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ENVIRONMENTAL AND NATURE CONSERVATION:
A FACET STUDY OF CONCERN FOR THE QUALITY OF THE NATURAL
ENVIRONMENT.

PAUL MARTYN WILLIAM HACKETT.

DOCTOR OF PHILOSOPHY.

UNIVERSITY OF ASTON IN BIRMINGHAM.

SEPTEMBER 1989.

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University of Aston in Birmingham.

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ABSTRACT.

A multi-variate descriptive model of environmental conservation attitudes and values is proposed and empirically supported. A mapping sentence is developed out of analysis of data from a series of Repertory Grid interviews addressing conservation employees' attitudes towards their profession's activities.

The research is carried-out within the meta-theoretical framework of Facet Theory. A mapping sentence is developed consisting of 9 facets.

From the mapping sentence 3 questionnaires were constructed to investigate orientations towards environmental concern. A mapping sentence and facet model is developed for each study. Once the internal structure of this model has been established using Similarity Structure Analysis, facet elements from one study are subjected to Partial Order Scalogram Analysis with base co-ordinates.

A questionnaire is statistically analysed to assess the relationship between facet elements and 4 measures of attitudes towards, and involvement with, conservation. This enabled the comparison of the relative strengths of attitudes associated with each facet element and each measure of conservation attitude.

In general, the relationship between assessed importance of conservation and involvement pledges to conservation were positive: Perceived importance of a conservation issue appearing predictive of personal involvement. Furthermore, the elements of the life area and scale facets were differentially related to attitude measures. The essential aspects of an environmental concern scale are presented.

The multi-variate descriptive model of environmental concern values and attitudes is discussed in relation to its implications for psychological research into environmental concern and for environmental and nature conservation.

Key Words: Facet Theory.
Environmental Concern.
Environmental Conservation.
Nature Conservation.
Environmental Psychology.

and Dr. Alan Hargrave, who conducted this research. My thanks go to the following individuals:

are interested in the many people who participate in the
today. They are the numerous in different parts of the
those who spend their time to doing a job, or a hobby, or
or participate in a hobby, or a hobby, or a hobby, or a hobby,
the various activities in the various parts of the world,
to be able to do it.

DEDICATION.

DEDICATION.

To my Parents.

Acknowledgements.

I would like to thank both of my supervisors, Dr Guy Cumberbatch and Dr Alan Hedge, for the help they have provided to this research. My thanks also go to Dr Ian Donald for his friendly encouragement.

I am indebted to the many people who participated in this study: They are too numerous to mention individually. Those who spared the time to complete a questionnaire or to participate in the initial interviews are particularly thanked. Many organisations also co-operated in the research, these must be briefly mentioned:

British Trust for Conservation Volunteers (Leeds), Urban Wildlife Group (Birmingham), Urban Base (Birmingham), Think Green Network (Birmingham), C.L.A.W.S. (London), Centre for Urban Ecology (Birmingham), Friends of the Earth (London), Clouston Landscape Architects (Birmingham), Royal Society for the Protection of Birds (Droitwich and Sandwell Valley).

My special thanks go to Alison my wife and to my parents, they made it all possible.

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CHAPTER 1

Introduction

Harvest Hymn.

We spray the fields and scatter,
the poison on the ground.
So that no wicked wild flowers,
upon our farm be found.
We like whatever helps us
to line our purse with pence;
The twenty-four hour broiler house
and neat electric fence.

All concrete sheds around us
and Jaguars in the yard,
The telly lounge and deep freeze,
are ours from working hard.

We fire the fields for harvest,
the hedges swell the flame.
The oak trees and the cottage,
from which our fathers came.
We give no compensation,
the earth is ours today.
And if we lose on arable,
then bungalows will pay.

All concrete sheds around us etc.

John Betjemin. (1970).

1.1 Introduction.

In a recently conducted major survey (Jowell et al. 1988) 56% of respondents reported feeling that the changes which have occurred in the British countryside had been for the worse. 60% of this sample also expressed a desire for the countryside to be afforded some form of protection from deleterious changes which have been, or

may in the future be, occurring there. These figures show that a significant proportion of the British adult population are concerned about the quality of the natural environment and the activities and changes taking place there. Moreover, when these figures are compared with previous studies carried-out by Jowell and his colleagues between 1984 and 1987, the figures show environmental concern to be growing.

Major changes are occurring in the world's environment, at all physical scales, and in all geographical regions: At the global and international environmental scales (Wilson 1984a) and more locally within the British countryside (Blunden & Curry 1985a&b). Accompanying these changes, sustained public concern for the quality of the natural environment has developed (Jowell, et al, 1987). In a survey conducted in 1983, Jowell and his associates (1984) found that across a number of different environmental issues, an average of 76% of their sample of the British population regarded waste in the environment to be a serious or very serious issue. By 1986, this proportion had risen slightly to 80%. This concern about the seriousness of environmental pollution is reflected in concern regarding changes in the British countryside. Here the same authors found in 1985 that 68% of respondents expressed some degree of concern over countryside changes, whilst in 1986 this proportion had grown to 75%.

In commenting upon the changes in public opinion currently occurring in Britain, Young (1988) wrote:

"We are witnessing some significant long-term shifts in public opinion as a result of which the countryside is likely to become a political issue in a deeper and more profound sense than ever before."

(Young.K. 1988 p 3)

More recent studies have discovered a similar level of awareness of environmental issues to be present in the British public (MORI 1987, NOP 1987). For example, when asked how important will the environment be as a political issue over the next 5 years, 56% replied very important, 38% fairly important whilst only 9% thought that it would not be a very important political issue (Harris 1988).

Accompanying this growth in interest in environmental matters and concern about changes in the countryside, there has been an increase in the number of groups or organisations working in environmental protection related areas (see, Barker 1986, Porritt & Warner 1988, Button 1988a). The environmental movement has also had an effect upon the consumer in general. This it has achieved through requesting the purchaser to buy only products which have no deleterious effects upon the environment at the stage of their production, consumption, or when disposing of their waste by-products (eg, Button 1988b, Elkington & Hailes 1988).

There has also been a steady stream of research reports which have taken the social aspects of environmental conservation and environmental usage as their subject matter (eg, Millward & Bradley, 1986, Miller & Tranter 1988, CEC 1980, Countryside Commission 1985, 1986a,b&c, 1987, 1988a). However, social scientists in general, and psychologists in particular, have been slow to become involved in this area of research. This is in spite of this lack of involvement being noted in the literature and there having been calls on several occasions for a greater level of psychological interest (eg, Fairweather, 1972, Lounsbury & Tornatzky, 1977, Heale, 1986)

1.2 Social Science Environmental Concern Research.

Psychological and other social science research has viewed many aspects of human responses to the quality of the natural environment. However, relatively few studies have investigated the structure of attitudes which may underlie personal opinion about changes in the natural environment, and / or actions which are aimed at conserving the natural environment

1.2.1 Environmental Concern Correlation Studies.

Research in the area of concern for the quality of the natural environment, typically, has initially developed a measure of concern for some aspect of the natural environment and then identified the measure's

intra-personal (ideological) and social (demographic) correlates. From the use of this approach and due to different studies adopting different measures and indicators of environmental concern, 2 potentially confusing states have arisen. Firstly, no consistent picture of the environmentally concerned person has been, or can be expected to be, identified. Secondly, no clear definition of attitudes pertaining to a concern for the quality of the natural environment has been made.

Attitudes about the protection of the natural environment have been defined as both issue specific and as an underlying general disposition. In both of these cases, this underlying attitude complex has been defined as concern for the quality of the natural environment, or simply as environmental concern.

1.2.2 Models of Environmental Concern.

Many of the environmental concern correlation studies have assumed that the public's apparent concern about environmental quality is rooted in one or more abstract ideologies or philosophies. This ideology is seen to be uni-dimensional in nature and to underlie specific beliefs about specific environmental issues (Pierce & Lovrich, 1980). The literature of mass belief systems implies that environmental opinion is probably very crude, fragmented and narrowly focused upon mundane, personal irritants (Converse, 1964. Natchez, 1985).

As a consequence of the shortcomings which have been noted of environmental concern correlation studies, more recently, research has attempted to produce more complex models of environmental concern. The development of more elaborate models of concern for the natural environment is a trend evident in the contemporary literature. Van Liere and Dunlap (1981) reviewed the environmental concern literature, and, on the basis of this, developed a multi-variate model. This was based upon 2 sources of variation in the results of the studies the authors reviewed. These were variations in the definitions used of environmental concern, and variation in the ways in which environmental concern was measured. The model they proposed found little support for any equivalence in different measures of the same environmental issue. Neither did they discover there to be equality when different environmental concern issues were measured by the same research instrument. They thus concluded that concern for the quality of the natural environment was not a simple uni-dimensional attitude, and could not be assessed by the use of uni-dimensional designs and analyses.

Other researchers have developed models which have taken attitudes towards environmental conservation and concern for the natural environment as components of a broader attitude complex (eg, Cotgrove, 1982, Buss & Craik, 1984). These models of "contemporary worldviews" embody a set of dispositions not only towards environmental

quality, but towards expert decision making, bureaucracy, the risks associated with various industrial and technological processes, etc. In conducting these research project environmental concern has been investigated as it exists as a component within a broader attitude complex. These studies have related measures of environmental concern, or sub-divisions of this concern, to other attitudes toward modern socio-political issues.

The investigation of environmental concern has increasingly used multi-variate techniques and approaches. A similar trend may be witnessed in contemporary studies of experience in other areas of human experience which impinge upon, or may in some ways be seen to be related to, environmental concern: For example, experiences of places. In this research Facet Theory and Facet analysis techniques (Canter, 1985a, Shye, 1978a) have been used. In employing a facet approach, standard research design and consistent results from an area under investigation have been produced.

1.2.3 Place Experience.

Studies of place experience have typically addressed experience of the built environment (eg, Canter & Kenny. 1981, Donald. 1985, Hackett. 1985). In these and other studies, a general model for place experience has emerged. This has been developed and refined within several different built environments (eg, offices, hospitals and airports). This leads to the conclusion

that there is a consistency in human-place experiences within built settings. To date, the model has only been used to design a pilot study to measure human experience within natural environments (Hackett, 1986b). However, other research which has not employed a facet approach has discovered experience of the natural environment to be multi-dimensional (Ullrich & Ullrich. 1976).

1.2.4 The Dimensionality of Models of Environmental Concern.

The uni-dimensional nature of human preferences for landscape features in the natural environment (Pierce & Lovrich 1980) has been questioned for many years (Ullrich & Ullrich. 1976, deHaven-Smith. 1988). Ullrich & Ullrich (1976) proposed a multi-variate solution which described experience of just one isolated topographic feature of the natural environment (rivers): In their study 2 dimensions were identified. However, the subject matter of their research was the physical characteristics of river landscapes.

In the present study physical elements of the natural environment will not be at the centre of attention. Rather, attitudes towards the conservation of natural environments will be studied, and attempts will be made to identify the dimensionality of these attitudes and social values.

1.3 Social Values.

In this study perceptions of, or responses to, features of the natural environment (eg. place experience) will be ignored. The commonly shared social value which emphasises the importance of concern for the natural environment and supports the need for environmental conservation being the subject which will be explored.

In the literature social values have been defined in a variety of ways. In the present research the definition offered by Levy, 1986., Levy & Guttman, 1974b) will be adopted. Levy defined a social value as a special case of an attitude. The specification of attitude she is using here is the one developed by Guttman, 1973). This states an attitude to be an evaluation which ranges from positive to negative toward a specified event. A social value fulfils this criteria but also stresses the 'importance' of a certain event. Thus, evaluations indicative of a social value range from, very important, to not at all important, toward a specified objective. Furthermore, a value item may address an end state (how important a given instance is or isn't) or a goal (the importance of means or actions in attaining a desired end state).

It is clear that by these definitions, concern for the conservation of the natural environment is both a social value and an attitude; environmental conservation issues

and actions may be ascribed to a position along a scale ranging from positive to negative, and also along a scale which ranges from very important to not at all important. It is also possible to address environmental concern in terms of its goals or in terms of the means by which these goals are to be attained. In the former instance, the researchers would direct their enquiries at the means of attaining the aims of environmental conservation. In the latter case, concern for the quality of the natural environment itself would be the focus.

1.4 Theoretical contributions.

As has been commented upon in the preceding paragraphs, environmental concern has been investigated by several researchers who have employed a variety of different measures. The investigations which will be conducted during this research will attempt to resolve uncertainty in regard to the dimensionality of environmental concern: Whether a uni-dimensional or a multi-dimensional, descriptive model for these attitudes is the most appropriate. It is hoped that in clarifying understanding of environmental concern in this way, less ambiguous measures of concern for the quality of the natural environment may be developed. Thus, the development of a descriptive, multi-variate model of environmental and nature conservation attitudes and values will form the primary objective of this research. Consequently, this research will offer a definition of environmental concern

as it is experienced by the studies' sample: A "personal", descriptive multi-variate model will be developed.

In using a facet theory approach a common definitional framework or taxonomy is developed. This classification system is explicitly stated as a taxonomy of items or variables within a mapping sentence. Facet research produces findings which are cumulative because this common taxonomy (design) is employed. Development of knowledge is achieved by using the same classification system for choosing variables and by observing these in different contexts. A second manner through which knowledge is built is through modifying the facet taxonomy of the mapping sentence to suit context. Through following both of the procedures variation in research findings is systematically observed and related to changes in the research population, research setting, or research items specified in the mapping sentence.

In the research which follows a template for the understanding of the personal and social meaning of environmental concern will be developed. This will be in the format of a mapping sentence. By the end of the thesis a mapping sentence will have been developed which systematically accounts for the variation amongst the correlation coefficients between items assessing expressions of concern for the quality of the natural environment.

To achieve this a series of 9 studies and analyses will be undertaken. Each of these will be concerned with developing a mapping sentence for the research. Consequently, this research will not be concerned with establishing the absolute value of concern across respondent samples. This will not be attempted for 2 reasons. Firstly, a large body of this sort of research already exists: An example of this are the bi-annual volumes from Jowell and colleagues (Jowell et al, 1985, 1986, 1987, 1988). In these publications British concern for the environment is yearly documented. The second, and most important reason for not adopting this approach, is that whilst much research assembles measures of environmental concern no clear definition exists of the psychological process of being concerned for the environment.

The research which follows will therefore establish a clear and concise definition of the intra-personal and social process of experiencing concern for the quality of the natural environment. This definition will be in the form of a mapping sentence. This will explicitly state the variables which have been considered in the investigations undertaken. The explicitness of this approach is of great importance as it allows other research to adopt the same definition. Adopting the model will allow the replication of this research and further support may be given to its findings. It also avails the researchers the opportunity of extending, modifying or

refuting the mapping sentences within the context of their own research.

The procedure of investigating a mapping sentence has been adopted in many areas of applied social research. An example of this has been in the area of place experience (which was briefly mentioned earlier in this chapter). In this research area a mapping sentence was firstly developed by Canter and his colleagues (Canter & Kenny, 1981, Kenny & Canter, 1981) to explain nurses' experience of ward design. Subsequent research viewed place experience within many different physical settings, including housing (Canter & Rees, 1982) offices (Donald, 1983) and airports (Hackett, 1985). The same mapping sentence has guided all of the above studies and has allowed comparisons to be made between the findings of the research. Adopting such an approach has resulted in research being precisely directed at pertinent aspects of the particular environmental setting in a clear, unambiguous and thorough manner. It has also resulted in direct comparisons being made possible between place settings. Consequently, 2 states have arisen. A standard design for place experience investigations has been established and a common model for place experience has been developed.

Within the research area of social values, ambiguous definitions have been forwarded for human experience. Several studies have been undertaken using the facet theoretical approach and employing a mapping sentence

(Levy, 1986, Levy & Guttman, 1974 a&b, 1976, 1981a,b,&c, 1985). However, all of these studies have concerned themselves with the "overall" structure of the concept of social values. Subsequently, this concept has then been investigated in several settings, with different populations and across age groups. The present research will extend the knowledge base which has been developed in the above studies through the investigation of the social value of environmental concern.

The major contribution made by this thesis is to facet theory investigations of social values and to research viewing environmental concern. A mapping sentence will be developed out of a series of repertory grid interviews, and questionnaires will be constructed based upon this mapping sentence. The questionnaires will then be subjected to both facet and other analysis techniques. This will enable comments to be made about the relationships between facets and attitude measures. At this stage of this introductory chapter it will be helpful to the reader if the structure of the thesis is briefly outlined.

1.5 The Structure of the Thesis.

In the remainder of chapter 1 there will follow a general outline of the thesis. Chapter 2 outlines the environmental issues which will form the context of the study area. This chapter will review environmental

conservation activities and issues about which the public may hold an opinion. In order to facilitate understanding, this review will be broken-down into sections which reflect environmental conservation issues and actions at a series of different physical scales. Chapter 3 will contain a review of environmental concern as a characteristic of the British public. This will include the presentation of the findings of several major studies of public opinion.

Chapter 4 will comprise a review of environmental concern as it has been viewed by the social sciences. Research findings will be presented to illustrate the variety of different measures which have been used to indicate environmental concern. The various different environmental issues which this research has investigated will also be reviewed. Furthermore, there will be a brief review of environmental concern as it has been modelled as a component of contemporary social values. The chapter will conclude by noting the lack of a clear definition of environmental concern and the need for the formulation of such a definition.

Chapter 5 will propose environmental concern to be a social value and attitude. The chapter will continue by reviewing how the facet theory approach to social research has been used to define personal meaning in several areas of life. Facet theory's contribution to psychological research into social values will be presented. The use of mapping sentences as templates for

designing research will be considered as a theoretical guide for studying social values. There will also be a brief consideration of the facet approach as an exploratory research technique. This will prepare the reader for the next chapter in which this approach will be used to explore environmental concern values.

Chapter 6 and 7 will present the design of, and findings from, 2 exploratory studies. These studies will form a series of Repertory Grid interviews. These will be conducted with employees in environmental conservation. Actions and issues in environmental conservation will be entered into grids. Similarity structure analysis will then be used to analyse resulting data sets. On the basis of this analysis a mapping sentence will be proposed.

In chapter 8 the development of 3 studies using the mapping sentence is detailed. Chapters 9 and 10 give details of the results of these studies.

The first 2 of these questionnaire surveys will address specific concerns about 2 environmental issues (the seriousness of environmental hazards and the urgency of selected environmental problems). These 2 studies will be constructed in order to enable analyses which will facilitate the investigation of the detailed structure of the elements of facets and the importance of these elements in structuring attitudes.

The third questionnaire will address more general concern about the environment. Respondents will assess, using 4 different evaluative criteria, a number of different conservation actions. The use of these different evaluation measures will allow comparison between the cognitive and behavioural elements of environmental concern. For each of the studies, the initial mapping sentence will receive any necessary modification.

Chapter 11 will form a discussion of the results of all of the studies which have been undertaken. The findings will be related to environmental concern research and will also be related to the area of psychological enquiry into social values and facet theory research. Suggestions for future research will be made. Finally, conclusions will be drawn in chapter 12 about the findings of the research.

1.6 Summary and Conclusion.

The need for the multi-dimensional investigation of environmental concern is based upon the assumption that attitudes toward the conservation of the natural environment are made up of multiple (more than 1) component. This hypothesis is derived from 3 separate sources: 1/ contemporary environmental concern research, 2/ the multi-dimensional nature of place experience, 3/ the multi-variate nature of social values.

The multi-dimensional nature of place experience has been

demonstrated to be consistent across a variety of settings in the built environment (eg, Donald. 1985). Less research has been undertaken into experience of the natural environment. However, Ullrich and Ullrich (1976) discovered a 2 dimensional model to explain perceptions of river features. It is therefore hypothesised that perceptions and experiences of the natural landscape will be multi-variate.

Environmental concern attitudes and attitudes towards environmental conservation are distinct attitudinal areas. In the case of the former attitude, the psychological domain of interest is that of the degree of concern an individual experiences in regard to a specified environmental state. In the latter case, attitudes within this domain are in respect of an action or series of actions which have arisen due to environmental concern. It is apparent therefore that the 2 domains whilst being similar are distinct. In the present research a similarity between the 2 areas will be assumed. However, empirical support for the assumption will be sought.

The present thesis is concerned with attitudes regarding the the conservation of the natural environment (environmental concern). Research viewing other social values has found multi-dimensional descriptions to best fit these phenomena. Therefore, this thesis will seek to develop a multi-variate, descriptive model of

environmental concern. A summary of the research aims are as follows.

1.5.1 Summary of Research Aims.

1. The overall aim of this research is to develop a multi-variate description of environmental concern in the form of a mapping sentence.

2. A second aim will be to resolve the conflicting hypotheses present in the literature of multi-dimensional and uni-dimensional descriptions of environmental concern attitudes.

3. Having developed this, a third aim will be to investigate the ability of the mapping sentence to represent opinion within a series of different behavioural modes of expression of environmental concern: attitudes of urgency, seriousness, the social value, the effectiveness, and levels of involvement with environmental concern and actions associated with these. The mapping sentence will also be investigated within a series of environmental concern contexts: environmental hazards, environmental conservation activities, environmental problems and general environmental concern.

4. In achieving the above, facet theory research and understanding of social values and attitudes will be extended into this new value area.

5. Finally, previously published mapping sentences will be used in the generation of the research instruments. These will be adapted and modified to the context of the current research. This will allow the fulfilment of the final aim: providing support for the mapping sentences as multi-variate descriptive instruments within their respective content areas.

CHAPTER 2.

Environmental Issues and Conservation.

2.1 Introduction.

"When this century began, neither human beings nor technology had the power radically to alter planetary systems. As the century draws to a close, not only do vastly increased human populations and their activities possess that power, but we are also faced with major unintended changes that are occurring in the atmosphere, in soil, in water, among plants and animals, and in the relationships between all of them."

(W.C.E.D., 1988 p32)

The subject matter of this chapter will be environmental issues. In the above quotation from Gro Harlem Brundtland, the Norwegian Prime Minister, & chairperson of the WCED it is clear that the issues facing the environment are many and of great diversity. This complexity is also found when attempts are made to define the conservation of the environment. However, as this research is concerned with attitudes towards environmental conservation, a definition of the area will be offered below.

"Conservation is concerned with the utilization of resources - the rate, purpose and efficiency of use. Conservation has received many definitions because it has many aspects. It concerns issues arising between groups, and involves private and public enterprise. Conservation receives impetus from the social conscience aware of an obligation to future generations and is viewed differently according to ones social and economic philosophy. To some extent the meaning of conservation changes with time and place. It is understood differently when approached from the natural sciences and technologies than when it is approached from the social sciences."

(Parker, 1980 p127)

Inspection of the above definition of conservation illustrates the fact that conservation is not only concerned with the saving of endangered species or places. Furthermore, it shows that it is not solely concerned with stopping deleterious events occurring. It is both of these things and it is also about sensible use and development. The breadth of conservations activities is clear in Parker's definition. This is also true of conservations effects which may be social, economic, ecological, etc.

In this chapter, the diverse strands present within the environmental conservation movement will be briefly reviewed. In doing this, conservation will be broken-down under the headings: pollution, countryside change, and the wider environment. These were not the only possible categories under which environmental conservation activities and issues could have been grouped. However, these categories have been chosen for the following reasons. Pollution and countryside change are both issues which directly affect the British public. This being the case, it would be expected that the public would have relatively well developed opinions upon these more immediate and personal environmental issues (deHaven-Smith 1988). Therefore 2 sections are devoted to these issues. The third section thus forms a "catch-all" category. This section will review global environmental issues and other issues upon which the

public is likely to have an opinion and which do not readily fall into the pollution or countryside change categories.

In this section there will be a review of a variety of environmental issues. These have been chosen to represent the breadth of issues and actions within contemporary environmental conservation. However, within the limited space of this report, it is inevitable that this review will not cover all possible issues and action.

It should be immediately clear to readers that the categories being used are not independent classifications. An issue which is being reviewed under the pollution category may well encompass changes in the countryside (and vice-versa). As McCormick writes:

"Most environmental problems and their solutions are local or national. But many of the most critical environmental problems go beyond national frontiers. ... many problems have their cause in one country and their effects in others."

(McCormick 1985a p67).

However, for the purposes of this research the threefold grouping chosen will suffice the purpose of outlining the diversity of issues which compose attitudes towards environmental and nature conservation.

2.2 Environmental Pollution.

Pollution was one of the earliest environmental issues to attract widespread public condemnation (McCormick 1985b).

"Many of the environmental problems of the past arise as a result of the pollution of the land....."

(Royal commission on Environmental Pollution. 1984 p7).

These are the opening lines from the tenth in a continuing series of reports from the Royal Commission on Environmental Pollution. Amongst other things, the tenth report emphasises the seriousness of the effects of pollutants within the environment. This point is illustrated by the definition of pollution initially proposed by Holdgate (1979) and adopted by the tenth report. Pollution is thus defined as: .1s1

"The introduction by man into the environment of substances or energy liable to cause hazards to human health, harm to living resources and ecological systems, damage to structures or amenity, or interference with legitimate uses of the environment."

(Royal commission on Environmental Pollution. 1984 p7).

Whilst the above definition is very broad in the area it covers, it is of particular interest as it denotes human-kind's actions to be the source of pollution. It also emphasises both the human and environmental consequences of these acts.

It is clear in the above quotation that pollution may effect all types of environment. Pollution may be of the ground and soil, of aquatic environments, or of the atmosphere. Regardless of the environment effected by the pollution, it is human wastes which cause these

effects (World Health Organisation. 1984). Waste may be directly hazardous (eg, toxic) to both human beings and other living organisms. Wastes may also be less direct in their destructiveness but non the less restrictive to amenity and recreational usages and detract from environmental quality and/or life quality. This may occur through visible, audible or odorous intrusion.

Thus, pollutants have a widescale of environmental effect. To quote the Countryside Commission:

"There is growing evidence that atmosphere, freshwater and marine pollution directly affect the environmental health of the countryside and coast - be it the suspected impact of acid rain on tree health, the quality of water in our rivers and lakes, or contamination of beaches by sewage and flotsam."

(Countryside Commission, 1989 p1)

All of the above types of waste can occur at any point in a wide variety of human activities. As far as their polluting effects are concerned, all forms of waste possess the common characteristic of not being required by their owner or producer. These are thus consigned to the environment, possessing no, little or negative economic value for the person generating it. These characteristics remove many of the incentives for the careful treatment of wastes. This being the case, waste is often introduced into the environment in a manner which will cause waste to be a pollutant by the definition of pollution offered above.

The introduction, or the prevention of the introduction, of wastes into the environment in a manner which would cause pollution, is then a solely human activity. Furthermore, these actions are intimately linked to other areas of human action. For instance, with manufacturing and wealth generation and with recreational amenity. Pollution may be the result of many forms of human activity. The consequences of this polluting may then affect all of us. It is hardly surprising therefore that a considerable amount of public concern about the environmental effects of pollution exists.

Having outlined some of the effects of pollution upon the countryside, the next section of this chapter will view changes in the countryside in greater detail.

2.3 Countryside Change.

Another issue covered by the term environmental concern is change in the countryside or natural environment. Since the last war many rural areas have been transformed by the carrying-out of major public works and private development. The construction of the post-war new towns presaged many of the issues that now attach to the building of motorways, airports, power stations, the channel tunnel and by the increasing number of people living or finding recreation in the countryside.

Blunden and Curry (1985a) provide a detailed review of these changes. These changes are illustrated in a

contemporary document which reviews the many changes which have occurred or are occurring in the social history of one particular Shropshire village. The sentiments expressed in this book exemplify reactions to the changes which are facing much of the British countryside. .ls1

"Change is a necessary adjunct to the survival of a settlement whether it is in the form of gradual development contained within the needs of the community or of sudden onslaught where the operative motive is now usually profit."

(Davis, 1989 p3)

Blunden and Curry (1988) have commented upon changes in countryside and other rural land usage. They claim that the countryside in Britain is undergoing a radical transformation. Food surpluses in agriculture are being tackled in a number of different ways. These range from the imposition of quotas and taxes on production to taking land out of production and putting it to some other use. They note how:

"With possibly as much as one quarter of our existing farmland surplus to requirements, there are now unprecedented pressures to diversify the rural economy, free up planning controls and expand forestry and recreational opportunities."

(Blunden & Curry 1988 p23).

If their predictions are correct, these new uses for rural land will be at the centre of an extremely important environmental debate during the next few years. These changes in the countryside are all the more

important as they come on top of an equally important long-term social change. Since the war there has been a gradual movement of unemployed farmworkers to the towns, whilst commuters, second homeowners and the retired have increasingly moved into the countryside. Bringing with them, it may be claimed, substantially different expectations and requirements of and from rural life.

There presence is having a significant impact on rural services and amenities, and on the infrastructure of village life.

Potentially damaging changes to the countryside have been written upon for many years (see for example, Williams-Ellis 1928, 1937). These and many other documents have expressed concern about the use of countryside areas as a recreational amenity for the increasing affluent and mobile urban dweller.

2.3.1 Countryside Amenity.

The growth in car ownership from the 1950's to the present date, has allowed an increasing number of urban residents to visit the countryside for recreational purposes. This factor, coupled with a booming economy, has enabled many city workers of the late 1980's to live rurally. In 1968 the Countryside Commission was formed with a mandate to manage countryside areas which are designated for amenity usage. The role taken by the Commission in fulfilling their duties is detailed by many

of their recent publications (see below). Within these reports are described the changing patterns of the recreational use of rural land. For this reason, the body of information contained within some of these recent publications is outlined below.

It has been found that visits to the British countryside are for a diverse variety of activities and purposes. In 1984, when asked why they visited the countryside, some of 18 different reasons were offered by respondents (Countryside Commission, 1984). Table 2.1 lists these findings which highlight the diverse activities which visitors to the countryside indulge in.

Table 2.1 Countryside Activities.

- visited the sea coast or cliff tops (but not seaside resort).
- visited historic buildings, stately homes, museums, gardens or parks in the countryside (excluding country parks).
- visited country parks.
- visited zoos, safari or wildlife parks in the countryside.
- visited nature reserves in the countryside.
- been on long walks, hikes or rambles of at least 2 miles (round trip) in the countryside, either from car or home.
- been birdwatching/nature study in the countryside.
- been fishing in the countryside.
- been hunting in the countryside.
- taken active part in other organised sport (eg, football, cricket, cycling, golf, sailing, running, climbing, motor sport, etc.) in the countryside.
- watched any organised sport in the countryside (in person, not on TV).
- visited friends or relatives in the countryside.
- carried any organised conservation or recreation work in the countryside (eg, tree planting, clearing of footpaths etc.).
- "picked your own" (fruit, vegetables etc.) in the countryside.

(Countryside Commission 1984 p3)

It was also discovered in the same piece of research that many more people visited these regions on a Sunday than at other times, and perhaps somewhat surprisingly that there were only minor variations in visiting patterns over the seasons of the year. The survey questioned respondents about the frequency of their countryside visits in order to reveal the proportion of people visiting the countryside during a four week period in the winter, spring and summer. It was found that in winter a little over half of interviewees had visited the countryside at least once. This proportion rose to 60% in spring and 70% in the summer. Those respondents who made frequent trips to the countryside (eg, 5 or more trips in a 4 week period) varied from 20% of the visitors in the winter to 28% in spring and 38% in summer. As the number of total trips increases through the seasons so the proportion of frequent visitors also increases: the proportion of casual, infrequent visitors remains the same whilst the proportion of non visitors declines (Countryside Commission 1984).

The Countryside Commission also investigated (for those who visit) the relative importance of a wide variety of recreational activities and venues. Table 2.2 clearly shows that whilst urban leisure activities are of great importance to people seeking recreational activities, overall it is the countryside which is the most important venue for recreational visits.

Furthermore, people show a strong preference for the countryside as a venue for visits. The survey also showed that the number of visits to the countryside is increasing.

wider countryside. They favoured countryside which is not managed as a tourism asset, rather than areas set-aside and managed as a recreational facility (Countryside Commission, 1984). This study also discovered that the majority of recreational activities take place informally, without outside organisation and without specialised equipment or high profile management. Furthermore, in their survey they found users tended to be general countryside visitors rather than specialists, concerning themselves with just one or two different activities.

Table 2.2. Urban and Countryside Recreation Visits.

1.	Park/urban perspective	20%	Urban
2.	Seaside resort	11%	Urban
3.	Drives, outings, picnics	13%	UC
4.	Long walks	12%	UC
5.	Visiting friends, relatives	10%	UC
6.	Sea coast	6%	UC
7.	Informal sport	8%	UC
8.	Organised sport	5%	MC
9.	Pick your own	3%	MC
10.	Historic buildings	3%	MC
11.	Country parks	3%	MC
12.	Watched sports	2%	MC
13.	Others	4%	MC
<hr/> Urban		31%	
Unmanaged Countryside (UC)		49%	
Managed Countryside (MC)		20%	
Total Countryside		69%	

(Countryside Commission, 1984 p8)

Changes in the frequency of visits to the countryside over the last decade have also been noted. In 1984 the Countryside Commission conducted a survey which repeated a series of questions regarding the regularity of visits. The studies were initially carried-out in 1977 and 1980. The results of this study showed that the number of trips

per person during 4 weeks in a summer period fell from 2.5 in 1977 to 1.6 in 1980. By 1984 however there had been a significant increase to 4.1 trips per person. This growth can be seen to be due largely to a decrease in the number of people who did not visit the countryside at all, coupled with an increase in the frequency of visits amongst those who were already very frequent visitors (Countryside Commission, 1984).

When enquiries were made about who visits the countryside, it was found that there was a small group of people (17% of the sample) who visited the countryside regularly and who account for 68% of all trips made. Conversely, a large section (40%) of the population did not visit these areas at all during a specified 4 week period. However, it is important to note that 84% of people visit the countryside at least once a year (Countryside Commission, 1984). Furthermore, the visitor can be typified as possessing certain socio-economic traits. In the same report it was reported that 46% of visitors had the use of a car of their own, 63% were managerial, clerical and skilled manual workers and 59% were from affluent suburban areas living in intermediate and higher quality family housing.

It is of great interest to the present research to note that membership of countryside protection and amenity related organisations (eg, National Trust, Royal Society for the Protection of Birds, Ramblers Association, Youth

Hostel Association) is significantly positively related to countryside visits. The Countryside Commission report (Countryside Commission, 1984) showed that members of countryside related organisations use the countryside at almost twice the level of those people who are not members of such organisations (67% members to 37% non-members). The report hypothesises that the distance that people lived from the countryside was not related to membership of these organisations. This suggests that membership is a reflection of interest in the countryside and countryside affairs rather than the ability to access countryside areas.

From all of the data presented above, it can be clearly seen that there has been a broadening interest and participation in countryside usage. This is summarised by the Countryside Commission thus:

"The level of countryside recreation has grown significantly, if irregularly, over the last 8 years (1977-1985) and has attracted a broader span of the population."

(Countryside Commission, 1984 p16)

However, the Commission noted a year later that whilst the 1984 National Countryside Recreation Study had confirmed the greater levels of countryside usage, this increase in itself was not the major feature noted about the alterations in countryside usage. Instead:

...in 1985, the Commission noted that the appearance and ecology of countryside have altered the appearance and ecology of countryside

".... it is the changing patterns of participation that are likely to be of increasing significance."

(Countryside Commission, 1984 p15)

These changing patterns of usage will not be dealt with any further in this thesis. The changing character of the rural visitor and dweller having been noted. The relationship between a person being environmentally concerned and visiting the countryside has also been documented. The interested reader wishing to further explore these social features is guided to the above cited publications by the Countryside Commission and to other reports from the same body (eg, Countryside Commission, 1988b).

Another area of change in the British Countryside has been in farming practices. When asked about the causes of countryside change, 62% of respondents agreed that modern farming practices damaged the countryside (Jowell et al 1987). It is this area of change in the British countryside which will be considered below.

2.3.2 Farming Practices and Countryside Change.

Several recent reports have reviewed modern farming practices in Britain. Changes in these practices have included the increased use of chemicals to reduce pests and to increase yield (eg, House of Commons Select Committee, in press, Jollans, 1985) and changes which have altered the appearance and ecology of countryside

regions such as hedgerow removal (eg, Westmacott & Worthington, 1984).

In their report of the following year Jowell et al, (1988) found that most people perceived the countryside to have recently changed (table 2.3)

Table 2.3 Degree of Change in the Countryside 1988

has not changed	22%
has changed a little	21%
has changed a lot	55%
Don't know	3%

(Jowell et al. 1988 p169)

As well as changes in the British environment, alterations are also perceived to be occurring in the international environment.

2.4 Changes in the Global Environment

In a brief review of environmental issues and environmental changes, such as the one contained in this chapter, it is not possible to cover all such issues. This section entitled "the global environment" will be made-up of a selection of environmental issues not covered already in any of the earlier sections of this chapter.

The issues covered in this section have been chosen to be illustrative of the problems and hazards facing the environment at a wider physical scale than solely

Britain. The issues are selected as examples of their type, rather than attempting to review all of the global environmental conservation scene. A more thorough review is provided by McCormick, (1985a,b,c.).

Environmental issues which are global or international in nature are many and extremely varied. Several of the issues already raised under the pollution or countryside change headings may be seen to be linked, to a lesser or a greater extent, to conservation issues at the global scale. For this reason much of what has already been written in this chapter applies to the global environment. For instance, public concern about pollution of the seas and rivers, may be understood by respondents, to relate to both the British and to wider environmental scales.

2.4.1 Changes in the International Environment.

Within this chapter we have already considered the conservation of the environment at the national and local scales. It is readily apparent that conservation may be practised at much larger scales. However, at these larger scales the definition of the boundaries of what constitutes an environmental conservation action or issue become less clear as breadth of morals as well as breadth of physical scale increases. At these larger scales, green philosophies and consideration of ecological principles also become included.

In the 1969 Reith lecture, Fraser Darling (1969) commented upon the global nature of environmental changes. The same theme was extended with greater detail in the 1989 Richard Dimbleby lecture given by HRH the Prince Philip (1989). A quotation from the latter of these 2 lectures serves well to illustrate the complex and interacting nature of global, ecological changes in the natural environment:

"All life depends upon the interaction between the inorganic elements of sunshine, climate, fire, water, altitude and soil chemistry. The relative absence of any one element, such as fresh water for instance results in dessert conditions. In addition, the living world also effects the climate and atmospheric conditions around it. The carbon dioxide and ozone layers were created by living organisms and they are now being affected by human activities."

(H.R.H. the Prince Philip, 1989 p4)

With the interacting system described above, it is of little surprise that problems which occur at this scale are complicated. The following definition illustrates the range of issues and problems at this scale. Bunyard and Grenville-Morgan (1987) state that the earth now faces a new and different scale of environmental threat:

".... the difference lies in the scale of the threat to the planet itself, through environmental destruction. This threat is largely created by man himself, whose enormous capacity for destroying already weakened systems is the factor which makes the position so grave."

(Bunyard & Grenville-Morgan, 1987 p,ix)

With such a wide scale threat to the environment the same authors state that human beings must respond with a

broad, all encompassing level of environmental concern:

"It means concern for life on earth. Not just concern for ones own family or friends, for community, or the whole human race, but concern for the process of life itself and everything that nurtures and sustains that process."

(Bunyard & Grenville-Morgan, 1987 p,x)

Many of the most crucial environmental problems go beyond national boundaries. Some, such as soil erosion, deforestation, and over-fishing are universal. The demand for more land for agricultural usage is causing further destruction of natural forests. As a consequence this in turn causes soil erosion, the siltation of rivers and climatic changes (Goldsmith & Hildyard. 1989). Many problems may originate in one country whilst the effects are primarily experienced in another. This is the case with pollution, where prevailing winds can blow contaminants across continents, and sea currents can wash contamination from one shore to another (Hinrichsen, 1989). The output of carbon dioxide from the burning of fossil fuels and rain forests, and the methane gas which is a by-product of much agricultural production, is already greater than can be absorbed by natural processes. The use of Chloroflourocarbons (CFC's) in refrigerator coolants, aerosol propellants and in foams is damaging the ozone layer (Lovelock, 1989).

As in the previous 2 sections (pollution & countryside change) over-usage, over-consumption and waste disposal

lies at the roots of most international environmental problems. The difficulties associated with solving these problems are increased at this scale of operations as one country may exploit another for its resources, or deposit its wastes there. Attempts to resolve these environmental problems must therefore deal with a large number of human activities. A growing population and waste disposal problem is being caused by the sheer number of the world's human inhabitants and their consumption of resources (Timberlake, 1989).

Much research has been conducted which has viewed the state of the international environment. This has lead to a large information base now existing for the area. An important publication within this field of research is that of the DocTer institute (1987). This publication does not take the global environment as its area of concern, instead it thoroughly reviews the state of the environment in Europe. The document sub-divides environmental issues, problems and actions. In doing this it is able to consider the state of the European environment in considerable detail. Furthermore, through maintaining constant the categories into which environmental issues and actions are divided from country to country, inter-country comparisons are made possible.

In viewing the international environment the DocTer institute show how it is therefore possible to approach the subject from either of 2 directions. Firstly, it is

possible to view the localised causes and effects of an environmental problem. Secondly, problems which effect the global system may be viewed, in terms of its social, economic or ecological causes and effects, at a local scale; the employment which is created in a specified geographical area by forest clearance, and the alternative employment which would be needed if these practices were curtailed; the local effects upon the flora and fauna and habitat loss. A global perspective would be concerned with the same issues but at a far greater geographical scale.

The literature on change in the international environment has looked at the changes presently occurring there. The research has also extrapolated from the information on present effects to produce projections of (the research often claims these to be probable or certain) future environmental scenarios on the basis of this. Some of these international environmental issues will now be briefly outlined. References will be provided for each of these sets of issues.

2.4.2 The Land

Desertification:

This is the process of desert conditions spreading to what was previously fertile land. Human pressure, specifically over-cultivation, over-grazing, the clearance of trees and plant cover and careless irrigation, have all removed protective vegetative cover

from the land. This has caused desertification to be occurring in more than 100 of the world's countries. Land so affected loses its fertility and economic value (Grainger 1982).

Desertification is continuing apace. Each year, 6.2 million hectares of land are lost in this way. The United Nations considered this issue and drew up an action plan for stopping this process. However, by 1984 the United Nations programme concluded that their hopes for halting this process were unlikely to be met (Tolba 1984).

Forests:

Forests, perform many functions. They provide timber for paper, fuel and many other products. They also support animal and plant life, soak up rain water (preventing flooding) bind the soil (preventing erosion) recycle oxygen and nitrogen and absorb carbon dioxide. These areas have taken millions of years to develop into areas which contain the richest concentrations of flora and fauna on the earth.

However, forests are being burned and cut down to make way for farmland (Myers 1979), roads and towns (FAO 1982) and for hardwood timber (Pringle 1976, Westoby 1983, Myers 1980). The rate of destruction is very rapid. In 1955 forests covered more than one-quarter of the earth's land surface, by 1977 they covered only one-fifth. By

1984 there were 4.9 billion hectares of forest globally. The annual loss of this is estimated to be 11.3 million hectares (Global 2000, 1982). Not all countries are losing forests at the same rate. Some far eastern countries have increased their amount of forest cover, whilst Asian, African and Latin American, tropical moist forests are being lost at the rate of 7 million hectares a year (Caulfield 1982).

In Britain, as in the rest of Europe, deforestation is not occurring at this scale. The problem in Britain is that since the war, nearly one-third of remaining ancient woodlands have been replaced with conifers (Rose 1984). Acid rain is also a problem for the European forests. In 1983, nearly one-third of West Germany's forests were found to be suffering from acid rain damage, and damage has also been reported in Poland, Czechoslovakia, Sweden and other European countries (Svensson 1984). Hinrichsen (1989) provides details which show that much of the world is now subjected to the damaging effects of acid rain. He also claims that 67% of British forests are acid rain damaged: This being the highest proportion of forests effected in Europe.

Erosion:

This is the removal of soil due to the action of the wind and rain. This is, under natural (normal) conditions, an extremely slow process. However, due to the results of deforestation, over-grassing and other inappropriate

agricultural practices, the erosion of top soil is now occurring apace. Erosion is a world-wide phenomenon in the late twentieth century. However, the most serious effects of erosion are in tropical areas where good quality top soils are an especially rare and valuable resource (Parrington 1983, Global 2000, 1982).

Erosion has been documented to be having a serious effect in many regions of the earth. The scale of this effect is demonstrated in the following figures. For example, India (6000 million tonnes of top soil lost annually); Ethiopia (1600 million tonnes of top soil lost per year); USSR (2500 million tonnes lost annually, 10 per cent of agricultural land affected); USA (one third of crop land seriously affected, 4000 million tonnes of top soil lost annually) (Goldsmith & Hildyard, 1989).

Agriculture:

Many changes have occurred in the patterns of the world's agriculture over the last 4 decades (Carson, 1971 Earthscan, 1984). These will not be commented upon in detail in this section as the main topics associated with agricultural effects upon the environment are reviewed elsewhere in this chapter. An example of this is the need for agricultural land. As a consequence of this need, forests are cleared in tropical regions. This leads to not only forest loss, but also extinctions and to damaging gasses being introduced to the atmosphere through burning the felled trees.

Agricultural problems are often associated with the use of chemicals to improve yields. These chemicals then find their way into food chains. Once within the chain they may have a directly toxic effect upon other organisms within the chain. A second way in which these substances may affect the environment is through causing alterations in growth patterns. This is illustrated in the process of eutrophication. In this process, a lake or a stream becomes richer and richer in plant nutrients until plants overgrow the water area. The decomposing remains of these plants causes the deoxygenation of the water which then becomes foul-smelling and virtually life-less. Eutrophication results as nitrate fertilisers and nutrients from animal wastes drain from fields to these wet areas.

2.4.3 The Atmosphere.

Ozone:

The ozone layer is being disturbed by long-living pollutants which are a result of human activity (Gribbin, 1988). The responsible pollutants being; Chloroflourocarbons (CFC's) and nitrogen oxides, which deplete the ozone layer, and methane which increases ozone levels. Nitrogen oxides and methane are by-products of both agricultural and industrial activities. As such they are difficult to control. However, CFC's are mainly produced from foam products, aerosol propellants, refrigerants, sterilants and solvents and it

is somewhat easier to reduce their emission into the atmosphere. The introduction of these chemicals to the atmosphere has lead to "ozone holes" appearing in the atmosphere over the polar caps.

Greenhouse Effect:

The atmospheric levels of carbon dioxide, methane and chlorophlourocarbons is increasing. All of these are greenhouse gases. These are atmospheric gases which warm the atmosphere by trapping heat around the earth's surface after this has been radiated into the atmosphere.

Many of the industrial processes associated with modern society produce carbondioxide as a by-product. Half of this carbondioxide is absorbed by natural carbondioxide absorbing "sinks" such as forests, oceans and the process of limestone deposition. The remaining half of the carbondioxide emitted collects in the atmosphere. Since the beginning of the industrial revolution carbondioxide levels have been increasing and the rate of increase is at present increasing. This could lead to a doubling of the 1850 level by the middle of the next century.

It is estimated that by the year 2050 that the atmospheric temperature could have risen by as much as 2 degrees centigrade. This represents the average global increase. The warming however, would not be evenly globally distributed with increases of perhaps less than 2 degree at the equator, to as much as 6 degrees at

higher latitudes (Lovelock, 1989).

Acid Rain:

This environmental topic has already been commented upon in the section of this chapter concerned with forests. However, a more thorough review is given below. Acid rain, and the acidification of aquatic and terrestrial rain ecosystems, is one of the industrial worlds most intractable problems (Hinrichsen, 1989).

The term acid rain is used to describe fall-out of industrial pollutants. These fall-outs sometimes occur as acidified rain water, and in other circumstances as dry depositions. Most of these pollutants are caused through the burning of fossil fuels (for instance in industrial processes and in power generation). However, some acid depositions are the results of exhausts for vehicles.

The effects of acid rain are many and varied. However, their impact is to a large extent biological (Wellburn, 1988). The extent of damage is illustrated by Goldsmith and Hildyard, (1989).

"Acid rain damages forests, plants and crops, acidifies lakes, rivers and ground water; and corrodes building materials. In Europe it has been falling for more than 100 years; and its effects are cumulative."

(Goldsmith & Hildyard, 1989. p92)

2.4.4 The Oceans.

Marine Pollution:

Dredged spoils, sewage and industrial wastes are dumped in large quantities directly from ships in large quantities. The Atlantic ocean and the North sea are the main areas where dumping occurs as dumping has been banned in most regional seas. Many of the areas used for dumping wastes are now severely contaminated with high levels of pollutants being discovered on the sea beds and within fish (Eckholm, 1982).

There are now many legislations which govern the dumping of wastes at sea. Even so, heavy metals and carcinogenic wastes are still dumped legally under this legislation which allows for trace quantities of banned substances to be present in wastes. Furthermore, whilst there has been a moratorium on the dumping of nuclear wastes at sea since 1983, before this date many drums of this form of waste was disposed of at sea (Gullard, 1975. Gwynn, 1987. Salvat, 1979). The effects of this pollution has been severe upon fish and other aquatic creatures (FAO, 1979) and has even reached the polar regions (Mitchell & Tinker 1980).

2.4.5 Population.

Many of the worlds environmental problems are rooted in a continuing growth in world population (eg, Ehrlich 1968,

Eckholm 1982, ICIDI 1980) or localised populations (Gupta 1988, Conroy & Litvinoff 1988).

A growing population requires more food to feed it, more land to live on and more organic resources for fuel, construction, etc. The rising rate of world population levels and the scale of this problem is made apparent in the report of the W.C.E.D. (1988). .ls1

".... The worlds human population may be expected to stabilise during the next century, depending upon when replacement level fertility rates are reached. If this rate is reached in 2010 the world population will stabilise at 7.7 billion by 2060; but if it is not reached until 2065, the population will stabilise at 14.2 billion in 2100."

(W.C.E.D, 1988 p109)

The rapid rise of world population levels is also shown in the speed with which the global population doubles. In 1800 the global population was 1 billion. This doubled in the next 135 years. The next doubling took just over 50 years, and it is projected that the next doubling will occur in 20 years (HRH Prince Philip, 1989). The shortening of the doubling time of the worlds population has been documented for many years. Continued growth is dependent upon improvements in agricultural yield, etc., to enable this size of world population to be fed. However, human technologies now manipulate natural systems to ensure regular food supplies. These technologies have now been developed into highly efficient techniques for exploiting both the natural and threat include coral reefs and...

mineral resources of the planet. Furthermore, humankind has learnt to control many of the previously lethal diseases. The extent to which these advanced technologies, future modifications and new discoveries will enable a growing world population to be supported is a matter of debate (eg, Meadows, etal, 1974).

2.4.6 Wildlife.

Threats to the earth's wildlife exist due to many of the environmental problems commented upon in the preceding paragraphs. For instance, acid rain will effect the acidity of fresh water. In sever cases, this will result in the destruction of the life in lakes, rivers, etc.

The process and some of the consequences of extinction (Allen 1980, Ehrlich, 1980, Halliday 1980) will be listed hereunder. This is a process which is by no means a recent phenomenon, neither has it always been man-made. Species have become extinct because they were unable to survive or adapt to natural environmental changes, or they have evolved into different life forms. Extinction is now occurring at a rapid pace and is due to humankind's actions which destroy habitats and consequently indigenous species (Worster, 1989). The loss of the worlds tropical rain forests is an example of habitat loss on a massive scale. The loss of these regions alone could account for the extinction of a third of the worlds species. Other major habitats under threat include coral reefs and wetlands. With such a

widescale threat, species are being lost at a faster rate than ever before (400 times faster than at any other recent geological time (Goldsmith & Hildyard, 1989)).

These authors conclude by stating:

"The long term outcome of today's extinctions cannot be predicted with precision: but the loss of species cannot continue with impunity forever. Sooner or later, the Earth's support systems will simply be overwhelmed."

(Goldsmith & Hildyard, 1989 p144)

As well as research covering the above mentioned issues, there has also been a steady stream of environmental literature which is of a more general nature. These publications have commented upon the state of the global system and have forwarded recommendations or recipes to enable environmental survival at this ecosystem level. (eg, ICIDI 1980, Global 2000 1982, IUCN, UNEP & WWF 1988, Brown et al 1984, Meadows et al 1974, Blueprint for Survival 1972, Ward & Dubos 1980, McCormick 1985a, Barr 1971, Allen 1980, Holdgate et al 1982, etc).

2.5 Conclusion.

The above environmental issues illustrate the vast range of problems the contemporary environment faces. Due to this breadth, it also demonstrates the possible complexity of the attitudes about environmental issues which the public may hold. Whilst this chapter has broken down environmental issues into a series of sub-

issues, the interrelated nature of these problems is at all times obvious to the reader. Environmental problems do not stand as separate issues but are rather intertwined with each other. Together, the issues relate to human beings' relationship and interactions with their environment.

This chapter has briefly outlined the content area of environmental issues. The next chapter will consider the extent of support for groups, organisations and legislation which aims to ameliorate some of Britain's environmental problems. The degree of concern present in the British public about these problems, as it has been revealed through social surveys, will also be considered.

CHAPTER 3.

Environmental Concern and Nature Conservation in Britain.

3.1 Introduction.

"The environmental movement in the second half of the 1980's is very much at a watershed. It would seem to be going through one of its periodic peaks, where the issues in which its protagonists are involved coincide with people's everyday concerns to force politicians and 'decision makers' into a more open and responsible pattern of activity."

(Porritt, 1986 p340)

In this chapter the British public's concern for the quality of the natural environment will be reviewed. This will be followed in the next chapter by a review of psychological research into environmental concern attitudes. There are several indicators of public concern for the natural environment. Two of these indicators are; firstly, the number of voluntary groups actively concerned with environmentally related issues, and the size of the membership of these groups; secondly, the type and extent of legislative protection offered through the statutory designation of natural landscape features as protected areas.

Both of the above 2 indicators of public concern, may be used to gauge public support for the conservation of the natural environment. This is achieved through inference, eg, by assessing activities present within society which are designed to achieve the aims of conservation. and

inferring social support for environmental conservation to underlie the existence of these.

Another approach which may be adopted in attempting to assess public opinion is that of the mass social survey. Fortunately for the present research, one such social survey conducted annually in Britain has, for the last 5 years, contained a section specifically addressing environmental concern. The survey is that of the "British Social Attitudes Survey" (Jowell, etal, 1984, 1985, 1986, 1987, 1988).

In the chapter which follows, all of the above indicators of the British publics' environmental concern, will be reviewed. This will commence with a brief overview of the growth of environmental groups in Britain and will continue by considering the present extent of British' land which receives either statutory or voluntary protection. Finally, public opinion surveys will be reviewed.

3.2 Environmental Groups.

The emergence of environmental groups can be traced back to the late 19th century. To illustrate this, in Britain the National Trust was founded in 1895 and the Royal Society for the Protection of Birds in 1889. Subsequently, many more organisations have emerged. As well as there being a significant increase in the number of environmental organisations the membership of these

groups has grown enormously. The National Trust now has over 1.6 million members (National Trust, 1989) whilst the Royal Society for the Protection of Birds has 540,000 members including 100,000 junior members (under 16 years (R.S.P.B. 1988)). For a detailed review of the emergence of environmental groups the reader is guided to; Sheil 1983, Sinclair 1973. By 1980 it was claimed that support in Britain for environmental groups had probably risen to 2,500,000 - 3,000,000 members (Lowe, et al, 1980). This represents approximately 1 in 10 of the adult population.

The early conservation groups were traditionally interested in the preservation of both the built and natural heritage of the nation. However, several authors have noted that in the 1960's, a new, more politically radical form of environmental organisation emerged (Lowe & Goyder 1983). Over the last 3 decades these new environmental groups have emerged which are not directly concerned with the protection of the national heritage through the purchase or management of countryside areas (McCormick, 1985b). Rather, these groups have become more overtly politically active. Such groups include the "Friends of the Earth", "Greenpeace" and others which are effective through being political pressure groups (Lowe & Goyder, 1983).

This new breed of groups has lead to the voluntary sector of the environmental movement embracing an ever more diverse range of issues. Stephen Cotgrove illustrates

this point by writing:

"Environmental groups embrace a very wide diversity of interests and approaches, from the preservation of wildlife and the natural heritage of buildings, to the enjoyment of the countryside through rambling, hostelling and caravanning. Such a broad based movement attracting so much support is undoubtedly of importance. But the groups formed in the late 1960's and early 1970's took on a new and distinctive direction."

(Cotgrove. 1982. p2-3)

Many of the politically active environmental protection groups which emerged during this time are still operating at the present time. The activities of these organisations are now geared to the raising of awareness both in the general public (eg, Porritt. 1987) and in political parties (through attempting to bring the pressure, of what they claim is popular opinion, to bear upon government (eg, W.W.F., etal, 1988)).

Whilst the 1960's and 1970's saw the origination of the more politically radical environmental groups, the late 1970's and the 1980's has seen the emergence of 2 further types of group within the environmental movement. The first of these is the green movement (Porritt, 1984., Porritt & Warner, 1988). Green groups or parties are politico-environmental parties. These groups arose simultaneously throughout the world (Capra, 1982, Spretnak & Capra, 1984). They provide a coherent political approach to environmental issues. They also offered an environmentally sensitive approach to many

socio-political issues and debates (eg, Kelly 1985, Spretnak 1986) on which these groups and individuals have stood for parliamentary election in their respective countries of origin.

The second of the new strands of the environmental movement are the urban conservation groups (Smyth, 1987, Davidson 1988). These groups are distinct from the traditional rural protection lobby both in terms of their area of concern and their actions. Property developers reluctance to re-develop derelict urban land sites, and the amenity loss that this implies for the local communities, is an important issue for the urban conservationist (Powell, 1986). Rather than purchasing natural sites of established wildlife or scenic value, the urban conservation or wildlife groups, through the reclamation of decaying urban areas, have aided in the introduction of green spaces to cities. In doing this these groups have attempted to educate the public about the need for conservation through experience and to improve the life quality of urban dwellers.

The philosophy which lies central to the urban conservation approach is that of community involvement. Community involvement in nature conservation and environmental issues is a growing trend within the environment movement. Indeed, several professional conservationists have written texts which call for a greater level of community involvement in conservation

projects (eg. Wilson, 1984b, 1986). These publications also provide practical information for the individual, action group or community wishing to take direct action (King & Clifford, 1985. Tait, etal, 1988).

Throughout the whole of this period there has been another branch of environmental activity; the committees and research groups. These groups are not open to public membership. Rather, they are groups of highly specialised experts. Examples of such groups are numerous, and the reports and publications which they produce often have far reaching effects in conservation practice. For example, there have been many far reaching reports issued by committees working for a variety of official bodies. Examples of these are: Stockholm, 1970, Council on Environmental Quality (1970,1971), UKWCS (1983), ICIDI (1980), "The Global 2000 Report to the President (1982), "A Blueprint for Survival" (1972), IUCN, UNEP, WWF, (1980), "Limits to Growth" (Meadows etal 1972), "Our Common Future" (Brandt, etal, 1987). These are just a few of the research publications which could have been cited. All of these publications (and many of the un-cited publications) have been responsible, to some extent, for the shaping of contemporary environmental concern and modern conservation practice.

As well as these official reports, research has been carried out by individuals and groups which has also been influential in shaping modern environmentalism. These publications are often more far reaching and perhaps more

speculative than are the committee reports noted above. Many of these reports exist, and below are listed a few which will illustrate the breadth of environmental issues about which authors have found concern. For example: Shoad, (1980), Carson, (1971), Eckholm, (1982), Brown, (1982), Ward & Dubos, (1980), Holdgate. etal, (1982).

3.3 Countryside Protection in Britain.

A second indicator of the extent of concern for the quality of the natural environment in Britain is the extent of protection offered to geographical areas which are of special interest or are particularly sensitive in terms of their indigenous wildlife or habitats.

The National Trust were the first organisation to own and designate land which was to be reserved for nature. By 1910 the Trust had 13 sites. The then new concept of setting land aside and reserving it for nature was further expanded in 1912 by the establishment of the Society for the Promotion of Nature Reserves. The growth in the number, of, and the increase in the amount of land covered by nature reserves has continued to the present date. Non-statutory bodies such as the ones already mentioned above (eg, National Trust) still own a significant area of the land which is set aside as non-statutory protected areas. Table 3.1 gives a detailed breakdown of these areas.

 Table 3.1 Non-statutory Protected Areas in the United Kingdom at 31.3.1987.

	Number	Area(sq km)
Royal Society for the Protection of Birds	121	574
Field Studies Council	2	14
Royal Society for Nature Conservation and the Local Nature Conservation Trusts	1.665	551
Woodland Trust	247	32
Wildfowl Trust	8	19

 (Department of the Environment, 1987 p296)

Land which is to be set aside for nature may now be designated under a series of different headings. The primary purpose of the U.K. system for designating areas is to identify and protect the finest landscape and the most important scientific sites throughout the country. Each of these land classifications offers a different form of protection and encourages or permits different specified uses for the land under its jurisdiction. In addition to the land owned or administered by voluntary organisations as nature reserves, several statutory bodies also own and manage reserve areas. Table 3.2 shows the main protected areas and long distance routes in Britain. Figure 3.1 provides a map of these areas.

 Table 3.2 Designated Areas in Great Britain - 31.3.1987.

	Area (sq km).	% of total area/ length in region.
National Parks	13,599	9
AONB	17,084	11
Heritage Coast	1,370 (km length)	31

 (Department of the Environment, 1987 p281)

The 10 National Parks in England and Wales were designated in the 1950's by the National Parks Commission (now the Countryside Commission). These were to safeguard and secure public access to the most beautiful wilderness areas. They are exceptionally fine stretches of relatively wild countryside, such as the larger unspoilt areas of mountain, moor, heath and some coastal areas. The National Parks cover 9 per cent of the total area of England and Wales and are mostly in private ownership. Each National Park has a committee or board which controls planning policies within the park. The Norfolk Broads and New Forest are not National Parks. However, due to their unique landscapes, both of these areas receive protection.

As well as the 10 National Parks, the Countryside Commission (or National Parks commission) has designated 36 Areas of Outstanding Natural Beauty (AONB's) in England and Wales. These areas contain outstanding landscapes which are generally more intensively farmed than National Parks and are therefore less suitable to large numbers of visitors. AONB's at present cover 11 per cent of the area of England and Wales.

These areas contain outstanding landscapes which are generally more intensively farmed than National Parks and are therefore less suitable to large numbers of visitors. AONB's at present cover 11 per cent of the area of

England and Wales and are mostly in private ownership.

There are thirty-nine lengths of unspoilt coastline which have been designated as Heritage Coasts, in England and Wales. These are designated by local authorities and the Countryside Commission and cover 31 per cent of the total English and Welsh coastline. The majority of the land so covered is in private ownership, although the National Trust own a substantial proportion.

As well as these designated areas, which have been established to reflect broader environmental aims, there are other categories of statutory protected areas. These have been established for the protection of natural features. Table 3.3 lists the area of land which has received statutory protection for its scenic or wildlife value.

Natural Nature Reserves are established to protect, through appropriate control and management, the most important areas of natural or semi-natural vegetation with characteristic flora, fauna and environmental conditions such as notable geological and physiographic features. These areas are owned or managed by the Nature Conservancy council.

Local authorities have powers to establish Local Nature Reserves, after consultation with the Nature Conservancy Council. The Local Nature Reserves include several Sites of Special Scientific Interest (SSSI's). Planning

authorities are required to consult with the Nature Conservancy Council before permission may be granted for development on SSSI'S.

The remaining categories of protected areas in Table 3.3 are the result of the U.K.'s involvement with international conservation initiatives. These include, Special Protected Areas, Biosphere Reserves, 'Ramsar' Wetland Sites and Environmentally Sensitive Areas.

This section of the chapter contains a brief illustration of the breadth of contemporary concern for the environment along with some examples of conservation activity.

The remainder of this chapter will again be divided into a series of sections. Each of these will consider public attitudes in regard to different forms of conservation issues and actions. These sections will be: 1/ environmental pollution, 2/ concern for the countryside, 3/ concern for international and global environmental issues. These are the same categories used in the previous chapter when consideration was given to contemporary environmental issues.

3.4 Concern for the environment in Britain.

The British public's concern for the quality of the natural environment has been the subject matter of many

Figure 3.1 Protected Areas in the United Kingdom

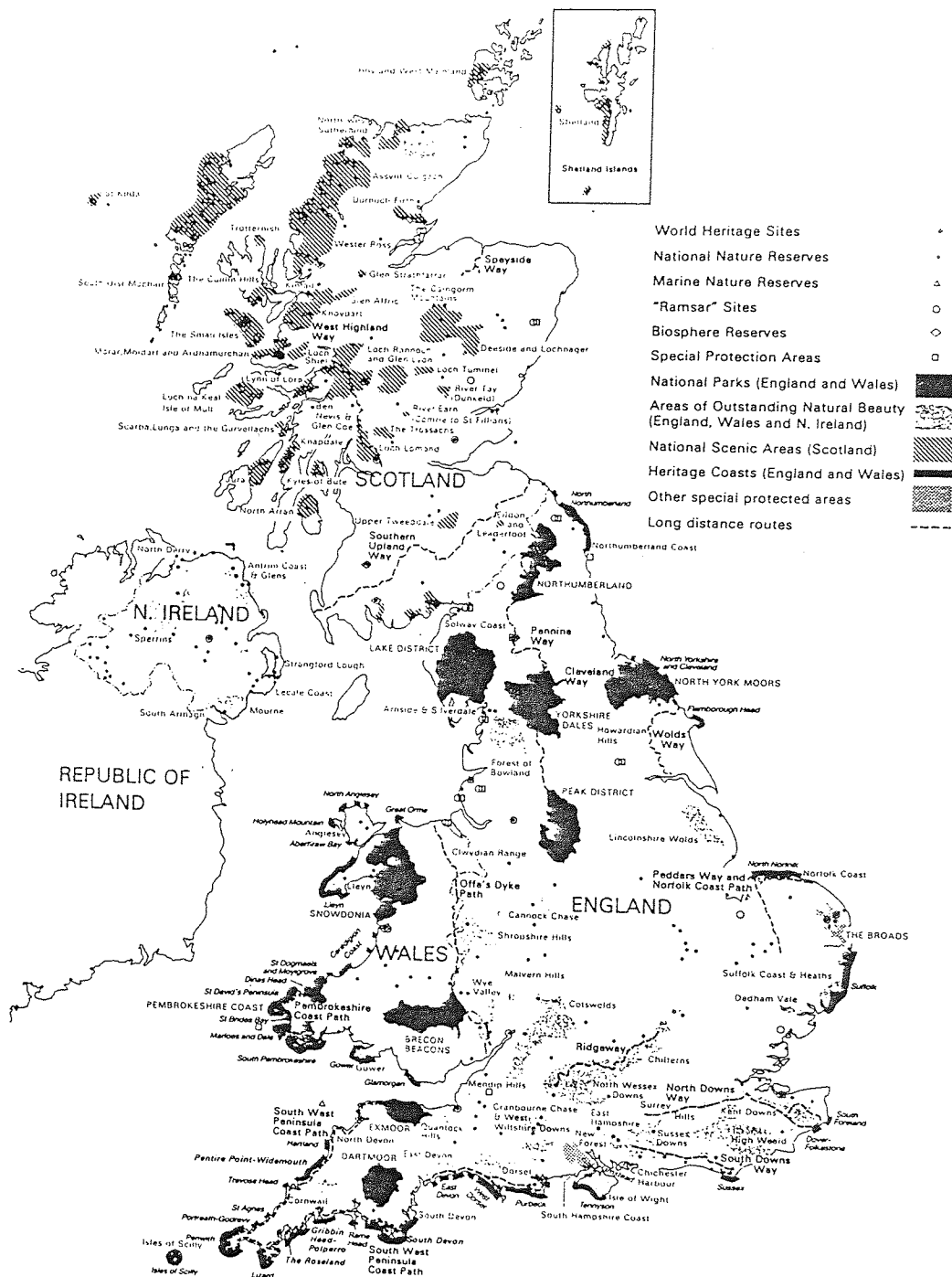


 Table 3.3 Statutory Protected Areas in Great Britain at
 31.3.1987.

