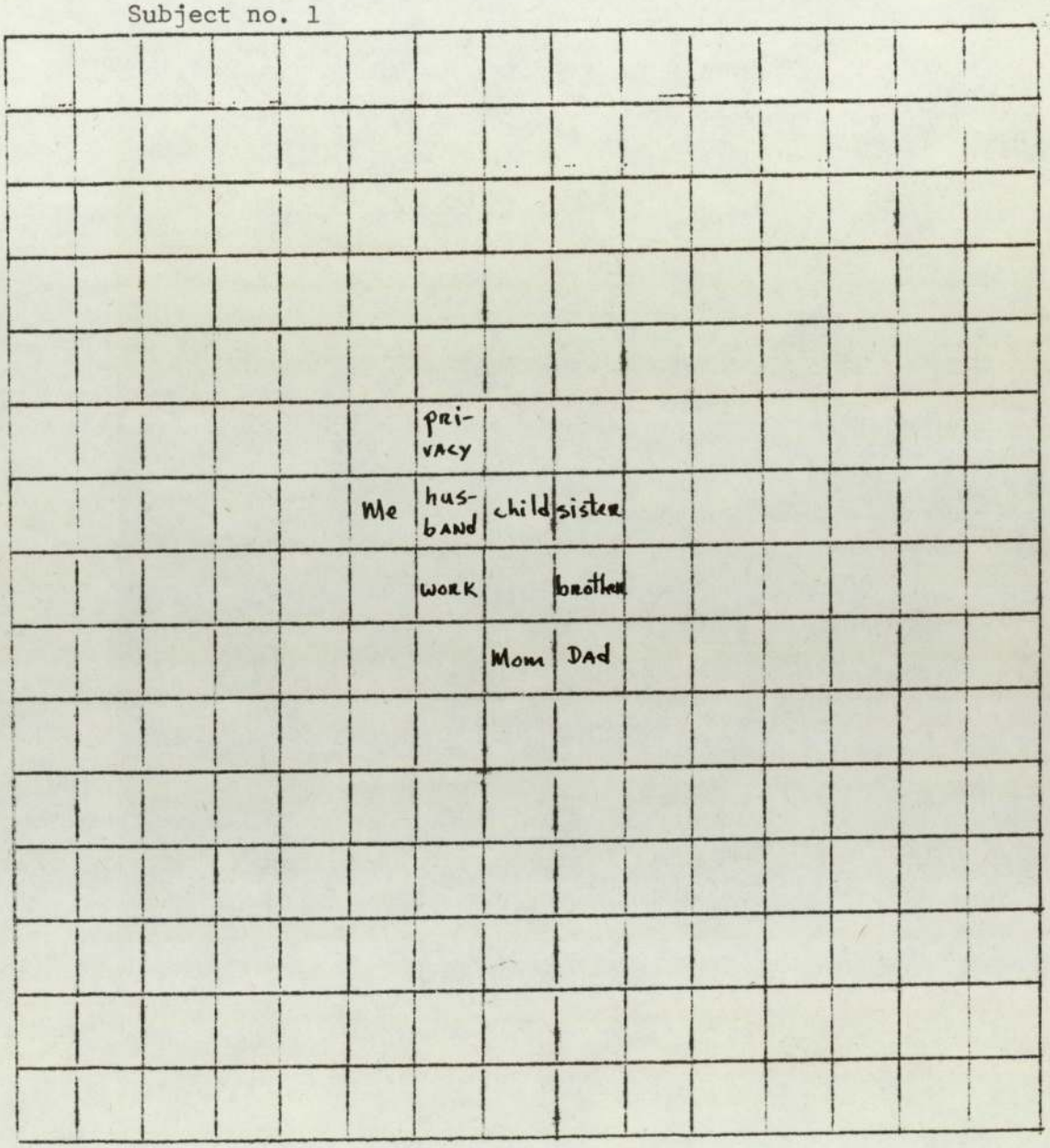
Subject No. 1

This first subject was a young female adult in her mid-twenties. (Diagram 28). She was very feminine, attractive, neat and well balanced emotionally. At the time of testing she had been married just under four years. She was pregnant but had no previous children. Her marriage was a very happy and adult one. Both she and her husband had very high intellectual quotients and degree of maturity. She was now established career-wise in an occupation which did not conflict with her child rearing, her marital life, and the termination of her studies.

The cognitive world structure is tight, simple and individual-dominated. The spacing in the middle renders it more flexible, less rigid than usual clusters. I^{13} (Me) is not at the centre of her matrix nor is it the calculated pivot, but it is still very central. In fact the calculated pivot is "the husband" (I^{10}), around which we find I^{5} (child), I^{13}, as well as the important comcepts of work. (S^{47}) and privacy (S^{48}). In her real-life, these items are similarly intertwined. Her use of verbal concepts and her seeing no necessity to elaborate these by adding blocks, suggests that she preferred intellectual verbal structures. The subject was also very close to her sister (I^{3}). This latter was younger and received both guidance and affection in the subject's home. The sister spent most of her free time with the couple. The brother (I^{4}) was also close in terms of affection. Being male he tended to have less real contact with this family unit. The subject's parents were only slightly more peripheral in terms of affection and amount of contact. This is indeed a simple highly interrelated well-structured and problem-free world. This interpretation was collaborated by interviews with friends,

DIAGRAM 28

Subject no. 1



acquaintances, peers and members of her family.

Subject No. 2

This subject is typical in terms of the patterns produced of the many secretaries teated (Tivendell, 1973). She was an efficient secretary having high status, a fair amount of responsibility, and she was popular with her peers and workmates. She was in her late twenties, unmarried and slightly uneasy at the lowering probability of this occurring. Her "regular boyfriend" was niether dominant in terms of his manner nor as an object of her affections. There were few prospects of his becoming a marriage partner, explaining the half-block relationship between I^{13} (Me) and I^{10} (husband/wife). The structure (Diagram 29) is simple and unidimensional. Increased distance from the I^{13} block correlates with a decrease in importance. The last series of social-contract blocks (bottom right of the matrix) were originally placed behind O^{26} (television) as if in an extra (16th) column to the matrix. The vertical blocks were attributed equal weightings within the structure. It can be seen that individuals were more important to her than social constructs. The individuals in her life in terms of psychological valence range from the place accorded I^{10}, i.e. her fiance, to work-associated people. Next a number of object blocks were found to be very important. This seems to follow the stereotype of unmarried young ladies from working-class backgrounds who often follow a similar career pattern. They are neat, proud of their appearance, and not occupationally ambitious.

Subject No. 3

This was a young man in his mid-twenties. He had been recently married. He was well-educated with good career prospects, above average intelligence but not extraordinarily creative. The blocks in this matrix are spaced, which should

DIAGRAM .29

	His DEATH	MOM	WORK					Hobby	NEW FRIEND					
ME	Husband	DAD	BEST FRIEND	WORK-MATES	CLOTHES	OWN MONEY	UN-EMPLOYED	Books	FAMILY TROUBLE	DEATH	SAVINGS	LAW	NEIGHBOUR	T.V.
			Boss			PRIVACY		Music						
								CAR						
														Politics
														MARRIAGE
														RACE
														RELIGION

be a sign of flexibility (Diagram 30). However, the pattern is very symmetrical and the distances between blocks very regular. This type of pattern is therefore unlike the patterns produced by younger more flexible subjects. According to peers and close friends, this subject was rather rigid and conservative in his ideas. At first glance the pattern did not seem support this but a closer analysis showed that the blocks respect a grid superimposed diagonally to the first. The structure was a fan-shaped with negative valences attributed to the blocks below the I^{10}, I^{13} pair. Importance decreased with distance from these anchor points.

Subject No. 4

This was a seventeen year old mulatto girl. She was planning to interrupt her schooling upon graduation that year. The interview disclosed a high degree of uncertainty in her self-concept. This is not unusual for young people at this stage in life. She was nearing adulthood and would soon contend with all its responsibilities and decisions. In addition, a decision to end her schooling raised problems of occupational decision and possible independence from her family. Conflicts here may be caused by the attraction of various poles; the transition from her school to her work environment; the transition from an adolescent to an adult; the move from a family-environment which may often foster dependency and individual (self-concept) immaturity, to that of a complex and hostile world of independent social interactions. In addition, this subject had to contend with problems rather unique to her worlds. The gap between her father and mother (Diagram 31) was due to the differences in their colour (race). Her father and brother (I^1 and I^4) were of the same race. Meanwhile her mother and her mother's friend (I^2 and I^7) were of a different

DIAGRAM 30

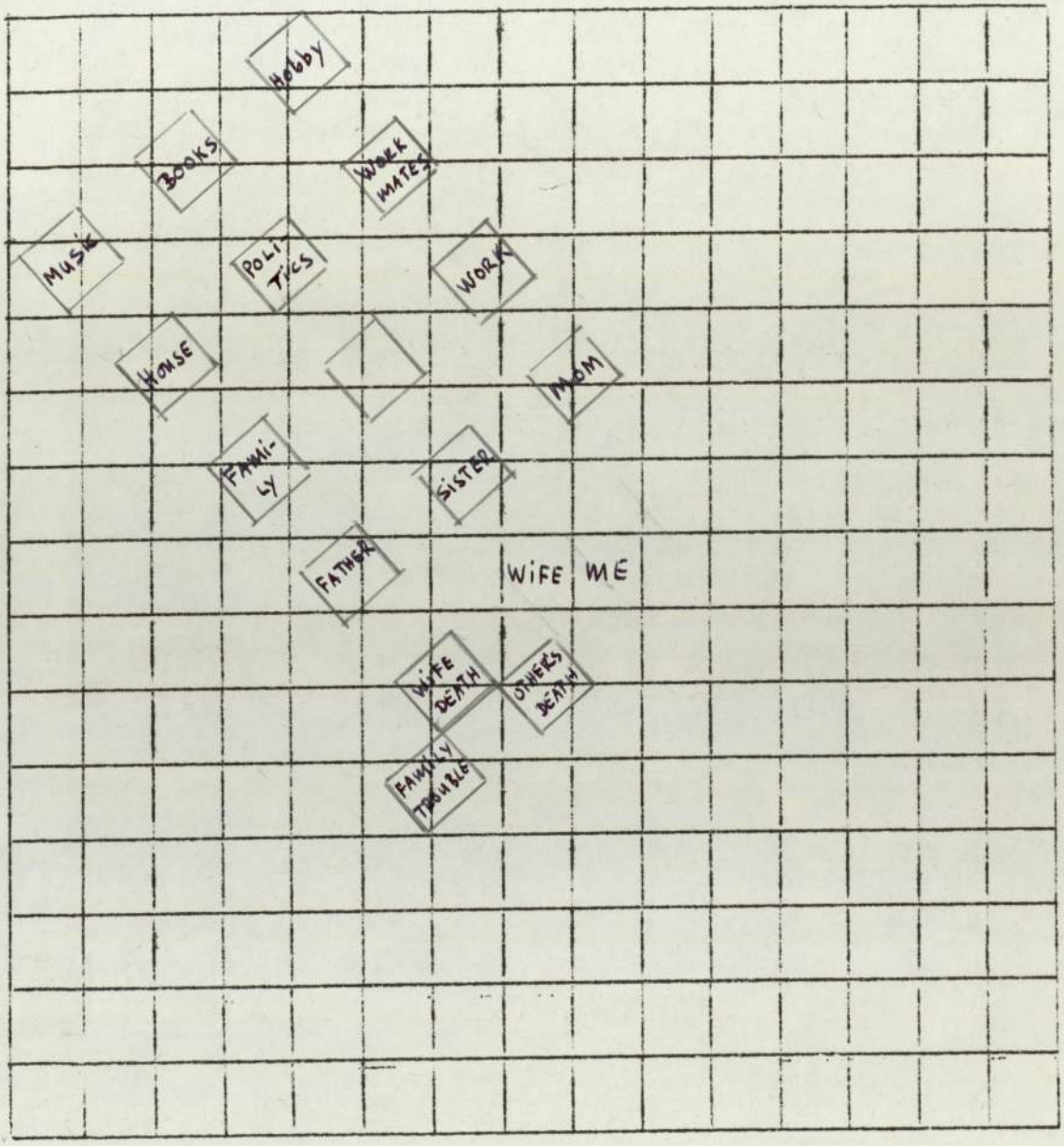
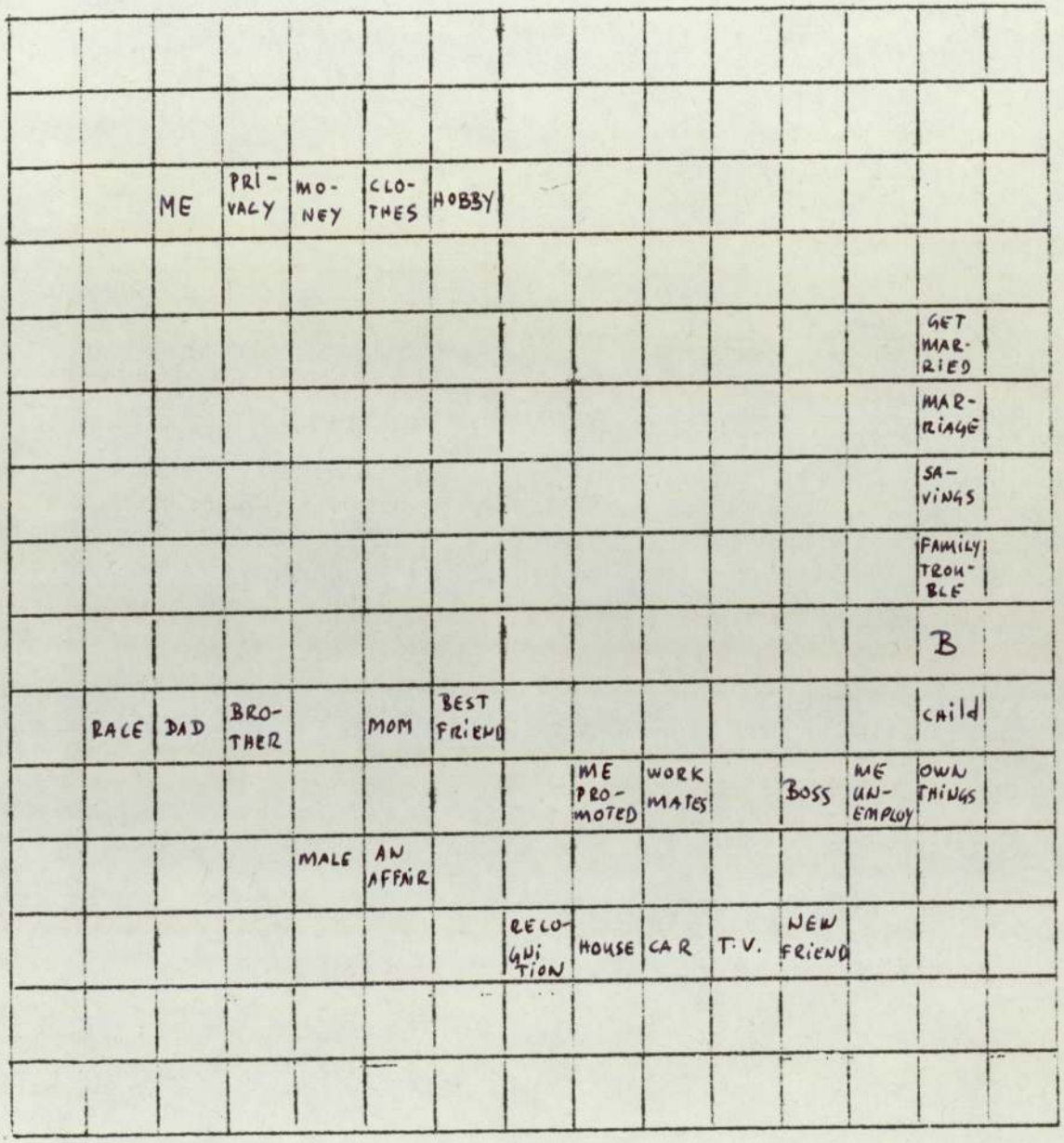

HOBBY
BOOKS
WORK MATES
MUSIC
POLI-TICS
WORK
HOUSE
MOM
FAMILY
SISTER
FATHER
WIFE ME
WIFE DEATH
OTHERS DEATH
FAMILY TROUBLE

DIAGRAM 31


ME
PRI-VACY
MO-NEY
CLO-THES
HOBBY
GET MAR-RIED
MAR-RIAGE
SA-VINGS
FAMILY TROU-BLE
B
RACE
DAD
BRO-THER
MOM
BEST FRIEND
child
ME PRO-MOTED
WORK MATES
BOSS
ME UN-EMPLOY
OWN THINGS
MALE
AN AFFAIR
RECO-GNI-TION
HOUSE
CAR
T.V.
NEW FRIEND

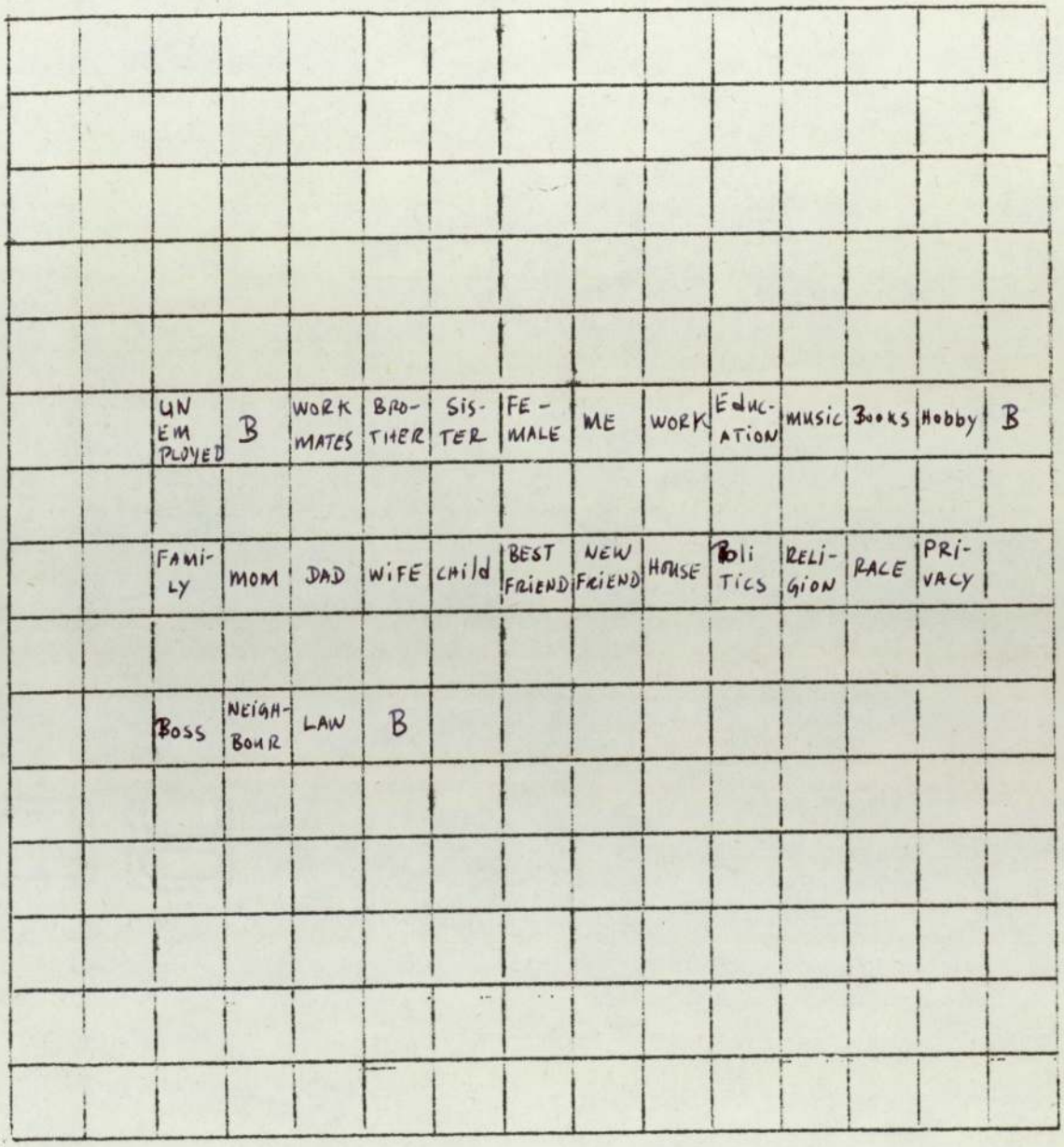
race/ With the exception of the blocks in the top left-hand portion of the matrix, the remainder of the structure was dominated by hypothetical (fanciful) events. These may be subdivided again, but all dealt with the future. Her own world was dominated by a wish to get away from these troubles. The use of S^{48} (privacy) and the very large distance between this grouping and the remainder of the matrix testified to the strength of this wish. This is not the tight, solid, well-established world of a mature woman such as subject No. 1. It is that of a youth becoming more introverted and retiring from reality. The danger is that she might evolve this cognitive structure into one similar to subject No. 52 (below) and subject "1" of Section IV. 1.

Subject No. 5

This matrix belonged to a forty year old male (Diagram 32). He is well established and successful in his profession and recently terminated a doctorate in a new, "few at the top", field. There was some minor friction with his "boss" or rather immediate superior. His home life was happy and stable with an intelligent wife and two children. He was well accepted and liked by his peers, family and friends, and was thus self-assured.

The structure is of a uni-dimensional or linear pattern. The complexity inherent in the pattern is however, unusual for such patterns. For example, it is very unusual for a subject using a linear structure to place the I^{13} block (Me) in the middle of his matrix. Similarly, other individuals have been put in control positions. The most important blocks in the first line occupy the seven middle columns of the 15 column matrix. These include workmates and other people with whom his contact may be sometimes quite frequent, although it is not

DIAGRAM 32


UN EM PLOYED
B
WORK MATES
BRO- THER
SIS- TER
FE - MALE
ME
WORK
Educ- ATION
MUSIC
Books
Hobby
B
FAMI- LY
MOM
DAD
WIFE
child
BEST FRIEND
NEW FRIEND
HOUSE
Poli TICS
RELI- GION
RACE
PRI- VACY
Boss
NEIGH- BOUR
LAW
B

very deep in nature. The second line is more sequential in nature beginning with family, mother, father, wife, children and best friend. Finally the blank blocks (marked B), the last four blocks in the third line, and E^{66} are a humouristic expression of the difficulty the subject has with his boss. With such a simple and stable-like structure, it is appropriate that this boss-subordinate conflict is revealed in the form of a joke. In brief, this linear-pattern seems typical of a self-assured person but may be due to stereotyped associations with "opposing" concepts such as flexibility and complexity. The matrix stressed the subject's stable nature not unlike subject No. 2 (above).

Subject No. 6

This was a man in his early twenties who at the moment of testing and, as far as can be determined from friends and acquaintances, for the past few years had been rather unsettled. He was unsettled in terms of self-concept and self-actualisation and this was reflected in his daily life. His education had not created any real job prospects nor did it produce the personal structure which he had hoped for. He had no special relation with a particular girl, and no such feelings had existed in the last few years. Nevertheless he had a number of friends who were sympathetic to him. This matrix contained a good degree of congruity, though there is a decrease in structure as we move downwards and towards the right. The fact that his pattern is predominantly stable suggests that he is in a better position to benefit from counselling. A more advanced stage of confusion in structure would demand more time and a specialist's effort. Intervention such as psychotherapy would be suggested by the subject's retiring behaviour from people and reality. In such cases a diagnostic tool such as the

Berneuter Personality Inventory (1935) might be used to confirm the existence of a problem, although it would not be of much use in solving it. The four blank blocks (Diagram 33) are cities, representing distant milieux and types of milieux in which the subjects feels at ease. This "at home" feeling was only temporary, admits the subject, though whether the reasons for this lie in the environment themselves or in the subject was not pursued. In any case, having four such places gave the subject physical, of not psychological freedom. The relations might then be shorter and therefore less strained and less dependent. Finally the bottom right portion of the matrix contains three groups of blocks which are separated from the main structure. In the first of these, his search for a stable family-like relationship is certainly natural, though culturally speaking rather late. (See I^{10}(wife), E^{61} (getting married), I^{5} (child)). For this particular subject the second grouping, E^{62} (house bought) and S^{43} (marriage) is separated so as to mirror the current trend in rejecting traditional views of marriage and personal possessions. Nevertheless the purchasing of a house was a wish and reflected his need for independence and increased introversion. Thirdly, the I^{1} block (father) involves a faint wish of the subject to meet and know more about his father. His father left home when the subject was still very young. Because of the two other groups of blocks involved wishes and fancies, it is probable that the father is not despised, despite his sequestration in the matrix, but represents a degree of curiosity.

Subjects Nos. 7 and 8

These are two nine year old schoolboys (Diagram 34 and Diagram 35) who may have an above average mental ability, though neither of them expressed special verbal or dexterous abilities.

DIAGRAM .33

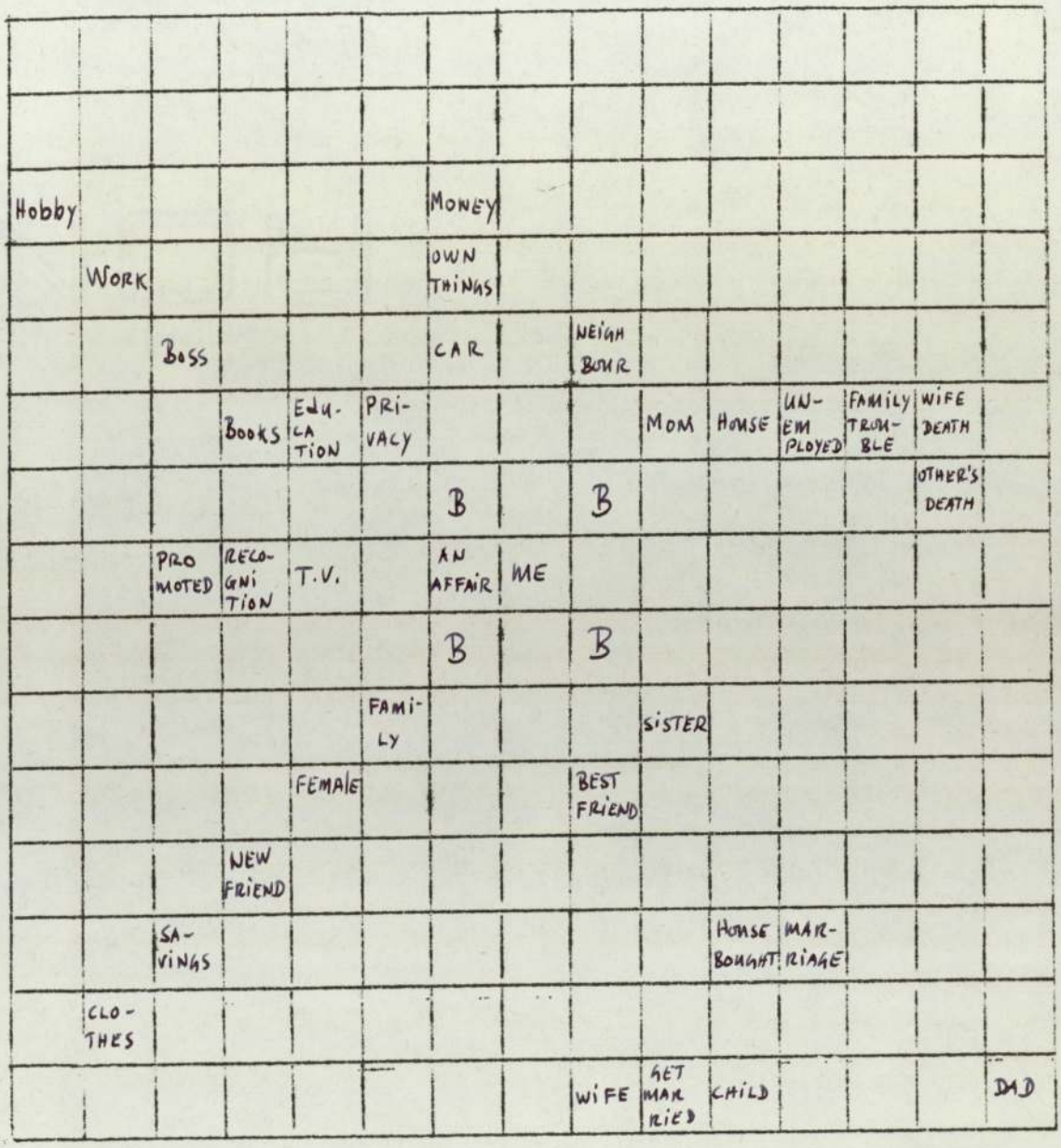

Hobby
MONEY
WORK
OWN THINGS
BOSS
CAR
NEIGH BOUR
BOOKS
EDU-CA TION
PRI-VACY
MOM
HOUSE
UN-EM PLOYED
FAMILY TROU-BLE
WIFE DEATH
B
B
OTHER'S DEATH
PRO MOTED
RECO-GNI TION
T.V.
AN AFFAIR
ME
B
B
FAMI-LY
SISTER
FEMALE
BEST FRIEND
NEW FRIEND
SA-VINGS
HOUSE BOUGHT
MAR-RIAGE
CLO-THES
WIFE
GET MAR RIED
CHILD
DAD