	Number	Area(sq km)
National Nature Reserves	269	1,645
Local Nature Reserves	141	158
Sites of Special Scientific Interest	4,724	15,175
Other Special Protected Areas	75	5,522

 (adapted from, Department of the Environment, 1987 p287)

reports and other publications over the last 3 decades. These have originated from a wide variety of government, statutory, private and academic bodies. In this chapter, selected contemporary publications will be reviewed. This will illustrate the present extent of concern about the destruction of, and support for the protection of, the natural environment in Britain.

The fact that concern about the environment exists amongst the British public is indisputable. This is evident in the findings of a survey which asked respondents to say in their own words what the most important problems facing the country today were 8 per cent of the sample included environmental problems amongst the most important problems the government should be dealing with (Department of the Environment, 1987). This study shows there to be general concern about environmental issues. In the next section of this chapter, attitude towards just one environmental issue, that of pollution, will be presented.

3.4.1 Concern about Environmental Pollution.

In 1984 the Royal Commission on Environmental Pollution published the results of a poll conducted by Jowell et al (1984). This showed that responses, by a representative sample of the British public, to questions regarding the "seriousness" of the effects on the environment caused by 6 sources of pollution. In 1987 Jowell et al, again ran the questionnaire on a similar sample. The results from these 2 surveys can be found below in table 3.4. This shows that whilst the ordering of the perceived seriousness of environmental hazard issues has remained constant, the degree of perceived seriousness has increased in all cases.

Table 3.4 The Perceived Seriousness of Environmental Issues, 1983 / 1986.

% of respondents regarding each of these environmental hazards as 'very' or quite serious.		
	1983	1986
Industrial waste in rivers or sea	91	94
Waste from nuclear electricity stations	82	90
Industrial fumes in the air	83	89
Lead from petrol	84	85
Noise and dirt from traffic	66	73
Noise from aircraft	30	42

(Jowell, etal, 1987 p316)

The table above shows, perhaps not surprisingly, that for both years aircraft noise pollution was seen as the least serious of pollutants with 30% of respondents rating this

to be very or quite serious in 1983 and 42% in 1986. The 5 remaining forms of pollution were however seen to be much more serious in terms of their effects upon the environment. For these pollutants, between 66% and 91% of the sample in 1983, rated these as very serious or quite serious whilst by 1986 this number had risen to 73% to 94%. Overall, in 1983, 72.6% of those completing the questionnaire thought these sources of pollution had a very or quite serious environmental effect, this rose to 81.6% if aircraft noise pollution was excluded. Whilst by 1986, 78.8% of the sample reported all hazards to be serious to some extent, with this number rising to 86.2% in aircraft noise is again removed from the calculations.

Table 3.4 also shows that there has been no large shift in attitudes over this 3 year period. However, there is a general increase in the willingness of respondents to rate any of these environmental hazards as being problems to some extent.

In their 1986 report, Jowell and colleagues also enquired about what was the most serious threat posed to the British countryside. In this study, industrial pollution was indicated to be the most serious threat to the countryside by 47% of the sample. The 2 next most destructive practices were identified as other forms of pollution: the use of chemicals or pesticides in farming (43%), and litter (26%). Responses to all these threats to the countryside are shown in table 3.5. This

illustrates the point that pollution is seen as the single greatest threat to the British environment.

Table 3.5 Threats to the Countryside 1986

	greatest and next greatest threat.
Industrial pollution	47
urban growth and housing development	25
motorway and road building	21
chemicals and pesticides from farming	43
landscape destruction by farmers	25
litter	26
tourism and visitors	3

(Jowell et al 1987 p319)

The present thesis is concerned with environmental concern in Britain. However, it is of interest to note that concern over pollution is international. Kessel (1984) compared assessments of the "urgency" of a series of environmental issues including pollution. His study was conducted in England, West Germany and the United States of America.

In this study it was found that all issues were rated above the half-way point on a scale which ranged from, 1 = not urgent, to, 7 = very urgent. Toxic wastes were consistently seen as the most urgent of environmental problems. Furthermore, Germans reported there to be more overall urgency than English respondents, who achieved an average rating for all problems of 5.5 on the above scale. This result shows the English public to perceive

environmental problems (especially pollution) as an urgent problem to be tackled. The American sample expressed the least amount of perceived urgency. The full results to this study are shown in table 3.6.

Having considered the effects of pollution upon the countryside, the next section of this chapter will view public opinion to the changes which are occurring in the countryside in greater detail.

Table 3.6 The Perceived Urgency of Environmental Issues:
An International Comparison.

ENVIRONMENTAL ISSUE	COUNTRY		
	West Germany	Great Britain	United States of America
Over population	5.2	5.1	4.6
destruction of town/landscape	5.9	5.4	5.3
depletion of natural resources	6.1	5.9	5.6
Energy issues	6.1	5.7	5.7
average	5.8	5.6	5.3

(adapted from Kessell. 1984 p86)

3.4.2 Concern Over Countryside Change.

In the previous chapter there has been a brief outline of some of the changes that have occurred in the British

countryside over the past few decades. It is true to state that over this time period:

".... the degree of concern about the countryside has increased markedly, ..."

(Jowell et al. 1987 p329)

In their report of the following year Jowell et al, (1988) found that most people in their sample perceived the countryside to have recently changed (table 3.7).

Table 3.7 Degree of Change in the Countryside 1988

has not changed	22%
has changed a little	21%
has changed a lot	55%
don't know	3%

(Jowell et al. 1988 p319)

Furthermore, 56% of respondents thought that changes in the British countryside had been for the worse, whilst 60% thought that the countryside should be protected in some way. They further found that the major proportion of respondents were concerned about countryside changes to some extent (table 3.8).

Table 3.8 Concern over Countryside Change 1988

very concerned	44%
a little concerned	33%
not concerned	22%

(Jowell et al. 1988 p318)

When asked to identify the source of the threats to the countryside, Jowell, et. al. (1988) found pollution from industry to be rated as the greatest threat. A full breakdown of responses can be seen in table 3.9 below.

Table 3.9 Threats to the Countryside 1988.

	greatest threat	next greatest threat	1985
Industrial pollution	32	21	47
urban growth and housing development	16	12	25
motorway and road building	11	11	21
chemicals & pesticides in farming	18	26	43
landscape destruction by farmers	11	12	25
litter	9	12	26
tourism and visitors	1	2	3

Under the 1985 column can be seen the percentage of respondents rating each countryside issue as being the greatest and next greatest threat in the 1985 survey.

(Jowell et. al. 1988 p324)

In the above survey, industrial processes were identified as being major sources of destruction to the environment. Farming was seen as somewhat of a lesser problem. However, modern farming methods are seen by the public to be damaging to the environment (table 3.10).

Table 3.10 shows that modern farming methods are perceived to be destructive to the British countryside. It also shows that the public is increasingly wanting to see the natural environment in Britain receiving adequate protection. Trust in farmers ability to look after the land is however present as they are still seen as doing a good job in protecting the countryside.

Table 3.10 The Farmers Role in the Countryside - 1985 & 1988.

	1985	1988
Modern farming methods damage the countryside.	63%	68%
Farmers should produce food over conserving the countryside.	53%	35%
Farmers do a good job looking after countryside.	75%	74%
Some farm subsidies should be withheld and used to protect the countryside	47%	51%

The figures above are the percentage of respondents agreeing & strongly agreeing with the statements.

adapted from: Jowell, etal, 1985, 1988.

In the 1988 survey, Jowell and colleagues also asked what should be done with farmland which is no longer wanted or needed for conventional farming activity and which is to be taken out of agricultural production. The single largest category of responses to this question suggested that the land should be used to create wildlife areas. In this study, 64% of respondents replied that the best or the next best thing to do with this category of land

was to set it aside or to use it for a conservational purpose.

This section has briefly reviewed environmental concern within a British context. In the following section of this chapter a broader view will be adopted in order to illustrate concern for the natural environment at a larger physical scale.

3.5 Concern about the Environment in General.

Many of the findings from the surveys reviewed above could also be applied to concern about the environment in general. MORI (1987) provide a review of public concern for these issues.

Environmental issues and activities which are 'British' may also often exist at a larger scale. It is possible that what are local (British) activities, cause environmental problems at a larger scale. Examples of this would include effluent and gaseous discharges from power stations and industry. Alternatively, the British environment may be the recipient of damage from extra-national sources. Oil slick pollution and damage would be an example of this.

The Department of the Environment have published figures which illustrate the British public to be concerned with these larger scale environmental issues (DOE, 1987).

For instance, when asked which environmental problems they were most worried about, the 4 issues which respondents were most concerned about were all 'international' (chemicals in the rivers and seas (1), nuclear waste (2), wildlife destruction (3), beaches and seas (4)). 2 more international issues were also included in the top 10 issues (Acid Rain (8) and Oil Slick (10)). It is interesting to note that between 86% (issue 1) and 64% (issue 10) of respondents reported being concerned about these environmental problems (DOE, 1987).

In the same survey, respondents were asked to state how much they thought could be done about each of the specified environmental issues. Generally, the relationship between assessed seriousness and the ability to remedy the problems was positive. Furthermore, the sample reported a belief that a great deal could be done to relieve the problems. 84% of respondents reported that a lot could be done to relieve the problem assessed to be the most serious environmental problem (chemicals in the seas) 61% stated that a lot could be done about the 10th most worrying problem (oil slicks) (DOE, 1987).

The results presented above serve to illustrate that the British public are concerned about problems at a scale which is larger than their own country. Furthermore, it shows them to believe that there are solutions to the most serious of these issues.

The data which has been presented has illustrated the presence of a considerable level of environmental concern to be present within the British population. This has been achieved through noting the growth of environmental groups and their growing membership. Secondly, it has been shown by the legislative protection of parts of the British countryside. This has been seen to take many forms, both voluntary and statutory. Finally, the results of opinion polls regarding concern about nature and the environment have been presented. These have shown concern to exist about the British countryside and environment. This concern has been shown to be about many different forms of environmental issue: Countryside changes, and pollution being two main categories of concern. It has also illustrated public concern to exist about environmental issues which have a larger scale of effect.

Environmental concern will again be the subject matter of the following chapter. However, this section will review the research which has been undertaken by psychologists and social scientists.

CHAPTER 4.

The Psychology of Environmental Concern.

4.1 Introduction

A large body of social research literature exists which takes environmental concern as its subject matter. In this chapter, this literature, as it is pertinent to the present study, will be reviewed.

A now somewhat dated review of research viewing public concern for the quality of the natural environment is presented by Dunlap and Van Liere (1978a). The same authors later noted that:

"In the past decade social scientists have shown a great deal of interest in public attitudes toward environmental problems and issues, as reflected by the large number of studies of public concern with environmental quality."

(Van Liere and Dunlap, 1980 p181)

Research into environmental concern was initially solely concerned with documenting the widespread existence of such concern. Much of this early research also provided information about the social basis of environmental concern (Dunlap and Van Liere, 1978a). In doing this, environmental concern literature viewed environmental concern as a general environmental attitude (eg; Allen, 1972. Arbuthnot, 1977. Braithwaite, 1977. Craik and McKechnie, 1977. Dunlap, 1975b. Iwata, 1977. O'Riordan,

1971, Ray, 1974, 1975, Hay, 1977). Research has also viewed many different types of specific environmental concerns. For example, studies have viewed attitudes towards air pollution (Sharma, et al, 1975. Wall, 1973, 1974, 1975); water pollution (Ditton and Goodale, 1974. Watkins, 1974); noise pollution (Camerson, 1972. Goodman and Clary, 1976); population issues (Albrecht, et al. 1975. McCatcheon, 1974. Mindick, 1977. Stokols, 1973. Watkins, 1975); animals and wildlife (Bart, 1972. Erickson, 1971); science and technology (Bruvold, 1974. Goldman, et al, 1983).

In conducting research into environmental concern social scientists have attempted to answer the question "what types of people are most concerned about the environment", or "what typifies the environmentally concerned person"? Investigations have therefore viewed the extent to which environmentally concerned individuals share patterns of ideological and demographic characteristics (Cotgrove, 1982). Research has addressed the question of whether environmental concern was a characteristic of a specific social group, or whether this concern is present across various social sub-populations.

It was hypothesised that if the latter instance was the case, then the degree of concern about particular environmental issues would be unrelated to personal attributes such as political ideology, age, education, income etc. Conversely, if environmental concern was

found to be more of a sectarian phenomenon, these variables may define the salient attributes of the environmentally concerned individual (de Haven-Smith (1988), Tognacci, et al. (1972)).

As a consequence of adopting such a line of enquiry, these studies have most commonly adopted a line of investigation which measured features of environmental concern such as environmental; knowledge, beliefs, emotion, and behaviour. These were then related to a host of socio-demographic variables such as; age, gender, education level, occupation etc.

In these studies a series of different measures and indicators of environmental concern have been used. The measures used have included reported levels of support for environmental protection actions (de Haven-Smith, 1988), concern for the quality of the natural environment (Maloney et al., 1975), support for and participation in environmental protection actions (Kronus and Van Es, 1976), membership of and active participation in environmental groups (Manzo and Weinstien, 1987) etc.

The results from these studies are reviewed hereunder. This is followed by a review of some of the instruments and techniques which have been used as indicators of environmental concern. Van Liere and Dunlap (1981) presented a review of environmental concern research. In doing this they sub-divided studies in terms of the

substantive issues addressed and the measure of environmental concern used, in each of the reviewed studies. Their approach will be adopted in this chapter. Following on from this, research which has attempted to produce more complex (multi-dimensional) models of environmental concern, or to depict environmental concern as a component of a wider attitude system will also be presented. Initially however, a brief overview is provided of psychological research which has attempted to offer solutions which aim to ameliorate environmental problems.

4.2 Psychological Studies of Environmental Problems and Environmental Concern.

".... the doomsday predictions of demographers (Ehrlich, 1968; Meadows, Meadows, Rander, & Behrens, 1972), the shrinkage of natural resources ... and the deterioration of environmental quality prompted widespread concern about the constraints of the ecological environment. Suddenly, psychologists "rediscovered" the large-scale physical environment and, in collaboration with architects and planners, became increasingly involved in studying its impact on behaviour"

(Stokols, 1978 p256)

From the above statement it can be seen that environmental psychology represents a distinct strand of psychological research. Stokols (1978) has differentiated environmental psychology from other areas of psychology on the basis of three major dimensions: 1/ an ecological perspective, 2/ an emphasis on scientific strategies for solving community/environment problems,

and, 3/ an interdisciplinary approach. Stokols went on to identify environmental psychology within eight topic areas. The most applicable of these to the present research he defined as "the experimental analysis of ecologically relevant behaviour". In the present research the perspective of environmental psychology will be adopted: An ecological perspective will be assumed and a scientific strategy will be employed.

Over the past few years, psychologists have considered environmental problems within their research. In doing this they have discovered that the application of a behavioural approach to be of some use. Cone and Hayes (1984) have reviewed existing environmental problems research which has fallen within the the behavioral school. In doing this they provide a guide to behavioural procedures aimed specifically at altering public behaviours which are damaging the environment. They suggest that environmental problems may be tackled and ameliorated through behavioral interventions. The environmental problems which they have viewed include: littering and pollution, (eg, Cone, Parham, and Feirstein, 1972, Clark, et al, 1972) community transport (eg, Everett et al, 1972) transport (eg, Everett et al., 1974, Hake and Foxx, 1978) energy conservation (eg, Kohlenberg et al, 1976, Zarling and Lloyd, 1978), etc.

Within each of these areas of environmental issues, behavioral principles have been found to be effective in

providing solutions to the problem. However, whilst accepting the usefulness of the approach, behavioral research does not attempt to understand the personal meaning attached to environmental concern related behaviours, for the individuals committing the behaviours.

An alternative approach which some psychologists have adopted when viewing environmental issues, has ignored the environmentally destructive behaviour. These studies have focused upon attitudes which underlie environmental protection behaviours and the way in which persons conceptualise and comprehend their everyday physical environments (eg, Craik 1969, 1970, McKechnie, 1974, 1978).

4.3 Environmental Concern Research.

Since 1970 "the environment" has been an important public issue and a considerable upsurge in public receptivity to these issues has occurred (Tognacci, et al (1972). This has resulted in a growth in the number of studies of public attitude toward environmental issues by the social and psychological sciences. This growth has been accompanied by increasing attention to the measurement of public concern for environmental quality (Dunlap & Van Liere, 1978a. Weigel and Weigel , 1978). A central theme may be identified running through environmental concern research. This is an attempt to categorise the environmentally concerned person (Manzo and Weinstein,

1987). Most of these attempts have proceeded by correlating a wide variety of measures of environmental concern with other characteristics (variables) of the environmentally concerned individual (Millbrath, 1984, Dunlap and Van Liere, 1985).

4.3.1 Socio-demographic correlates of Environmental Concern.

There have been several important studies which have taken various measures of environmental concern and investigated the socio-demographic correlates of these measures (eg, de Groot, 1967; Van Liere and Dunlap, 1980; Weigel, 1977, Millbrath 1984). The existence of a large body of literature (see, Dunlap and Van Liere, 1978a) which attempts to identify these correlates is due to 2 facts. Much research has been concerned with the identification of the social basis of environmental concern. This has been for theoretical reasons (Hornback, 1974) and because of potential policy implications (Dillman and Christenson, 1972). However, relatively little research in this area has attempted to document changing levels of environmental concern among the public (eg, Buttell and Flinn, 1974; Grossman and Potter, 1977b).

During this brief review of environmental concern / socio-demographic correlation studies, 8 selected variables will be considered: These will be the 8

Table 4.1 (Continued).

	(a)	(b)	(c)	(d)
study	Age	Educ	Inc	Occ Res Sex Party Ideol.
Env. Funding Scale	-.08	.11	-.07	-.02 .06 .07 .07 .21
Env. Regulation Scale	-.07	.17	-.06	.09 .10 .14 .05 .16
Personal Beh. Scale	-.15	.10	-.12	-.02 .06 .03 .27 .07
Public Beh. Scale	.12	.01	-.16	.07 .02 .21 .04 .04
Weigel 1977	.04	.16	.07	.12-.04 .07 -.06 .03
Env. Beh. Index.	-.24	.42	*	.32 * * * .34
Studies Reporting Gamma.				
Buttel				
and Flinn 1974				
Env. as Problem 1968	*	.51	.22	* -.12 * * *
Env. as Problem 1969	*	.26	.32	* -.08 * * *
Env. as Problem 1970	*	.22	.09	* .03 * .02 *
Constantini				
and Hanf 1972(e)				
Env. Concern Scale	NR	.20	-.13	* * * * .22 .36
Dillman and				
Christenson 1972				
Pollution Value	-.21	.20	.12	.17 .05 * .0014 .13
Harris 1970a				
Air Poll (in State)	-.08	.11	*	* .19 * * *
Air Poll (Community)	-.19	.26	*	* .57 * * *
Water Poll (in State)	*	.05	*	* .07 * * *
Water Poll (Community)	*	.22	*	* .41 * * *
Harris 1970b				
Air Poll (in State)	-.15	.20	*	* .15 * * *
Air Poll (Community)	-.20	.19	*	* .35 * * *
Water Poll (in State)	-.12	.15	*	* -.06 * * *
Water Poll (Community)	-.23	.25	*	* .06 * * *
Hornback 1974				
Env Most Important				
Problem 1970	-.19	*	*	* .04 .04 -.06 *
Env Most Important				
Problem 1972	-.14	*	*	* * .03 -.12 .11
McEvoy 1972				
Env. Concern	-.06	.30	.22	* .06 1.16 * *
Murch 1972				
Env. concern	*	.15	*	.01 * .07 * *
Murdock				
And Schrinder 1977				
Pro Env Protection	-.26	.24	.04	.15 * * * *
Nat'l Wildlife 1972				
Env. Concern	-.08	.27	.15	* .12 -.08 * *

- a - A Positive coefficient means that more urban residents are environmentally concerned than rural.
- b - A positive coefficient means that more women are environmentally concerned than men.
- c - A positive coefficient means that Democrats are more environmentally concerned than Republicans.

Table 4.1 (Continued)

-
- d - A positive coefficient means that liberals are more environmentally concerned than conservatives. Where 2 coefficients are given, the first refers to "anti-laissez faire liberalism", the second "welfare state liberalism".
 - e - NR means that the author reported "no relationship" - no coefficients were given.
 - f - Chi-square statistics were reported at the given level.
 - g - Difference of means were reported at the given level.
-

(adapted from: Van Liere and Dunlap 1980 p186-187)

variables selected by Van Liere and Dunlap, 1980. The selection of these variables is due to the fact that the largest body of data exists for these social and demographic variables which are routinely included when employing sample survey techniques. The variables reviewed will therefore be; age, gender, income, education, occupational prestige, residence, political party and political ideology. The present review will concentrate upon the associations between these variables and various indicators of environmental concern. Other demographic measures such as race and religion could also have been included. However, as relatively few studies have examined environmental concern's relationship with these variables, they will not be included. Furthermore, in this review only bivariate associations will be presented. Studies which have employed multi-variate analysis will be considered in a later section.

The review of the socio-demographic correlates of environmental concern in table 4.1 suggest that age, education and political ideology show moderate but

consistent relationships with environmental concern.

Thus, Van Liere and Dunlap (1980) state that:

".... we have confidence in concluding that younger, well-educated, and politically liberal persons tend to be more concerned about environmental quality than their older, less educated, and politically conservative counterparts."

(Van Liere and Dunlap, 1980 p192)

The evidence for the relationship between environmental concern and the other socio-demographic variables reviewed by Van Liere and Dunlap, is less conclusive. A link between urban residence and environmental concern is suggested, and is supported when environmental concern is limited to environmental problems at a local level (Tremblay and Dunlap 1978). When environmental concern has been correlated with occupation, a series of occupational categories, which are not related to occupational prestige categories, have been found to be negatively related to environmental concern. For instance; business occupations (Buttel and Johnson, 1977. Constantini and Hanf, 1972) technologically dependent occupations (Malkis and Grasmick, 1977) and nature exploitative occupations (Harry, 1977). Whilst sex and income do not appear to be systematically related to these measures of environmental concern.

From the above results of correlational research Cotgrove (1982) found it possible to draw 2 conclusions. These are that it is:

"... important to differentiate between different components of environmental concern, and secondly, that cognitive variables are just as important as socio-demographic variables in predicting environmental concern in the general public."

(Cotgrove, 1982 p132)

The foregoing research findings indicate that researchers have had limited success in explaining the social basis of environmental concern. This is due to the relatively low correlations found to exist in bivariate analyses between a variety of measures of environmental concern and other characteristics of the environmentally concerned individual. In order to examine the explanatory power of socio-demographic variables when they are viewed in combination, some researchers have chosen to employ multivariate analysis techniques. As well as viewing the cumulative effects of several variables upon environmental concern, through multivariate analyses, the researcher is also able to answer questions in regard to the relative statistical importance of each of these variables in relationship with variables indicative of environmental concern.

4.3.2 Multi-variate Research into Environmental Concern.

In conducting a multi-variate investigation of the area of environmental concern two approaches have been adopted. The first of these have attempted to depict environmental concern as part of an attitude complex. This attitude set is taken to include a variety of other attitudes to

contemporary social issues. The second approach depicts attitudes towards environmental issues within a multi-dimensional context. The 2 approaches have been used in a non-exclusive manner. In these situations, the models produced, in multi-variate analysis of environmental concern, are related to a more general multi-dimensional representation of social dispositions. Moreover, the elements of environmental concern models are also correlated with socio-demographic characteristics of the environmentally concerned individual. The research which is presented hereunder is representative of such research.

4.3.3 Environmental Concern as a multi-Variate Attitude.

An example of multivariate research into environmental concern is given in table 4.2. Presented in this table is a zero order correlation matrix of the data obtained by Cotgrove (1982). This shows the relationship between 3 measures of environmental concern (Damage, Shortage, Nature) 4 measures of socio-demographic variables (Age, Politics, Income, Market) and 4 measures of cognitive variables associated with contemporary worldviews (Anti-industry, Anti-science, Post materialism, Anti-economy). The sample for the study was taken from the British public. The precise meaning of each of the 11 variables is of little importance to the present research; rather the relationship between environmental concern variables and socio-demographic and cognitive variables is of interest. For a full explanation of these 11 variables

the reader is guided to Cotgrove's (1982) text.

The correlation matrix shows several interesting features. Firstly, it may be noted that several of the coefficients are negative. Furthermore, these negative relationships are often of quite large magnitudes. Guttman (1983) and other researchers concerned with the theoretical study of attitudes (eg, Levy, 1985) commented upon the presence of negative relationships in a correlation matrix of attitude items. The presence of these relationships is indicative of the heterogeneity of the items. More importantly, it is indicative of the heterogeneity of the semantic area addressed by the research instrument. Having stated this it should be noted that the negative correlations involve 3 of the 11 variables (variables X1, X2, X3). Variable X3 is income and may be expected to be negatively related to other measures of this largely charity related area. Indeed, the majority of relationships between this and other variables are negative or low positive. The other 2 variables with negative correlations are age and politics. These correlations are neither consistently negative or positive and are of varying magnitude. As such, these variables can be seen to play a minor role in the systematic structure of the relationship between the attitudes contained within the matrix.

Some of the highest and most consistent relationships are present between variables X9, X10 and X11. These variables represent 3 measures of environmental concern. From these coefficients it may be claimed that a common

Table 4.2 Zero Order Correlation Matrix of Environmental Concern, Socio-demographic Variables and Cognitive Variables*.

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
X1	..										
X2	-154	..									
X3	071	045	..								
X4	-007	-067	-184	..							
X5	-179	310	083	124	..						
X6	024	124	-021	197	407	..					
X7	-175	451	022	072	448	339	..				
X8	-184	561	-006	062	392	274	660	..			
X9	109	-025	-219	045	217	231	230	227	..		
X10	057	089	-076	083	147	177	129	171	619	..	
X11	083	028	-171	100	272	212	302	255	642	525	..

- X1 = Age (young to old)
 X2 = Politics (conservatism to liberalism)
 X3 = Income (low to high)
 X4 = Market (market sector to non-market sector occupation)
 X5 = Anti-industrialism (low to high)
 X6 = Anti-science (low to high)
 X7 = Post Materialist Values (low to high)
 X8 = Anti-economic Values (low to high)
 X9 = Damage (concern about environmentally destructive practices)
 X10 = Shortage (concern about resource shortages)
 X11 = Nature (concern about extinction, countryside and habitat damage, etc.)

* = decimals omitted.

(Cotgrove, 1982 p133)

attitude (which may be called concern for the environment) is being assessed by each of the measures employed. However, due to the relatively small magnitude of the relationship of variable X10 with variables X9 and X11 it may be suggested that this variable (X10) is measuring a slightly different section of the environmental concern attitude complex (this is however purely speculative). Inspection of variable X10 shows it to be measuring shortages. Variables X9 and X11 are however measuring activities which are damaging to the environment. Shortages may be the consequences of environmentally

damaging practices and therefore a difference in respondents understanding of, and responses to, these 2 types of environmental concern may be explained.

The purpose of this exposition of Cotgrove's (1982) matrix has been for 3 reasons. It has been undertaken in order to illustrate that environmental concern attitudes may be both positively and negatively related to cognitive and socio-demographic variables. As a result of this, environmental concern may be correctly identified as a component part of an attitude set which may be labelled "contemporary world views". Secondly, the 3 measures of environmental concern are positively related, therefore enabling the hypothesis of a distinct sub-set of environmental concern attitudes within contemporary worldviews to be made. Finally, the environmental concern attitudes were all positively interrelated and consequently form a homogeneous sub-set of attitudes. However, differences in the relative sizes of these interrelationships enabled the attitudes to be divided into components of environmental concern. These relationships provide further justification for the multi-variate investigation of environmental concern attitudes and values.

The matrix in table 4.2 also shows that cognitive measures (X5 - X8) consistently correlate more highly with the 3 environmental concern sub-scales than do socio-demographic measures (X2 - X3). Multiple regression analysis of this

data was performed and the results are shown in table 4.3. This shows that on the basis of these analyses, it is possible to conclude that environmental concern is more a product of an individual's particular set of social values and attitudes, than a reflection of social group membership.

Table 4.3. Multiple regression Analysis of Environmental Concern Sub-Scales.

Independent Variable	Dependent Variable		
	DAMAGE	SHORTAGE	NATURE
Age	0.179	0.097	0.170
Politics	-0.234	0.004	-0.193
Market	-0.077	0.032	-0.002
Income	-0.245	-0.081	-0.187
Anti-Industry	0.175	0.079	0.211
Anti-Science	0.096	0.103	0.028
Post-Materialist	0.104	-0.021	0.197
Anti-Economic	0.230	0.139	0.173

(Cotgrove, 1982 p134)

When inspecting Cotgrove's data, it can be further noted that there were different personal variables associated with his 3 types of environmental concern measure. When viewing awareness of environmental damage, high scorers on this scale were typically politically left-wing, of lower income, older than average and held anti-economic and anti-industry values. When viewing the environmental shortages scale, anti-economic and anti-science values were found to be the best predictors. By contrast, age, politics and income have only a weak direct effect. Finally, concern about nature is very similar to awareness of environmental damage, except that anti-industry and post-material values have larger direct effects relative to the socio-demographic variables.

It can be seen from this analysis that both cognitive and socio-demographic variables have substantial direct effects on environmental concern. Cognitive variables are also found to be the most consistent predictors of environmental concern measures. This is due to the large differences which exist in the patterns of associations between the 3 measures of environmental concern and socio-demographic variables.

Cotgrove's research raises the important points that:

"Awareness of damage and concern for nature are very similar, but the constituency for awareness of shortages is very different. This implies the need to analyse different types of environmental concern separately, and not to conflate them. The general conclusions to emerge from this analysis is that there is no single constituency for environmental concern (and) There is little evidence to suggest that environmental concern is the exclusive preserve of a particular social group."

(Cotgrove, 1982 p133)

Different variables are correlates of environmental concern dependent upon which dimension of environmental concern is being viewed. Studies have shown that concern tends to be somewhat higher among people who are younger, female, more educated and more liberal (Millbrath, 1984). However, as Van Liere and Dunlap (1980) and others have noted;

".... these associations tend to be weak and are somewhat inconsistent from study to study."

(Manzo and Weinstein, 1987 p676)

There are also differences in which variables are correlates of environmental concern dependent upon the manner in which this concern is expressed (ie, dependent upon how environmental concern is being measured (Buttel and Flinn 1976a). In short, the above correlation studies may be criticised for their lack of a standardised variable or criteria which establishes or is indicative of environmental concern (Van Liere and Dunlap, 1978).

Many of the studies mentioned so far in this chapter have gathered together diverse measures of environmental concern (such as, air and water pollution, population issues, animal and wildlife issues) to form a global measure of environmental concern. It is unclear from the research literature as to whether persons concerned with one of these issues will be equally concerned with others. Indeed, from the analysis of Cotgrove's (1982) data matrix it appears that they may not be. Although one study has documented a relatively high degree of consistency between attitudes toward different environmental problems and policies (Tognacci et al., 1972) many other studies have concluded that environmental attitudes are issue specific (Simon, 1972; Lounsbury and Tornatsky, 1977; Van Liere and Dunlap, 1981; Webber, 1982; Connerly, 1986). Whilst Cotgrove (1982) proposed 3 dimensions around which environmental concern attitudes varied.

In the section which follows the measurement of environmental concern will be further considered. Criticisms in regard to the measurement of environmental concern will also be reviewed in greater detail.

Past studies of environmental concern have measured the concept in many ways. Attitude scales have been developed to measure environmental concern (eg, Albrecht et al., 1982; Dunlap and Van Liere, 1978; Maloney and Ward, 1973; Maloney et al., 1975; McKechnie, 1974, 1978; Weigel and Weigel, 1978). It is often assumed that different types of measure are equivalent.

In order to produce improved measures of environmental concern, researchers have generally adopted 2 strategies. First, multiple rather than single item indicators have been used to improve reliability and to allow for the use of more powerful analytic techniques (such as regression analysis as opposed to tabular analysis). Secondly, standardised measures have begun to be used in attempts to allow comparisons among studies (eg, Maloney, et al., 1975; Dispoto, 1977; Borden and Francis, 1978). This second point has started to lead to the production of a cumulation of results and generalisations about environmental concern (Van Liere and Dunlap, 1980). comparability among measures is important because, as it has been pointed out:

"The variety of indicators ... (of environmental concern) is quite vast, and there is virtually no replication of early studies with comparable measures of "environmental concern".

(Buttel and Johnson, 1977 p49)

Despite improvements in the measurement of environmental concern, problems remain. One measurement issue which has received little attention is the degree to which different measures serve equally well as indicators of the same underlying construct. This construct is conceptualised in the literature as "concern for environmental quality" or simply as "environmental concern". Do the various measures of environmental concern constitute parallel tests, or are they measuring different underlying concepts?

Other research has questioned the assumption that all of the different measures of environmental concern are in fact equivalent and measuring the same underlying concept.

As one researcher suggested:

".... attitudes toward overpopulation, growth management, pollution and nuclear power appear to be, at most, only loosely related. Additionally, different substantive dimensions of environmental concern have different demographic and ideological correlates,"

(de Haven-Smith, 1988 p278)

This proposition has lead to environmental concern measures being systematically differentiated in terms of 2 sources of inter-measure variation. Firstly, measures differ in terms of the different substantive issues they address (the issues reflected in measurement scale items) and secondly, the theoretical conceptualisations used in developing the items (the measurement scale used, (Van Liere and Dunlap, 1981).

What is meant by variation in the substantive issues

addressed by measures is the extent to which they incorporate different environmental issues such as pollution, population, natural resources, wildlife, and wilderness, etc. For example, some researchers have measured attitudes toward each of the above areas (eg, pollution, population, etc.) as distinct dimensions of environmental concern (eg, Tognacci, et al., 1972; Lounsbury and Tornatsky, 1977). A more common practice has been to combine items dealing with these differing substantive issues into a single environmental concern measure (eg, Buttel and Flinn, 1976a, 1976b; Dunlap et al., 1973; Maloney et al., 1975; Weigel and Weigel, 1978). However, it is unclear in the research whether attitudes toward these different substantive issues reflect to an equal extent a broader "common" concept of concern with environmental quality. Analysis of the data from Cotgrove's 1982 study (table 4.3) questions such an hypothesis. The supposition that support for all environmental issues taps a single underlying attitude is further questioned by the finding that different social sub-groups have different environmental concerns (Horvat and Voekler, 1976).

The second source of variation in measures of environmental concern is that due to the different theoretical conceptualisations used to develop the research instruments. What is meant by this are the different implicit or explicit assumptions regarding what constitutes the respondent samples' expression of

environmental concern. Furthermore, it questions along what scale should environmental concern be measured. As an example of this, studies have examined the perceived seriousness of environmental problems (eg, Buttel and Flinn, 1976a,b., Kronus and Van Es, 1976) support for environmental protection (Dillman and Christenson, 1972; Marsh and Christenson, 1977) knowledge of environmental problems and issues (Arbuthnot and Lingg, 1975; Maloney et al., 1975) support for environmental reforms designed to protect environmental quality (Buttel and Flinn, 1976a, 1976b; Buttel and Johnson, 1977) and actual involvement in pro-environmental behaviours (Dunlap et al., 1982; Heberlein and Black, 1976; Weigel, 1977). Each of these represents a different theoretical approach to the conceptualisation of environmental concern.

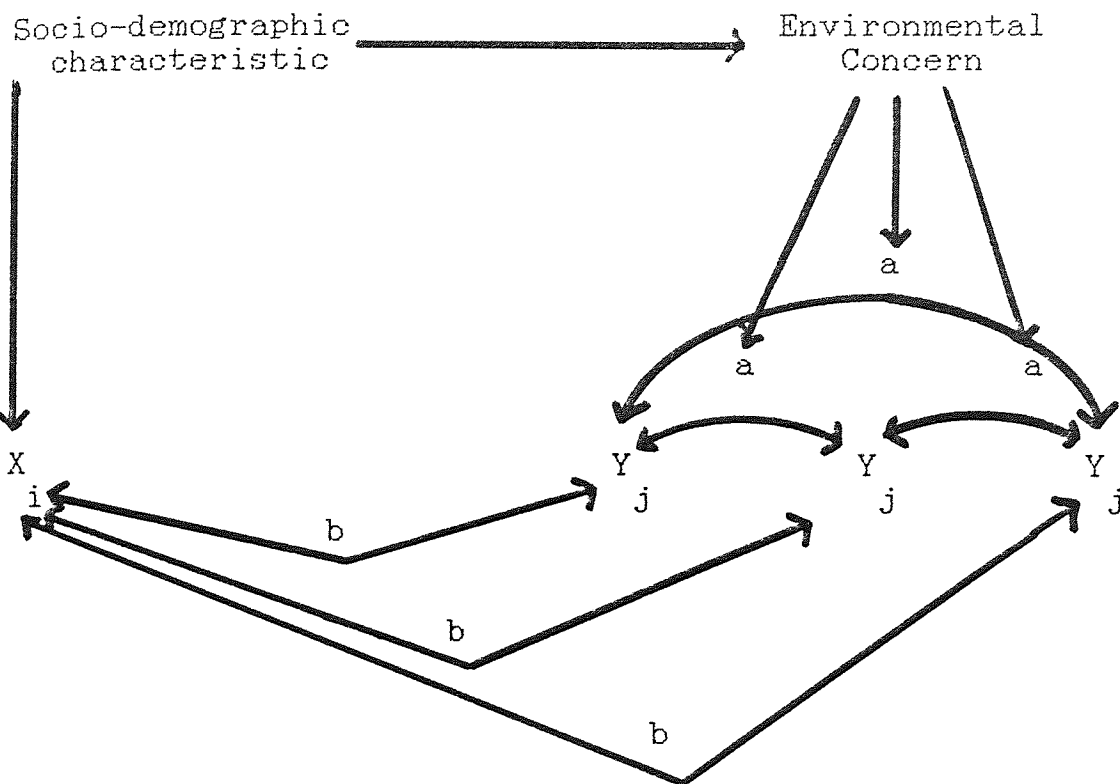
There are many different substantive issues which fall within the area of environmental concern. The same is true of the possible ways in which these may be measured. This has resulted in numerous combinations of substantive issues and theoretical conceptualisations being made to produce many different measures. As a direct result of the different measures which have been used to indicate environmental concern, and the lack of comparable replication studies, three difficulties have arisen. It has been difficult to: 1/ establish the meaning environmental concern possesses for individuals, 2/ compare the results of different studies of environmental concern, 3/ establish empirical generalisations about the relationships between environmental concern and other

variables (Lowenthal, 1972; Buttel and Johnson, 1977). At the same time there has been very little research examining the degree to which the different measures of environmental concern produce consistent results; rather, it is generally assumed that all measures tap concern for environmental quality equally well. This assumption is accompanied by the supposition that environmental concern is a single, well defined attitude or attitude complex.

Van Liere and Dunlap (1981) examined empirically these assumptions by incorporating them into a model and testing hypotheses based upon this. Such a model is illustrated graphically in figure 4.1. This model shows the relationships between specified socio-demographic characteristics and environmental concern. Conceptually, the model shows the socio-demographic variable to be measured once (X_i) and environmental concern to be measured more than once (Y_j 's). The socio-demographic variables could be age, gender, income level, etc, whilst environmental concern measures could be based on different substantive issues (eg, pollution, population, etc) or on different theoretical conceptions (eg, attitude scales, frequency of behaviour scales, etc). The model also shows explicitly the assumption that all environmental measures are influenced by the single underlying construct of environmental concern.

Van Liere and Dunlap (1981) conducted a study to test the model in figure 4.1. If the model was correct and the

Figure 4.1 The Relationship Between Socio-demographic Variables and Environmental Concern.



Model illustrating 2 types of consistency, where X_i refers to a socio demographic measure (i = age, sex, etc.) and Y_j 's refer to environmental concern measures based on differing substantive issues or theoretical conceptualisations or both (j = population attitudes, conservation behavior, etc.).

(Van Liere & Dunlap, 1981)

environmental measures (Y_j 's) were tapping the same construct of "environmental concern", they predicted that 2 types of consistency should be found amongst the correlations between the variables of a study based upon the model. They hypothesised that the correlations between the environmental concern measures and any specified socio-demographic variable would be of similar magnitude and direction (the b 's in figure 4.1).

Van Liere and Dunlap (1981) constructed scales which differed only in terms of their substantive issues. To do this they included issues on 3 environmental problem areas and constructed 3 scales: Population Scale, Pollution Scale,

Natural Resources Scale. They also constructed 3 scales with measures which focussed upon pollution and natural resource issues but differed in terms of their range of responses. these 3 measures formed the: Environmental Regulation Scale (measuring attitudes toward government regulation to protect the environment) Environmental Spending Scale (measuring the level of government spending on environmental protection favoured by respondents) Environmental Behavior Scale (respondents reported frequency of engaging in environmental protection behaviors).

The scales constructed are shown in table 4.4, all of which were deemed, by the authors, to have adequate internal consistency. In this table can be seen the degree of inter-correlation between the 6 scales.

The 6 measures in table 4.4 (X1 to X6) correspond to the a's in figure 4.1. These are shown along with the mean and standard deviation for each scale and the average correlation of each scale with the remaining 5 scales.

The results reveal that whilst all coefficients are positive, there is considerable variation in the size of

correlation between the scales. These range from 0.10 to 0.64. This refutes the hypothesized consistency of the size of correlation implicit in the model in figure 4.1. Furthermore, if the average correlation of each scale with all other scales (r in table 4.2) are considered, it is the Population (X1) and Environmental Behavior (X6) scales which are primarily responsible for the low correlations between items in the table, (with their coefficients being considerably lower than the other 4 scales average correlations). With the Population and Environmental Behavior Scales omitted, Van Liere and Dunlap conclude that the remaining correlations are both substantial and consistent. Therefore the pattern of overall correlations does not support the model. However, if the measures of environmental concern are restricted to those which are concerned with more "ecological" rather than "human@ issues, support is found for the prediction in figure 4.1.

The second form of consistency predicted by the model in figure 4.1 is a consistency between measures of environmental concern and socio-demographic variables. If the predicted relationships in figure 4.1 are correct then the correlations within any row in table 4.5 should be approximately equal. The results in this table do not support this hypothesis.

The final column in table 4.5 (Z) indicates the number of pairwise correlations, conducted exhaustively for each row, which were found to be significantly different at the 0.01 level of significance. This shows that for 4 out of

Table 4.4 Correlation Matrix, Average Correlations, Means and Standard Deviations for 6 measures of Environmental Concern

	X1	X2	X3	X4	X5	-(a) r	- X	S.D.
Population Scale. (X1)						.28	15.49	4.83
Pollution Scale. (X2)	.31					.46	16.70	3.80
Natural Resource Scale. (X3)	.42	.64				.51	14.46	2.83
Environmental Regulation Scale. (X4)	.35	.62	.64			.50	34.87	5.15
Environmental Spending Scale. (X5)	.23	.53	.58	.54		.42	4.37	1.07
Environmental Behavior Scale. (X6)	.10	.23	.25	.36	.22	.23	18.91	2.88

(a). The average correlation (r) is the average of the bivariate correlations of each scale with the five remaining scales.

(Van Liere and Dunlap (1981 p664)

the 5 socio-demographic variables the correlation coefficients are significantly different from one another. In only one case (residence) are there no significant differences between the 2 correlations in the 15 pairs. However, as with the data in table 4.2, if the Population scale and the Environmental Behavior Scales are ignored there is much greater consistency. With these 2 scales removed, only in the case of age are the correlations in any of the pairs significantly different from one another.

Table 4.5 Bivariate Correlations Between Environmental Concern Scales and Selected Demographic Variables.

Demographic Variables.	Environmental Concern Scales						
	X1	X2	X3	X4	X5	X6 (Z, a)	
Age	-.04	-.25***	-.06*	-.09**	-.13***	.12***	9
Sex (b)	-.02	.15***	.08*	.14***	.08**	.21***	6
Residence (c)	.10**	.04	.11***	.10**	.06*	.02	0
Political Ideology (d)	.12***	.19***	.20***	.16***	.23***	.04	5
Education	.11***	.18***	.15***	.17***	.10**	.01	3

Z = Number of correlations significantly different at the .01 level.

a = X1 to X6 corresponds to Scales listed in table 4.2.

b = A positive coefficient means women are more environmentally concerned than men.

c = See text for details

d = A positive coefficient means that liberals are more environmentally concerned than are conservatives (American Residents).

* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.

(Van Liere and Dunlap, 1981 p666)

A further important issue may be raised from inspection of the correlation matrix in table 4.4. The correlations between all variables reveals there to be positive associations. However, the correlations between the Environmental Behaviour Scale and other measures are relatively low. This is perhaps indicative of the differences in the types of assessments involved in each of the 6 scales. In the Environmental Behaviour Scale, subjects were asked to assess the frequency with which they engaged in a variety of pro-environmental behaviours. In the 5 other scales the assessments made by respondents

were purely cognitive. This raises the important point that whilst different attitude measures may have the same substantive content area, they may differ in terms of their assessment criteria.

Cognitive involvement is different from behavioural involvement. Inclusion of a "mixed range" of responses, (cognitive and behavioural) may facilitate understanding, for the researcher, of how these behavioural modalities are related to the research content area. However, if the modality of response is ignored by the researcher, variation may be present in a data set which is not accounted for by a corresponding variation in the substantive focus of the attitudes being investigated.

The modality of behavioural expression is of great importance to environmental concern research. This issue is one which will be comprehensively addressed in the present research.

Van Liere and Dunlap (1981) concluded that when scales are limited to cognitive measures of pollution and/or natural resources, considerable consistency is found between correlations. Furthermore, this consistency is present in the correlations between environmental concern measures and in the correlations of socio-demographic variables.

From the above findings it is possible to form the conclusion that Van Liere and Dunlap found little support

for the model proposed in figure 4.1. This model embodies the implicit assumption that all measures of environmental concern are equal. Therefore, this suggests that different types of environmental concern measures may be more distinct than previously assumed. In the same report these authors found that in terms of consistency among different substantive issues, concern about population issues appeared to be rather distinct from concern about natural resources and pollution, whilst these latter 2 measures were highly correlated. Furthermore, if the substantive issues were restricted to pollution and natural resources, all attitudinal measures were highly correlated, whilst the behavioural measures appeared less so.

This lends further support to the hypothesis that environmental concern possess more than 1 dimension to its substantive content area. Furthermore, it suggests that behavioural and cognitive evaluations form distinct modalities of assessment in relation to the content area.

Other research supports this claim as it has found a similar division of the relationships between environmental concern measures to be present in the environmental concern literature. These studies report that population and behavioural items tend to load on separate dimensions, distinct from other kinds of environmental issues (Horvat and Voelker, 1976, Lounsbury and Tornatsky, 1977). Consequently, it would appear that environmental concern may be a fairly broad concept. It

would also appear to possess at least 2 separate dimensions, one which is best represented by, the ecological items of, concern about pollution and natural resources, and one which is better characterised by, the more human, population and behavioural items. Van Liere and Dunlap (1981) also found support for a multi-variate model of environmental concern when the relationship between differing measures of environmental concern and socio-demographic variables were viewed. Overall these authors concluded that different types of environmental concern measures were differentially related to socio-demographic variables. More specifically however, this variation was found to be mainly due to the Population Scale and Environmental Behavior Scale (see table 4.4). The correlations between the other 4 (ecological) scales and socio-demographic variables were found to be much more consistent. The authors thus conclude that concern about population issues and behavioural involvement (more human issues) are tapping dimensions of environmental concern which are understood somewhat differently by the public than concern about pollution and natural resources (more ecological issues).

4.5 Conclusion.

From the research evidence presented above it would seem appropriate to state that somewhat more attention should be paid by researchers to the measurement of environmental concern. In particular, the combination of a range of

broad based issues into a single research tool may produce internally inconsistent results:

"... a composite scale including diverse dimensions of environmental concern might "mask" the true relationships between the dimensions and, for example, selected demographic variables."

(Van Liere and Dunlap, 1981 p669)

In general, over the past few years, there has been an increase in the theoretical and methodological sophistication of studies of environmental concern, although there is still room for much improvement (Dunlap and Van Liere, 1978).

"In short, further research is needed to establish clearly the "boundaries" of the concept of environmental concern".

(Van Liere and Dunlap, 1981 p670)

It is apparent from the evidence presented in this chapter that the boundaries of environmental concern have not yet been clearly established. It is also evident that different types of environmental concern measures may be more distinct than was initially assumed.

An approach to social research which has been used successfully to help delineate a content area is the facet theoretical approach. This orientation has been applied to several content areas of social experience. In the chapter which follows, studies which have employed a facet theory approach in their research design and data analysis will be outlined as they are applicable to the study of attitudes and social values.

CHAPTER 5

Facet Theory Studies of Attitudes and Social Values.

5.1 Introduction.

In the preceding chapters support for environmental conservation, both generally and within Britain, has been reviewed. The relevant psychological literature on environmental concern has also been presented. This has lead to 3 conclusions being drawn: 1/ that environmental concern is a pertinent social value in Britain in the late 1980's; 2/ that no commonly accepted definition or reference criteria has developed which may be used to establish the existence of environmental concern amongst a sample of respondents; 3/ that due to points 1 and 2, some anomalies and discrepancies are present in the environmental concern literature. (these have been detailed in chapter 4).

The lack of a clear definitional framework has been noted to be present in other areas of psychological study (Levy and Guttman, 1985). Facet theory (Canter, 1985a) has been used in a wide variety of research areas to provide a framework in the format of a definitional taxonomy. In this chapter the facet approach to social research (Canter, 1985a) will be reviewed. This review will be of facet research in the applied areas of, and as it relates to, the study of attitudes (Guttman, 1982) and social values (Levy and Guttman, 1985).

A brief introduction to facet theory will now be given. For the interested reader, a more comprehensive description of the facet theoretical approach to social science research, along with some further details of facet analysis procedures, are given in Canter, 1985b., Shye, 1978a., and Borg, 1981, and a comprehensive review provided in Donald, 1987).

5.2 Facet Theory.

Facet Theory is a coherent meta theoretical approach to the design of research projects, measuring instruments, and data analysis (Shye, 1978a). It also provides guidelines for the manner in which research should be conducted and a rationale for why it should be done that way (Runkel and McGrath, 1972). The approach has been applied to many aspects of scientific endeavour. However, facet theory has found its major applications and has achieved its principal impact within the social sciences. As the social sciences have developed over the past few decades, their subject matter of human behaviour and experience has become theoretically and empirically more complex. As a consequence of this increase in complexity of the subject matter of the social sciences, the questions asked of the social scientist have become more sophisticated (Canter, 1982).

As this has happened, the need for a means of specifying the conceptual content of a variety of research areas in

a systematic and precise way becomes more urgent. As Roskam, (1981) states:

"Psychology seeks answers to the questions how and why people think, feel and behave in the way they do. Progress of (psychological) science depends on adequate definitions of its concepts Psychology must define its empirical concepts of behavior by means of an objective definitional system"

(Roskam, 1981. p198-199)

Facet theory provides a way of meeting such needs. Facet theory research has proved most useful in social science investigations which have been concerned with complex behavioural systems.

Facet theory has been used as an exploratory technique for the investigation of new content areas (Hackett, 1989). It has also been used as a technique for the broadening of knowledge within previously researched or analogous research area (eg, Donald, 1987, Hackett, 1985, Hackett, et al, 1989). Hackett, et al, (1989) provides an example of both these orientations in the use of a facet approach within a single research context.

As Canter (1983) states, the approach grew out of the work of Louis Guttman (1954) and his colleagues (eg, Foa, 1953 Borg, 1978; Shye, 1978a) who were mainly based at the Israel Institute for Applied Social Research. Canter (1982) claims that facet theory:

".... utilizes three major constituents of scientific activity: 1) formal definition of the variables being studied 2) hypothesis of some specified relationships between the definition and an aspect of empirical observations, and 3) a rationale for the correspondence between 1 and 2.

(Canter, 1982 p144)

In undertaking the above activities it proposes a definitional framework in the form of facets.

Since the development of facet theory in the 1950's, the approach has been applied to many areas of concern to the social scientist. Indeed, several authors have commented upon the wide range of its application (eg, Borg, 1979., Shye, 1978a). Illustrations of the theoretical and applied topics of this research are numerous and include: social values (Levy, 1986., Levy and Guttman, 1976., Levy & Meyer-Schweizer, 1989); job satisfaction (Payne et al, 1976); well being (Levy, 1976; Levy and Guttman, 1975); involvement (Levy, 1979); attitudes towards work and technological change (Elizur and Guttman, 1976); energy conservation (Miles and Canter, 1976); place evaluation (Donald, 1985); intelligence (Schlesinger and Guttman, 1969); social attitudes (Harrelson et al, 1972) and many others. At present, facet theory is being used to, amongst other things, illustrate several professional, occupational and applied areas of interest to the social scientist. For instance: organisational perception (Donald, 1987); dental treatment (Hackett, et al, 1989); perceptual development within the architectural profession (Wilson and Canter, 1989); and the facet evaluation of offices (Donald, 1989).

Facet theory recognises the fact that human beings and human characteristics may frequently be defined in terms of several relevant dimensions "at the same time" (McGrath, 1967). Such conceptual dimensions are referred to as facets. The constituent parts of these facets are called elements and make up the values on that dimension. To illustrate this approach let us consider a definitional framework developed by Brown (1985) as an illustration of the facet approach. She stated that:

".... people may be classified in terms of the facet 'marital status', whose elements would be defined as single, married, divorced, separated, widowed. At the same time they can be categorised by the facet 'number of children', whose elements might be none, two, three, or more."

(Brown, 1985 p21)

This definition illustrates well that the researcher may propose any number of related although mutually exclusive facets in an attempt to develop a classification system of their research area. However, facet research goes beyond this speculative enterprise by gathering empirical data and analysing this in order to support the hypothesised dimensions (facets). At an even later stage of a facet research project, the relationships between the elements of facets within a study may be analysed.

The paragraphs above are intended to provide the reader with some idea of the scope and nature of facet research. It is not the intention within this chapter to review in

detail the approach. However, from the aforementioned it is immediately apparent that the approach is applicable to the investigation of environmental concern.

Amongst the many ways in which the facet approach to social research has been utilised has included the investigation of social values and attitudes, acts of protest and socio-political involvement. This research will now be reviewed.

5.3 Definition of Social Values.

The earlier sections of this thesis have demonstrated that support for environmental conservation is widespread (Lowe & Goyder, 1983). Therefore, environmental concern is similar to many other social beliefs systems or social values. Inspection of the social science literature concerning social values reveals however that considerable disagreement exists over the definition of social values. Furthermore, whilst such discord exists, it is not possible to identify a single clear framework within which a study of a social value may be undertaken. In the section which follows this lack of clarity will be considered.

The concept of social values has been defined in a variety of different ways. Many of these definitions are vague in specifying the concept they are attempting to define. These definitions have also been criticised as

being too "complex and unclear" (Levy, 1966). These claims are illustrated in the following definition:

"The term "values" may refer to interests, pleasures, likes, preferences, duties, moral obligations, desires, wants, needs, aversions and attractions, and many other modalities of selective orientation."

(Williams.Jr, 1968 p363)

This definition encompasses many modalities of human behaviour and typifies these by defining them as types of selective behaviour. Selection is identified as being important in distinguishing values from other human activities. However, the criteria of selective orientation (for assigning the presence of "value" to a selective instance) is not specified. A further example of a complex and unclear definition of values is given by Scott & Scott (1965):

"A value is a hypothetical construct assigned to that class of hypothetical constructs known as individuals phenomenology, the way one views the world and himself in relation to it."

(Scott & Scott, 1965 p97)

By categorising values as hypothetical constructs, in this imprecise manner, the definition of value within a specified context is left unclear. However, Scotts' definition offers some further criteria which may be used to identify values:

"Value is an individual's concept of an ideal relationship (or state of affairs), which he uses to assess the 'goodness' or 'badness', the 'rightness' or 'wrongness', of actual relationships that he observes or contemplates".

(Scott & Scott, 1965 pp99)

The greatest short-coming in all of the above definitions is lack of clarity. The social researcher who adopts one of the above definitions in the investigation of social values (as an area of human behaviour) would encounter considerable difficulty in delimiting an area for study. The same is true of research viewing a specific area of human activity in terms of its social value. This point is illustrated by Levy when she states:

"Any review of the research literature on 'values' immediately reveals that the concept has been rather vague. definitions are complex and unclear, and almost invariably include external aspects that are but empirically related to the concept values (are but correlates)."

(Levy, 1986 p2)

Scott's (1965) definition allows an hypothesised construct to be identified as a value if its selective orientation involves choice along a positive to negative dimension. However, many positive to negative orientations occur which may not involve the ascription of value (Levy, 1985). Thus, it is necessary to more clearly define this dimension by stating the form that such a positiveness may take. In 1974, Levy and Guttman

negative dimension running from important to not-important is defined as indicating choices (selective orientation) which ascribe value within their selection process.

According to the above definition, the concept of "values" has 3 component parts. Firstly facet A distinguishes between goal and behaviour. For example, it is possible to assess the importance of a goal (eg, happiness) or the importance of a behaviour (eg, helping others'). Secondly, if goals are considered, in facet B it is specified that these may be of an affective modality (eg, happiness) of a cognitive modality (eg, equality) or of an instrumental modality (eg, wealth). Behaviours may also be of these 3 modalities. They may be of an affective modality (eg, to love) of a cognitive modality (eg, to learn) or of an instrumental modality (eg, to make money). Finally, it is possible to assess the importance of the goal or behaviour in itself, or as a means for attaining a more primary goal or behaviour (facet C). For example, it is possible to assess the importance of learning to read as a goal or ends in itself or as a means of attaining a more primary goal (eg, attaining a job). Therefore, the question must be asked, "important for what purpose?" This is necessary as the meaning of the assessed importance depends on the goal. Also, the assessment of a goal or behaviour may change in accordance with purpose (Levy and Guttman, 1981c).

It has therefore been possible to assemble a definition of social values through the use of the facet theory approach. The value of employing this approach to research is that it forms both a starting point and a conclusion (providing hypotheses for investigation and the format for, and results to, an investigation). Having developed a taxonomy of elements of the concept of social values, research has applied this definition to specific social value contexts. This procedure has found empirical support for the theoretical classification system and allowed understanding to be developed of the social values which have been investigated within a real life setting. The results which have been obtained from the facet theory investigation of social values will now be reviewed.

5.3.1. Faceted Investigation of Social Values.

Several studies exist within the facet theory literature which have attempted to develop an understanding of the personal and social values of a variety of issues within a given social population (Levy, 1986. Levy & Guttman, 1974a,b, 1976, 1981a,b,c, 1985). The populations which have been studied have been from different countries (Levy, 1981c). This research has found it possible to distinguish between values which exist in different areas of their respondents lives. For example, religious, economic, leisure, work and family are all life areas which have been researched.

These life areas have all been separately identified as components of respondents' value systems. This has been possible as these value areas all possess an internal consistency amongst social value items which relate specifically to them (Levy, 1986). To illustrate this, (Levy, 1986) discovered that when questions about value in specific life areas (such as religion) were inter-correlated, these relationships were nearly always positive or zero. However, when values from different life areas were mixed, the direction of the relationship was not always present: Religious and some other social values were found to be consistently negatively correlated. For instance the religious values of "to be religious" and "to believe in god" were negatively related to the leisure related value of "to be rich" (Levy, 1986).

When social value items are correlated it has been found that the size of the coefficients between any 2 items is dependent upon 3 facets. These are: the life area to which the social value refers, the expression modality of a value (internal expression or external expression) and the mode of the value (for itself or for some greater goal).

In all of the studies which have used a facet theory approach in the investigation of social values a common structure of life area categories (elements) has emerged. Levy (1986) provides a discussion of the life area facets

and elements involved in social value judgements. The common structure which has been observed has taken the structure known within facet literature as a circumplex (Runkel & McGrath, 1972 pp357). A circumplex is represented spatially as a circle. Within such a structure elements or items within an analysis are qualitatively different. This ordering amongst elements possess neither a beginning nor an end (Lorr & McNair, 1963). The precise description of these elements has been found to vary in accordance with the context of the values within the study.

Due to the similarity present within the results from the research cited above it has been possible to develop a general model of social values. Using this approach findings are stated in the form of a mapping sentence (Levy, 1976). This has already been carried-out for social values. Figure 5.1 lists the general mapping sentence for social values).

5.3.2 The Specific context of Values Research.

In any facet designed study of social values the general mapping sentence definition of social values must be adapted to the specific context of the research:

"To the general definition of values (and attitudes) each research must add those facets that are specific to it and classify concrete types of values."

(Levy, 1986 p7)

Adapting a mapping sentence to the research context is achieved through adding facets to the facets in the general mapping sentence as they are necessary to allow classification of the social values within the area of interest. This results in the modification and refinement of the original mapping sentence. This adapted mapping sentence then provides a conceptual framework which helps the researcher precisely investigate the concept under investigation. This is achieved as the modified mapping sentence offers a detailed definition of a social enquiry. It allows development of specific items in a study and provides hypotheses about the empirical structure of the relationships between the items included.

There is a growing body of facet theory analytic research into social values. Each of these studies has commenced by taking the Levy & Guttman (1974b) mapping sentence (the general mapping sentence) and adapting this template to the specific value context. Published examples of this process are reviewed below. These have been included in order to illustrate: 1/ how each of these mapping sentences is related to the general mapping sentence, 2/ how each of these mapping sentences has been adapted to the specific research context, 3/ the possibility of adapting the general mapping sentence to the investigation of environmental concern.

5.4 Facet Analytic Research into Social Values.

Levy and Guttman first applied the facet theory approach to the study of social values (Levy and Guttman, 1974a&b, 1976). In these studies the general mapping sentence for social values was developed (table 5.1). Since these publications, the mapping sentence has been applied to a variety of social value research problems. It is these applications which are now reviewed.

The general mapping sentence for social values has been used in both the design and interpretation of findings in social value studies. These studies and the facets which they have included in their mapping sentences in order to make them pertinent to context are now reviewed. The studies are presented so as the reader may observe the cumulative nature of the research findings produced.

5.4.1 Fundamental Problem Values.

Levy and Guttman, (1985) provide a mapping sentence for the investigation of fundamental values in society. The mapping sentence is shown in figure 5.2.

Their study examined responses to a questionnaire which was generated from this mapping sentence. Questions were devised each of which could be categorised by systematically selecting and combining elements from each of the 2 content facets.

Figure 5.2 Preliminary Mapping Sentence for "Fundamental Values".

The extent to which respondent 's' assess the importance for his or her country that most of its people should have positive behavior

A

oriented to (1. personal ñincluding egotistical)
(2. interpersonal ñincluding altruistic)
(3. impersonal ñtranscendental being)

B

Recipient, in behavioral modality (1. cognitive)
(2. instrumental)
(3. affective)

R

(high)
(to) importance,
(low)

for the well-being of his or her country.

(Levy & Guttman, 1985 p210)

Their mapping sentence (figure 5.2) has 3 facets. The first of these is defined as "s" and symbolises the research population. Facets A and B together constitute the domain of the research. The third facet type is designated "R" and represents the range of responses to be collected. Of the domain facets, facet A specifies the philosophical direction to which the value is oriented. Facet B specifies the modality of the value related behaviour. The study employed a cross-cultural sample of residents from Israel and Switzerland. It was possible, through the use of Similarity Structure Analysis, to clearly identify both the common structure of social values for the 2 groups and inter-cultural differences in these values. Figure 5.3 shows the structure of fundamental problem values for the Israeli

sample. Figure 5.4 shows the same for the Swiss sample.

From these results Levy and Guttman concluded that:

"The faceted common definition framework enabled development and testing of a cross-cultural theory of values,"

(Levy and Guttman, 1985. pp218)

The faceted definition employed by Guttman and Levy in their mapping sentence enabled the development and testing of a cross-cultural theory of the stability of the structure of social values. Semantic similarity analysis of results suggested that 2 more facets were present in responses. Therefore the authors modified their mapping sentence to incorporate these. Figure 5.5 lists the modified mapping sentence.

In the revised mapping sentence (figure 5.5) the orientation and modality facets, which were formerly labelled A and B, are stated now in somewhat greater detail. This expansion of detailed elements allows the construction of more (and more representative) questionnaire items. The order of these 2 facets is reversed in the modified mapping sentence. The latter of these 2 facets now also includes specific sub-varieties of behaviour which may be studied as they are listed in the orientation facet. Levy and Guttman (1985) found this elaboration of these 2 facets to focus their research upon the main issue of interest to them. Elements were added to facets to allow a broader and more detailed study to be undertaken.