DIAGRAM 3.4

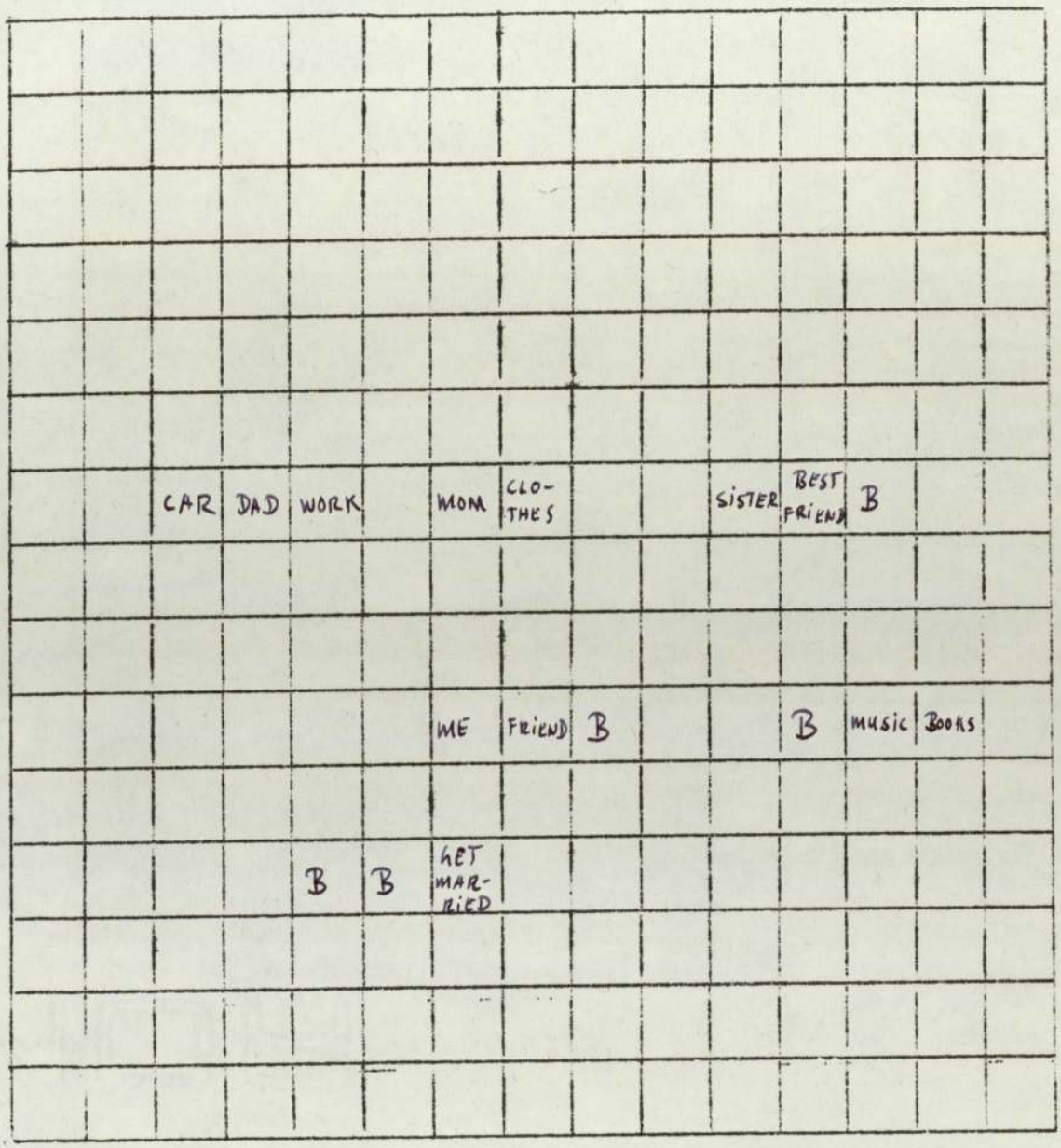
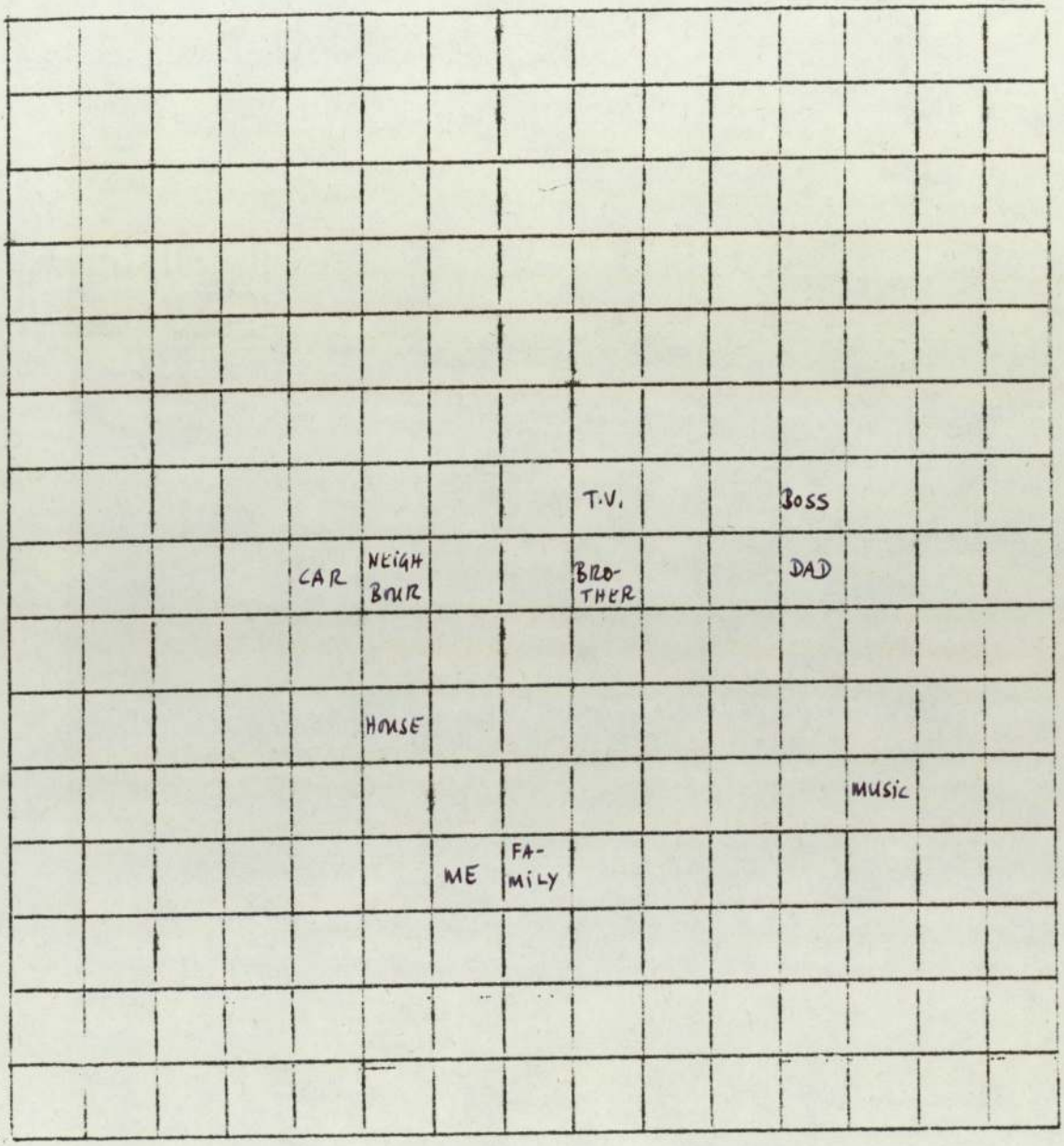

CAR
DAD
WORK
MOM
CLO-
THES
SISTER
BEST
FRIEND
B
ME
FRIEND
B
B
music
Books
B
B
GET
MAR-
RIED

DIAGRAM .35



Their patterns are composed of small, simple and independent worlds. The interview suggested that though some of these worlds were dominated by an individual, it did not render these more important as far as the subject was aware. The fact that I^{13} (Me) was placed in one rather than another grouping, did not make that world more important! For example, one subject placed I^{13} alongside a block representing his friend, while the second sugject placed I^{13} with his parental family. Perhaps the latter (subject No. 8) was more socially minded or socially more dependent having "matured" beyond the family as the most important agent of his socialisation. His behaviour in the test situation was not that of leader but more that of a follower. As suggested in Section IV.3 and IV.4.2, leadership does not necessarily depend on maturity or intelligence. Subject No. 8's worlds are smaller than his friend's, being composed of two rather than three blocks each. Maturity of self-concept may at this stage of personality development be linked to the size or complexity of these worlds, but further studies in cognitive styles (Tivendell, 1973) are needed. Similarly Subject No. 8 matrix may look more fluid and less mature, though neither is very close to a "crystalized" state, a concept which will be studied in subsequent research. (Section V.3).

Subject No. 9

This subject (Diagram 36) was a female adult who was happily married and had a family. Her test and re-test matrices and personal background were introduced in the reliability section (Part II, subject No. 27). The patterns were of a linear type of structure. Each group of blocks was separated by a new line but the preceding set was the more important as we moved vertically down the grid. In the post-Game interview

DIAGRAM 7.36

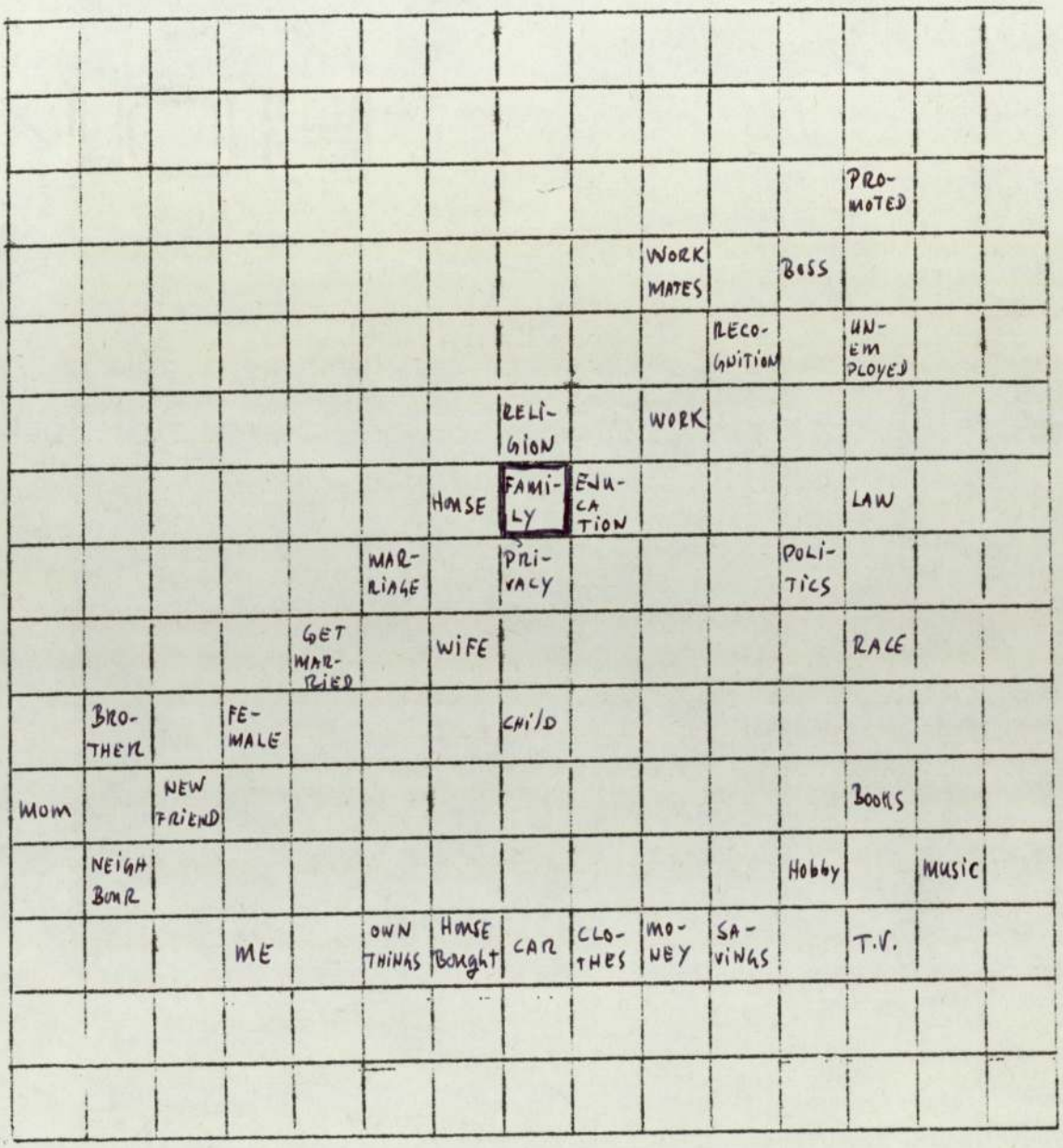
SAVINGS														BROTHER
													SISTER	
			CLOTHES									MOM		
		OWN THINGS	CAR											
				OWN MONEY										
						HOBBY		MARRIAGE	HOUSE Bought					
								HUSBAND	GET MARRIED					
				WORK-MATES			ME							
				Education	WORK				POLITICS					
			BOSS		BEST FRIEND				BOOKS	MUSIC				
		PROMOTED									RACE			
	RECOGNITION													
TV.														
	RELIGION													

the subject explained the absence of I^{13} (Me): "there is no Me, its all Me". The starting point of the matrix is I^{10}, (husband/wife) found in the upper left hand corner. Because of the label on the block, i.e. "husband/wife", it is probable that the concept of "Me" was included in I^{10} in the first stages of playing the Game. This I^{10} was followed closely by her children (a blank block) and the concept of privacy (S^{48}). The importance of her new found career was reflected in the blocks, "clothes" and "attractive male/female". The retest matrix was nearly identical. One exception was the introduction of the concept "immediate family" (blank block No. 2). This new block could be related to having recently being forced to give up her job in favour of her family's needs, The pattern and most of the blocks used in the retest-matrix had remained essentially the same, despite the twelve months between the test-retest sessions.

Subject No. 10

This subject (Diagram 37) helps underline the difference suggested in Part I between personality and abilities. This was a male in his early forties, who scored very high on a number of conventional intelligence tests. In terms of age and intellectual abilities he was similar to the subject whose matrix is found in Diagram 36. However, in both cases their intellectual ability was not revealed in their cognitive world structures (e.g. in terms of pattern or complexity). Similarly, tests of intellectual ability do not purport to measure the connotative factors of maturity, adaptability and creativity associated with "intelligence". Subject No. 10 (Diagram 37) was a stable person and quite successful in his career. He was more noteworthy for his perseverance then his originality, and this was reflected in his work. His pattern structure is

DIAGRAM .37


PRO-
MOTED
WORK
MATES
BOSS
RECO-
GNITION
UN-
EM
PLOYED
RELI-
GION
WORK
HOME
FAMI-
LY
EDU-
CA
TION
LAW
MAR-
RIAGE
PRI-
VACY
POLI-
TICS
GET
MAR-
RIED
WIFE
RACE
BRO-
THER
FE-
MALE
CHILD
MOM
NEW
FRIEND
BOOKS
NEIGH
BOR
HOBBY
MUSIC
ME
OWN
THINGS
HOME
BOUGHT
CAR
CLO-
THES
MO-
NEY
SA-
VINGS
T.V.

unorthodox in that he used two-dimensions i.e. time and importance. Except for this fact, his pattern was not complex, but indeed followed a simple left to right sequence. On the other hand, the calculated pivot of his matrix is S^{44} (family) which is both central to the structure and quite distant from I^{13} (Me). As with I^{13}, I^{5} (child) and I^{10} (wife) are separated from the centre of the matrix by both distance and the concept of privacy (S^{48}). This too is somewhat unusual and certainly not duplicated in Diagram 36. Further research, it is proposed in Section IV.3, must look more closely at the relation between levels of performance and the Game. (See too Tivendell, 1973; including a study of the relation between a non-verbal intelligence test and the Game).

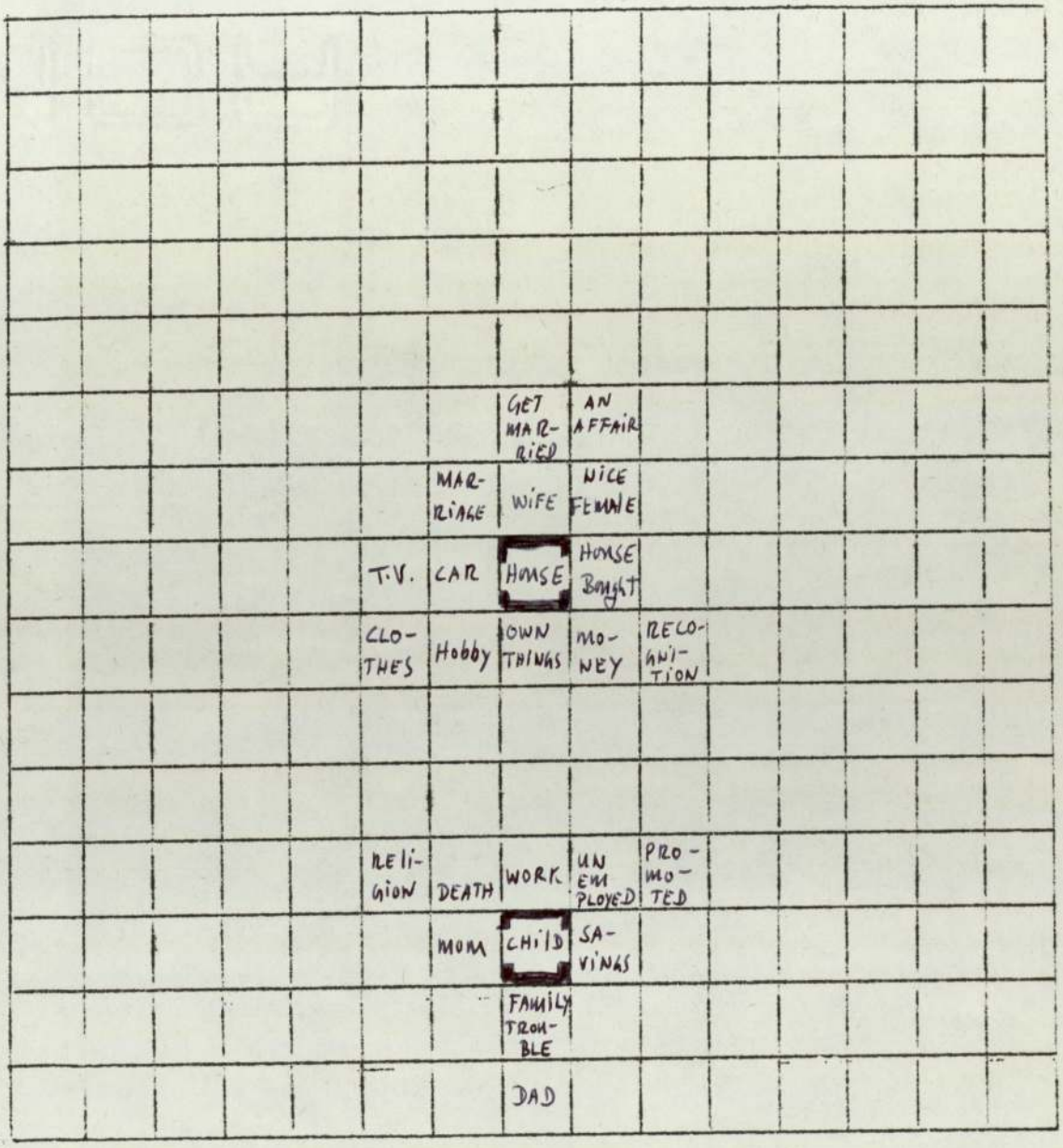
Subject No. 11

This subject, a female in her early twenties is only briefly mentioned here to underline the consistency of the Game results despite the occurrence of traumatic environmental changes. Her test and retest matrices were presented in the reliability section, Part II (See subject No. 41), along with a brief description of her family background. At the time of the first testing she had been having a fruitless love affair which had just "ended". However, seven months later, at the time of retesting the love affair had resumed, her personal life had not improved, and her behaviour was generally more introverted. This was reflected in the tightening of the pattern and a mild deterioration in structure. Nevertheless the basic hierarchical nature of the structure and the items used were very similar.

Subject No. 12

This was a young male adult (Diagram 38). His background was fairly typical of young men in university in that he had always been an academic. At the time of testing, he had recently

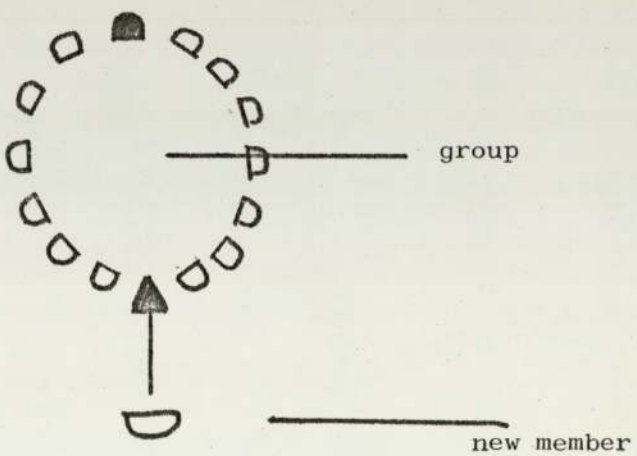
DIAGRAM .38 (Subject No: 52)



secured a teaching position in a university. That is, he had just emerged from a long period as a student with little status and responsibility. His behaviour underlined his inexperience in adapting to a new role, a new environment, and in altering his social behaviour patterns. His social behaviour at work in particular was inappropriate, peers and subordinates were disturbed at his style of interaction and were rejecting him.

The problem is fairly common and is illustrated in the following model of social interaction, called "the doughnut theory of social interaction". The objective of this subject's inter-personal behaviour is to join an existing group. The group can be represented by the circle of, for example chairs, as in Figure 27.

FIGURE 27 : The doughnut-theory" of interpersonal behaviour



a new member joining a group causes the moving-over (affecting change) of all the other members

The problem when entering a new group is that every member of the group must "move over". That is, with the exception of one member of the group, they must all be affected or changed. This exception can be said to be the member who invited the subject to join. The change that the group must undergo will

disturb these members to some degree. The degree of antagonism is directly linked to the speed and nature of the change imposed upon them. This will also be affected by other variables such as the role that the group plays in the lives (worlds) of its members. For example, an adopted child will seriously affect the whole family. A new member of a work-team will affect more considerably those members who see work as a key part of their self-concept. Finally, a new person sitting at one's usual table in the library or entering one's compartment on the train, will have only a minimal effect. In these examples, the speed and nature of the change is initially effected by the new member. The loud, bold or forward subject might push into the circle (Figure 27) more quickly, with disrespect for the group's traditions. On the other hand a subject may pretend to sit outside the circle, and only slowly increase his contribution to the group. In the case of subject No. 12 he attempted the first approach. It is proposed that the reasons for the group's reactions and the consequential decrement in the subject's self-assurance, is linked to the fundamental structure of his cognitive world. This schizophrenic-like pattern is believed symptomatic of unsuccessful interpersonal relations. The larger of the two clusters had I^{10} (husband/wife) and O^{21} (house) at its centre. There were certainly problems inherent in this portion of the structure, such as the role of I^{9} (attractive male/female) and E^{67} (me having an affair), but the main part of this cluster revolved around his personal family and interests. The second cluster (bottom) had I^{5} (my child) as its centre. The absence of I^{13} (Me) in the matrix was perhaps compensated for by its possible inclusion in I^{10} and in I^{5}. In the case of I^{10} there have been precedents for this use of the block, such as subject No. 9 above. In the

case of I^5 this is supported by the nearness of I^2 (mother), E^{65} (trouble in my family) and I^1 (father). This latter cluster also included such diverse and seemingly inconsistent items such as work-related concepts (e.g. S^{47}(work) E^{66} (me unemployed) and E^{64} (me being promoted)) and parental family. The experience with the Game suggests that this type of cognitive structure does not foster successful social interactive styles (See Section IV.1).

Subject No. 13

This last subject (Diagram 39) was a male first-year undergraduate student and, at the time of testing, he was comtemplating interrupting his courses. He could not formulate his reasons clearly, but he no longer felt any affinity with the course itself and his reasons for choosing it. He felt he had been pushed into further education because it was "the thing to do" and a safe-guard against unemployment. This was represented in the E^{61} (getting married), E^{66} (unemployed), S^{46} (education), and S^{47} (work) sequence of blocks. An alternative that he felt he should have followed was expressed in the S^{48} (privacy), I^7 (best friend), I^6 (new friend) and I^{11} (workmates) sequence. In time there should have been an amalgamation of these two work-alternatives and his decision will influence the resulting world's content. The family was a second group of blocks attached to "privacy" (S^{48}). Some similarity exists between his preferred work-alternative and his relation with his family. These seem to belong to personal rather than socio-cultural worlds. Meanwhile the division within the family suggests some conflict arising from parental upbringing and expectations. The subject obviously feels close to his brother, sister and mother while his father still treats him like a child. The conflict was reflected in the lack of linearity within this

DIAGRAM .39

						NEIGH BOUR		BOSS						
DAD	CHILD							WORK MATES			WORK			
			BRO-THER				NEW FRIEND			EDUCA-TION				
		MOM		SIS-TER			BEST FRIEND		UN-EMP-LOYED					
						PRI-VACY		GET MAR-RIED						
							ME							
						MUSIC		HOBBY						
							BOOKS							
				CLO-THES										
														LAW
			OWN THINGS										RACE	
T.V.	CAR											POLI-TICS		RELI GION

group of blocks (family) compared to the overall pattern. That is, with the exception of the family and a group of concepts irrelevant to him placed at the bottom right hand of the matrix, the pattern was that of a star. These are generally very simple structures (See Subject No. 8 in Section IV.3). A university selection committe might have been mislead by his mature relation with his parents and thus would neglected to consider the overall simplicity of his personality. On the other hand boys of this age would not be expected to have fully mature self-concepts. An interviewer must generalise from data such as a student's relation with his family, to predict the type of cognitive structure which will emerge. Unfortunately, this subject did abandon his course.

This last sample has underlined the need to study the process and variables in such interviews. This must involve a study of the information-flow, decision-making strategies and cognitive control imposed upon the process by the interviewer or counsellor's own cognitive styles and cognitive world structure (See Section V.3). Similarly more information is needed concerning the subject or counsellee. The following section will look at subjects in more depth as they would be studied in a counselling situation.

IV.4.5 Counselling

IV.4.5.1 Introduction

The following section involves a first step in a counselling situation, the use of two different neasures which might help the counsellor in his task. The first part of each analysis describes the subject using the California Personality Inventory or C.P.I. (Gough, 1956). The second part uses the Cognitive World Structure Game. Despite the comparisons which are made it is assumed that there is a need for both types of

measure. Most approaches to counselling see it as a process involving an analysis of personality and, in some cases, personality-change itself. An indefinitely dynamic view of personality (e.g. Gough, 1956) helps explain many inconsistencies in behaviour but cannot permit predictions of future behaviour nor contribute to solving existing proglems. The assumption of the existence of a consistent cognitive structure and the environmental approach of the Game seems in this respect a more valid and viable answer.

The subjects were selected from a wide range of people volunteering to take part in experiments in the Applied Psychology department.* Five of the seven Ss were students from local Birmingham schools. The two remaining subjects were young adults. Diagrams are included to summarize each S's C.P.I. profile and scores, and their Game matrix. Figures 28 and 29 represent the means and standard deviations of scores for comparable American samples of male and female high school students (Gough, 1956). Meanwhile Table 31 summarizes the eighteen scales of the C.P.I. and their labels.

IV.4.5.2 A note about the C.P.I.

Figure 30 represents a study done by Gough (1956) to determine a sample's profile if the questions were answered randomly. The means and standard deviations are plotted for a sample size of N = 30. Figure 31 plots the expected median score per scale based on the number of items or questions found in each scale. It may be noted that these two figures are identical. In view of, among other facts, the low standard deviation of the first sample (N = 30)it is statistically extradordinary that each of the eighteen scales were randomly

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*University of Aston in Birmingham

Figure II.2.8 C.P.I. profile in percentage frequency (mean & s.d.), for a sample of High School males (Gough,1956).