Figure 5.3 Radex Structure of Fundamental Values
(Israeli Sample)

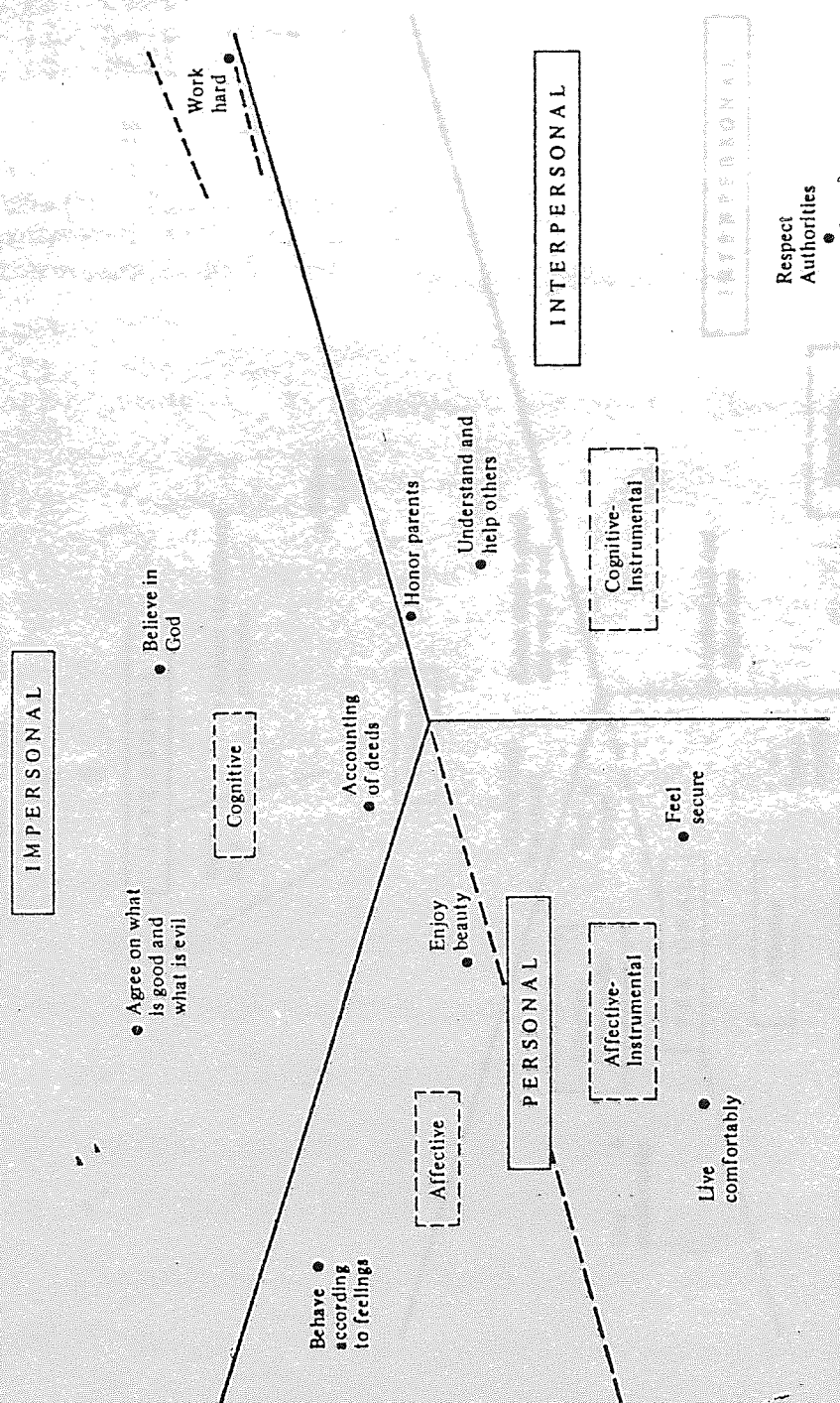
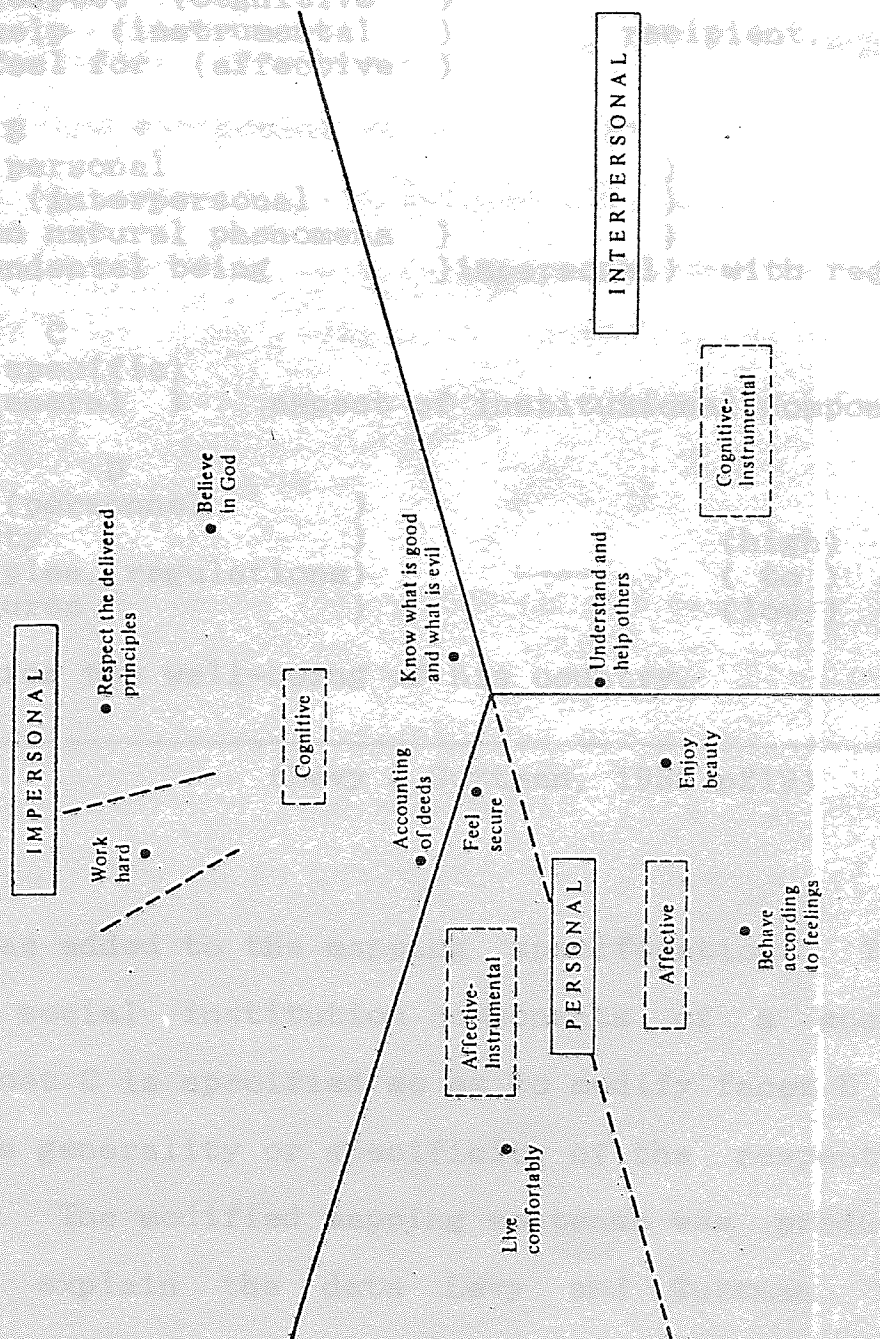


Figure 7-1 The radex structure of 11 "fundamental problem" values for Israel (SSA-II of Table 7-2).

(Levy and Guttman, 1985 p215)

Figure 5.4 Radex Structure of Fundamental Values
(Swiss Sample)



(Levy and Guttman, 1985 p216)

Figure 5.5 Revised Mapping Sentence for Fundamental
Problem Values.

The extent to which respondent (s) assess the importance
for his country that the behaviour of most of its people,

A

(1. respect (cognitive)
be to (2. help (instrumental) recipient,
(3. feel for (affective)

B

(1. self (personal)
(2. others (interpersonal)
(3. nonhuman natural phenomena })
(4. transcendental being }impersonal) with regard

C

(1. specific)
to a (2. general) aspect of institutional component

D

(1. life (personnel)
(2. property) (high)
(3. principles, regulations) ---- (to)
(4. procedures) (low)

importance for the well-being of his country.

(Levy & Guttman, 1985 p219)

Facet D was added to the mapping specification. This
lists the social institution components of a social
value. Facet C is specified so as to modify facet D in
terms of the generality or specificity of the respective
institution. The modified mapping sentence was produced
firstly to explain the data Levy and Guttman had
gathered. However, the revisions were also made to
enable future research to assemble more well-structured
items when investigating fundamental problem values (Levy
& Guttman, 1985).

5.4.2 Values as Guiding Principles.

In another study conducted by Schlomitt Levy, social values were investigated as they perform in the role of guiding principles in life (Levy, 1986). In this research, as in the research reviewed above, the general mapping sentence for social values was extended to bring more social values within its definition. This was then modified to context. This revised version was then employed in the construction of research items and hypotheses (this mapping sentence is listed in figure 5.6).

The mapping sentence in figure 5.6 is considerably more complex than any of those reported in the previously detailed studies. Indeed, it includes 9 content facets. This mapping sentence was reduced in size to enable questionnaire items to be generated. The reduction of the size and complexity of a mapping sentence is often performed in order to address specific research problems. This revised mapping sentence is shown in figure 5.7.

The Levy (1986) mapping sentence was used to develop a list of 28 social values. Respondents were then asked to indicate the degree to which they considered each value important as a guiding principle in the lives of both themselves and others. Therefore, each question referred to the importance of the value objective in itself and not as a means of attaining other goals (this is shown in element 1 of facet A).

Figure 5.6 Mapping Sentence for Observations on Social Values

A Mapping Sentence for Observations on Social Values

The assessment of respondent (x) of the extent of (1. importance to)
(2. execution by) himself
(3. attainment by)

of a (1. situational) social precept that his reference group
(2. behavioral)

(1. himself)
(2. most people)
(3. his government) should support, by (1. internal)
(4. unspecified) (2. external) behavior in the

(1. cognitive)
(2. affective) modality, a (1. personal)
(3. instrumental) (2. interpersonal) object, in order to support
(3. impersonal)

(1. own wellbeing)
(2. the State's wellbeing)
(3. other precepts) from the (1. specific)
(4. the precept itself) (2. general) aspect of institutional

(1. principles)
(2. procedures)
component (3. manpower) in life area (1. social acceptability)
(4. property) (2. religion)
(5. in general) (3. family)
(4. society)
(5. government and politics)
(6. leisure)
(7. work)
(8. economics (money, consumption))
(9. in general (unspecified))

(positive)
(to) assessment of supportive social precepts.
(negative)

B

supportive social precepts.

this was that the aforementioned research was concerned only with 1 specific life area. This mapping sentence posits 9 elements of life area (with further sub-regions). It further hypothesises that life area will be modified by the judgements contained in facet H. Through specifying more facets in this way it is possible to hypothesise more complex relationships. However, the facet researcher will often choose to firstly develop a complex mapping sentence for a research area. Having done this the specific facets may then be isolated for more detailed forms of analysis.

Indeed, the mapping sentence in figure 5.7 is an abbreviated form of a mapping sentence developed to observe social values as guiding principles in life (Levy, 1986). The difference between these 2 sentences is not in the number of facets present. Rather, in the case of facets a, c and g (in the revised sentence) only 1 element is included for each facet (these facets are held constant). Adopting this procedure enables the relationships both within and between the remaining facets to be hypothesised and tested.

In the first stage of testing the hypotheses of a mapping sentence, monotonicity coefficients are calculated between each pairing of items in a study. These coefficients for the Levy study are listed in table 5.1. From this table it can be seen that some of the relationships between variables are negative (with values up to -0.17). These negative relationships are unusual

in facet research. This is because observations are designed in order to address a single content area and as such it would be expected that all items were positively correlated. Levy explains the negative correlations in his data by stating that; .1s1

"... although all these values share the common concept of "guiding principle", "the extent of importance" does not refer to that general concept, but rather to the value itself as a guiding principle. There may be contradictions between various values as guiding principles, especially if they are not recognised as such in society. Thus, one cannot assume that all correlations among the values will be positive or zero"

(Levy, 1986. p12)

Closer inspection of the coefficients between values reveals that negative relationships are systematically and logically between specific variable pairings. For example, as was noted earlier, religious values are negatively related to leisure values.

To understand the overall structure of correlations between items, Levy performed similarity structure analysis (SSA). This geometric analysis method presents each value item in space such that the greater the distance between 2 items the lower the non-linear coefficient for the pairing. This relationship is held constant between all combinations of item pairings. Levy's analysis revealed that a 3 dimensional cylindrical shaped space best represented relationships between value items. In this space each value item occupied a point within the cylinder.

Table 5.1 Interrelationships (Monotonicity Coefficients)* among Values as Guiding Principles.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	--	81	47	09	31	-05	34	30	19	23	35	47	42	46	40	29	37	43	39	17	06	18	32	34	45	21	26	05
2	81	--	65	-03	30	-10	49	45	24	32	50	66	57	51	62	43	60	49	56	27	11	12	60	45	52	41	39	-01
3	47	65	--	31	42	08	07	48	43	23	47	47	23	03	37	47	60	38	42	31	22	02	45	37	11	24	35	13
4	09	-03	31	--	09	36	-03	24	15	-02	-03	24	13	15	-18	-09	-07	32	-13	-13	16	49	-08	04	-04	-04	12	36
5	31	30	42	09	--	40	44	42	62	17	47	21	05	-01	40	32	37	27	43	38	40	12	48	27	13	43	32	36
6	-05	-10	08	36	40	--	12	27	33	02	13	06	-17	-17	-06	09	10	10	04	07	35	36	04	01	-08	16	13	43
7	34	49	07	-03	44	12	--	39	35	29	37	24	36	45	55	42	40	26	43	32	25	11	45	20	55	36	28	04
8	30	45	48	24	42	27	39	--	67	25	59	42	08	05	30	35	42	37	44	25	31	35	39	46	18	41	43	29
9	19	24	43	15	62	33	35	67	--	38	57	18	-01	-15	32	40	42	31	43	39	52	17	47	16	06	43	40	34
10	23	32	23	-02	17	02	29	25	38	--	55	26	28	23	37	28	30	25	41	23	16	39	31	30	29	26	20	
11	35	50	47	-03	47	13	37	59	57	55	--	49	15	02	49	49	59	32	66	58	34	06	65	62	26	50	40	13
12	47	66	47	24	21	06	24	42	18	26	49	--	49	35	46	36	54	56	26	13	21	38	39	29	39	24	29	20
13	42	57	23	13	05	-17	36	08	-01	28	15	49	--	93	46	21	29	50	21	-02	-04	26	22	12	73	12	05	-05
14	46	51	03	15	-01	-17	45	05	-15	23	02	35	93	--	42	20	16	44	14	-03	-14	26	12	08	72	-00	-06	-12
15	40	62	37	-18	40	-06	55	30	32	37	49	46	46	42	--	73	73	41	62	49	31	01	67	49	60	51	36	05
16	29	43	47	-09	32	09	42	35	40	28	49	36	21	20	73	--	83	25	50	53	35	02	60	43	44	47	31	18
17	37	60	60	-07	37	10	40	42	42	30	59	54	29	16	73	83	--	44	58	49	38	06	69	56	41	54	35	19
18	43	49	38	32	27	10	26	37	31	25	32	56	50	44	41	25	44	--	45	11	22	42	40	31	48	38	18	22
19	39	56	42	-13	43	04	43	44	43	41	66	26	21	14	62	50	58	45	--	71	33	05	70	68	39	64	45	12
20	17	27	31	-13	38	07	32	25	39	41	58	13	-02	-03	49	53	49	11	71	--	43	03	68	52	23	48	38	17
21	06	11	22	16	40	35	25	31	52	23	34	21	-04	-14	31	35	38	22	33	43	--	33	45	16	13	57	25	47
22	18	12	02	49	12	36	11	35	17	16	06	38	26	26	01	02	06	42	05	03	33	--	15	09	29	11	16	50
23	32	60	45	-08	48	04	45	39	47	39	65	39	22	12	67	60	69	40	70	68	45	15	--	70	50	65	41	25
24	34	45	37	04	27	01	20	46	16	31	62	29	12	08	49	43	56	31	68	52	16	09	70	--	33	51	46	10
25	45	52	11	-04	13	-08	55	18	06	30	26	39	73	72	60	44	41	48	39	23	13	29	50	33	--	43	15	-06
26	21	41	24	-04	43	16	36	41	43	29	50	24	12	-00	51	47	54	38	64	48	57	11	65	51	43	--	39	29
27	26	39	35	12	32	13	28	43	40	26	40	29	05	-06	36	31	35	18	45	38	25	16	41	46	15	39	--	26
28	05	-01	13	36	36	43	04	29	34	20	13	20	-05	-12	05	18	19	22	12	17	47	50	25	10	-06	29	26	--

*Decimal point omitted

* = non-linear similarity coefficients with decimal point omitted

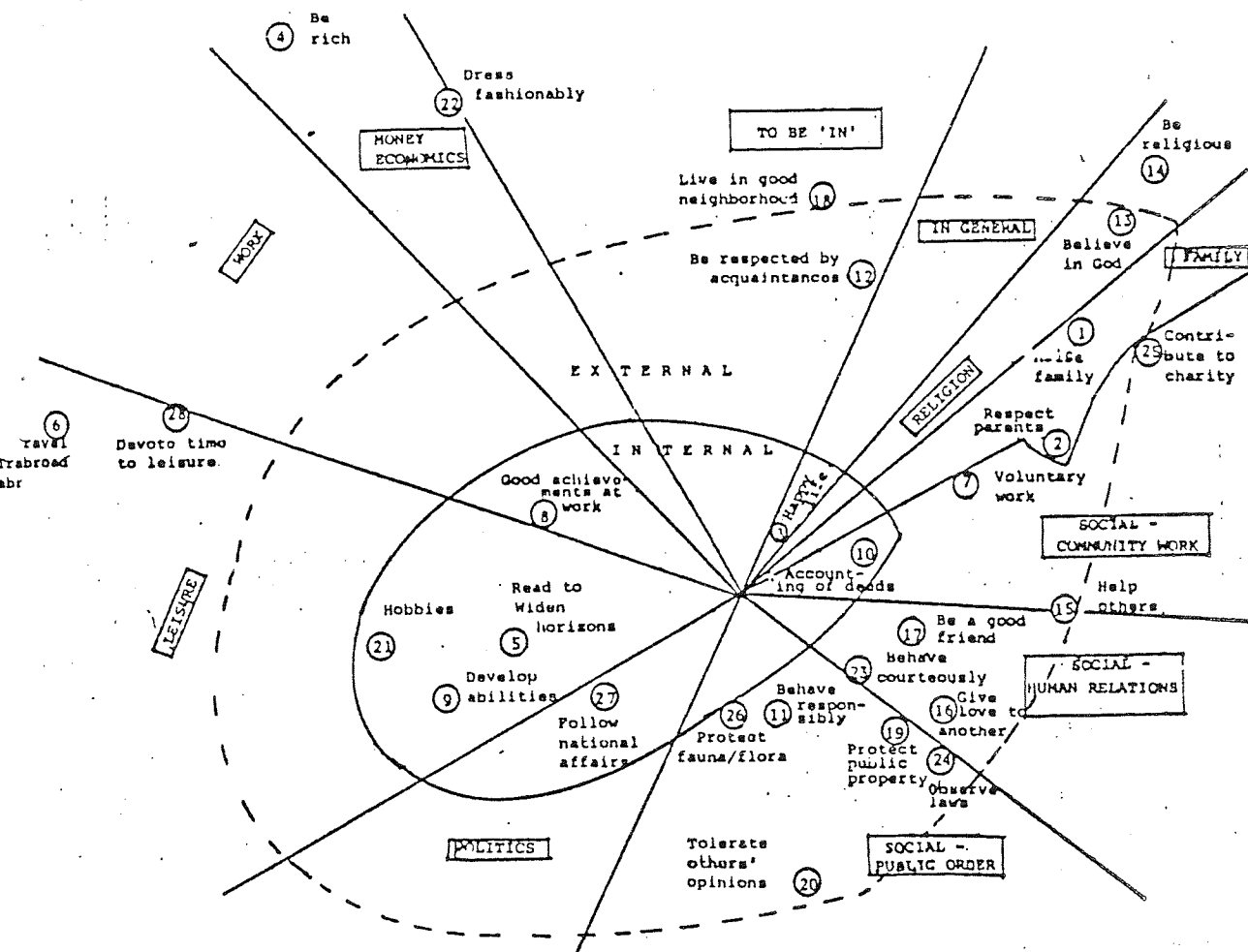
(Levy, 1986 p13)

Cylinder space in facet theory is called a cylindrex. This form of partitioning of space has been found in research studies of a variety of research domains (Levy, 1985). The 2 SSA plots in figures 5.8, and 5.9, together form the cylindrex of Levy's data. The 2 projections are orthogonally related in the combined form of a cylinder.

In figure 5.8 is shown partitioning in a circular order corresponding to the elements of facet J (life area). A circular arranged "polarising" facet has been found in a large number of studies to best represent the role played by a life area facet. Levy (1985) provides a review of this literature. The modality and mode facets (facets D & E) are also present in this plot. the 2 dimensional inter-positioning of the 2 facets shows that evaluations present in facet J are modified by the inherent facets D & E. Thus, life area judgements are seen to be "modified" by whether they are internally or externally expressed behaviours.

The third facet of this analysis segregated values in accordance with each value item referring to a value situation or behaviour (facet B in figure 5.9). This combines orthogonally with facets J and D/E to form a $(3 \times 2) \times 2$ classification taxonomy for values as guiding principles in life.

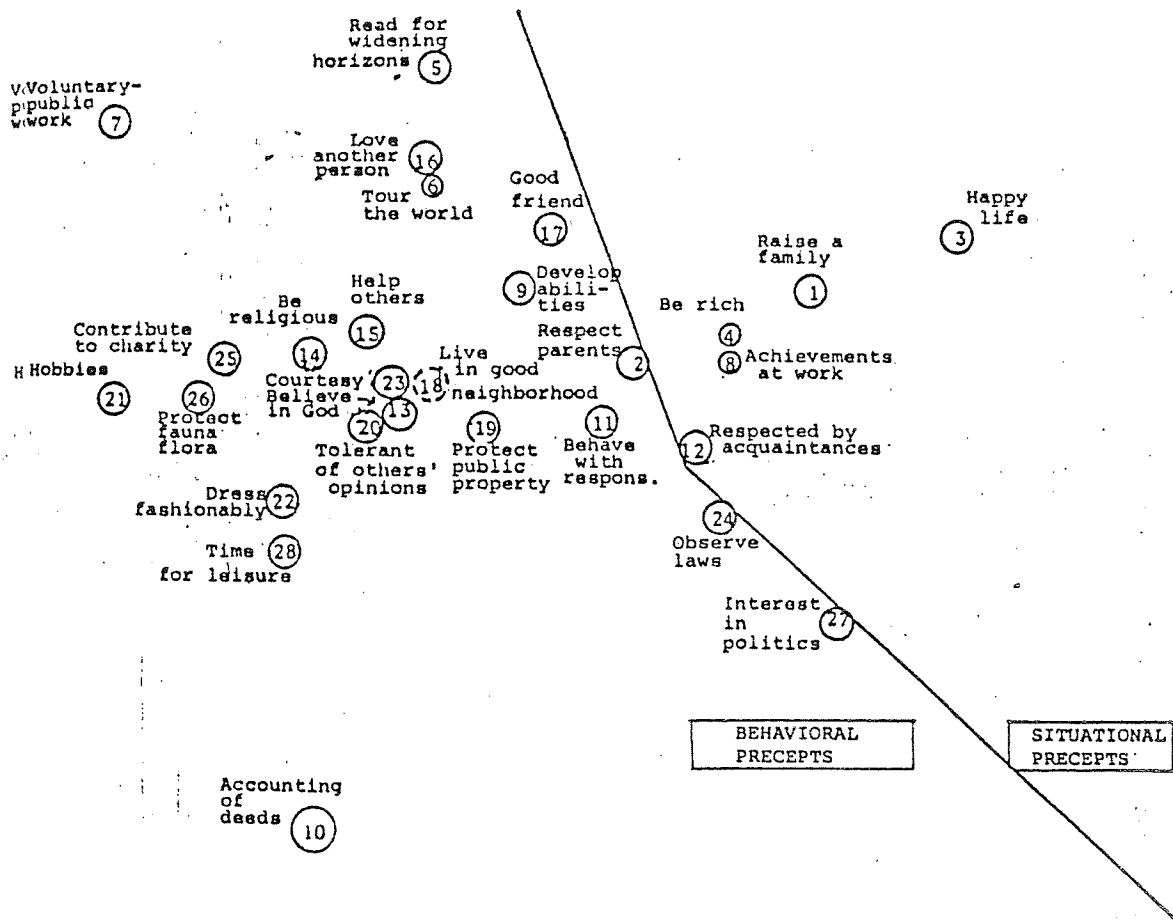
Figure 5.8 Graphical Presentation (SSA-1) of Interrelationships among Values as Guiding Principles. The Circular Order of the Cylinder.



(Levy, 1986 p16)

Figure 5.8 Graphical Presentation (SSA-1) of Interrelationships among Values as Guiding Principles. The Axis by type of Social Precept.

Figure 1a. Graphic presentation (SSA-1) of interrelationships among values and guiding principles: Cylinder axis by type of social precept (two-dimensional projection out of four, orthogonal to the two dimensions presented in Figure 1a)



5.4.3 The Value of Social Control.

Levy and Guttman (1981c) provide an example of an extension in the use of the general mapping sentence for social values (figure 5.1). In doing this they use the mapping sentence to guide their research through the design of questionnaire items. Levy and Guttman found that as all the questionnaire items addressed a common value object, all were monotonically interrelated.

The values in this study were all concerned with social control. The authors hypothesised 3 elements to be present in a life area social control facet. the facet and facet elements of this study are shown in the mapping sentence in figure 5.10.

Figure 5.10 Mapping Sentence for Social Control Values.

Attitude of respondent (x) toward the (1. result)
(2. application)
(3. approach)
of social control of the government for the country's
welfare in life area
(1. political)
(2. economics) (very positive)
(3. religion) ---- (to)
(4. general) (very negative) attitude with
respect to social control.

(Levy & Guttman, 1981c p52)

This mapping sentence shows that the observations are to be made of the positiveness of respondents attitude to the 3 forms of social control within the 4 life areas. consequently, it is attitudes which are being assessed. However, as these attitudes are towards the value of social control for respondents, the study is of social values.

The mapping sentence hypothesises 2 orthogonal facets of control type and life area, with 3 and 4 elements respectively. SSA of the study's data found support for these facets. The life area took the structural form of a circumplex with the facet polarising assessments (life area facets are discussed in, Levy, 1981c). The control type facets were found to be quantifiably differentiable. The 2 facets contained independent judgements and were therefore orthogonal: For each evaluation of a questionnaire item made in terms of the life area it addressed an independent assessment of the control type was also made.

A similar result for structure was obtained for both the Israeli and Swiss samples in the study. However, Levy and Guttman (1981c) made the important point that:

"Having established a similarity in the general structure of values it is worth examining the difference in extent of positiveness on each value separately."

(Levy & Guttman, 1981c p57)

The same authors continued their analyses by analysing the average values attained on each of the questionnaire items. They went on to stress that:

"Similarity in structure of correlations does not necessarily imply similarity in level (averages) there are differences among the various countries in the extent of positiveness with regard to different topic, despite similarity in the structure."

(Levy & Guttman, 1981c p56)

5.4.4 The Continuation of Social Value Research.

At a recent international conference, it was reported that facet research employing the mapping sentence for social values was continuing. However, the populations now being studied had been broadened to include subjects from countries not previously sampled (Levy & Meyer-Schweizer, 1989).

The findings of facet research which has employed the mapping sentence are summarised below.

Specific Content Area:

The specific content area of content values may be defined by the addition / deletion of facets / facet elements from the general mapping sentence for social values.

Relationships Between Values:

These may be expected to be non-negative only if the values observed are oriented toward a general principle and if this general orientation is recognised by respondents.

Life Area of Value:

These may be specified and investigated as a constant within a mapping sentence. Alternatively they may be specified by multiple facet elements. Life area facets are usually found to be arranged as a circumplex.

Behaviour Modality Facet:

"the behaviour modality facet can play different roles under different circumstances, depending on the notions of order of the other content facets of design. This simple looking facet can require very complex consideration"

Value Range:

The range facet specifies the responses which the researcher will observe and gather during a study. Attitudes are cognitive dispositions which are arranged along a positive to negative dimension. Social values are ordered from positive to negative toward an object. These therefore fulfil the criteria to enable their classification as attitudes. However values are specific in that positiveness is related to the importance of

existence, attainment or maintenance of the object of value. The actual behaviour which is measured may be cognitive, affective or instrumental towards the value item.

It is possible to assess environmental concern in terms of its perceived importance to a social group. In such an assessment environmental concern is being investigated as a social value. The general mapping sentence which has been developed in the research reviewed above, forms a template which may be used in value investigations. The adaptation and modification of the general mapping sentence to investigate the social value of environmental concern will be undertaken in the present research. However, the first stage in achieving this contextualisation of the mapping will be a series of exploratory studies. The hypotheses implicit in the mapping sentence will then be subjected to investigation.

In the next section of this chapter, details are given of the design of a series of exploratory studies. These will directly address the content (life) area of environmental conservation activities. The sample for this investigation will be environmental conservation employees. Restricting the sample to this "knowledgeable" group is intentional: Interviewees will be asked to identify actions and activities within environmental conservation and subsequently to assess the similarities between activities. Facet analysis will be used as a multi-dimensional geometric technique for the

exploratory analysis of this data. This will enable a taxonomy representative of the respondent sample's dimensions of evaluation of the similarities and dissimilarities between environmental conservation activities to be assembled. Content facets and their elements for the environmental conservation life area will be identified and a mapping sentence produced.

The mapping sentence produced at this stage will be reflective of individual values. In order to achieve the aims of this research and to investigate environmental concern as a social value, this mapping sentence will lead to the development of a series of questionnaire studies. To facilitate the development of these studies the individual values mapping sentence will be combined with the Levy and Guttman (1985) general mapping sentence for social values (figure 5.1). Questionnaires will be designed to enable examination of both specific environmental concerns and more general environmental concern.

5.6 Survey Design.

In the present research both the life area and mode facets will be present, the external mode element alone will be used as the only environmental concern related

value reported in the literature, "to protect flora and fauna" was found by Levy (1986) to be an external modality social value. The situation and behaviour elements of the second mode facet will both be included. From the above mentioned studies it can be seen that Facet Theory has been used in many different areas of social research. The research briefly reviewed above is directly applicable to the present area of research; environmental concern. As has been noted from the literature, facet research has provided a template which may be used to aid in the design and interpretation of research viewing social values. However, as the precise area of environmental concern values has not been viewed by facet researchers, as a consequence no precise statement in regard to the structure of this attitudinal area exists. Therefore, the initial survey which will be undertaken will be exploratory in its nature and will aim to provide a template of the semantic structure of environmental concern in the format of a mapping sentence. Details of the design of this study are presented in the following chapter.

CHAPTER 6.

Exploratory Studies: Design, Samples and Procedure.

6.1 Introduction

In this chapter the details of the design of the research instruments which will be used in the exploratory studies will be outlined; including the logistics for the design. The samples for each of the studies will also be discussed. This will be followed by information in regard to the procedure adopted in each study. Data analysis will not be commented upon; this will be delayed until the next chapter. The order of the studies presented in this chapter will be that of the order in which the surveys will be conducted.

6.2 Exploratory Study 1: Repertory Grid Interview Study of Environmental Conservation Employees attitudes Towards Their Professional Activities.

In the previous chapters it has been found that no single definition or classification of environmental concern was present within the social science literature. In order to remedy this omission it was decided to conduct a series of repertory grid interviews with employees - from the environmental conservation profession. These studies were designed to assess respondents personal understanding of environmental conservation. In doing

this a detailed classification system will be developed for environmental conservation actions and issues as these are understood by respondents from the sample. After this classification system has been assembled, it will be used to develop research instruments which reflect environmental concern in a way which is meaningful to respondents. In order to enable the exploration of the personal meaning of environmental concern, 2 repertory grid studies will be designed. the design of the first of these is reported below. However, a brief description of the repertory grid approach will first be given.

6.2.1 Repertory Grid Technique.

The repertory grid technique was developed as a means of collecting data within the framework of personal construct theory (Kelly, 1955, Fransella & Bannister, 1977).

The repertory grid technique was designed by Kelly (1955) as a technique for measuring perceived personality. More specifically, repertory grids measure cognitive assessments of the perceived similarities between a series of items (the procedure for achieving this is listed below). Kelly (1955) labels these assessments, that the individual makes, as personal constructs. Through requiring respondents to differentiate between items which have been selected, or supplied, as representative of a research domain, the psychologist

develops a picture of personal understanding of this domain.

The repertory grid is a means by which the researcher may bring some order to an attitudinal complex. Fransella and Bannister (1970) describe the repertory grid procedure as:

".... a way of getting individuals to tell you, in mathematical terms, the coherent picture they have of say, (a specified object).

(Fransella & Bannister, 1970 p59)

Kelly further emphasises the point that human beings possess clear understanding of the things they do in their lives. It is these cognitions which Kelly states as being of greatest importance in psychological investigations which attempt to produce understanding of human behaviour.

".... the ultimate exploration of human behaviour lies in examining man's undertakings, the questions he asks, the lines of enquiry he initiates, and the strategies he employs,"

(Kelly, 1969. p16)

Many forms of repertory grids have been, and are being, used in psychological inquiry. However, all of the different grids have the same basic characteristics in common (Fransella & Banister 1977). Grids are all attempts to: 1/ elicit from a person, the relationship

between a set of constructs, 2/ to develop understanding of the ways in which these dimensions of understanding (constructs) interrelate, 3/ all grids are context specific (they are designed to assess specified content domains), 4/ they are all of a quantifiable format which allows statistical analysis.

The mathematical component of the repertory grid is extremely important in the present research. Kelly (1955, 277-291) developed a non-parametric technique for the mathematical analysis of repertory grids. In the present research a facet theory approach is being adopted which too employs non-parametric analysis procedures.

Repertory grid technique has been applied to a large variety of research settings. These have included the study of socio-political issues (Slater, 1980). A review of the application of the techniques is provided by Beil, (1985). Whilst Phillips, (1989) develops a critical review of the use and misuse of the approach in applied research and work settings. More specifically she notes how there are principles that the researcher must be aware of during the different stages of administering, analysing and interpreting a repertory grid. Throughout her paper, Phillips issues warnings about labelling any study which employs a 'repertory grid like approach' as personal construct research. These caveats have been noted but will not be further commented upon as the present research will employ a repertory grid approach but will not refer the results to construct psychology.

6.2.2 The Sample

The sample in this study was of employees working in environmental conservation. Organisations which were concerned with a wide range of actions and issues within the environmental movement were selected. This was in an attempt to include a variety of the many different environmental conservation activities and jobs of environmental concern within the research. Once these organisations had been selected they were approached and their assistance in conducting the research interviews requested. In all cases no difficulties were encountered in obtaining an organisations permission for their employees to be approached. Once an organisation had agreed to participate, individual employees within the organisation were approached and an interview requested with them.

The selection of individual respondents proceeded along the following lines. Individual employees were identified in terms of the operations they performed in their work. Individuals were selected for possible inclusion in the sample on the basis of this categorisation. Attempts were made to include respondents from as many different types of work as was possible. Individual employees were then asked if they were willing to be interviewed. All individuals and employing organisations approached agreed to participate. this resulted in a sample of 16 respondents being assembled. However, before the interviews commencement,

3 of these potential respondents withdrew. This left 13 subjects who, it was decided, formed an adequate sample for the study. A listing of the 13 respondents and their employment categories and gender is given in table 6.1. Of the initial 16 interviewees who agreed to participate in the study, the 3 potential respondents who withdrew before the interview stage were members of the following categories: 3 Males; 2 Urban conservation, 1 rural conservation; 2 Educational conservation, 1 Landscape Architect. this resulted in the sample shown in table 6.1.

No other variables were controlled for in the opportunity sampling of respondents. As this initial stage of the research took an exploratory format, no mapping sentence was specified or used to guide subsequent data analysis.

Table 6.1 Respondent's; Gender, Work Area And Work Type (Individual Grids).

GENDER

Males	- 5
Females	- 8

WORK AREA (*)

Urban conservationists	- 6
Rural conservationists	- 3
Global conservationists	- 6
Single-Issue conservationists	- 3

WORK TYPE

Education	- 1
Administration	- 3
Information Officer	- 1
Conservation Planning	- 3
Landscape Architect	- 2
Conservation Research	- 2
Reserve Warden	- 1

(*) Note: This category represents the major areas of respondents work, as such, some respondents fell into more than one of these categories.

2.2.3 Procedure.

Once the 13 respondents had agreed to participate in the study, interviews with each of the respondents, were arranged and conducted during the spring of 1986. Each interview was carried-out at the interviewees work place. Only the interviewer and interviewee's were present at each of the interviews.

In conducting a repertory grid study which took the conservation of the natural environment as its subject matter, no a-priori rationale existed for the specification of features of environmental conservation as elements in a repertory grid study. This was due to the many different scales which have been used to assess environmental concern in the literature. This was also true of grid constructs. It was therefore decided to elicit both elements and constructs from each respondent individually.

Each interview lasted between 1 and 3 hours, and included the completion of a repertory grid. During the initial stages of each interview the respondent and interviewer informally discussed environmental conservation. The interviewee was then asked to identify all the categories of environmental conservation issues and actions that they were able to. The categories supplied were reduced to the minimum number of separately identifiable areas of conservation action. Between 6 and 12 separate areas

were identified by any one respondent and a total of 91 (non-exclusive) categories were obtained from the whole sample (these are listed in appendix A.2). For each subject, their list of actions were then entered into a repertory grid as elements. Respondents were then required to differentiate between triads of elements and to report these differences and similarities. Differentiation was achieved by respondents responding to the question "look at these 3 areas of environmental conservation, can you tell me how 2 of these are similar to one another but are different from the third?" This is the procedure known as triadic sort technique (Fransella & Bannister, 1977). The distinctions obtained in this way were then entered into repertory grids as emergent construct poles. The contrasting pole was identified by answering the question "what would be the opposite or contrast of this (referring to an emergent pole) within environmental or nature conservation?". These were then also entered into the respondents repertory grid. Triads of elements were repeatedly selected by the interviewer for subjects to differentiate between. This procedure was repeated until no new constructs were emerging.

When the process of identifying elements and construct was finally complete, respondents were asked to identify the more favourable pole (emergent or contrast) for each construct. Elements were then rated in terms of the constructs. The element best described by, or containing the most of, a constructs favourable pole was given a

score of 1 on this construct. The element best described by the less favoured pole was given the score of the total number of elements present for the respondent. All elements were then ranked without ties at a point between these 2 extremes. Full instructions are listed in appendix A.3.

In order to investigate environmental concern as a valued attitude for the same population from which the sample completing the repertory grids reported above, it was decided to produce a standardised repertory grid. The design of this study is reported in the section which follows.

6.3 Exploratory Study 2: A Standard Repertory Grid Study of Environmental Conservation Employees Attitudes Toward their Professions Activities

6.3.1 Sample

The population of respondents from which the sample for this investigation was to be drawn is the same population as was used in the individual repertory grid study: People working full-time in the environmental conservation profession.

In this study several environmental conservation groups were initially contacted. These organisations were asked to circulate test materials to their employees. All of the organisations approached agreed to do this. In order

to obtain responses from as wide a cross-section of environmental conservation employees as possible, a variety of different organisations was selected (a listing of these is given in appendix A.5). Each participating organisation was sent 5 repertory grids along with detailed instructions for their use, and reply paid envelopes for returning these. this resulted in 35 repertory grid packages being sent-out. The organisations were asked to distribute the repertory grids to a varied selection of employees within their organisation. Resulting from this procedure, 13 completed and usable repertory grids were returned. A breakdown of respondents is given in table 6.2.

Table 6.2 Respondent's; Gender, Work Area And Work Type (Group Grid).

GENDER	
Males	8
Females	5
WORK AREA (*)	
Urban conservationists	4
Rural conservationists	7
Global conservationists	3
WORK TYPE	
Education	3
Administration	5
Conservation Planning	3
Conservation Research	1
Reserve Warden	1

(*) Note: This category represents the major areas of respondents work, as such, some respondents fell into more than one of these categories.

8.3.2 Repertory Grid Design and Procedure.

The repertory grid which was circulated to environmental conservation employees in this study had both elements and constructs supplied. These were derived by assembling all different elements and all different constructs which subjects had supplied in the initial repertory grid study. This resulted in a repertory grid being assembled which had 19 elements and 49 constructs. Each grid had a detailed set of instructions attached to it which were designed to enable a respondent to complete the grid unaided. Both the grid and the instructions went through several iterations. The instructions were tested upon a group of undergraduate students and members of the general public before the final version was arrived upon (see appendix A.4) for an example of the standard repertory grid and instructions).

Each grid was accompanied by a reply paid and addressed envelope. Each respondent was given a date by which they were required to return the completed grid. 11 completed and usable grids were returned by this date. On this predetermined date all organisations were contacted and requested to contact their employees who had not returned the grid and request them to do so. This resulted in a further 2 grids being returned. Unfortunately, several further grids were returned a considerable time after the final return date. Consequently, these grids were not included in the analyses.

The results from the above 2 studies are presented in the chapter which follows.

CHAPTER 7

CHAPTER 7.

Results 1:

Environmental Conservation Employee's Attitudes Towards their Profession's Activities.

7.1 Introduction

In this chapter the results from 2 exploratory studies with employees from the environmental conservation profession are presented. The studies assess respondents personal understanding of environmental conservation. From the analyses presented hereunder a classification system is developed for actions and issues associated with environmental conservation. This takes the form of a mapping sentence.

Reported in this chapter will be: 1/ the result from a series of repertory grid interviews, and, 2/ the results from the administration of a standardised repertory grid based upon the results of the first stage interviews. Similarity Structure Analysis, otherwise known as Smallest Space Analysis (SSA) will be employed to identify similarities present in the data of the repertory grids.

Through the use of SSA and through adopting a facet approach as a graphical exploratory data analysis technique (du Toit et al 1986) a mapping sentence will be produced. Initially, the facets which have emerged from

the analysis of the repertory grid data will be presented. Subsequently, the potential usefulness of these facets in designing research instruments for use in the next stage of this enquiry, into environmental concern, will be briefly discussed. It should be noted at this stage that the square boxes within which SSA plots are enclosed should not be interpreted as axes to the plot. Rather, it is more useful to think of these as simply being present to aid in the presentation. This is the case for all SSA plots in this thesis.

Results 1: Exploratory Study 1. Individual
Environmental Conservation Repertory
Grids.

The results from the analysis of a series of repertory grid interviews with individual environmental conservation employees are presented in the section which follows.

7.2.1 Data Analysis

The data which emerged from each repertory grid was analysed to reveal its smallest space partitioning using Similarity Structure Analysis (SSA). This was performed individually for all 13 subjects in order to reveal semantic similarity amongst grid elements. It was only possible to analyse grid data individually due to the individual nature of the grids; elements and constructs were different for each respondent and therefore it was

not possible to collapse grids into a single grid representative of the whole sample. The analysed data therefore revealed facets of semantic similarity for each respondent.

The plots resulting from the SSA are summarised in this chapter. A schematic form of these results is produced through the combination of the results of all individual grids.

SSA of the repertory grid interview data is schematically presented in the diagrams of the plots contained in figures 7.1 and 7.2. This analysis revealed 4 facets which respondents possessed in a variety of complete and non-complete combinations. The facets were: environmental conservation life area, scale of environmental conservation action or issue, relevance to environmental conservation, and personal relevance to the respondent.

Guttman Lingoes coefficients of alienation were all at levels of 0.20 or below. These levels are usually taken as acceptable (Kenny, 1981). A 4 dimensional explanation of environmental conservation experience for conservation employees is therefore proposed. Each of the 4 facets is now considered in some detail. An overall facet model compiled from these individual plots is also proposed.

7.2.2 Environmental Conservation Life Area.

Figure 7.1 shows the life area referent facet in schematic form. This facet formed a circular structure which distinguished qualitatively between life areas associated with environmental conservation. The plot of this facet shows clear partitioning existed in the following format:

Life Area Facet.

This reflected the "socialness" or "ecologicalness" of conservation actions. The elements of this facet were:

- ecological conservation (conservation primarily for the sake of the environment)
- educational conservation (conservation which was aimed primarily to educate or inform the public)
- social conservation (conservation primarily for the sake of human beings).

This facet makes it possible to state that the environmental conservation employees in the sample possess a facet of their assessment of environmental conservation actions and issues which assigns these to one of the above three life areas. These areas form a qualitative radial continuum and are arranged; ecological, educational, social As can be seen in figure 7.1 a second facet was present in the same plot in

multi-dimensional space. This the second facet of assessment modified the judgements of the life area facet with assessments of personal relevance.

7.2.3 Personal Relevance Facet.

The facet took the format of a modulating facet and modified the assessment criteria present in the referent facet A, of life area (figure 7.1). The structure of the facet was as follows:

Personal Relevance Facet.

This reflected the extent of personal experience or personal value attached to a given environmental conservation action or issue. The elements of this facet were:

- personally relevant
- less personally relevant.

The repertory grid elements which were of greater personal relevance (issues and actions with which the individual had personal contact (or to which they ascribed importance) were placed centrally in the plot. Those elements of less personal relevance, in the above terms, were found peripherally in this projection of multi dimensional space. As this facet appears in the same plot as the life area facet, the 2 facets can be seen to interact. What this means in practice is that

assessments of the social, educational or ecological content of an issue or action will be modified by the criteria of the personal relevance of the issue or action under consideration.

7.2.4 Physical Scale Facet.

A second circularly arranged facet was discovered during the analysis of repertory grid data for this respondent sample (figure 7.2). This facet made reference to the physical scale addressed by an action or issue. This is detailed below:

Conservation Scale Facet.

This facet reflected the Scale of an action or issue, in both its area of environmental concern, the scale of actions and operations associated with this, and in terms of the resources it consumed.

The elements of this facet were:

- Ethical conservation
- Global conservation
- International conservation
- National conservation
- Local conservation

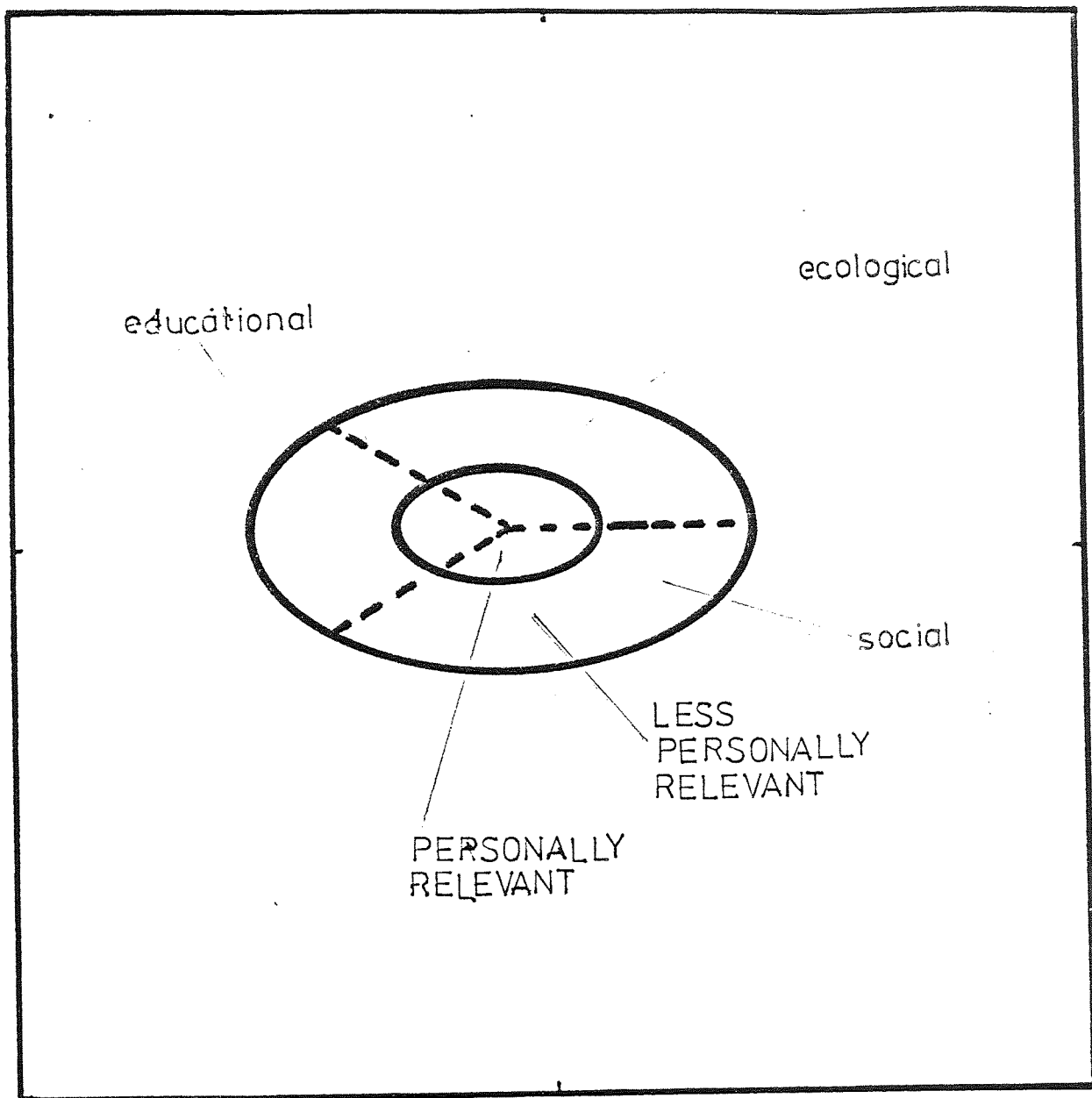


Figure 7.1

Individual Repertory Grid Study. Schematic Representation
of: Life Area Facet and Personal Relevance Facet.

These elements were found in a radial configuration similar to the life area facet. The configuration of this facet's elements shows this to be a second qualitative facet of assessment. It performs a similar role in structuring assessments to the life area facet (figure 7.1). As with the life area facet, the facet of conservation scale was also modified by a second facet. This is shown by the presence of a second facet in the same SSA projection and by the relative positioning of these 2 facets within the projection. The modifying facet in this case being a focus of conservation relevance.

7.2.5 Conservation Relevance Facet.

The structure of this facet was as follows:

Conservation Relevance.

This reflected the perceived relevance to environmental conservation of the specified action or issue. The elements of this facet were:

- of conservation relevance.
- of less conservation relevance.

Figure 7.2 shows that the configuration of this facet is such that the facet elements which were considered to be of greater relevance to environmental conservation were placed centrally in the plot. Those items which were of lesser importance in these terms were found peripherally.

The facet of conservation relevance was found in the same SSA plot as the referent of conservation scale. The facet therefore modifies the judgements of the facet of conservation scale. Therefore, for environmental conservation employees in our sample, the assessment of the physical scale of a conservation action or issue interacted with assessments of the actions' or issues' perceived relevance to conservation and the environment.

7.2.6 Individual Facets of Assessment.

The facet model proposed above reflects the ways in which environmental conservation is understood and assessed by the sample of respondents in the study. The specified facets are separately identifiable, inter-related areas of the sample of environmental conservation employees understanding of actions and issues within the environmental conservation movement. It must be noted however that all 4 facets were not necessarily present for each respondent. Table 7.1 shows a breakdown of the 4 facets as they appeared for each respondent.

It is important to note that when any of the specified facet's did appear, they were present in the format shown in figures 7.1 and 7.2 on all occasions. This being the case the following may be concluded: Whilst the judgements embodied in the facet model were not present in their complete, combined form for all subjects, due to similar structure of the facets in all

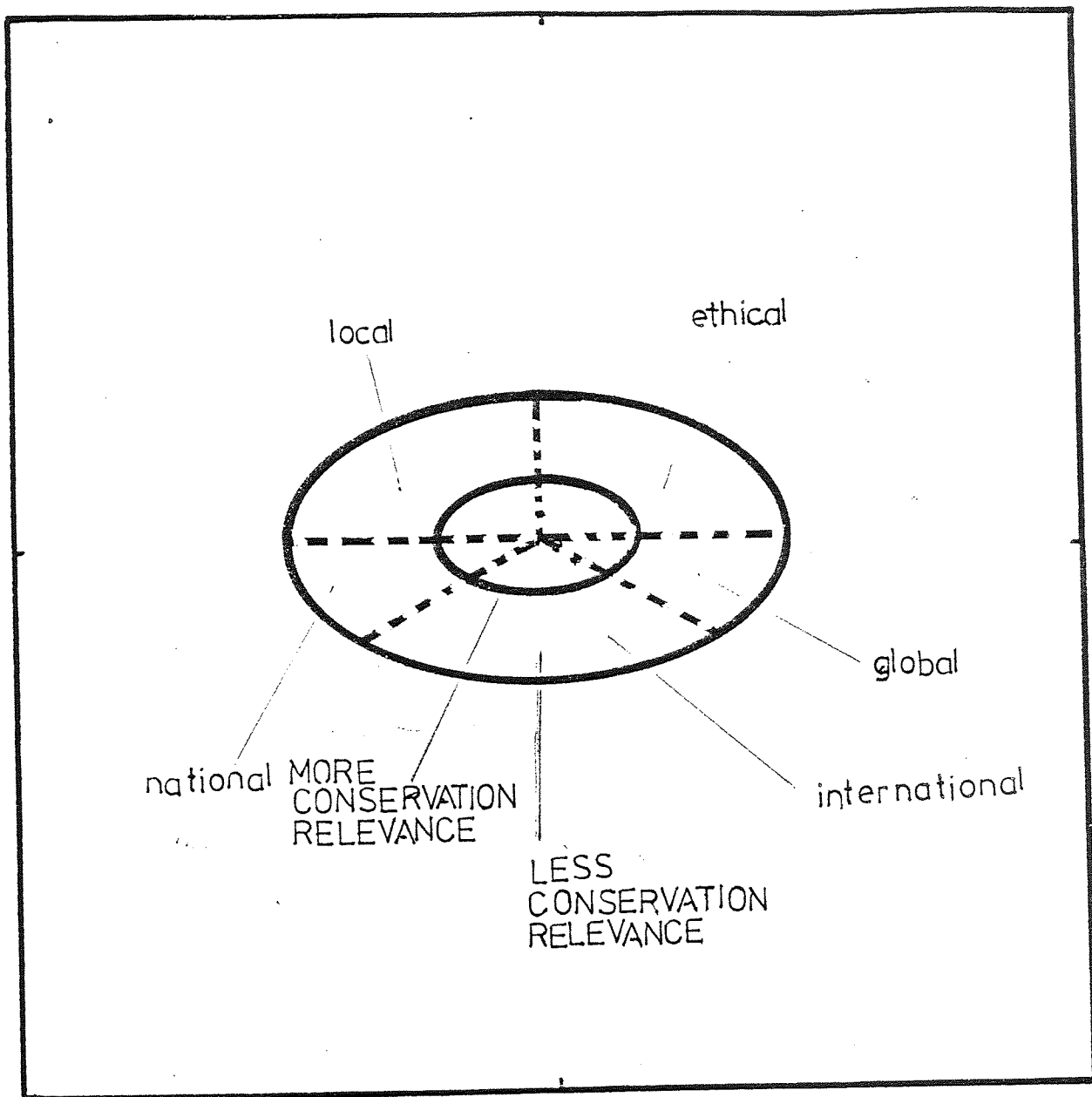


Figure 7.2

Individual Repertory Grid Study Schematic Representation
of: Scale Facet and Environmental Relevance Facet.

instances of their occurrence, the model may be seen as depicting the "complete" experience and evaluations for the sample investigated.

Table 7.1 Breakdown of Facets by Respondents.

RESPONDENT	FACETS.			
	Life area	Personal Relevance	Environmental Relevance	Physical Scale
1	*	*	*	
2	*	*	*	*
3	*	*	*	*
4	*	*		*
5	*	*	*	
6	*	*	*	
7	*	*	*	
8	*	*	*	
9	*			
10		*		*
11	*	*	*	
12	*	*	*	*
13	*		*	

The "*" indicates the presence of the specified facet for the respondent.

No statement in regard to the facets as they relate to any background characteristics of respondents can be made. This was due to the relatively small number of respondents and also because no a-priori rationale existed for the specification of such relationships. Similarly, it is not possible to make statements in regard to the presence or absence of facets in relation to background characteristics. It should be noted that a circularly arranged (qualitative) facet (scale and/or life area) was present in all analyses. A full set of facet plots for all respondents is given in appendix A.1.

7.2.7 Combined Model of Facets of Assessment.

The four facets listed above and shown schematically in figures 7.1 and 7.2, form two qualitative forms of assessment each modified by a separate and different facets of relevance. The two radex configurations so formed occupy an interacting position in four dimensional space. The two radexes illustrate the manner in which individual respondents utilised two qualitative and two quantitative judgements in evaluating environmental conservation.

Each of the qualitative assessments was modified by a different quantitative judgement: An area of environmental conservation was ascribed to one of the life areas of social, educational or ecological and conjointly assigned to being of more or less relevance to the respondent. Simultaneously, the same area of environmental conservation was allocated to one of the five physical scales; ethical, global, international, national and local and at the same time deemed to be of more or less relevance in terms of environmental conservation. Having discovered these 4 facets of respondents' experience a convenient manner in which the facets may be stated is through the specification of a mapping sentence.

7.2.8 Mapping Sentence for Environmental Conservation.

Mapping Sentences are statements which arise through the specification of all the variables (facets and elements) within the area of enquiry, along with any relevant background features (population or observational characteristics).

Connective words are used between facets to suggest their inter-relatedness and a "range" into which data may be classified is specified.

From the results of the present study it is possible to formulate the following mapping sentence for Environmental Conservation. This mapping sentence is shown in figure 7.3. The mapping sentence represents a framework within which the attitudes of environmental conservation employees may be understood.

7.2.9. Conclusions (exploratory study 1).

The study reported above has investigated the personal understanding of environmental conservation for a sample of employees in this area of work. The results from this investigation clearly show a common structure to these evaluations. However, due to the idiosyncratic nature of the study (the individual nature of the repertory grids completed) few, if any, comments may be made in regard to the topic of major interest to this present research: The structure of environmental concern as it exists as a social value.

Figure 7.3 Environmental Conservation Mapping Sentence.
(Individual Evaluation).

Person (x) being an environmental conservation employee,
assesses the specified -

Facet A.

- social conservation
- educational conservation
- ecological conservation

action or issue, which is of

Facet B.

- more personal relevance
- less personal relevance

being a

Facet C.

- ethical
- global
- international
- national
- local

action or issue, which is of

Facet D.

- more conservation relevance.
- less conservation relevance.

to be,

Range.

More

to -

Less

of the specified construct.

In order to investigate environmental concern as a social value for the same population as completed the repertory grids reported above, it was decided to produce a standardised repertory grid. The results from this study are reported in the section which follows.

7.3 Results 2: Exploratory Study 2, Environmental Conservation Repertory Grid Group Study.

In this section, the results will be presented of a further repertory grid study. The study employed a standard repertory grid which was administered to a sample of environmental conservation employees.

7.3.1 Data Analysis.

Data analysis was again performed using SSA of the elements in the repertory grid. This was similar to the procedure adopted in the previous exploratory study (the repertory grids for each individual environmental conservation employee). However, due to the common nature of the grids, all data were analysed together. This produced a series of plots for this group of environmental employees. In the next section these results will be presented.

Through SSA of the data, 3 facets were revealed with a Guttman Lingoes coefficient of alienation at the acceptable level of 0.15059. The facets were: a/ life

area, b/ relevance to environmental conservation, and c/ action purpose. A 3 facet structure to conservation employees group attitudes is therefore proposed. These results will now be considered in some detail.

7.3.2 Life Area Facet.

Figure 7.4 shows the plot of the life area facet. This facet was circular in structure which showed it to differentiate qualitatively (play a qualitative role in differentiating) life areas associated with environmental conservation. Partitioning existed in the following format:

Life Area Facet.

This reflected the "socialness" or "ecologicalness" of conservation actions. The elements of this facet were:

- ecological conservation (conservation primarily for the sake of the environment)
- ethical / educational conservation (conservation which was concerned with education or environmental morals)
- social conservation (conservation primarily for the sake of human beings).

The facet elements form a qualitative radial continuum and are arranged; ecological, ethical educational, social In figure 7.4 a second facet is present in the same plane of multi-dimensional space. This is the second facet of assessment; the facet of environmental conservation relevance.

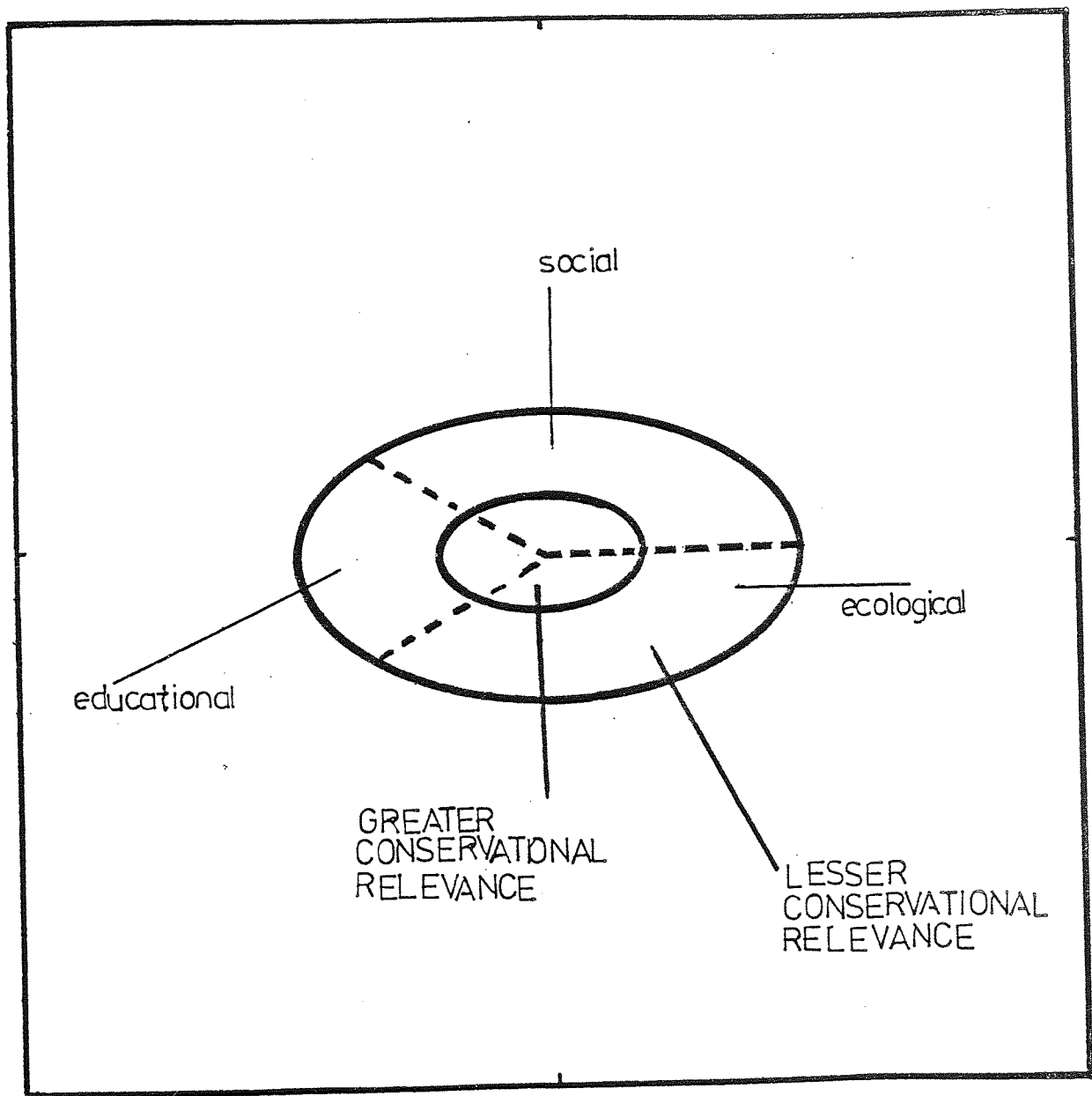


Figure 7.4

Group Repertory Grid Study. Schematic Representation of:
Life Area Facet and Conservation Relevance Facet.

7.3.3 Facet of Environmental Conservation Relevance.

This facet, which is also shown in figure 7.4, was a modular facet, modifying the assessment present in the facet of life area. The facet's structure was as follows. The facet reflected the extent of conservational value attached to a given environmental conservation action or issue. The elements of this facet were:

- of greater conservational relevance
- of lesser conservational relevance

Items from the element of greater conservational relevance were placed centrally in the plot. Those items from the element of less conservational relevance were found to be located more peripheral. This facet appears in the same plot as the life area facet and the 2 facets interact.

7.3.4 Action Purpose Facet.

This third facet is found in a separate plot and can be seen in figure 7.5. The division of the facet was into 2 parallel halves. The 2 sections divided conservation actions and issues in terms of their purpose. The structure of this facet was, an action or issue which was undertaken in order to have an effect:

- for itself.
- for a more primary aim within conservation.

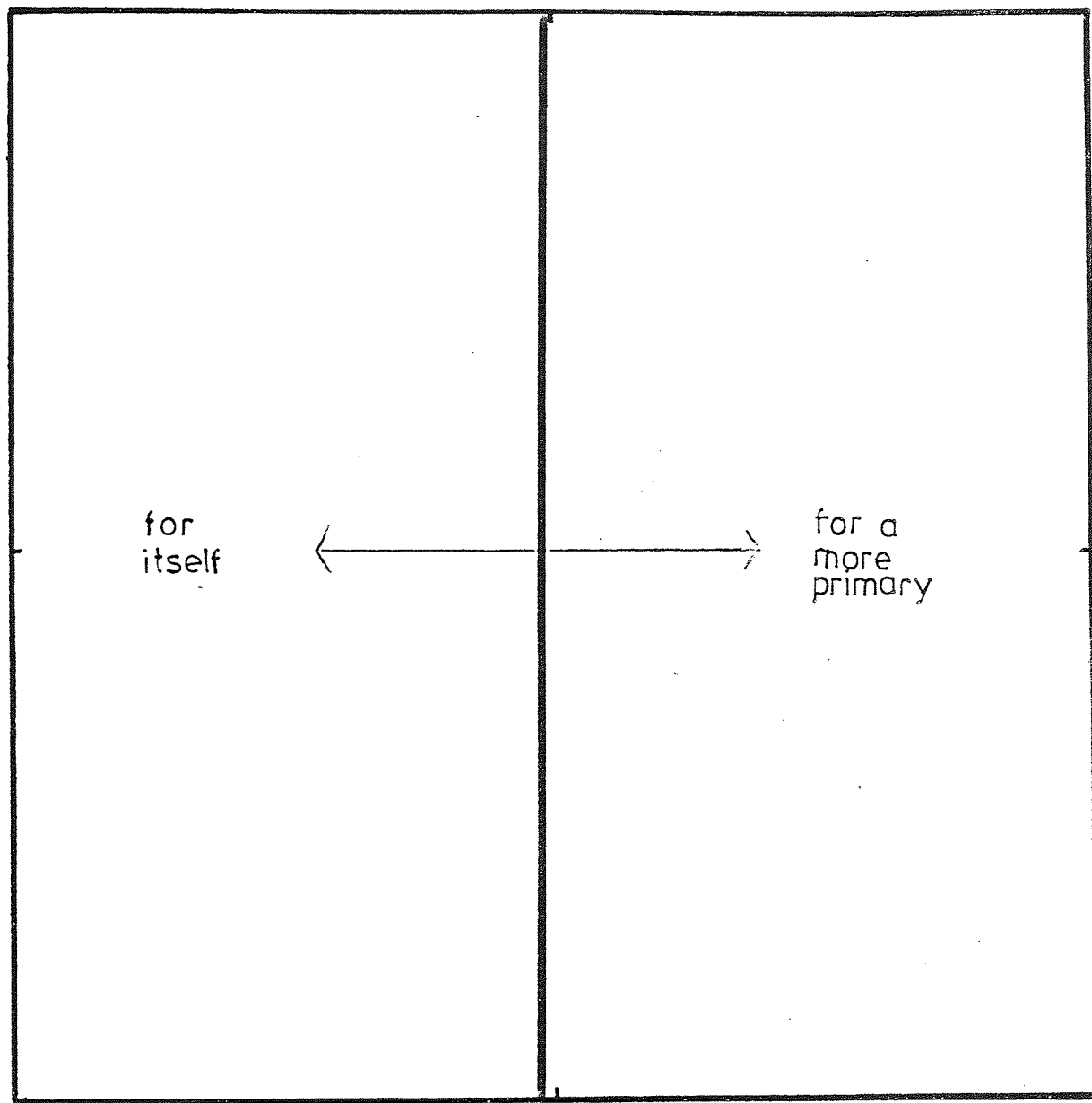


Figure 7.5. Group Repertory Grid Study Schematic Representation of Action Purpose Facet.

7.3.5 Conclusions (exploratory study 2)

This study has investigated the social understanding of environmental conservation for a group of respondents employed to work in this area. The results of this group's standard repertory grid show that the structure of this analysis is represented by the 3 facet detailed in the mapping sentence in Figure 7.6.

Figure 7.6 Environmental Conservation Mapping Sentence.
(Group Evaluation).

Person (x) being an environmental conservation employee,
assess the specified -

Facet A.

- social conservation
- educational / ethical conservation
- ecological conservation

action or issue, which is of

Facet B.

- conservation relevance.
- less conservation relevance.

Facet C.

- for itself
- for a more primary reason

to be -

Range.

More - to - Less

of the specified construct.

The results clearly show that a common structure for the social evaluation of environmental conservation exists for this respondent sample, as shown in the mapping sentence above. Inspection of the 2 facet models (mapping sentences) produced in these 2 studies reveals these to differ significantly. The differences in these and their implications for further studies are discussed in a later section of this thesis.

In the following chapters the results will be presented from a questionnaire study. The mapping sentences for the internal structure of environmental concern, developed above, will be used to develop a questionnaire. This will investigate environmental concern as a social value. Therefore, the mapping sentence will be used in conjunction with mapping sentences which have been developed in published facet theory research into social values.

Chapter 8.

The Design and Development of 3 Studies to Evaluate Environmental Concern.

3.1 Introduction.

The exploratory studies reported in the previous chapter resulted in a mapping sentence being generated for the internal structure of the evaluation of environmental conservation. Following-on from these exploratory investigations of environmental concern activities, the section below will report the design and development of 3 research investigations to study the social values, attitudes and personal involvement associated with environmental concern.

It must be noted at this point that the repertory grid studies were designed to assess the sample of environmental conservation employee's understanding of their profession's activities: Their personal understanding of environmental conservation and their personal environmental concern values. However, in the studies presented in this and the following chapters, it will be lay (public) concern for the natural environment that will be assessed.

In order to evaluate the structure of environmental concern among this population, 2 questionnaires will be devised which view specific areas of environmental

concern attitudes. A 3 part questionnaire will also be developed which will allow the investigation of the entirety of the semantic area specified in the mapping sentence for environmental conservation.

The issues and actions addressed by all of these research instruments will be based upon the mapping sentence produced in the previous chapter of this thesis. The manner in which environmental concern issues are developed into questionnaires will, for each of the questionnaires, be facilitated through reference to the general mapping sentences for social values (Levy, 1986).

In this chapter details will be given of the development of these questionnaires. Data arising from the 3 questionnaires will be analysed using facet analytic techniques. This will be followed by other statistical analyses of the final questionnaire as and where this is appropriate. The results of these analyses will be combined with the results from the earlier repertory grid studies. Together this information will form an answer to the questions which motivated this research.

8.2 General Issues in Questionnaire Design.

The mapping sentences developed out of the repertory grid studies were used as a template for the design of items to be included in the present questionnaire. The incorporation of facet elements into questions as defined

by a mapping sentence can produce potentially complicated statements for respondents to digest. Shye (1979) has demonstrated that if the researcher clearly understands the precise meaning of the elements in the mapping sentence, questions can be developed which express the meaning of each of these elements without explicitly stating them (it is this explicit statement of facet elements which may make facet questionnaires turgid and difficult to understand).

The questionnaires in the present series of studies are derived from, and understood through to the mapping sentence below in table 8.1.

This mapping sentence is a result of combining the mapping sentences for the internal structure of environmental conservation (figures 7.3, 7.6) with the Levy (1986) mapping sentence for social values (figure 5.1). The mode (2) facet is included as it allows the comparison of (and the broadening of) the analysis of environmental concern values to include the performance of value related behaviours. Levy, (1986) also adapted an existing social value mapping sentence in her research. In doing this she was able to examine the relationships between assessments of the importance of values, value related actions and the attainment of value goals. The design of the questionnaires will now be presented separately. The mapping sentence above represents an idealised form for

Figure 8.1. Mapping Sentence for the Definition of
Environmental Concern.

The extent to which person (x) makes a (cognitive
assessment of the:

Scale	Life Area	Type
(local	(Social	(action
(National	(Educational	(issue
(international	(Ecological	
(Global		
(Ethical		

issue, within environmental conservation for,

Mode (1)
(itself
(a more primary

Purpose within environmental conservation, by

Mode (2)	Range
(cognitively	expressing this to be (very positive
(behaviourally	to
	(very negative

in terms of their concern for the quality of the
environment.

the structure of environmental concern attitudes.
Furthermore, no specific range is given into which
responses may be mapped. Inspection of the environmental
concern literature shows immediately that little concern
has been paid to the specific range of responses to
environmental concern questions. As noted in chapter 4,
it is often the case that different measures of concern
have been taken as being equivalent. In this research
different ranges will be used in the different
questionnaires in order to permit direct comparison of
these ranges to be made.

Environmental concern will be investigated in terms of its perceived value to respondents, the perceived effectiveness of conservation actions and in terms of respondents involvement with these actions.

8.3 The Development of 2 Questionnaires Investigating the Urgency of Environmental Problems and the Seriousness of Environmental Hazards.

From the facets and the facet elements present in the mapping sentence in table 8.1 a matrix of facet elements may be produced. This would produce a set of all possible combinations of facet elements in a $1 \times 5 \times 3 \times 2 \times 2 \times 2$ combination, and would result in 120 possible elements. Questions could be generated which were representative of all of these combinations (an illustration of an exhaustive combination of elements is given in Hackett, et al., 1989). However, such a lengthy instrument would be extremely time consuming for respondents to complete. It may therefore be beneficial to conduct several studies each of which is specific in terms of its context and in terms of the facet elements that will be included. Furthermore, in specific contexts it is often found that certain facet and facet element combinations are nonsensical.

The first 2 questionnaires to be developed will be based upon the division of environmental problems into 2 categories. These categories of environmental problems have been used to classify environmental concern in published research (eg, Kessell, 1984, Royal Commission

on Environmental Pollution, 1984). The instruments developed will investigate attitudes regarding the perceived urgency of environmental problems and the seriousness of selected environmental hazards.

8.3.1 The Seriousness of Environmental Hazards Questionnaire.

In choosing the specific environmental hazards which were to be included in the questionnaire, items were selected based upon the environmental hazards identified in the questionnaire used by the Royal Commission on Environmental Pollution (1984). It was found that these hazard areas could be represented by elements of the facets in the mapping sentence in figure 8.1. A further facet was added to this mapping sentence. This was done as it was thought that when viewing the seriousness of environmental hazards, the time scale over which the seriousness of effect was perceived would be pertinent to respondents.

The revised mapping sentence is given in figure 8.2. This mapping sentence resulted in $1 \times 3 \times 1 \times 2 \times 1 \times 2 \times 1 = 12$ possible combinations. All of these 12 elements appeared at least once in the 6 questions that were selected for the final questionnaire. This small number of questions was chosen for the following 2 reasons. Firstly, the questionnaire was to be given as a street questionnaire and it was felt that a lengthy instrument was inappropriate. Secondly, the aim of the study was to attempt to support or

Figure 8.2 Mapping Sentence for Seriousness of
Selected Environmental Hazards.

The extent to which person (x) makes a (cognitive
assessment of the:

Time Scale	Scale	Life Area	Type
(Present	(National	(Social	(issue
(Future		(Ecological	
(No Effect			

environmental hazard, being a problem in,

Level
(itself (a direct problem)
(a more primary (a less direct problem)

within the area of environmental concern, and,

Mode (2)	Range
(cognitively assess this to be	(very serious
	to
	(not very serious

in terms of their concern for the quality of the
environment.

refute the environmental concern mapping sentence through
direct reference to existing research in this area and
the research used as a model was made up of these
elements.

Whilst it may be inappropriate to base conclusions upon
facet models which have been derived from such a small
number of items, it is not the intention of this research
to do this. Rather, the findings from this questionnaire,
will be combined with the results from 2 further
questionnaire studies. One of these will view another
specific area of environmental concern, whilst the other
instrument will take a much broader view. In combination,
the results from these questionnaire studies will be

used to develop further hypotheses about the structure of environmental concern attitudes.

The questionnaire developed to assess the perceived seriousness of environmental hazards which resulted from the above procedure can be found in appendix A.6. In the next section of this chapter the details are given of the construction of a questionnaire to investigate the perceived urgency of selected environmental issues.

8.3.2 The Urgency of Environmental Problems.

As with the hazards questionnaire, items which were to be included in the questionnaire were derived from the results of a published study in the area (Kessler, 1984).

The mapping sentence used in generating this questionnaire was again a modification of the mapping sentence in figure 8.1. The revised mapping sentence is shown in figure 8.3.

This mapping sentence resulted in $1 \times 1 \times 2 \times 1 \times 2 \times 2 \times 1 = 8$ possible combinations. Each of the 8 elements appeared at least once in the 10 questions selected for the final questionnaire. The rationale for the inclusion of 10 questions in the questionnaire are the same as those given above in respect to item selection for the environmental hazards questionnaire. The questionnaire which was developed to assess the perceived urgency of selected environmental issues can be found in appendix A.7.

The extent to which person (x) makes a (cognitive assessment of the:

Scale Life Area Type
(National (Social (issue
(Ecological

Level
being an urgent problem in, (itself
(a more primary

context within environmental conservation, and with which

Level
respondents have (direct personal contact, by,
(indirect

Mode (2) Range
(cognitively assessing this to be (very urgent
to
(not very urgent

in terms of their concern for the quality of the environment.

8.4 Samples.

In the exploratory repertory grid studies, samples were drawn from a population of individuals working professionally in environmental conservation. This was to sample "expert opinion" about environmental conservation action and issue. In the studies which follow samples will be drawn from a "lay" population.

It was decided to administer the environmental seriousness of pollution and the urgency of environmental issues questionnaires together. As this was the case the sample for each of these studies was the same.

The sample for these studies comprised 211 members of the general public. Respondents were opportunity sampled in main streets in Birmingham's city centre. The survey was carried-out at several times of the day and on all days from Monday to Saturday during 1 week in 1987. Potential respondents were approached and asked if they would complete a short questionnaire. This was completed in the street with the help of the interviewer. The whole procedure took approximately 5 minutes. Several respondents asked the interviewer questions about the study after completing the questionnaire, and the questions were answered honestly and to the best of the interviewer's ability. The interviewer attempted to sample equal numbers of male and female respondents. They also ensured that a wide age range was represented in the sample. This resulted in males and females completing the questionnaire.

8.5 The development of a questionnaire to investigate social values, attitudes and involvement associated with environmental concern.

8.5.1 Design.

In the final and most comprehensive study undertaken, the mapping sentence in figure 8.1 was used as a template for the design of questionnaire items. This resulted in $1 \times 5 \times 3 \times 2 \times 2 \times 2 = 120$ possible items for inclusion. It was decided, after several iterations of draft questionnaires, that the format which should be adopted was the one which would be most easily understood by

respondents. To this ends, it was decided to firstly develop questions which reflected the elements of the scale and life area facets.

This resulted in a total of 25 questions. The mode (2) facet reflecting the form of behaviour which was to be taken as indicative of environmental concern was further sub-divided. In the format shown in the mapping sentence (figure 8.1) this facet has 2 elements: behavioural and cognitive. It was decided that each of these elements should be represented by 2 sub-divisions. This was in order to facilitate the later investigation of the relationship between different types of attitude toward (cognitive) and different levels of involvement with (behaviour) environmental concern.

In the previous 2 questionnaires the same element of the type facet which specifies the modality of environmental concern to be either action or issue, was employed in the design. In these instruments issues were chosen. In the present questionnaire it was decided to incorporate the alternate element: actions. This resulted in a $25 \times 4 = 100$ set of questions in the final questionnaire (the final questionnaire is included in appendix A.8).

The precise wording of questions was finalised after a short pilot study in which 14 subjects (9 undergraduate students and 5 members of academic staff from Aston University) participated. In this study, data were not fully analysed using facet analytic techniques.

Data were instead analysed to ensure that a wide range of responses were being gathered. Subjects were also encouraged to make suggestions and comments about this. Respondents were also asked about the questionnaire's structure and to state how complicated they thought it would be to complete the questionnaire "without the aid of the researcher". In all cases it was felt that there were no problems with self-completion.

8.5.2 Sample and Procedure.

The questionnaire was given to 2 samples of undergraduate students. It was decided to use undergraduate students as the population for the study for several reasons: Students were felt to be a relatively well informed group and would therefore provide useful information when attempting to establish the internal structure of this attitude area. Undergraduate students were also a readily available respondent group. The study was attempting to view the internal structure of environmental concern attitudes and not attempting to make comments upon the social or personal correlates of environmental concern and it was therefore felt to be justified to use this group of respondents.

The survey took place during winter 1987. Respondents were approached in halls of residence and in refectories and after lectures at Aston University. These different locations were chosen in order to sample as wide a range

of both campus and non-campus living students as was possible. Potential respondents were initially approached and their assistance requested. Those who agreed to participate were given the questionnaire along with instructions for its completion. The names and addresses were taken of residential students and a time was agreed when the completed questionnaires were to be collected.

Non-residential students were approached in a similar manner. However, they were asked to return the completed questionnaire, through internal post at the university by, an agreed date. 240 questionnaires were distributed in this manner. A total of 218 completed and usable questionnaires were returned.

In the chapters which follow, the results are presented from the administration of the questionnaires which have had their development detailed in this chapter.

CHAPTER 9

Results 3: Urgency of Environmental Problems and Seriousness of Environmental Hazards

9.1 Introduction

During this chapter the results from 2 attitude surveys will be presented. The first set of results will be from a questionnaire to assess public evaluations of the urgency of selected environmental problems. After this, the results will be presented from a questionnaire given to the same sample on environmental hazards.

Similarity Structure Analysis (SSA) (Shye, 1985a) will be performed upon both of these questionnaires. This will result in facets of assessments being established for each study. The environmental hazards questionnaire will also be analysed to reveal how assessments are structured by the facets and facet elements revealed in SSA. This questionnaire was chosen for this partial order format of analysis as the facets specified in its design were ordered making it ideal for this type of analysis. Partial Order Scalogram Analysis (POSA) (Shye, 1985b) will be performed to illustrate the ways in which the facets and facet elements are meaningful (to respondents) divisions of Environmental attitudes: Facets are not simply a researcher imposed classification system.

The results from the questionnaire investigation into the perceived urgency of environmental problems are firstly analysed to reveal similarity structure.

9.2 Results 3a: The Urgency of Environmental Problems

The design and development of the urgency of selected environmental problems questionnaire has been outlined in chapter 8 (the questionnaire may be found in appendix A.7). The mapping sentence which was used to develop questionnaire is shown in figure 8.3.

The intercorrelations between questions is shown in appendix A.10. Responses were analysed using SSA. This revealed 3 facets of assessment at an acceptable level of stress; $GL=0.15$. There now follows a discussion of these facets.

9.2.1 Life Area Facet.

The SSA plot in figure 9.1 shows the facet of life area. This facet partitioned into 2 main regions: environmental problems which were primarily "social" or "ecological". In this projection of multidimensional space, the ecological element is placed to the top left of the diagramme. The social element is to be seen to the bottom right of the plot. these 2 elements are divided by the solid line in the diagramme. As well as these 2 regions, the ecological element further divided to reveal 3 sub-elements. These were environmental problems which

addressed; pollution issues, ecological waste issues and resource depletion issues. The sub-elements of this facet were arranged in a manner which reflected primarily ecological or social effect. Ecological items, and elements, which had more of a social effect, were located closer to the social region. The more ecological items were placed centrally in the ecological regions.

The structure of this life area facet may therefore be specified:

- a) Social Problems
- b) Ecological problems
 - pollution
 - waste
 - resource depletion

The presence of these sub-regions showed this facet to be a polar facet (to be qualitatively arranged in a circular order). The main elements of the facet were in the format specified in the mapping sentence. However, the sub-regions were not hypothesised. The presence of this facet and its structure implied that when evaluating the urgency of the selected environmental problems, respondents assigned each problem to one of the above listed categories. Due to the circular arrangement of this facet's elements, none of the elements was evaluated by respondents as being of any more urgency than any other of the categories.

It may be seen in the plot of the life area facet (figure 9.1) that some items were located slightly towards the

centre of this plot. Indeed, one item, (2) was placed centrally. This item was effectively removed from the circular arrangement of the life area facet. This was due to the influence of a second facet interacting with the facet of life area. The facet was a facet of personal relevance.

9.2.2 Personal Relevance Facet.

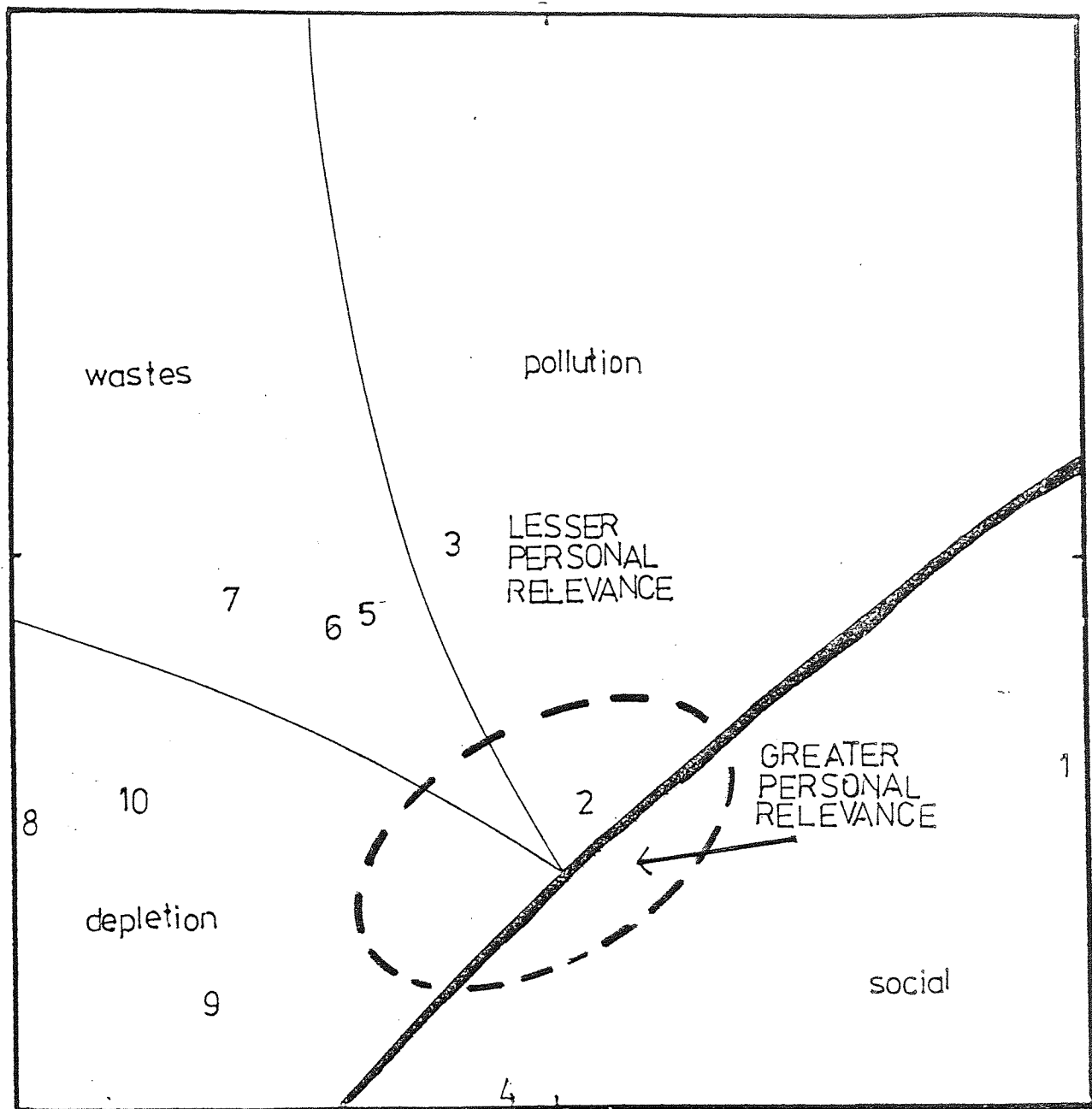
The circular arrangement of the life area facet was modulated (modified) by the facet of personal relevance (figure 9.1). However, only 1 item in the analysis was of central relevance to respondents (item 2). Therefore, the element of more personal relevance comprised 1 item. However, more peripheral environmental problem items approached central positions as they became more personally relevant in terms of their urgency. The elements of this facet were, an environmental problem of:

- a) greater personal relevance.
- b) lesser personal relevance.

Future research is needed to clarify the role of this facet in structuring evaluations through the inclusion of more items representative of the central element.

9.2.3 Environmental Relevance Facet.

The third facet present in this assessment was a facet of environmental relevance (figure 9.2). Within this facet

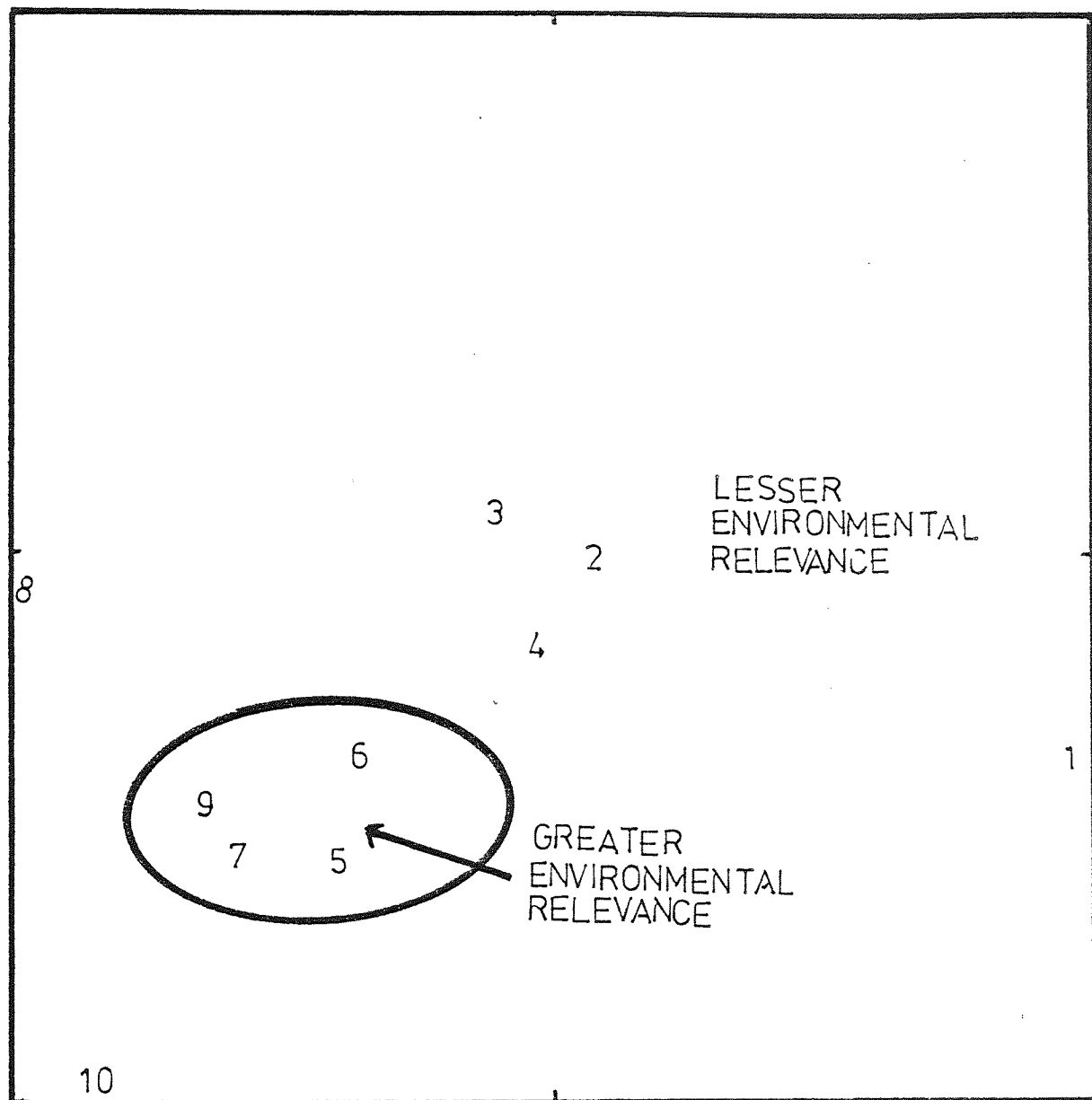


Item numbers.

- | | |
|--------------------------|-----------------------------------|
| 1. Noise. | 6. Toxic waste |
| 2. Air pollution. | 7. Nuclear waste |
| 3. Water pollution. | 8. Destruction of land/townscape |
| 4. Over-population. | 9. Depletion of natural resources |
| 5. Solid waste disposal. | 10. Energy |

Figure 9.1.

Projection of the SSA of the urgency of environmental problems questionnaire showing partitioning of the life area facet and personal relevance facet.



Item numbers.

- | | |
|--------------------------|-----------------------------------|
| 1. Noise. | 6. Toxic waste |
| 2. Air pollution. | 7. Nuclear waste |
| 3. Water pollution. | 8. Destruction of land/townscape |
| 4. Over-population. | 9. Depletion of natural resources |
| 5. Solid waste disposal. | 10. Energy |

Figure 9.2

Projection of the SSA of the urgency of environmental problems questionnaire showing partitioning of the environmental relevance facet.

were embodied judgements regarding the relevance in, environmental terms, of a specified environmental problem. The elements of the facet were:

- a) Greater environmental relevance.
- b) Lesser environmental relevance.

The structure of this facet was such that it caused some items to be placed centrally in relation to other items. This structure is characteristic of a modulating facet. This format of facet causes the judgements carried in a separate facet to be modified. However, in this plot, no other facet was identifiable.

9.2.4 Summary of Plots.

From the plots presented above, 3 facets have been identified. The facets identified are: Life Area; Personal Relevance; Environmental Relevance.

As well as simply stating the facets of the assessment, the relationships between facets are revealed. The facet of life area qualitatively arranges problems. Respondents perceived the environmental issues to be problems as either, pollutants, wastes, resources depletions or in human terms. These judgements are modified by evaluations of personal relevance. Simultaneously, although relatively independently, judgements were also made by respondents about the environmental relevance of the problem.

9.3 Conclusion

To conclude this analysis the results may be summarised by a series of questions, in which each facet of the assessment is represented by a question. These are the questions which are asked by an individual to themselves each time they evaluate the urgency of an environmental problem. The questions posed regarding the urgency of environmental problems are:

How urgent is the social, waste, pollution, resource depletion, problem as it is relevant to me, and how relevant is this problem in environmental terms.

The answers which are formulated to these questions will effectively determine the evaluation of an environmental problem's urgency.

9.4 Results 3b: The Seriousness of Environmental Hazards.

Reported in this section of the chapter are the results of the analysis of the questionnaire produced to investigate evaluations of the seriousness environmental hazards. SSA of data is performed to reveal the structure of attitudes. In the latter sections of this chapter, further analyses will be performed which will provide more details of the facets identified in the section hereunder.

9.5 The Structure of Assessments of the Seriousness of Environmental Hazards.

This section reports the results of the analysis of the total data set collected from the administration of the questionnaire. The analysis investigated the mapping sentence in figure 8.2 through SSA. This produced 3 facets of assessment at an acceptable level of stress; Guttman Lingoes Coefficient of Alienation (GL) = 0.11, 0.20 or below usually being accepted). The correlation matrix of the questions in this study is given in appendix A.9. The facets are presented in the section which follows.

9.5.1 Life Area Facet.

Figure 9.3 shows the projection of the life area facet. The plot clearly partitioned into 2 regions. These were social conservation and ecological conservation. Items referring to the social or human consequences of pollution were located toward the upper left of the plot. The region toward the lower right was comprised of items addressing the ecological consequences of hazards. This facet divided issues in terms of the life area of the consequences of the specified environmental hazards. The facet was present in the format specified in the mapping sentence (figure 8.1).

From the structure of this facet it may be stated that the first facet in assessment of the seriousness of one of the specified environmental hazards involved its consequences be ascribed to either the human or ecological areas of life. Due to the existence of only 2 facet elements the facet took a dichotomous format. However, a similar life area facet appeared the SSA of both the environmental urgency questionnaire and the repertory grid interviews. In these analyses the life area facet contained the above two elements. In addition a third element of education was present: The arrangement of this facet was circular.

Closer inspection of this facet reveals a circular arrangement in the positioning of items rather than a dichotomy. Items were arranged circularly as follows; less social, social, less social, less ecological, ecological, less ecological,..... This arrangement leads to the conclusion that the circular order of a circumplex was present in the analysis.

It should be noted that in the present analysis the life area facet has been shown to consist of 2 elements. However, a circular order of items has also been identified. More precise understanding of the structure of the life area facet may be established by the development of a more extensive questionnaire. This research instrument would contain a greater number of questions representative of these and other possible facet elements.

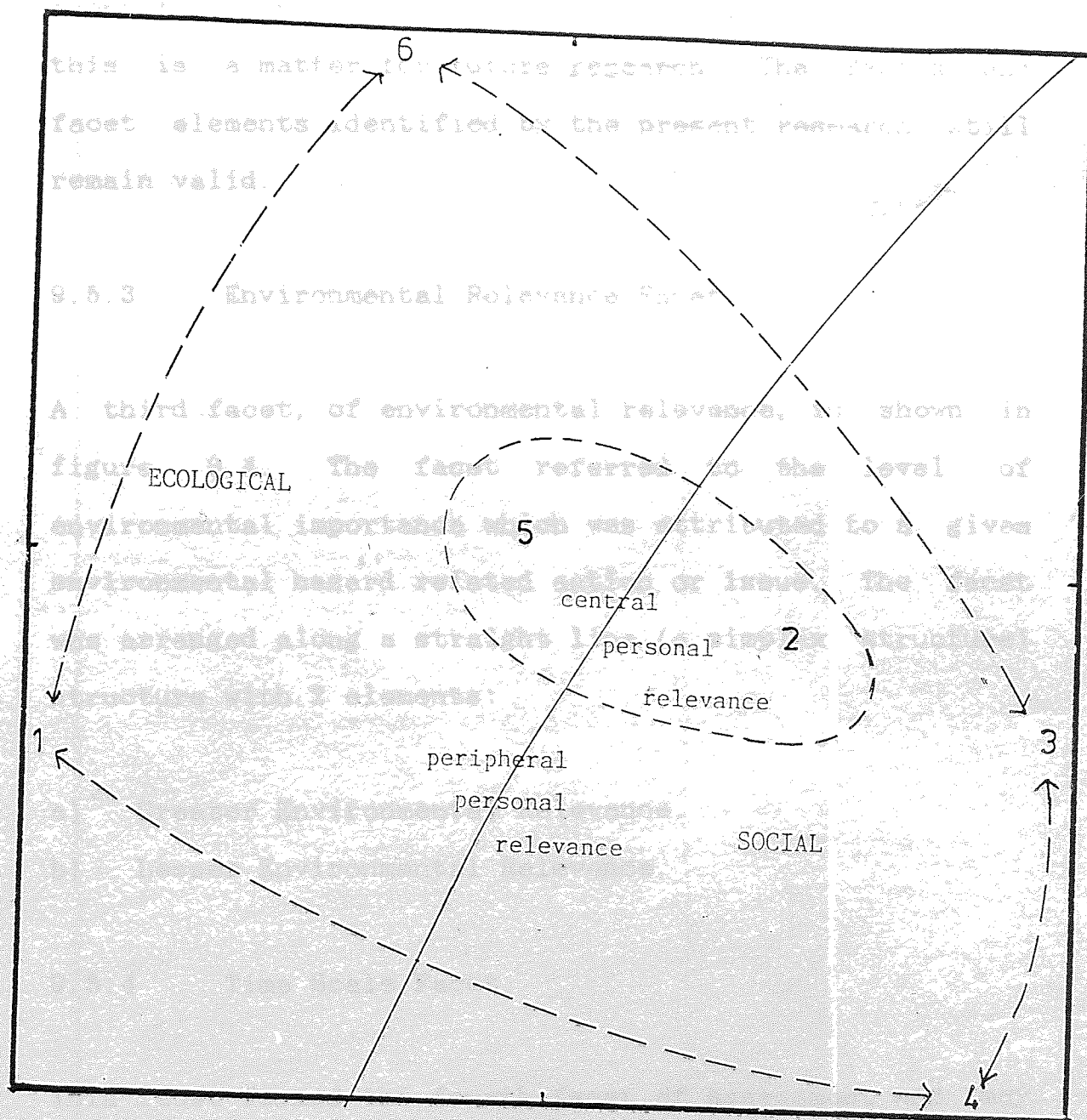
The circumplex hypothesis was given extra support by the central placing (removing them from the circular order) of two items (items 2 and 5). These items represented hazards the hazards of lead from petrol and industrial air pollution. As the sample was drawn from the population of a large city (Birmingham) it may be proposed that these hazards were those with which respondents had the greatest degree of personal contact. The displacement of these items was due to the presence of a second facet in the same plot of the analysis. This second facet modified the judgements present in the life area facet. (this can be seen in figure 9.3).

9.5.2. Personal Relevance Facet

It was noted above that the facet of life area appeared to have a circular structure. This facet was modified (modulated) by a facet of personal relevance (figure 9.3). Due to the small number of questions in the questionnaire, the partitioning of this facet resulted in one element of the facet being made-up of 2 items. The 2 elements of the facet of the personal relevance were environmental hazards of:

- a) Central Personal Relevance,
- b) Peripheral Personal Relevance.

These 2 elements were in a configuration which is characteristic of a facet playing a modifying role upon a circumplex.



Item numbers.

1. Noise from aircraft.
2. Lead from petrol.
3. Industrial waste in rivers and seas.
4. Waste from nuclear power stations.
5. Industrial fumes in the air.
6. Noise and dirt from traffic.

Figure 9.3

Projection of the SSA of the Seriousness of Environmental Hazards Questionnaire showing partitioning of the life area facet and the personal relevance facet.

The small number of items (6) in this analysis made the identification of structures more difficult. However, this is a matter for future research: The facets and facet elements identified by the present research still remain valid.

9.5.3 Environmental Relevance Facet.

A third facet, of environmental relevance, is shown in figure 9.4. The facet referred to the level of environmental importance which was attributed to a given environmental hazard related action or issue. The facet was arranged along a straight line (a simplex structure) structure with 2 elements:

- a) Greater Environmental Relevance.
- b) Lesser Environmental Relevance.

9.5.4 Time Scale Facet.

This facet formed the fourth facet of assessment and may be seen in figure 9.5. The facet had 3 identifiable elements (regions) in a linear (simplex) arrangement.

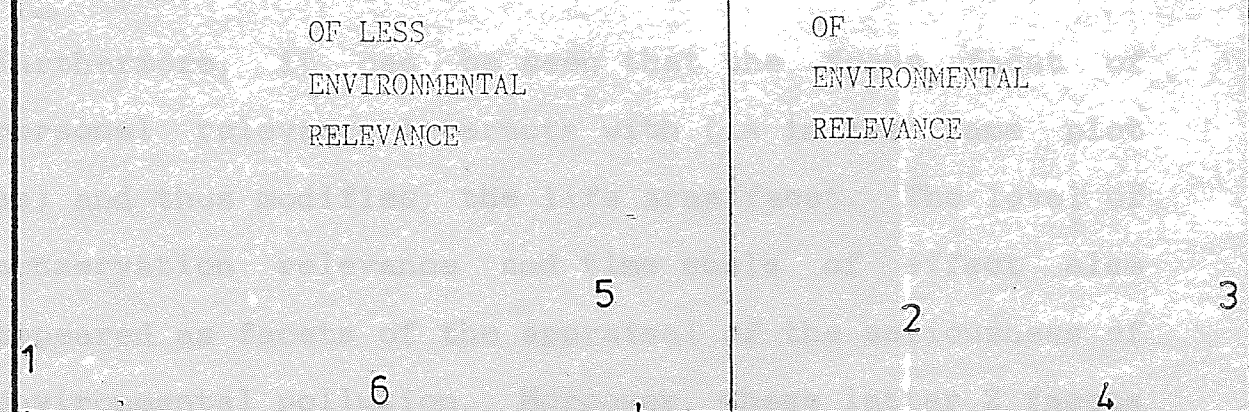
These were:

- a) No Effect.
- b) Future Effect.
- c) Present Effect.

effect (facet elements) are given by a single number in
 items (see figure 9.5). This does not represent a
 problem in the identification of facets or facet
 elements. However future research should aim to enable
 a greater number of questions representative of facet
 elements. This facet also played an axial role in
 structuring assessments.

9.5.5 Summary

The 10 items presented above, a sample of the
 questionnaire. These are ranked by (1) degree of
 environmental relevance, and (2) degree of



Item numbers.

1. Noise from aircraft.
2. Lead from petrol.
3. Industrial waste in rivers and seas.
4. Waste from nuclear power stations.
5. Industrial fumes in the air.
6. Noise and dirt from traffic.

Figure 9.4.

Projection of the SSA of the seriousness of environmental hazards questionnaire showing partitioning of the environmental relevance facet.

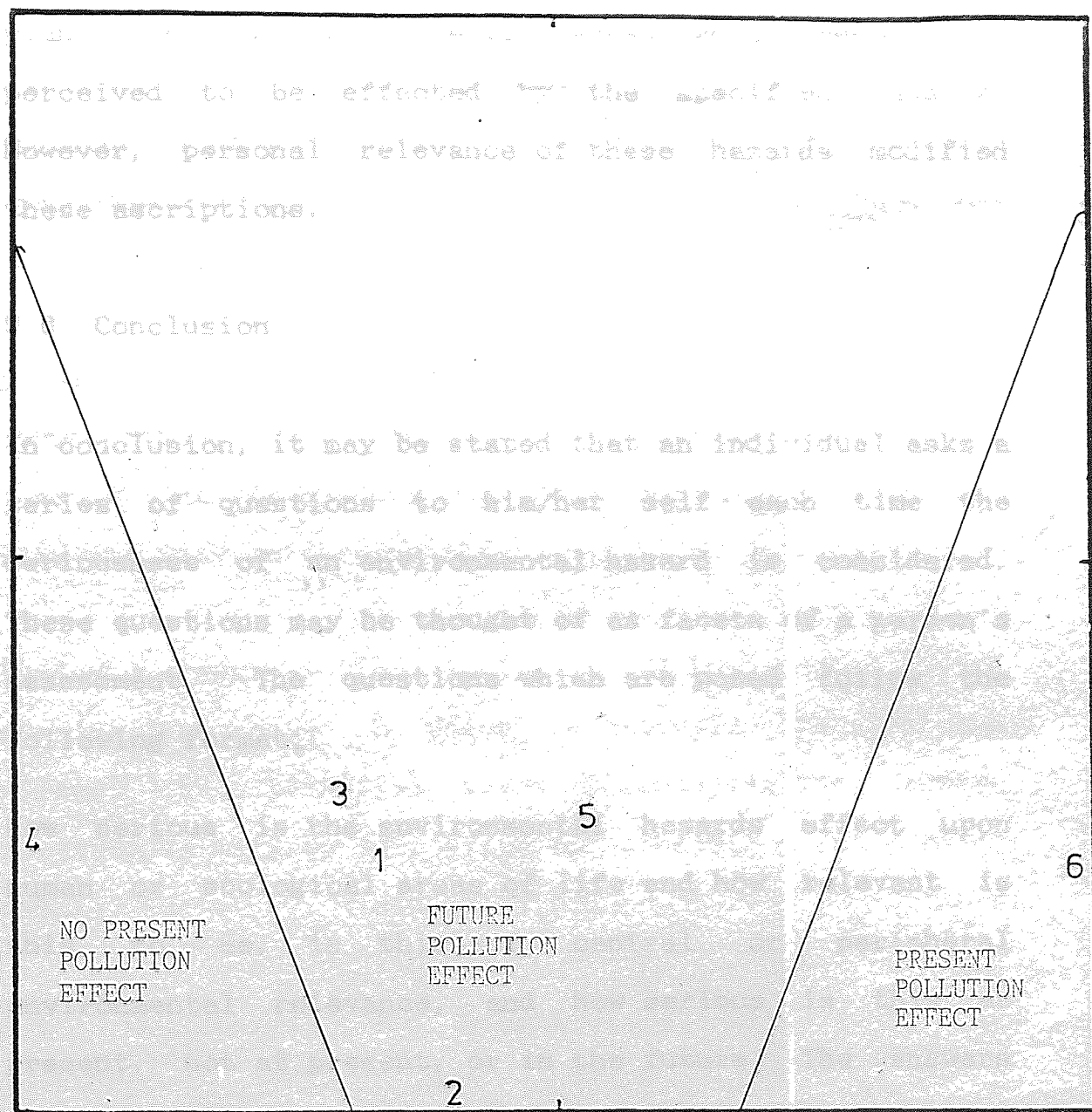
As with the facet of personal relevance, due to the small number of questionnaire items, "no effect" and "present effect" facet elements were made up of single question items (see figure 9.5). This does not represent a problem in the identification of facets or facet elements. However future research should aim to assemble a greater number of questions representative of these facet elements. This facet also played an axial role in structuring assessments.

9.5.5 Summary.

From the 3 plots presented above, 4 facets are clearly identified. These are facets of: Life Area; Personal Relevance; Environmental Relevance; Time Scale Effect.

Furthermore, it can be seen that the focus facet of personal relevance interacts with (is in the same plot as) and thus modifies, the life area facet. The level of conservation relevance and time scale of effect also appeared as facets of the appraisal of the seriousness of environmental pollution. Moreover, these latter 2 facets appeared as relatively independent facets of the appraisal; as axial facets.

It should be noted that the elements of the life area and environmental relevance facets have identical items comprising them. It is the differences in the structure of these 2 facets which enables their differentiation.



Item numbers.

1. Noise from aircraft.
2. Lead from petrol.
3. Industrial waste in rivers and seas.
4. Waste from nuclear power stations.
5. Industrial fumes in the air.
6. Noise and dirt from traffic.

Figure 9.5.

Projection of the SSA of the seriousness of environmental hazards questionnaire showing partitioning of the time scale of effect facet.

Evaluations of the seriousness of environmental pollution in terms of its effect upon either humankind or the planets ecology, were the life areas which respondents perceived to be effected by the specified hazards. However, personal relevance of these hazards modified these ascriptions.

9.6 Conclusion

In conclusion, it may be stated that an individual asks a series of questions to him/her self each time the seriousness of an environmental hazard is considered. These questions may be thought of as facets of a person's assessment. The questions which are posed follow the following format;

How serious is the environmental hazards effect upon human or ecological areas of life and how relevant is this to me, is this of central or peripheral environmental relevance, and how serious is this at present, not at present, or in the future. The answers to the 3 sub-questions of this question will determine the overall assessment of seriousness an individual attaches to a given environmental hazard.

Individual responses to the environmental hazards are structured in terms of the facet elements. The qualitative and quantitative ways in which these facets effect assessments are the subject matter of the next section of this chapter. In this a partially ordered structure will be presented.

9.7 Individual Response Profiles

The results have been presented of assessments of the seriousness of environmental hazards. A mapping sentence has been developed from variations in assessments. The next stage in this analysis is to consider the structure of these attitudes in more detail. It has already been possible to establish new and important understanding about these evaluations. There remains however the question as to exactly what role each of the facets' elements play in shaping these individual judgements.

During the next section, analyses will be reported which examine the ways in which individuals' evaluations differ. The principal items differentiating between assessments will be identified and considered in greater detail.

9.8 Qualitative and Quantitative Differences in Evaluations.

It is possible to identify 2 basic ways in which individuals may differ in terms of a given evaluation they make. The first of these differences is purely quantitative. In this research, this would be an individuals total score in their assessments of the seriousness of all specified environmental hazards.

The second way in which individual responses may differ is qualitative. At each quantitative level assessed of

seriousness, qualitative differences may exist between respondents. What this means is that at each level of quantitative similarity in evaluations there is agreement amongst respondents in regard to the seriousness of all environmental hazards. However these totals may differ in terms of the individual scores comprising them: These are the qualitative differences in evaluations.

This chapter section will consider both the qualitative and quantitative similarities and differences in the questionnaire data.

9.9 Partial Order Scalogram Analysis

Partial Order Scalogram Analysis (POSA) or Partial Order Scalogram Analysis with base co-ordinates (POSAC) are analysis methods which have been used in a variety of research settings. They have proved both appropriate and useful when studying qualitative and quantitative dimensions of judgement (Brown 1985). Detailed descriptions of POSA and POSAC are provided by several authors (eg, Brown, 1985., Shye, 1985b., Dancer, 1989). The reader requiring further information about this procedure is guided to these texts and to Shye, 1986, who thoroughly reviews the procedure of scaling. However, it is appropriate to note several points at this stage.

POSA and POSAC provide 2 types of information. Firstly, total scores are provided for individuals responses to a

specified questionnaire item. Secondly, differentiation is made between responses which are similar in their totals but which differ in the items which compose them; their qualitative differences. This allows for the observation of differences in the composite scores and the identification of the basic qualitative dimensions' differentiation.

It is possible to subject a total raw data matrix to analysis through POSA. However, it is usual practice within facet research to reduce the matrix to a smaller set of variables. This reduction helps greatly in the interpretation of POSA (Donald, 1988).

It should be noted that by collapsing the original data matrix into a matrix comprising variables representing the facet elements revealed in the previous semantic similarity analyses, several tasks are simultaneously performed. It 1/ reduces the data matrix to a more easily interpretable format, 2/ helps to provide further support for the facet elements identified in SSA, by 3/ facilitating an understanding of the roles played by these elements in structuring evaluations.

The above mentioned advantages of collapsing the data matrix into variables representative of the SSA facet elements formed the rationale for the procedure adopted in the present POSA. Other techniques might have been employed to reduce the data matrix for subsequent analysis to reveal partial ordering. These techniques include the random selection of variables for inclusion

or selecting variables deemed to be representative of the original matrix. However, none of these procedures has the above advantages of calculating average scores.

A further problem associated with random or systematic selection of variables is that the specific area addressed by the chosen variables may confuse the more fundamental facets of evaluations. Including all variables in a collapsed format ameliorates these problems.

The procedure adopted in the present research for the calculation of sub-scales prior to their entry in POSA was developed by Donald (1983) and used by others (Canter & Donald. 1985. Zeibland. 1986). In this procedure, a mean score is calculated for all questionnaire items which comprise each facet element of a study's original mapping sentence. For example, in the present research, each questionnaire item which included a social element from the life area facet is summated and divided by the total number of such items, eg:

Social
Element = Social/Present, Social/Future, Social/No Effect
Score. 3

In selecting facet elements for inclusion in POSA the modulating facet was not included. This was because the facet was not specified in the initial mapping sentence. This procedure of discarding unspecified modulating facets is in accordance with previous research (eg, Donald 1987).

It has already been noted that the elements of the life area facet and the elements of the environmental relevance facet were composed of the same questionnaire items. In POSA the option exists to choose which items are included for POSA. The element scores calculated were techniques. However, this will not be done for the following environmental hazards; social/human, ecological, no present effect, present effect, and future effect. Rather, the full data set will be included so as to more accurately represent the relationship between the data matrix.

9.10 Element Item Composition

9.10.1 Internal Consistency of Element Scales

Following the procedure detailed above, 5 element item scores were calculated. The items comprising each of these were:

- Element 1. Social effects - questions, 1,5,6
- Element 2. Ecological effects - questions, 2,3,4
- Element 3. No present effect - question, 4
- Element 4. Future pollution effect - question, 6
- Element 5. Present effects - questions, 1,2,3,5

A further point which should be noted is that due to the small number of questionnaire items (6), only this number of items existed for combining to form element scales. This has resulted in some element scales having single representative items. However, this does not effect the role played by this item as a facet element; such items

are simply deemed to play a perfect role in terms of the element scale they represent.

In POSA the option exists to dichotomise data. This procedure may be accomplished using a wide variety of techniques. However, this will not be done in this research. Rather, the full data set will be included so as to more accurately represent the variations in the data matrix.

9.10.1 Internal Consistency of Element Scales.

It is necessary to establish the internal consistency and reliability of each scale prior to conducting POSA. Therefore, Alpha coefficients and standardised Alpha coefficients were calculated for each element scale (see Table 9.1).

TABLE 9.1 Alpha Coefficients for Element Scales.

ELEMENT	ALPHA	STANDARDISED ALPHA
Social	0.72	0.72
Ecological	0.73	0.74
No Present	0.67	0.67
Future	0.62	0.63
Present	0.69	0.71

In the context of the present research, all the above levels of alpha are within acceptable levels as described by Nunnally (1967).

It should be noted that items comprising an element scale contain the element as part of their definition. However, they also are made up of items from the other

facet being investigated through POSA. As this is the case, element scales should display acceptably high Alpha coefficients whilst displaying variance due to the presence of this second facet : Items do not come from unidimensional scales (Guttman, 1944).

Partial Order Scalogram Analysis with base Co-ordinates (POSAC) (Shye 1978b) was used to reveal ordering present in the data. The results of this analysis are presented in the following section of this thesis.

9.11 Element Scales Partial Order Scalogram Analysis.

Partial Order Scalogram Analysis has 2 axes. The first runs from the top right of the rectangular plot (such plots are known as space diagrams) to the bottom left. This is known as the joint axis, and is quantitative in its nature. It represents quantitative differences in the data. Individuals with the highest summated element profile scores will be located toward the top right hand corner of the POSA plot. Along this line, individuals who have progressively smaller summated element scores will be found progressively closer to the bottom left location.

The second axis in a Partially Ordered Scalogram Analysis runs from the top left hand corner to the bottom right hand corner of the space diagramme. This axis is termed the lateral axis.

Along this line, or any other line running parallel to it, will be found individuals with the same scores on the joint axis. However, whilst summated profile scores may be similar, individuals may have very different scores on any one element item in their respective profiles. Differences in this essentially qualitative dimension are represented along the lateral axis. Individuals with the same scores on any specific profile element item are located in a similar position along the lateral dimension.

The location of individuals in a space diagram is thus derived from their full data profile. What may be termed the qualitative and the quantitative variation in the data are both taken into account in locating an individual profile. The distance apart of two profiles in a space diagram is dependent upon: 1/ the summation of the profile, 2/ an attempt to locate all similar scores for each profile item in adjacent 2 dimensional space.

The print-out from POSAC provides a space diagram of all individuals as they are located by the above rationale. A plot for each item (element scale) in the investigation is also provided. In the case of this particular study there are 5 element scales and thus 5 item diagrammes. In these plots, the locations of the profiles are the same as in the space diagramme. However the item score for the particular profile appears in the position which was previously occupied by the item

number. This allows the boundaries of the item scores to be easily identified and thus greatly reduces the time required to interpret the roles played by elements in an analysis.

In order to facilitate interpretation of the plots, lines are drawn (which should be as straight as is possible) to partition regions. Each region contains a single score for an item. The direction of lines reveals how the items structure the POSA. The different shapes produced in partitioning regions enables the researcher to clearly identify the role played by that element in structuring the attitude, value, behaviour, etc. The partitioning lines reveal the role of elements in determining the qualitative (lateral) dimensions of evaluations. The joint (quantitative) axis is simply the sum of a profile score.

If no qualitative differences existed between respondents, individuals would be found along the joint axis. This is rarely, if ever, the case. What is attempted through the use of POSAC is to identify the important features of a given content area which cause differentiation between items.

The more that lines partitioning regions deviate from being straight, or the more element items that are excluded from a region by the fitting of straight lines, the less "important" the element item in structuring evaluations. However, more minor roles may be

identified. These take the polarising roles which produce an "L" shape partitioning, and moderating roles causing an inverted "L" shape partitioning. With a polarising element, high values on this are associated with extreme values upon the lateral axis. The second type, the moderator, tends to have high scores upon its axis associated with mid value scores upon the lateral axis.

The above description assumes that high scores are located at the top left of the space diagramme. However, the psychological meaning of the scores may be reverse in a plot, so that "psychologically greater" is located bottom right. If this is the case, the roles of items in partitioning space will be reversed in respect to the shape of partitioning. In the present research the criteria to enable the descriptions of partitioning are fulfilled.

In the section which follows, the partially ordered structure of the total data set arising out of the administration of the seriousness of environmental hazards questionnaire is presented.

9.12 Partial Order Scalogram Analysis: Results.

Figures 9.6a to 9.6e show the plots for each of the 5 items (elements). The role played by each item in structuring the assessment of the seriousness of

environmental hazards, along qualitative dimensions, is shown by the partitioning lines in these diagrams. Each plot will now be considered in turn.

Element 1: Social/Human item plot (figure 9.6a).

Vertical partitioning can be seen in this plot. This form of partitioning shows the Human/Social effects of hazards to be one of the elements that define the first qualitative pole which differentiates between respondents. The straightness of the partitioning lines show this element to play an important role in the structuring of assessments.

Element 2. Ecological item plot (figure 9.6b).

This element is shown to partition space into vertical regions. The partitioning is in a similar direction as the Social/Human element. This being the case, the element plays a similar role to this element. It forms the second component of the first qualitative pole.

From the direction of the partitioning of the first 2 items, the first axis of qualitative differentiation between perceptions of the seriousness of environmental hazards is as follows:

High - social environmental hazard
High - ecological environmental hazard

TO

Low - social environmental hazard
Low - ecological environmental hazard

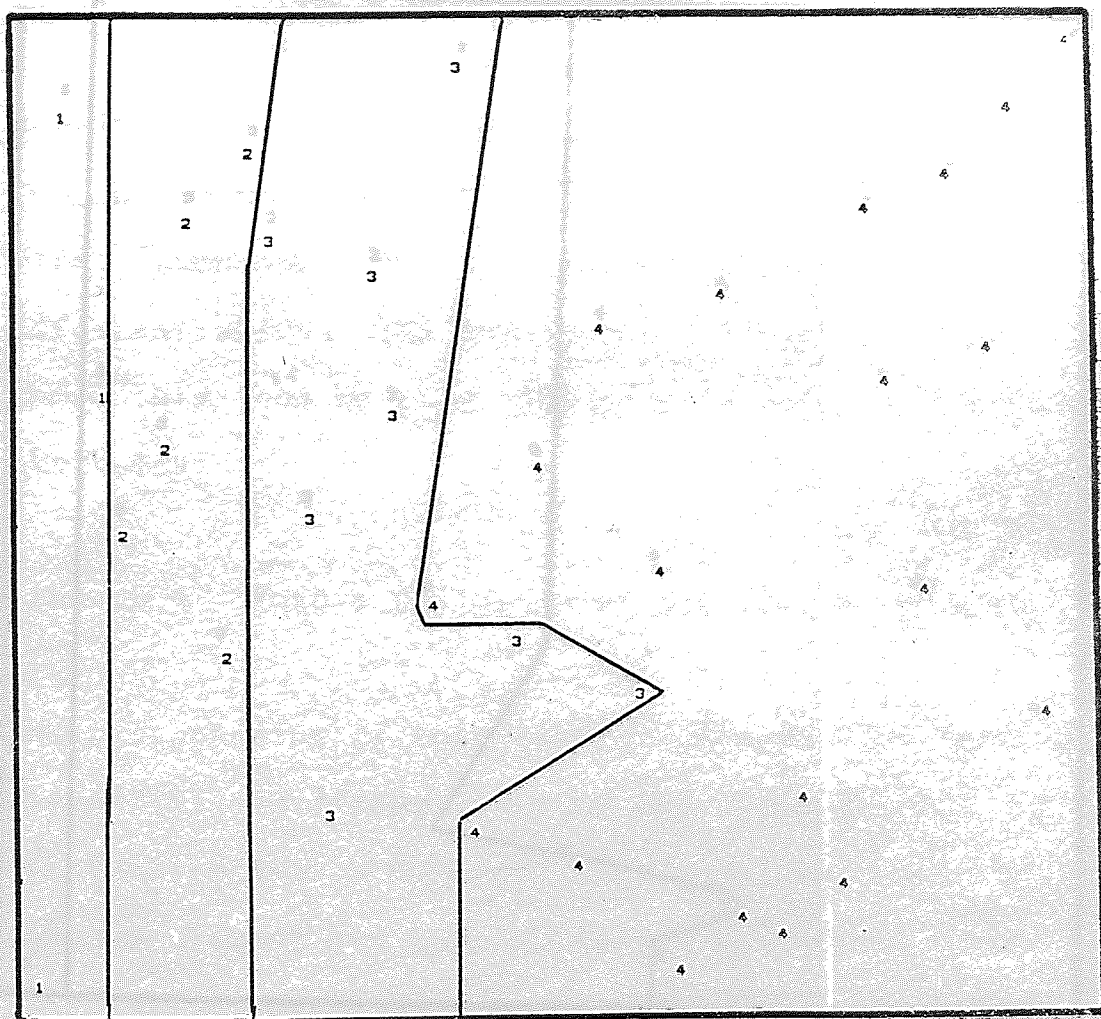
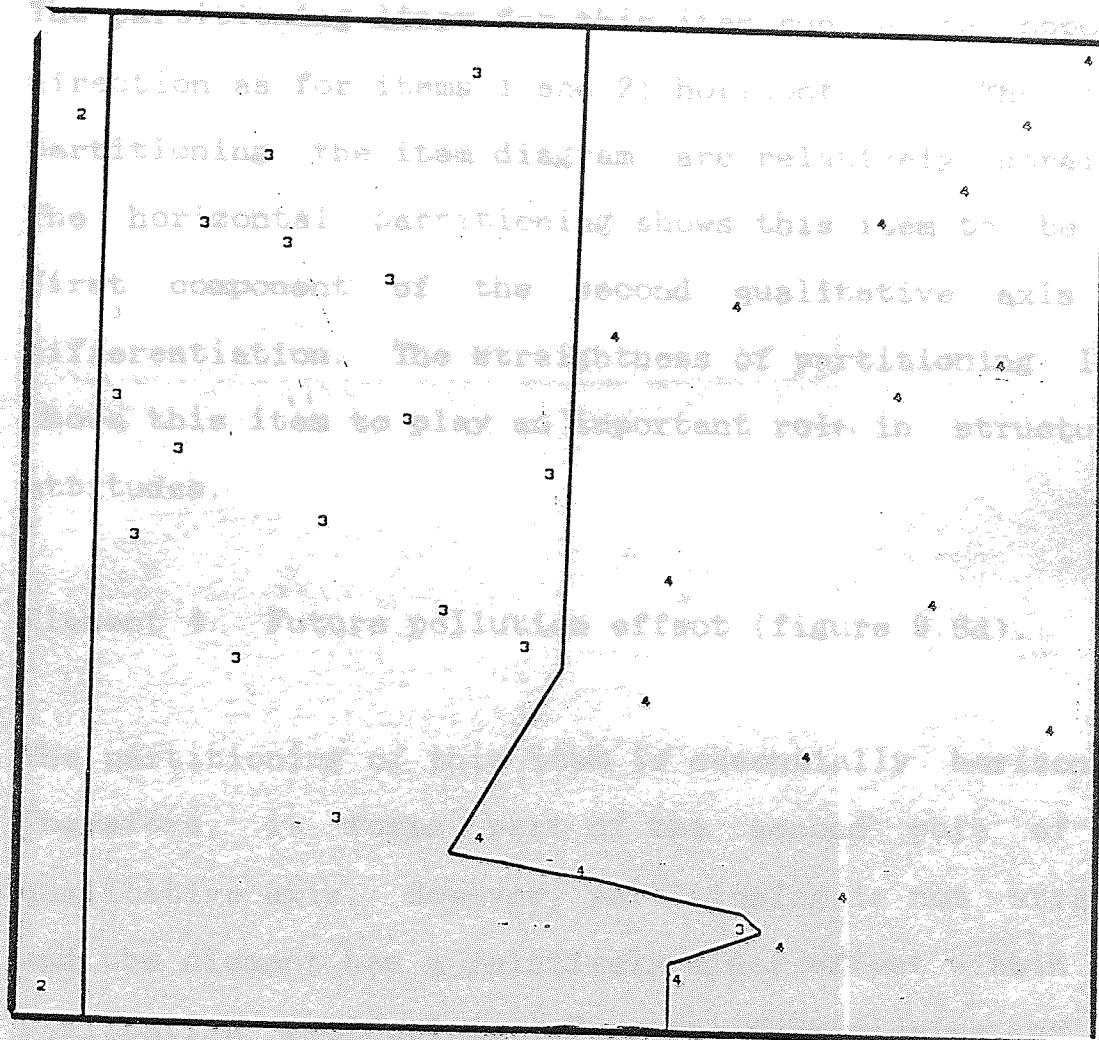


Figure 9.6a

Item Diagram of the Social Element of Evaluations of the Seriousness of Environmental hazards.



Item Diagram of the Ecological Element of Evaluations of the Seriousness of Environmental hazards.

If we now consider the remaining item diagrammes, the second qualitative axes of the partial ordering of responses may be identified.

Element 3. No present pollution effect (figure 9.6c).

The partitioning lines for this item run in the opposite direction as for items 1 and 2; horizontally. The lines partitioning the item diagram are relatively straight. The horizontal partitioning shows this item to be the first component of the second qualitative axis of differentiation. The straightness of partitioning lines shows this item to play an important role in structuring attitudes.

Element 4. Future pollution effect (figure 9.6d).

The partitioning of this item is essentially horizontal. Therefore, it forms part of the second pole of the qualitative axis. However, partitioning is not straight and the element has a relatively minor effect within the qualitative evaluations. From the partitioning of the above 2 item diagrammes, it is possible to state that the second qualitative axis of assessment is as follows:

High - no present environmental hazard
(high - future environmental hazard)

TO

Low - no present environmental hazard element
(low - future environmental hazard)

(The future environmental hazard element is enclosed in parentheses to indicate the relatively minor influence of this element in structuring assessments).

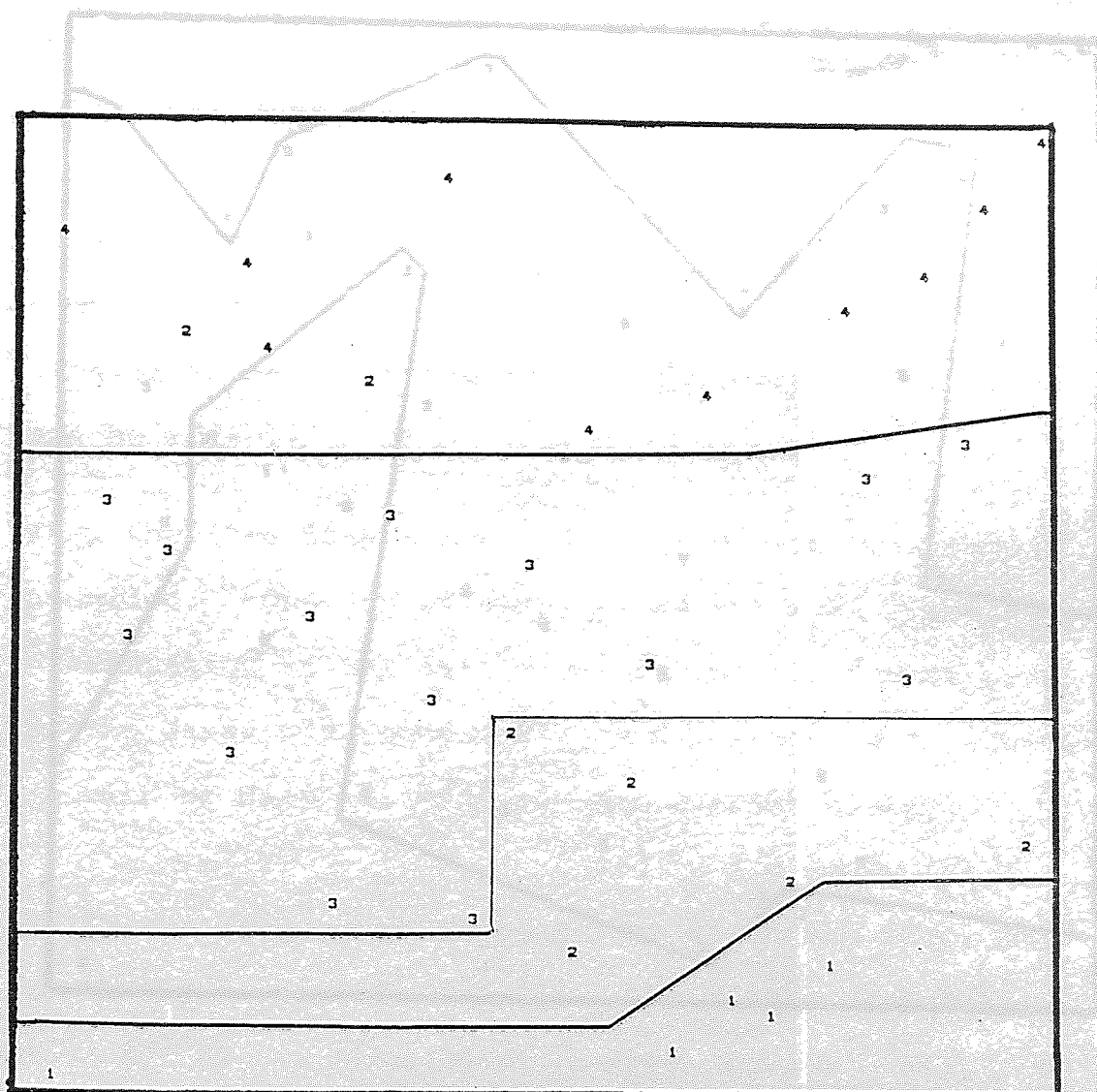


Figure 9.6c

Item Diagram of the No Present Hazard Element of Evaluations of the Seriousness of Environmental Hazards.

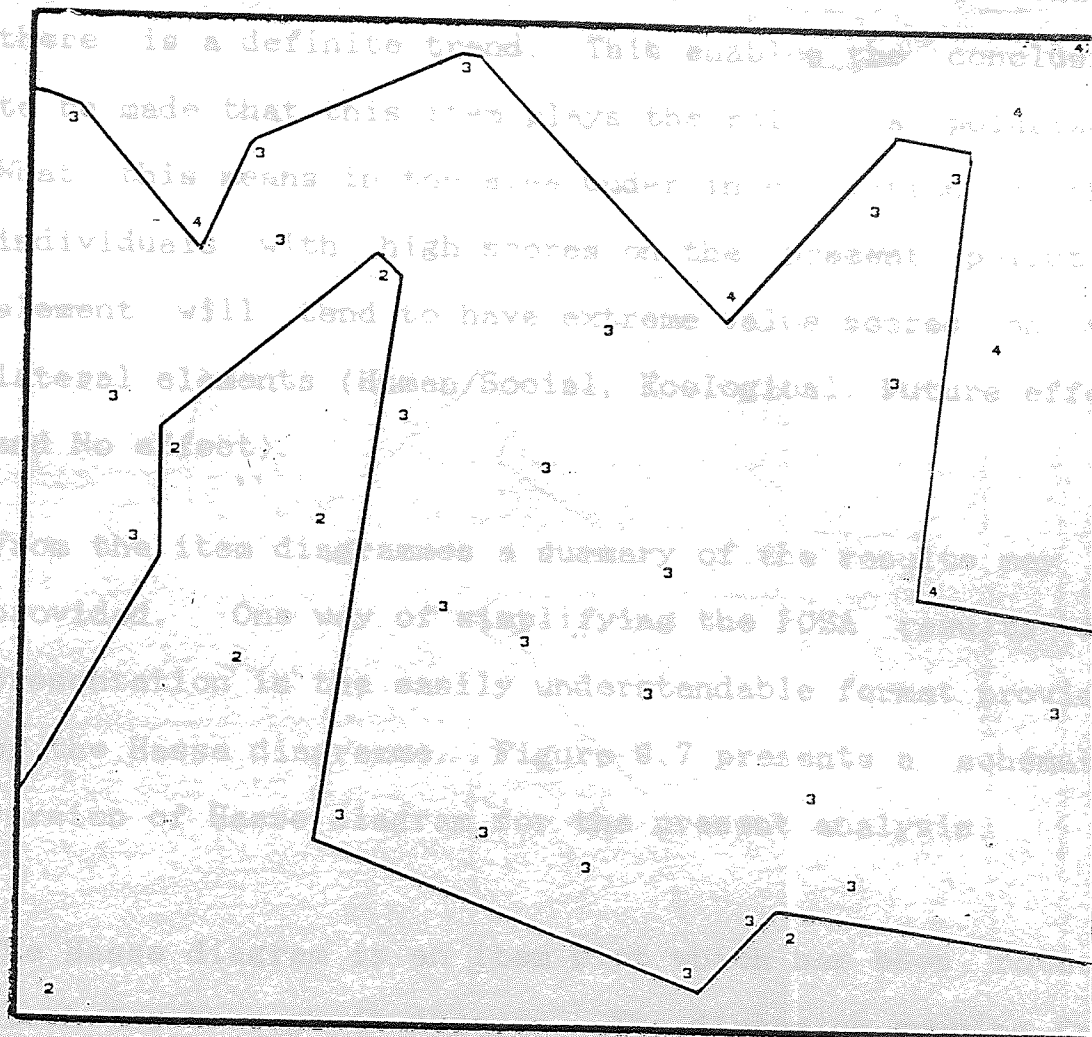


Figure 9.6d

Item Diagram of the Future Hazard Element of Evaluations of the Seriousness of Environmental Hazards.

Element 5. Present pollution effect (figure 9.6e).

This item formed an inverted "L" shape in partitioning the item diagramme. Even though the shape of partitioning is far from forming a perfect "L" shape, there is a definite trend. This enables the conclusion to be made that this item plays the role of a polariser. What this means in the area under investigation is that individuals with high scores on the present pollution element will tend to have extreme value scores on the lateral elements (Human/Social, Ecological, Future effect and No effect).

From the item diagrammes a summary of the results may be provided. One way of simplifying the POSA results for presentation is the easily understandable format provided by the Hasse diagramme. Figure 9.7 presents a schematic version of Hasse diagram for the present analysis.

The Hasse diagram is an item plot which has been rotated clockwise through 45 degrees. The dimension running from A1 to A2 is the quantitative (joint) axis which represents overall assessments of the seriousness of environmental hazards. The qualitative (lateral) axis runs from B1 to B2 and is composed of Social, Ecological, No present effect and future effect elements.