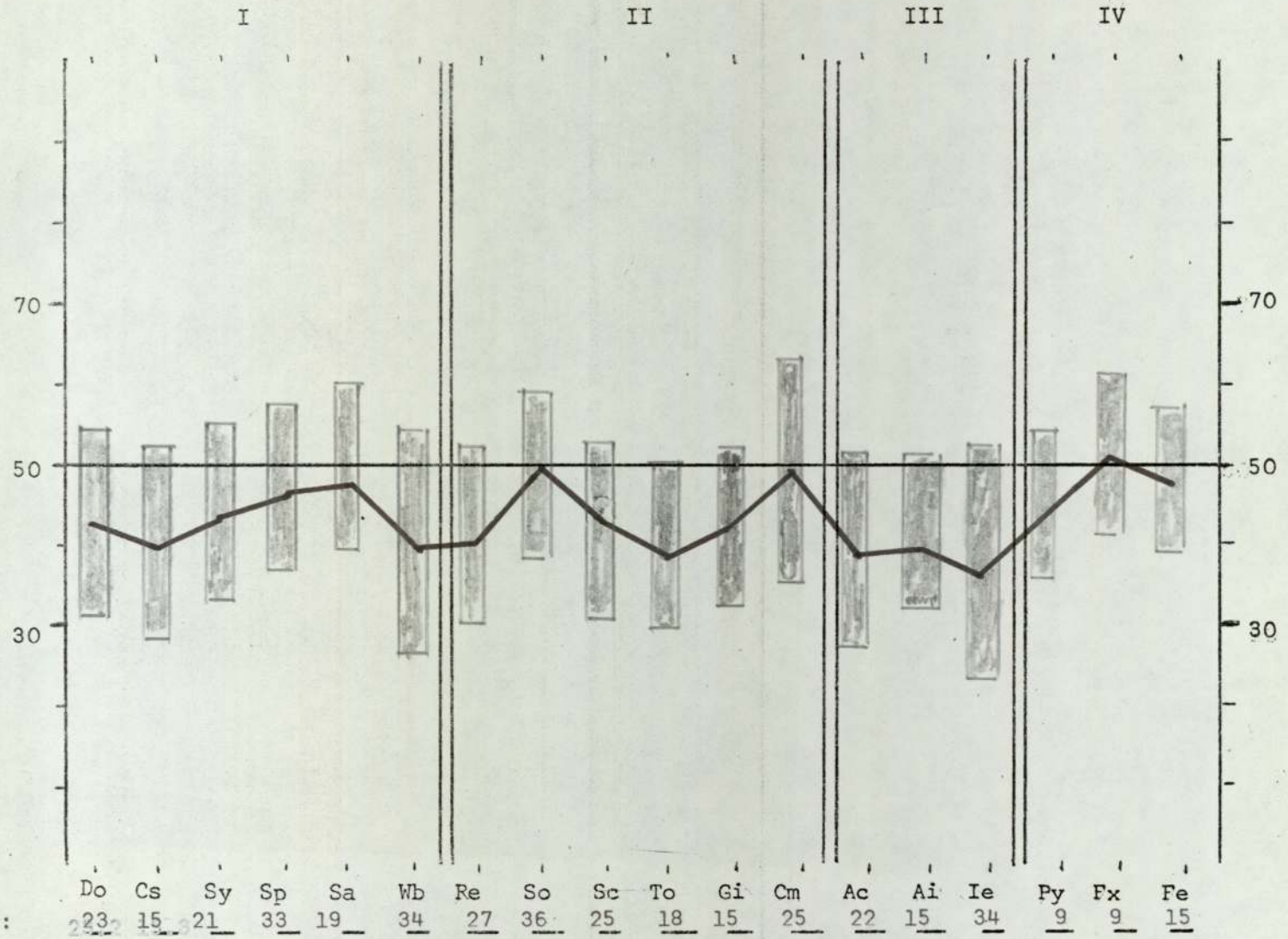
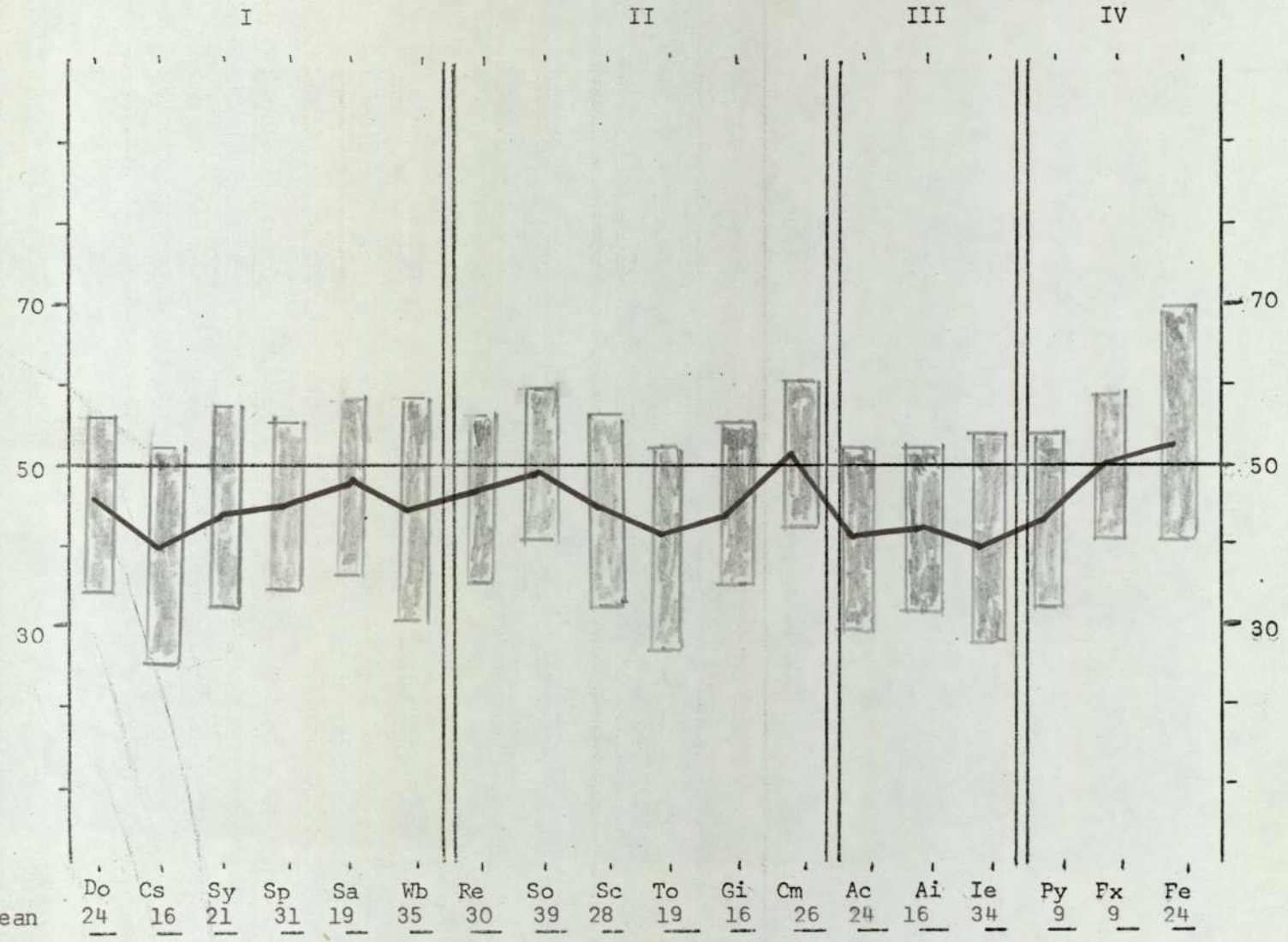


Figure II.2.9 C.P.I. profile in percentage frequency (mean & s.d.), for a sample of High School females (Gough,1956)



IV .4.5.1 Introduction (continued)

TABLE 31 : the eighteen scales of the California Psychological Inventory

Category I :

1)	Do	Dominance
2)	Cs	Capacity for status
3)	Sy	Sociability
4)	Sp	Social Presence
5)	Sa	Self-acceptance
6)	Wb	Sense of well-being

Category II:

7)	Re	Responsibility
8)	So	Socialisation
9)	Cs	Self-control
10)	To	Tolerance
11)	Gi	Good impression
12)	Cm	Commonality

Category III:

13)	Ac	Achievement via Conformance
14)	Ai	Achievement via Independence
15)	Ie	Intellectual Efficiency

Category IV:

16)	Py	Psychological-mindedness
17)	Fx	Flexibility
18)	Fe	Femininity

Note: categories I to IV are clinical interpretation clusters and not factorial or psychometric categories (Gough, 1956)

I common emphasis on feelings of interpersonal and intra personal adequacy

II concerned with social norms and values, and dispositions to observe or reject such values

III this is not a psychometric dimension but is important in school counselling

IV are independent scales reflecting attitudes towards life

Figure 3.0 C.P.I. profile in percentage frequency (mean & s.d.), for a random sample of (N= 30) subjects (Gough, 1956)

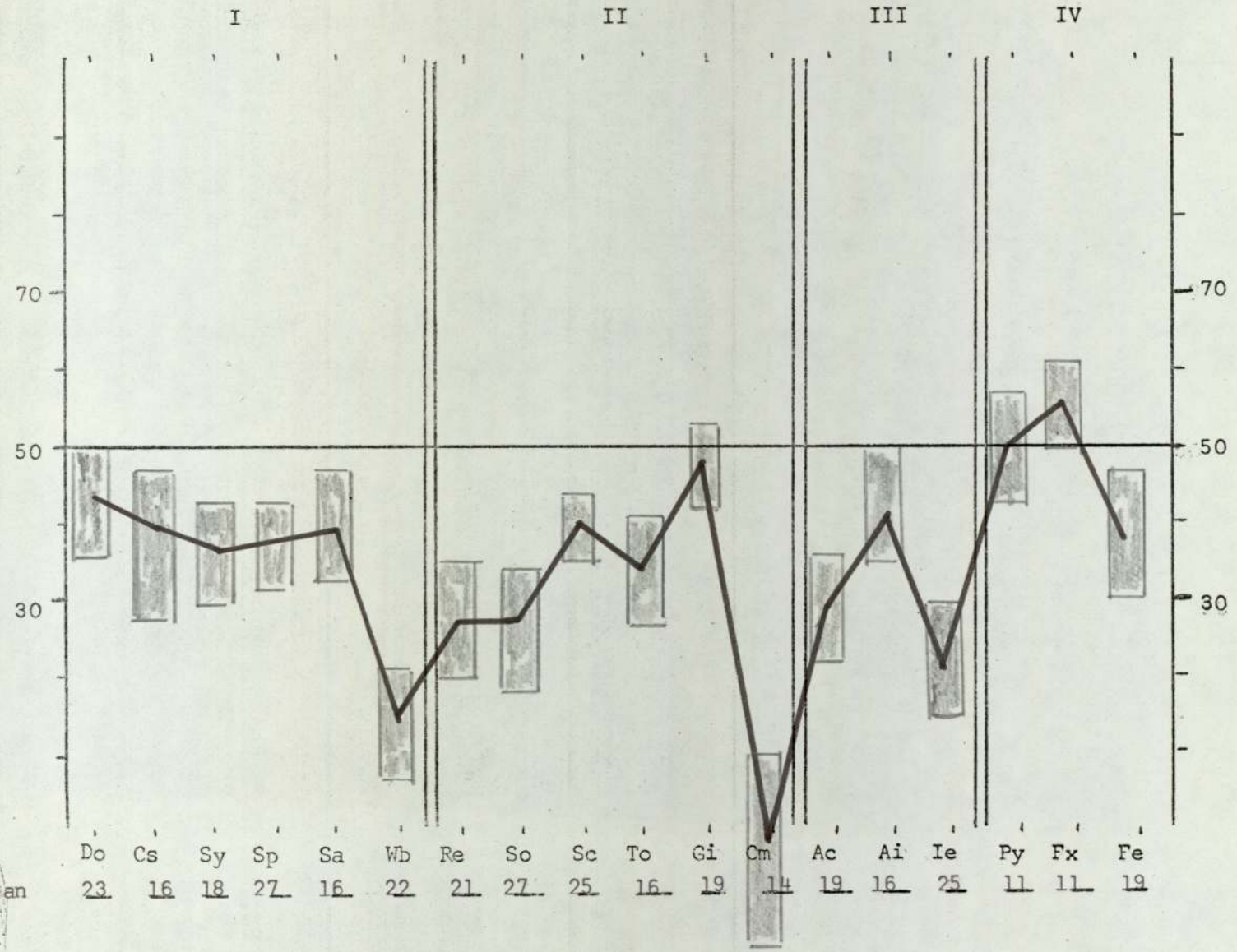
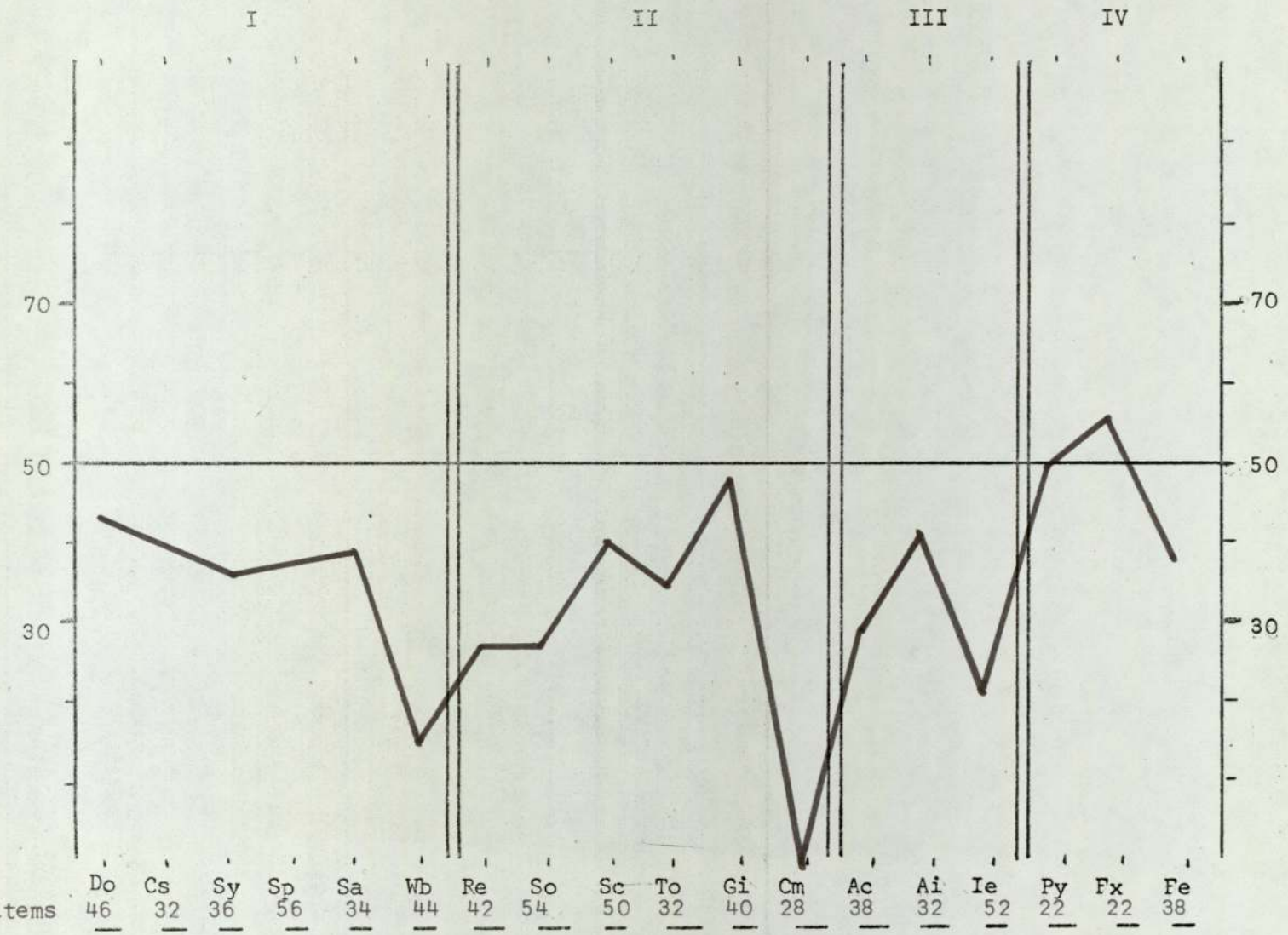


Figure 3.1 C.P.I. profile hypothesized; a median based on the number of items per scale



answered in an identical way to the distribution found in Figure 31. Note that a random population of thirty Americans, as Gough's study is based upon, demands that the Arkansas hillbilly, the Iowa farmer, and the French-Canadian in Massachusettes all have an equal probability of being sampled. If indeed the thirty subjects were randomly selected it seems that Gough used these particular subjects to create his table for translating raw scores into standard scores. As this matching of raw and standard scores is a crucial step in this type of psychometric measure, it seems a very small sample upon which to base a test.

The reasons for using the C.P.I. in the following sections are functional and not theoretical. Its use does not imply that it is considered a more valid measure than for example, the 16 PF. Indeed the use of a 16 PF with British norms may be more appropriate in counselling situations where the welfare of the client is being served rather than the objectives of a study such as this one. However, the C.P.I. is important here because it is based on a dynamic theory of personality, as opposed to a consistency theory such as that of the Cognitive World Structure Game. In addition, the C.P.I. attempts to deal with more aspects of an individual's personality (e.g. 18 scales), and therefore its scales are based on a greater number of items than many popular measures of personality. Finally, like the Game, it stresses the importance of the environment.

IV.4.5.3 Discussion

Subject No. 14: the C.P.I.:

Her overall C.P.I. profile is slightly low indicating the individual is experiencing difficulties in interpersonal adjustment. This is rather normal for a seventeen year old and is reflected in the difference in profiles between high school

Diagram 40 C.P.I. profile in percentage frequency, for subject 14

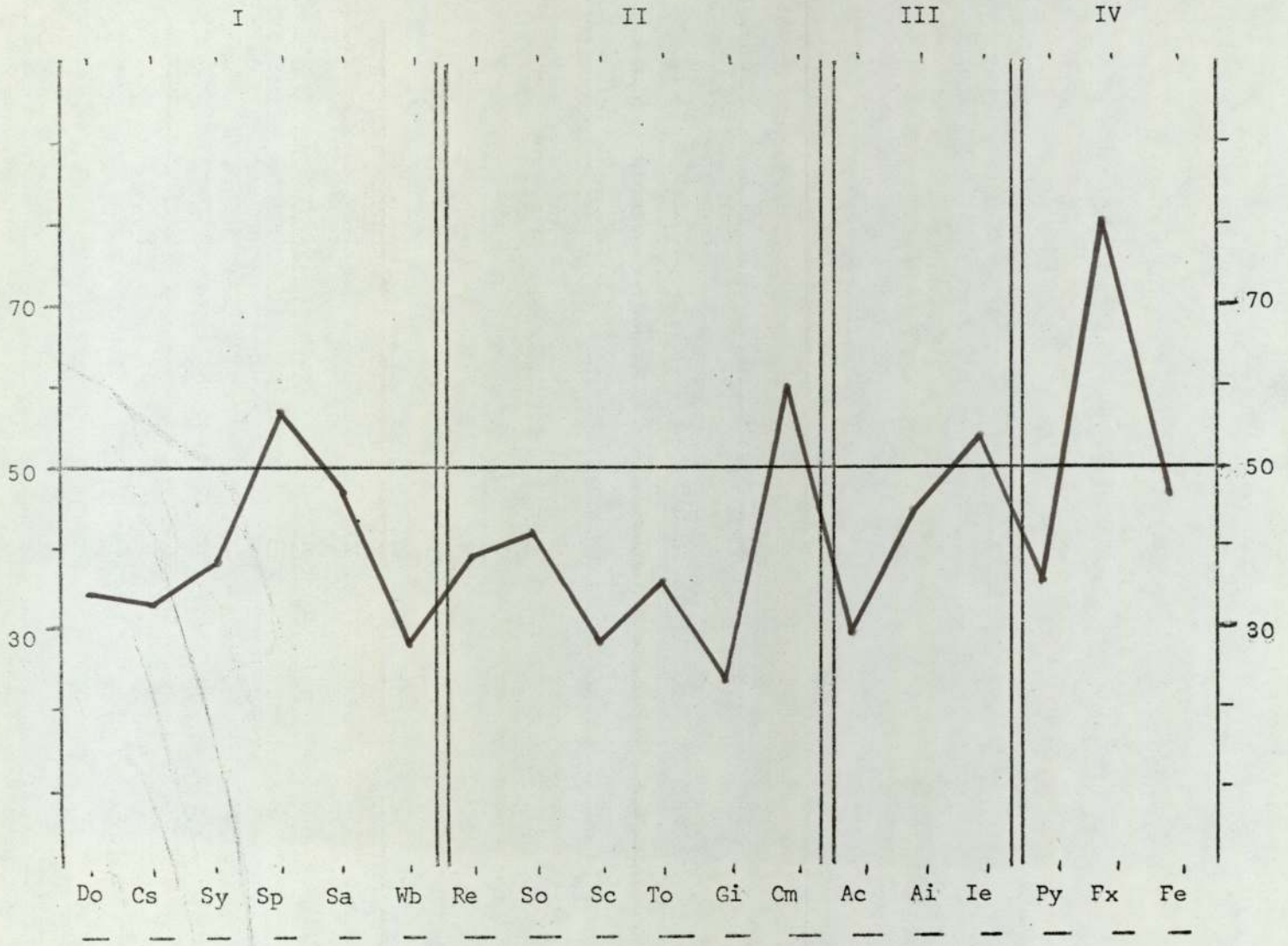


DIAGRAM .41

LAW							HAPPINESS						RACE	EDUCATION
				BOOKS						BEST FRIEND				WORK
			MUSIC					OWN MONEY	CLOTHES					POLITICS
		HOBBY					CHILD							
			NICE MALE			MOM		PRIVACY						
			LOVE				FAMILY							
			GET MARRIED	WIFE		SISTER		DAD	RELIGION					
			OWN HOUSE											
			CAR											
HUSBAND'S DEATH	OTHER'S DEATH						FAMILY TROUBLE							

and college students (See Manual; Gough, 1956). Note the latter subjects are older and in theory have greater interpersonal and intrapersonal experience and adjustment. She is especially low in category II, but this followed closely by category 1. The first is a measure of socialisation and the subject's dispositions towards these values. It would seem, once again reflecting her age and era, that she is rejecting these values but in a realistic and moderate way (See her C M score which is moderately high). The category is also related to intrapersonal structuring of values and its relation with maturity and responsibility. Her self-concept has yet to fully crystalize and this might account for the low degree of intrapersonal structure. Category I is also slightly low. This category measures interpersonal and intrapersonal adequacy, i.e. in terms of poise and self-assurance. This level would then be expected because of her age and circumstance, in the sense that she had yet to be independent of her parents, financially, physically and psychologically.

Certainly the most impressive point in her profile is her degree of intellectual flexibility (Fx). She also is insightful, informal and confident. There is an evident sarcasm and cynicism in her behaviour indicating an egoistical concern with pleasure and diversion. At that age, many young ladies are becoming aware of their physical charms and "power". In addition, she is living in a society and time which permits women to choose their male friends. Thus she is adapting her social behaviour and possibly conforming to an age/environmental norm. Her low Gi (good impression) score underlines this self-centredness and slight lack of concern for the needs and wants of others. In terms of the dispersion of the loadings possible in this score, i.e. disregarding the standard score distribution, this

subject is scoring rather low on these items. This would tend to emphasize to an even greater degree the shrewd, distant and self-centred type of social relationships which she creates. Note that Gough (1956) sees personality as a dynamic thing and particularly defined in terms of social relationships as well as intrapersonal interest and value structures. That is, he would expect this subject to change in the near future and perhaps even reverse the type of behavioural patterns described herein.

Subject No. 14: the Game

According to her Game matrix the most apparent theme is that this subject has yet to complete her personality development. However, many of the basic structures for this personality had already emerged. This is quite a distance (developmentally) from the simple differential view of one's immediate environment such as found in subjects Nos. 7 and 8, Section IV.4.4. This girl was still living at home and dependent in many ways on her parents. For this reason the blocks concerned with this world were still central in the matrix. As was expected of her age and state of development, there was a lower centre of gravity as it were belonging to these blocks. They were linked in a much less tight (dense) fashion than the blocks to the left. Privacy (S^{48}), a concept quite important in the first steps of independence, was present. It was the hope of a future marriage, the cluster to the left of the family, which was now the more important construct of this independence. Whereas privacy meant freedom to interact with peers (See the cluster immediately above S^{48}, i.e. I^{7} (best friend), O^{28} (money) and O^{27} (clothes)), the possibility of a future husband was now underlining the real source of independence. On the periphery of the matrix there were the signs of a lack of struc-

ture typical of youth. Concepts like work (S^{47}) were intermingled with ones of education (S^{46}), politics (S^{49}) and race (S^{50}). Similarly the block dealing with police (S^{41}) was included here, yet according to the interview had no relevance here. Adverse events were finally relegated to the bottom of the matrix but rudimentally distinguished by placing them under their appropriate world. The pattern indicates that the subject had yet to have a fully defined self-concept. The calculated pivot, the focus of her cognitive structure, was "getting married" (E^{61}). As development continues, and unless traumatic events occur to change its direction, it is assumed that the most dense world (group of blocks) will become the basis of this cognitive structure. In this process there will probably be a shift from E^{61} to I^{10} in the calculated pivot, as a specific person enters her envrionment. In addition, many of the peripheral blocks will either move towards the centre of the structure or be dropped completely. That is, it is assumed that her world will become simpler. Experience suggests that her parental family will remain fiarly central, but certainly , secondary to the main world. Finally, interests such as work will probably become moderately more important whilst law/police (S^{41}) and politics (S^{49}) will be dropped altogether. Because of the late development of this girl's cognitive world structure, little depth or complexity is expected. It is also unwarranted to describe such a young person as egoistical and self-centred. Neither is her self-concept crystalized nor is "Me" (I^{13}) a viable concept here. It was assumed from this lack of complexity and normal degree of self-interest, that the focus of attention will eventually be someone else, i.e. the husband (I^{10}) (See for example subject No. 9 in Section IV.4.4). As for attitudes dealing with lack of self-assurance

Diagram . 42 C.P.I. profile in percentage frequency, for subject 15

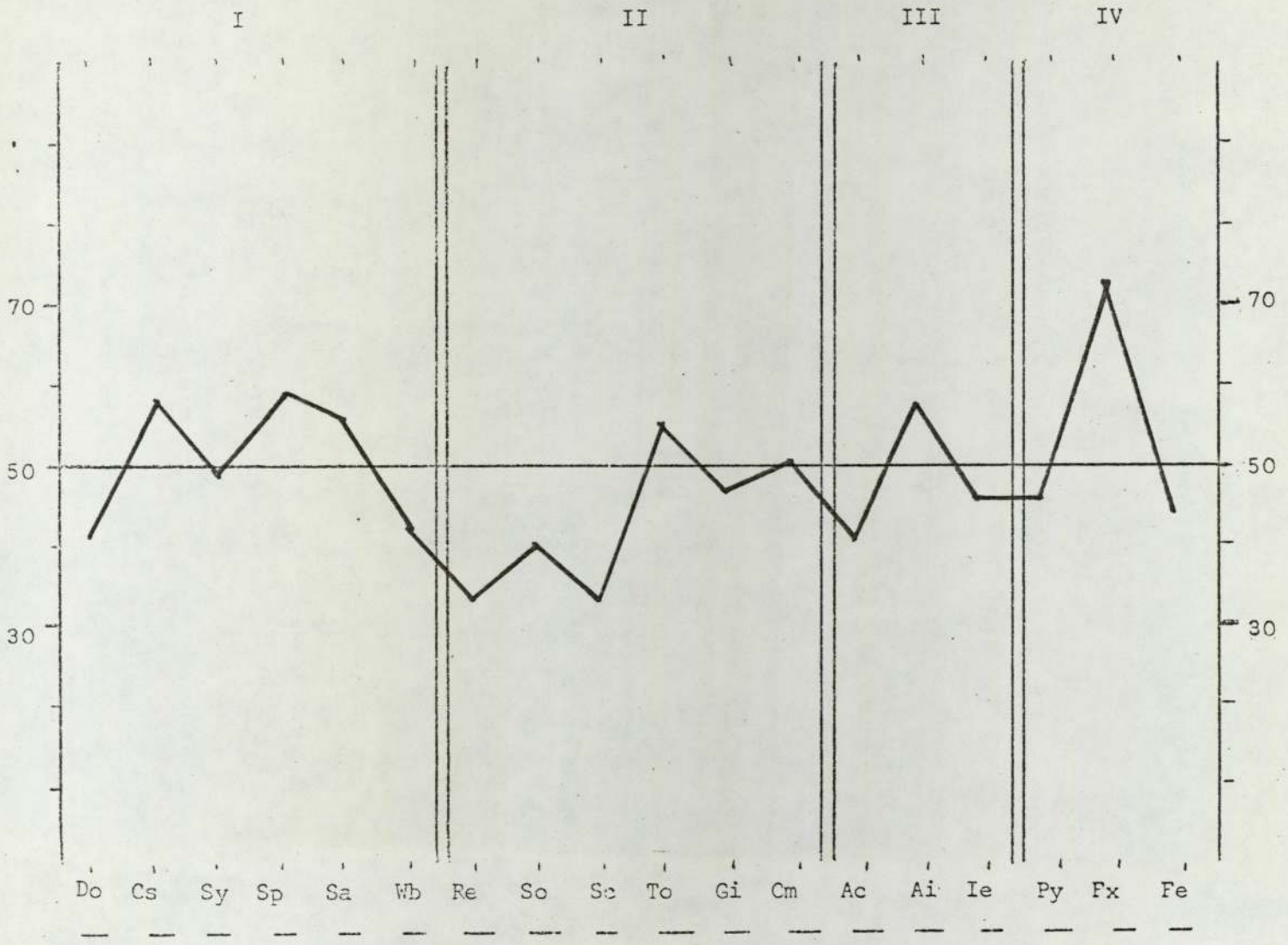
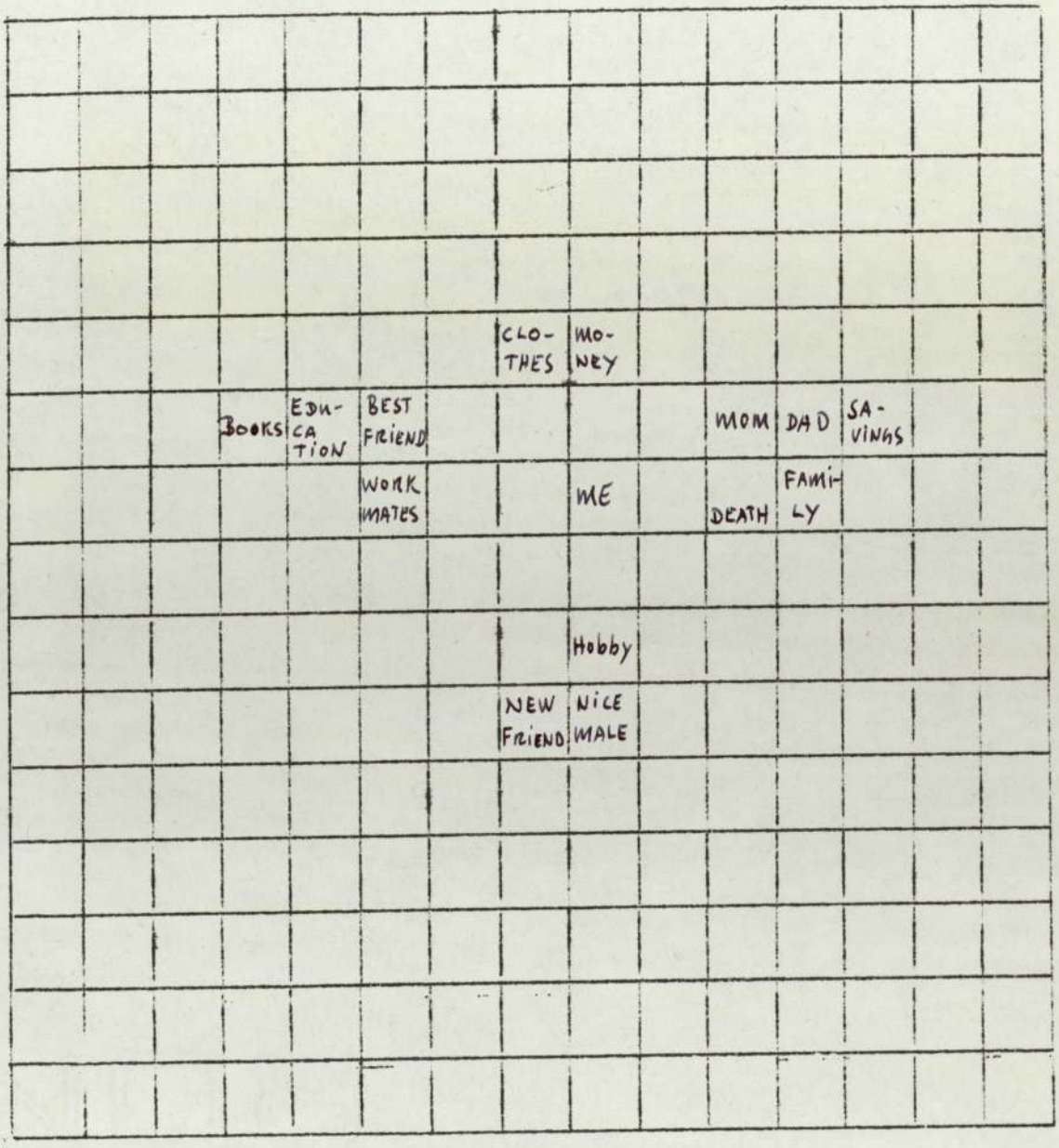


DIAGRAM .43


CLO-
THES
MO-
NEY
BOOKS
EDU-
CA
TION
BEST
FRIEND
MOM
DAD
SA-
VINGS
WORK
MATES
ME
DEATH
FAMI-
LY
Hobby
NEW
FRIEND
NICE
MALE

and internalisation of traditional values, these were probably due to the immaturity of the subject's self-concept. Once I[10] becomes a real person and thus speeds up the development of personality, both will be untenable concepts.

Subject No. 15: the C.P.I.:

This young lady was a friend of subject No. 14 (above) and was also a sixth-form student. Her C.P.I. profile is average in that it has nearly as many points above as below the median standard score. Category No. II is generally lower than her friend's. Category I for the most part, that is excluding dominance (Do) and the sense of well-being (Wb) scales, is rather higher than the median and particularly higher than the high school norm found by Gough (1956). Category II indicated that this subject has a tendency to reject social norms and values more so than her American high school peers. Undoubtably, an E.P.I. (Eysenck (1967) user would explain this difference as due to the more conservative nature of the American. This is possible, but it is more probable that semantic differences in the connotation of the labels used in the C.P.I. are at fault. That is, rather than a deep psychological difference in the youth of both cultures, there is a difference in meaning and use of certain verbal labels as in different languages. Compared to subject No. 14 this subject has a better disposition towards the intrapersonal value structures described in the test. There is, according to the scores in Category I, a higher degree of adequacy found in this subject. Poise and self-assurance were above the norm for both the general population and girls of her own age. In particular the capacity for status (Cs), and social presence (Sp) scores were above the standard deviation for the average of high school females. Of the unique features of her profile, the flexibility scores (Fx)

which was above the 70th percentile was the most evident. To a slightly lesser degree than her friend, subject No. 14, this young girl was insightful, confident, idealistic and rebellious. This state is influenced by the camaraderie she shared with her friend. The reason for this rebellious, adventurous and idealistic nature was suggested in her low responsibility (Re) and self-control (Sc) scores. Her disposition was rather less dependable, still reflecting the immaturity common to her age. She was awkward, changeable, impulsive and disbelieving. Perhaps she was influenced by family biases but her general disposition to reject traditional value structures (See above) would suggest, rather, that these were due to personal biases. The self-control score (Sc) also discussed her in terms of being exciteable, irritable and, for now, self-centred. Like the above young lady, she was certainly so because of her age. Her environment was rather rigid, being still forced upon her and determined by particular social, cultural and parental value structures. As these value structures are expected to change, according to Gough's view of personality, this state of affairs is understandable. Nevertheless, personologists still contend that there is a something unique to each individual which remains throughout their life. This consistent cognitive structure is sought by the Cognitive World Structure Game.

Subject No. 15: the Game:

The subject's irritable and self-centred nature is a common occurrence in adolescence of most cultures. As in subject No. 14, there was conflict between the view of her as a child held by her parents and immediate family, the view of her as a woman held by people outside her family, and her own urge towards independence, self-definition and self-fulfilment.

This conflict was expressed in the subject's Game matrix, where a number of worlds seek the majority of her attention. First, there was the parental family, still the dominant world in terms of the real object of her affections and the source of security, stability. There was also the social world which was gaining in importance and which was made up of her academic activities and school mates (I^{11}). Thirdly, less important to her self-concept there was a personal world which included individuals such as I^{9} (friend). Unlike subject No. 14, this third world was not seen as the solution to her need for independence, despite its link to future married life. It is probable that this subject will later entertain ideas of a career, as she seems more advanced in terms of interpreting her immediate environment. This is reflected in the degree of confidence, insight and indeed rebellion expressed in her C.P.I. scores. Meanwhile her Game matrix was tighter, more balanced and better differentiated. An advanced stage of self-development not only enhances feelings of self-assurance and adequacy in interpersonal relationships, but allows her to be more realistic as to the role of her parental family. Her father (I^{1}) was the most important person in her world (calculated pivot) yet, as with subject No. 14, the fact that the family was off-centre suggested the transient nature of this world's importance. Like subject No. 14, she was still developing, but the stage of self-development was believed more advanced and the potential for self-growth greater with this type of matrix. Subject No. 14 had a matrix typical of the traditional role in the focus being placed on I^{10}, but subject No. 15's suggests a more independent nature.

Subject No. 16: the C.P.I.:

The next two subjects were sister and brother. The girl,

Diagram 44. C.P.I. profile in percentage frequency, for subject 16

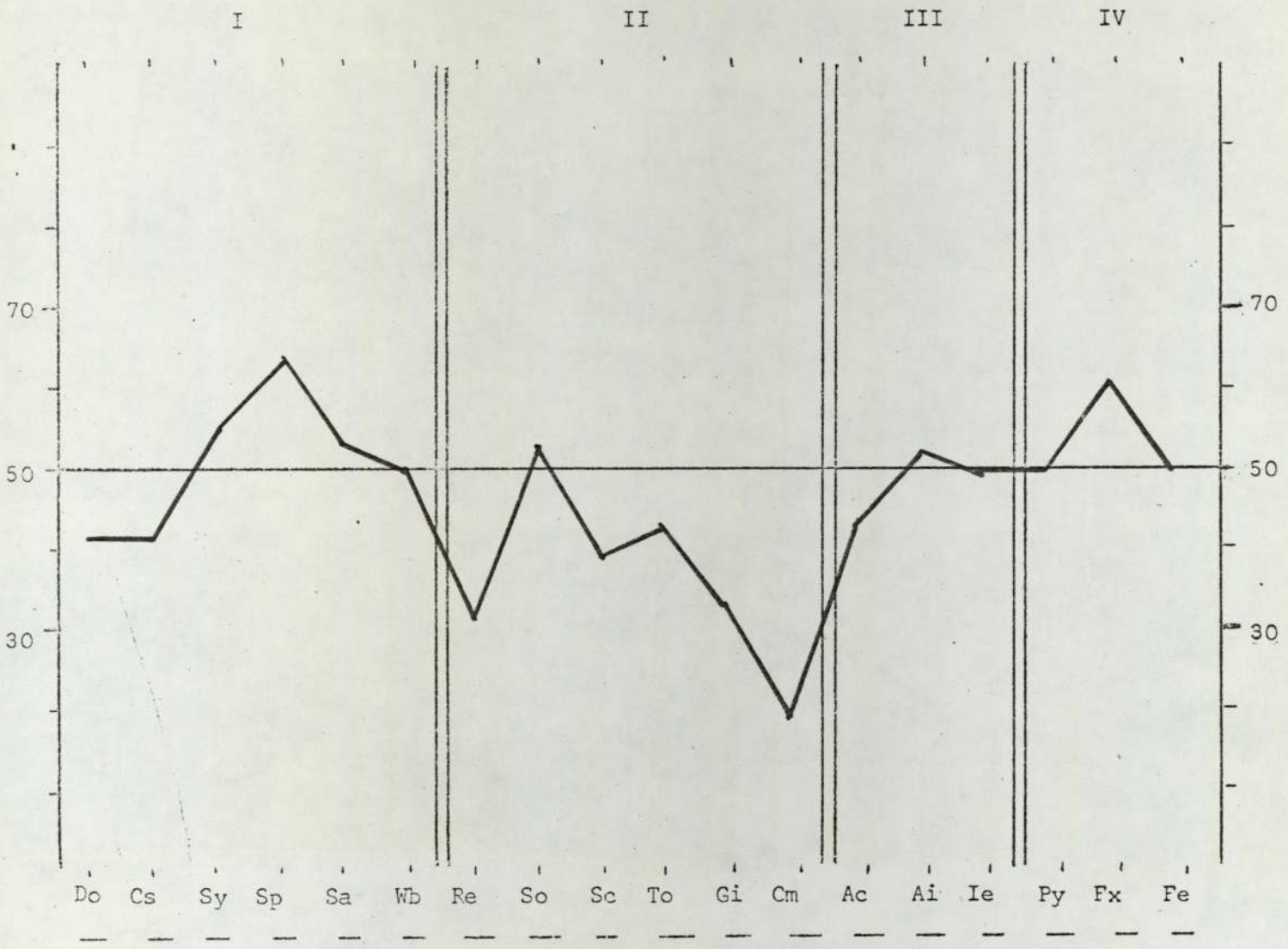
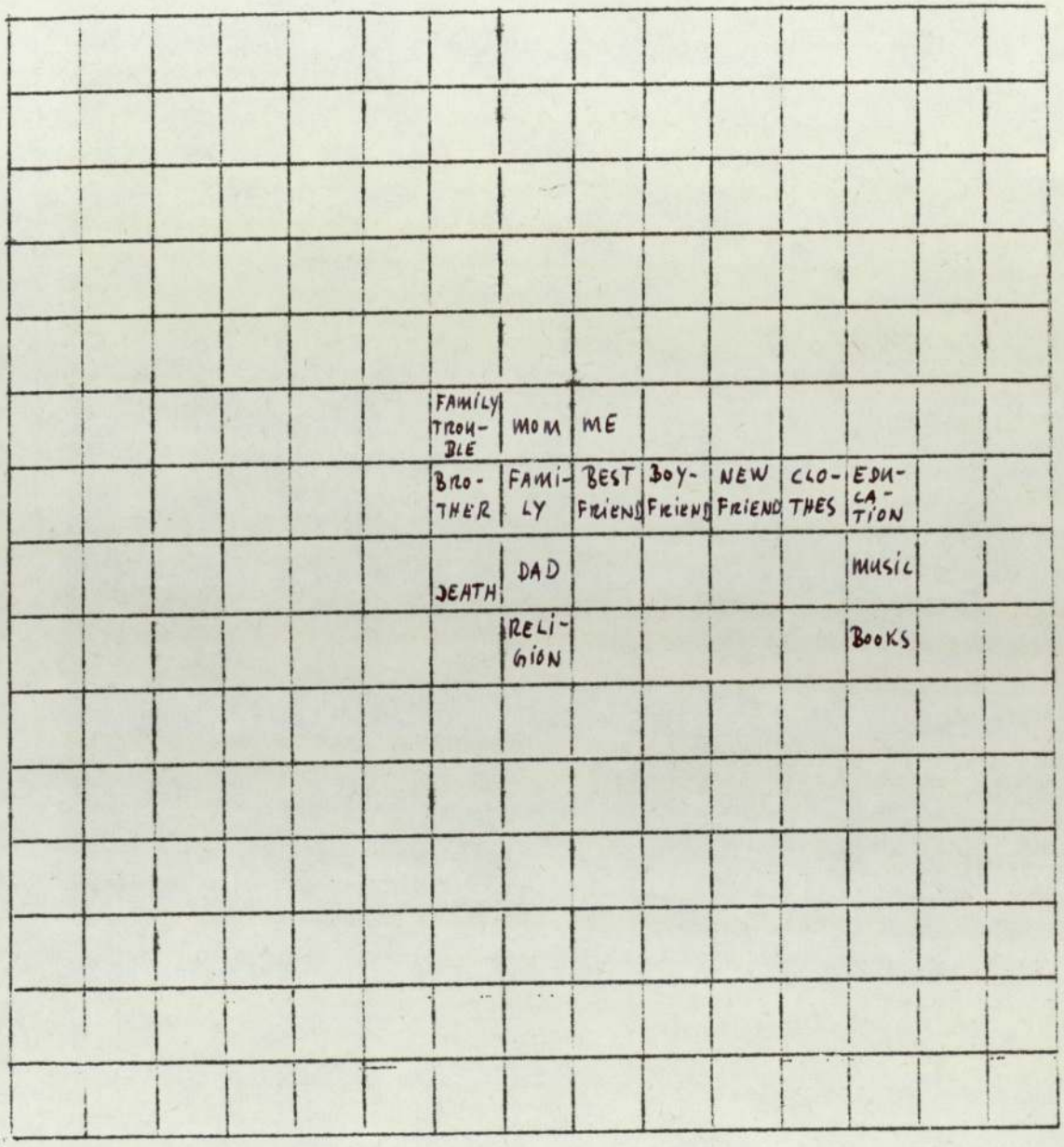


DIAGRAM 45


FAMILY TROU-BLE
MOM
ME
BRO-THER
FAMI-LY
BEST FRIEND
BOY-FRIEND
NEW FRIEND
CLO-THES
EDU-CA-TION
DEATH
DAD
MUSIC
RELI-GION
BOOKS

subject No. 16, will be considered first. She had scored generally lower than the median in Category II. That is, in terms of her disposition towards traditional intrapersonal structuring of values and socialisation, maturity, and responsibility, she tended to reject these norms. In comparison with American high school norms this disposition to reject traditional value structures is tempered in three out of the six scales. This thirteen-year-old was scoring lower than her American peers on the responsibility (Re), good impression (GI) and especially communality (Cm) scales. Surprisingly, in terms of achievement potential and intellectual efficiency, she was scoring above the norm for her high-school peers especially in the achievement via independence (Ai) and intellectual efficiency (Ie) scales. This is all the more important in view of her age as efficiency is believed to increase with age. The older student should score higher because of his increased knowledge. There were no exceedingly high scores in her profile, i.e. above the 70th percentile. As with the two previous female subjects (14 and 15), the social presence (Sp) and flexibility (Fx) scores were above the median for the test's general population and the high school sample's mean in particular, but still within their standard deviation. On the other hand, she did score significantly low in the communality scale (Cm) and, as mentioned above, rather low on the responsibility (Re) and good impression (Gi) scales.

The very low communality seems due to her age and recent sexual maturity. She was impatient, changeable, inattentive and forgetful. In older subjects this may be due to an imaginative and complicated nature. Those states were moderately reflected in the responsibility (Re) and good impression (Gi) scores. Again, the immature, awkward, changeable and even dis-

believing temperament, typical of early adolescence, was found here. Due to internal conflicts raised by the newly acquired physical maturity, her relationships with others remain for the present distant, cool and self-centered. Similarly, her youth explains the enthusiasm and ebullience expressed in the Social presence score (Sp) and the adventurous sometimes cynical temperament expressed in the flexibility (Fx) score. The changes in her intrapersonal and extrapersonal environment are therefore reflected in her behaviour. A dynamic view of personality justifies inconsistencies in behaviour in such terms. But is there not something which makes her unique? Despite the similarities with peers and superiors, can it not be expected that some of her "behaviour" will be idiosyncratic?

Subject No. 16: the Game:

The matrix produced by this thirteen year old was somewhat extraordinary. Unlike the previous subject, the cognitive structure was very stable and realistic. As would be expected from a young lady of her age, the centre of focus of the matrix (calculated pivot) is still within the parental family. The father, mother and brother were in prominent positions whilst the I^{13} block (Me) was more modestly positioned. The type and content of the pattern is contrary to the C.P.I. proposition that this subject is self-centred, cool and distant in her relationships with others. The relationships she had with members of her family were certainly close and self-centred. In addition, the position of I^{7} (friend) was similar to that of I^{1} (father), I^{2} (mother), and I^{4} (brother) and thus contrary to above hypothesis. Fairly close by, but less prominent than I^{7} were the roles of the "boyfriend" (B) and a "new friend" (I^{6}). The latter two blocks and the remaining blocks were

peripheral to the main structure. The matrix was stable and this would account for the very mature behaviour exhibited by the subject during the test session. The impatience, enthusiasm and immaturity in the C.P.I. were not fundamental to the subject's personality but are possibly due to her age. This type of pattern does explain the achievement potential and intellectual efficiency shown by the subject. She was not distressed nor inhibited by any internal conflicts. On the other hand, this pattern does not lend support to the impressive degree of imagination suggested by the C.P.I. Depth is being misinterpreted as complexity in her personality, because of her age. Finally, despite the stability even rigidity of the cognitive structure, future development may well be difficult for this subject. There is no evidence in the interview of internal conflicts due to development of the self, but it is assumed from experience with the Game, that when adults having such tight structures are subject to a degree of change similar to the one she must undergo, these conflicts will occur. That is, she will eventually be moving the emphasis of her cognitive world away from her parental family towards a nucleus of husband and children and this might well be traumatic. It is believed that the more dispersed patterns suffer from lack of structure and stability, but being less rigid are able to replace blocks without altering and therefore affecting the whole cognitive structure. The alternative to imagination and flexibility is stability and rigidity of structure. In the case of this subject the stability originates from the central cluster. Imagination and flexibility, though in limited quantity here, originate from the peripheral blocks to the right of the main cluster.

Diagram .46 C.P.I. profile in percentage frequency, for subject 17

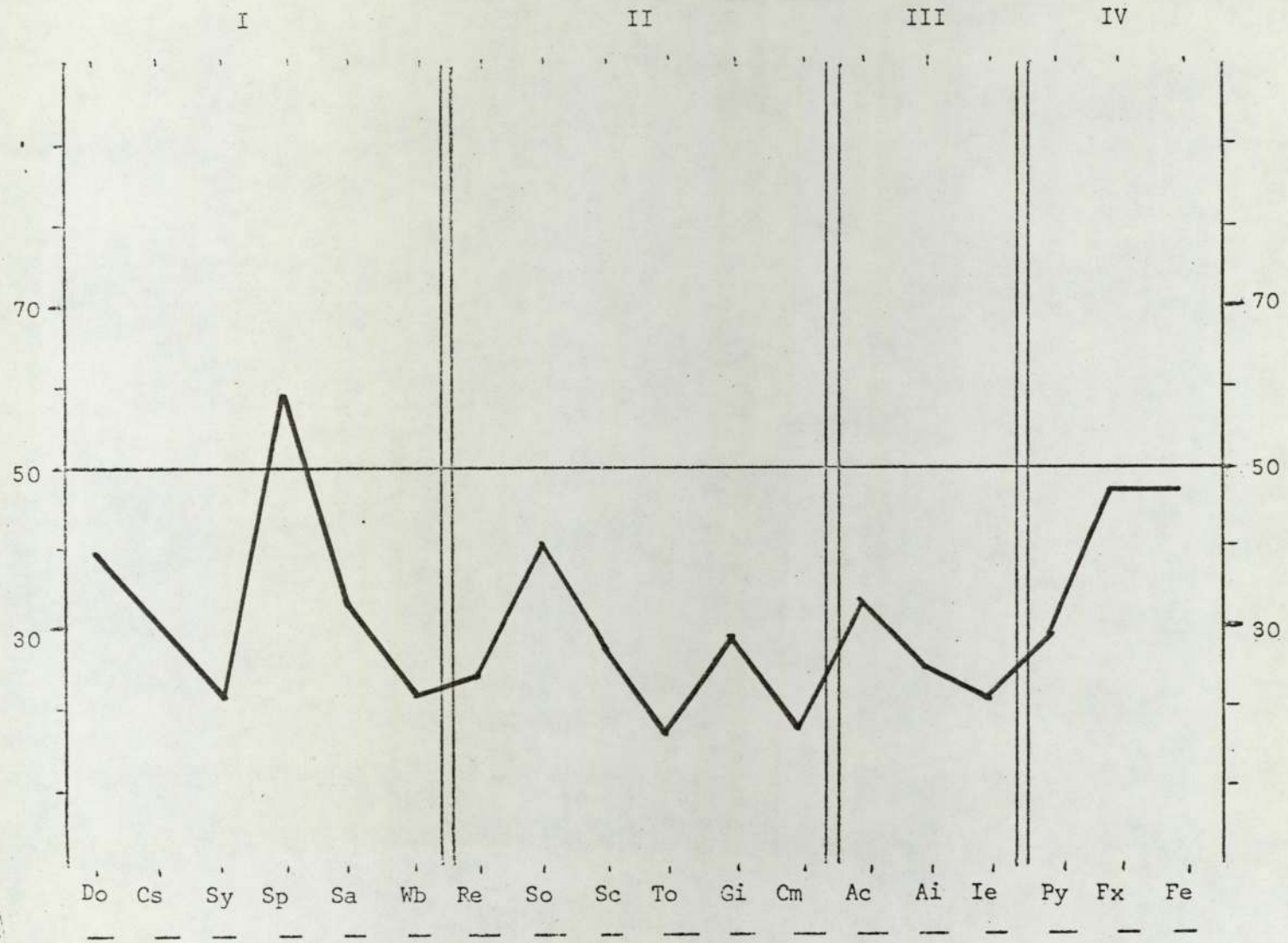


DIAGRAM .47

Mom	DAD	SIS-TER	NICE FEMA-LE	EDU-CA-TION	WORK	AN AFFAIR	T.V.	Music	FAMI-LY TROUBLE						
GET MAR RIED	MAR-RIAGE	WIFE	FAMI-LY	CHILD	MO-NEY	House Bought	House	CAR	MO-NEY						
BEST FRIEND	CLO-THES	SA-vings	NEW FRIEND	Books	DEATH	WORK MATES	NEigh-bour	OWN THINGS							
Hobby	PRO-MO TED	RECO-GNI TION	RACE	ME	UN EM PLOYED	RELI GION	Boss	LAW	POLI TICS						
WIFE's DEATH															

Subject No.17: the C.P.I.:

This was the subject 16's older brother. The most important aspect of his C.P.I. profile was that all the scores lay well below the median with the exception of Social presence (Sp). He saw himself as very low in terms of interpersonal and intrapersonal adequacy. Poise, ascendency and self-assurance may be affected by his short physical stature but is now, according to this test, a definite psychological problem. To a greater degree than even the general population of high school boys, he rejected the values associated with specialisation, maturity and responsibility. The subject was definitely committed to not observing traditional intrapersonal values. Similarly in Category II his C.P.I. scores are rather low. Due to slightly greater standard deviation of these scores, he was scoring within the norm for high school boys but at the lower end of the distribution. That is, his academic and intellectual behaviour reflect a low achievement potential and efficiency level.

In terms of unique features, he had scored near the 20th percentile in the following scales: Sy (sociability); Wb (sense of well being), Re (responsibility), Sc (self-control), To (tolerance), Cm (communality), Ai (achievement via independence) and Ie (intellectual efficiency). In comparison to high school boys his self-acceptance (Sa), good impression (Gi), and psychological-mindedness (Py),scores were also very low. (Note that his dominance (Do), and self-confidence (Sp) scores were identical to those of his sister's, suggesting perhaps that these are environmentally (family) determined). The two lowest scores were evidently tolerance (To) and communality (Cm). The first (To) deals with social beliefs and attitudes. Here the subject was described as being suspicious, narrow and reti-

ring. His personal and social outlook was passive, distrustful, and one of disbelief. His behaviour did not correspond to the normal pattern for the inventory's communality distribution. He was nervous, confused and perhaps deceitful. Undoubtedly his score is equated with having internal conflicts and problems. Future counselling sessions should enquire into his physical maturity and, more important, his real attitudes in these matters. The problems may be of a sexual nature and/or be due to his physical stature, for he is just sixteen and rather small even in comparison to his thirteen year old sister. However, the C.P.I. cannot elaborate on the origins of these problems. It is possible that the cause of this conflict is not physiological but psychological. His sister's growing independence may be making redundant his previously self-defining role of the older brother. Moreover the fact may be accentuated by its timing. He is now at an occupational crossroad, pressured by societal, parental and personal attitudes as well as the socio-economic realities. This stature suggests too that he may be late in sexual development, with all its psychological implications, for instance in terms of interpersonal relations with peers of the same and different sex.

This is the first truly different (atypical) profile discussed here and the C.P.I. has pointed out two possible sources of this individual difference, i.e. feelings of responsibility and self-assurance and adequacy. What the C.P.I. has not done is specify in concrete environmental terms the possible origins of this conflict nor the way in which the counsellor may help the subject. On the other hand the Game will present these in terms of the subject's immediate environment. In addition to describing this individual's relationship with the environment, the pattern might suggest real attitudinal, and

behavioural changes which would remove these conflicts (e.g. see subjects Nos. 4 and 13 in Section IV.4.4).

Subject No. 17: the Game:

This subject's Game pattern is of a simple linear type usually associated with lower intellectual potential. There have been exceptions, such as subject No. 5 in Section IV.4.4, but most linear-type patterns are associated with fairly uncomplicated personalities. For example, there is an abundance of such patterns in occupations usually associated with more average degrees of creativity and intellectual ability (Section III.4). There were, however, sections in his matrix which are flexible or ambiguous. These might be the source of the communality score (Cm) which described him as nervous, confused and deceitful. The top section of the matrix reflects the subject's internal conflicts. The first three blocks evidently represent his family. The remainder of the section is not as straight-forward. For example, next to his sister (I^3) is a block representing the concept of an attractive female (I^9). Most people use this block to represent an acquaintance. From the lack of individuals in the remainder of the section, this block may be used as a concept associated with I^3, though this should be cautiously investigated in subsequent interviews if indeed necessary. Two other important blocks were evidently related to the I^3 and I^9 combination. They were "having an affair" and "trouble in my family", which were spaced by unrelated and, in this matrix, unimportant blocks. Note too that there were two blocks preceding I^3 and I^9, emphasizing a second-order level concentration upon these (See Part II). Finally, we may not that the first block in this linear pattern is I^2 (mother). It is not unusual, at this age, to find that it may be a more important concept than father (I^1). Society

prefers to wait until children become adults to inform them that their secret wishes, dreams and behaviour were not only transient but normal and necessary. The subject is at an age when his awkwardness might seem an obstacle to his ("ever") gaining sexual experience and it may be relatively common for boys to momentarilly turn their attentions towards a more receptive person such as a mother or a sister. Note that in the past such behaviour was rewarded by love and attention.

The subject's self-concept is still developing and he is therefore, torn, by what may seem at the moment, deep internal conflicts. It seems that it is his sexual development which is causing the confusion, the rejection of traditional values and the feelings of inadequacy in both intra and inter-personal settings. Once the problem area has been defined it is a matter of choice, for the counsellor, as to which approach is more suitable to help the subject in his self-development. The non-directive counsellor may let the client find his own way towards defining the causes and then solutions for his internal conflict. For example, a Rogerian would contend that he must help the subject liberate his own existing capacity for self-actualisation. A transactional approach would wish the counsellor to guide the subject to determining his role and specify its relationships in a changing environment. A perceptual-phenomenonological approach might use role-theory to look at some aspect of the subject's life. There are rational-approaches, such as Ellis's, which attempt to cure unreason (emotional) by reason (the rational). Finally there are also learning, psychoanalytical and existential-psychtherapeutic approaches which can be used. These are outlined in, for example, Patterson (1966).