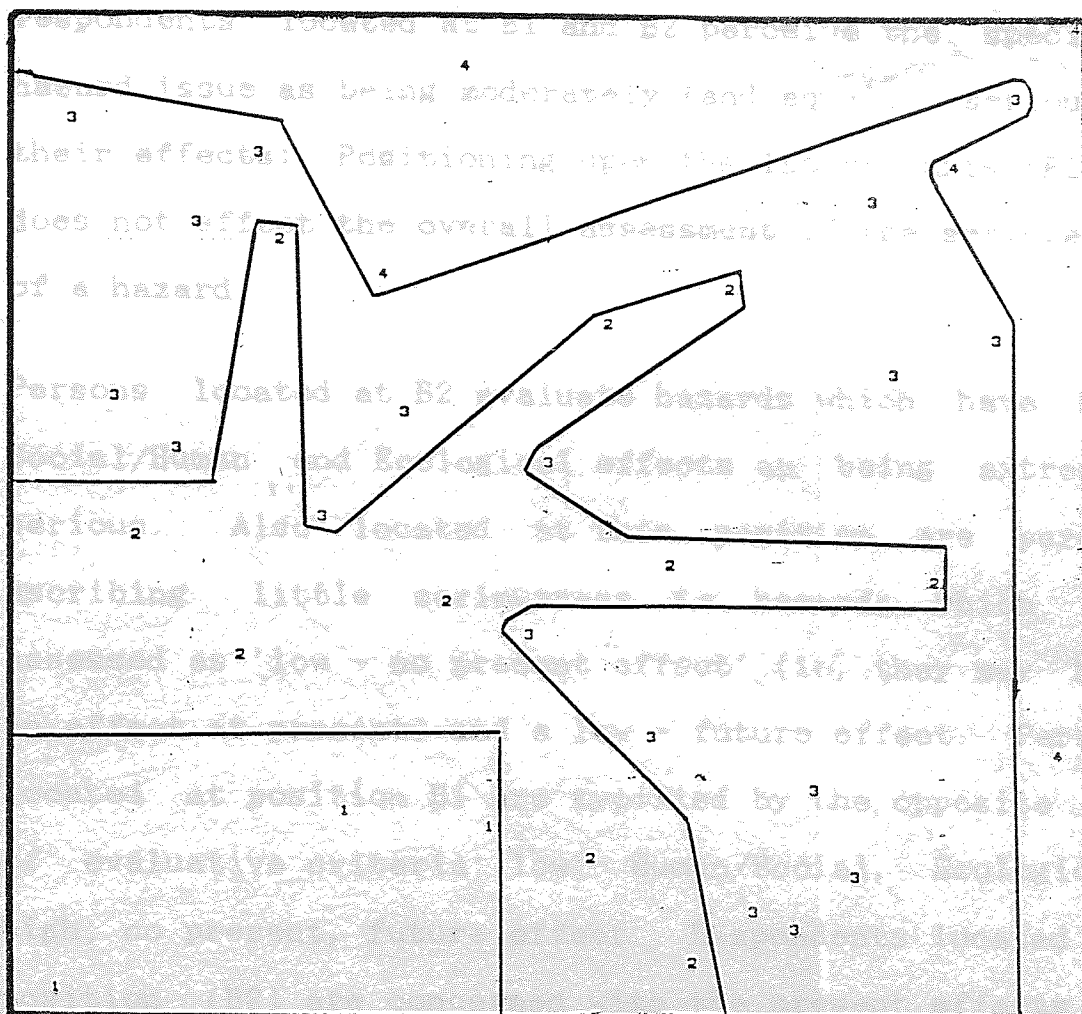


Fig 9.6e

Item Diagram of the Present Hazard Element of Evaluations of the Seriousness of Environmental Hazards.

The joint axis (A1-A2) is quantitative in its nature. Respondents located at A1 perceive all specified environmental hazards as being more serious problems overall than respondents located toward A2. Those respondents located at B1 and B2 perceive the specified hazard issue as being moderately (and equally) serious in their effects: Positioning upon the lateral axis (B1-B2) does not effect the overall assessment of the seriousness of a hazard.

Persons located at B2 evaluate hazards which have high Social/Human and Ecological effects as being extremely serious. Also located at this position are persons ascribing little seriousness to hazards which are assessed as 'low - no present effect' (ie, they may have an effect at present) and a low - future effect. Persons located at position B1 are typified by the opposite set of evaluative criteria: low; Human/Social, Ecological, high; no present, future effect. Respondents located at position (B2) are concerned with the present effects of environmental hazards upon both the human and ecological aspects of the environment. However, they are less concerned with the future effects of hazards.

To summarise, the target of the environmental hazard effect and the time scale over which the hazard will have its effect discriminate between ratings of the perceived seriousness of environmental hazards, these form the important qualitative differences in evaluations. Furthermore, the POSA provides further support for the facets (and their elements) discovered in SSA.

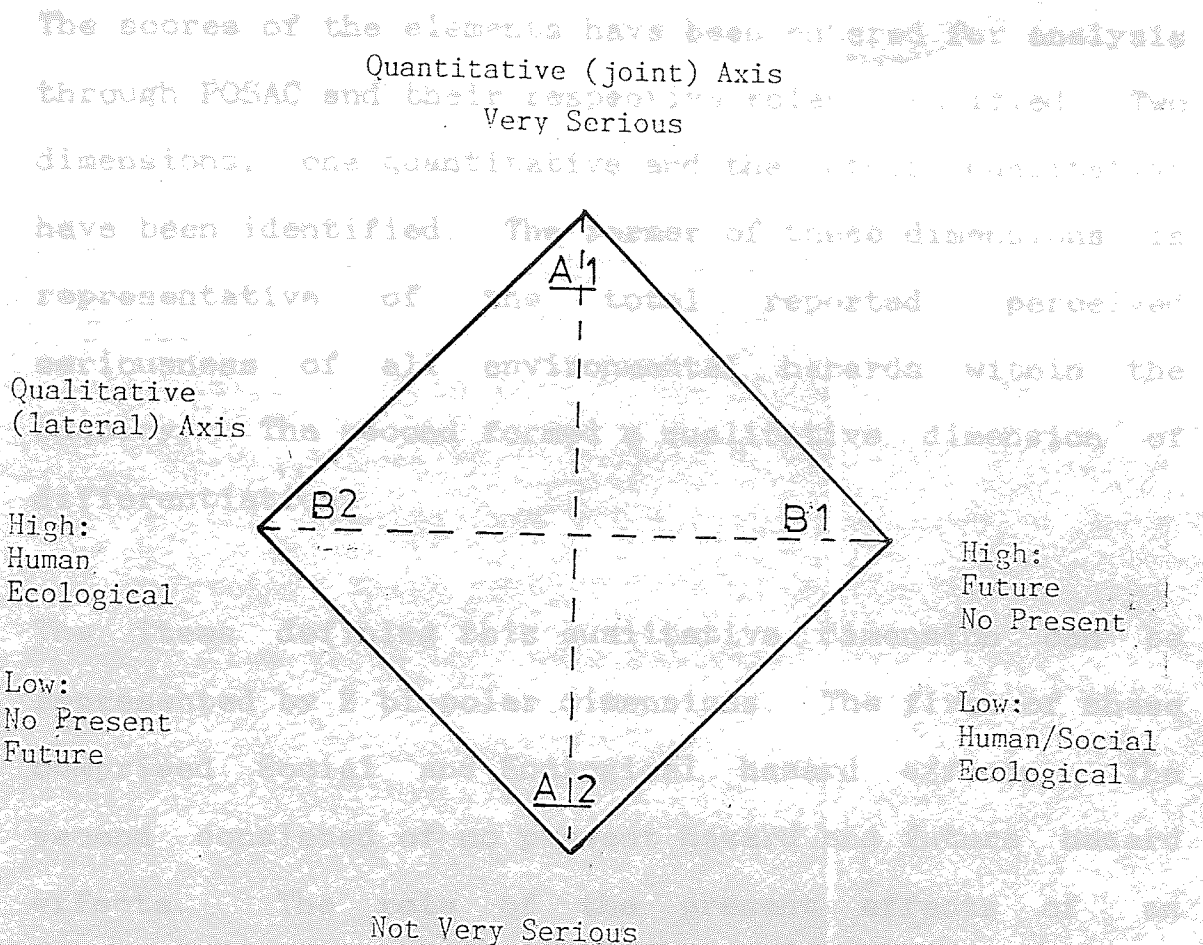


Figure 9.7

Schematic Representation of the Essential Aspects of the POSA of the Seriousness of Environmental Hazards.

9.13 Summary.

In this chapter section, the partially ordered structure of respondents profile scores have been viewed. The raw scores of responses to all questions have been used to

provide mean scores for the 3 facet elements of; Social/Human, Ecological, No present pollution effect, Future pollution effect and Present pollution effect.

The scores of the elements have been entered for analysis through POSAC and their respective roles identified. Two dimensions, one quantitative and the other qualitative have been identified. The former of these dimensions is representative of the total reported perceived seriousness of all environmental hazards within the enquiry. The second formed a qualitative dimension of differentiation.

The items defining this qualitative dimension can be represented by 2 bi-polar dimensions. The first of these comprised Social and Ecological hazard effects. The second consisted of no present hazard and future hazard effects. The role of the present effects of an environmental hazard is to moderate the roles of the above 2 qualitative lateral dimensions. That is, high scores on the present effects of hazards will be associated with the middle value scores on other elements.

In the chapter which follows, the results are presented of a study of general environmental concern.

Chapter 10.

Results 4: A facet study of Environmental Concern.

10.1 Introduction.

In this chapter the results from a questionnaire study investigating a wide range of environmental issues and actions will be presented. The design of the questionnaire used in this study, along with details of the sample, are given in chapter 8. In the preceding chapter the results from 2 questionnaire studies have been presented. These results have supported the mapping sentence from which they were generated.

Similarity structure analysis (SSA) was again used to analyse the data from this questionnaire. This was designed to investigate the social value of environmental concern. The questionnaire was made-up of 100 questions. This included 4 sub-sections of 25 questions per section. Each of the sections addressed a different response, by subjects, to the environmental conservation actions and issues specified as social values in the mapping sentence in figure 8.1. Therefore a sub-section of questions was assembled which assessed the perceived importance and effectiveness of the actions, and the reported level of monetary and time contribution each respondent was willing to pledge to each of the environmental conservation activities.

Analysis will firstly be presented for the questionnaire as a whole. Subsequently, each section of 25 questions will be analysed independently.

10.2 Similarity Structure Analysis of the Environmental Concern Questionnaire.

10.2.1 Similarity Coefficients.

The first stage in the similarity structure analysis of a data set is the calculation of similarity coefficients between each pairing of all variables in the set. This is done for 2 reasons. Firstly, it provides the coefficients which will later be used to locate points in plots of smallest space. Secondly, it enables the investigation of the directionality of the correlation between each of the variables under investigation. Inspection of the correlation matrix which was produced in this manner for the data arising out of the 100 questions of the entire questionnaire reveals interesting relationships in the data (the correlation matrix can be found in table appendix A.11).

This correlation matrix shows there to be a significant number of negative relationships. Some of these negative correlations are of quite large magnitudes with several exceeding -0.20 . The presence of a substantial number of negative correlations within a matrix is indicative of the fact that more than 1 semantic area is falling within the research area. This is supported through closer inspection of the matrix. All except 1 of the pairings of

the importance variables (variables 1 - 25) are positive. The single negative association being almost zero (-0.02). The same positive relationships are present between correlations for each of the modes of expression of concern (mode 2 facet, figure 8.1) when each of these modes is analysed separately (the correlation matrix for each of these ranges of responses may be identified in appendix A.11). Therefore, it would appear that each of these modalities comprise a single area of meaning to respondents. However, when effectiveness variables are entered into the matrix, the relationships are frequently negative and often greater than -0.15 . A similar though less consistent relationship is found when the variables of time and monetary pledges are correlated with the other 2 modalities. However, for all 4 response modes, (importance, effectiveness, time pledge and monetary pledge) the internal relationships are relatively monotonic. The negative correlations which do occur are usually of relatively small magnitude.

However, the presence of the negative correlations in the matrix for all 100 variables should be noted. Variables which are consistently negatively related to other variables will tend to be located towards the edges of SSA plots. The negativeness of their relationship will moreover tend to destroy or obscure any other relationships present in a data set. This is found in the case of variables 26 - 50 (effectiveness variables). These variables are found consistently to the periphery

of the plot in figure 10.1. Furthermore, variable 35, for example, which is negatively related to a large number of other variables, is placed on the edge of the plot. With this caveat in regard to the large number of negative relationships noted, and with little expectation of finding support for the mapping sentence, it is possible to continue with the interpretation of the SSA plots.

10.2.2 Similarity Structure Analysis Plots.

Analysis to reveal similarity structure present in the data set was performed. This produced a single facet of evaluation, at an acceptable level of stress (Guttman - Lingoes coefficient of alienation = 0.14). This facet is discussed below.

10.2.3 Mode of Expression Facet.

Figure 10.1 shows partitioning for the mode facet as stated in the mapping sentence (figure 8.1). Space in the plot was divided into 2 regions. These reflected cognitive and behavioural elements of the mode of expression facet. The cognitive element of the facet further divided into 2 separate areas. These regions were of importance and effectiveness; reflecting the wording of the questionnaire. However, the behaviour element did not divide to show the 2 types of behaviour (time and money) specified in the questionnaire. Consequently, the elements of this facet were:

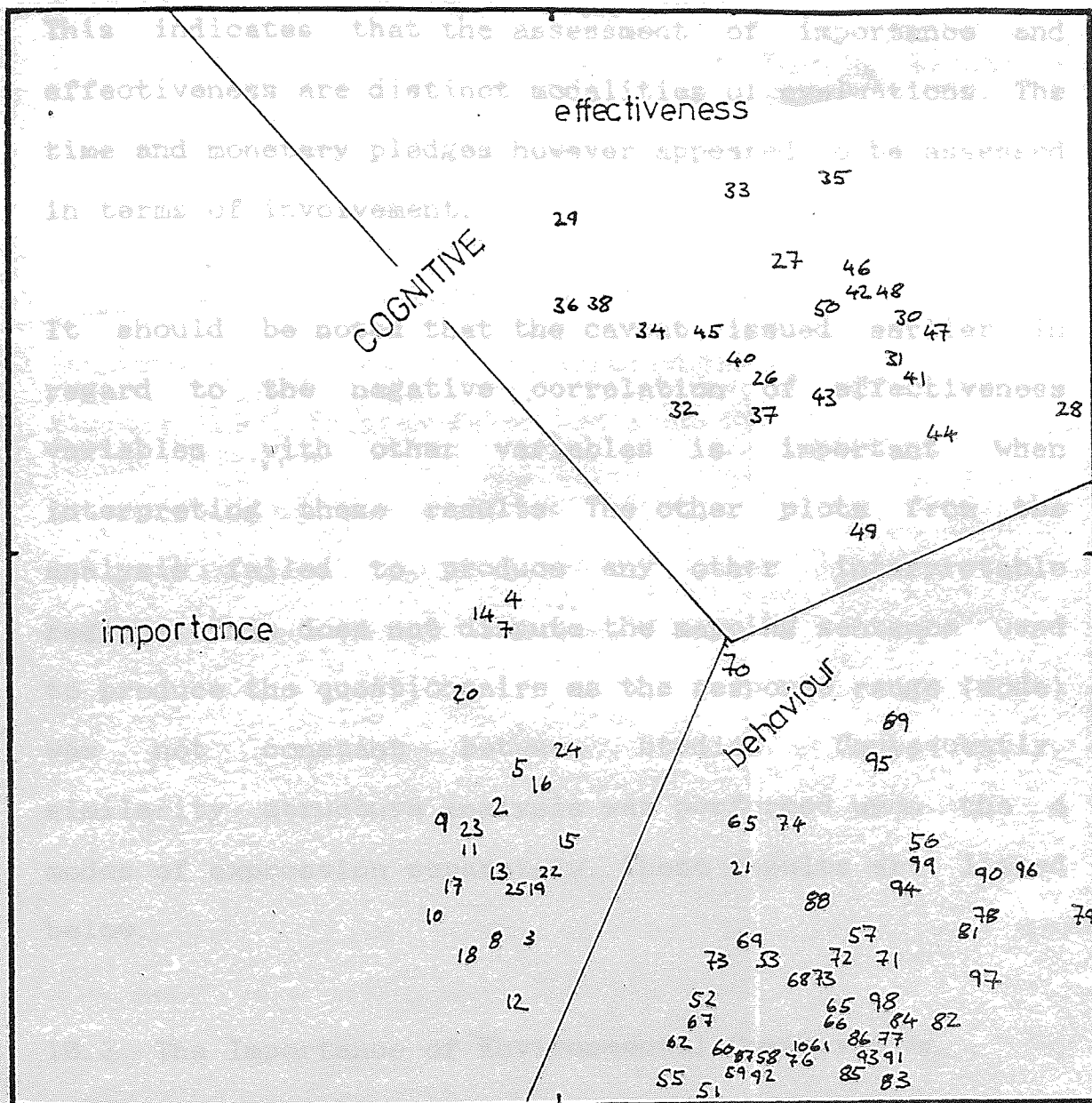


Figure 10.1

Projection of the SSA of overall environmental concern questionnaire showing partitioning of the mode of expression facet.

- 1/ cognitive (1a importance)
(1b effectiveness)
- 2/ behavioural

This indicates that the assessment of importance and effectiveness are distinct modalities of evaluations. The time and monetary pledges however appeared to be assessed in terms of involvement.

It should be noted that the caveat issued earlier in regard to the negative correlation of effectiveness variables with other variables is important when interpreting these results: The other plots from the analysis failed to produce any other interpretable regions. This does not dispute the mapping sentence used to produce the questionnaire as the response range (mode) was not constant between studies. Consequently, similarity structure analysis was performed upon the 4 modes of expression separately. These results are listed below.

10.3 The Importance of Environmental Conservation.

This analysis produced 3 facets with a coefficient of alienation of 0.17. The facets are now described.

10.3.1 Life Area Facet.

In figure 10.2 is shown the plot of the facet of life area. This facet was proposed in the mapping sentence

(figure 8.1). However, the facet structure discovered modified the format of this facet. It was hypothesised that the facet would take a qualitative (polar) form; this was in fact the case. The proposed structure was of 3 elements: Social conservation (which has a primarily human effect or benefit) educational conservation, and ecological conservation (primarily to benefit / effect animals or the environment). In figure 10.2 it can be seen that the elements of this facet were not as proposed. In terms of the importance of environmental concern the life area facet had elements of;

- 1/ area/habitat conservation
- 2/ species/animal conservation
- 3/ moral issues in conservation.

The circular arrangement of elements originating from a central point differentiated between environmental concern issues which addressed the different life areas. Furthermore, those items at the boundaries of the elements were described by both their own and their neighbouring element category. A second facet, of personal relevance, was also present in this plot.

10.3.2 Facet of Personal Relevance.

In figure 10.2 can be seen the second facet of this analysis. This was present in the same plot as the life area facet. The facet embodied evaluations related to the personal relevance of a conservation issue or action. The

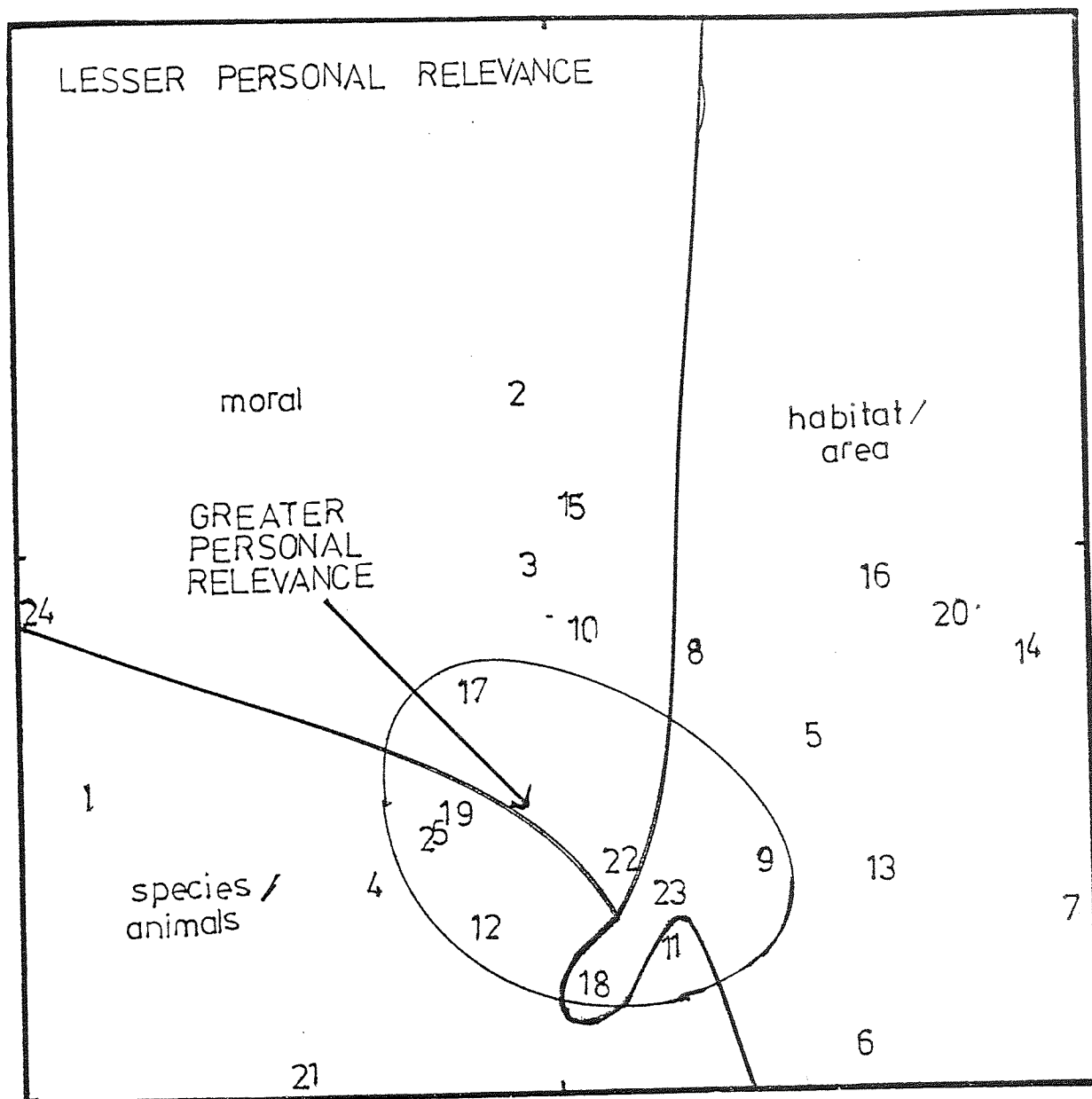


Figure 10.2

Projection of the SSA of the importance of environmental concern questionnaire (items 1-25 app.11) showing partitioning of the life area facet and personal relevance facet.

facet had a quantitative format and modified the qualitative assessments of the life area facet. The elements of this facet were:

4/ natural conservation.

1/ greater personal relevance.

2/ lesser personal relevance.

The relative positions of these facet elements show them to play a qualitative role in the assessment of Actions of greater personal relevance were located more centrally in the plot.

Origin. This is so for all elements except the natural

conservation element. This was located in the same sector

The elements of this facet interact with the elements of the local conservation element. However, the element

the life area facet. Thus, environmental concern

activities, be they related to species/ animals,

area/habitat or morals, if they were of greater personal

relevance to the assessor were located more centrally in

the plot. It is worth noting that a central position

often refers to the juncture of the elements of the facet

rather than the geometric centre of the plot.

The third facet of this analysis was a second polar facet.

10.3.3 Scale of Action Facet.

The third facet present in SSA was a scale of action facet. This is shown in figure 10.3. The format and structure of this facet was that proposed in the original mapping sentence (figure 8.1). The elements of the facet were:

- 1/ global
- 2/ international
- 3/ ethical
- 4/ national and local

The relative positions of these facet elements show them to play a qualitative role in the structuring of attitudes with elements forming sectors around a common origin. This is so for all elements except the national conservation element. This was located in the same sector as the local conservation element. However, the element was separately identifiable as

it occupied a more central area of the region. The explanation for this lies in the fact that the facet of personal relevance (section 10.3.2) is also present in this projection. Therefore this second facet modifies the scale facet. The reason for the positioning of the national concern element is therefore explained by the amount of personal relevance attached to this in comparison with concern at a local scale. It is therefore the case that national concerns were more central and therefore more personally relevant / important.

Together these 3 facets structure respondents' assessments of the importance of the selected environmental concern actions and issues. In the next section the perceived effectiveness of environmental conservation in these areas of concern will be evaluated.

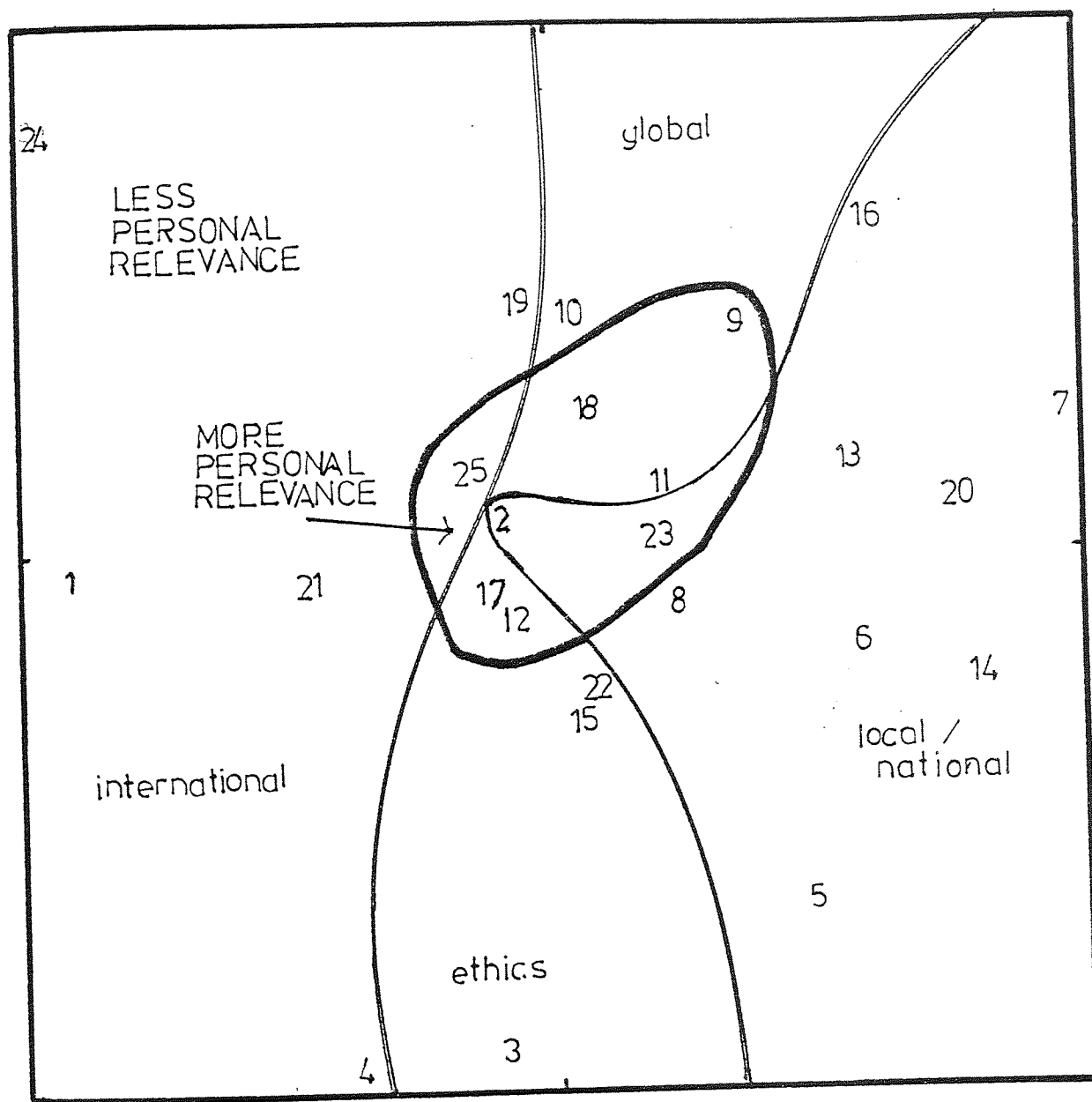


Figure 10.3

Projection of the SSA of the importance of environmental concern questionnaire showing partitioning of the scale of action facet and personal relevance facet and the personal relevance facet.

10.4 The Effectiveness of Environmental Conservation.

SSA produced a solution with 3 facets (Guttman-Lingoes coefficient of alienation = 0.16).

The elements of the 2 facets are distributed allowing different processes to be attributed to each of the 2 facets. The third facet in effectiveness was a second polar facet.

10.4.1 Life Area Facet.

This facet (figure 10.4) took an identical format to the life area facet identified in the analysis of the sub-section of importance questions. The facet had 3 elements:

- 1/ animal/species
- 2/ area/habitat
- 3/ moral

The elements were circularly arranged showing the facet to qualitatively structure assessments of the effectiveness of environmental conservation. A second facet was found to be present in the same plot. This facet reflected environmental relevance.

10.4.2 Environmental Relevance Facet.

This facet was present in the same plot as the facet of life area (figure 10.4). It therefore modifies the judgements implicit in the former facet. There were 2 elements in this facet. These were:

- 1/ greater environmental relevance.
- 2/ lesser environmental relevance.

The facet structured assessments in a similar way to the relevance facet in evaluations of the importance of environmental concern. However, the items which comprised the elements of the 2 facets are different, allowing different processes to be attributed to each of the 2 facets. The third facet in effectiveness assessments was a second polar facet.

LESSER
PERSONAL
RELEVANCE

10.4.3 Facet of Scale.

A facet of physical scale was present in this analysis (figure 10.5). The facet was circularly arranged suggesting a qualitative distinction to be present in respondents judgements. This facet had elements of:

- 1/ international
- 2/ national
- 3/ local
- 4/ ethical
- 5/ global

Reported in the next section are the results from the analysis of time pledges.

10.5 Time Pledged to Environmental Conservation.

The data which originated from this section of the questionnaire was analysed to reveal similarity structure. This produced 3 facets with a coefficient of alienation of 0.13. These facets are described below.

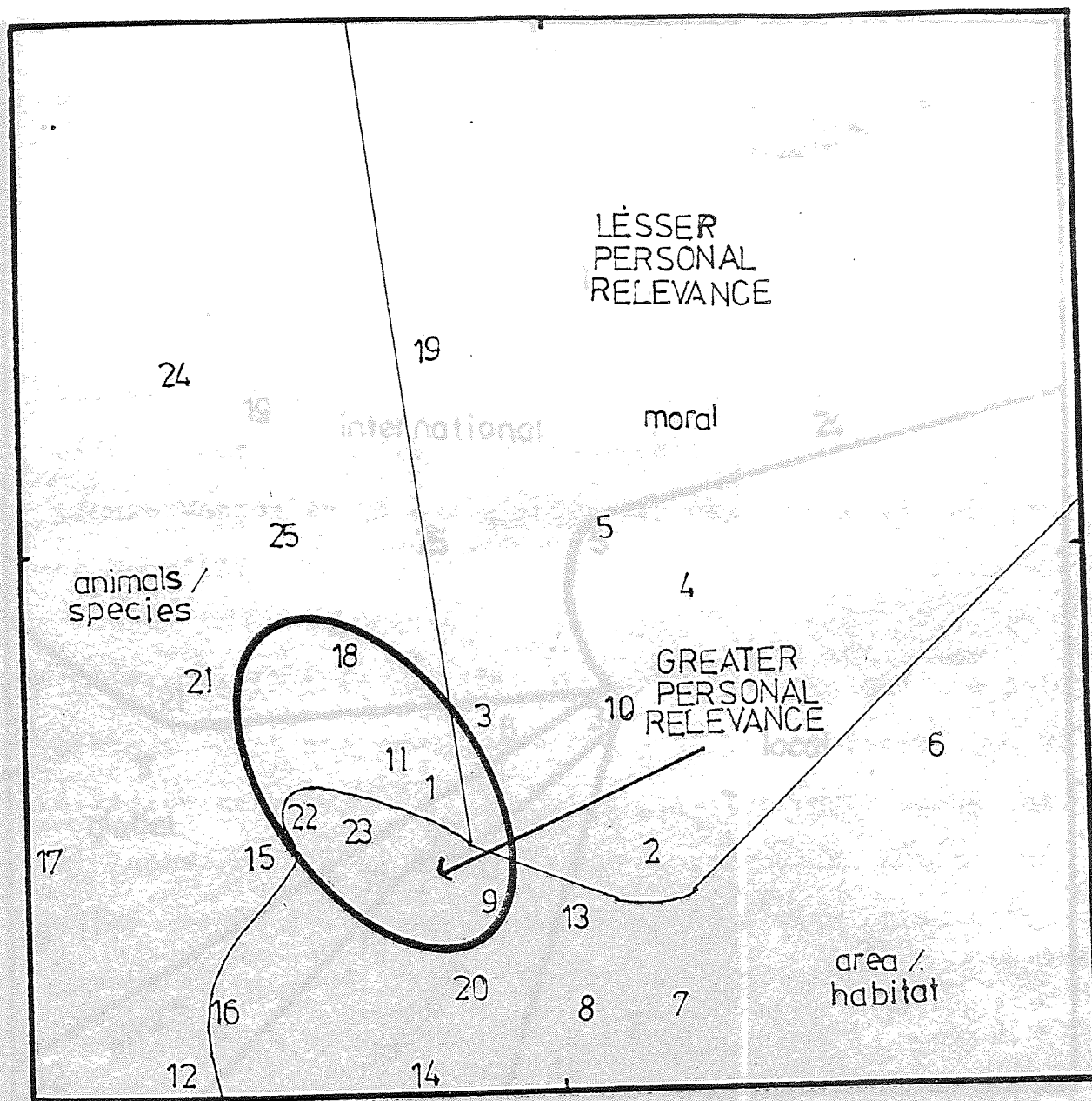


Figure 10.4

Projection of the SSA of the effectiveness of environmental concern questionnaire (items 26-50 app.11) showing partitioning of the life area facet and the environmental relevance facet.

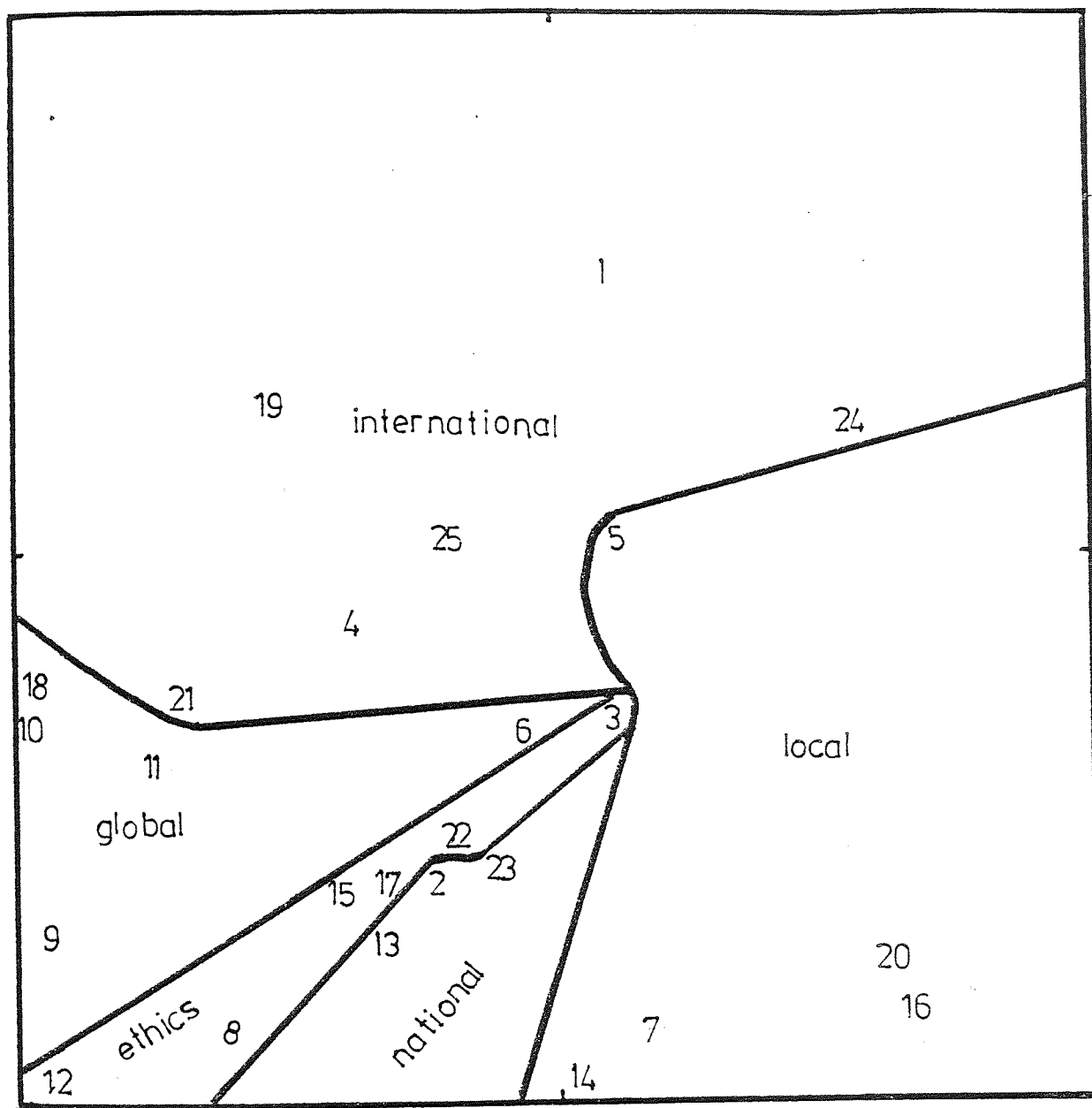


Figure 10.5

Projection of the SSA of the effectiveness of environmental concern questionnaire showing partitioning of the scale facet.

10.5.1 Action Type Facet.

In figure 10.6 is the plot of the action type facet. This facet was not proposed in the research design (mapping sentence, figure 8.1). A life area facet was expected which was similar to the facet present for evaluations of importance. It was hypothesised that a qualitatively arranged facet would be present; this was the case. The structure hypothesised was of 3 elements with these being, social (conservation which had a primarily human effect or benefit) educational, and ecological (conservation which has a primarily environmental effect or benefit).

In figure 10.6 it can be seen that these regions are not present. What was revealed was a qualitative facet with a circular arrangement of its elements. The positioning of elements reflected the type of conservation action to which respondents were being asked to pledge time. The elements of the facet partitioned the plot into the environmental conservation types of:

- 1/ saving and protecting species and the environment.
- 2/ regulating and controlling environmental hazards.
- 3/ promotion of actions supportive of, or which advanced, the aims of conservation.

In the same plot was found a second facet of respondents evaluations, an involvement / benefit facet.

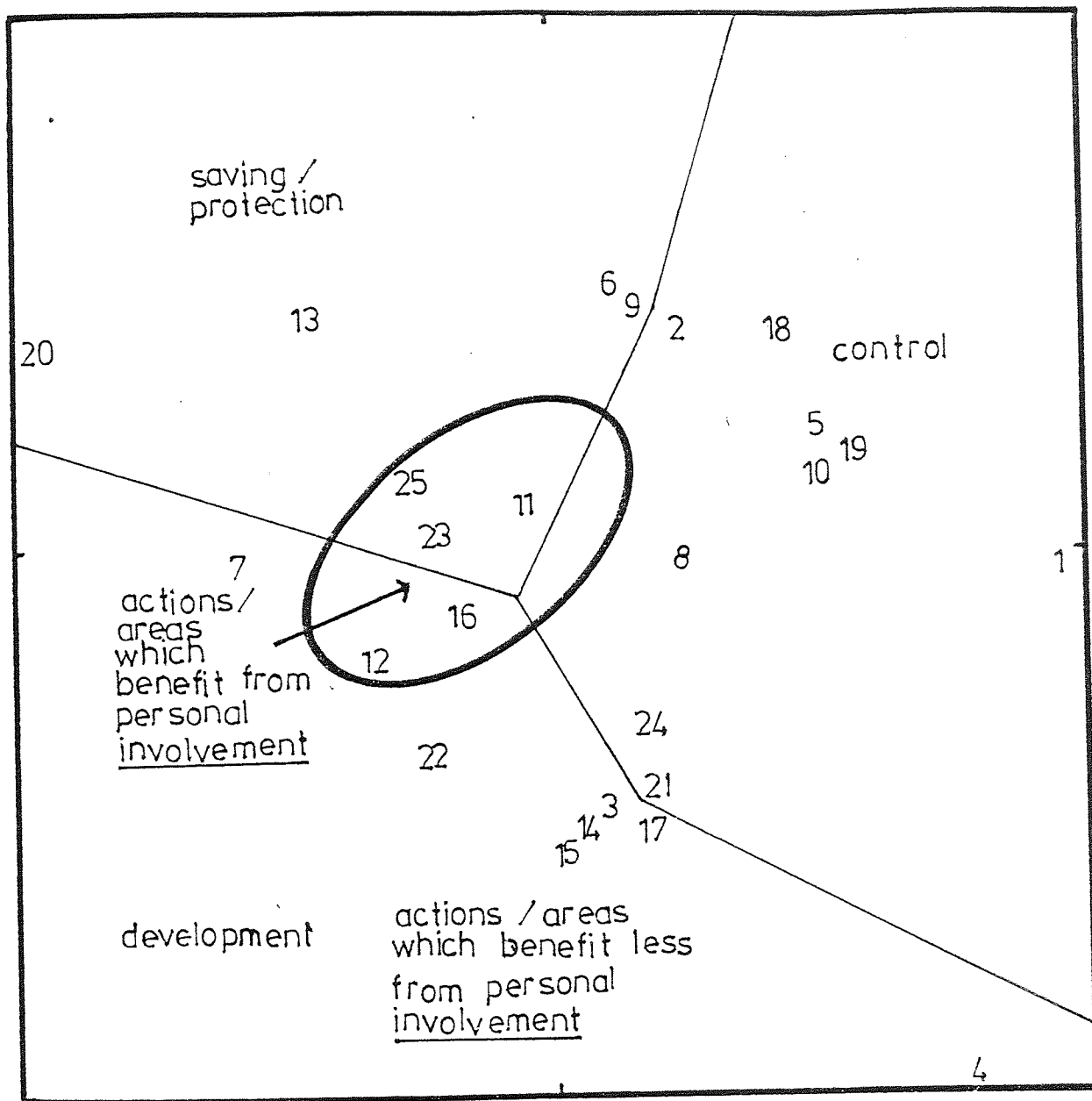


Figure 10.6

Projection of the SSA of the time pledged to environmental concern questionnaire (items 51-75 app.11) showing partitioning of the action type facet and the involvement / benefit facet.

10.5.2 Involvement / Benefit Facet.

The second facet for which partitioning occurred was for a facet which modified the action type facet. This facet was therefore located in the same plot as the action type facet (figure 10.6). Judgements involved in this facet were complex and initially difficult to label. The items which fell within the central region (element) of the facet were all actions which would benefit most from the 'personal', direct involvement of respondents. The items which fell within the peripheral region (element) were conservation actions which would benefit less from such involvement.

As with the facet of action type, this facet was specified in the initial mapping sentence (figure 8.1) but with an extremely different element structure. This difference in structure is of little surprise as the structure of the action type facet, upon which this facet has a modifying effect, was also not in the structure specified a-priori. The elements of the involvement / benefit facet were:

- 1/ more benefit from personal involvement.
- 2/ less benefit from personal involvement.

10.5.3 Action Purpose Facet.

The third facet which emerged through SSA is shown in figure 10.7. This was the action purpose facet as

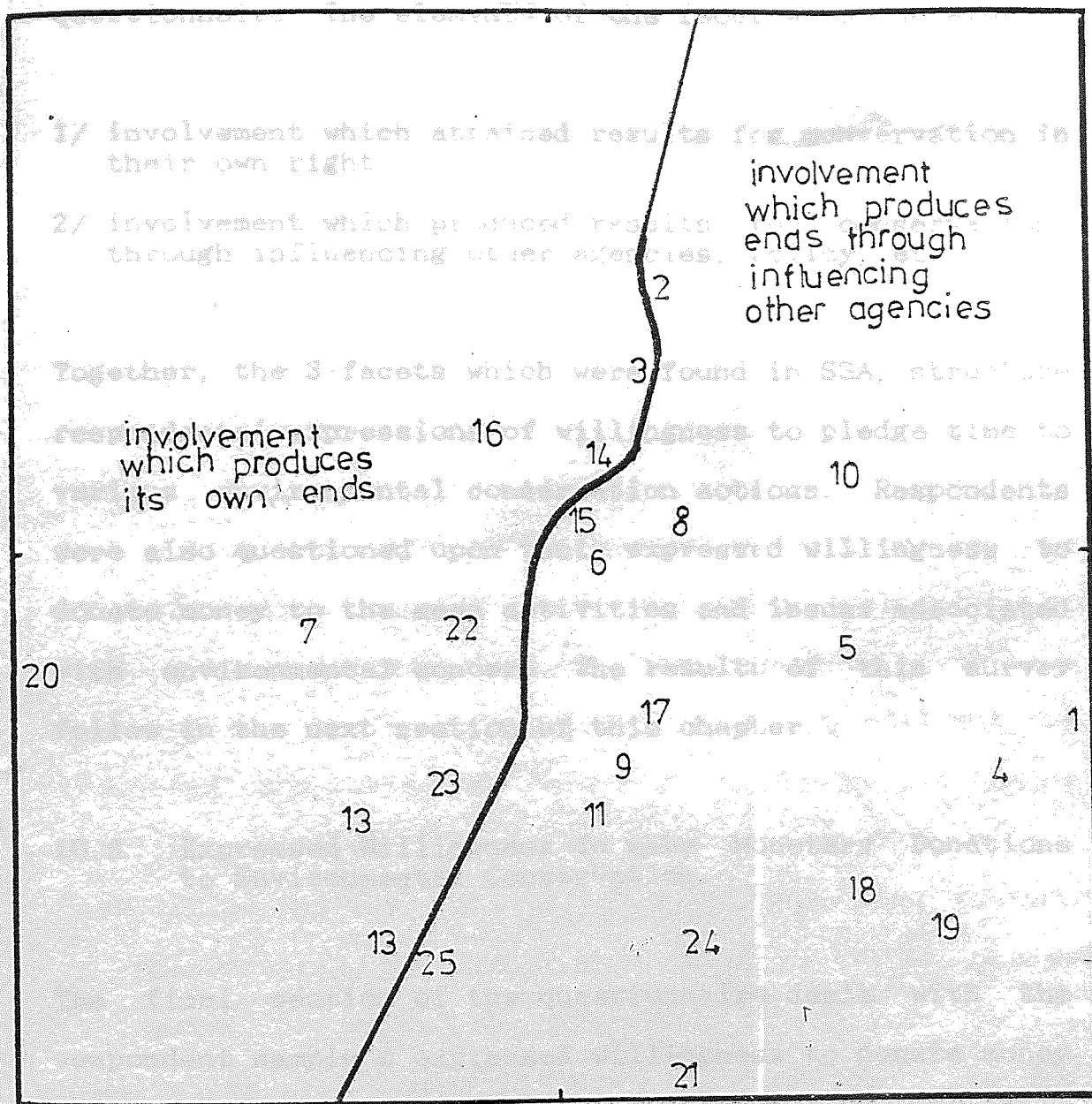


Figure 10.7

Projection of the SSA of the time pledged to environmental concern questionnaire showing partitioning of the action purpose facet.

specified in the mapping sentence in figure 8.1. In the analysis of the present questionnaire the facet was found to have its precise nature modified by the context of the questionnaire. The elements of the facet were therefore:

- 1/ involvement which attained results for conservation in their own right.
- 2/ involvement which produced results for conservation through influencing other agencies, policy, etc.

Together, the 3 facets which were found in SSA, structure respondents' expressions of willingness to pledge time to various environmental conservation actions. Respondents were also questioned upon their expressed willingness to donate money to the same activities and issues associated with environmental concern. The results of this survey follow in the next section of this chapter.

10.6 Expressed Willingness to make Monetary Donations to Environmental Conservation.

The final section of the questionnaire dealt with the respondent sample's expressed willingness to donate money to environmental conservation. The inter-correlations between variables were mainly positive, showing this to be a relatively homogeneous area of the expression of environmental concern. The conservation areas which were addressed by the questionnaire were the same as for the previous 3 sections of this study. The questionnaire data was again subjected to SSA. This produced a solution with 3 facets at an acceptable level of stress (Guttman-

Lingoes coefficient of alienation = 0.14). Details of this analysis now follow.

10.6.1 Action Type Facet.

This facet (figure 10.8) reflected the broad type of action involved. The elements of this facet were:

- 1/ development actions.
- 2/ controlling actions.
- 3/ regulatory actions.

The action type facet which emerged was similar, in the elements which composed it, to the action type facet of time pledged (section 10.5.3). These elements have been described in the preceding chapter and they will not be commented upon further in this section. However, a major difference existed between the structure of this action type facet and the one reported in the previous section of this chapter. The action type facet for time pledge was polar, and showed the judgements it contained to be qualitative. The present facet, which emerged from the SSA of the expressed willingness to donate money, was quantitatively differentiated. Elements of the facet formed 3 parallel regions in the plot. Elements were ordered:

- 1/ halting actions.
- 2/ control actions.
- 3/ development actions.

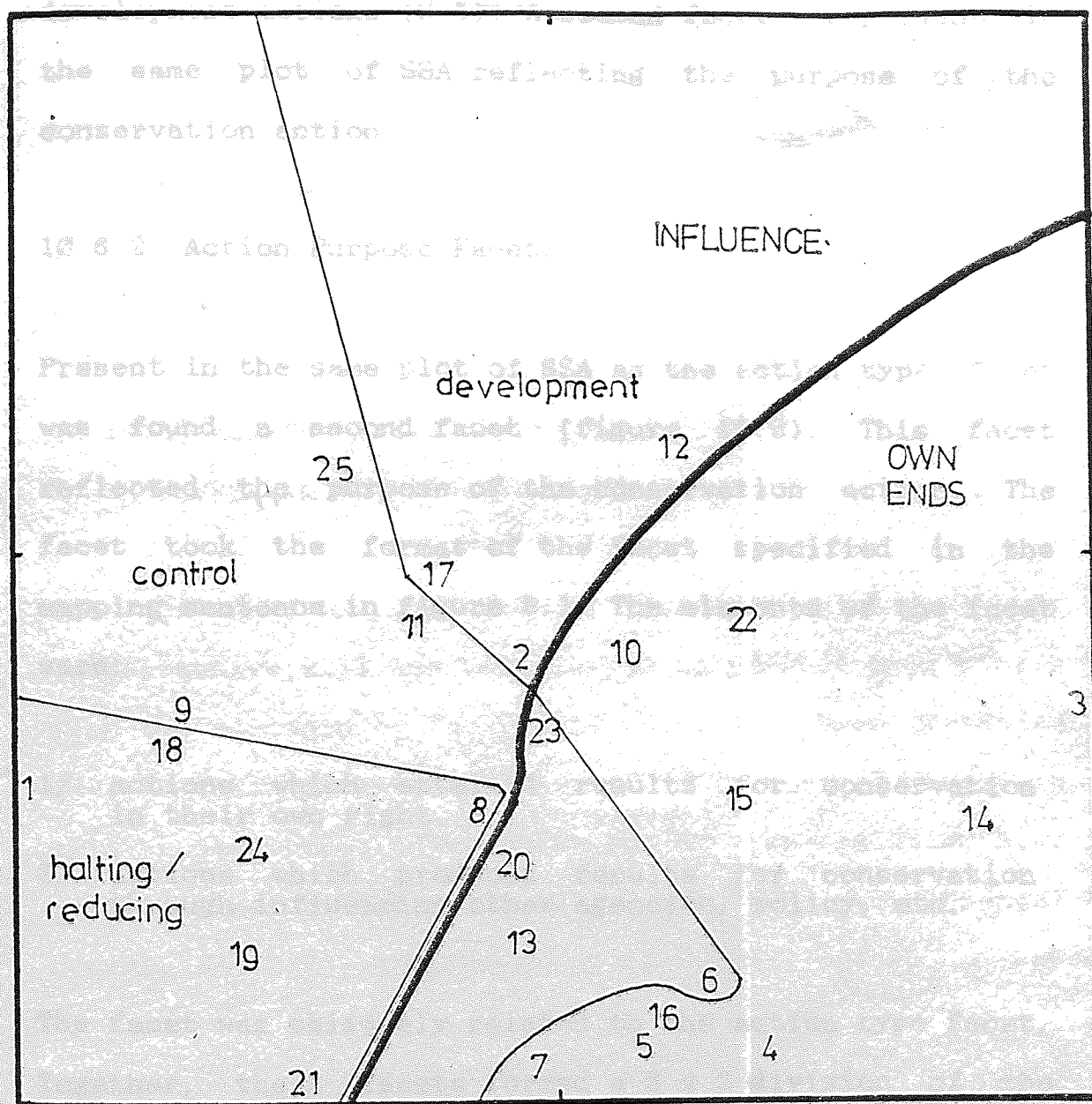


Figure 10.8

Partitioning of the SSA of the money pledged to environmental concern questionnaire (items 76-100 app.11) showing partitioning of the action type facet and the

The mean scores for these elements show that respondents were most willing to donate money to (in descending order) halting actions(1.2), controlling actions (0.8), development actions (0.5). A second facet was present in the same plot of SSA reflecting the purpose of the conservation action.

10.6.2 Action Purpose Facet.

Present in the same plot of SSA as the action type facet was found a second facet (figure 10.8). This facet reflected the purpose of the conservation action. The facet took the format of the facet specified in the mapping sentence in figure 8.1. The elements of the facet were:

- 1/ actions which attained results for conservation in their own right.
- 2/ actions which produced results for conservation through influencing other agencies, policy, etc.

The facet was obliquely related to the action type facet. Together, these facets formed a 3 x 2 division of the space in the plot. It should be noted that the plot was actually divided into $(3 \times 2) - 1$ regions. This was due to no item being present in the analysis which was a member of one of the elements of the possible combinations.

10.6.3 Physical Scale Facet.

A physical scale facet emerged in this analysis (figure 10.9). The physical scale of environmental conservation actions was specified in the mapping sentence in figure 8.1 as having 5 distinct elements. However, in the context of donating money to environmental conservation, the facet was found to divide into 2 distinct regions. The facet elements were therefore:

- 1/ local and British conservation.
- 2/ conservation at a larger scale.

The data from the general environmental concern questionnaire will now be analysed to produce mean scores for the elements of the facets which have been revealed due to their semantic similarity. This form of analysis will enable the identification of the relationships between the modality of expression of environmental concern and other components of its social value.

10.7 Further Analyses.

SSA of the questionnaire data has resulted in the production of a mapping sentence for the social value of, and attitudes towards, environmental concern. In this section, further analyses will be performed upon the same data. These analyses will be performed in order to show the relationships between the modes of expression facet.

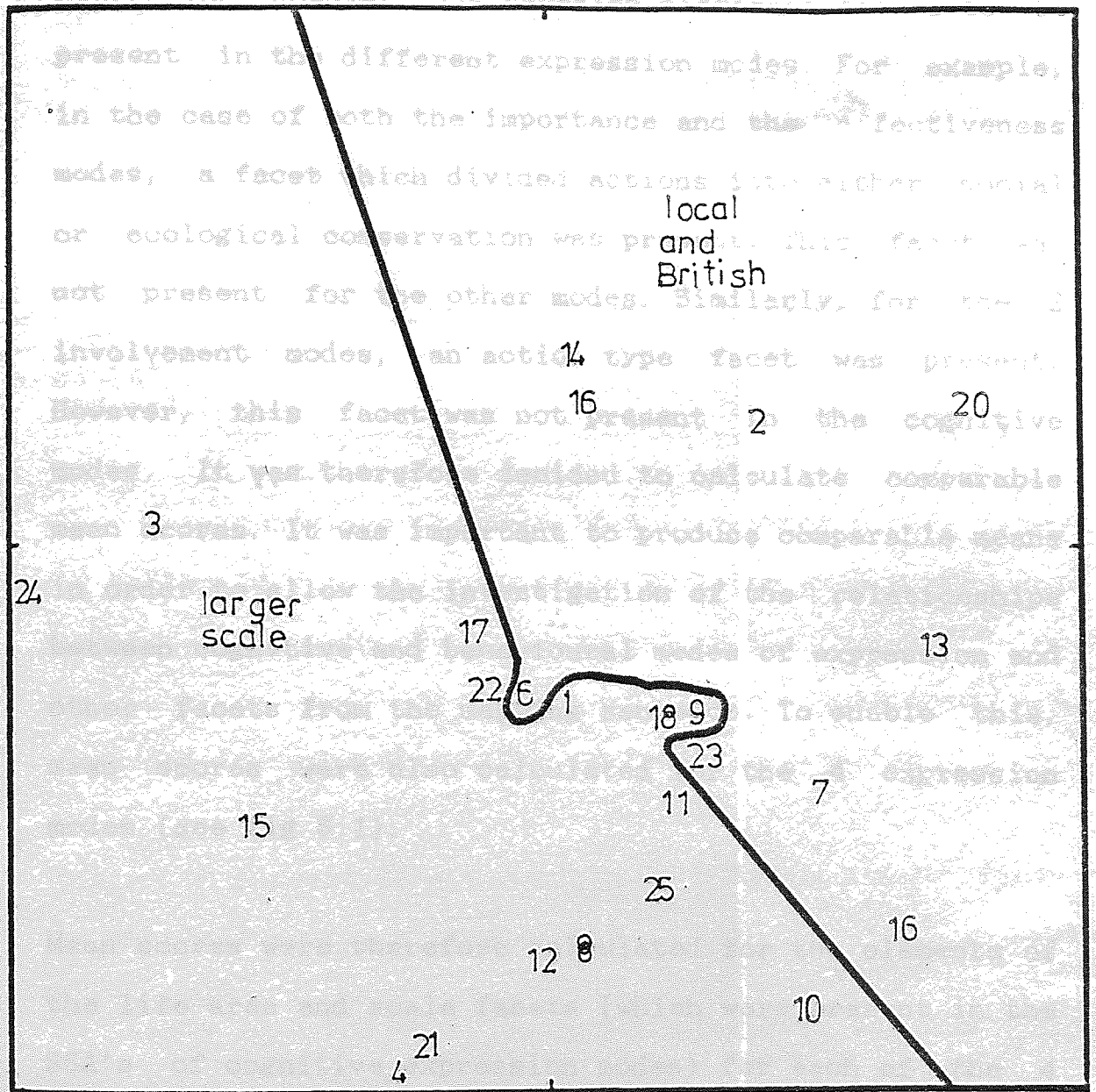


Figure 10.9

Projection of the SSA of the money pledged to environmental concern questionnaire showing partitioning of the physical scale facet.

Data will firstly be summarised through the calculation of mean scores. It was originally planned to calculate means for the same facet elements within each mode of expression. However, SSA revealed different facets to be present in the different expression modes. For example, in the case of both the importance and the effectiveness modes, a facet which divided actions into either social or ecological conservation was present: This facet was not present for the other modes. Similarly, for the 2 involvement modes, an action type facet was present. However, this facet was not present in the cognitive modes. It was therefore decided to calculate comparable mean scores. It was important to produce comparable means in order to allow the investigation of the relationships between cognitive and behavioural modes of expression and other facets from the mapping sentence. To enable this, mean scores were also calculated for the 4 expression modes (see fig 8.1).

Mean scores were therefore calculated for the elements of the life area and scale facets (which were present in the SSA's of cognitive expression modes) for each of the 4 modes of expression. A mean score was also calculated for each of the elements of the 'behaviour mode facet' (instrumental = time & money, cognitive = importance & effectiveness). The facet elements for which mean scores were calculated, along with their respective mean scores, are listed in table 10.1.

Table 10.1 Facet Element Mean Scores.

Facet/Element.	mean score.
BEHAVIOUR MODE.	
importance.	3.13
effectiveness.	1.76
time.	1.41
money.	0.65
LIFE AREA.	
social conservation.	1.70
ecological conservation.	1.92
PHYSICAL SCALE.	
local.	1.58
national.	1.84
international.	1.80
global.	2.10
ethical.	1.68

The data contained in table 10.1 is further broken down in tables 10.2 to 10.5. In table 10.2 the mean scores are presented for each of the questions in the questionnaire by each of the modes of expression. questions are arranged in descending order of their mean scores.

Table 10.3 presents a breakdown of behaviour mode facet by physical scale facet elements.

In table 10.4 the mean scores are presented for each of the behaviour mode facet elements in combination with each of the life area facet elements.

Table 10.5 shows the mean scores for the elements of the life area and scale facets as they combine within the questionnaire. Each combination of life area and physical scale facet elements is presented for each of the behaviour mode facet elements. It should be noted that no

Table 10.2 Mean Scores for each Question by Behaviour Mode.

Question (with questionnaire number).	MODE.			
	Imp	Eff	Tim	Mon
Saving unspoilt areas (9)	4.0	1.6	1.7	1.2
Halt atmospheric destruction (1)	4.0	1.2	1.7	1.2
Reduce rain forest destruction (18)	4.0	1.2	1.8	0.8
Protect animals world-wide (11)	3.9	2.3	1.6	1.0
Support 3rd world agri' dev' (4)	3.8	2.1	1.6	1.0
Protect British wildlife (23)	3.6	2.3	1.6	0.9
Develop local nature reserves (7)	3.5	2.2	1.3	0.6
Lead reduction policy (19)	3.5	2.0	1.6	1.0
Concern for environmental issues (17)	3.4	2.2	1.5	0.8
Halt EEC food mountains (21)	3.4	1.1	1.6	0.9
Save British countryside (13)	3.3	2.5	1.6	0.9
Children's nature experiences (14)	3.3	2.0	1.2	0.6
Halt internat'l animal trade (25)	3.3	1.8	1.5	0.1
Control development in G.B. (6)	3.3	1.7	1.2	0.4
Care for all living things (22)	3.3	1.5	1.4	0.6
Reduce world population growth (24)	3.3	1.3	1.1	0.5
Industrial exploitation (8)	3.3	1.2	1.1	0.5
International fishing policy (10)	2.9	2.0	1.0	0.4
Destructive G.B. farming (2)	2.9	1.6	1.0	0.4
City traffic levels (5)	2.8	1.3	1.1	0.4
Global family (3)	2.8	0.7	1.2	0.4
Protecting villages (20)	2.6	1.8	1.0	0.4
Campaigning for animal rights (12)	2.4	2.0	1.0	0.6
Encouraging city wildlife (16)	2.3	1.5	0.9	0.3
3rd world mineral exploitation (15)	2.3	1.0	0.9	0.4

Table 10.3 Mean Scores for Behaviour Mode by Life Area.

Behaviour Mode.	Life Area.	Mean
IMPORTANT	ecological	3.46
	social	3.08
EFFECTIVE	social	1.82
	ecological	1.79
TIME	ecological	1.52
	social	1.30
MONEY	ecological	0.94
	social	0.62

Table 10.4 Mean Scores for Behaviour Mode by Physical Scale.

Behaviour Mode	Physical Scale	Mean Score
IMPORTANT	global	3.92
	international	3.21
	ethical	3.07
	national	3.07
	local	2.85
EFFECTIVE	national	2.07
	local	1.82
	international	1.71
	ethical	1.64
	global	1.56
TIME	global	1.72
	national	1.45
	international	1.42
	ethical	1.37
	local	1.16
MONEY	global	1.21
	international	0.86
	national	0.75
	ethical	0.67
	local	0.50

combinations of the local and ecological facet elements were present in the questionnaire.

The mean scores for the 3 facets of behaviour mode, physical scale and life area have all been calculated. These scores are presented in tables 10.1 to 10.5, both as mean scores for each of these elements, and as mean scores for elements in facet combinations. The data in these tables will now be

Table 10.5 Mean Scores for Combinations of Physical Scale with Life Area by Behaviour Mode.

Behaviour Mode.	Life Area	Physical Scale.	Mean Score.
IMPORTANT		GE	4.04
		IS	3.56
		GS	3.37
		NE	3.37
		NS	3.16
		ES	3.12
		EE	3.11
		LS	3.07
		IE	2.96
EFFECTIVE		NE	2.16
		LS	1.91
		NS	1.87
		IS	1.77
		EE	1.69
		IE	1.66
		GE	1.62
		ES	1.58
		GS	1.33
TIME		GE	1.83
		IS	1.65
		NE	1.43
		EE	1.36
		ES	1.32
		IE	1.26
		GS	1.25
		NS	1.24
		LS	1.11
MONEY		GE	1.33
		IS	1.03
		NE	0.77
		IE	0.74
		EE	0.72
		GS	0.69
		LS	0.63
		ES	0.58
		NS	0.45

Facet element codes for table 10.5

EE = ethical + ecological
 ES = ethical + social
 GE = global + ecological
 GS = global + social
 IE = international + ecological
 IS = international + social
 NE = national + ecological
 NS = national + social
 LS = local + social

commented upon in respect to each of the 3 facets noted above.

10.7.1 Behaviour Mode Facet.

Table 10.1 shows the mean scores for each of the 4 elements of the behaviour mode facet. This shows that respondents clearly felt that most environmental issues were of importance (mean scores = 3.29). They also expressed a belief that most environmental actions were ineffective (mean score = 1.76). Respondents were relatively unwilling to pledge to give either their time or their money to environmental conservation activities, although they were slightly more willing to pledge time than money (mean time score = 1.41, mean money score = 0.80).

Table 10.2 shows the mean scores for each of the questionnaires 25 questions for each of the modes of behavioural expression. From this it can be seen that the activities and issues which were rated to be of the greatest importance were those which were rated as being of low effectiveness. The same was true of those areas assessed to be of low importance. Areas and issues judged to be of moderately high importance were assessed to be of most effectiveness.

It can be seen from the data presented in table 10.4 that a positive monotonic relationship existed between the 3 scales of importance, time pledge and money pledge.

Those issues areas which are assessed by respondents as being of greatest importance were likely to receive the greatest levels of time and money pledges. If an area of environmental conservation is seen to be important by respondents, then it is more likely that a greater level of support will be pledged to this area of conservation activity (relative to other areas of conservation).

The effectiveness scale was not positively related to the other 3 scales; perceived effectiveness not appearing to be related to expressed willingness to become involved in conservation activities. However, the effect of perceiving an environmental issue area to be effective may be seen to be playing a minor role in influencing involvement pledges if viewed in combination with perceived importance. Table 10.6 illustrates this effect.

In order to produce this table the mean scores given in table 10.2 were firstly divided into quartile groups, independently for each behaviour mode. The top 25% of each of these groups taken separately, assigned to a "high" response category. The bottom 25% of each group were assigned to a "low" category, whilst the mid 50% were assigned to a middle category. To simplify any relationships present in the data matrix so formed, the 3 category groups were each assigned a symbol; high = "+", middle = "0" and low = "-". The resulting symbol matrix is shown in table 10.6.

Table 10.6 Matrix of Score Symbols Comparing Cognitive Modes and Involvement Modes.

Question Number.	IMP'.	MODE. EFF'.	TIME.	MONEY.	code
9	+	Ø	+	+	c
1	+	-	+	+	c
18	+	-	+	+	c
11	+	+	+	+	a
4	+	+	+	+	a
23	+	+	+	+	a
7	+	+	Ø	Ø	a
19	+	+	+	+	a
17	+	+	+	+	a
21	+	-	+	+	c
13	Ø	+	+	+	d
14	Ø	+	-	Ø	b
25	Ø	+	+	+	d
6	Ø	Ø	-	Ø	b
22	Ø	-	-	Ø	b
24	Ø	-	-	-	b
8	Ø	-	-	-	b
10	-	+	-	-	b
2	-	Ø	-	-	b
5	Ø	-	-	-	b
3	-	-	-	-	b
20	-	+	-	-	b
12	-	+	-	-	b
16	-	-	-	-	b
15	-	-	-	Ø	b

codes - a = if IMP = "+" and EFF = "+", then TIME = "+" and MONEY = "+".
b = if IMP = "-" or 'Ø' and EFF = "+" or "Ø" or "-", then TIME = "-" and MONEY = "-" or 'Ø'.
c = if IMP = "+" and EFF = "-" or "Ø", then TIME = "+" or "Ø" and MONEY = "+" or "Ø".
d = if IMP = "Ø" and EFF = "+", then TIME = "+" and MONEY = "+".