The four remaining sections of subject No. 17's matrix

were less important than this first one. They were separated from this first section by a blank row of the grid. In terms of these last four sections the row beginning with E^{61}, a section which deals rather fancifully with marriage, will probably be given priority. In time the first section (I^2, I^1, etc.) may be allocated to a less important role and it will then be easy for the subject to stabilise his cognitive world structure, including the second section. The fourth and fifth sections were straight forward in that they respectively dealt with his future career and events to be avoided which were beyond his control. At his age (16) neither of these areas can be specifically defined. The third category is, on the other hand, confused. It would seem at the present time to be dealing with his friends and peers of the same sex. It is now an important "world" but might later be amalgamated into, for example, section four and/or section one.

In summary, this subject was feeling inadequate as a person and in social interactions. Occupational discussions were not at the forefront of his mind as he was dominated by the ambivalent feelings he had towards his sister. The interview discovered that he made a career choice which now makes only minimal commitments on him in terms of time, education needed, and parental expectations. His decision to become a draftsman organized his career plans (section four of the matrix) and permitted him to focus his attention on his more important problems. In time, with or without professional counselling, he should stabilise and therefore normalise his cognitive world structure.

Subject No. 18: the C.P.I.:

This young girl was a sixth-form student from a Birmingham school, as were subjects Nos. 14 and 15. Category I in her

Diagram .48 C.P.I. profile in percentage frequency, for subject 18

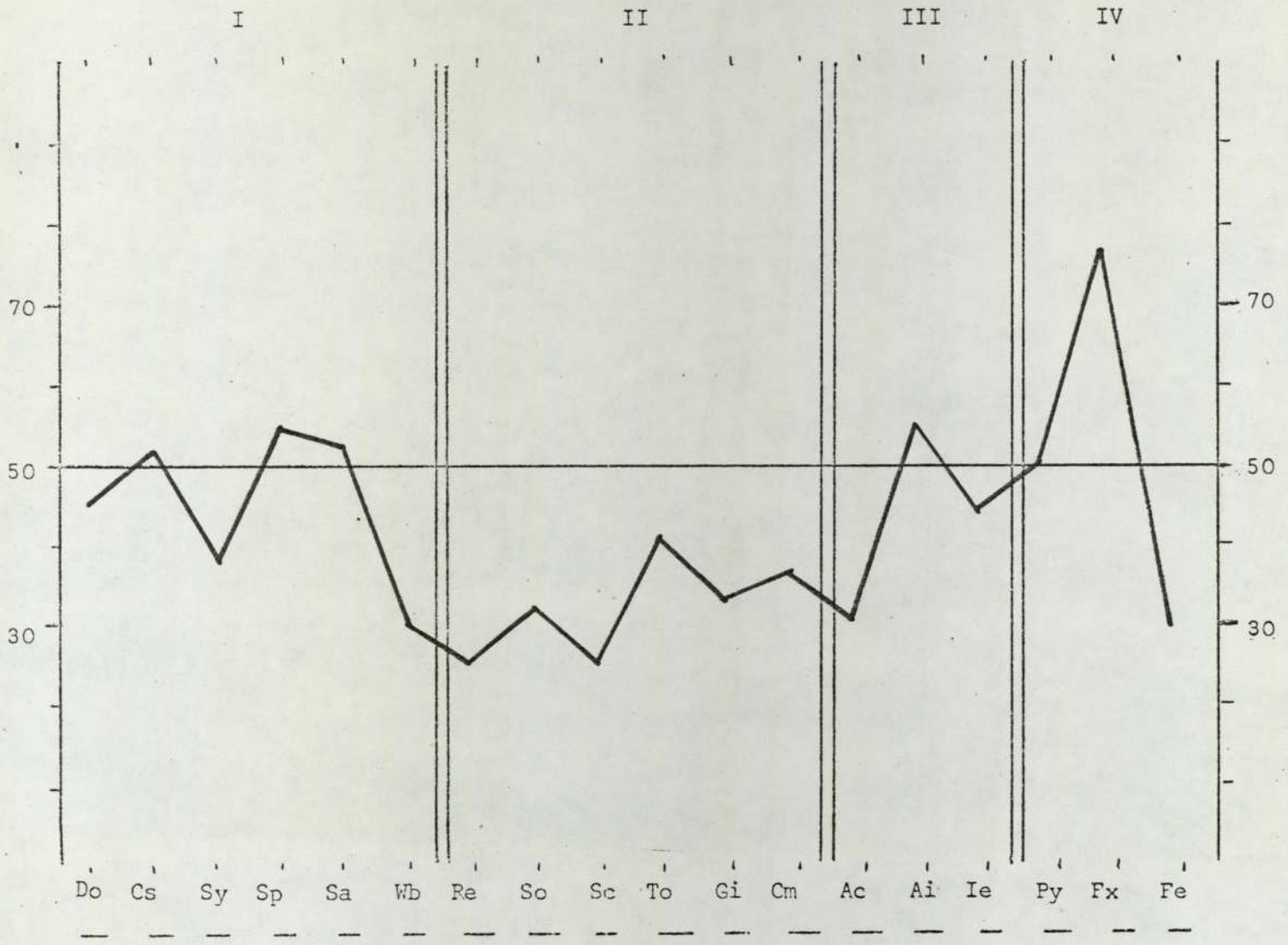
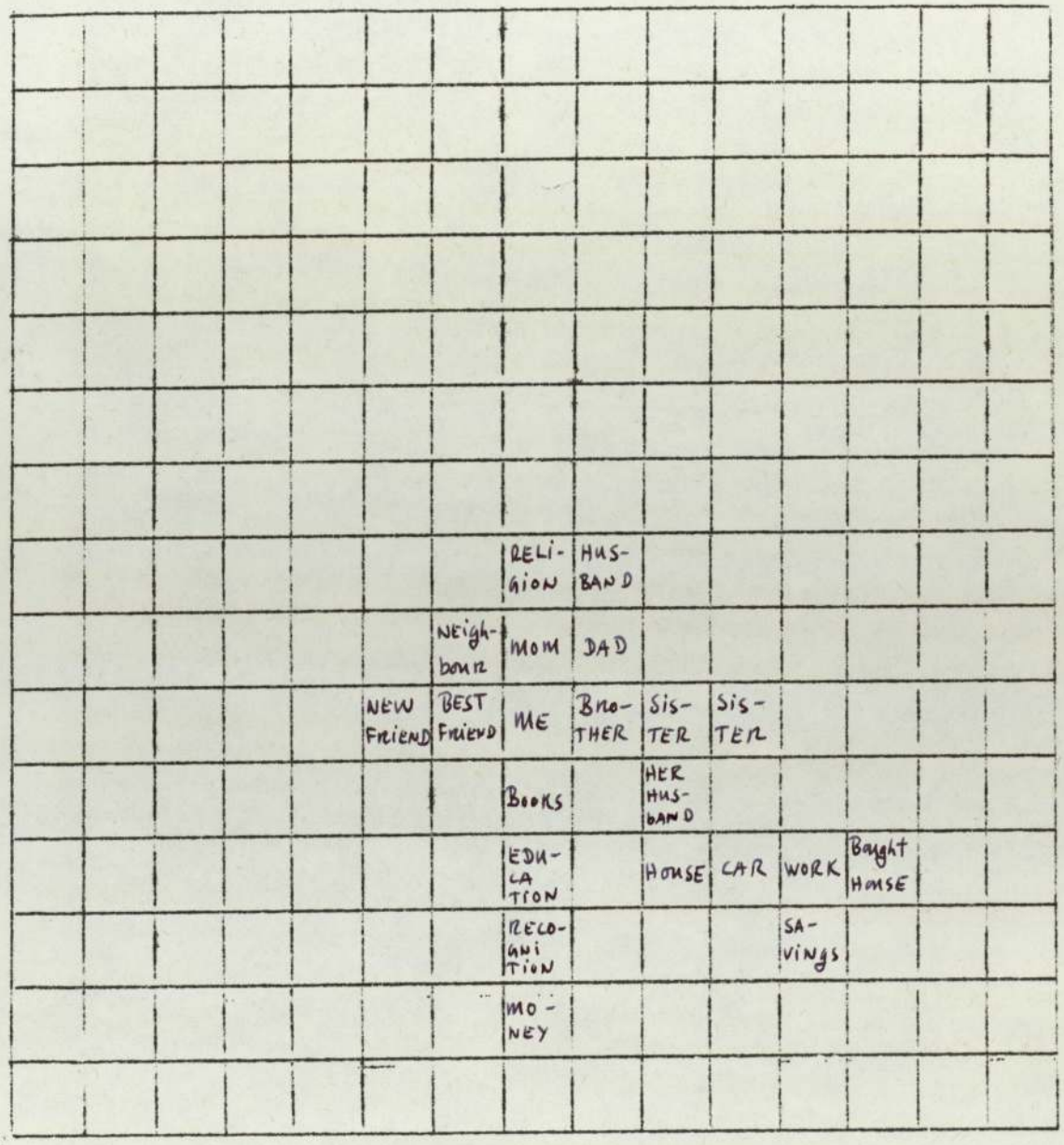


DIAGRAM .49


RELI-GION
HUS-BAND
NEIGH-BOUR
MOM
DAD
NEW FRIEND
BEST FRIEND
ME
BRO-THER
SIS-TER
SIS-TER
BOOKS
HER HUS-BAND
EDU-CA TION
HOUSE
CAR
WORK
BOUGHT HOUSE
RECO-GNI TION
SA-VINGS
MO-NEY

profile is not as consistent as is Category II. Her generally low scores in Category I denote a less positive disposition towards traditional values of socialisation, maturity and responsibility. This rejection of traditional value-structures is rather lower than that observed in the norms of her American high school peers. With the exception of flexibility (Fx) and femininity (Fe), the scores of the other three categories fall within the norm for her age-group. The flexibility score was the highest score recorded and therefore she was rated as insightful, adventurous, idealistic and possibly egoistic. Her femininity score, though not the lowest of her profile, was rather unusual as it indicated more masculine interests. This young lady was quite attractive and, more important perhaps, she was aware of her physical charm. This Fe score conflicts with her behaviour and appearance. There was little evidence of an outgoing hard-headed, robust and masculine nature! The other two low scores recorded were responsibility (Re) and self-control (Sc) and it is possible that her youth accounted for this trend. Immature, disbelieving and awkward dispositions are quite typical in youth, and may well account for a self-centred nature involving a degree of dogmatism due to personal biases. The low sense of well-being (Wb) and achievement via conformance (Ac) scales, though belonging to different categories of disposition and temperament factors, also described her in terms typical of early adolescence such as awkward and opinionated.

Once again the C.P.I. was able to tap typical nomothetic attitudes and behaviour, yet it contributed little to the real understanding of the subject. Certain discrepancies occurred in addition to that with the femininity scale (Fe) discussed above. For example, both an interest measure (See subject

No. 26 in Section III.3) and an in-depth interview revealed that the subject had realistic occupational plans in view of her interests, abilities and environment's opportunities, yet the low achievement via conformance (Ac) score would suggest a pessimistic attitude towards her occupational future. The C.P.I. seems to lack differential and precise interpretation of attitudes and dispositions, and neglects the idiosyncratic nature of the subject. It does, however, perform rather well in the global analysis (postdiction) of interpersonal behaviour and social-attitude structures.

Subject No. 18: the Game:

This subject had a very stable cognitive world. (Diagram 49). Unlike subject No. 16, hers will remain similar to this over time. I^{13} (Me) was definitely the centre of this matrix (calculated pivot) and need not be dislodged by time or events. There are worlds which are independent of each other yet linked to I^{13}. For example, there is a section involving the parents (I^{8}, I^{2}, I^{1}) which is in a prominent, but neither crucial or rigid position. For example, I^{10} (husband) may later trade positions with this world. There is a less important section dealing with peers (I^{6} and I^{7}) which probably will not expand in the near future but whose P-value denotes an appropriate degree of concern for others. Immediately below I^{13} is a less important section dealing with more personal aspirations and interests. Despite the absence of the S^{47} (work) it will probably develop into a work-oriented world. In fact the interview did emphasize the realism and important but not vital role of this world to her self-concept. Her interest measure (an A.P.U. Guide, see Section III.3) did point out her concern for people and probable science-oriented career, both points having been repeated in the Game and its interview. An important sec-

tion uncovered in the Game and later discussed by the subject in the interview, involved a close relation with her brother and two sisters (I^4, I^3 and I^{14}). The remaining blocks belonged to the periphery of her structure and were assumed to be easily displaced. A compination of these will probably be linked to I^{10} or to the career world, as circumstances change in her life. The advantage of such a matrix is that it provides a high degree of security, stability and organisation. When events and conditions impose a change of structure, such as the replacing of the parental family by a personal (marital) one, the core (I^{13} in this case) need not be traumatically displaced. It is expected that this subject will not undergo any deep personality adjustments due to changes in her environment and she may benefit immediately from the stability and organisation of her Cognitive World Structure.

Subject No. 19: the C.P.I.:

The following two subjects were older than the previous subjects discussed and are thus young adults. The first was a young man who came from a fairly disturbed family environment. The mother in particular showed a degree of neuroticism and a number of guilt complexes because of recent symptoms of (catatonic) psychosis in another of her children. The subject too had been under treatment for neurosis and depression. The C.P.I. profile for this young man was erratic. In the four categories there was little evidence of consistency, with scores vacillating considerably across the median. There was, however, a tendency for most scores to be significantly below the median for the inventory. In particular intrapersonal structuring of values shows the subject rejection of tradition values related to socialisation, maturity and responsibility. Certainly the most unique feature of the profile was this man's exaggerated

Diagram 50 C.P.I. profile in percentage frequency, for subject 19

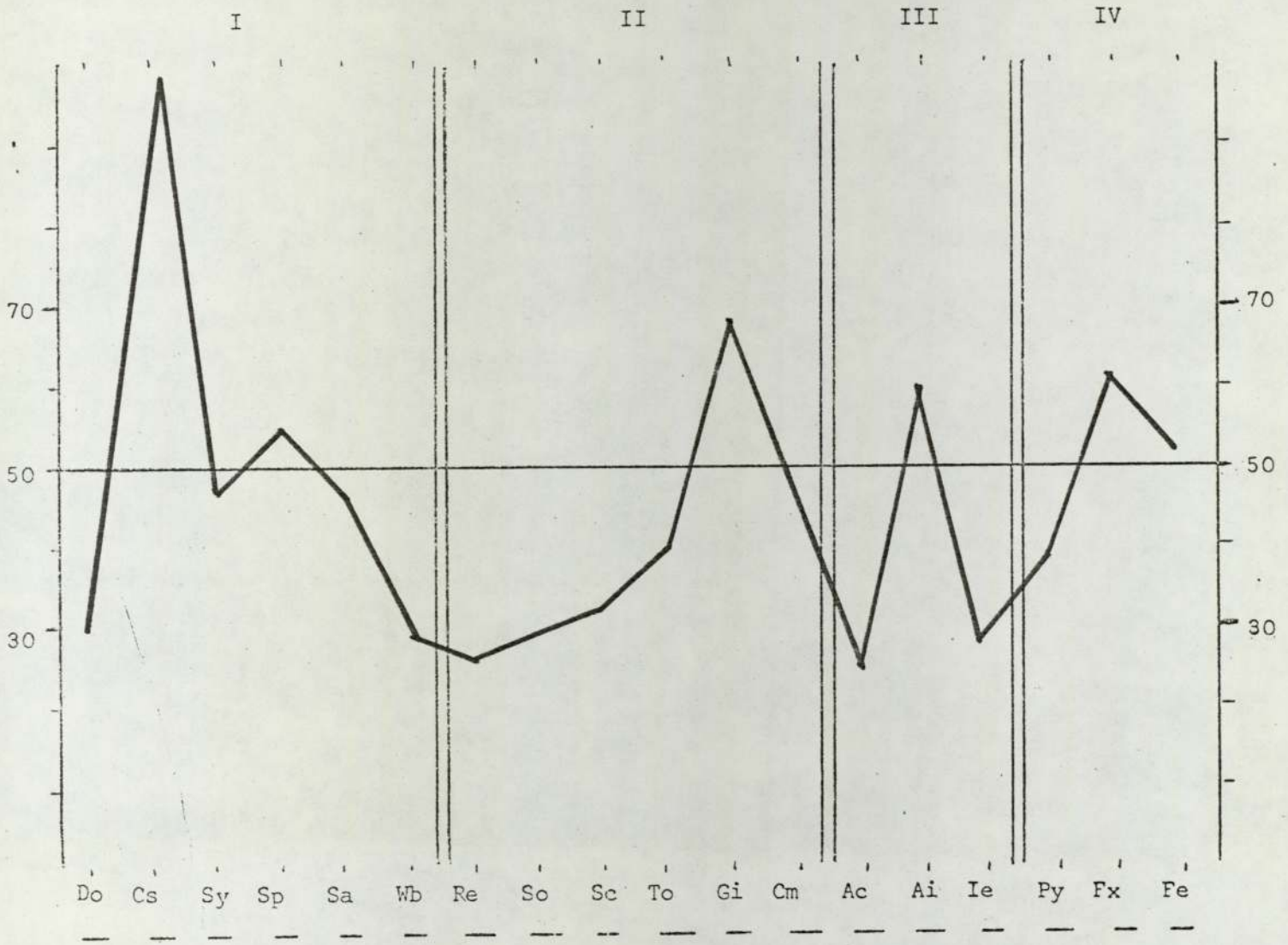


DIAGRAM 51

						ME								
					UN-EMPLOYED	AN AFFAIR								
						GET MARRIED								
			OWN MONEY			HOUSE Bought			BOOKS	MUSIC	CLOTHES			
			CAR	SAVINGS							MARRIAGE		CHILD	
			WIFE			HOUSE	PRIVACY	OWN THINGS		WORK	WORK MATES	BOSS	PROMOTED	
		DAD		MOM				OTHER'S DEATH						
			FAMILY TROUBLE					WIFE'S DEATH				NEIGHBOUR		
		SISTER	FAMILY	BROTHER							EDUCATION	LAW		
										RELIGION	RACE			
			BEST FRIEND				T.V.	NEW FRIEND						
	NICE PERSON						Hobby	POLITICS					RECOGNITION	

capacity for status score. This described his personality as versatile, insightful, as well as ambitious and resourceful. The rating for "effective in communications" and his "having personal scope and breadth of interest" should be regarded with suspicion. For example, his dominance (Do) score was below the thirthieth percentile indicating a retiring, inhibited and unassuming nature. This lack of self-confidence was not the mark of an ambitious communicative person with "great capacity for status". Similarly, his good impression (Gi) score conflicted with a low responsibility, socialisation and self-control score. The first described this man as co-operative, outgoing, dilligent and persistent. Yet the responsibility (Re) score described him in terms of moody, changeable and lazy in disposition. Meanwhile, socialisation (So) ascertains that he is undependable, perhaps even guileful and deceitful in dealing with others. The common feature of the above scores seems well described in the achievement via conformance (Ac) score, i.e. his being insecure and easily disorganised under stress. The dominance score (Do) pointed to his lack of self-confidence. The sense of well being score (Wb) found him self-defensive and constricted in thought and behaviour. The responsibility score (Re) labelled him as immature, changeable and impulsive in behaviour. In addition to the possible deceitfulness of his nature, the socialisation scale (So) added that he was given to excess and exhibition in behaviour, a fact suspected in view of his capacity for status score (Cs). Similarly, the low intellectual efficiency score (Ie) underlined a lack of self-direction and self-discipline as well as noting a confused and shallow nature.

The C.P.I. scales have extrapolated from the man's answers, the existence of a problem with this self-concept. More im-

portant perhaps is the point that the non-integrated nature of the self is affecting his social behaviour. What is to be done about it? In terms of real behaviour, both interpersonal and intrapersonal, what is the cause, the origin of the problem? Is it the present state of the self, as Allport would expect? Is it a deep childhood fantasy or trauma such as a psychoanalyst would search for? Finally, what can be done about it today? The C.P.I. gives no hint as to the solution or causal understanding of the situation.

Subject No. 19: the Game:

This subject should be fairly advanced in terms of development of cognitive structure and yet he was still suffering from conflicts of adjustment with his environment. He had understood that the problem is not resolved by simply blaming environmental circumstances. Hence he has tried to structure his interactions with this environment beginning with I^{13} (Me). Hierarchies whose "point de depart" for a conscious attempt at structuring one's environmental interactions is I^{13}, are believed prone to disorganisation. This is so because the simplicity of the structure often clashes with the perceived complexity of interactions between the parts of the environment. Hierarchies are successful when the environmental interactions are themselves simple. Some hierarchical cognitive world structures beginning with I^{13} were both successful and complex, but they had been attempted by chronologically and experimentally mature people (e.g. subject No. 10, Section IV.1).

The matrix pattern shows a fair amount of disorganisation and an analysis of the sections or worlds also reflects this confusion. A first example of this is that he had linked I^{10} (wife), with father (I^1), mother (I^2), sister (I^3) and brother (I^4) into one unit, and yet had in the opposite corner of the

matrix I^5 (child), S^{43} (marriage), etc. The subject, did not have a brother! His including I^4 might suggest that he was being deceitful, which is unprobable due to the nature of the Game, the test situation and his own motivations to partake in the study. On the other hand it was possible that he was either being unrealistic, i.e. he was doing some wishful thinking for example, or that he was even showing schizoid tendencies. Next, despite the C.P.I.'s description of this subject as versatile, ambitious and with a scope and breadth of interest, the Game underlined, with his positioning of E^{63}, (me achieving recognition) that the contrary was true. His "category width" (Gardner and Schoen, 1962) might suggest a diversity of interest though the content of these worlds had neither consistency nor depth.

Of the last five sections, three were composed of independent blocks, one of which is E^{63}. The two remaining sections dealt with arbitrarilly differentiated interests and hobbies. A stable, organised individual would have linked these two latter sections, and possibly all five sections, into one group. In conceptual differentiation terms, such as those of Gardner and Schoen's (1962) rather than Glixman's (1965) research into this cognitive style, this would not have jeopardised the measurement of scope of interest and yet it would have linked these sections together so as to give more structure to the pattern. The situation here resembles more a disorganised and confused search for structure than a real diversity of interest.

The five sections just discussed fall below the row with the maximum P value (Note that a calculated pivot is found by searching for the row and column with the maximum P value). Though in this case it falls on an unoccupied square in the grid (row 11, column 7), this point is quite distant from I^{13}

the starting point for his structuring of his cognitive world. The sections falling below this "calculated pivot" were shown to be unstructured and confused. The six sections lying above it had more apparent structure but their contents were confused. The two "family" sections introduced are an example of this. The world of work on the other hand had a well balanced structure and content but seemed too remote to help stabilise the whole matrix. That is, it was as if the importance of this world was not great enough to help the subject attain the stable and consistent platform from which he can put order into the rest of his environment. (See Peters 1968).

In summary, this was a subject who had fallen behind in his development of a stable self-concept. Perhaps the family environment is to blame, for instance the trouble with his mother and sibling. Unlike subject No. 14, he does not have a stable world in his cognitive structure to which he can retreat or from which he may begin developing a stable schema for environmental interaction. Despite its restrictions on freedom and independence, this is one major role of a family has in the formation of an individual. However, many people have "survived" unstable family environments and traumatic upsets in their world.

The root may be in the past, but the problem is one of the present. This subject must begin by stabilising one of the parts ("worlds") of his environment. It is from this stable point that he may begin to analyse and describe his other world in terms of interaction. He may retreat to this stable world for self-definition and rest from the sheer task of ordering one's life. The world of work looks like the only stable portion of his environment and the counsellor should focus his attention on to it. Here a "rational" or

"perceptual-phenomenonological" approach would perhaps be most beneficial. Until the subject has developed (a) a part of his environment to a point of stability and (b) developed the response of retreating to it when in a conflict situation, a psychoanalytic type approach would be detrimental. It is important to emphasize that this "retreat", in this case to the world of work, is not a physical one but a psychological one. For example, a certain situation may demand a definition of the self such as in a complex selection procedure involving interviews and test behaviour, or again in a deep social interaction such as with a "special" person of the opposite sex. The subject may define himself as a programmer or a man interested in computers rather than seek definitions of the self based on future plans and wishes, or past interactions such as with his family and peers. The C.P.I. pointed out that a problem did exist, though, unlike the Game no reason for this conflict or problem was given and no answer could have been suggested. The Game alone is not a panacea for such cases. It too needs, indeed requires, the subsequent presence of an experienced counsellor. What it has done, is to analyse in real terms the origin and more important the steps to be taken to help the subject resolve the conflict.

Subject No. 20: the C.P.I.:

This last subject was a married woman in her early twenties. Her C.P.I. profile was generally lower than would be expected for her age, and had no extraordinary features or peaks. The scores in Category I express a general lack of self-assurance and low feelings of interpersonal adequacy. The remaining categories have their locus somewhere found below the median but individual scales were sometimes found above it. The highest and lowest scores were respectively femininity (Fe) and sense

Diagram 52 C.P.I. profile in percentage frequency, for subject 20

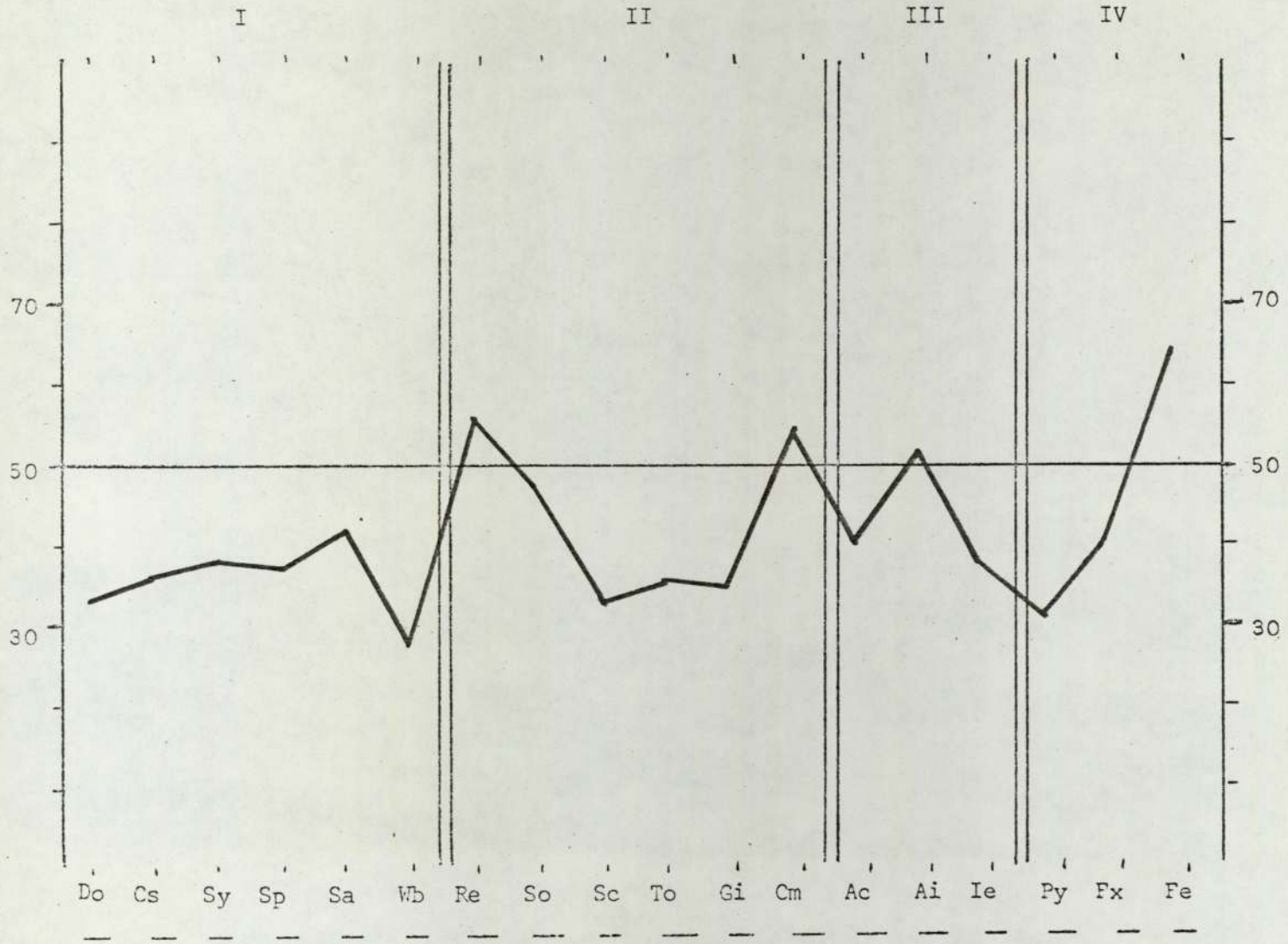
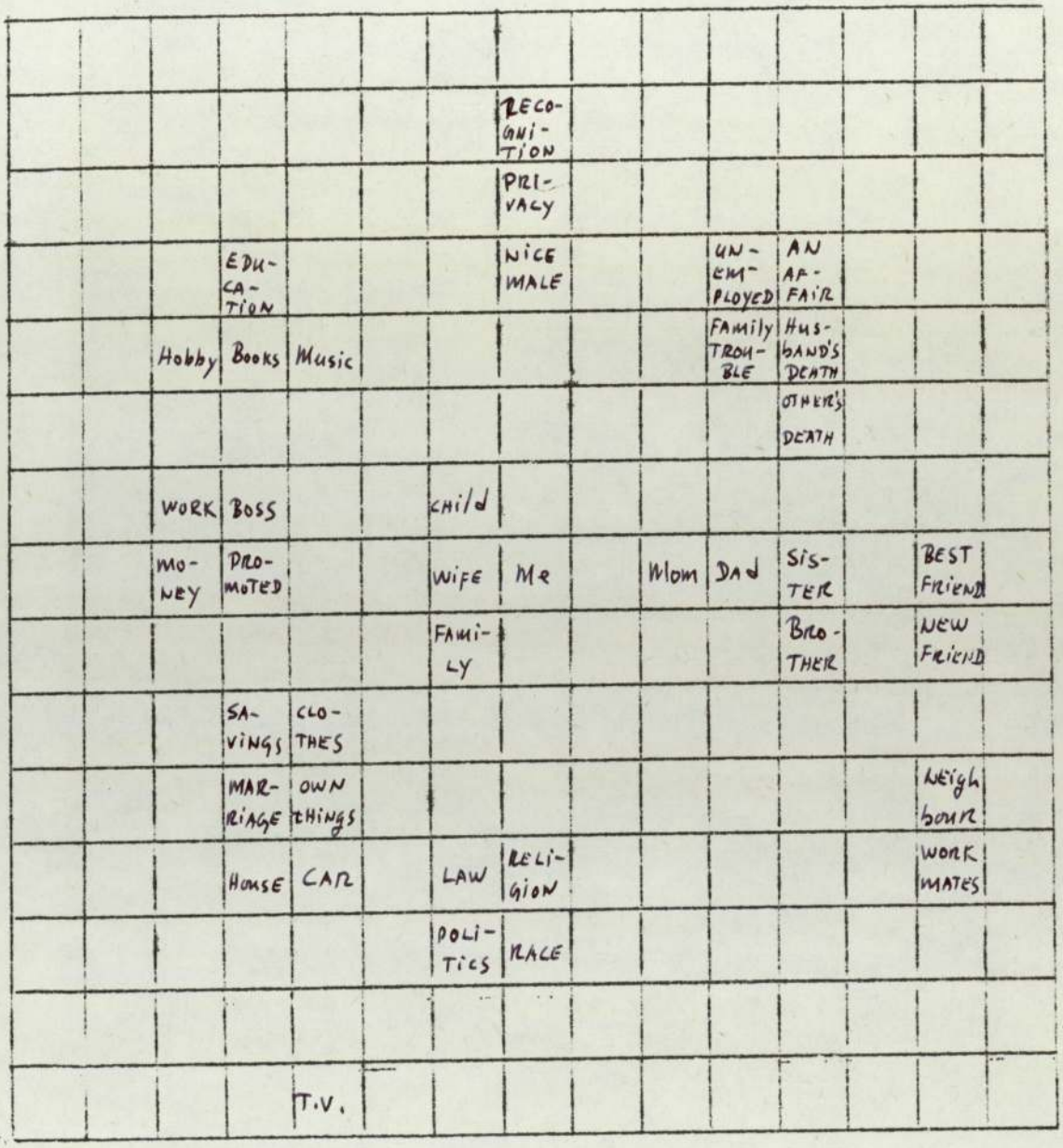


DIAGRAM .53


RECOGNITION
PRIVACY
EDUCATION
NICE MALE
UNEMPLOYED
AN AFFAIR
Hobby
Books
Music
FAMILY TROUBLE
HUSBAND'S DEATH
OTHER'S DEATH
WORK
BOSS
CHILD
MONEY
PROMOTED
WIFE
MR
WIDOW
DAD
SISTER
BEST FRIEND
FAMILY
BROTHER
NEW FRIEND
SAVINGS
CLOTHES
MARRIAGE
OWN THINGS
NEIGHBOUR
HOUSE
CAR
LAW
RELIGION
WORK MATES
POLITICS
RACE
T.V.

of well being (Wb). Though an item analysis is not warranted, this subject certainly had a wish to express her sexual nature. It is possible that the Fe scale has picked up this sexual reality, but more probably it has focused on her recent occupational interest in childcare and social work. This score describes her as helpful, gentle, sympathetic and respectful of others. The Wb score (sense of well being) on the other hand, hints at a possible apathetic nature and a certain constriction in thought and action unusual for social workers. Presently she was living in a stressful post-marital period, which is not atypical in the first years of marriage, and where husband and wife's career plans are antagonistic. This would account for her low Do score (dominance), i.e. tending to avoid situations of tension and decision, as well as the above apathy.

With no specific problems, the C.P.I. functions quite well. The counsellor is however, faced with a lack of real information with the exception perhaps of the profile's differential elevation of the four groups of scales. An item analysis with such a lengthy instrument is not feasible and an in-depth interview must be planned. The Game on the other hand would have reduced the interview/contact time between the client and counsellor and have provided pertinent information despite the "normality" of subject. This "lacune" in the C.P.I. is particularly distressing as Gough (1956) assures us that the ofjective of the test was to deal with normal, "non-psychiatrically disturbed" subjects.

Subject No. 20: the Game:

Unlike the previous two subjects, there is no "problem" here. Like the C.P.I. the Game has been developed for use with normal subjects. It is expected that such a subject might, at some time, seek the help of an occupational or marriage

counsellor. That is, not everyone who seeks help from a counsellor has deep internal conflicts. As described in the C.P.I., four features of this young lady's "personality" emerged. The first question raised (and unanswered) by this test was the actual interpretation of the high femininity score (Fe). Does the helpful, gentle sympathetic nature exposed by the femininity score refer to sexuality or to caring? In the light of this question, how does a counsellor using the C.P.I. interpret the low elevation of her profile and the sense of well being (Wb), and dominance scores (Do)? That is, can one who is helpful, sympathetic and respectful of others, also be apathetic, constricted in thought and action, seek to avoid tension and decisions, have a low feeling of interpersonal adequacy and self-assurance, and yet be a successful child-care worker? The Game on the other hand, answers rather than asks the questions. There is structure and consistency within the categories produced (Diagram 53), yet such a pattern obviously lacks an overall structure. Patterns such as these are common and all the subjects need not undergo phychotherapy. Though there are advantages in having a structure similar to subject No. 18's it would neither suit everyone nor Society to create this "brave new world". In this case, the subject had a number of separate peripheral sections. The top three groupings, for example, were not areas upon which she concentrated. The first dealt with general intellectual interests. The second dealt with the fantasies and wishes which were possible such as becoming successful, popular and eventually separating herself from her present life. The third involved events which she would simply wish to avoid. Similarly, the two lower groupings in the matrix were peripheral. First, there was television and its place in her present interests. Secondly, there were the

concepts of race, politics, religion and the law which are topics of conversation rather than interests on their own accord. The remaining groups of blocks were more central physically and important psychologically to the matrix structure. This can be verified by their content.

Certainly the most striking feature of the matrix is the use of individuals and in particular their importance to the core of the pattern. That is, not only do these blocks belong to the core of the pattern but their P values and distances emphasize their importance. This confirms the suspicion that the high femininity (Fe) score is due to her interest in people. In the light of this concern for people, the findings from her scores on the sense of well being (Wb) and dominance (Do) scales and the overall degree of elevation of her C.P.I. profile are explained. Unlike the suggestion by the C.P.I. scores that these were independent features, the Game links these to the precarious stability of her type of cognitive structure. There is therefore, more than a semantic link between her personality and her low self-assurance, feelings of inadequacy in interpersonal relations, the lack of organisation in her behaviour and what the C.P.I. called apathy. The relation with her husband may be temporarily settled, but the role he plays in her world and the role of family, marriage, etc, are less than consistent and stable. For example, the S^{43} block (marriage) is associated with a different (separate) category in the matrix whereas in most cases, it would be linked to I^{10} (husband), S^{44} (family) and I^{5} (child).

Secondly, it may be noted that I^{13} (Me) is half way between her parental and marital families. For a younger girl like subject No. 14, or a different type of structure like subject No. 18's, this is quite acceptable. This is, however, unusual

in such structure in view of her age and maturity. Thirdly, not only is the calculated pivot not central, but neither is it very close to I^{13}, and nor is it near the group of blocks representing her husband. Recent conflicts with her husband were blamed on their conflicting careers, and not on either's personality, it was revealed in the post-Game interview. The reason for the conflict seems more fundamental. Despite the fact that the calculated pivot is E^{64}, i.e. career oriented, it is not central (core) to the matrix nor is ti very close to I^{13}. Finally, this type of structure, rather unlike tighter patterns is more flexible and can thus be easily changed without traumatic consequence.

IV.4.5.4 Conclusion

The difference between the underlying theories of the Cognitive World Structure Game and Gough's California Psychological Inventory (C.P.I., Gough 1956), are fundamental. The latter defines personality as a changing entity whilst the former stresses the existence of a consistent cognitive structure. More behaviouristically, the Gough inventory is not perturbed by dramatic reversals in personality. The advantage is certainly the facilitation of interpretation or description of a person. However, if one accepts that personality may change fundamentally, it becomes irrelevant to attempt to predict future behaviour. At best the complexity and variety of environmental circumstances and stimuli, which are the causes of this personality, must still be analysed, classified and then in some way related to the prediction of behaviour, perhaps in terms similar to those of the C.P.I. A posteriori description of people is only useful in evaluating a hypothesis in terms of eventual prediction. Even criminology, which for example may use postdictive evaluation for such things as sen-

tencing and punishment, hopes to predict and thus influence future behaviour. It thus seems that the C.P.I. has added to the psychologist's (verbal) repertoire for description of subjects. The problem of prediction, the real goal of science, has not been advanced. That is why the Game, like many of its predecessors sought to analyse the cognitive structure itself. However, recognising the place and role of the environment in personality development and determination, the Game has made steps towards its description, analysis and classification.

The emphasis so far in the thesis has been on the value of the Game in the study of organisations and occupations within these. What information does the Game give concerning the individual himself, i.e. the ideographic aspect of occupational research? Here the counselling situation is first given a much wider definition and scope. With this in mind a first "mise au point" is made where the phenomenon of leadership is re-defined. Next some types of dyad-teams are studies in search of an explanation for that phenomenon which links its members. The Game is then applied to individual cases to show how it may be used in a counselling setting. Finally the C.P.I., a sophisticated version of the type of personality measure available to counsellors, is compared to the Game in a few applied cases.

PART V CONCLUSIONS

V.1 Summary

The study began with a general introduction to the content and aims of an occupational research methodology. The pilot study which preceded this report was then summarized. It not only put the problems of occupational research into a real perspective but also introduced in general terms the orientation of this thesis. Firstly, one occupation was studied in depth: that of Probation and After-Care Officer. In doing so, this pilot study uncovered three components which would determine the orientation of the following studies. First, there was need of a macro-model for such research with suggestions made for the actual make-up of this model. Secondly, it underlined in a practical sense the need for a personality component in this occupational research method and the inadequacies of current tools for measuring this component. Thirdly, it discussed some of the advantages in using an interview in this research so as to emphasize the multidimensionality, a point which later influenced the creation of the Game. Next, the Model itself was developed for this method of occupational research. It attempted to circumscribe the whole area by producing a three-part taxonomy, i.e. of Man, Job and Environment. After briefly introducing the model and its origins, alternative models were discussed. Finally, the model was discussed in terms of its place in general psychology.

Sections I.2.1 to I.2.3 described in much more detail each of the Model's three blocks. The Job component was shown to have two major approaches. These were very similar to Professor Alec Rodger's "fitting the man to the job" and

"fitting the job to the man". Undoubtably, improvements to the study of this block can be made. Nevertheless, it was argued that this area had developed much expertise. The second block involved the study of the environment. A taxonomy of environmental sources of influence, on the worker, was introduced. Basically, the area was divided into remote and immediate environments. The remote environment's influences were considered as the domain of sociology, economy, political science, and so on. The immediate environment was also introduced with special reference to the idea of "worlds". That is, each person's immediate environment is composed of a number of worlds, such as family, work and his friends. The third block received the most attention.

As the pilot study was emphasized, the problem of measuring Man was both crucial to the development of the method, and the present tools for measuring personality were inadequate. The study of Man was believed best approached from two viewpoints. These involved looking at Man in terms of processes and properties. Both of these were analysed and developed theoretically. Moreover, the use of "model psychology", as suggested in the pilot study, was expanded. Finally, a breakdown of the Man block dealt with the pilot study's suggestion that profiles of the worker could be developed. As would be expected, the main discussion here involved the existing tools developed by Herzberg (1957) and Cattell (1970). The last section of Part I continued the discussion on the measuring of personality. In particular, traditional and popular theories, models and tools in personology were looked at. This was done with special regard to Mischel's (1967) critical analysis of the field. Once again, the tools were found to be inadequate if not misleading and

concrete suggestions were put forth. These suggestions literally form the basis of the Cognitive World Structure Game.

Part I had developed a model for occupational research but had found that the study of Man, the most important part of the Model, could not be satisfactorily undertaken in view of existing models and measures. Part II summarized the Cognitive World Structure Game, the proposed alternative for the study of Man. This forms the basis of a preliminary manual or handbook for the Game.

First, the Game's background was linked to a number of influences such as: existential philosophy, the concept of personal distance and the work of Sommers (1967), and finally, the idea of a sociogram (Moreno, 1934). Next, and more important here, was the development of a third type of stimuli, a "universal" stimulus set, which had been conspicuously absent from psychometrics. This section clearly distinguishes the Game from projection theory (Sechrest, 1968). Implicit in the discussion is also its difference from semantically biased stimuli such as found in Osgood (1957) and Kelly (1955). As would be expected, the universal-stimulus set is finally differentiated theoretically and operationally from the very popular "loaded" stimuli found in most trait-oriented personality tests. Thirdly, in Part II, the Game's response mode was discussed in terms of the actual and theoretical implications. A large part of the discussion centred round the idea of response sets and their relation to the Game. This is a fairly common practice in most personality test manuals (See, for example, Cattell, 1970 and Eysenck, 1964). Fourthly, Part II contains an explanation of the environmental approach which underlined the Game and its development. In brief, the

Game's underlying theory of personality is that an individual is defined by the way he interacts with his environment. It will be recalled that an individual's immediate environment was found to be composed of a number of worlds. Not only does he differentially interact with these worlds, but he plays different roles in each. For example, at work an individual may be regarded as an expert in psychology. Meanwhile, at home he may be seen to be as capable of mending the car as bringing up the children. The cold scientist, the loving father, the handsome mysterious man in the commuter train and the witty party guest can indeed be the same person. The roles or definitions of the individual are made by the environment or more precisely his interaction with his environment. The Game's manual and much of the remainder of this thesis has shown that there are individually different patterns of such interactions with one's environment. Next, the handbook (Part II) discusses the social psychology of testing with particular reference to the Game. This aspect is not found in other manuals. First, in the development stages of these texts a large population is believed synonymous with validity and reliability and is obtained via group testing. Group testing usually employs a setting and not unlike that of a traditional school examination. Perhaps the psychometrist uses the strict nature of the context to justify his test or to impress upon the subjects the importance of the research. Secondly, most measures seek to be expedient in terms of the psychologists who will later use this test. Once again, an academic-like context with problems, questions and answers, in addition to a teacher-like supervision, is believed to be advantageous. The instructions to the tester found in such manuals attempt to create a similar type of

experimenter bias (Mischel, 1967) across all test situations. Rather than equate such experimenter bias, the Game's approach described in this section is to remove this particular kind of bias and indeed reduce other types whenever possible. The advantages of an interview-like session, which it is argued best controls experimenter and test-environment variables, were discussed here. Operational suggestions for benefiting from these were made and include such aspects as individual-testing, particulars of the experimenter's behaviour and the test session's environment.

On the procedure level, Part II discusses the usual problems of reliability, validity and utilisation of the test (Anastasi, 1961). Here the determinism of traditional psychological testing theory and in particular the influence from previous models of personality is first shown. For example, the approaches for assessing the reliability of a test have generated sophisticated explanations for the variance found in inventory-type tests. Variables such as time and attitude change which negatively affect the reliability of tests,have been controlled whenever possible. For instance, the elaborate matching of different trait items rather than the reproducing the same items is often done with a disregard for the overall test validity. Despite not having such advantages for measuring the reliability of popular trait-tests and the controlling of variables which should naturally reduce their reliability-measurement models, they have been discussed in detail with the Game in mind. A large number of analytical methods relating to the Game exist (Tivendell, 1973) and have been introduced in this chapter. Details for hand-scoring the Game and two computer scoring programmes were made available. When possible, alternative versions of the Game and

alternative scoring and analytical procedures were mentioned along with any pilot data. For example, a number of versions of the Game were introduced including a three-dimensional version for use with highly intelligent subjects and a figural-verbal version for younger and less advantaged subjects. Conclusions and research proposals pertinent to this stage were made in the section dealing with the utilisation o of the Game.

In brief, this Part II states that the Cognitive World Structure Game is a new technique for looking at Man. It is not a state, trait or semantically weighted personality measure. It is, however, based on the theory that the way you interact with your environment is the way you are. It is a novel, reliable and valid technique which stresses the importance of the immediate environment. Naturally, this preliminary handbook discusses the stimuli, the response, the structure and the hypotheses of the Game. The social psychology of the test situation was also discussed in some detail. Finally, the scoring including hand and computer methods and analysis and utilisation of the Game were dealt with.

Part III of the thesis involved a number of pilot studies being carried out with the Game. The chapter began with a reiteration of the operational definition of Man in terms of his cognitive world structure. A note was made as to the determinism of traditional models of personality. The Game was then proposed as a valid measure of this cognitive structure. General hypotheses were put forth concerning the relationship between the Game and certain other phenomena dealt with via psychometrics. It was, however, underlined that the following were limited pilot studies and that ultimately, the

Game's validity required in-depth investigations using both experimental and field approaches.

First, the Game's possible correlation with three popular measures of personality and two interest measures looked at. The three personality tests were: Cattell's 16 PF, Eysenck's E.P.I. and the Bernreuter Personality Test. Only six of the first test's sixteen personality traits were found to be correlated with the Game. These were intelligence, ego-organisation, a tough-tender scale of temperament, a simple-sophisticated scale, a confidence-insecurity scale, and a measure of conservatism. The second test's two second-order factors, i.e. introversion and stability, along with its social desirability scale, were also found to be correlated with some of the Game's scores. Finally, the third and oldest test was not found to be correlated with any of the Game's scores. Each scale's correlation with the Game was discussed individually. It was concluded that the Game generally did not measure the same aspects of personality as did these tests. It was suggested that this was due to the Game's measuring a more fundamental aspect of personality, i.e. the cognitive structure. Meanwhile, these more popular tests were believed to be dealing with the measurement of attitudes.

Section III.3 included a similar type of study with interest measures. A review of the literature found two basic models of interest measurement. The A.P.U. Guide (Closs, 1968) represented a job-activity approach. This involves the subject showing a preference for either of two work-related activities. By introducing a large number of such activity-pairs, a range of interests can be studied. The Rothwell-Miller test used another approach, this time invol-

involving job titles. Here, the subject's stereotypes concerning jobs are used to measure his interests. This is done by the subject ranking job titles in order of occupational preference. With a number of such rankings, it is possible to extract interest categories whose order is relevant to the individual. In brief, five of a total of twenty occupational interest scales were found to be correlated to the Game's scores. Thus, the discussion remained on an illustrative rather than explanatory theme. This was believed necessary due to the nature of these scales and the very concept of interest itself (See Section III.2). Most important in these two sections (III.2 and III.3) was the emphasis placed upon the pilot nature of these studies. That is due to the limited number of Ss and the type of subject tested; only very tentative conclusions could be made. The importance of these studied lay rather in the methodology developed and the questions raised.

Three nomothetic variables were also studied. These were age, occupation and sex. The very small sample sizes involved in the first two pilot studies severely limited the number and validity of the conclusions. The age-study did show that the Game had a dynamic component reflecting personality development. The occupation-study lent support to Holland's theory (1959) that personality is an important influence on occupational choice. Moreover, the Game was found to be able to distinguish between occupationally different samples. The study involving the nomothetic variable sex was successful in as much as certain Game scores were found to be differentially used by both sexes. However, the particular Game scores involved, particularly the NE variable (i.e. the number of event items used), suggested that these

differences may be due to cultural variables rather than fundamental psychological differences. A few questions were answered by these pilot studies but many more questions were formulated. Many of these new questions demand a reassessment of traditional models of Man.

Though the problem of slanting answers on a test often has little significance, such as in many counselling and therapeutic situations, many tests today include a scale to evaluate response bias. Hypotheses as to the possibility of distorting the Game had been put forward in Parts II and III. The purpose of this pilot study (Section III.5) was to look at this problem of motivational distortion. The study was preceded by a critique of a certain type of test including distortion scales. Those tests measuring attitude-like psychological phenomena. In brief, the results showed that the E.P.I., a second measure used in the study, could be easily distorted. Moreover, the new personality profiles could not always be detected as being false via the lie scale included. Indeed, this suggested that the Ss had undergone important personality changes! The Game, on the other hand, was found to be difficult to distort. When distortion did occur, it did not suggest that a fundamental change in personality had taken place, as did the control test. One score was particularly linked with distortion (PE/NE) and future research was proposed to (a) refine this measure further so as to produce a valid distortion scale and (b) that studies be undertaken to explain how the attribution of valence to events is related to motivational distortion.

As mentioned, the object of developing the Game was to secure a tool which could differentiate between individuals

and occupations. Both these points have been discussed in Part II and Part III. The next logical step to take was to ensure that such information could be applied in the field. The following four sections composing Part IV have this purpose in mind. Either by choice or circumstance, each study focuses on individual or occupational differences but all studies attempt to include information concerning both these objectives.

Section one of Part IV is a study of an industrial-based computer department. It was possible to include in the study data obtained from the company's upper management. This gave some idea of the whole structure, both above and including the department concerned. Few companies and certainly no one department have within it a very wide range of occupations. Interesting data was, nevertheless, extracted from people within one field (computers) but often with very different jobs and tasks. As most occupational research of this nature involves analysing a limited number of individuals per sample, it is important that the tools used be acceptable in "individual" situations also. The Game and the research interview piloted in the previous study (Tivendell, 1971) have such a flexibility. The resulting data was thus pertinent to the host company. For example, if interested in stress and upper management, the data obtained can be of some use to the participating companies. Finally, as was discussed in Section four of these field studies, a new concept of leadership was developed from this study.

Section two looked briefly at social workers. Four teams of social workers were tested. Three of these teams were working in the field while the fourth was composed of teachers involved in the training of future social workers.

All belonged to the greater Birmingham area. Holland (1959) had hypothesized that different personalities would be attracted to different occupations. It was found that these teams could also be similarly differentiated. It seems that the types of tasks and work environments could be the source of this difference. Just as personality differences can account for occupational choice, the results suggested that personality could also account for seeking membership in certain teams rather than others.

Section three of Part IV involved the study of an assessment centre (formerly called a remand home) in Scotland. It was possible here to test the whole organisation, i.e. all its members with only a few exceptions.* In the study in Section IV.1, a modified version of the Game dealing with the work-specific world of the individual was studied in a pilot project. However, it was unsuccessful and not included in the study proper. A new modified version of the Game was also tried with the boys living in the centre. Because the changes made here were minor, i.e. specifying as items four individuals belonging to the centre's staff, these were more productive. Nevertheless, these changes did affect the analysing and comparing of the results. The Game was again demonstrated to be a useful tool in understanding the individuals tested. In addition, a new aspect of the Game was uncovered with these subjects' results. The "environmentally deprived" boys did not have the same level or type of cognitive complexity as compared to previous subjects. Their results suggested that a continuum based on a linear model was probably

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*"The members of this small "work society" included the Superintendent, the matron, the shift supervisors, the kitchen staff and the boys themselves.

providing an incomplete explanation, at least for a range of subjects. Future research should investigate the possibility that the development of personality in general and each Game variable in particular might follow an oval rather than linear distribution.

Occupational psychology is understood to include the fields of counselling, organisational and industrial psychology. The research methodology and its discussion of the Game had focused primarily on the two latter aspects of occupational psychology. The fourth and final section dealt with a different aspect of the Game's possible use. Three main points were looked at in this section. First, as mentioned above, a new concept of leadership was elaborated. Next, the subject of teams was looked at, this time concentrating on various types of "team membership" such as friends, workmates and even siblings. Finally, an in-depth research using the Game was undertaken with a number of individuals. Some of these subjects were also tested during the California Personality Inventory (Gough, 1956). This permits the initiated reader to compare these measures, while others may wish to look at this latter test as an additional source of data. It is difficult to talk of validity and satisfactoriness of results here. The section may again help to emphasize the real power of the Cognitive World Structure Game, though its function should be to cause psychologists to actually try the Game.

V.2 Conclusions

There were two objectives connected with this research. First and most important, it was to try to understand and compare occupations. Secondly, if possible, it was to

contribute to the improvement of these occupations. The research has met the first objectives and, it is hoped, has at least prepared the way to meeting the second. This was achieved by developing a simple though effective model for any occupational research. This model involves the Job/Man/Environment complex. Each of the Model's blocks was developed in terms of its measurement and meaning. The Man block was found to be the more complex and, in particular, there were problems in defining and measuring personality. At first, it would have seemed that what psychology did not need was a new personality measure (Tivendell, 1973). Unfortunately, the literature and past experience had uncovered just such a need. "A priori", it was understood that the object of developing a measure of individual difference, would be of an applied nature rather than an academic exercise. In other words, the aim was to develop an operational measure of individual difference and not a diagnostic tool for labelling these individuals. Also, despite this aim, the development of the Game was tied to a fundamental assumption concerning the nature of Man. That is, Man's personality is reflected in his interactions with his environment; he <u>is</u> the way he interacts with his environment. This assumption might become the basis for a theory of personality (Section V.3). Next, the Game itself was developed as a viable measure. It began by making certain contributions to psychometrics particularly introducing a unique method of responding and certainly by introducing a new alternative type of stimulus-set.

It was emphasized a number of times in the above test that the studies in Part III were strictly pilot in nature. Several aspects of the sample populations limit the generalisation of the results to other populations. These include

variables such as age, type (volunteer) and, most important, number of subjects. These variables also influenced the level of statistical analysis chosen (Pearson r) and the use of a simple rather than a more complex version of the Game (See Part II). Despite these limitations and conditions, the pilot studies were expected to lend support to a number of hypotheses.

Basic assumptions concerning the make-up of an individual's environment and the definition of personality as his interaction with this environment were reiterated. It was argued that personality was not equatable to attitudes or sets of attitudes (Section III.1). According to this, attitudes should be more susceptible to change than the cognitive structure. Specifically, it was hypothesized that very little correlation would be found between the Game and personality tests, whose roots lie in attitude patterns of individuals (Section III.2) and between the Game and interest measures which also deal with peripheral aspects of the cognitive structure (Section III.3). Having argued that personality plays an important part in occupational choice, it was hypothesized that the Game could distinguish between Ss in various occupations (Section III.4). This same section included analyses aimed at finding those Game scores which might be influenced by the differences in age and sex of Ss. Finally, Section III.5 looked at the possibility of distorting the Game and, if so, what form this distortion would take.

Six of the sixteen personality factors in Cattell's test (1970) were found to have a small but significant correlation with the Game. These were intelligence, ego-organisation, a tough-tender trait, a simple-sophisticated trait, a confidence-insecurity scale, and a measure of degree of conservatism.

Two non-exclusive interpretations were put forth to explain the correlation found between the first of these traits and the Game. First, the results suggested that Cattell was measuring a S's interests, attitudes and stereotypes of how an intelligent person behaves rather than measuring a mental ability. The need to redefine the concept of intelligence was suggested, perhaps in terms of a S's ability to adapt and adapt to his environment. Secondly, it was proposed that the positive correlation found between the Game's N scores and intelligence reflected the need of a high scorer on this I.Q. scale for increased cognitive stimulation. A positive correlation was also found between a person's "strength of character" and his Game's DS score. These results lend support to Adcock's (1970) relabelling Cattell's (1970) "G" scale as an "ego-organisation" trait rather than a measure of "super-ego strength". More specifically in terms of the Game, it was found that a well-organised, responsible S depends less on cultural standards. This is reflected in a S's placing the social construct items increasingly further away from the centre (calculated pivot) of his cognitive world structure.

Two aspects of the negative correlation found between the 16 PF's I scale and the Game's PE/NE and PE scores were discussed. First, in accordance with the conservative S's cognition of event items in his immediate environment (See the Q_1 scale below), this more practical, responsible, uncultured and independent individual was found to attribute significantly more valence to events than his more tender-minded colleagues. Secondly, it was noted that this tough-minded S was found to have "a better group performance" (Cattell, 1970). This, it was interpreted from the results, could be explained if the conservative Ss of the sample were people-oriented

because the event items included in the Game almost all involve another person. That is, the tough-minded Ss of this sample were nevertheless attributing valence to events having a social component. The above interpretations also found some support in the negative correlation of the Game's PE score and the 16 PF's N scale, a simple-sophisticated bi-polar trait. The intercorrelation coefficients of the 16 PF's scales had suggested that this N scale was not an independent and homogeneous factor. These results propose that a similarity existed between Ss being described as unsophisticated (N scale) and those being described as tough-minded (I scale).

The 16 PF's fifth scale found correlated with the Game was a confident-insecurity trait. A negative correlation suggested that the calm, unanxious Ss with unshakable nerve not only had a more flexible cognitive structure, but also demonstrated better ability in dealing with life-events in a detached manner. Flexibility in a cognitive world structure is reflected in a Game's high D score (See too Part IV). Meanwhile, a high DE score is believed to reflect the S's facility in dealing with those events found in his immediate environment. It was proposed that future studies dealing with the life-cycle and stress should include a control of the different personality "types". It was suggested that different Ss might respond better if "treated" differentially, as opposed to their being grouped according to a sample, universal hierarchy of life-events.