The symbols in column 5 of table 10.6 are included to simplify the relationships between the elements of the modalities of behaviour facet. Four relationships exist and these are listed a to d. There were the following number of cases described by each of the relationships: a = 6, b = 13, c = 4, d = 2. These symbols show the importance variable to have an important relationship with involvement pledges. In all cases when the

importance of an environmental conservation action or issue is perceived to be high, involvement pledges fall within the high or mid ranges. In 12 cases, when importance was rated as low or mid range, involvement pledges were low. In 2 case, importance was rated as low whilst involvement was high.

The above relationships may be interpreted in the following manner. If an area or issue within environmental conservation is perceived as being of importance, and actions within this area are assessed to be effective, then pledged involvement will be relatively high. Involvement pledge will also be relatively high if perceived importance is high but effectiveness is seen to be low. However, pledges of both time and monetary involvement (contributions) will be low if importance is seen to be low and effectiveness is low, medium or high.

These relationships are also present when the mean scores of physical scale and the mean scores of the life area facets are related to the elements of the behaviour modality facet (table 10.3, 10.4).

This leads to the hypothesis that cognitive assessments of importance are the primary factor in motivating pledges to become involved in activities which are supportive of environmental conservation.

10.7.2 Life Area Facet.

Having considered the modality of behaviour facet, attention is now addressed to the life area facet. Ecological conservation received an higher score than social conservation, when these were summated across all 4 behaviour modality elements.

In terms of their importance, ecological conservation issues were judged to be of greater importance than social conservation issues. There were no differences between the assessments of the effectiveness of the 2 life areas, and respondents were more willing to pledge to become involved (both cognitively and behaviourally) with ecological concerns (table 10.3). This again demonstrates how assessments of the importance of environmental issues are closely associated with involvement.

10.7.3 Physical Scale Facet.

The mean scores for the elements of the physical scale facet across all modalities were (in descending magnitude) global, national, international, ethical and local scales of conservation (table 10.1).

Table 10.4 presents the mean scores for each physical scale facet element broken down by behaviour modality. It can be seen that global conservation was assessed to be of the greatest importance and also to attract the most

pledges of involvement. Conversely, local conservation was assessed as least important amongst the conservation issues, and received the lowest level of involvement pledges. The same relationship is present in nearly all of the remaining 3 scale elements.

10.7.4 Combined Facet Relationships.

Table 10.5 lists the mean scores for each combination of the physical scale facet elements and the life area facet elements, by the elements of the behaviour modality facet. From this table it is apparent that the importance assessments are closely related to expressions of involvement. Global/ecological and international/social element combinations being consistently rated as being of greater importance and receiving pledges of greater levels of involvement.

In the section which follows the results of the above reported questionnaire studies, along with the results from the repertory grid interviews, are discussed. The findings which have been presented in this thesis will be related to the existing social science environmental concern literature. These results are also compared with to social values research which has adopted a facet theory approach.

Chapter 11.

Discussion.

11.1 Introduction.

Environmental and applied social psychology draw upon many different approaches in their research (eg, Bell, et al, 1976). Facet theory is one approach which has been employed. This has been used as it provides a technique for the analysis of complex, multi-variate events. In this chapter the results of the facet analyses presented in the preceding chapters will be discussed as these relate to both strands of research which motivated the multi-variate investigation of environmental concern; 1/ facet theory approach to the study of social values and 2/ environmental concern research.

In the first chapter of this thesis a series of hypotheses were stated. In the chapters which followed, the theoretical bases for the hypotheses were given. This resulted in a series of studies being designed and implemented in order to test these hypotheses.

The hypotheses that were investigated were embodied in the facets of the mapping sentences used to design each of the studies. Canter (1985b) comments in some detail upon the procedure of developing facet research projects. He cites the development of an initial mapping sentence

as the first objective of this form of research. However, he also notes the diverse ways in which a mapping sentence may be developed.

"The initial mapping sentence may be developed from any of a mixture of sources. If the area of research has already been thoroughly studied within a facet framework, then already established mapping sentences will exist which can be raided from the particular purpose that the researcher has in mind."

(Canter, 1985b. p266)

In this research the mapping sentence for social values (Levy 86) was adapted to the specific context of environmental concern. This modification was undertaken in order to illustrate the psychological processes associated with the social value of environmental concern. It was also performed to allow answers to be made to questions about the dimensionality of environmental concern.

In order to achieve the above aims it was necessary to 'contextualise' the mapping sentence. This was achieved through open ended repertory grid interviews. This form of study is often useful in initiating a facet investigation.

"In many cases researchers find that exploratory data collection helps them to give the literature some organisation. This may be through open-ended interviews, field observations, or any of a number of common exploratory techniques which help to identify the likely critical facets in an area of concern. The researcher is, in essence, making a preliminary attempt to establish a category scheme which would help to explain established or anticipated variations in responses or observations."

(Canter, 1985b. p266)

The exploration of the content area was undertaken in the initial stages of the present research.

The results which arose from this exploration, and the mapping sentence produced have already been presented. In the current chapter these results will be discussed as they provide answers to questions regarding the dimensionality of environmental concern and research into social values.

The results from all studies which have been conducted will be presented in a single table. This will allow the reader to compare results from the separate studies. An overall mapping sentence will then be proposed for the content area. The facets listed in these will account for the variation in the results from all of the studies, and it will therefore depict the entire semantic domain of environmental concern.

Having established an overall mapping sentence for the content area of the research more detailed relationships in the data will be discussed. The specific roles each of the elements of the ordered facets performed in structuring evaluations will be reviewed. The partial order scalogram analysis of elements of facets for evaluating environmental hazards will be related to the overall findings of the research.

The discussion will then proceed to consider the effect each facet, and its elements, had in shaping specific

aspects of environmental concern. This will be followed by a review of the findings of this research as these relate to the literature on environmental concern. The discussion will conclude by considering the overall implications of the research.

Attention will also be paid to the cumulative findings of the results. From the results, answers may now be forwarded to the hypotheses which motivated the research. These answers are in the form of an overall model (mapping sentence) for the social value and attitudes of environmental concern and the facets and facet elements contained therein.

11.2 The Dimensionality of Environmental Concern.

The investigation of environmental concern reported in the literature has taken many forms. These different forms were discussed in chapter 4. As a result of the different measures which have been used to generate research instruments, several authors have questioned the dimensionality of environmental concern. Some of the contemporary research in this area has moved away from a uni-dimensional design for its research instruments. The investigations by Van Liere and Dunlap (1981) and Cotgrove (1982) are examples of multi-dimensional conceptualisations and designs to research.

The individual studies from the research contained in this thesis have led to the development of a multi-variate descriptive model being proposed for attitudes and social values associated with environmental concern. A mapping sentence, and the facets contained within this, has been presented for each of the studies which have been conducted. During this discussion these facets will be reviewed. They will firstly be presented in a manner which will allow the comparison of the facets present between studies. This model, including all domain and background facets, will then be posited in the form of an overall mapping sentence. The development of this will now be discussed.

11.3 The development of a Mapping Sentence Model of Environmental Concern.

In this research, multiple hypotheses were stated regarding the structure of environmental concern attitudes and social values, in the format of a mapping sentence. This mapping sentence was used to design questionnaire studies and to interpret and analyse subsequent data. This mapping sentence was derived from 2 sources: existing mapping sentences from the facet theory's literature on social value and attitude, and exploratory studies which developed a mapping sentence for the structure of individual understanding and personal values associated with environmental conservation activities. The findings of the research will now be summarised and a mapping sentence stated for

the measurement of the social value of environmental concern.

1.3.1 A Summary of the Structure of Attitudes and values of Environmental Concern.

The results of the similarity structure analysis of all of the research studies have been presented in the result sections of the thesis. The structure of assessments which has been displayed through the facet studies will now be summarised to enable the commonalties and pertinent differences present between studies to be readily observed. Furthermore, the structure will be clearly related to the specific context of assessments.

Initially, a common structure for environmental concern values will be established as an overall mapping sentence. Subsequently, the variations in this structure which were present between the different studies conducted during this research, will be considered in relation to the overall mapping sentence.

In table 11.1 the facets and facet elements which were present for each of the studios are listed.

The findings from all of the studies are thus presented in a format which enables the results from each of the individual studies to be compared. This clearly illustrates several points which help answer the original hypotheses of the research. However, this table does not

form a mapping sentence. It is merely a listing of facets of the evaluation of environmental concern issues and actions. This does not constitute a mapping sentence as no linkages are proposed between the facets of the studies. Furthermore, the context, subjects and response ranges are not listed. The 'contextualisation' of facets through their inclusion in a mapping sentence greatly effects the psychological nature of the facets. The development of an overall mapping sentence will illustrate this at a later stage of this discussion.

The results (table 11.1) report only the associations between environmental concern and cognitive variables. No socio-demographic variables were included in the study as variation has consistently been found in the associations between socio-demographic and environmental concern measures (Van Liere & Dunlap, 1981, Cotgrove, 1982). The aim of the present research was to develop clear models of environmental concern which could (in future research) be investigated to reveal its socio-demographic correlates. In developing a model of environmental concern, Cotgrove (1982) makes the important point that:

".... analysis shows that cognitive variables have substantial direct effects on environmental concern. These variables are also the most consistent predictors of environmental concern"

(Cotgrove, 1982. p134)

Table 11.1 Facets and Facet Elements by Research Study.

1.	Social - Educational - Ecological. (e1)	Ethical - Global - International - National - Local. (f)	More - Less. (h)	More - Less. (c)
2.	Social - Educational - Ecological. (e1)	For itself - For a greater. (d)		More - Less. (c)
3.	Social - Ecological. (e1)	No present - future - present. (g)	Central - Peripheral. (h)	More - Less. (c)
4.	Social - Pollution - Waste - Depletion. (e1)	U.K. (f)	Central - Peripheral. (h)	Central - Peripheral (c)
5.	MODALITY Cognitive - (important (effective Instrumental. (i)			
6.	Habitat - Species - Moral/Ethical. (e2)	Global - British - International (f)		Central (for itself) - Peripheral (for a greater). (c)
7.	Habitat - Species - Development. (e2)	Global - International - National Local - Ethical. (f)		Central - Peripheral (c)
8.	Protection Control - Development. (e3)	Own ends - Influences. (d)		Central - Peripheral Benefit. (c)
9.	Protection - Control - Development. (e3)	Small scale - Large scale. (f)		Own ends - Influences. (d)

Table 11.1 (continued).

- 1 = Exploratory Repertory Grid Study/Analysis 1.
 - 2 = Exploratory Repertory Grid Study/Analysis 2.
 - 3 = Environmental Hazard Study/Analysis.
 - 4 = Environmental Urgency Study/Analysis.
 - 5 = General Environmental Concern Study/Analysis.
 - 6 = Conservation Importance Study/Analysis.
 - 7 = Conservation Effectiveness Study/Analysis.
 - 8 = Time Pledge to Conservation Study/Analysis.
 - 9 = Monetary Pledge to Conservation Study/Analysis.
-

c = environmental relevance facet
d = purpose facet
e1,e2,e3 = life area facet
f = physical scale facet
g = time effect facet
h = personal relevance facet
i = behaviour modality facet

Note: the precise element structure for each of the studies is shown by the elements listed in the cells in the matrix.

11.4 Facets of Environmental Concern.

Table 11.1 provides a list of the cognitive facets or dimensions which have been discovered within each of the studies. It has been possible for each study to be categorised by no more than 4 of these facets. However, the context of the study had considerable influence upon the precise psychological nature of each facet. This will be commented upon below.

The interrelationships present between each of the facets is specified in the overall mapping sentence for environmental concern in Figure 11.1. This mapping sentence clearly specifies all facets of the research domain. For any one of the studies in this thesis,

facets and facet elements were chosen for inclusion in the research design as they related to the context of the survey. A mapping sentence is defined as a facet set from which one element of each facet is present within each observation. This was not explicit in all of the surveys described by the overall mapping sentence. A form of mapping sentence is however formed with this caveat.

This research has developed and proposed this template or classification system in the form of an overall mapping sentence. This systematically accounts for the variation amongst the correlation coefficients between each pairing of the variables which have been used to assess respondents expressions of concern for the quality of the natural environment. It is both the conclusion of the present research and a template for developing future research. The mapping sentence provides a taxonomy which, if used in future research design, will enable environmental concern research to more directly address the specific areas which are of most interest to that research.

In the sections which follow each of the facets in figure 11.1 will be independently considered as they relate to the study in which they were present, and to the overall structure of environmental concern.

Figure 11.1 General Mapping Sentence for Environmental Concern.

 P
 Person (x) being a (conservation employee
 (member of the public
 (undergraduate student

 a
 in a, (cognitive modality of expression,
 (affective
 (behaviour

 assesses the environmental concern (issue goal,
 (action

 c
 which is of (central environmental relevance,
 (peripheral

 d (e1)
 for, (its own purpose, in (social
 (a greater (educational
 (ecological
 -waste
 -pollution
 -depletion

 (e2) (e3)
 or, (habitat / area or, (protective life areas,
 (species / animals (controlling
 (morals / ethics (developing

 f g
 at the (local scale, having a (present
 (national (future
 (international (no future
 (global
 (ethical

 h
 time effect, of (central personal relevance,
 (peripheral

 i
 and express their concern in a (cognitive modality,
 (instrumental

 R
 very great

 as being - to in terms of the
 content of evaluation.

 very little

note - Facet 'e' had 3 alternative parts (e1, e2, e3).
 Only 1 of these facet configurations occurred in any one of
 the research studies.

11.4.1 Behaviour (expression) Modality

This facet was specified as facet 'a' in the overall mapping sentence. During the present research respondents were required to make a cognitive assessment in their evaluations of environmental concern. Levy and Guttman (1985) have stated that:

"The assessment itself of importance may be regarded as a cognitive behaviour of a person or group."

(Levy & Guttman, 1985 p206)

A behaviour modality facet could have been included which had elements representative of other behaviour modalities. For instance, in investigating environmental concern, more overt 'behaviours' could have been included. Examples of this behaviour facet element would have been attendance at meetings organised by the environmental movement, purchasing 'P.C.P.' free aerosols, installing catalytic converters to motor cars, etc. A person performing the specified behaviour could then have been deemed to be environmentally concerned.

Indeed, by adopting such an approach, a more accurate measure of a persons 'real life' commitment to environmental protection may have been assembled than that achieved by cognitive reports of support. However, this may not have occurred as a person's reasons for committing behaviours cannot be judged from overt actions. A person may attend a meeting of Friends of the

Earth because their girl-friend attends, may have purchased a given aerosol as it was the cheapest available, or have had a catalytic converter fitted because of their employing company's policy. To discover intent a person must be questioned in some way as to the motives for his/her actions.

".... the ultimate explanation of human behaviour lies in examining man's undertakings, the lines of enquiry he initiates, and the strategies he employs, rather than analysing the logical pattern and impact of events with which he collides. Until one has grasped the nature of man's undertakings, he can scarcely hope to make sense out of the muscular movements he observes"

(Kelly, 1969. p16)

In the present research it was not the intention to assemble a list of actions which were supportive of the aims of environmental conservation. Instead it was intended that the cognitions through which respondents understood environmental conservation, and were therefore concerned for the quality of the natural environment, were to be investigated. Consequently, cognitive measures, rather than affective measures or measures of overt behaviour were employed in all of the studies. It should be noted however, that overt behaviours could have been specified and included in this research. In doing so variation amongst responses may have been observed which related to this inclusion of this element from the modality of behaviour facet.

11.4.2 Life Area

The life area facet was present in all of the studies which were undertaken during this research. Furthermore, the structure of this facet was approximately similar in each of its appearances. The element arrangement was circular with each of the elements of the facet corresponding to different directions from a common origin. However, in the environmental hazard questionnaire study only 2 elements of this facet were included. Consequently, a dichotomous configuration of elements occurred. However, the arrangement of items within elements suggested circularity.

An un-ordered arrangement was present for all occurrences of the life area facet. Facets with this type of structure are deemed to be playing polarising roles (Levy, 1985). What this means is that the facet embodies qualitative distinctions between each of the regions (life areas). In the present research each region corresponded to the life area which was the primary target of a specified environmental conservation action or issue.

With these types of assessments being embodied within the facet it is of little surprise that the precise type of elements present in this facet varied a great deal between studies. The specific elements of each of the life area facets being dependent upon the domain of the

research. A similarity of the underlying form of elements was present for most of the studies. This lead to life area being divided into 2 regions, human and ecological, which represented the main life areas which were effected by, or were the cause of, the activity or issue specified.

Respondents differentiated consistently between environmental activities by using this facet. For each of the studies, respondents assigned questionnaire or repertory grid items to a life area element. The precise psychological meaning of the facet and its elements varied according to the substantive content of a study. This is shown in table 11.1. When respondents were questioned about the personal value of an environmental conservation activity or issue (studies 1 to 4, table 11.1) the life area elements of social and ecological were present. When respondents were from the 'knowledgeable' sample of environmental conservation employees, a subdivision of educational conservation was also present. This element fell between the ecological and social elements. This positioning showed education to link activities which were aimed at protecting the environment for its own sake, and saving the environment for human beings. It also is demonstrative of the context of the research in these studies. In these studies, conservation activities rather than conservation issues formed the subject matter. It would appear from these findings that education is more readily construed as an activity than as an issue of environmental concern.

In the seriousness of environmental hazards questionnaire survey, the social / ecological dichotomy was present. This was also present in the analysis of the urgency of environmental issues questionnaire. However, in this latter case, the ecological element sub-divided into 3 distinct types of issue; pollution, waste and resource depletion.

In studies 6 and 7 (the importance and effectiveness surveys) another set of elements were present for the life area facet. These were the same in both of these 2 studies. The 3 elements of the facet were: habitat, species and morals. Again these elements reflect an underlying human / ecological dimension. The facet elements of habitat and species are identifiable as embodying ecological considerations. Conversely, the ethics (morals) element was a specific form of the human or social element of this facet.

Finally, in the 2 studies which viewed the instrumentality modalities of time and money pledges to environmental goals (studies 8 and 9) a different element set was present. These elements were of; protection, control and development. It is interesting to note that for these 2 studies, the human / ecological distinction was less obvious and may not have been the psychological variable which produced the dichotomy which was present in the print-out from the analysis.

From the presence of a life area facet in 8 of the 9 studies, (the facet was only missing in the general environmental concern study) it would appear that this form of qualitative assessment was intrinsic in all forms of evaluation of environmental concern. The variation of the elements of this facet show it is the facet which, in effect, defines the orientation of research toward the assessment of environmental concern.

If the social value or social attitudes about environmental conservation actions and issues are being assessed, respondents categorise conservation in terms of its affecting human or ecological life areas. When importance and effectiveness of environmental conservation actions are evaluated, this facet specifies the areas of environmental concern which will benefit from the actions. When people are approached and asked to directly support environmental conservations activities, this facet then specifies the type of behaviours for which support is being requested.

These findings have important implications for the design of environmental concern research. They show how the presence of variation in the issues addressed within a research instrument or variation in the substantive issues addressed between surveys, will significantly effect the responses that are collected (this variation will have important effects upon the comparability and cumulativeness of findings). This provides support for

the variation in substantive issue dimension in the model proposed by Van Liere & Dunlap, 1981 through which they explained the differences in environmental concern research findings.

This finding also issues a warning to researchers who have assembled a battery of environmental concern related questions and included these within a single questionnaire (eg, Maloney, et al, 1975). Adopting an approach which includes different life areas within a single study instrument may result in variation in the subsequent data which is reflective of the different life area elements present. Moreover, the existence of an underlying 'contextualised' human / ecological division in evaluations would suggest that the researcher should include these 2 elements (in their contextualised format) in their investigation of specific environmental concerns. This approach would be recommended in both academic research (eg, Tait, 1987), and in applied surveys attempting to gauge responses from a social grouping to environmental development and changes, or the conservation of the natural environment.

The human / ecological life area facet also lends support to the notion that a broad range of issues fall under the "environmental" heading. This finding to some extent justifies the diverse subject matter which social scientists have studied within investigations of environmental concern. For instance: Technological impact and the risks associated with this (Fischhoff, et

al, 1978, 1979. Kates, 1972) social values and ecological values (Buss & Craik, 1973. Disch, 1970. Caldwell, 1970. Campwell & Wade, 1972. Craik, 1969, 1970. Dunlap, 1975a, 1976. Dunlap et al., 1973, 1981. Harry, 1971. Johoda & Freeman, 1978. Malkis & Grasmick, 1977. Pirages & Ehrlich, 1974. Barbour, 1973. Harman, 1977. Henderson, 1976. Daly, 1973. Yankelovich, 1972. Dunlap & Van Liere, 1978b); environmental legislation (Dillman & Christenson, 1972. Weigel, et al, 1977.); the environmental movement (Albrecht, 1976. Dunlap, et al, 1979. Hornback, 1974. Buttlet & Flinn, 1974. Cotgrove & Duff, 1980); political orientations and affiliation (Dunlap, 1975b. Buttlet & Flinn, 1976c. Dunlap & Allen, 1976. Ray, 1980. Lowe & Rudig, 1986). All of the above research areas may be usefully included within the social element of a study of environmental concern.

The life area facet has been found to be present in all previous investigations using a facet theory approach in the study of social values (Levy & Guttman, 1974 a&b, 1976, 1981 a,b&c, 1985,. Levy, 1986) and in studies of attitudes (Guttman, 1973) well-being (Levy & Guttman, 1975) and socio-political involvement and protest (Levy, 1978, 1979, 1982, 1983). For example, Levy (1986) discovered a polarised (circularly arranged) life area facet to be present in her investigations of Israeli social values. This element structure was evident in analyses of values as guiding principles, personal well-being values, social values and their execution,

fundamental problem values and socio-political values. The life area facets in all of these studies also categorised life area in a contextualised manner which was analogous to the present results.

The qualitative differentiation process which is present in the life area facet has been found to be the type of differentiation process present in many other life area facets within a wide variety of different contexts (eg, Marsdon & Laumann, 1978. Levy & Guttman, 1975. Canter & Walker, 1980). Levy (1985) provides a thorough review of this facet. She notes how a second facet modifying the life area facet is often a necessary component in a social research study. The inclusion of this facet allows the researcher to 'focus' the life area being addressed by a questionnaire item. This modification is achieved by conjointly requiring a quantitative evaluation to be made of the life area's qualitative differentiations.

In many of the results from the present surveys, the life area facet was modified by a second facet. This was either discovered (as in the exploratory studies) or included in the research design (all other studies). Two types of modulating facets (modifying facets) were found during data analysis and these are now discussed.

11.4.3 Environmental Relevance.

The environmental relevance facet (facet c in the overall

mapping sentence) appeared on 7 occasions in CSA. The facet had the same structural format on 6 of these appearances. On these 6 occasions the facet structured evaluations as a modulating facet. This form of facet structure has elements which are centrally and peripherally positioned. The facet appeared once with a different structure. On this occasion items were arranged along a straight line. When this facet possessed a modulating structure the elements were of a single type. Elements were a central region element reflecting items of central relevance, and an outer region comprising items which were of peripheral relevance.

This was achieved through the facet causing some items to be displaced from the circularity of arrangement. Some items are "pulled" towards the centre of the plot due to their possessing a similarity in terms of the judgements present in this modifying facet. As the 2 facets are found in the same plot of smallest space, the evaluations each possess are intimately related to each other. The 2 dimensional plot of the life area and environmental relevance facets showed the life area facet to be partitioned into circularly arranged sections. Each of these sections represented a particular life area of environmental concern. In the same plot, a centrally placed circle was found to divide the items. The more central being of more environmental relevance.

The 2 facet layout is not unusual in facet theory analysis. Levy, (1982) compiled expert opinion upon the impact on environmental quality of a nuclear power plant. When interpreting the position of items in her resulting similarity analyses, Levy stated:

".... the picture conforms to what has been more generally noted in previous studies, namely the fields, domains or life areas tend to be circularly ordered.... The distance of a plotted item from the centre of the map is determined by the extent to which that item belongs exclusively to its sector."

(Levy, 1982. p296)

It is possible for Levy to form this conclusion as an item which has some level of affinity with sectors of the analysis, other than its own, will tend to be located closer to these other sectors: The geometric position implied by this is centrality (Levy, 1982). Guttman (1976) and others (eg, Levy and Guttman, 1974a) discovered within the domain of social values and social satisfaction, a life area of circularly arranged regions which were modified by a modulating facet . In the present research this modulating facet was present in all studies except the monetary pledge and general environmental concern studies.

11.4.4 Personal Relevance.

The facet of personal relevance was the second facet of the analyses which had a modifying effect upon evaluations. This modular facet of personal relevance

(facet h in the overall mapping sentence) caused the assessments present in the life area facet to be modified in a quantitative manner. Essentially, its structure was similar to that of the environmental relevance facet (facet c) and many of the above points made about the facet of environmental relevance apply to this facet also. The facet of personal relevance was present in 3 of the studies (personal repertory grid, environmental hazards and urgency surveys).

The facet structure was similar in each of these studies and modified the judgement criteria present in the life area facet. The facet had 2 separately identifiable regions; central and peripheral. Centrality was afforded to those hazards, issues and activities with which respondents had the greatest extent of personal contact. The peripheral element comprised those items which were experienced, by the sample, through less direct contact.

The 2 modulating facets of personal and environmental relevance, brought a sense of importance or value to environmental concern judgements. However, as this facet was found in the same plot as the life area facet, importance is not assigned to "environmental concern overall, but to each of the elements of the life area facet. The facet allows there to be central and peripheral components of each of the judgements embodied in the life area elements.

Furthermore, whilst the life area facet may possess a similar structure between different studies the different substantive issues addressed causes the precise content of the facet elements to change. Furthermore, the form of the commitment required from respondents also changed between studies. This is shown in the different response ranges and issue types.

The modulating facets found in analysing the results of the present series of research studies appeared particularly sensitive to these changes in issue and range specification, the modality facet logically represented such changes in its structure. This may be illustrated by considering the environmental relevance facet's elements in the instrumental modality study of time pledged to environmental activities. Central regions of the environmental relevance facet were formed by items which respondents evaluated to benefit most from their personal 'involvement' (an instrumental activity). Whereas, in the studies requiring cognitive evaluations, central regions were comprised of items perceived as being of central relevance (a cognitive activity). The sensitivity of modulating facets should be noted, and should be taken into account when designing research instruments.

11.4.5 Behaviour Modality.

This second behaviour modality facet (facet 'i' in the overall mapping sentence) was included in all of the

research surveys. However, in all studies except 1, (the general environmental concern study) this facet possessed only 1 specified element. Constantly specifying 1 element from a facet in a design has the effect of holding constant the variation due to this facet. Consequently, partitioning of regions for the facet was only present in the 1 study in which multiple elements were specified.

In the overall mapping sentence the behaviour modality facet has 2 specified elements of cognitive and instrumental. This is derived from the mapping sentence for social values (Levy, 1985) which was used as a template for the present research design. Throughout all the research reported in this thesis these 2 modes were superordinate facet categories with a total of 4 subordinate elements. The 4 elements so formed were used in the design of all questionnaires. The sub-categories which were used in the final stage of the project were,

important, effective, (Cognitive)
time, money, (Instrumental)

The response ranges of seriousness and urgency, importance, effectiveness and repertory grid evaluations used in research instruments, are ranges all from the cognitive element of the behaviour modality facet. The 2 involvement pledge studies were both of instrumental modality.

It was decided to include one individual sub-category from the cognitive or the instrumental element within each sub-section (importance, effectiveness, time, money) of the general environmental concern questionnaire. This was done in order to simplify the format of questions and to make them easily understandable to respondents. The design of the questionnaire viewing overall environmental concern was such that direct comparison was possible between the 2 modalities (4 elements) of expression of environmental concern.

The behaviour modality facet appears to be structurally simplistic. However, the effects it has upon the cognitive assessments within a research domain may be complex.

"... the behavioural modality facet can play different roles under different circumstances, depending upon the nature of order of the content facets of the design."

(Levy & Guttman, 1985. p89)

The complexity of the effect that this facet had upon responses is illustrated by the coefficients between the 4 elements (appendix A.11). All of the ranges of the 4 modes were specified from positive to negative towards an action or issue. However, the correlations were not always positive and the directionality of the relationship was not always constant between mode elements. When all 4 modality facet elements were

included in an analysis, the polytonic relationship between elements of this facet effectively masked variation attributable to the other facets.

This finding has 2 important implications within environmental concern research: 1/ items within a single survey should be carefully selected with similar response modalities; 2/ caution should be employed when interpreting the results of multiple response modality studies.

11.4.6 Goal.

The goal facet is present in the overall mapping sentence as facet b. A structure emerged for 2 of the studies (group repertory grids and time pledge questionnaire) which dichotomised items. The 1 region was made-up of items which were important in their own right, the other region contained those which were at achieving a greater goal or achieving goals through influence. This implies that the goal of environmental concern should be recognised in research design. It is common practice in environmental concern research to include items which achieve ends which are important in their own right and items which achieve important ends through influence (eg, McKechnie, 1974. Millbrath, 1984). This facet may account for much of the inconsistency between environmental concern measures found by Van Liere and Dunlap (1981).

11.4.7 Physical Scale.

A facet was present in 5 studies which reflected physical scale (facet f in the overall mapping sentence). This represented the physical scale of the conservational or environmental action or issue being investigated. The precise structure of the judgements embodied in this facet varied considerably between the studies in which it was present. In each instance of its occurrence this facet was present in a separate plot of similarity structure analysis to any of the already noted facets.

In one study in which this facet was specified, only 1 element was delineated. In the questionnaire investigation of the urgency of environmental issues, all issues specified were of urgency within the context of the United Kingdom. Consequently, no partitioning occurred in analysis for this facet. The effects of specifying 1 element of a content facet have already been discussed and will not be further commented upon.

In the analyses of the 2 studies viewing individual assessments using repertory grids, and in the effectiveness of actions questionnaire, a similar structure was present for the scale facet. In both of these studies this facet had 5 elements. This structure represented the 4 physical scales of global, international, national and local conservation. The findings from the questionnaire investigating the importance of conservation activities and issues were

similar to these but the local and national scale elements were collapsed into a single British element.

In all 3 of these analyses the facet formed a second life area facet. The elements were qualitatively ordered with elements circularly arranged around a common origin.

For each of the 3 circular arrangements of this facet a second modifying facet was also present in the same SSA plot. For the individualistic repertory grid study, the modifying facet was one of personal relevance. For both of the importance and effectiveness studies, the modulating facet was one of environmental relevance. It has already been commented upon how the 2 elements of local and national conservation were combined within a single circularly ordered region in the analysis of importance. The 2 elements were in fact present but formed a single region in terms of the life area facet.

The reason for this was due to the effects of the modifying facet. The national element was placed centrally within the British region, the local element peripherally. This demonstrates that the sample of respondents assessed the national items which were included to be of greater environmental relevance than those items which reflected a local life area.

A differently formatted scale facet was present in analyses of monetary pledges. In this, a scale facet was

present with 2 elements of large scale and small scale. These findings show the overall context of a research study (the mapping sentence used in its design) to significantly effect the manner in which respondents evaluate the scale of the actions and issues involved.

In previous research viewing social values (eg, Levy, 1986) a facet of physical scale has not been included in the research design. In each of these studies value was studied at the national scale. Consequently, scale has not been present in analyses. However, in the present research, a specific social value has been investigated rather than the broad concept of 'social values'. If other specific social values are delineated for facet investigation it may be expected that this facet will also be pertinent in design and analysis.

Levy (1979) conducted a research project which viewed political involvement. Whilst she did not include a scale facet in her design, it is interesting to note that all involvement items were of a national scale except for 2. These 2 items reflected political issues at a larger physical scale. The coefficients between these 2 items were extremely high (0.82). This may suggest the presence of scale discrimination present in evaluation. This however, is a question for future research.

A facet of physical scale has however, been found to be useful in the design of place evaluation research (Donald, 1985). This is of interest as the multi-

dimensional nature of evaluation in this study area was one of the reasons for employing a facet design in the present research. In place evaluation and experience studies, different physical scales have been discovered. The precise nature of this facet being related to the place under investigation and the samples purpose within this setting. For instance, Hackett (1985) included a facet of physical scale in an evaluative study of an international airport. The same questions about the design of the airport were given to 3 separate samples of airport users: passengers, visitors and staff. SSA of data from the 3 samples revealed a scale or a level of interaction facet to be present for 2 of the samples, however, the psychological processes involved were of a very different kind for the 2 samples.

"We originally proposed a scale of interaction facet. This was found to be present in visitors responses, ... but not in other groups. Visitor division was found to be in terms of, the terminal, the location, and the gallery. Passengers were found to employ a level of interaction facet, with staff revealing no structure along this dimension."

(Hackett, 1985. p 55-6)

Hackett interpreted these findings to support the claim of Donald, (1985). Hackett stated that:

"..... when no clear single goal can be identified then the level of interaction will be in terms of environmental scale."

(Hackett, 1985. p 56)

In the present investigation of social values and attitudes a similar relationship may have existed between the content area and the presence in analyses of a scale facet. For instance, the physical scale facet was present in the evaluation of importance and effectiveness of environmental concern activities. However, when evaluation was changed from these 2 forms of cognitive evaluation to behavioural pledges, the scale facet did not appear. Instead, in both of these cases a purpose facet was present. This facet will be discussed in detail in the next section. However, for a clear purpose to be identified a clear, and perhaps single, goal must also be identifiable. In pledging their own time and money it may be proposed that respondents indeed possessed this clarity. Whereas, in the theoretical cognitive assessments, purpose was less well defined.

This is an important finding in this context of social value research as it has direct consequences upon the design of attitude research, social values research and environmental concern research. Different behavioural modalities cannot be employed as equivalent and comparable measures of environmental concern. Reasons for this statement have already been noted. However, the presence of 2 different types of facets (scale and purpose) which are dependent, to some extent, upon the modality of assessment, gives more support to this contention.

A further scale facet was present in one analysis. This was a time scale of effect facet.

11.4.8 Time Effect.

Similarity structure analysis of the data from the environmental hazard questionnaire revealed a structure for a time scale of effect facet. This facet had a linear structure and caused hazard issues to be arranged along a straight line. This line had at its one end hazards which are having an effect at present time. Progressing along the line the next element was one of hazards which respondents judged to pose a serious future hazard. The final element was one of items assessed to have little or no serious effect.

On its one occurrence, this facet appeared alone in a plot. The fact that this facet appeared separately suggests that the evaluative criteria it embodies are relatively independent processes.

The facet approach social value literature has not previously included a time scale facet in its design, neither has one been reported in exploratory facet analyses in other research areas. Consequently, this facet cannot be related to previous research. Furthermore, in the present studies, the environmental hazards questionnaire was the only study which possessed this facet. Therefore, little can be stated about this facet. Its presence in the format specified above states

clearly the way in which respondents evaluated the time scale of effect. Future research could usefully benefit from designing investigations into other environmental topics which included these, and perhaps other, time scale elements.

From the elements which comprise this facet it can be seen that this facet was intimately linked to the perceived seriousness of the environmental hazard. This is not surprising as they range into which responses were gathered was a range of perceived seriousness. It does however re-iterate the claim that the scale facet is sensitive to the form of the response which will be gathered in a survey.

The physical scale facet has now been presented. However, it has already been noted that a facet of purpose was present in some analyses. Furthermore, this facet may constitute a scale facet in the contexts of the research in which it occurred. This facet will now be considered.

11.4.9 Purpose.

The final content facet to be discussed is the facet of action or issue purpose. This facet occurred 3 times in the 9 analyses. The facet was present for the studies requiring the instrumental involvement of money and time and in the group repertory grid study. On all occasions

it dichotomized involvement items into actions which achieved their own ends, and actions which were for a greater or more superordinate purpose.

The facet appeared on a separate plot of analysis in the time pledge study and the group repertory grid study. However, with monetary pledges this ordered facet interacted with the life area facet to form a duplex structure (Brown, 1985). The presence and structure of this facet show it to play a quantitative role in structuring involvement.

In the time pledge and group repertory grid study, respondents were being asked to evaluate their own levels of time involved with each of the specified environmental concerns. In both of these situations the evaluations which were performed were independent of other assessments which respondents made. However, with the monetary pledge commitment, respondents judgements of purpose were intimately related to the type of activity their involvement was supporting. The presence of these differences in the judgements which are made further support the hypotheses that all measures of environmental concern are not equivalent.

An ordered facet which causes the structuring of responses in terms of instrumentality or cognition has been found to be present in facet research into socio-political involvement (eg, Levy, 1978, 1979). However, this facet was an involvement modality facet which

modified the life area of the specified issue. Consequently, the present ordered facet which is of action purpose cannot be directly compared to existing research. A facet which contains the purpose of a value or involvement represents an important extension of the mapping sentences which were used to generate the present research.

11.4.10 Background Facets.

A background facet included in each study was one of respondent type. This is specified in the overall mapping sentence as 'p'. This facet has 3 elements which reflect the 3 different samples used in the surveys. These were, students, members of the general public and conservation employees. Each of the studies contained a sample from only 1 of these groups. As a consequence of this design, and the different measurement instruments used in each investigation, no comments regarding the variation in responses due to background facets can be made. However, this was not the intention of the research.

11.5 Partial Ordering of Elements

The facet elements from the similarity structure analysis were subjected to further analysis. This was undertaken in order to reveal the joint ordering which was present in assessments of the seriousness of environmental

hazards. This particular study was chosen for this form of analysis for several reasons which were presented in the results section. Furthermore, to perform POSA upon all data sets would have been unduly time consuming and may well have produced confusing findings which were beyond the scope of the present investigation. The environmental hazard study which was selected contained a dichotomised life area facet and a linear scale facet (ordered facets being applicable to POSA). The structure of this POSA may not be present in all of the studies. Indeed, as the similarity structure varied between studies, partial ordering would also be expected to differ. A researcher is therefore required to perform a POSA of his/her own data. What is achieved through the current POSA is the demonstration of the techniques usefulness in allowing further statements to be made about a data set.

These statements allow individuals to be identified with respect to their response profile in an investigation. The POSA which has been performed demonstrates this to be a useful analysis procedure in environmental concern research.

All partial order scalogram analyses plot the quantitative and qualitative dimensions of the research content. The Hasse diagram in figure 9.7, specifies the quantitative dimension from very serious to not very serious (this is the response range of the investigation). Plotted at 90 degrees to this is the

qualitative dimension. Respondents located at the one end of this dimension were those who assessed all life areas of hazard to be serious (both human/social and ecological). These respondents also tended to be relatively unconcerned about hazards which had no present or future effects.

Positioned at the other extreme of this dimension are respondents who rated the human and ecological effects as being of low levels of seriousness and who perceived, as very serious, future hazard effects and who scored highly upon the no present effects element. From this it is possible to state that respondents tended to fall into 2 structural categories. the first category of respondents perceived as serious all hazards which may be considered to be 'here and now' hazards. Whilst the second group were more concerned with the possible future effects of hazards.

The 2 groupings described are not typical of all respondents from the sample. However, the qualitative and quantitative dimensions described in this analysis are the only systematic dimensions which discriminate between individuals. Whilst some respondents will be characterised by the dimension, others will be represented less perfectly. Furthermore, the facet elements which are specified in the Hasse diagram in figure 9. systematically structure responses. Other elements were discovered to be playing less important or

less consistent roles.

The important points to be noted from this POSA are as follows. The facets identified, and their respective elements, are important dimensions or criteria along which respondents may be differentiated. This differentiation may be of a qualitative or a quantitative kind. Through the use of POSA responses are not simply used to understand the content area of an evaluation (as is done with SSA). In these analyses, respondents may be typified within the context of the research area in terms of their actual scores upon each of the facets within the research area.

These findings allow further support to be given to the facets identified in the similarity structure analysis. Thereby, these results support the multidimensional hypothesis of environmental concern, and the hypotheses of the facet and facet elements proposed for environmental hazard attitudes.

Having discussed the findings in terms of their facet structure, the questions regarding the dimensionality of environmental concern, posed at the start of the research, can now be addressed.

11.6 Facet Elements of Environmental Concern.

The results of similarity structure analyses have revealed facets (or dimensions) of environmental concern. Partial order scalogram analysis of the element scores,

from one survey have further supported the multi-variate descriptive model proposed in an overall mapping sentence. This multi-dimensional descriptive model of environmental concern has important implications in environmental concern research design. The mean scores for facet elements further illustrate this need for careful design which takes into account the variation due to these facets.

Mean scores have been calculated and presented in chapter 10 (tables 10.1 to 10.6). The presentation of these scores have enabled some interesting relationships between elements of the facet model to emerge. Statements have been made about these relationships in chapter 10. Some of these will now be re-iterated as they apply to the design of research to investigate environmental concern.

Table 10.1 shows that the overall importance of environmental concern issues and activities is rated quite highly, whilst effectiveness is rated somewhat lower. Respondents were also more willing to pledge money than time. This order of the behaviour modality facet elements (important - effective - time - money) was present in all analyses. Effectiveness is to a large extent negatively related to all other modalities. This is illustrated in tables, 10.3 and 10.4. In these 2 tables the life area elements are broken down by behaviour modality (table 10.3) as are the scale elements table 10.4.

Table 10.3 shows the life area element of ecological conservation is rated more highly than the social conservation element, in importance modality and the 2 instrumental modalities. However, the order is reversed by altering the modality to effectiveness. Table 10.4 shows a similar effect due to the specification of effectiveness as the modality facet element, in reference to physical scale elements. The elements of importance and the 2 instrumental modalities are not identical, but a degree of commonalty exists. The modality of effectiveness conversely has an meaning which is reversed relative to the other modalities.

Table 10.5 presents a breakdown of mean scores for a 3 way combination of scale, life area and modality facet elements. From this table it can be seen that the reversed relationship between the effectiveness modality and other modalities is less consistent. A similarity between the importance modality and the 2 instrumental modalities does however still exist (although this is less perfect than in the previously presented tables). Several important points can be made from these relationships of element order.

From the comparisons of mean scores it is important to note that the degree of support for environmental concern given by respondents varied according to the measurement taken. Also, by changing the range of responses it is possible to reverse the psychological meaning of a scale.

Furthermore, as more facets were included within a comparison of mean scores, the relationship between any 2 facets of the evaluation became less predictive in their nature. These findings have important implications upon the design of research. They imply that the researcher must take great care in designing observations and in clearly specifying response ranges. It also illustrates the point that as more complex research items are defined, the internal consistency of observations is likely to be reduced. These caveats do not invalidate the study of complex behaviours associated with environmental concern, neither do they remove the possibility of employing multiple response ranges in research. Their implication is that research must be aware of these findings. From the findings of this research a simple solution which will allow research design to conform to these standards would be to use and adapt the mapping sentence in figure 11.1.

A further important point made by the mean score analyses is that a specified facet (for instance the behavioural modality facet) can have direct substantial effects upon the data gathered. However, in research into complex multi-variate events, the effect of any given variable, facet or dimension will be mediated by all other facets, variables, etc., included within a design. Without carefully specifying all facets in a design, variation within a data set cannot be thoroughly understood. In the context of environmental concern, the facets of the

overall mapping sentence (figure 11.1) need to be clearly specified in relation to the specific environmental concern context of a study.

Having discussed the facet structure of environmental concern and the implications of this structure for research design, the next section will consider the dimensionality of the research area.

11.7 The Dimensionality of Environmental Concern (Conclusions).

The initial question which motivated this research was "how many dimensions are present in environmental concern attitudes, and what is this, or what are these, dimensions"?

A different question has been posed in the literature which has developed out of an uncertainty of the dimensionality of Environmental Concern. This has been explicitly stated as, do all measures of Environmental concern measure the same underlying concept? Van Liere and Dunlap (1981) reviewed this and concluded that measures were measuring differentially the concept of Environmental Concern. They concluded by stating the need for;

"... further research is needed to clearly establish the boundaries of the concept of Environmental Concern"

(Van Liere and Dunlap 1981 p670)

The findings from the present research have investigated the dimensions of Environmental Concern. These (it may be argued) form the dimensions, at the extreme ends of which, may be found these boundaries. The location of these boundaries is a matter for future research, the facets provide the design for this inquiry.

There has been disagreement regarding the dimensional structure of environmental concern in the literature (de Haven-Smith 1988). Psychological research has usually stopped short of directly investigating the dimensions of environmental concern. Instead, imprecise statements have been made about uni-dimensional hypotheses (Tognacci, et al. 1972) or multi-dimensional (Van Liere & Dunlap, 1981; Cotgrove 1982) structures being the most appropriate solutions. The doubts which have been expressed regarding the uni-dimensional hypothesis have usually been in the form of questions such as; "will the environmentally concerned individual be equally concerned with all environmental issues (de Haven-Smith, 1988).

Some research has found that there is a strong positive relationship between all measures of environmental concern issues (eg, Tognacci et al, 1972). However, other research has found this to be missing (eg, Van Liere & Dunlap, 1981). These latter findings have led to the hypothesis being forwarded by some authors that support for environmental actions are issue specific (Connerly, 1986).

Cotgroves's (1982) data supported the existence of a 3 dimensional structure being present in environmental concern attitudes. The dimensions Cotgrove (1982) proposed were of damage, shortage and nature. However, the dimensions which were suggested were each composed of relatively few representative items. Furthermore, no precise statements were made about 2 important characteristics of the dimensions: Neither the psychological nature of the proposed dimensions, or the interrelationships between the dimensions, were specified. Both of these have been major tasks of the present research.

This research has addressed several different substantive types of environmental concern. Studies were designed so as to employ different environmental concern measures. The reason for doing this was to answer the question of whether different types of environmental concern measure are equivalent. To state this more explicitly, researchers have asked, in a variety of ways, the question; 'do all (or different) measures of environmental concern measure the same underlying environmental concern concept and to a similar degree and in a comparable manner?' (Weigel & Weigel, 1978. Van Liere & Dunlap, 1981).

The theoretical model developed by Van Liere & Dunlap (1981) to account for inter-measure variation was also investigated in the present research. The results found

considerable support for the authors 2 dimensions. These authors claimed that if the 2 dimensions were not held constant between different environmental concern studies then these differences in research instruments would account for variations in research findings. The 2 hypothesised dimensions were based firstly upon, variation in the substantive content of research (the incorporation of different environmental issues within a single research instrument). Secondly, they identified a dimension which embodied variations in the theoretical conceptualisations which had been used to develop measurement items (the scaling procedures and the range into which responses were gathered).

The claim that variation in the findings of environmental concern research is due to differences in the measurement scales used (reviewed by Van Liere & Dunlap (1981) is supported in the present research. This is shown by the differences in facet structure which were present in assessments and which were due to the range into which responses were mapped. The hypothesis that another cause of variation was due to substantive issue variance is also upheld. Support for this claim is illustrated by the presence of a content 'facet structure' for environmental concern.

The research therefore supports Van Liere and Dunlap's 2 hypotheses. These being that environmental concern is multi-dimensional and that differences in the results

from a number of research studies is due to substantive and theoretical variations in research design. However, the present research continues beyond a conclusion which simply denotes the presence of this variance. It is now possible to state that variation will be present along the specified facets of the overall mapping sentence (figure 11.1): Substantive variation is due to 9 facets.

In all studies (except the general study) a qualitative life area facet was present. This facet was often accompanied by either a qualitative or quantitatively differentiated scale facet. The evaluation criteria present in these facets were often modified by assessments of the personal and/or environmental importance of the specified environmental concern action or issue. The structures discovered, have been discussed in detail above, as they pertain to specific studies. It is interesting to note that this 4 facet structure was common (or though often in a modified form) to many of the results.

The specification of the findings of the research in table 11.1 includes a listing of all of the facets of assessment which were present in each study. It has therefore been clearly demonstrated that the range along which responses are gathered, together with the modality of behaviour which is being assessed, have very important effects upon the data gathered. The different ranges and modalities which may be employed are differentially related to environmental concern. As a consequence of

these findings it may be stated that any study which inter-mixes different substantive issues (modalities) or theoretical conceptions (ranges) may produce results, which at best, do not form a component with a cumulative body of environmental concern literature.

The findings from the present research would also advise caution in adopting standardised measurement approaches. This is due to the different structures which emerged for the different assessments of environmental concern. By unsympathetically using a standardised assessment package, in the context of environmental concern monitoring, a structure could easily be imposed upon the data by the researcher.

It is clear from the data presented in table 11.1 that there are several dimensions to environmental concern. The precise number of dimensions being dependent upon the precise context of the environmental concern attitudes and social values being investigated. However, most environmental concern issues and activities can be accurately depicted using up to 4 selected facets from the overall mapping sentence.

The behaviour modality of responses will also become important in a research study in which affective responses are included. Furthermore, the facets which should be included in a study, their structure and the elements of a facet, are all dependent upon several

factors. These factors being the precise issues, actions and design of the research. The claims made above are supported by the variation in the number and type of facets, and facet elements present for each of the 9 studies (these are contained in the cells of table 11.1).

Several researchers have been criticised for not using comparable criteria to indicate environmental concern (Van Liere & Dunlap, 1978). The results of the present research suggests that there is a diverse nature to this concern. However, diversity is predictable using the facets of the overall mapping sentence and applying these appropriately to a specified research setting. Consequently, it would be appropriate to develop a standardised questionnaire for the investigation of environmental concern using the overall mapping sentence.

It should be noted that careful specification of both content facets and mapping range are necessary as context influences the format of these facets. Therefore, an alternate approach to environmental concern research would be to use the overall mapping sentence to design instruments which are specific to each environmental concern investigation. The employment of the overall mapping sentence in research development would ensure 2 features being present in research. Firstly, the research would clearly address the semantic area of environmental concern which the researcher was wishing to investigate. Secondly, the results produced in this way

would be directly comparable with other environmental concern research employing this design. Consequently, the findings of studies would be cumulative.

Both the literature on facet theory design (Canter, 1982b, 1983) and the findings of the present research, would suggest that facet theory approach could be beneficially employed to guide future environmental concern research. This would guide the researcher to produce standard instruments by requiring them to develop and modify the mapping sentence developed in this thesis in their own research design.

The ability of mapping sentences to co-ordinate research in applied fields has been previously documented (Levy, 1976. Schlesinger, 1978).

"A mapping sentence is frequently both the start and the conclusion of a research project. It is not necessary that a mapping sentence identical to the one which helps initiate the project will also be produced at its end. Indeed, one may think about a piece of facet research as a process of refinement, elaboration, and validation of a mapping sentence."

(Canter, 1985b p260)

In the present research a mapping sentence has been developed as a conclusion. The overall mapping sentence, and the individual mapping sentences for each study, have been refined, elaborated and validated as they are appropriate to the study of the social value of environmental concern.

Through using the overall mapping sentence in future investigations of environmental concern, the mapping sentence would be further modified and developed by researchers to the specific context of their investigations. The present research provides a starting point in further multi-dimensional investigations.

The initial aim of this research was to initiate further research into environmental concern. Research has been undertaken to illustrate this concern in a wide range of environmental issues and the results are presented in the following chapters.

Chapter 12.

Conclusion.

12.1 Introduction.

The initial aim of this research was to initiate facet theory research into environmental concern. Research has been undertaken to illustrate this concern in a wide variety of psychological contexts. This has culminated in the development of an overall mapping sentence.

From the results which have been presented above, a number of interesting and important conclusions may be drawn. In the following sections the main conclusions will be presented of the individual facets of the research, and from the overall mapping sentence.

The initial stages of this research were exploratory. The facets identified in these studies were facets of content. In the sections and studies which followed, this content was investigated. The research of this content was in terms of its attitude, social value and involvement components. These studies in effect allowed environmental concern to be investigated in context. The dichotomy of content and context is of course artificial: Content being dependent upon context, and vice-versa. In the section below, the content facets will firstly be presented.

12.2 Model of Environmental Concern

12.2.1 Facets of Content

As the area of the research had not previously been the subject of facet research no mapping sentence existed to guide research design. Consequently, the first 2 studies which were conducted did not use a mapping sentence in either their development, execution or interpretation. Instead, they formed an 'in-depth' investigation into the semantic content of environmental concern. This resulted in the identification of 3 main facets of content; life area, physical scale and relevance. Other facets were added in later studies.

12.2.2 Life Area

The facet of life area was discovered to be present in both of the exploratory studies. Furthermore, the structure of this facet and the elements which composed it, were similar in both. The discovery of a life area facet was of little surprise as this form of facet has been discovered in many other faceted investigations (Levy, 1981a,b,d).

The facet was composed of 3 elements in the exploratory studies. These were of social conservation, educational conservation and ecological conservation. These elements were circularly arranged, showing the differentiations and interrelationships between them.

between elements to be qualitative. The circular order reflected the primary target of an environmental concern activity or issue. Issues which were assessed as being aimed to benefit humans (eg, provisions of green spaces, cleaning cities) formed one position in the circle. An opposite position was formed by actions and issues which were primarily ecological (eg, saving Blue Whales (for their own sake)). Sandwiched between these two elements of life area was found educational conservation, which appeared to link the other 2 elements. The arrangement of elements showed respondents to clearly identify environmental concern along this continuum.

This structure of life area was included in all research instruments used in the questionnaire studies. However, analysis of these studies revealed different cognitive structures to be pertinent when environmental concern attitudes, values and involvement were investigated.

Two studies of environmental concern attitudes were conducted. These viewed the urgency of environmental issues and the seriousness of environmental hazards. In both of these studies, the same underlying social - ecological qualitative dimension was present. This structure was modified by the context of the inquiry. Neither assessments of hazard seriousness or issue urgency were perceived to possess an educational element. Furthermore, the ecological element of the urgency survey was sub-divided into the 3 regions of, wastes, pollution and depletion. This illustrates that, the precise

subject which is being investigated, and the type of evaluations which respondents are required to make, will significantly effect responses.

This point is further supported by the analyses of the 4 remaining questionnaire studies of the importance and the effectiveness, of environmental concern, and the degree of expressed willingness toward involvement.

In the first 2 of these analyses, the life area facet took a structure which reflected the social - ecological arrangement. However, the precise elements of this facet were of habitat, species and morals. The difference in the elements which were present was due to requiring respondents to make value assessments along different response ranges. This effect is also present when respondents were asked to pledge involvement. The life area of involvement changed quite drastically from the structure of life area which has so far been presented. In both involvement surveys, the life area facet had elements of protection, control and development. These elements differentiate the types of actions with which respondents were being asked to become involved.

From the above findings 2 important claims may be made, both of which have an effect upon environmental concern research. Firstly, the presence of this facet in all of the individual analyses of the studies undertaken show this to be a very pertinent facet of environmental

concern attitudes, values and involvement. As a consequence of this pertinence, research should specify the life area facet in its design. Secondly, the variation in the precise nature of the elements which composed the facet between different studies suggest that great care should be taken in specifying the elements of this facet. A social - ecological division was present in most analyses. However, changes occurred due to both the substantive content and the response range of the research.

A second facet of the content of environmental concern is that of its physical scale.

12.2.3 Physical Scale

This facet was present in the individual exploratory study and the importance, effectiveness and money questionnaire. In all cases the facet had elements which reflected the geographic scale of an action or issue. The precise elements of this facet differed between studies, in a similar way to the life area facet,

In the analyses of the individual repertory grid, and the importance and effectiveness questionnaires, 4 or 5 facet elements were present. However, in assessments of monetary pledges, only 2 elements were present. This demonstrates that respondents making cognitive assessments made fine differentiations of the activities and issues they were assessing. However, in the case of

instrumental assessments, discriminations were less refined. The validity of this statement is a subject for future research. Furthermore, the cognitive evaluations were circularly arranged, whilst the instrumental evaluation was quantitative. This demonstrates that involvement is an instrumental activity which involves different assessments to those present in cognitive appraisals. The inclusion within a research instrument of both cognitive and instrumental assessment ranges, or the comparison of questionnaires of different ranges, will be confounded in terms of the physical scale of respondents assessments.

It should also be noted that the physical scale facet was not discovered within both exploratory studies, or included within each design. This may however be a confusing finding as a single element (a single scale) may have been present in these studies. The presence of this facet in several of the analyses does show this to be an important source of variation in research data. Consequently, the physical scale facet should be explicitly stated in research design.

The sections above have both presented polar facets (and in 1 case a linearly ordered facet). These polar facets have been found to qualitatively differentiate responses to questions about environmental concern. A further facet which was present in nearly all studies was a facet of environmental relevance.

12.2.4 Environmental Relevance

On all but 1 of the occurrences of this facet it was found to possess a modulating structure. This is the structure of a facet which is found in a plot to have centrally and peripherally placed elements. Items which comprise the central region are more similar to other items in an analysis in reference to the modulator. It is also often the case with a modulating facet that it is discovered in the same plot of SSA as a polar facet. It is therefore possible to state that the centrally located items are classified by the 2 facets concurrently.

Environmental relevance tended to be a modulating facet. The presence of this facet in research design is of great importance as modulation is a form of modification. This facet was found to modify the assessments of both the life area and the physical scale facets. What this means in effect is that the life area and physical scale of environmental concern are qualitative distinctions which must be specified in research design. However, each element of both of these facets has items which may be of central or peripheral environmental relevance. This implies that the design of environmental concern research should enquire about the life area and scale of concern, both at different levels of environmental relevance.

The structure of this facet was relatively constant. The structure did alter in 2 cases. In the questionnaire

survey of problem urgency, the facet had central and peripheral elements. However, the facet appeared in a plot of its own and did not modify qualitative assessments. In the seriousness study, the facet took a totally different structure. On this occasion the facet was linear with elements arranged from greater to lesser environmental relevance. These findings show that in certain circumstances, the facet of environmental relevance can play an independent quantitative role in structuring responses. Therefore, the researcher should carefully specify the role this facet plays within the design of attitude assessments: In many instances it may not be appropriate to ask questions of environmental relevance without first specifying relevance toward what (life area or action scale).

12.2.5 Personal Relevance

The facet of personal relevance was essentially of the same structure, and possessed the same elements, as the environmental relevance facet. Therefore, the statements made for this previously discussed facet, apply.

Each time this facet was present its structure was modular. Furthermore, the facet always modified the qualitative regions of the life area facet. This implies that subjects often referred the life area of an action or issue which was being addressed to themselves.

Perhaps the point of greatest importance in regard to this facet was that it was present in the same analysis as the environmental relevance facet. This shows that relevance can be accorded conjointly in terms of both the environmental and the personal. This necessitates research to consider both relevance facets in design. It also shows that the personal relevance of environmental concern should be investigated in terms of specific life areas.

12.2.6 Time

A facet which represented time scale was included in 1 study; attitudes towards environmental hazards. SSA of this data showed this facet to play an independent role in structuring responses along a linear quantitative dimension.

The elements of this facet are of particular interest. Placed at one end of the linear order were items which were assessed to be serious hazards at the present time. At the other end were located items which were not serious environmental hazards at the present time. Sandwiched between these poles were items which were evaluated as presenting future environmental hazards.

The presence of this facet implies that care should be taken in designing and interpreting research which includes multiple time scale elements. However, the facet was only included in the 1 study. Therefore,

further research is needed to investigate the universality of this facet in structuring environmental concern attitudes. The unusual elements of this facet may represent the elements of time scale evaluations across environmental concern in general. Alternatively, the elements may be specific to the present study. These too are questions for future research.

12.2.7 Purpose

The purpose of concern facet was present in the analysis of the 2 instrumental studies of environmental concern. In both of these analyses the structure of this facet formed 2 parallel regions. In the one element, items were contained which achieved an environmental goal in themselves (were undertaken for their own ends) whilst the other element comprised items which achieved goals through indirect means (influence).

The presence of this facet in the analysis of the 2 instrumental studies is of importance to design. It implies that not only is an instrumental act different in its level of overt expression, the criteria which are used to evaluate the effectiveness (or other forms of evaluation) of instrumentally differ to cognitive evaluations. The purpose of instrumental involvement is here being used as an assessment criteria.

Researchers must therefore employ careful design which

takes into account the modality of concern expression (cognitive or instrumental). Design must also be aware of the effect of the modality upon the presence of a purpose facet. Furthermore it would appear that instrumental studies should include a facet of purpose in their specification.

12.2.8 Behaviour (expression) Modality

Within the mapping 2 modality facets are present. The first of these represents the modality of the behaviour which is to be gathered in a study (cognitive, affective, behaviour). All of the studies were of the cognitive type. This facet will therefore not be discussed further. However, it should be noted that future research could be designed which investigated other modalities of environmental concern. For instance, conservation actions could be observed and these observations related to other facets of the overall mapping sentence (figure 11.1). This would investigate the usefulness of this taxonomy in guiding research into more overt behaviours which are related to environmental concern.

12.2.9 Behaviour Modality

The second of the behaviour modality facets specified the modality of concern. The facet elements were of cognitive and instrumental behaviours. The facet was not concerned with the modality of the behaviour which was to

be gathered, but with the modality of involvement.

This facet was employed differently to any of the other facets used in designing the present research. Different elements from this facet were not included within the same research instrument. Instead, each research study was designed around one of the elements. All instruments were of a cognitive modality excepting the questionnaires of time and monetary pledge. The questionnaire studies (studies 6 - 9 in table 11.1) included identical items but 2 studies were of a cognitive modality (studies 6,7) and 2 were of an instrumental modality (studies 8,9). The reasons for adopting this design have already been noted.

Analyses have shown that this facet is of considerable importance in structuring assessments of environmental concern. The instrumental and cognitive elements have been seen to have significant effects upon the structure of other facets of assessment. The structure of this facet has been commented upon as it relates to the facet of purpose. Indeed, these 2 facets are very similar to each other. The purpose facet however classifies items in terms of their scale of purpose (eg, activities which are undertaken for their own ends, and activities undertaken for more superordinate ends). The modality facet however divides actions and issues into assessments of cognitive and instrumental 'behaviours'. Moreover, the structure of the purpose facet is to a large extent

dependent upon the modality of assessments.

The bipartite division of modality has been expanded to include 'specific forms' of each modality. The results have shown this to produce psychological dimensions which may be negatively related to each other. It is therefore obvious that this facet requires careful consideration and inclusion in the design and analysis of observations.

12.2.10 Goal

This facet specified environmental concern as being issue or action. The facet was derived from the mapping sentence for social values (figure 7.1). However, in the present research none of the studies contained both elements from this facet. However, this is a facet which would benefit from inclusion within future research into environmental concern.

12.3 The Model of Environmental Concern in General

A number of general conclusions may be drawn about the model of environmental concern. It is clear that a general model for environmental concern has been established in the form of an overall mapping sentence. Mapping sentences have also been developed for each of the research studies. From this it is apparent that no more than 4 facets define variation within any one study. Furthermore, this is a generalisable and coherent structure. This generalisability is evident from the 9

analyses which have been presented. The evidence presented therefore represents a significant increase in the understanding of environmental concern.

The overall mapping sentence, and the ways in which it has been applied to specific environmental concern research, has been discussed. The generality of the template it provides suggests a wide number of possibilities for its future use. The model the mapping sentence provides may be used to further investigate environmental concern (this has been suggested in earlier sections). This is also the case with concern which is expressed through behavioural modalities other than cognitive. Repertory grid and questionnaire methods have been used and both have produced data supportive of the mapping sentence. Other data collection methods (such as secondary sources, eg, society membership) could be used separately and with verbal collection methods. Furthermore, the mapping sentence could be employed to re-interpret many of the findings of environmental concern research in the literature.

The use of the mapping sentence could also facilitate the comparison of different research projects. The differences between projects could be of many different kinds. For example, using the mapping sentence template, assessments could be made of different environmental issues, and solutions to these issues within a single population. This would allow the direct

comparison of alternative future scenarios. A variation upon this would be to investigate the same (or different) issues and/or concerns across different populations. The standard framework provided by the mapping sentence allowing comparability of results.

There is a need to continue research by applying the mapping sentence to other environmental concerns with different respondent samples. In doing this, the utility of the existing structure will be tested and adaptations and extensions made. The model represents a first attempt at developing a framework for environmental attitudes and this initial statement has been published and attracted attention (eg, Hackett, 1987a&b). Attention should therefore be directed at replicating this model. Subsequently, this model may then be expanded.

12.3.1 Background Variables

The mapping sentence could also be used to design studies investigating the association between environmental concern and background variables. One such study is at the present time being analysed. This has used the environmental hazard and urgency questionnaires and differences are emerging due to respondents gender. Many other background variables could be investigated in this way.

The use of this research template would result in directly comparable results. This may help to resolve many of the differences in associations between environmental concern and socio-demographic variables reported in the literature.

12.4 Model of Environmental Concern and Social Values and Attitudes.

One of the explicit aims of the research was to relate environmental concern to social values and attitudes. Through the use of what was termed at the start of this chapter 'context facets', this aim has been achieved. A mapping sentence, and thereby understanding, has been produced for environmental concern as a personal and social value and attitude. Furthermore, variation in respondents' understanding of this concern has been seen to be influenced by the context of the inquiry.

In general it can be concluded that a useful descriptive structural model of environmental concern values and attitudes has been produced. The integration of facets from mapping sentences for social values has allowed environmental concern to be investigated in this area of life.

12.5 Extensions of the model

The mapping sentence has already been used to design a questionnaire study concerned with third world issues.

The results from the analysis of this study leant support to the mapping sentence in this analogous semantic area (Phipps, 1988).

The ability of the mapping sentence to help design investigations of third world issues illustrates the existence of a great potential for future research. This is because whilst these issues are similar to environmental concern in that they embody a social issue, they differ in many ways. To successfully adapt the general mapping sentence for environmental concern to this research area, suggests that the sentence may be adapted to address and investigate other social problems.

Furthermore, the mapping sentence could be used to ask applied questions and help to provide answers to environmental problems. An example of this would be the proposed development of community forests (Countryside Commission, 1989b). Questions could be developed based upon the facet structure of this research. In doing this it would be possible to assess the impact, and attitudes about potential impacts, of these forest developments in a manner which is meaningful to respondents.

12.6 Summary of the Research Aims

The conclusion of this research will be in the form of a recapitulation of the research aims which motivated the current work.

The overall aim of this research was to develop a multi-variate description of environmental concern in the form of a mapping sentence. This has clearly been achieved. Furthermore, the model so produced provides a template for future research into environmental concern and possibly into other social issue areas.

A second aim of the thesis was to resolve the conflicting hypotheses regarding the multi-dimensional or uni-dimensional structure of environmental concern. This has been resolved in favour of the multi-variate depiction. Furthermore, the dimensions have been identified as facets in several contexts. The mapping sentence has been used to represent different behavioural modes of the expression of environmental concern. Personal and social attitudes of urgency, seriousness, the value, the effectiveness, and levels of involvement with environmental concern, as well as a variety of different contexts of concern (hazards, environmental problems, etc.) have all been viewed: This being the third aim of the research.

In achieving the above objectives the research has fulfilled its fourth aim. This was to extend facet theory research of social values and attitudes into this new research domain.

The final aim of the thesis was to adapt, to the environmental concern context, the published mapping

sentences used in the generation of the research instruments. These have been modified to fit the context of the current research. This has provided support for each mapping sentence as a multi-variate descriptive instrument within the specified content areas. Furthermore, achieving this has allowed the production of appropriate research instruments. The results of this have been the development of a multi-variate description of environmental concern.

These aims, and the findings they have generated, represent the most comprehensive multi-variate investigation of environmental concern so far undertaken. The findings represent a significant advance in both environmental concern research and in facet theory approach to investigations of values and attitudes. The mapping sentence taxonomy provides a template for the research domain. This may be modified and adapted to allow future environmental concern research to extend the understanding which has been developed in this thesis.