The sixth and last 16 PF scale to be found correlated with the Game was the Q_1 scale, a measure of one's liberal-conservative temperament. The negative correlation with NE suggested that the more experimenting Ss had, a greater number of event items in their cognitive world. In view of the

two preceding scales which were correlated with the attribution of valence to these same events, it was suggested that the items under Q_1 dealt with a pragmatism factor. It would seem that the conservative S was "using" the few events found in his immediate environment to monitor and moderate or limit his otherwise analytical intellectual behaviour. However, as in the interpretation of the above correlations, it was noted that any "conclusions" had to be limited in nature due in particular to the low number of Ss in the study and that the same sample of Ss was involved in the discussion of the 16 PF's scales found correlated with the Game.

Two other studies were carried out to look at the possible relationship between personality measures and the Game. The first of these included the Bernreuter (1938) Personality Inventory. No correlation was found between this somewhat controversial test and the Game (Section III.2). The second study included the Eysenck Personality Inventory (E.P.I.). Though all three scales included in this test were found to be correlated with the Game, only a few of the Game's fifteen scores used were actually involved.

The E.P.I.'s E scale, a measure of extraversion, was found to be negatively correlated with the Game's NS score. In view of some of Cattell's (1970) research involving the 16 PF's B scale (See above), these results were not unexpected. The NS score was not only correlated with I.Q. or more exactly with the attitudes and behaviour of Ss scoring high on this scale but also with those aspects of behaviour which cause Ss to be described as introverted. It was concluded that studies must be undertaken to differentiate, if indeed possible, between introversion, intelligence and attitudes held by "intellectuals". One suggestion was to redefine the

concept of intelligence to include a S's ability to adapt and/or adapt to his environment. A second suggestion was to distinghish between items dealing with the "pure" concept of either introversion or intelligence and those which deal with the attractiveness of certain reference groups, such as introverts and intellectuals. A third suggestion involved the possibility of distinguishing between behaviour which are used to define a S as an introvert, those which are due to his striving to attain a particular goal (e.g. his belief that to become a professor, he must be an introvert) and those which are due to personality "per se". This last suggestion does not seem feasible when personality is described in terms of behaviour and attitudes, as in most objective tests today. However, it would be feasible if it were defined in terms of the cognitive structure itself, as in the Game (See Part II).

The E.P.I's N scale is a comprehensive (second order) factor whose high scorers are described as anxious, unstable, having less self-awareness and self-acceptance. It has been correlated with low scores on scales of well-being, tolerance and intellectual efficiency (Section III.2). It was not unexpected that the Game's P scores, including PI, PI (and exceptionally, PO/NO) and PS scores, were found to be positively correlated with this measure of neuroticism. (Note, it had been expected that PE would be excluded, since it had already been linked with the holding of conservative attitudes). Most important, the results supported the proposition that very "tight" patterns (i.e. high P/N scores, See Part II) would not be unstable although moderalty tight patterns, e.g. "groupings", would tend to be. Interestingly, the valence attributed to most items was linked to a decrease in self-acceptance. Studies must be initiated to explore why the

attribution of valence to most items is linked to emotional instability. Eysenck himself may have offered the explanation (1968). Perhaps neurosis is the inability to return to a normal state after emotional experiences, rather than a general instability trait. This suggests that N (E.P.I.) might be a cognitive style rather than a cognitive property (See Part I).

The third E.P.I. scale was originally intended to be a measure of motivational distortion. It was noted (Section III.2) that although this measure was suspect when used as a lie scale, it could be more convincingly used as a personality trait measure. Indeed this study showed a positive correlation between the Game's NI score (the number of individuals) and this measure of "social desirability". Similar results were reported in a separate study quoted in Section III.5.

In brief, the Game was not found to be identical to current so-called objective measures of personality. This was interpreted and supported in individual scale analyses as meaning that the Game was measuring a different level of individual differences. That is, it was not a measure of attitudes but, it was suggested, it was probably measuring something much closer to the cognitive structure itself. Despite the Game's not being, as a whole, identical to other tests, there were small but significant correlations of certain of the Game's scores with some of their scales. Further studies, it was proposed, should attempt to label the Game's parts using similar but more extended and better controlled studies.

Two studies were then undertaken to look at the possible correlation of the Game with occupational interests. Having assumed that the Game was measuring a different, indeed a more fundamental level of psychological phenomena than attitudes

and interests correlations here were not expected to be high nor frequent. A short review of the literature on interests led to an operational definition of the term, the setting-up of a research methodology and the choosing of two representative measures of the field. The first measure used was Closs's Experimental A.P.U. Interest Guide (1969). Only one of this measure's eight scales was found to be correlated with a Game score. The interpretation here was based on Campbell's (1972) review of the test and on experience involving the Game and motivational distortion (See Section III.5). It was suggested that the positive correlation between the A.P.U.'s artistic scale and PE was best explained in terms of "good impression" biases. In the second study, only four of a possible twelve interest categories belonging to the Rothwell-Miller Interest Blank (RMIB; 1968) were found correlated with Game scores.

First, the "scientific" interest category was found to be correlated with PS scores. Although this was in accordance with previous results showing the more pragmatic Ss giving less valence to social constructs, these results seemed best explained in terms of intra-test intercorrelation of interest scales. The "persuasive" interest category was found to be negatively associated with PI/NI and PE/NE. This seemed particularly disturbing as "persuasive" occupations are expected to be people-oriented while the Game scores suggested that the Ss were attributing little valence to people. However, a review of the test (Section III.3) showed that this scale was made up of financial rather than people-oriented items. It was much simpler to explain the positive correlation found between the "social service" scale and NS. It should be noted that the RMIB deals with a S's stereotypes,

in this case mostly of the social worker. It was hypothesized that this correlation with the number of social constructs used in the matrix is due to a stereotype of an introverted, intellectual social worker favouring such concepts. It should also be noted that NS has been linked to intelligence and intellectual attitudes. The fourth RMIB scale, interest in medical occupations, was found to be negatively correlated with PE. Very briefly, such an attribution of valence to events may be linked with an interest in the functional aspects of certain occupations. A certain co-relation with the A.P.U.'s artistic scale may be involved also. In summary, very little correlation was found between the Game and the interest measures used. This had been anticipated (Sections III.2 and III.3). The most important aspect of these two studies was the emphasis placed upon the note of personality in occupational choice. Future research should test and choose between the models of occupational choice proposed by Holland (1959) and Fox (1970).

Section III.4 attempted to look at the influences of age, sex and occupation on playing the Game. In looking at the variable age, a first part dealt very briefly with an analysis of patterns. Only six Ss were looked at, belonging to three age groups. Naturally, no "conclusions" could be put forth with such a small sample. This analysis was merely used to demonstrate the type of evolution which might occur in a cognitive world structure as S grows older. The second part dealt with the differences in Game scores due to age. Here, some one hundred and twenty-six Ss belonging to three age (13 year olds, 16 year olds and 20 year olds) were looked at. First, the NO score (number of objects) was found to increase with age. This probably due to a cultural influence

whereby an individual is expected to be increasingly aware of his material environment. Secondly, the PS/NS score was found to have a significant but not a proportional relationship with age. That is, the Ss belonging to the two first groups (13 and 16 year olds) had increasingly higher PS/NS scores. However, the young adults were beginning to attribute less valence to these same verbal structures. There seems to be first an increasing use of socially accepted structures, while primary socialization occurs. However, in early adulthodd, a re-evaluation is made of these culturally popular constructs. This is perhaps linked to their new independence or an attempt to establish a more individualised type of morality.

Thirdly, both the valence and number of events were found to be influenced by this age variable. The first group of Ss (13 year olds) had high NE scores. The 16 and 20 year olds, however, were both found to have low, stable scores. Though possibly due to a sample specific variable, this change more probably involves a general masculinity trait (See below). Because the third group of Ss analysed here were university students, future research should look to see if these results would be found in a more general adult population. Meanwhile, the PE/NE score (valence attributed to events) was found to simply decrease with age. This, it was assumed, is linked to a general increase in self-actualisation and definition of the self-concept. This should also be consistent with the decreasing influence of a social desirability variable in the structuring of one's cognitive world (See Section III.5)

A second study in Section III.4 involved the differential analysis of Game scores according to occupation. One of the

objectives in developing the Game was to be able to differentiate between occupations. Similarly, this study permitted testing part of the hypothesis that personality is important in occupational choice. It had also been assumed that the wide variety of tasks found in most occupations underlined the need for a range of types of people and certainly the need for a wide range of skills. In brief, the Game was found to differentiate between occupations. Moreover, it was suggested that its scores could be used to determine "cut-off" points (Schein, 1965) necessary in the selection of workers. Future research would need to undertake more extensive (versus pilot) research in these areas. The need for increases in sample size, in number of occupations tested, and fro a stratified sampling both within and across these occupations was underlined. Such suggestions are evidently pertinent to all the pilot studies quoted in Part III.

A third and final study in Section III.4 involved the analysis of the Game scores of some two hundred and fifty Ss according to their sex. The N, NS and more significantly, the NE scores were found to be differentially used by male and female Ss. This latter score had been linked to a masculine-feminine trait in previous research. A socialisation of different roles for males and females was the favoured explanation of the above results. Once again, it was suggested that future research verify such findings using a greater number of Ss specifically chosen for such a study.

Section II.5 looked at the possibility of distorting Game scores. Previous experience suggested that it would be difficult to do so in most test situations. In addition, it was hypothesized that any distortion that was found would not involve the total personality. When a second, more popular,

personality measure was used, it suggested that fundamental changes in personality had taken place even in the simple type of distortion paradigm found here. This was not the case when the Game was distorted. Distortion here involved the Ss including more individuals in their matrix and attributing slightly more valence to these. One score was particularly linked to the intention to distort the Game and yet was found not to be consciously controlled by S. This PE/NE score, it was suggested, should become the object of a more extensive study. Efforts should be made to refine this score's use as a distortion measure and to explain its relationship to the various types of distortion (See Berg, 1967).

Part IV introduced four field studies. These studies were undertaken to test the Game's validity in applied situations. They included two organisational studies. Section IV.1 was the study of the computer department of a large international metal company. Section IV.3 was the study of a complete organisation, an assessment centre in Scotland. Section IV.2 involved the analysis of a number of teams of social workers. Finally, Section IV.4 involved a number of individual case studies using the Game in a counselling-type situation. This whole section (Part IV) is in a sense ideographic research. Whereas nomothetic research involves correlational and experimental-type studies, these were in fact case studies. Though no "conclusions" can be made when using a case study, such studies can serve to illustrate, support or indeed disprove particular hypotheses or parts of a theory. Individual concepts such as a new definition of leadership and that of cognitive world flexibility (for instance, a S's ability to cope with life events) were put forth as material for furure research. On a general level, these studies did lend

support to the assumption made here as to the nature of Man (Part II).

In brief, these studies did lend support to the Model's objectives (Part I) and in particular suggested that its needs for an adequate measure of Man were met with the Game (Part II). The Game's ipsative and normative nature should then adequately serve as a vehicle for the expressing of ideas belonging to our assumption of the nature of Man and still be an adequate measure of this nature, permitting its comparison and its understanding.

V.3 Future Research

One classic method of assessing the scientific value of a new model or measure is to look at the amount and type of research it generates. Some of this research may be due to the incomplete nature of the model, for example, psychoanalytical theories. However, a large amount of this research may be due to the model's causing a re-evaluation of many traditional and current ideas. Research of both types will be considered. A number of research proposals have been made concerning values aspects of the Model (Part I) and the Cognitive World Structure Game (Part II). Not all of these proposals have been referred to in this thesis, though some of the more important ones are introduced in this section. In fact, some of these projects have already been initiated.

(1) A review of personality theories as found in the literature is being prepared. It pays particular attention to the relation which the theories have with both the Game's methodology and its theoretical basis. The review relies heavily on the texts by Hall and Lindzey (1972), Maddi (1972), Bischof (1970) and Borgatta (1968).

Two one-semester courses in theories of personality, aimed at final year psychology undergraduates, have been used to evaluate part of a first draft.

(2) Other studies dealing with personality have been suggested. One of these should involve the somatic theory developed by Sheldon. Pilot studies have shown that the three main body-types can be found in somewhat equal proportions among the population. Thr project itself would involve an observational study to first classify the subjects according to somatic type. Secondly, it will be necessary to test subjects, using perhaps, among other measures, the Cognitive World Structure Game. Thirdly, a survey of attitudes, beliefs and values should be linked to any in-depth analysis of their behaviour. This will not only test some of the theory's own hypotheses, but will also permit an evaluation of the complexity and level at which the theory operates.

(3) A pilot study of a somewhat similar nature was carried out to investigate the astrological or Zodiac event-theory of personality. Unfortunately, the sample tested was found to have significantly more subjects born under one of the "signs". From the results, it seemed at least as important to look at "parental" variables as to hypothesize about astral influences. For instance, a majority of the subjects were believed conceived during their parents' summer holidays. This would certainly affect the attitudes and feelings to which they were exposed during early childhood. The planned

child may well be a more wanted and loved child.

(4) The development of personality has not been an important topic in this thesis. Nevertheless, some basis ideas were put forth, which seem to concur with Donald Super's concept of self-crystalisation. Suggestions have been made regarding the study of the development of the cognitive world structure. In particular, a research project is underway based on a child-guidance clinic in Scotland. Here, classes of pupils belonging to at least three age groups in six schools will be studied. If the schools represent an adequate cultural and socio-economic range of population, the study's results will be of great interest to development psychologists and personologists in particular. On a more methodological level, the Game must also engender a number of research projects which are of a self-critical nature.

(5) A careful item analysis should be undertaken. Here, both experimental studies and field studies should be attempted so as to benefit from their respective advantages. A field study would benefit from the greater depth and reality that its methods permit. On the other hand, the more controlled aspects of experimental studies can include such well-documented tools as Osgood's semantic differential and Kelly's Repertory-grid, both of which are appropriate for this type of research (Borgatta and Lambert, 1968). Preliminary experimental paradigms have already been

designed for this item analysis*.

(6) The Game's other versions introduced in Part II must be tested. Some of the more pertinent hypotheses have already been introduced, for instance involving the use of the figural, figural-verbal and three dimensional versions of the Game. Two pilot studies might be of use to such methodological research. First, a study tried unsuccessfully to duplicate the Game's results using a Q-sort technique. Here, the items, printed on cards, were to be ranked. The second involved the computer-interaction technique used with a sample of architects (Tivendell, 1973).

(7) More complex analyses of the Game's resulst might be done. For example, the Game's handbook (Section II.3.4) has suggested a number of ways the analysis might be changed, stressing in particular the modifications to the P-values which could be made. Similarly, researchers might wish to develop more complex analyses of the distance variable. This might draw from the work by Lewin (Personal space, 1951) and Sommers (Personal distance, 1967) already introduced.

(8) The development of occupational norms must be extended in both the number of occupations and number of subjects sampled. The Applied Psychology Department, University of Aston, has already pioneered a number of occupational studies which will be pertinent here. Similarly, studies whose objectives include the developing of norms for the Game will benefit from the Model discussed in Part I.

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*L. Piery, behaviour science III (A.P.D.), 1974.

(9) The labelling of Game's scores should be studied (See Section III). Those interested in the clinical psychology might also wish to develop a labelling process. Meanwhile, labelling of the Game should rely heavily on performance studies, both in the field and in laboragory settings. Pilot studies have already begun to analyse the Game's relationship to four levels of performance (i) manual tasks; (ii) perceptual tasks; (iii) decision-making tasks and (iv) organisational efficiency. It is hypothesized, and preliminary results substantiate, that manual and perceptual abilities are not related to the cognitive world structure to any important degree. However, it is hypothesized that the two other levels of performance, in particular decision-making strategies are involved here.

A number of miscellaneous studies have also been proposed.

(10) For instance, a research project was proposed that would study the stress found in upper-management using the Game. This would involve Canada's shipbuilding industries in Sorel (Quebec), though the results should be of importance to other organisations.

(11) A project involving decision-making in the counselling process has already begun. Suggestions concerning the use of different decision-making strategies in various types of counselling situations can be evaluated with regard to their satisfactoriness and, as related to the Game and individual differences, whether good counsellors can be selected and/or trained. The focus of such studies can be placed upon the clients (client-centred) as well as the counsellor.

(12) Another post-graduate study involving the counselling process will test the hypotheses that the Game will (i) decrease the amount of contact time needed for certain counselling situations; and (ii) that it increases the amount of information available to both counsellor and counsellee.

(13) Just as a review of the theories of personality is being prepared, the Game's relation to popular counselling theories should also be investigated. This would rely heavily on Patterson's important review of the area (1966).

Finally, studies should be initiated to deal with other major problems described above. For example, the relationship found between NE and the sex of a subject should be analysed in more depth (See Section III.4). Laboratory studies involving the Game and attitudes, beliefs and valence, in particular their measurement and change, can be carried out using matched subjects or repeated measure paradigms. A third example would be the development of a motivation distortion scale (See Section III.5) and the analysis of why the valence attributed to events (PE/NE) is involved here.

Five publications will follow closely this thesis. They are: (i) a preliminary handbook for the Cognitive World Structure Game; (ii) factor analysis, controlled and orthodox methods; (iii) The Game, an occupational psychological tool; (iv) The Cognitive World Structure Game and the counselling situation; (v) Personality theories and the Cognitive World Structure Game.

It is hoped that these research projects and the thesis itself will contribute to making psychologists aware of the Game. It is expected that the Cognitive World Structure will

contribute to the marked developments which have occurred in the study of personality (for example, Bischof, 1970) and initiate research

APPENDIX A The Game items labelled

Individuals

1. Father
2. Mother
3. Sister
4. Brother
5. My child
6. New friend
7. Best friend
8. Neighbour
9. Attractive male/female
10. Husband/wife
11. Workmates
12. Boss
13. Me

Objects

21. House
22. Car
23. Books
24. Music/art
25. Personal possessions
26. Television
27. Clothes
28. Money in my pocket
29. Savings and investments

Social constructs

41. Law/police
42. Religion
43. Marriage
44. Family
45. Leisure/hobbies
46. Education
47. Work
48. Privacy
49. Politics
50. Race

Events

61. Getting married
62. House bought
63. Me achieving recognition
64. Me being promoted
65. Trouble in my family
66. Me unemployed
67. Me having an affair
68. Death of husband/wife
69. Death of a close relative

APPENDIX B The Game's instructions, pages (i) and (ii)

THE COGNITIVE WORLD STRUCTURE GAME

INSTRUCTIONS: (page i)

(E PLACES BLOCKS IN FRONT OF S, LABELS TOWARDS HIM, SPREAD OUT ON TABLE)

1. "You have in front of you a number of white blocks."

2. "Each of these blocks has the name of a person or thing on it."

3. "Please read the labels and try and place these blocks on the board in front of you."

4. "This is not a test, so there is no right or wrong way to do it. Take as long as you like."

5. "You may use any part of the board. If it helps, use half squares letting some of the blocks stand on two squares at once."

6. "You need not use all the blocks, but you can if you wish."

7. "You may use some and take them off later; you may also change their position as many times as you wish. We are only interested in their final position."

8. "There are some blocks not labelled, which you can use to write upon, to represent any person or thing you think is missing."

(page ii)

9. "Finally we would like you to place these blocks in such a way as to represent YOUR FEELINGS towards these persons or things."

10. "Are there any questions?"

(E PARAPHRASES INSTRUCTIONS IF NEED BE)

(S DENOTES THE END OF THE PLACING)

DATA SHEET : Appendix C

SUBJECT No.: _____ and NAME: _____

PERIMENTER: _____

APPENDIX D An example of the letter to the subjects

THE COGNITIVE WORLD STRUCTURE GAME

Dear Subject

As you probably know, PSYCHOMETRICS usually covers two main areas: (a) general laws of behaviour (intelligence and aptitude testing) and (b) individual differences (personality measurement). Though some progress has been made in these areas, a new technique has been devised. This new approach looks at individual differences in the way people structure the world around them. A good deal of progress has been made in its design and validation. What we need now are further trials with the Game and comparisons with other measures.

The Game attempts to look at Man based on fewer assumptions than usual personality, attitudes and other 'psychological' measures. It does not postulate the existence of traits (Allport, 1937), states (Freud, 1933), nor does it explore semantic weightings (Kelly, 1955) given on a number of differential scales. It does, however, assume that subjects structure their environment (cognitive world) using at least one of a number of ways and on one of a number of dimensions. Pilot studies have so far indicated that the resulting structure is reliable and unique to that subject, given he uses the same dimensions (time, importance, etc.).

The Cognitive World Structure Game is not a test so there is no right or wrong way to do it. It does not measure intelligence nor can it discover any thoughts, tendencies or behaviour that a subject is either unaware or unwilling to communicate. Previous subjects have found it a very interesting exercise.

"Answers" will be kept confidential and your identity will be known to ourselves alone. We are, in fact, concerned with the collective results of the wide groups rather than those of any particular individual.

The Game will involve about 30 minutes of your time. We will arrange a time convenient to you. Your help would be very much appreciated. Please call at the Applied Psychology Department in College House, General Office, where the bookings are made.

Very many thanks,

John Tivendell

APPENDIX E Computer scoring

Program JON BLOCK

Aston Computer Centre
University of Aston in Birmingham

Computer ICL 1905

Language Fortran

The Program must only be used with the specific permission of author, John Tivendell.

The following is an example of the data obtained:

THE PIVOT MATRIX FOR SUBJECT B05 IS

R/C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	42	6	61	0	0	0	0	0
7	0	0	0	0	0	0	0	44	13	9	0	0	0	0	0
8	0	0	0	0	0	0	0	7	71	48	0	0	0	0	0
9	0	0	0	0	0	0	0	0	63	0	0	0	0	0	0
10	0	0	0	0	0	0	0	28	47	66	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

P= 56 ,I= 22 O= 2 S= 15 E= 17

P/N= 4.30769 I/NI= 5.50000 O/NO= 2.00000 S/NS= 3.75

N= 13 I= 4 O= 1 S= 4 E= 4

MAX P ROW = 18 IN ROW 7

MAX P COLUMN = 28 COLUMN 9

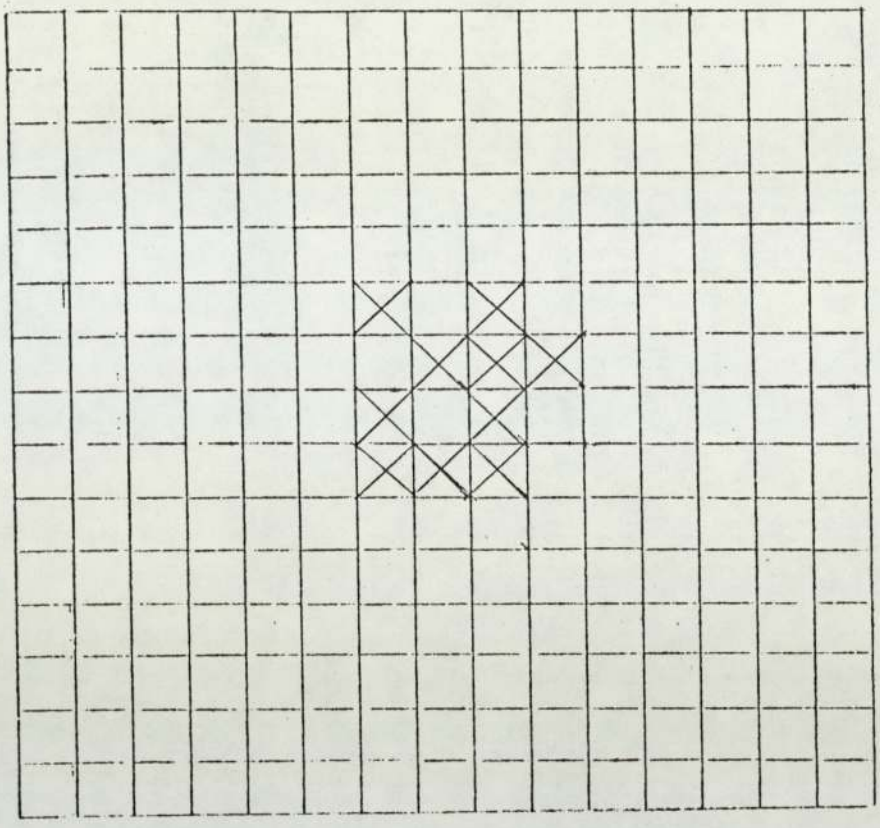
CALCULATED PIVOT = 13

E/NE= 4.25000

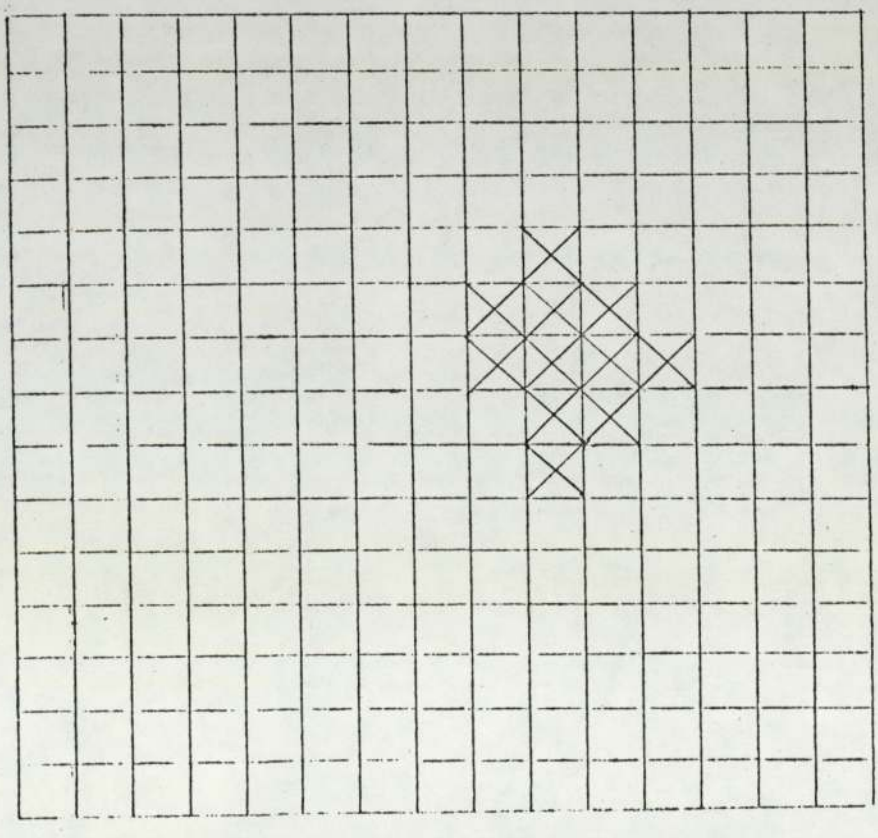
R	C	VALUE	PIVOT	DIST.
6	8	42	13	3.16228
6	9	6	13	3.60555
6	10	61	13	4.24264
7	8	44	13	2.23607
7	9	13	13	2.82843
7	10	9	13	3.60555
8	8	7	13	1.41421
8	9	71	13	2.23607
8	10	48	13	3.16228
9	9	63	13	2.00000
10	8	28	13	1.41421
10	9	47	13	2.23607
10	10	66	13	3.16228