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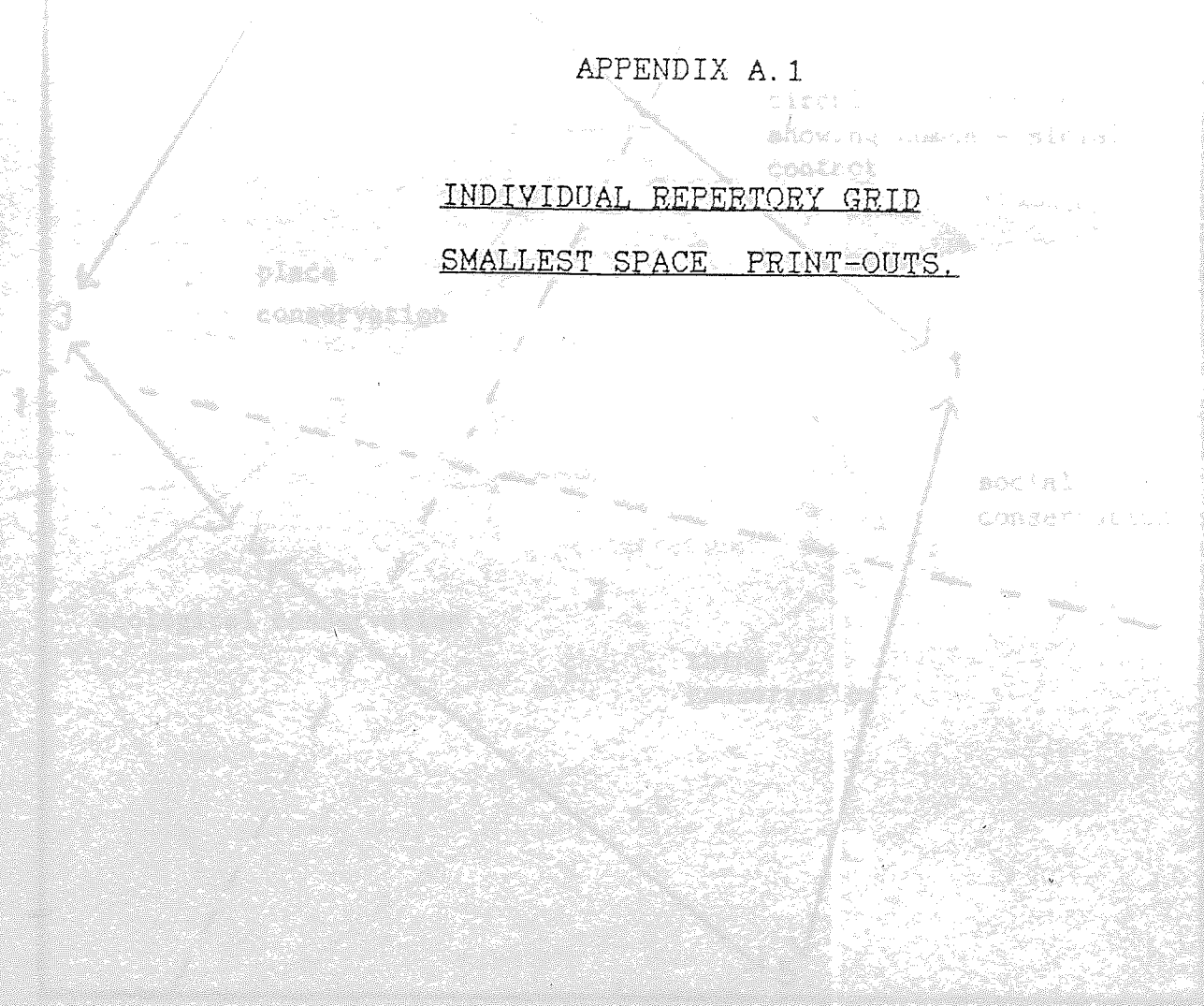
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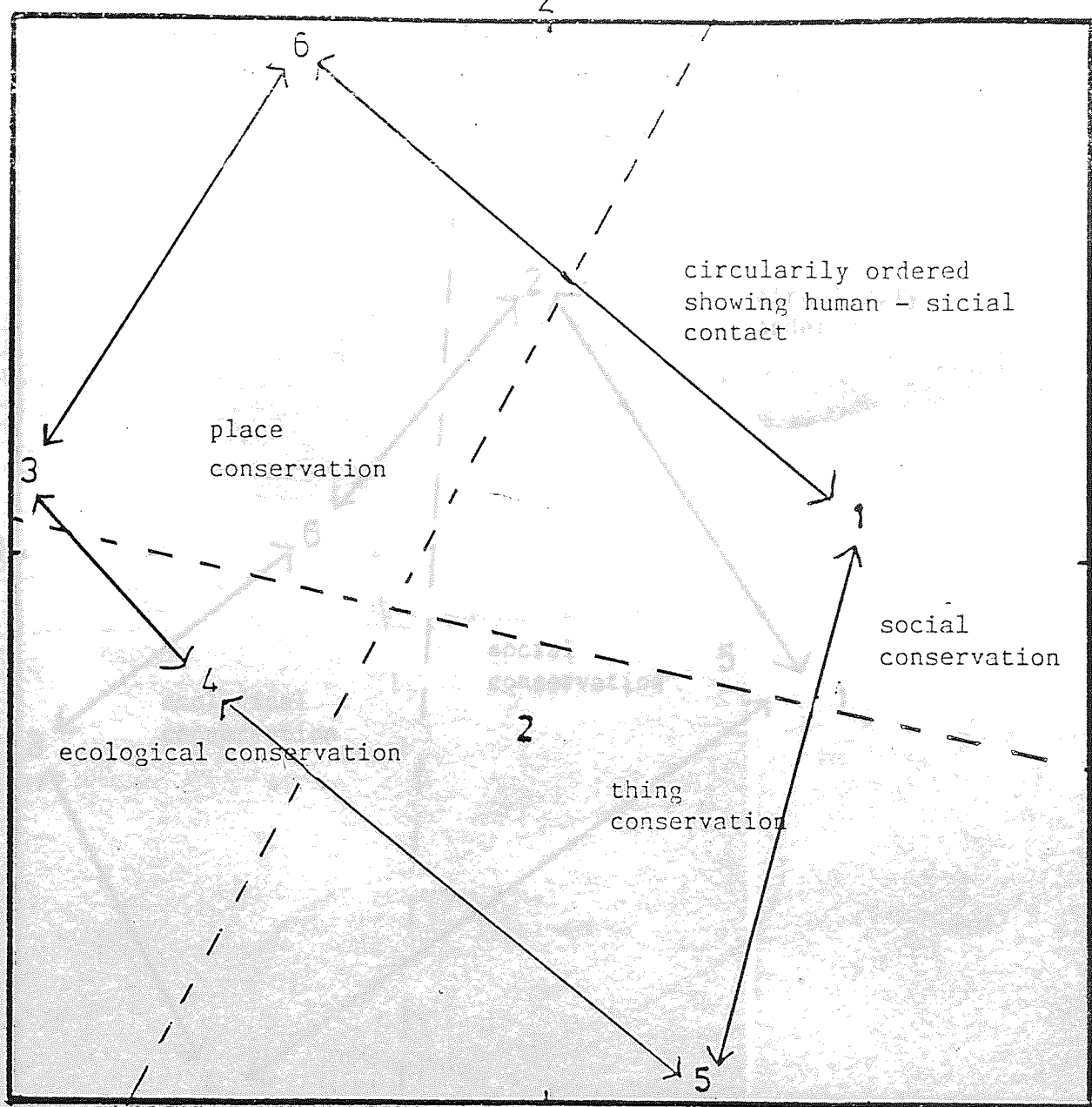
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APPENDIX A.1

INDIVIDUAL REPERTORY GRID

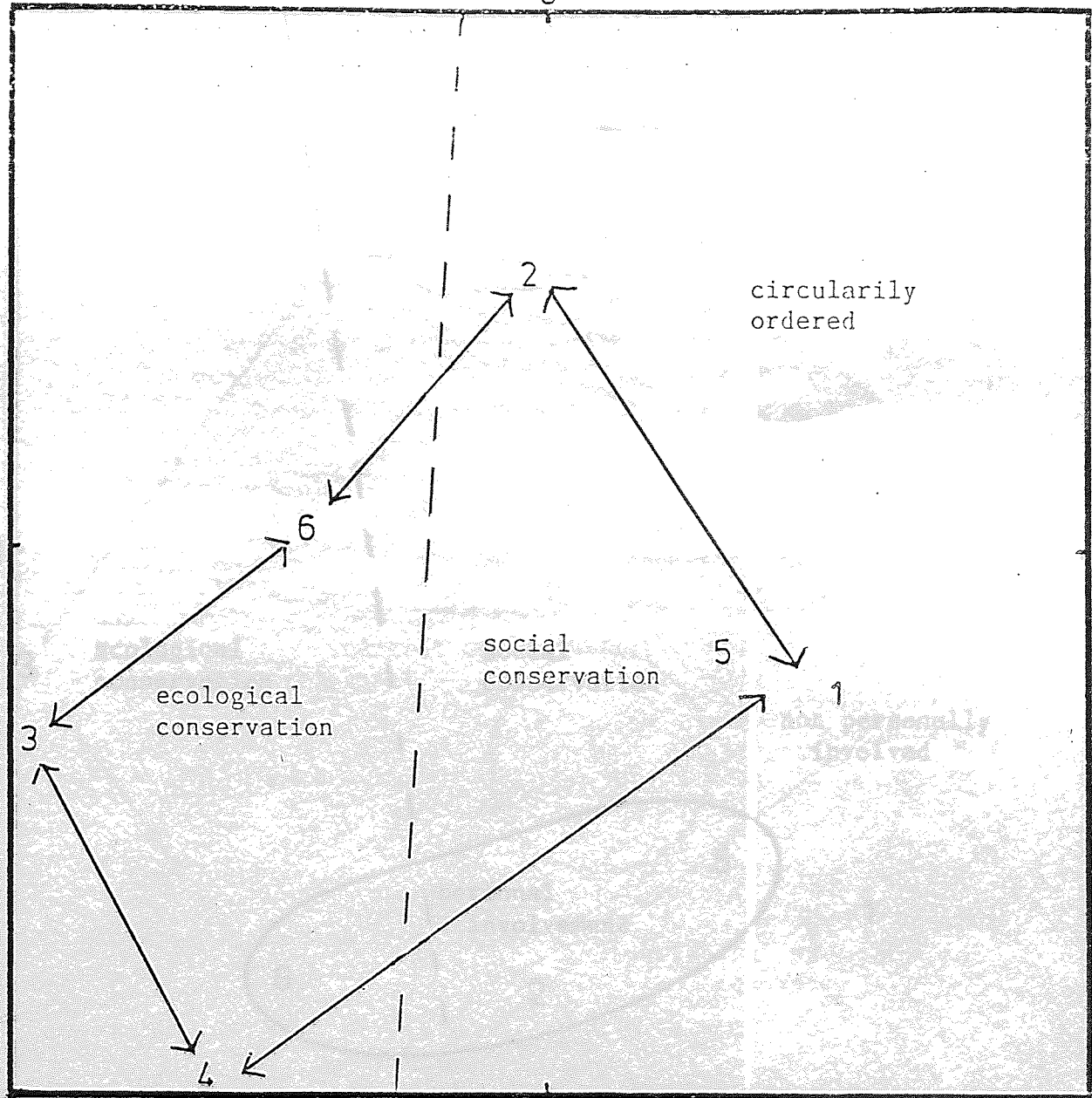
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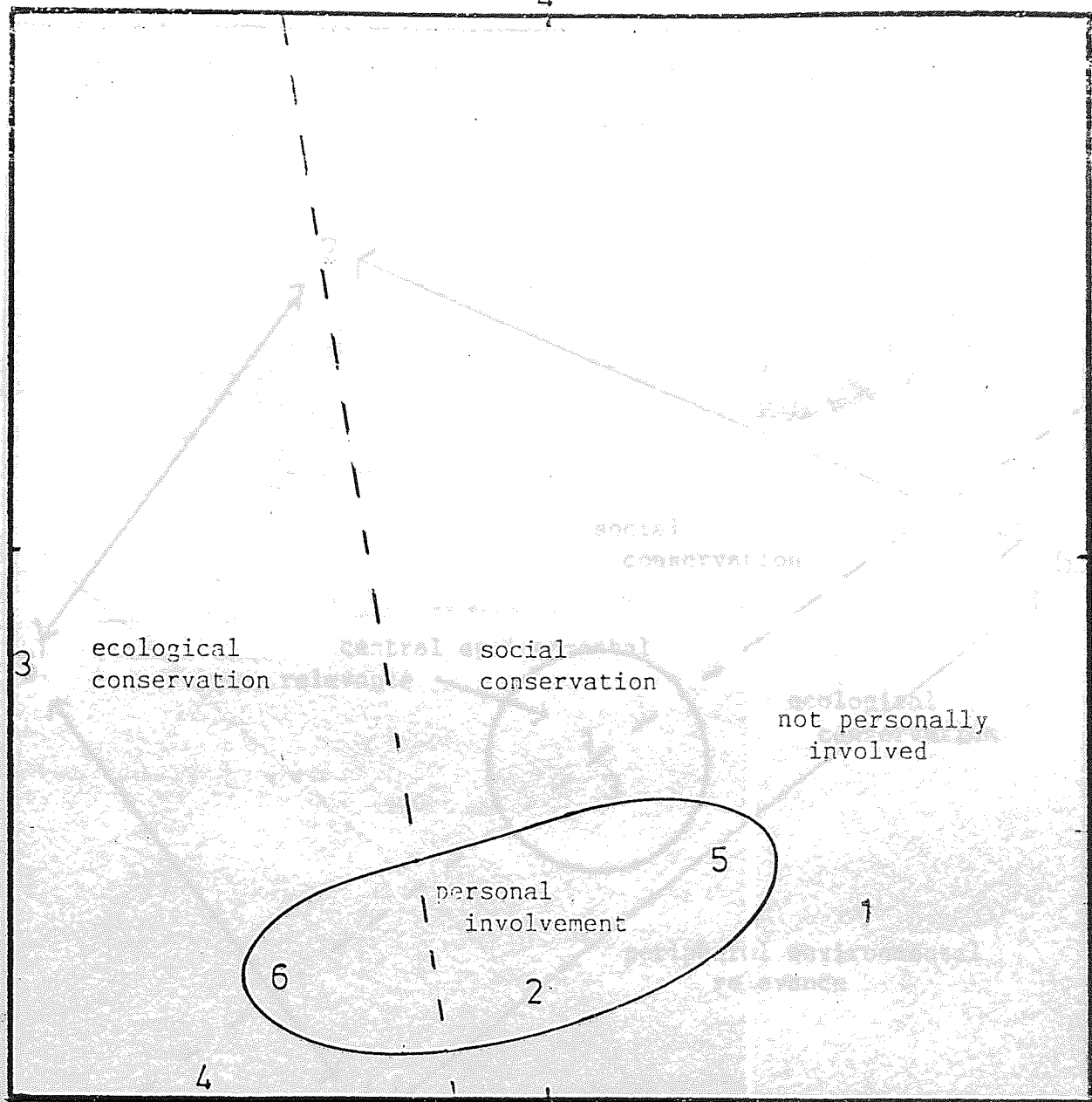


GL 0.07

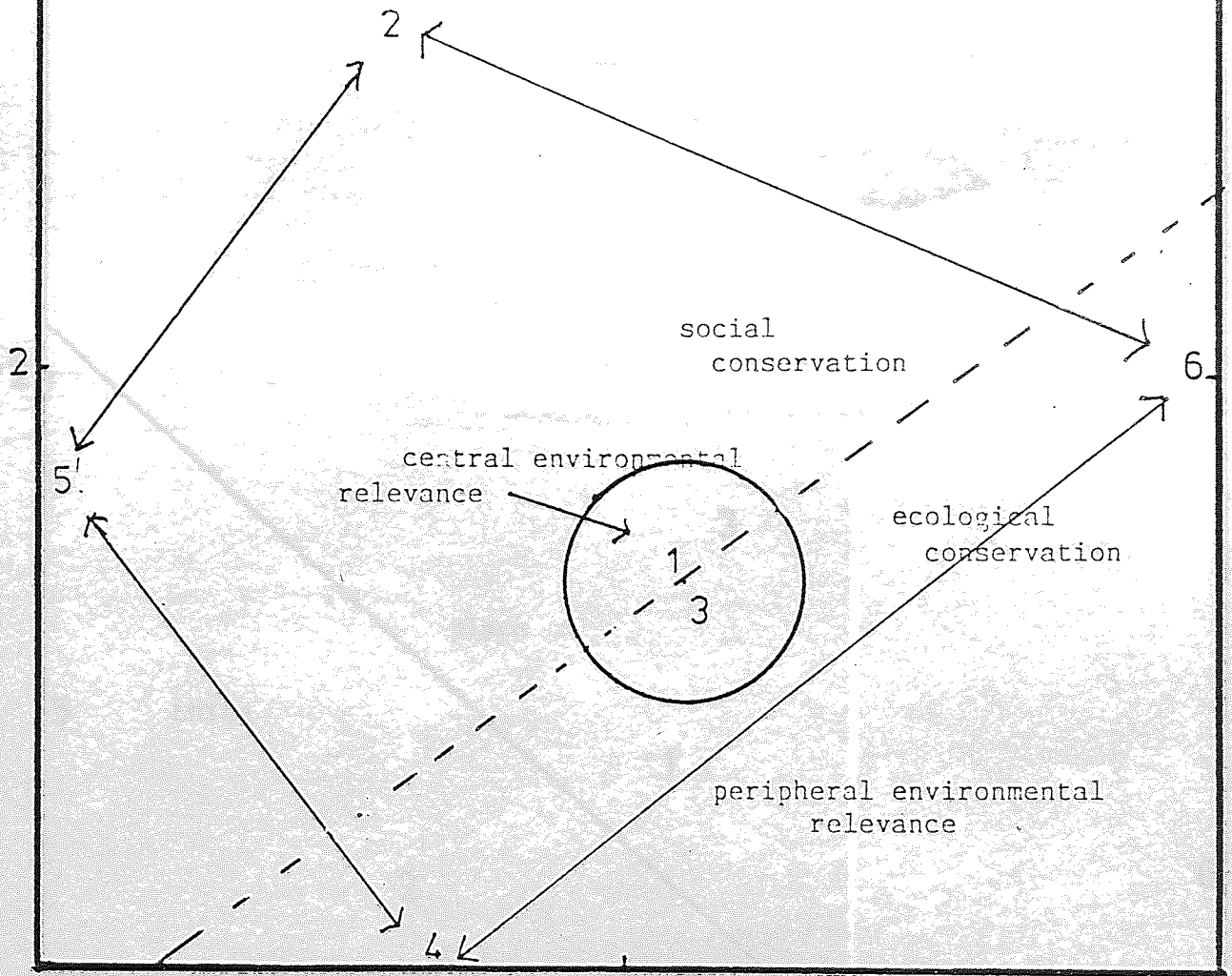
subject 1.



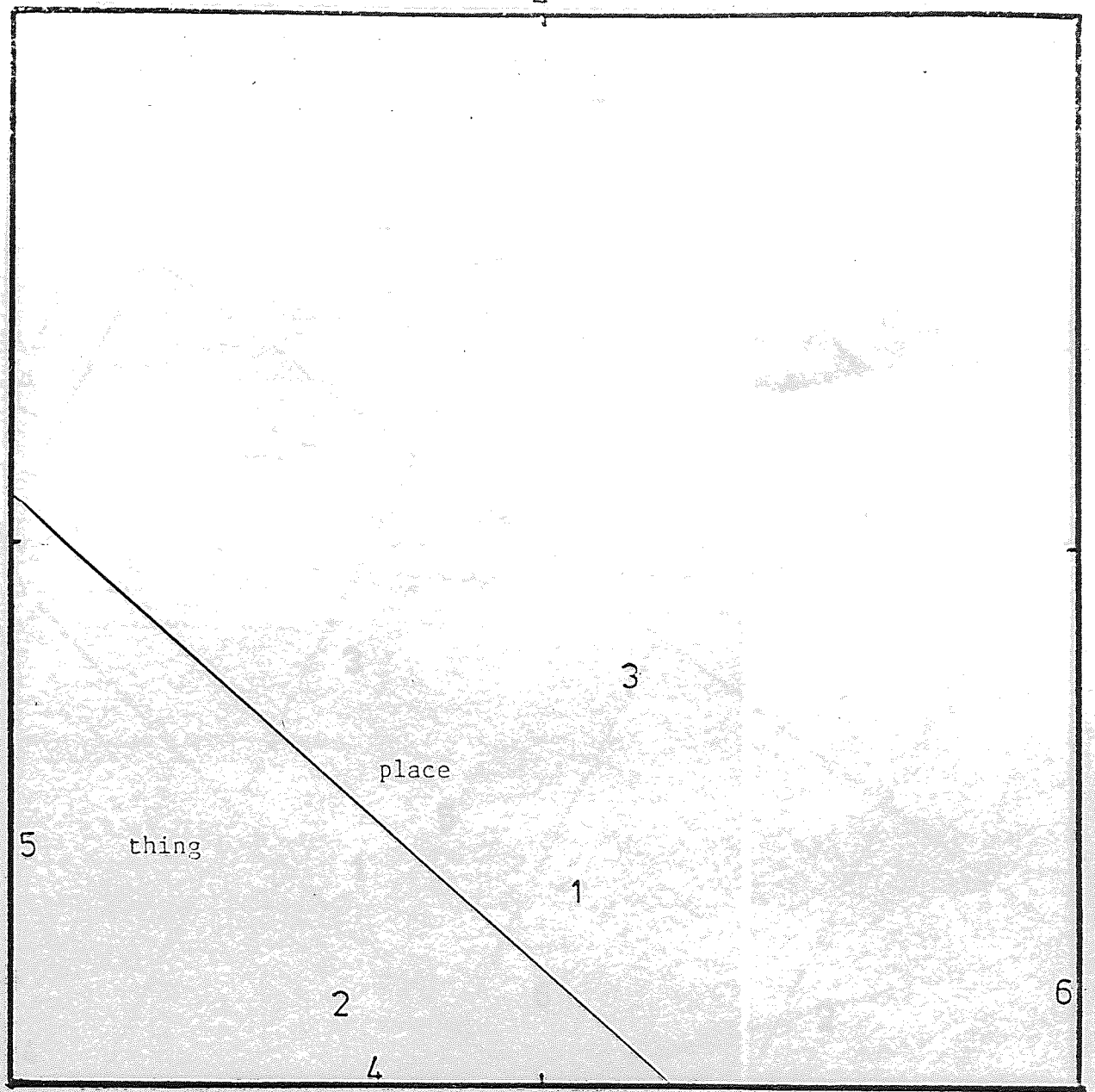
subject 1.



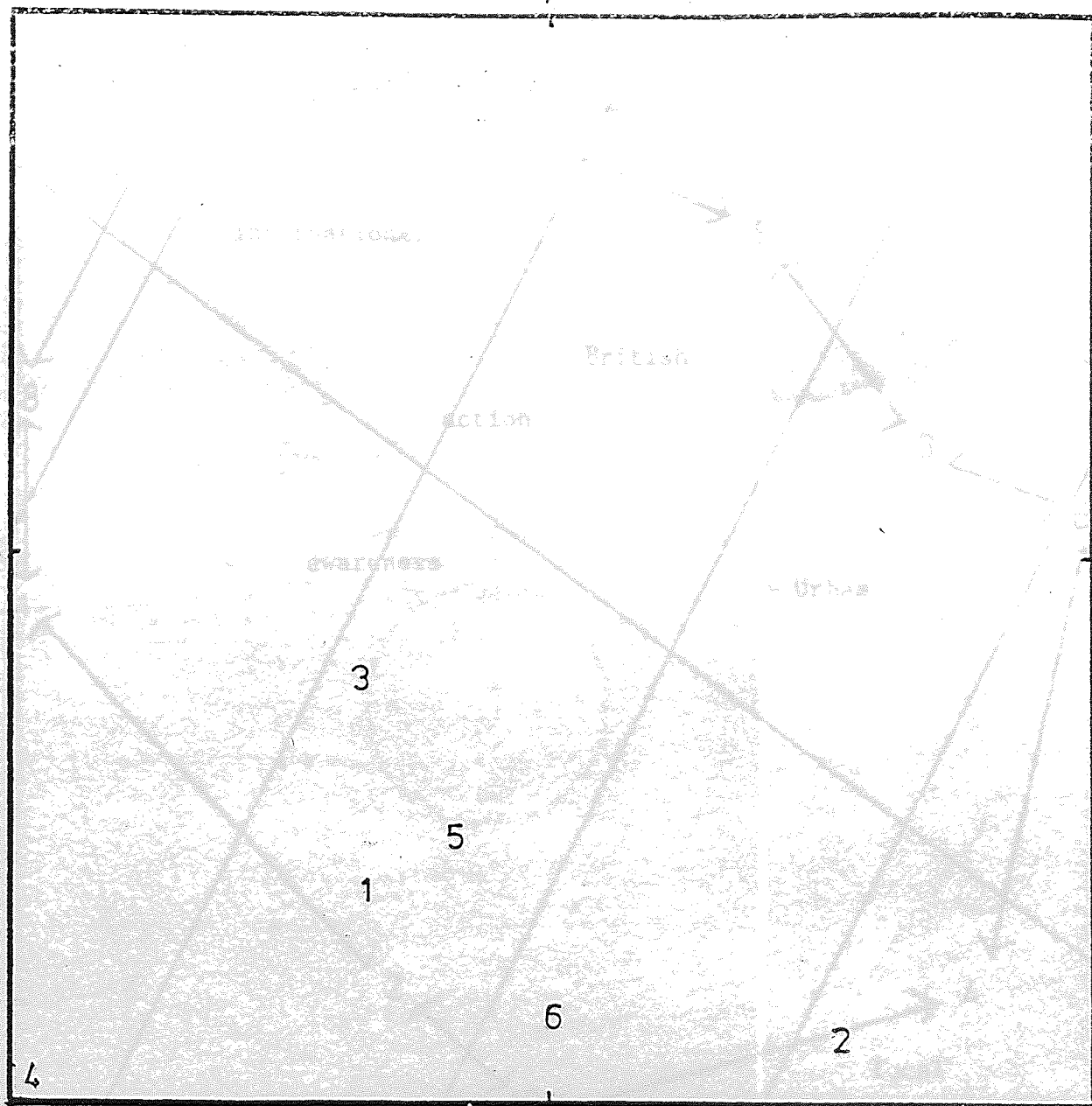
subject 1.



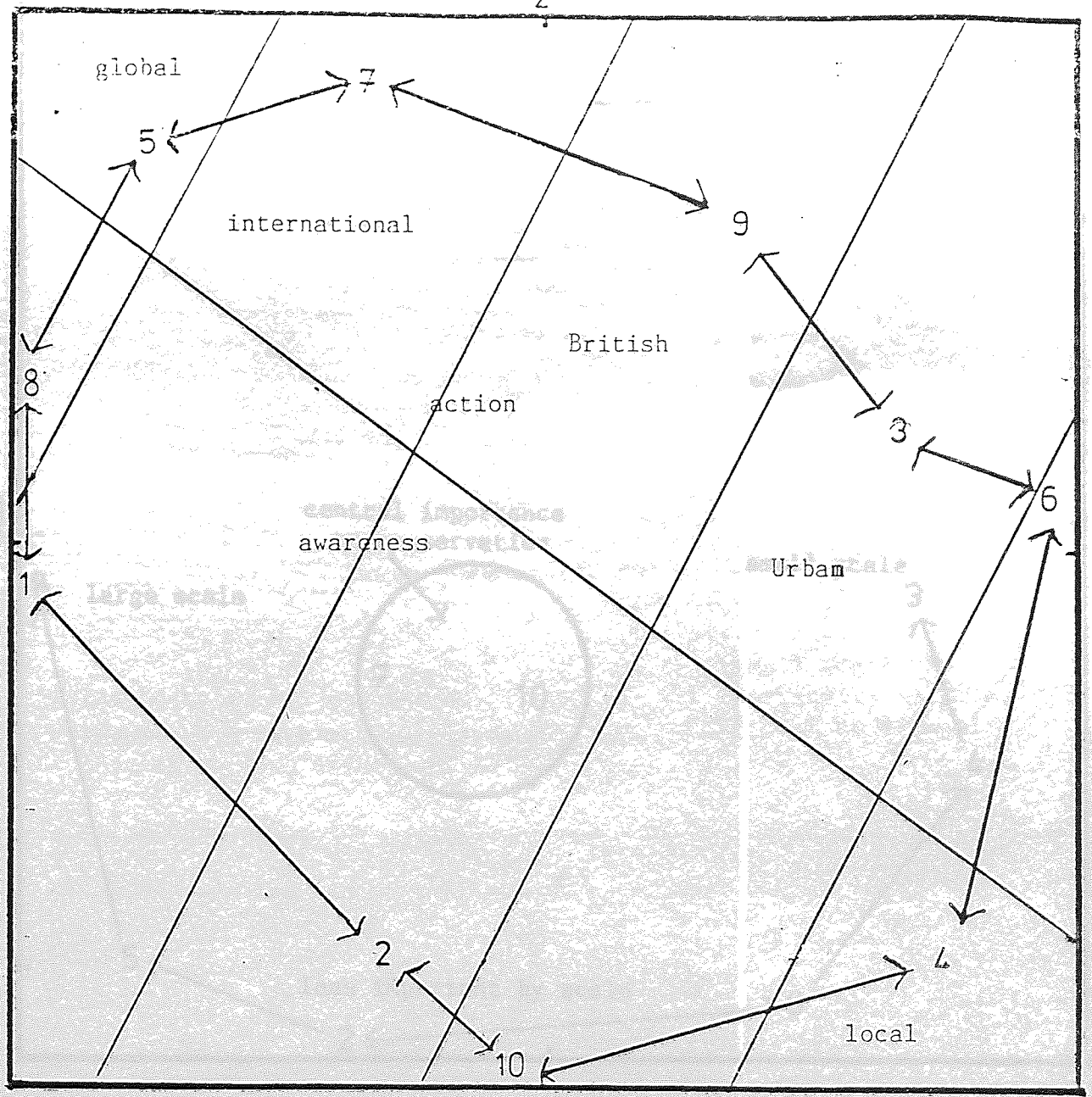
subject 1.



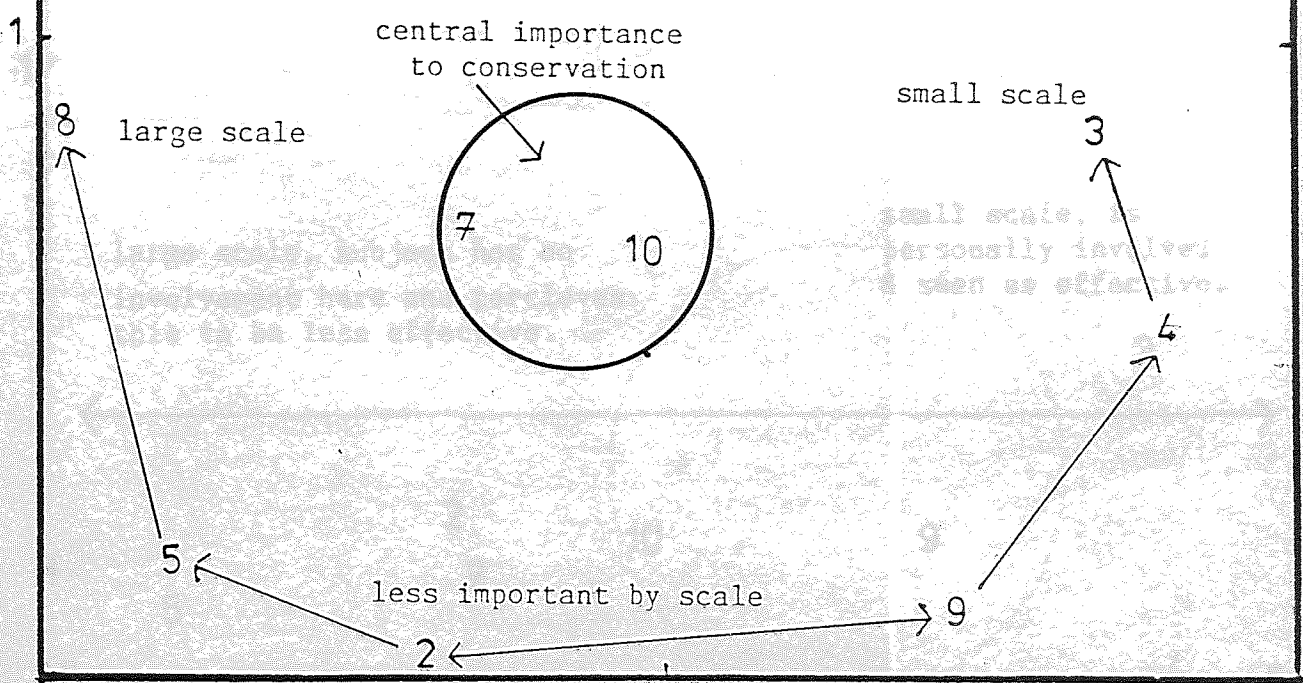
subject 1.



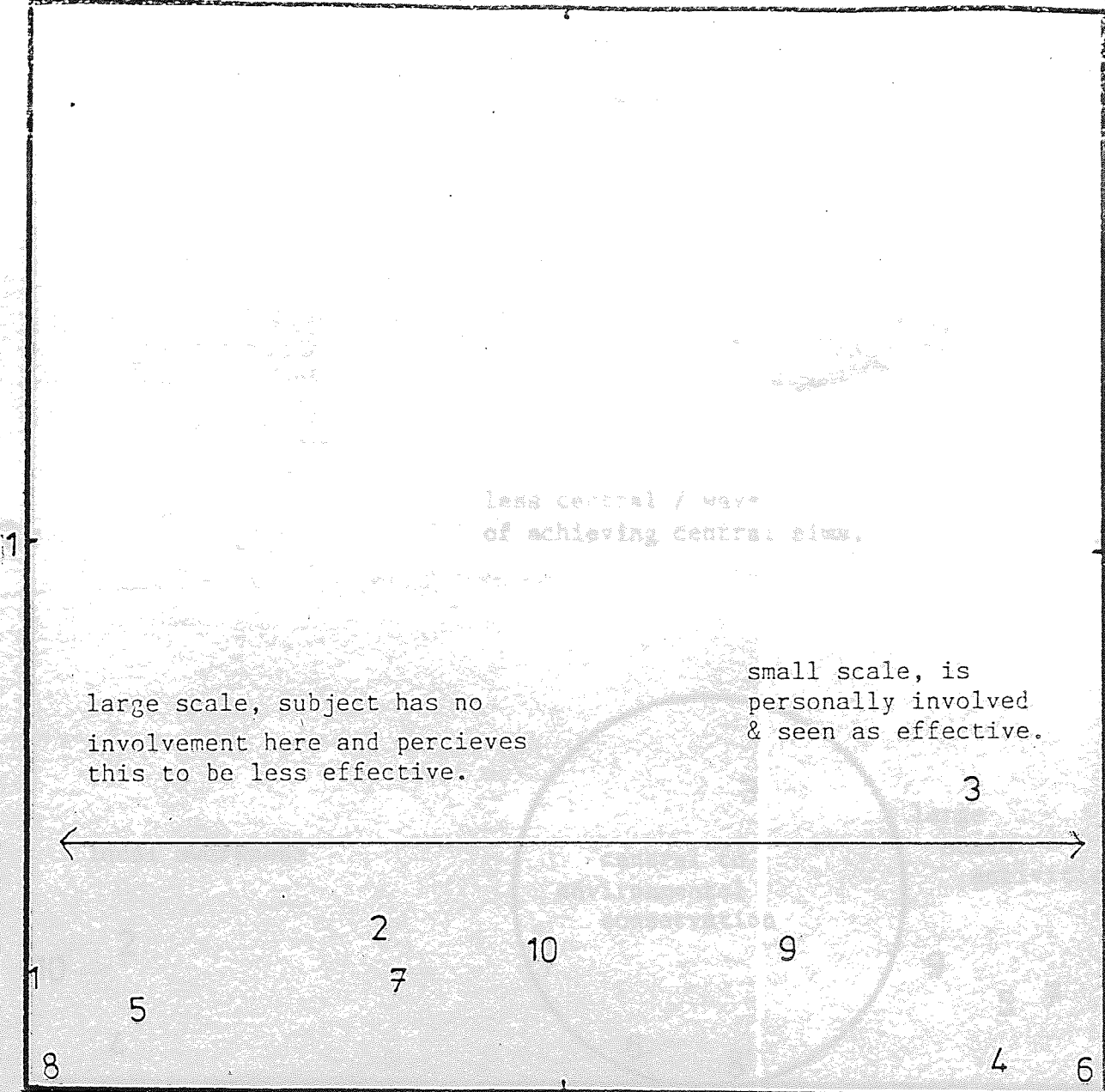
subject 1.



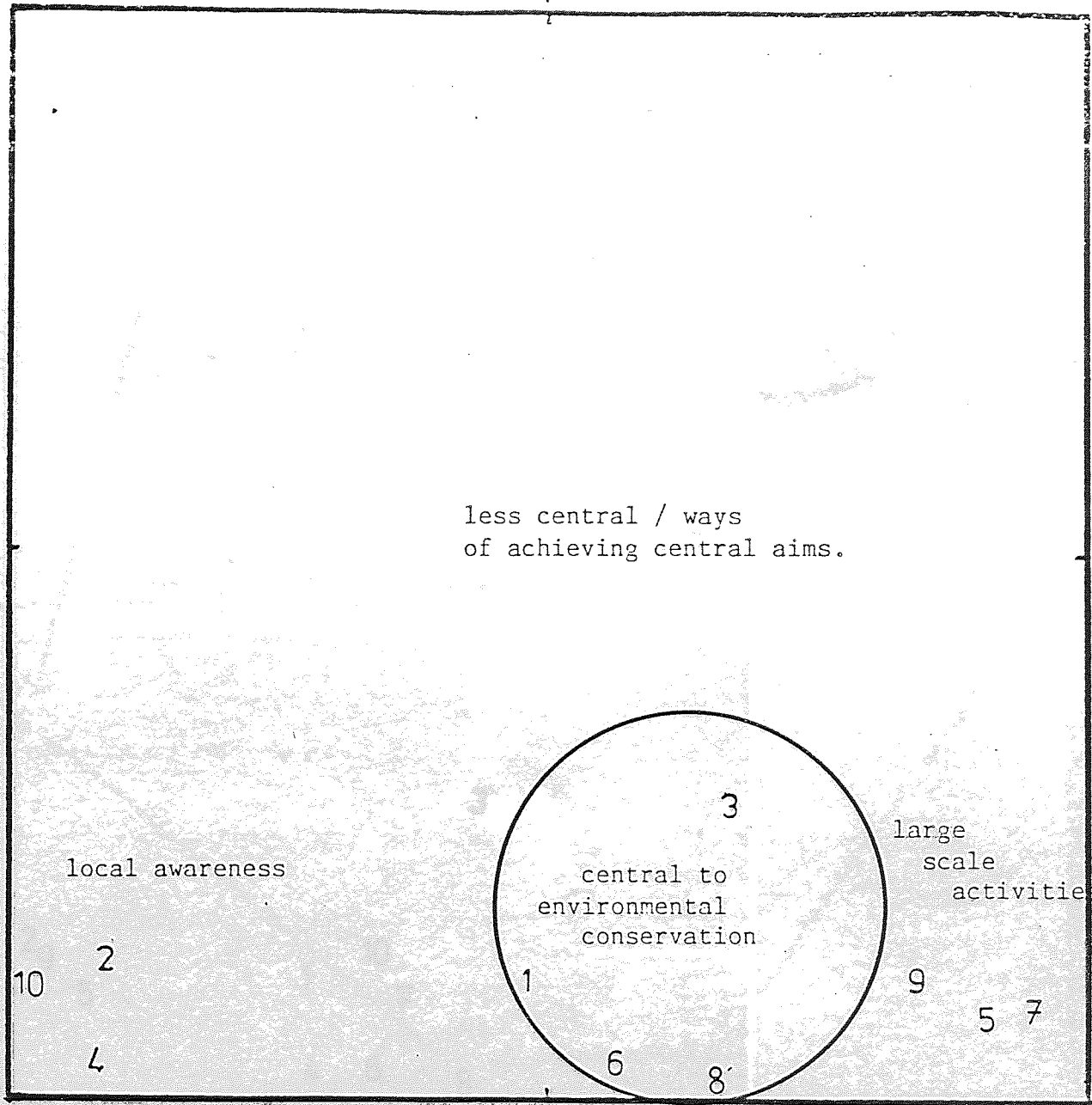
subject 2.



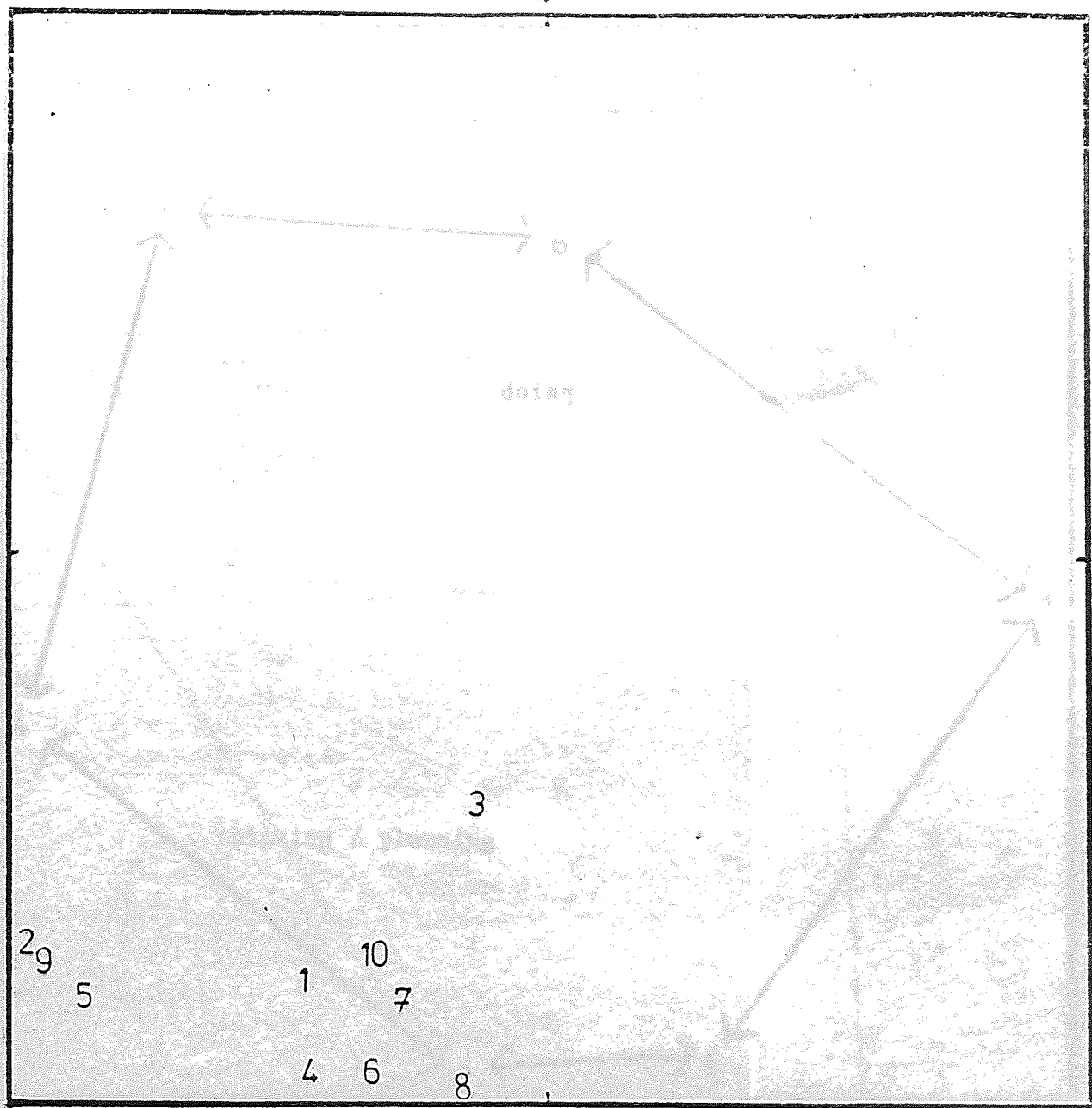
subject 2.



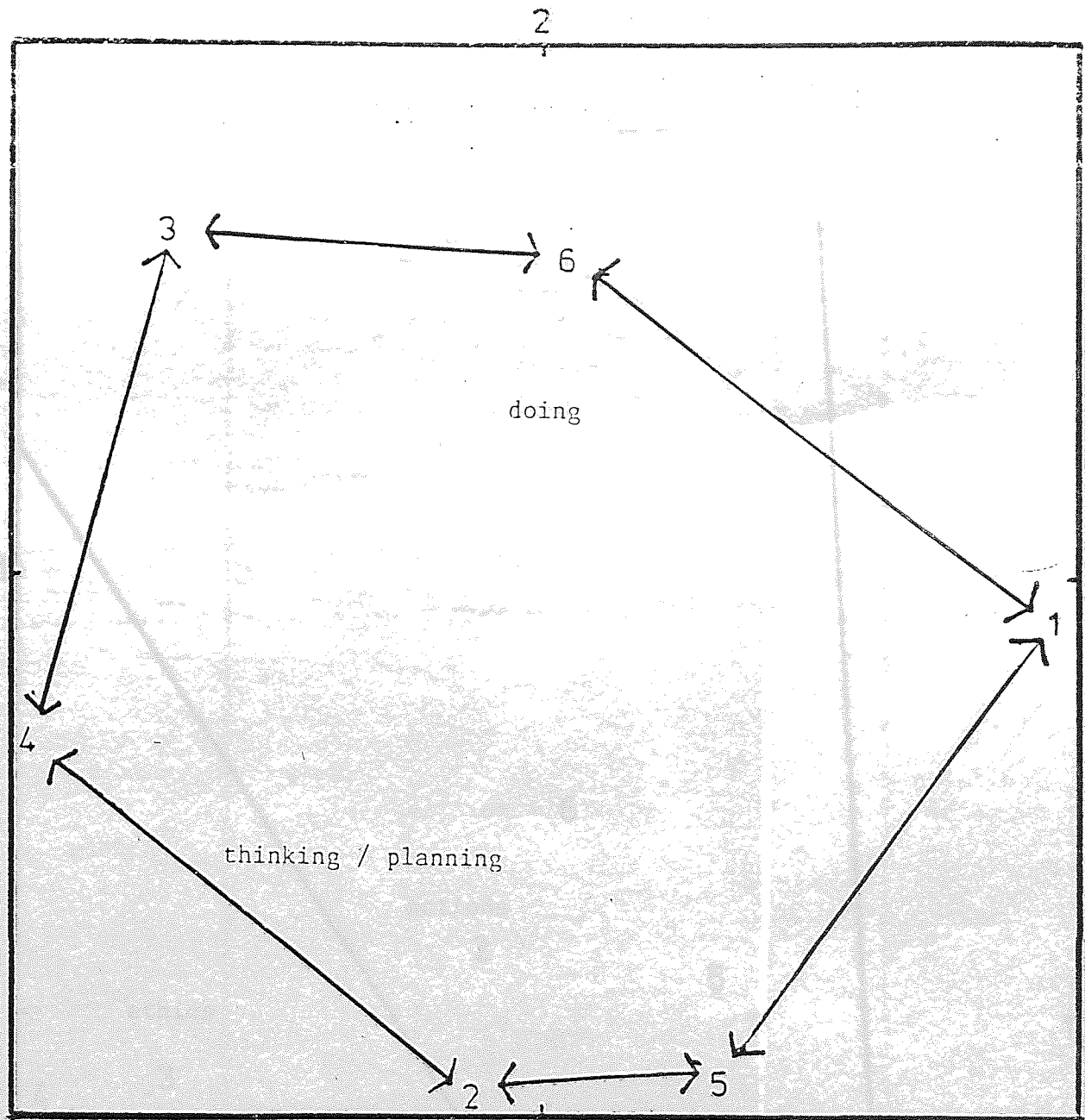
subject 2.



subject 2.

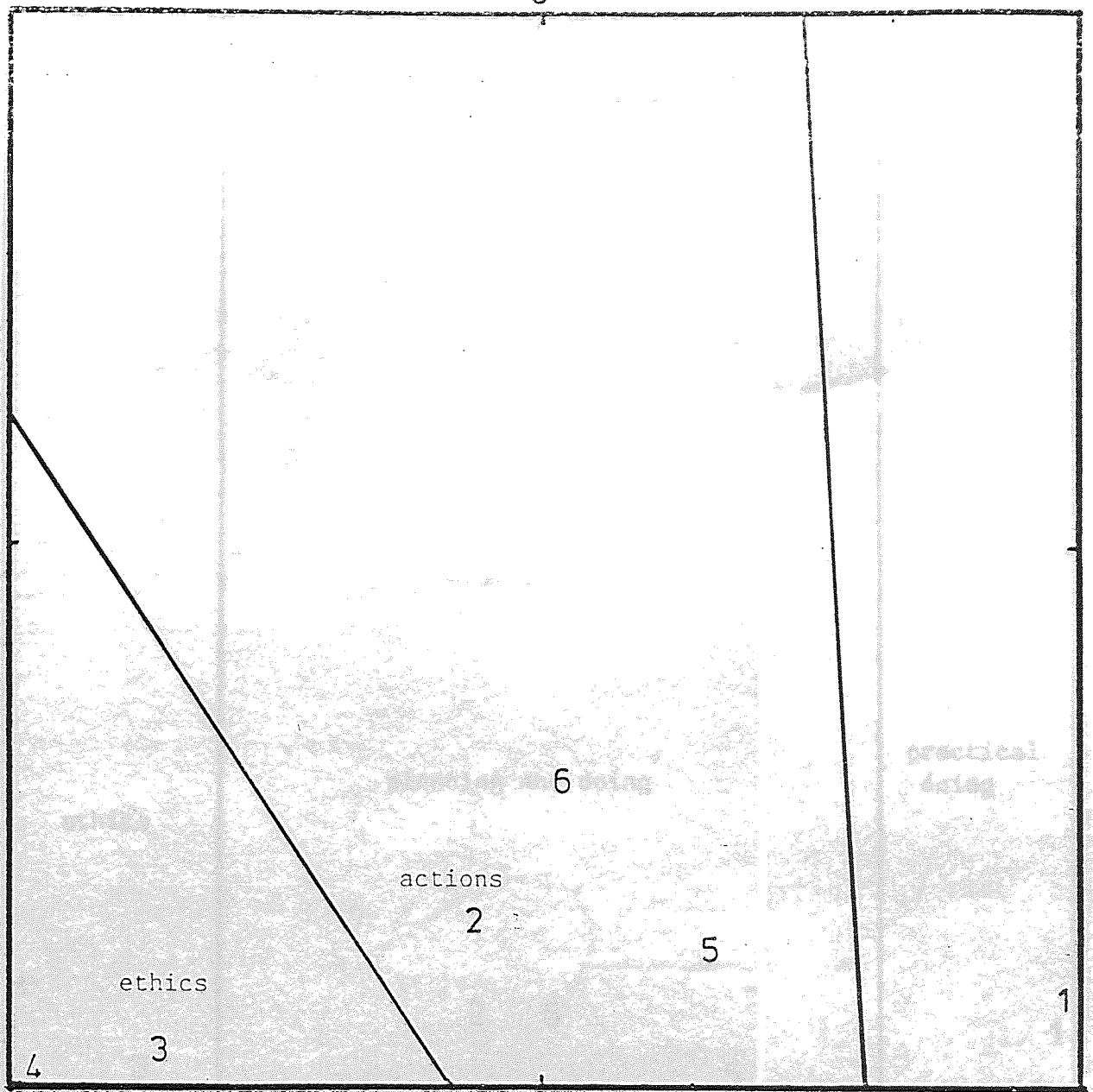


subject 2.

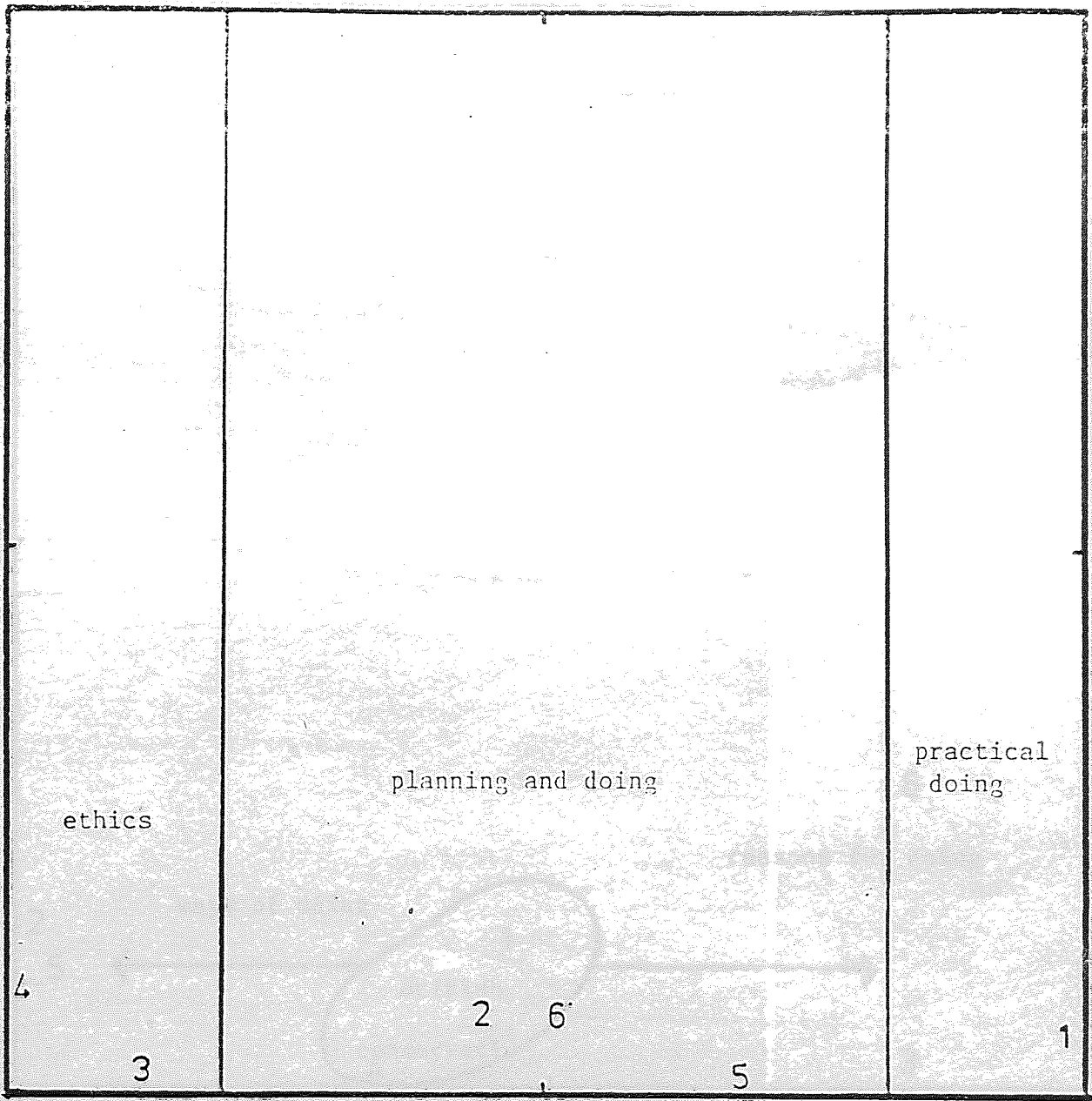


GL 0.11

subject 3.



subject 3.



subject 3.

2

6

reasons for doing

ways of doing

2

5



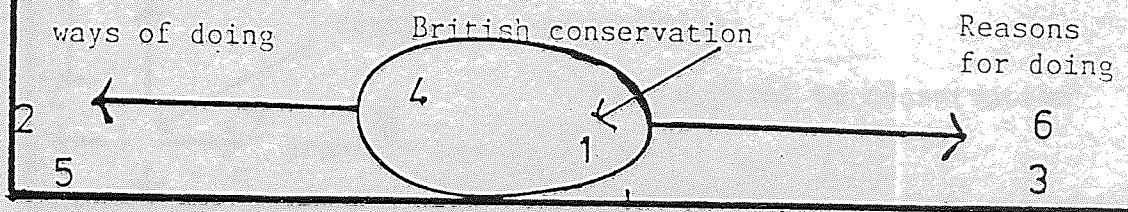
1
British
conservation



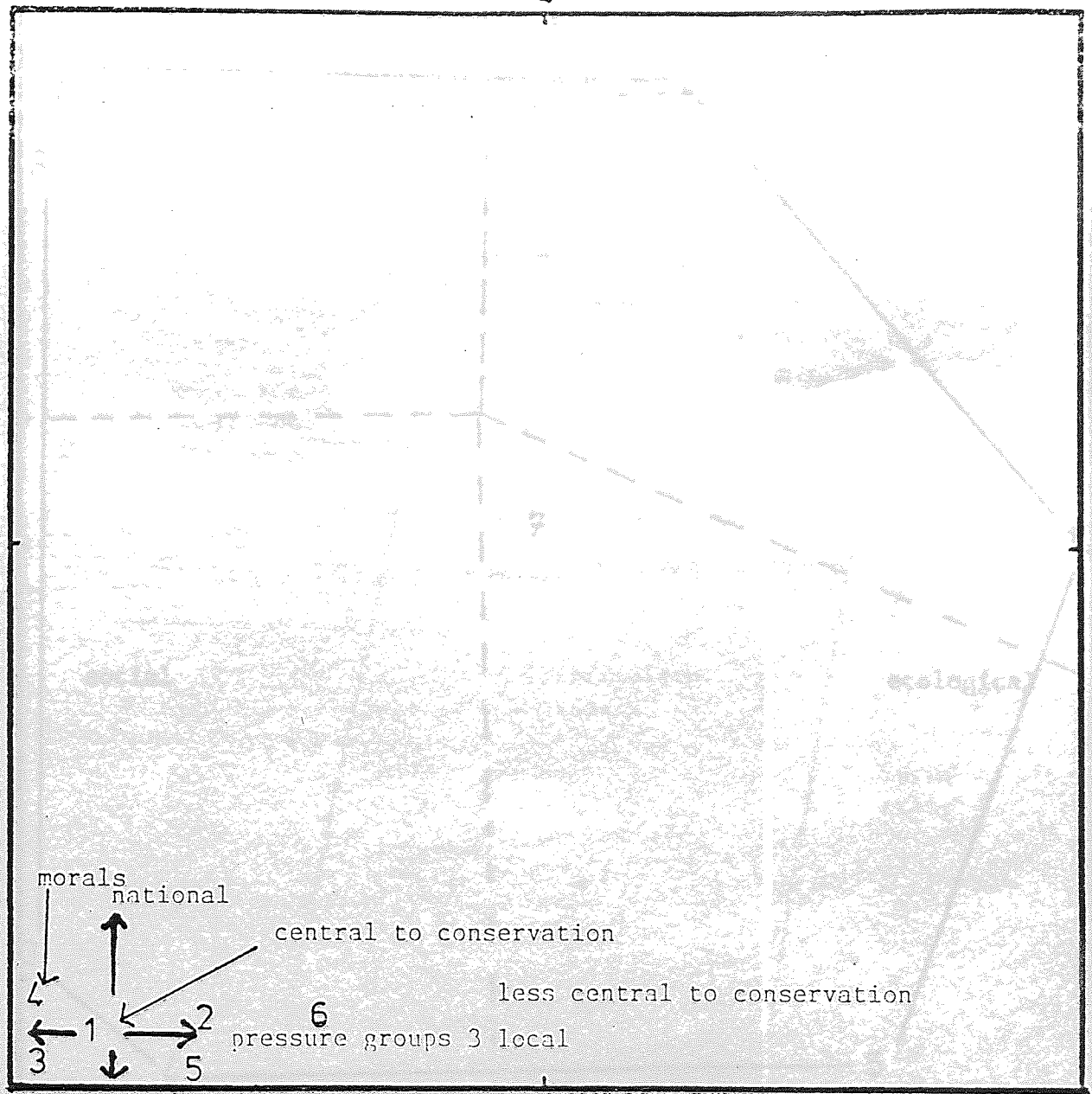
3

subject 3.

2

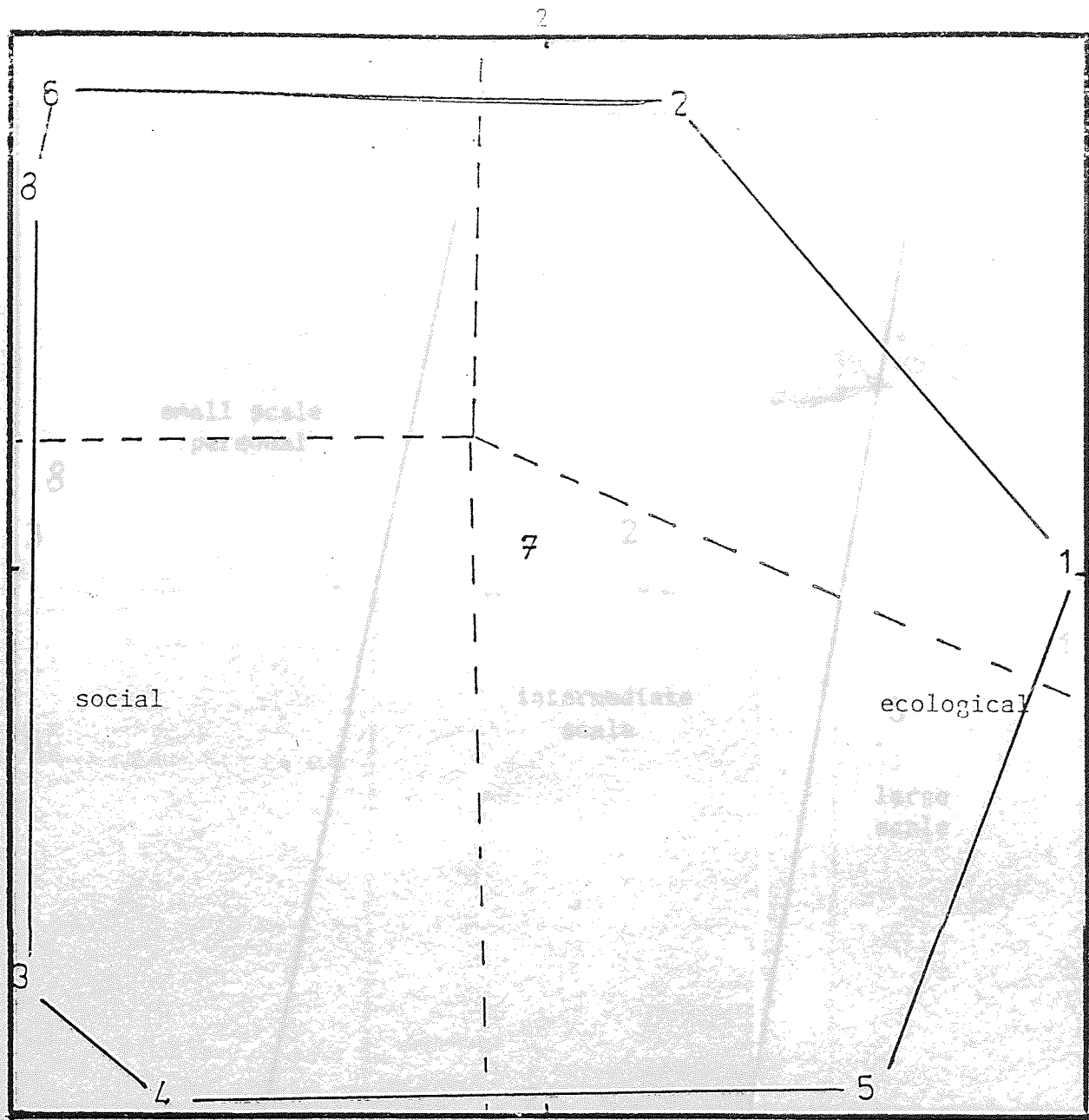


subject 3.



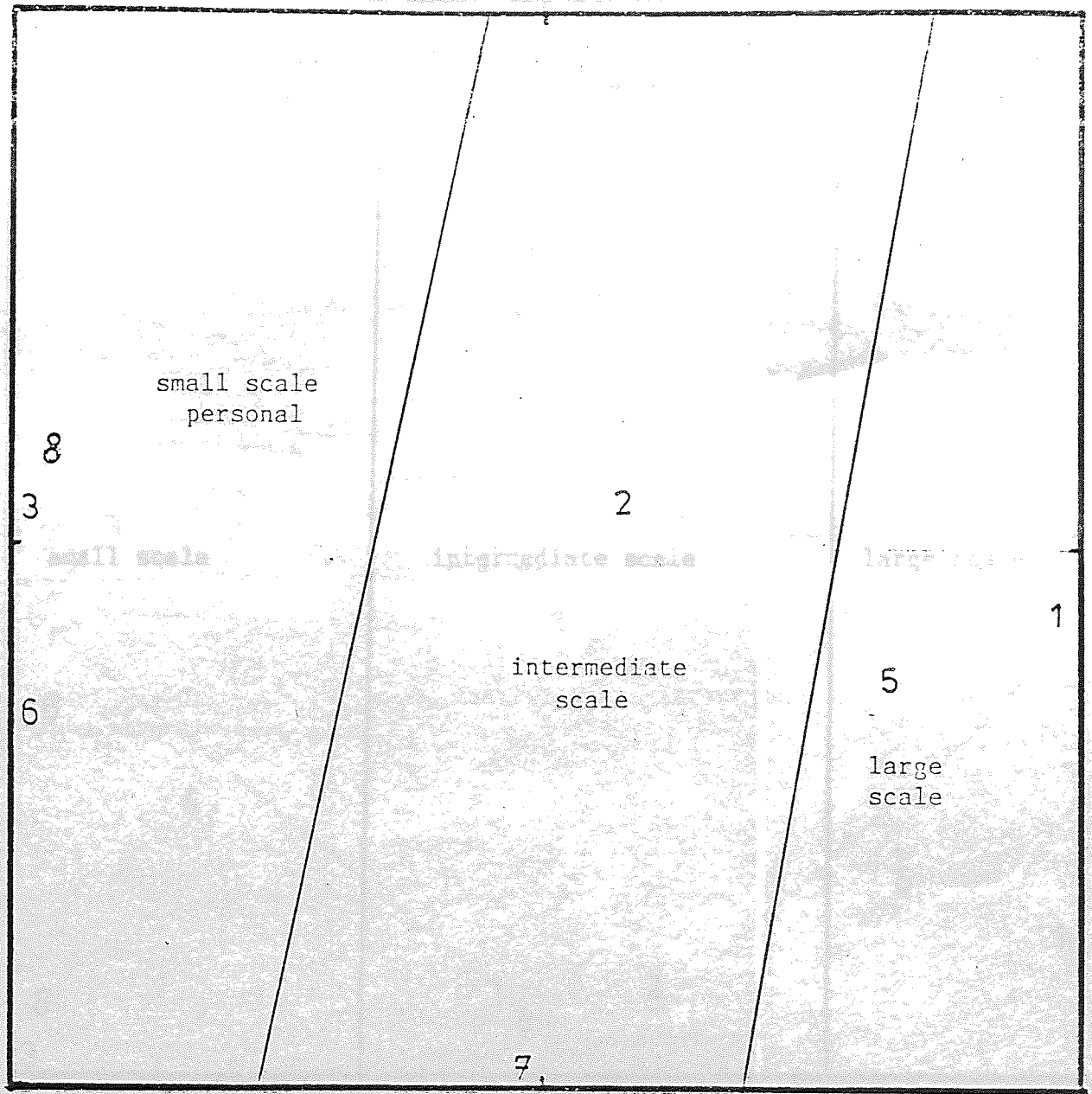
small scale

Subject 3.