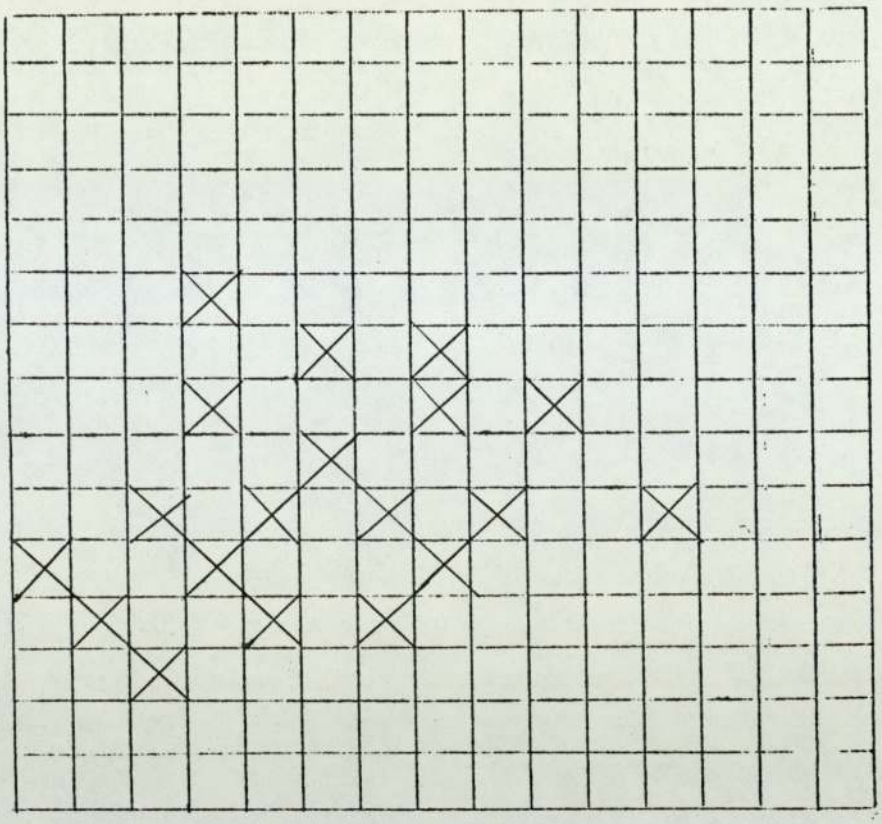
MEAN= 2.5218310 S.D.= 0.3073571

APPENDIX F Examples of patterns used when playing the Game

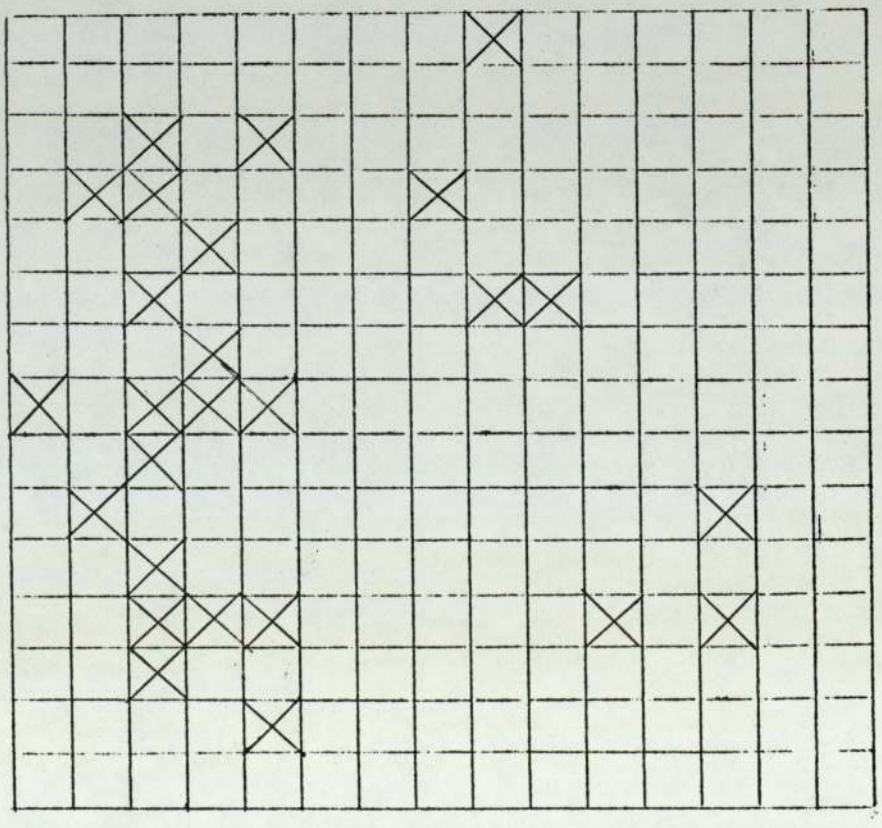


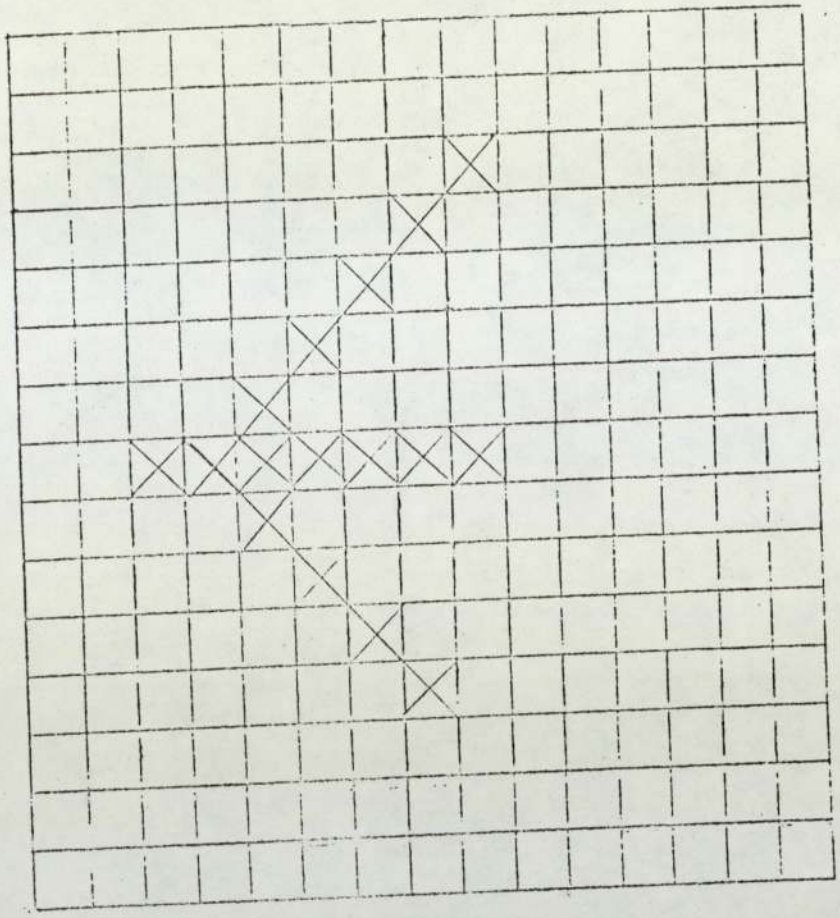
CLUSTER:



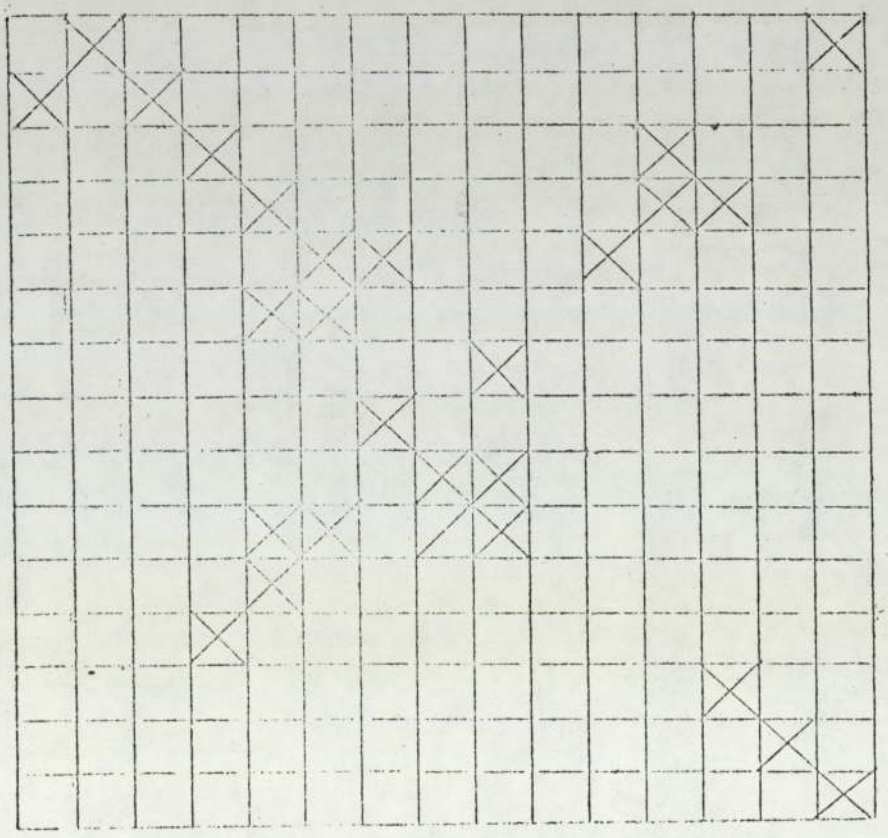


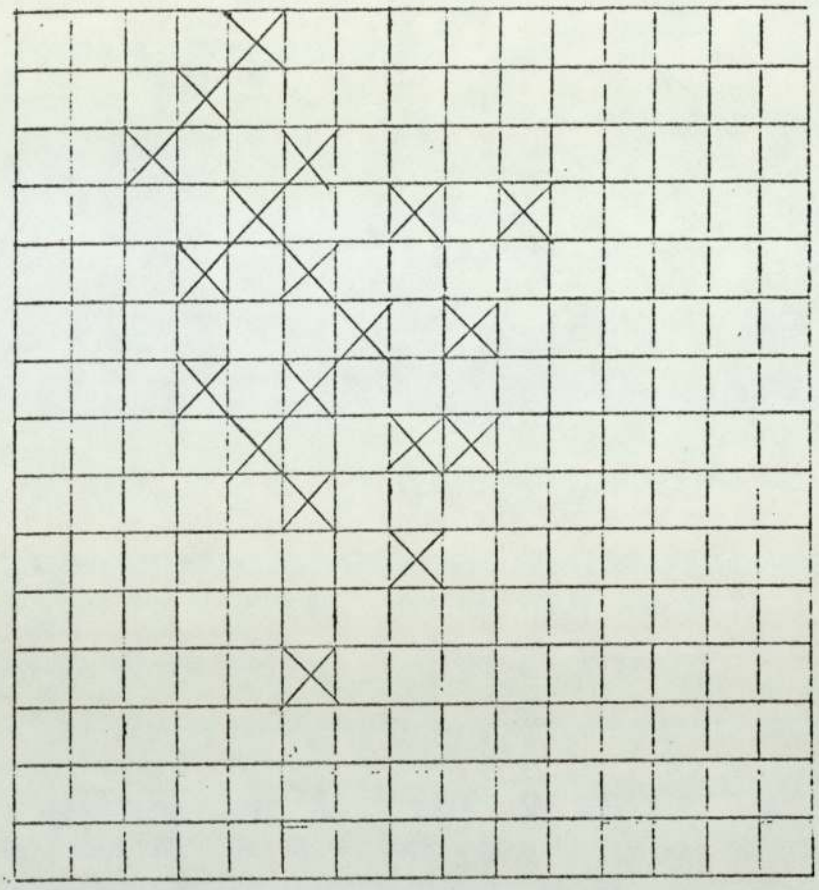
GROUPINGS



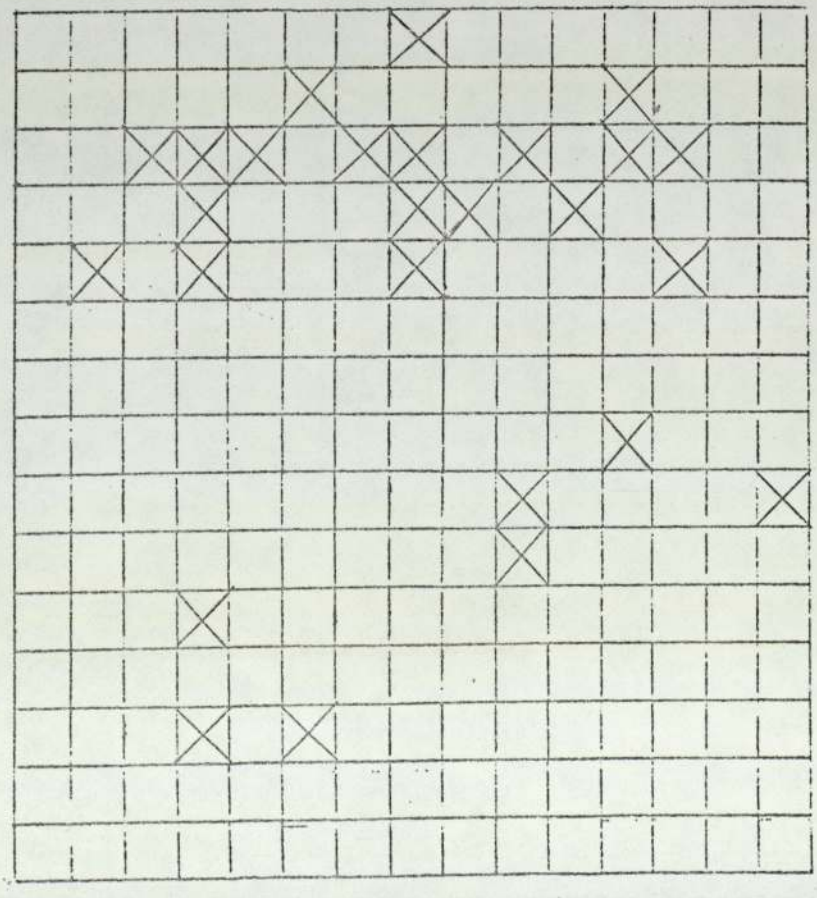


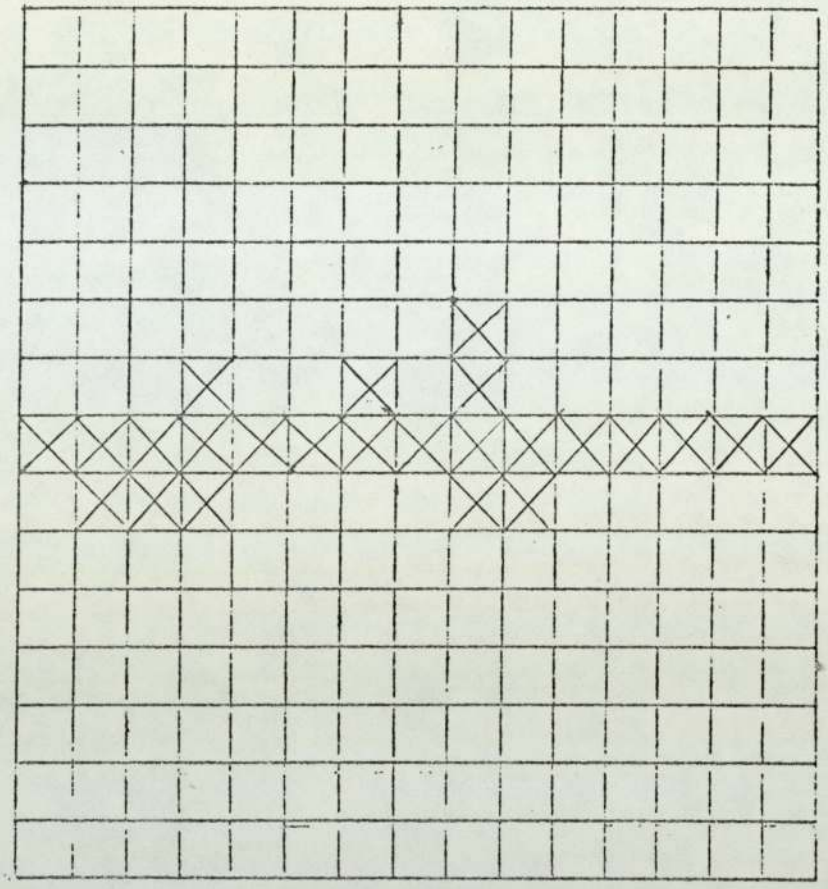
STAR



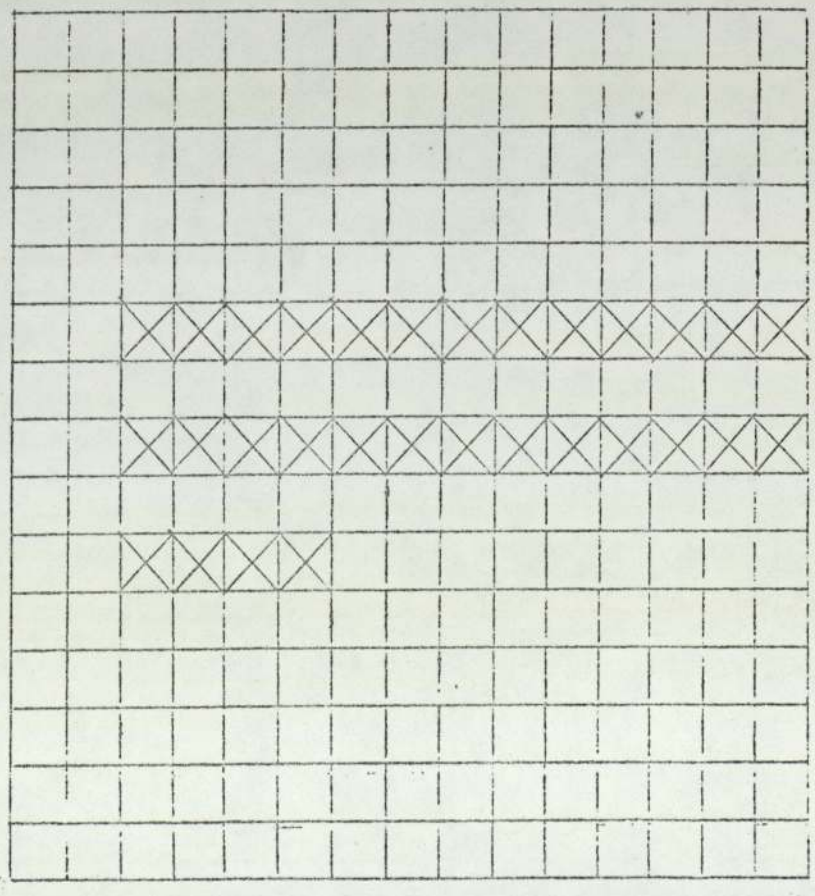


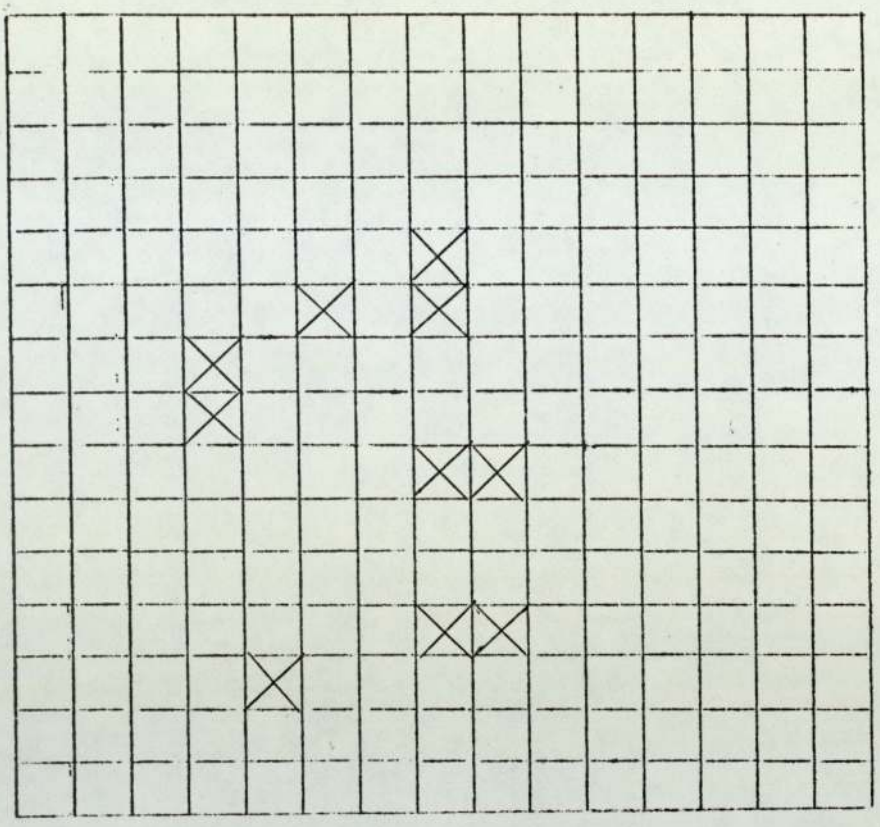
HIERARCHY



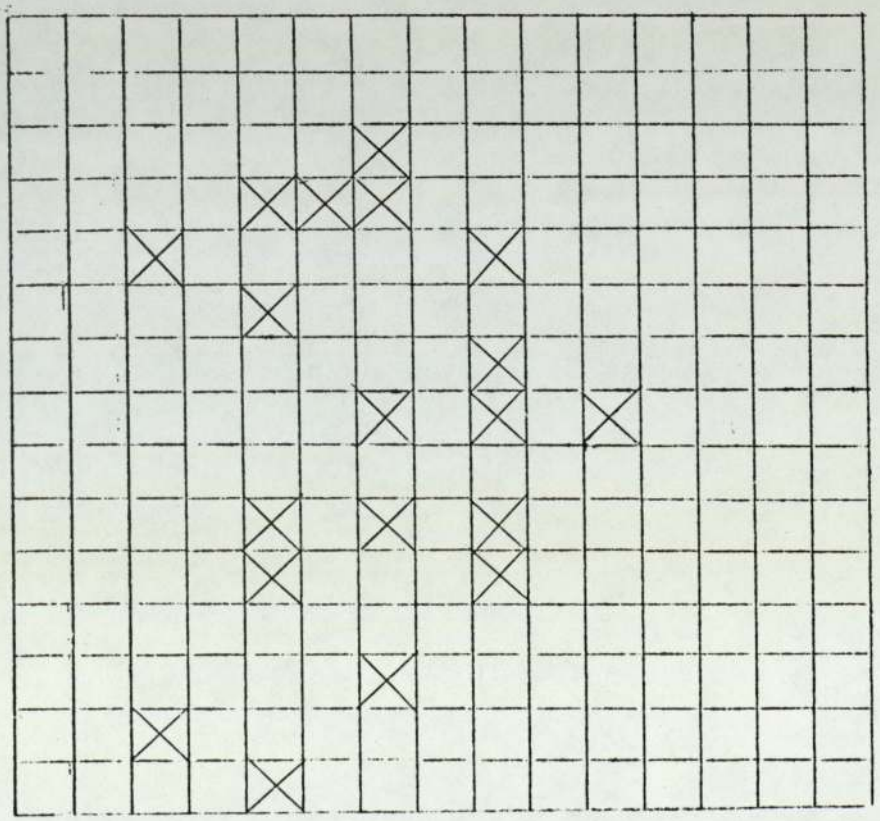


LINEAR

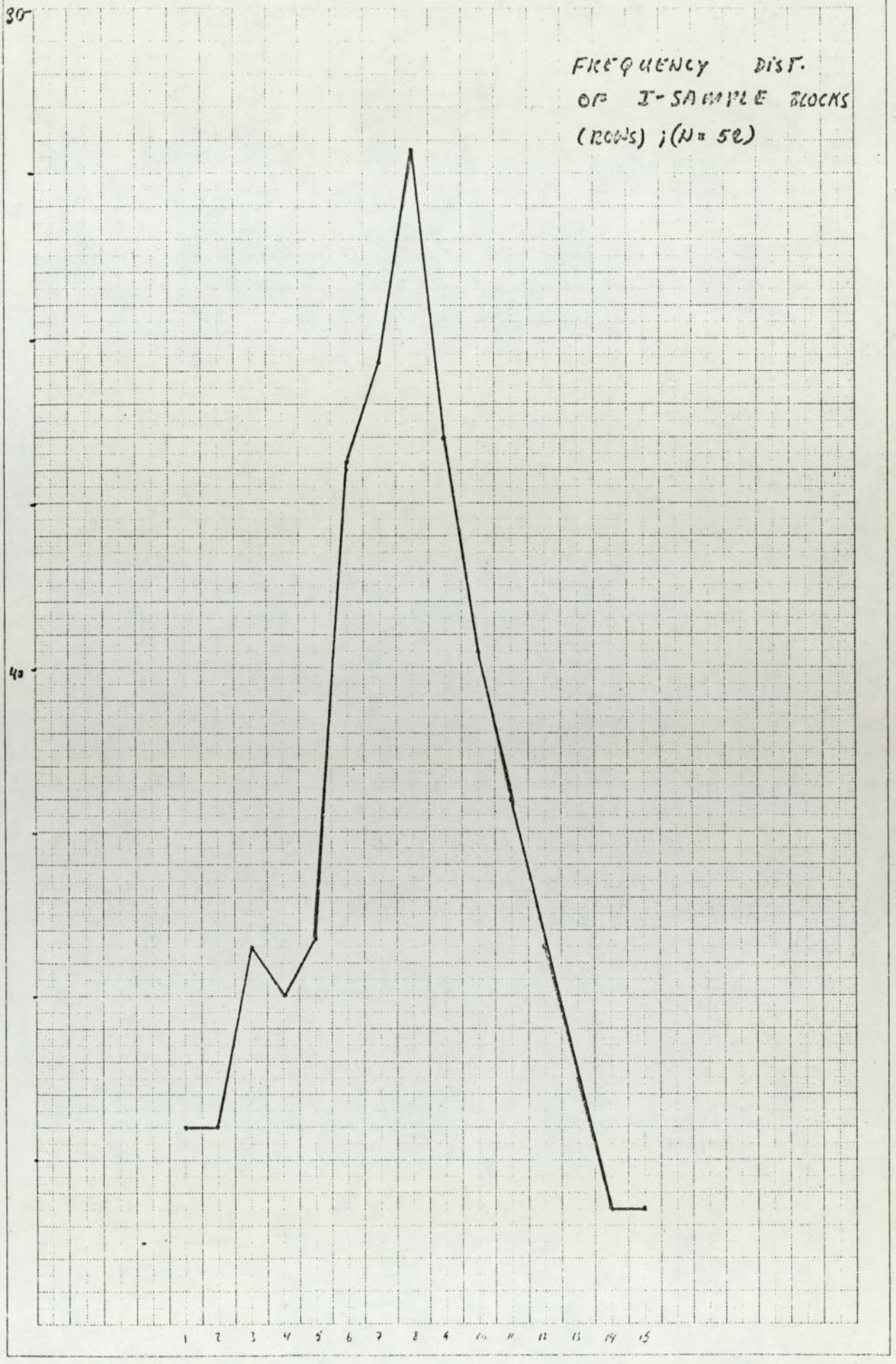


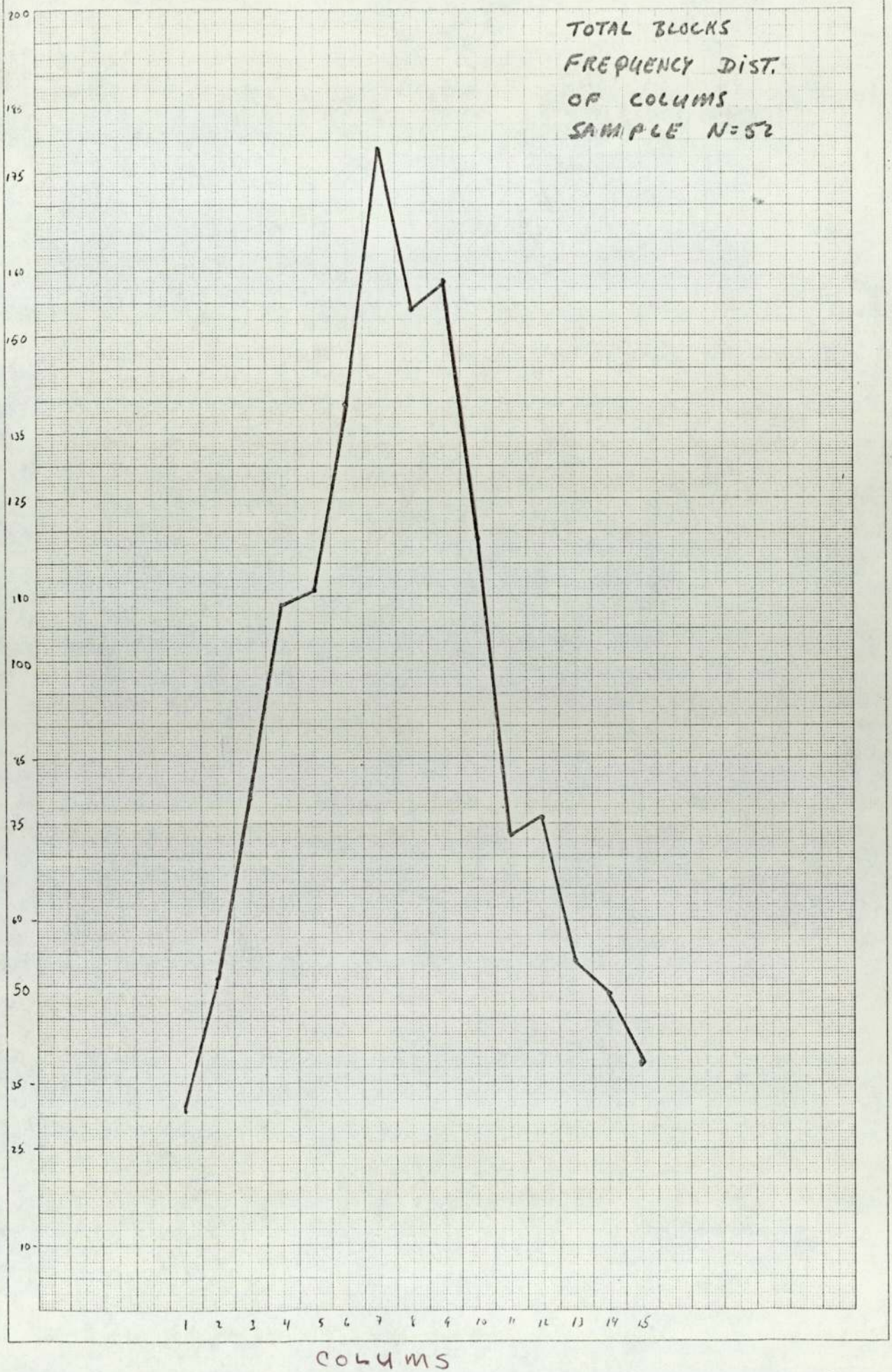


RANDOM



APPENDIX G An example of the distribution of blocks per matrix row and per column


30
40
FREQUENCY DIST.
OF 1-SAMPLE BLOCKS
(ROWS); (N = 50)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
ROWS


TOTAL BLOCKS
FREQUENCY DIST.
OF COLUMS
SAMPLE N=52
200
185
175
160
150
135
125
110
100
85
75
60
50
35
25
10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
COLUMS

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