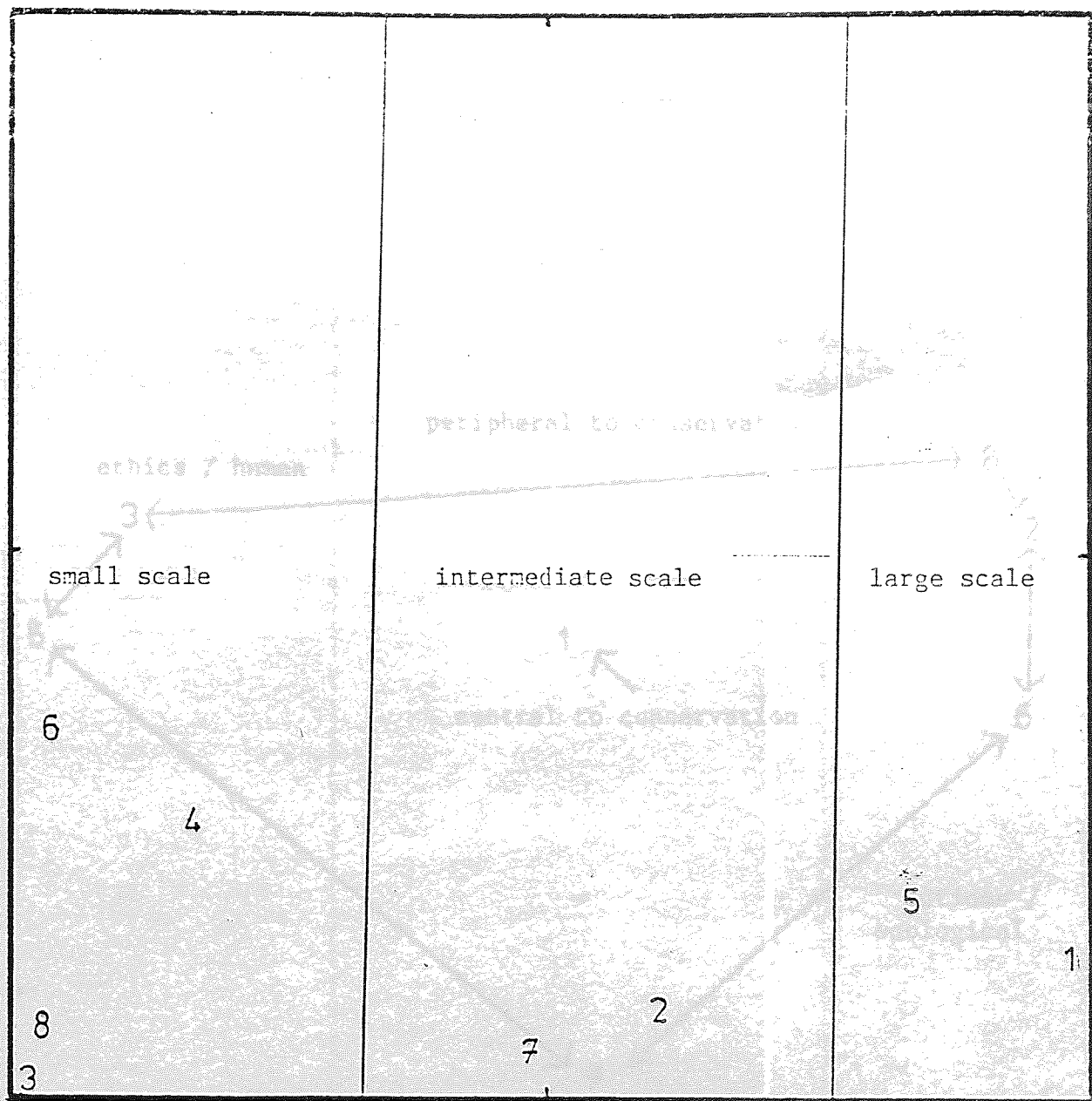


subject 4.

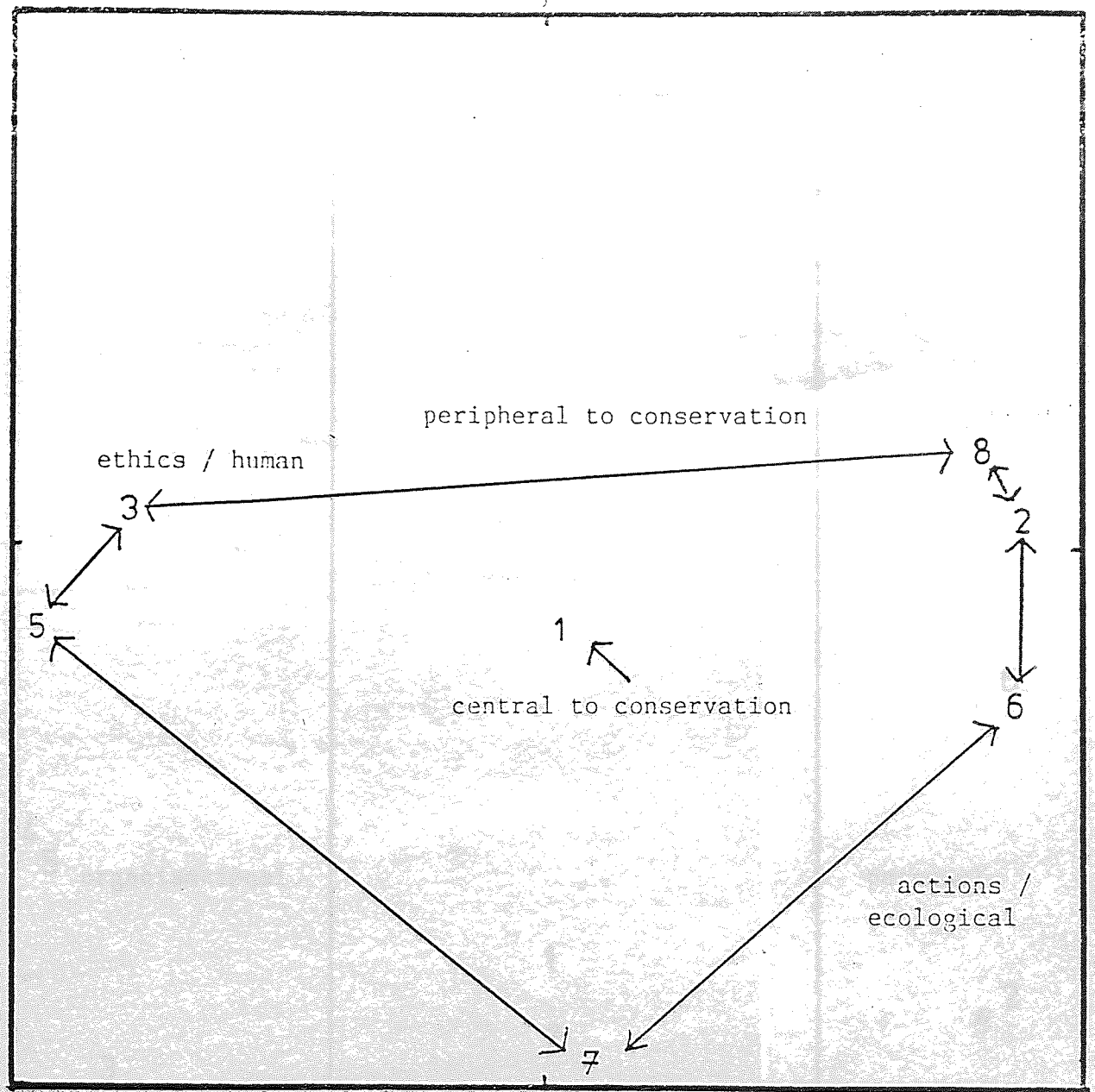
GL 0.08



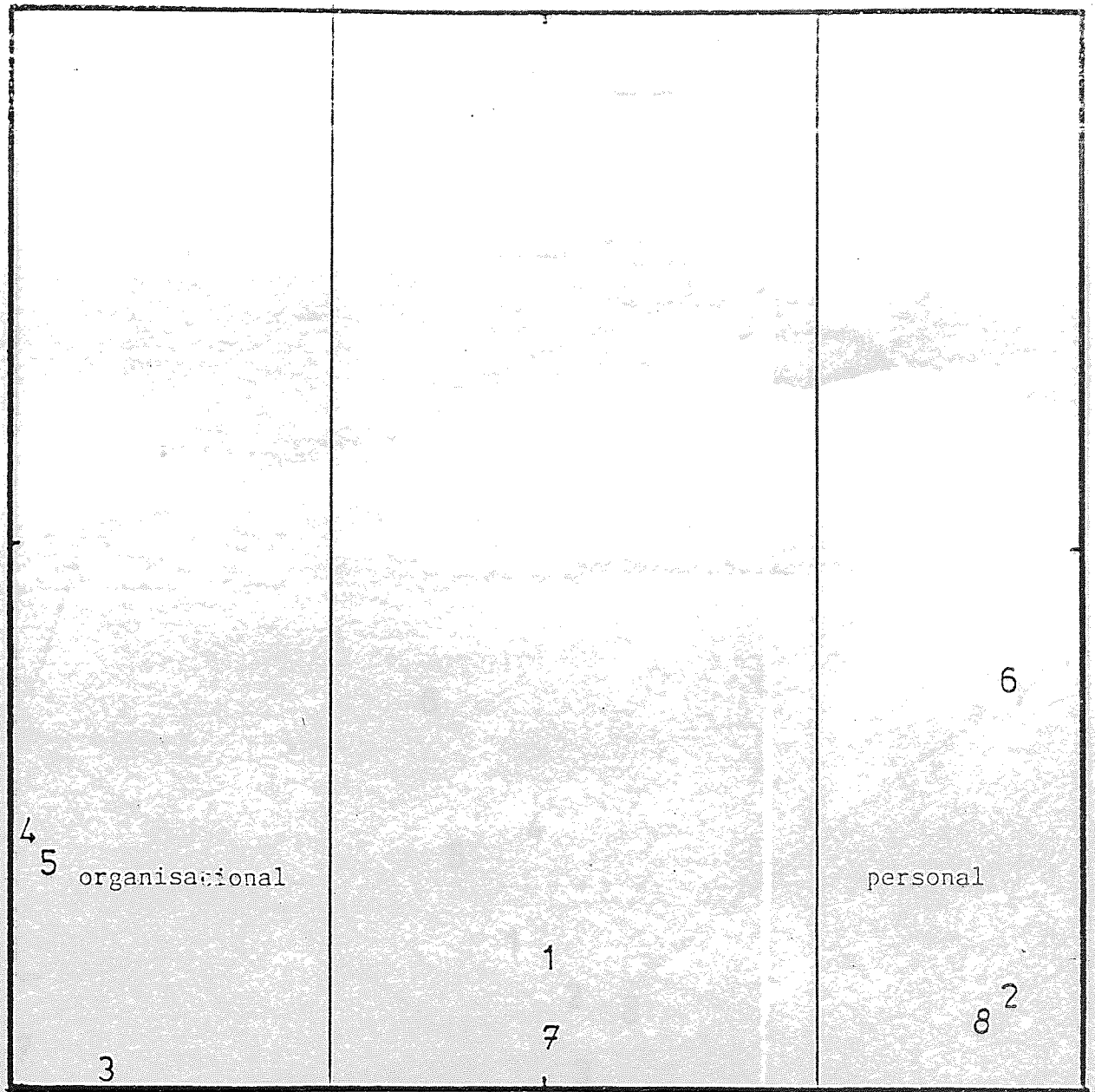
subject 4.



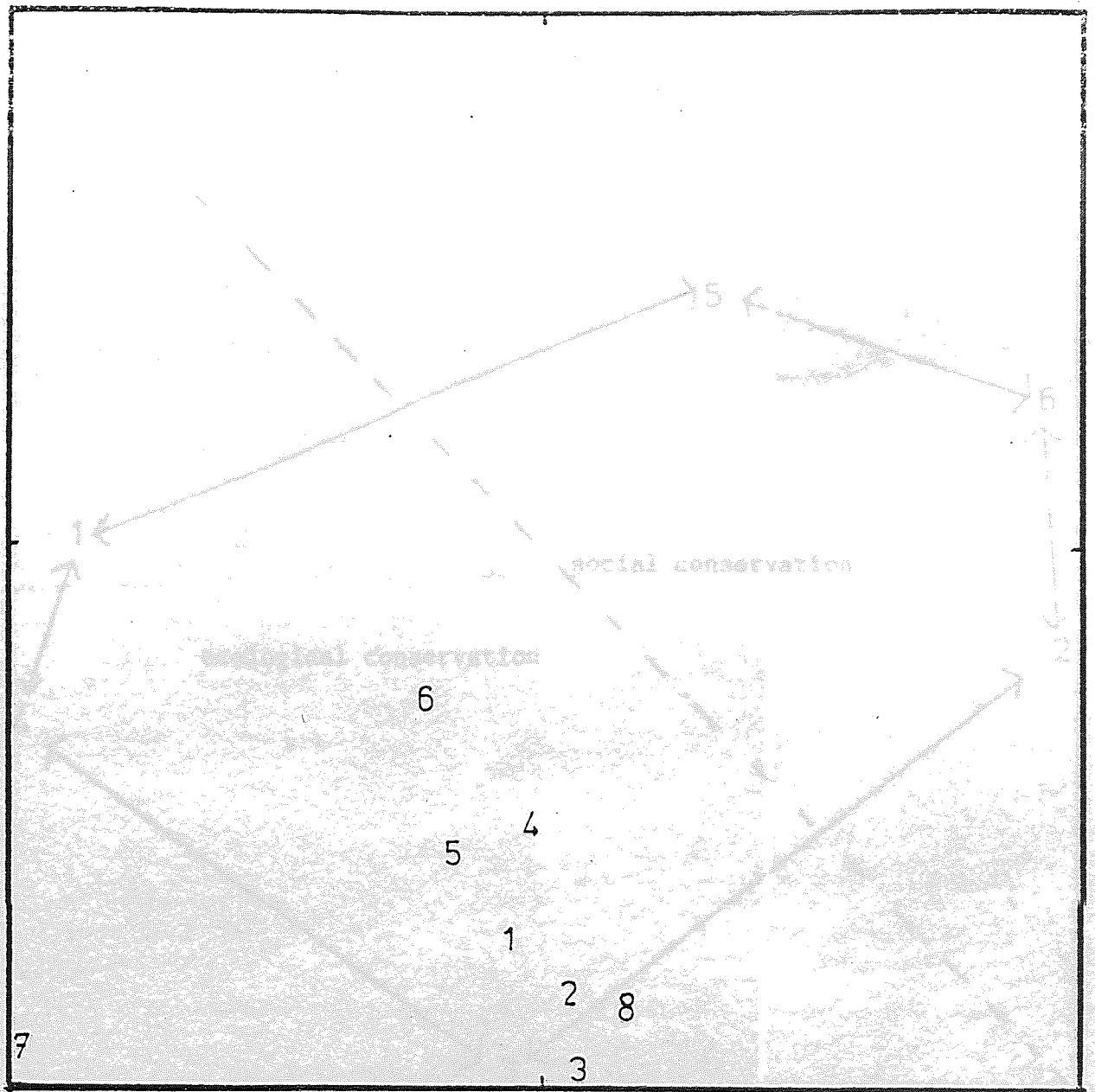
subject 4.



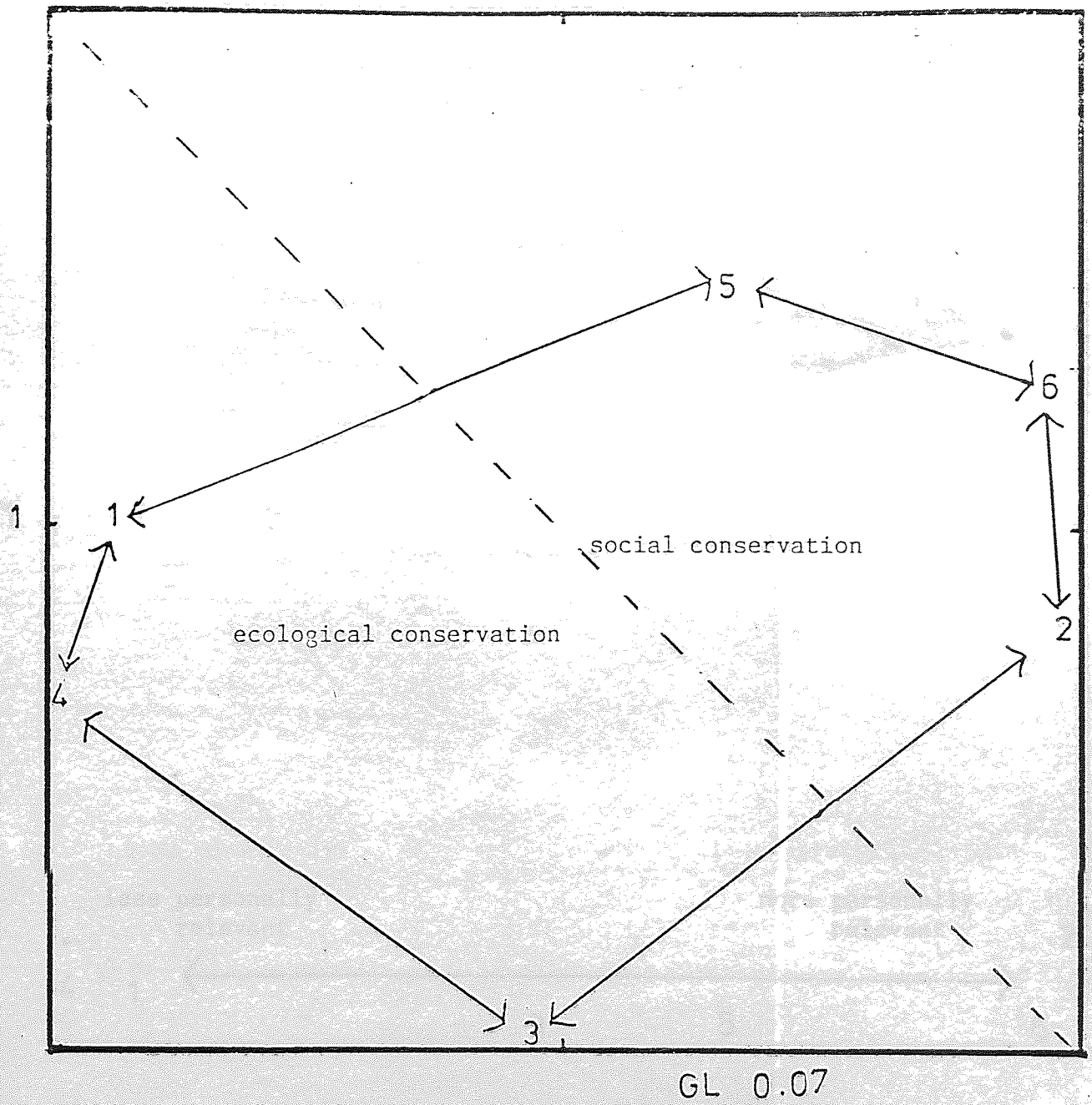
subject 4.



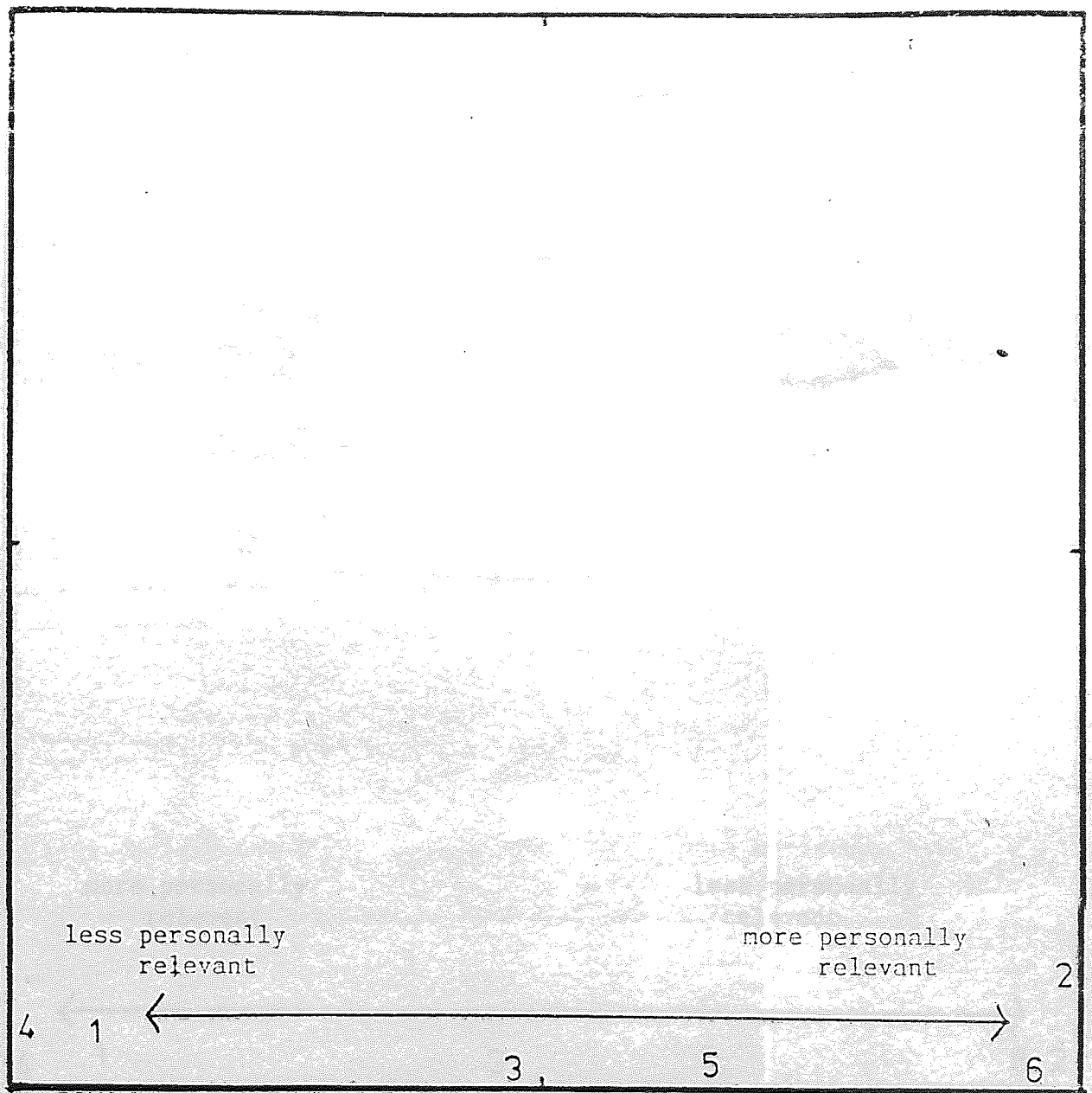
subject 4.



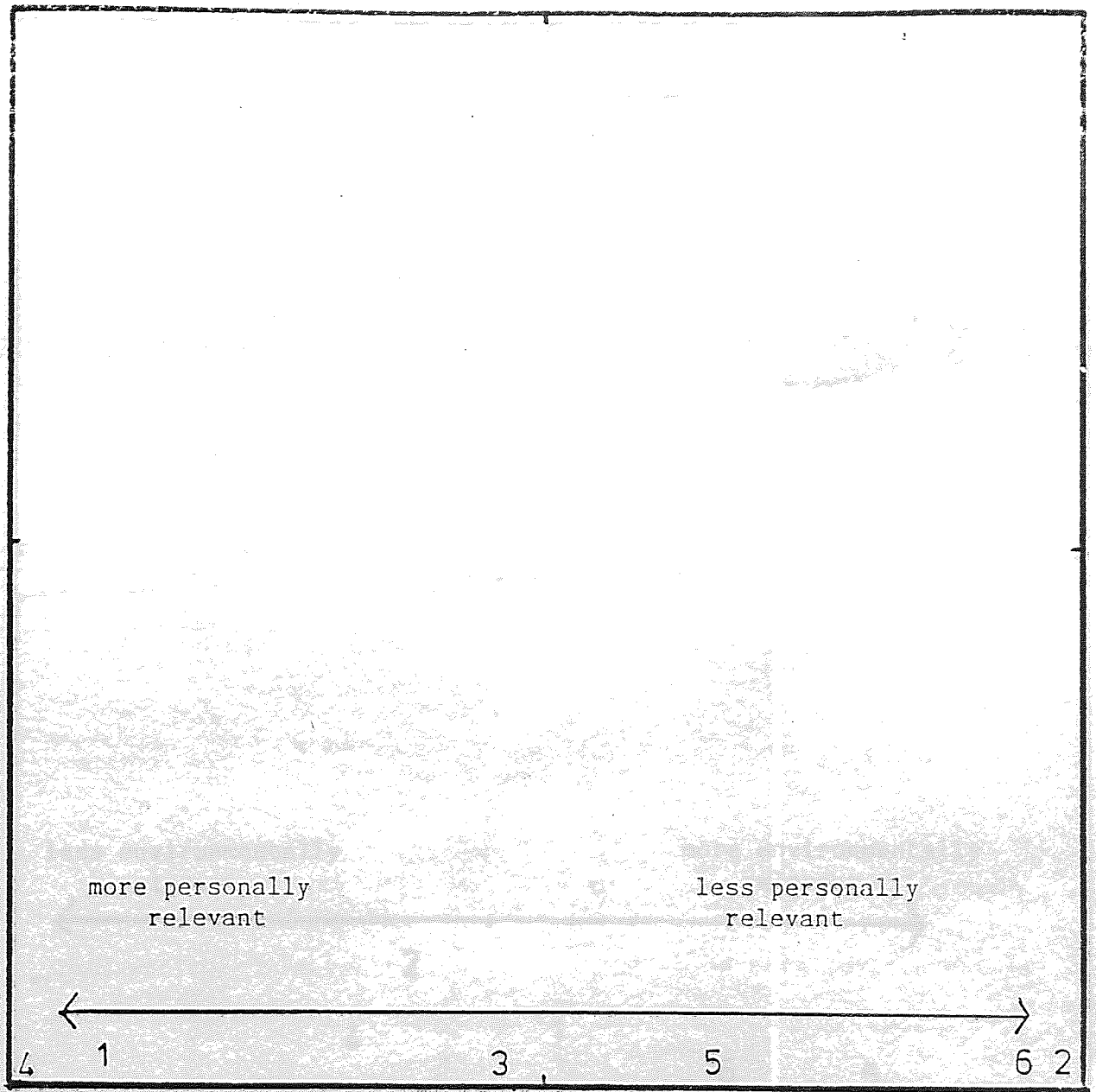
subject 4.



subject 5.

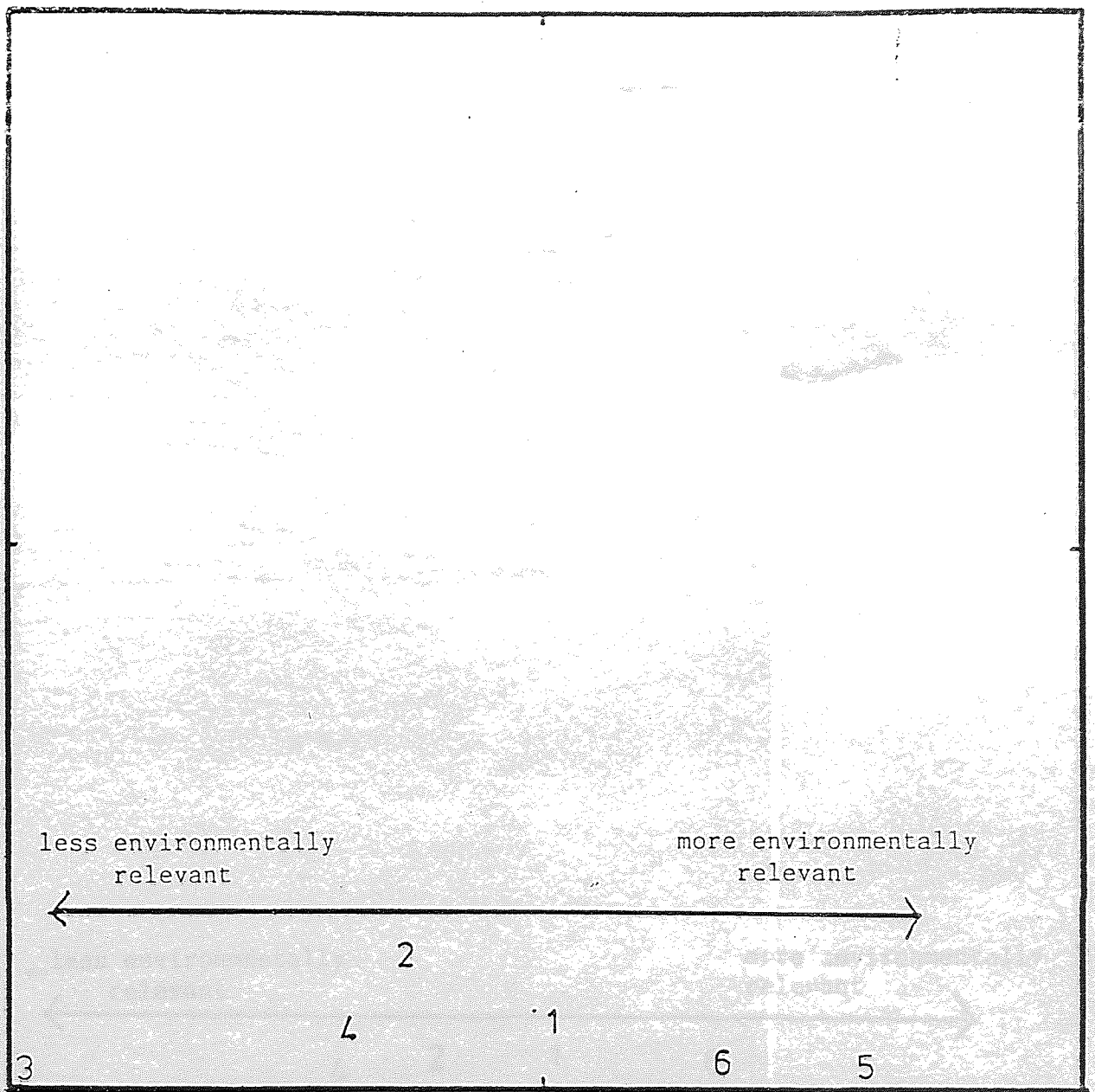


subject 5.



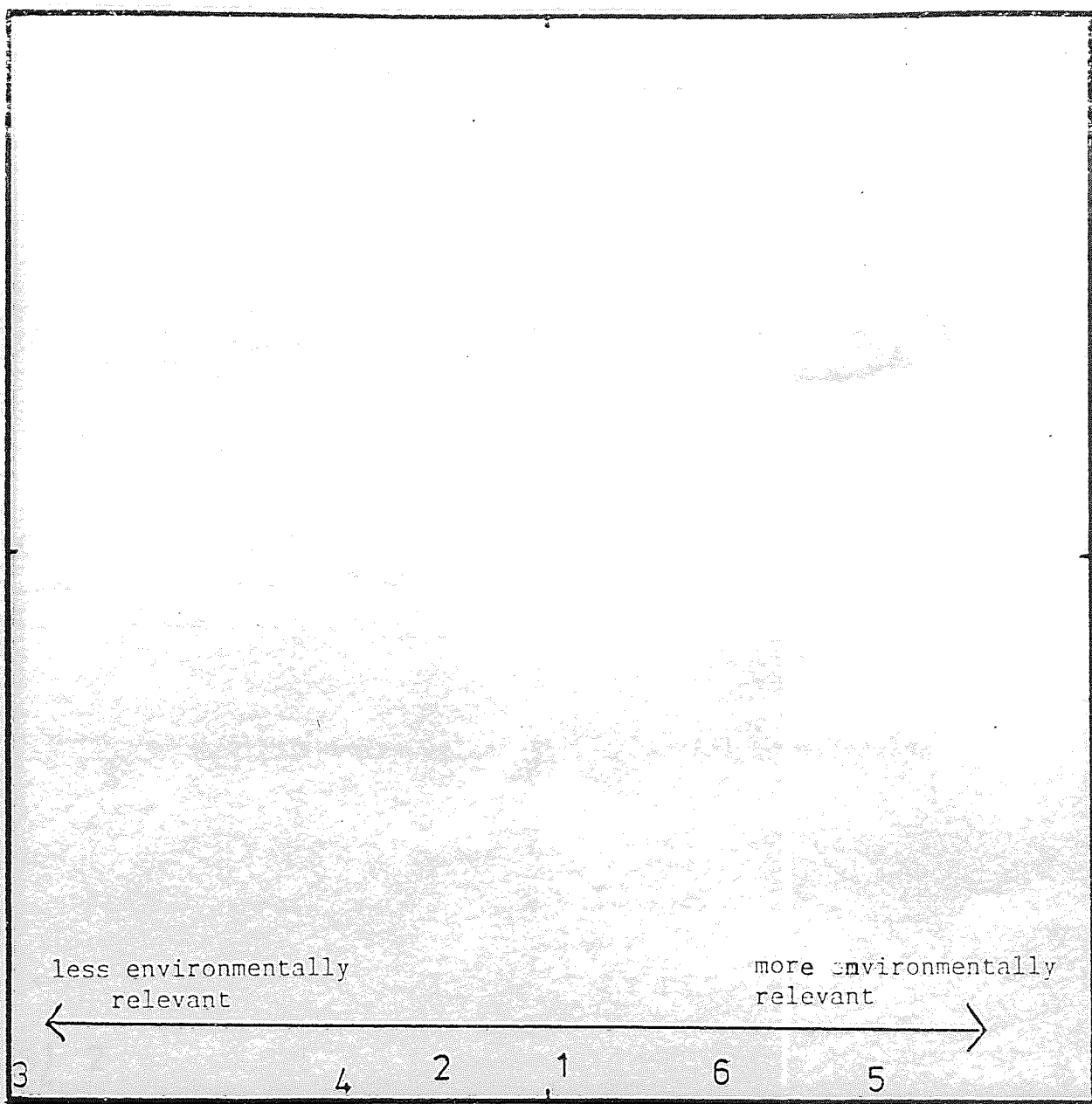
subject 5.

2



subject 5.

2

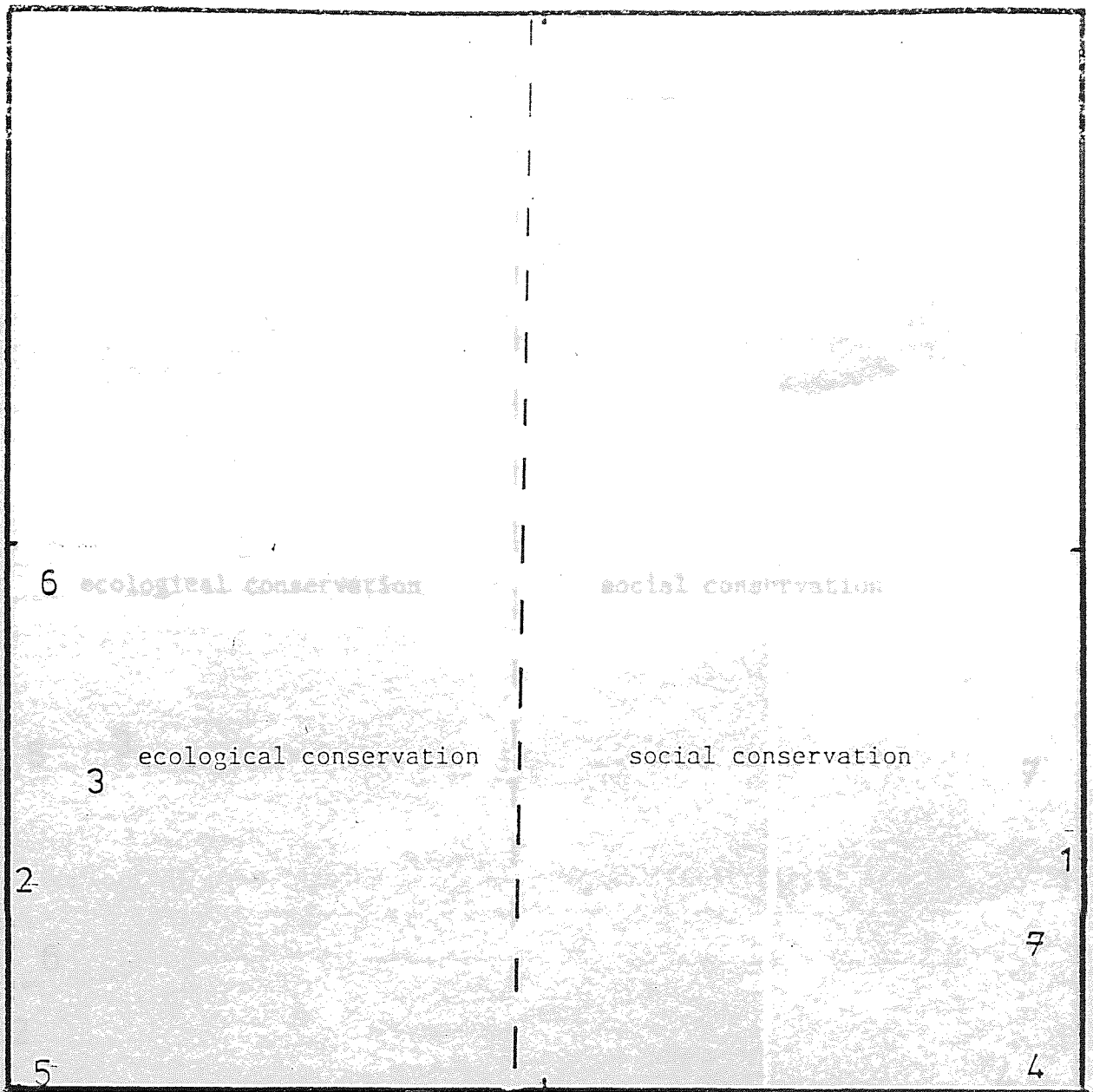


subject 5.

3

61 2

subject 5.



GL 0.04

subject 6.



subject 6.

1

ecological conservation

social conservation

3



2

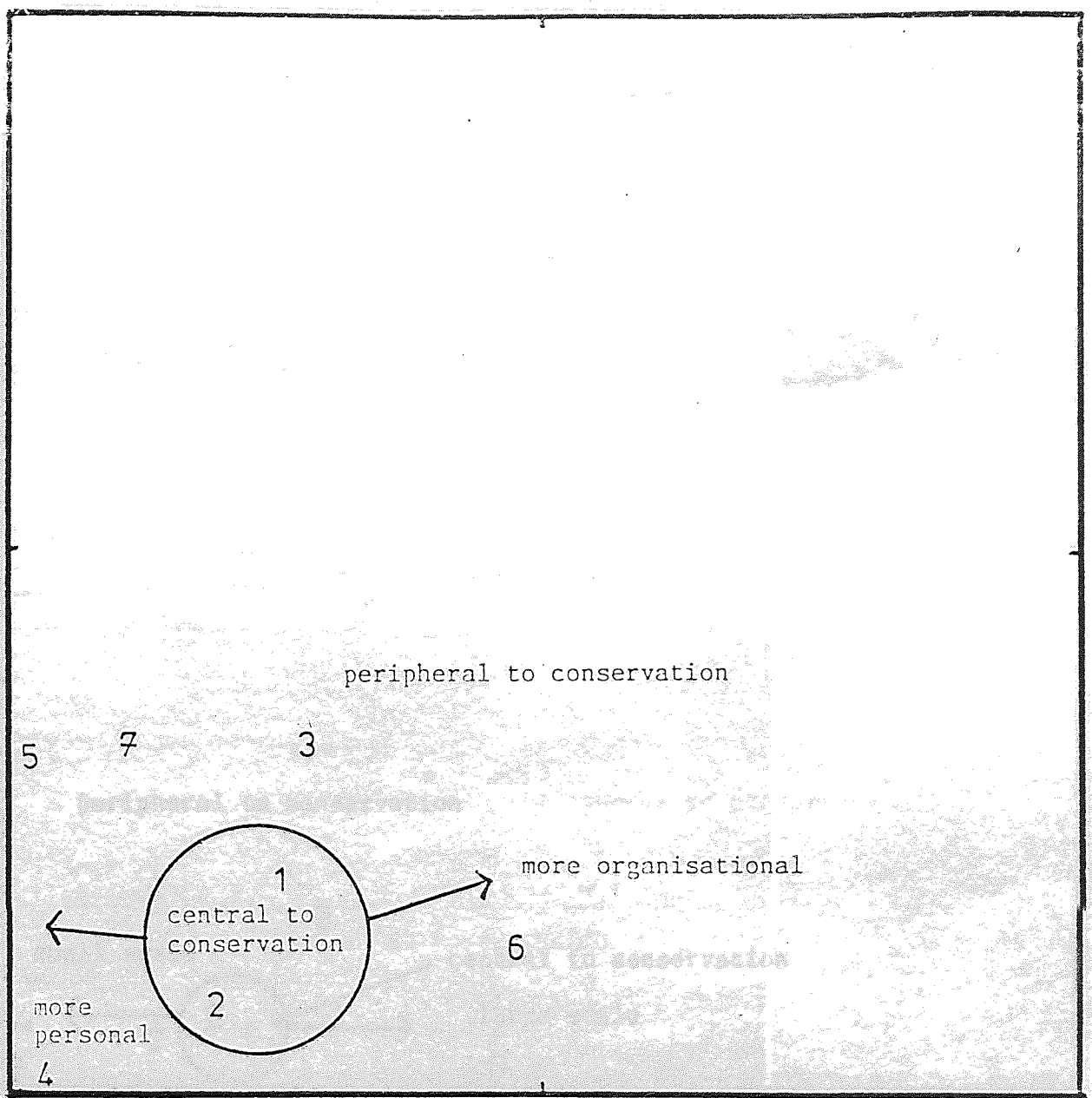
5 6

4

7

1

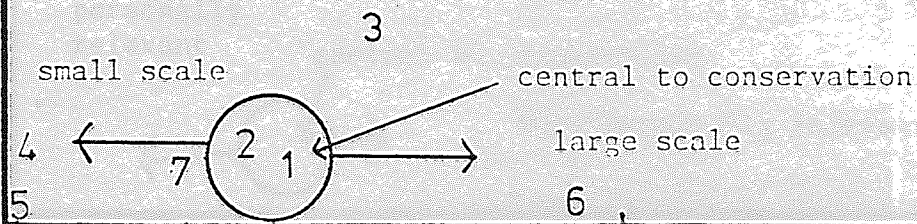
subject 6.



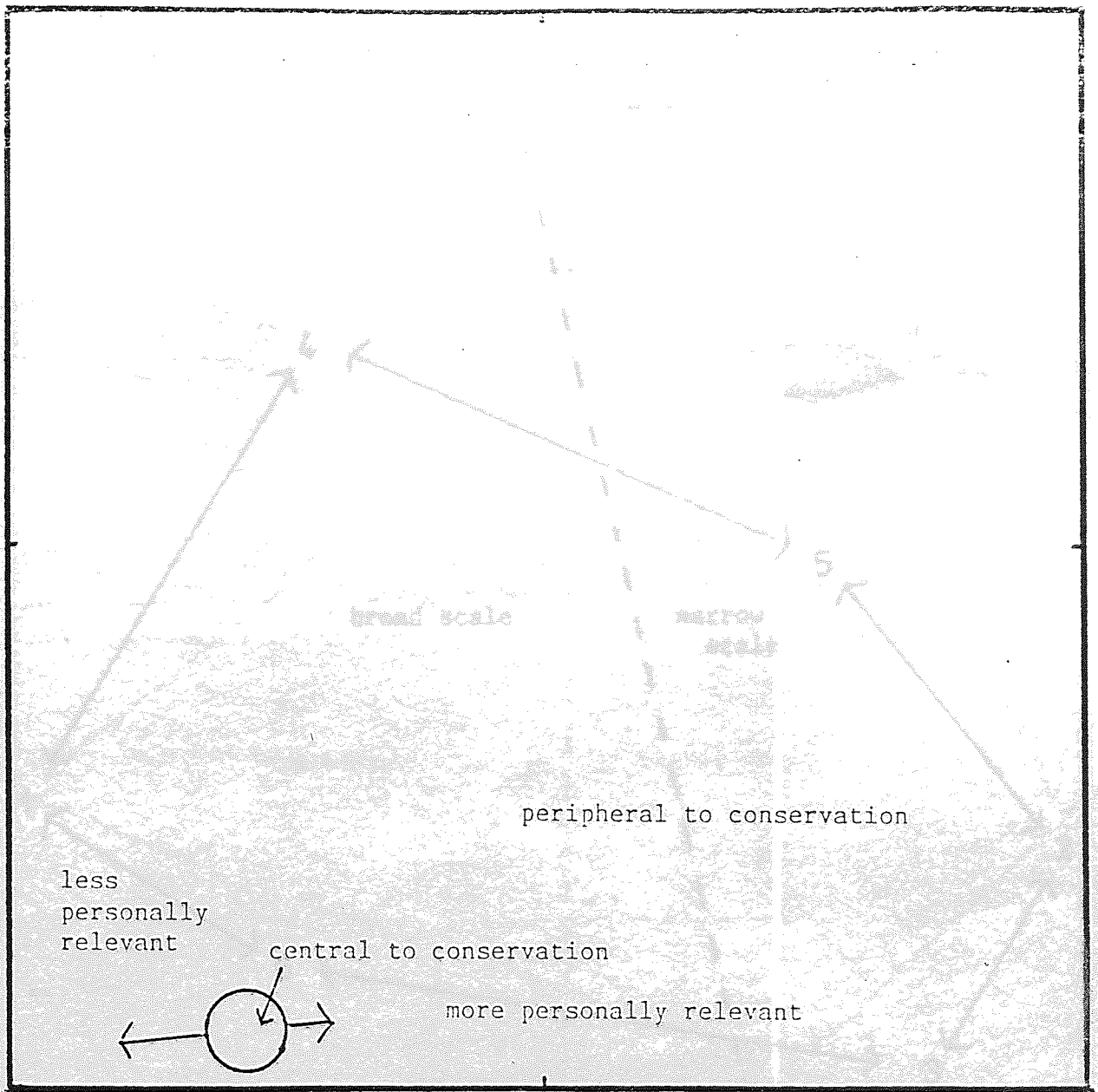
subject 6.

2

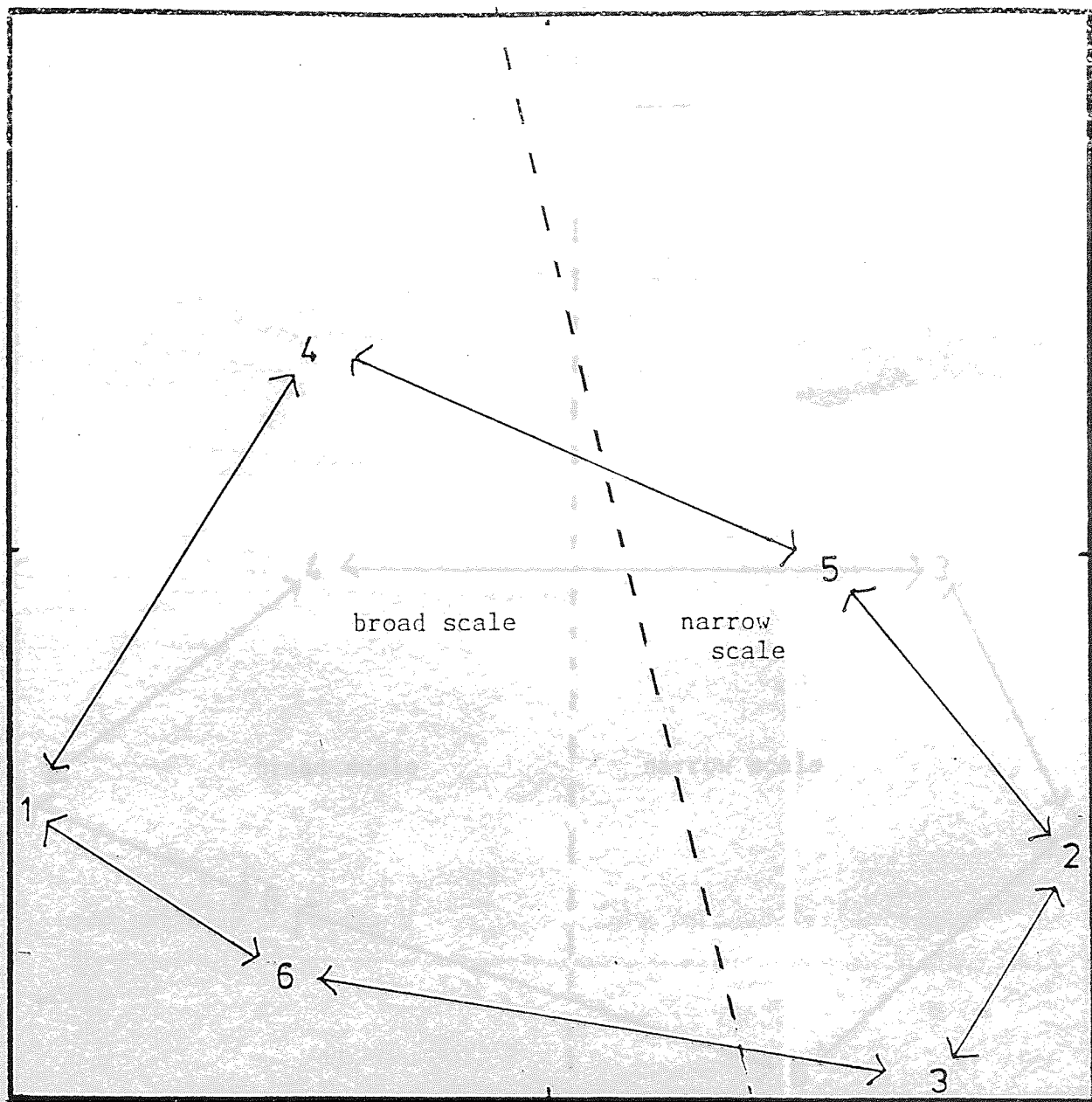
peripheral to conservation



subject 6.

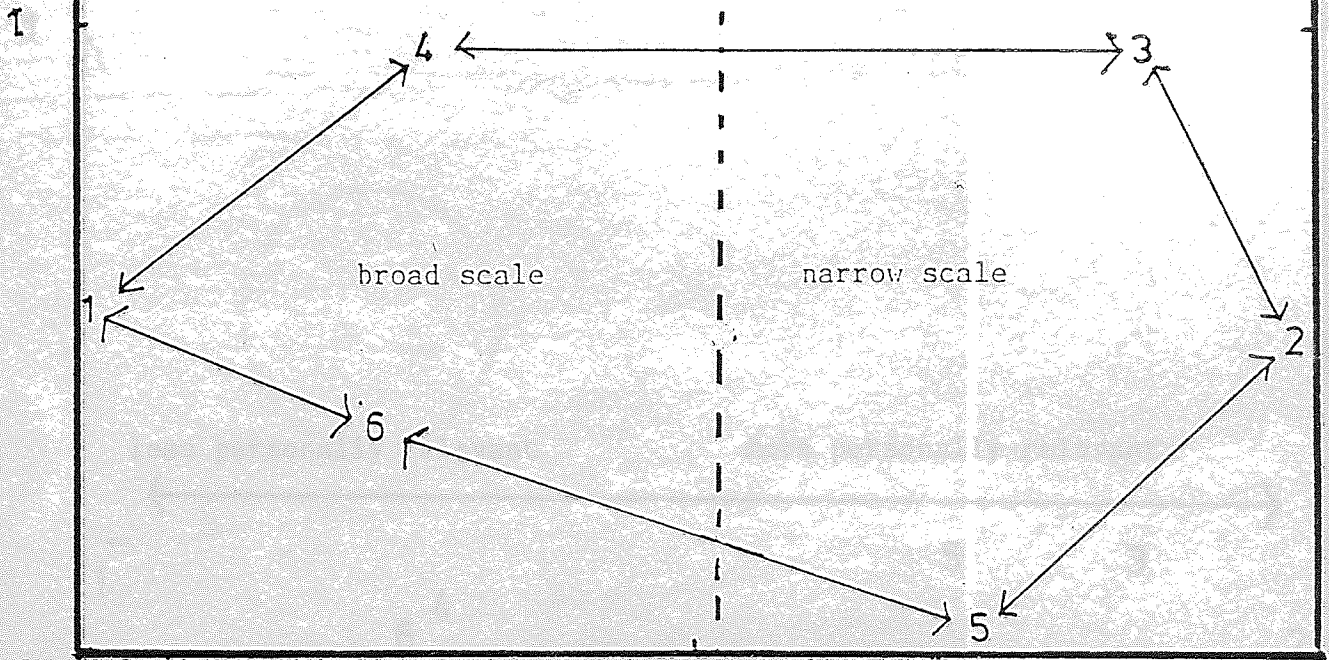


subject 6.

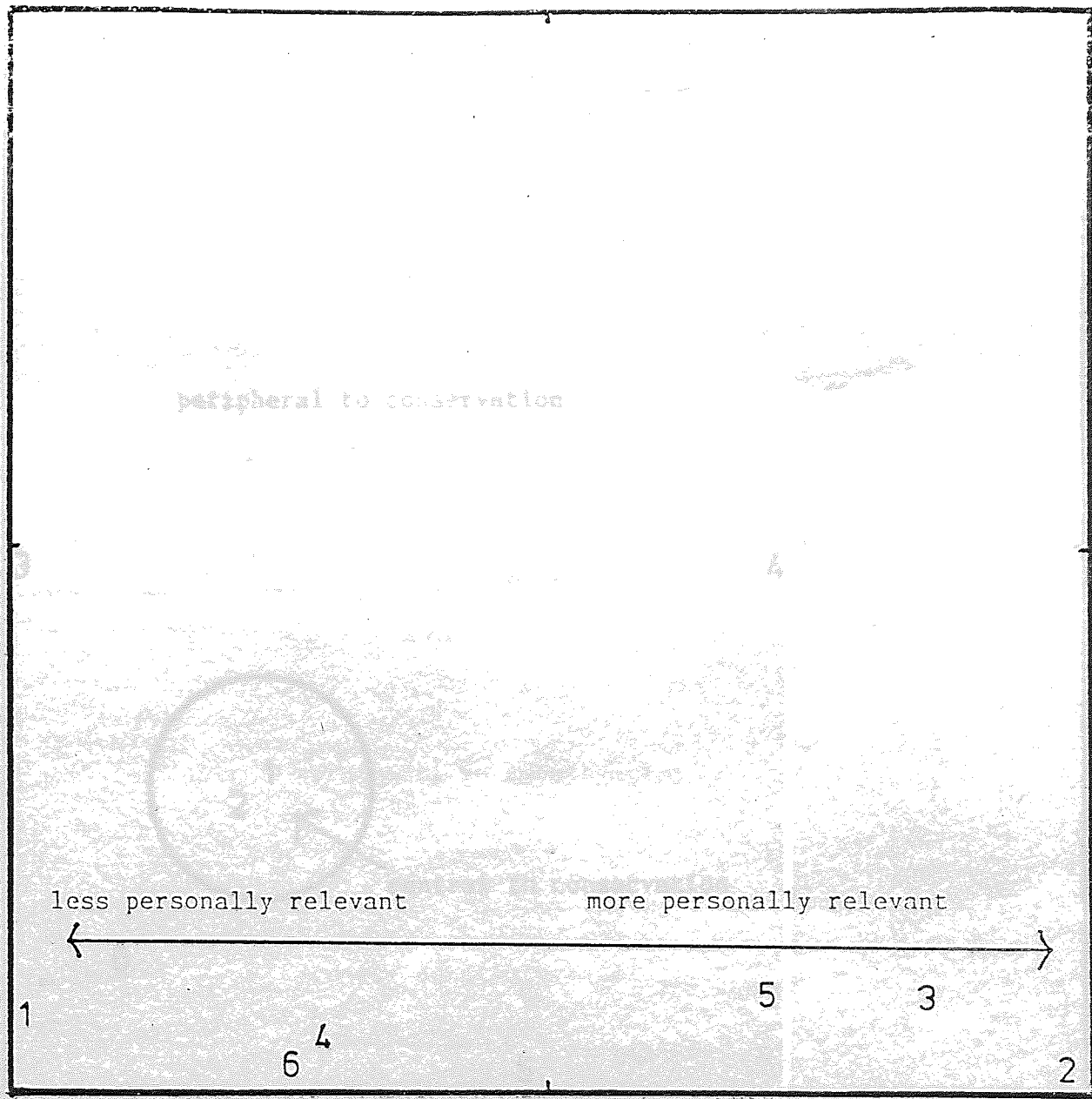


GL 0.11

subject 7.



subject 7.



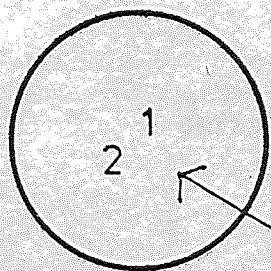
subject 7,

peripheral to conservation

2

3

4

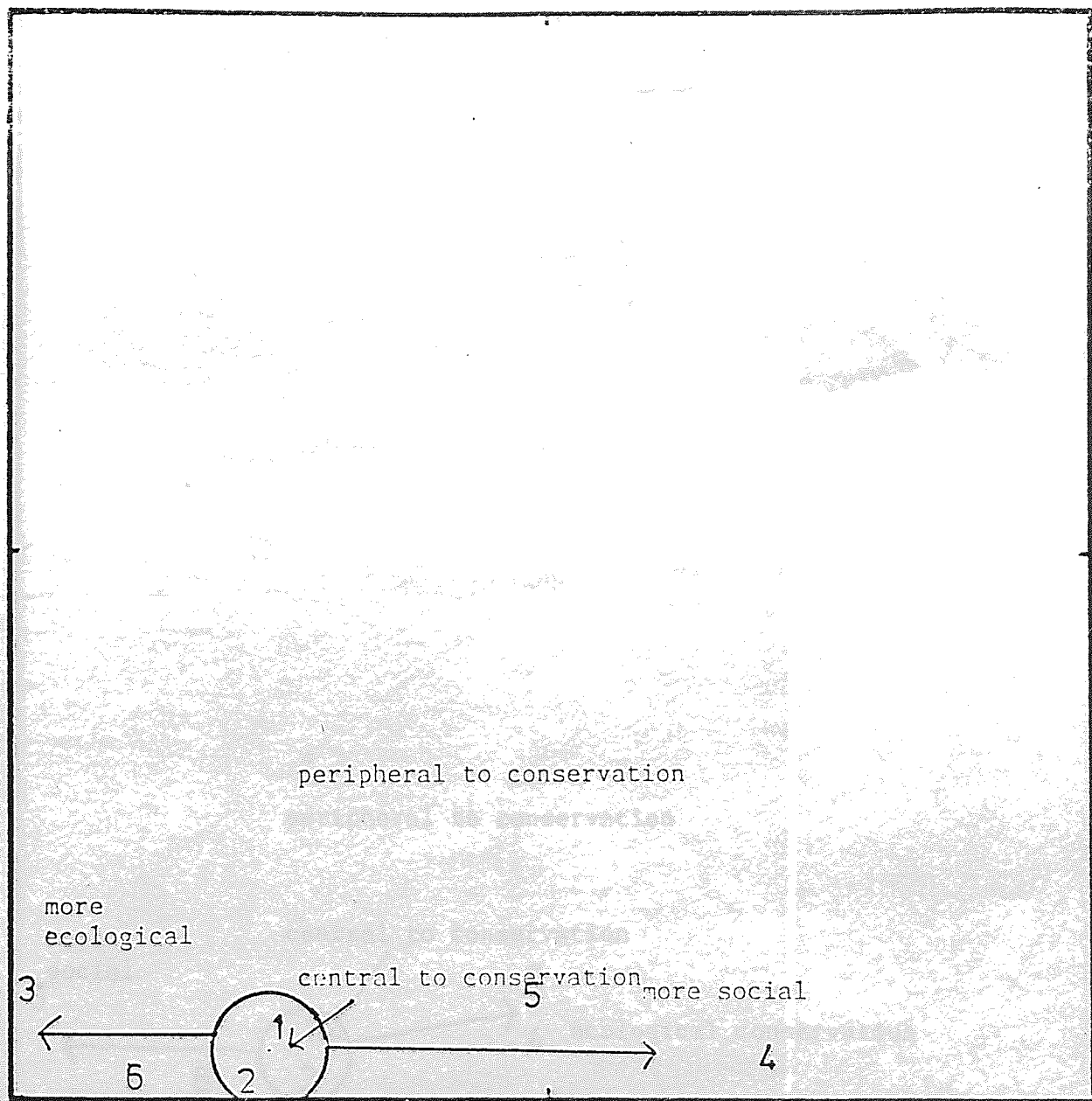


central to conservation

6

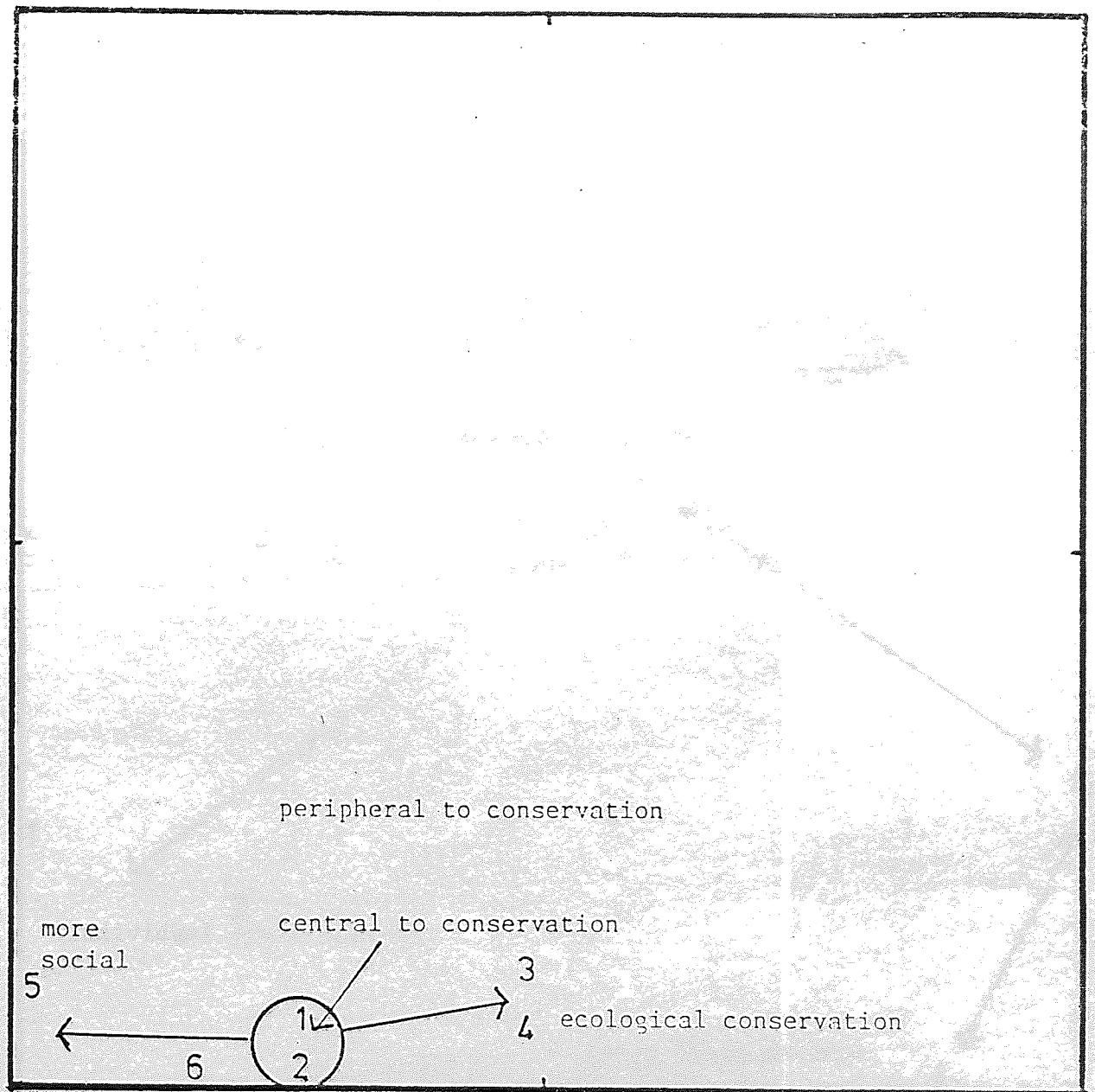
5.

subject7.

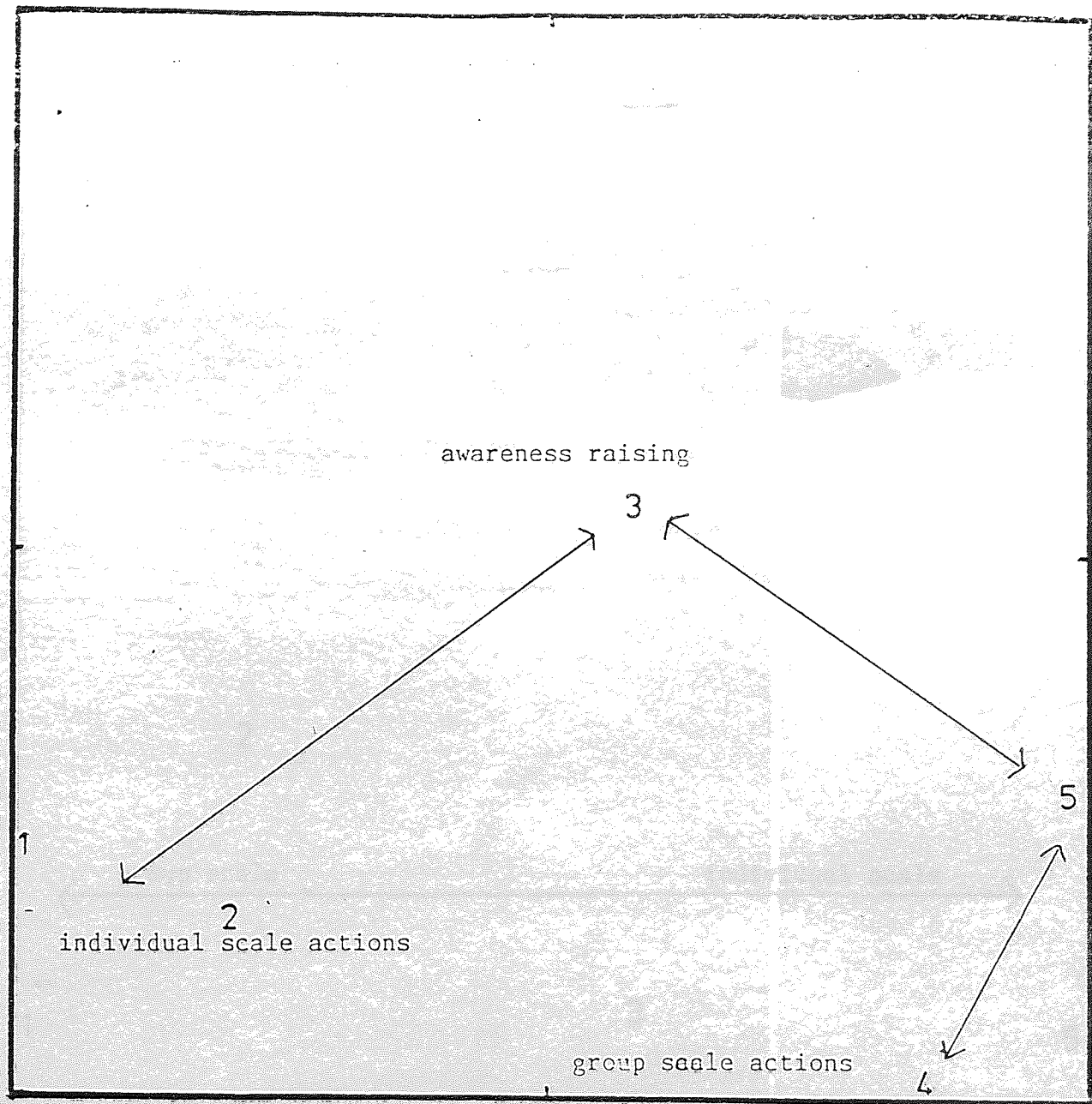


subject 7.

3

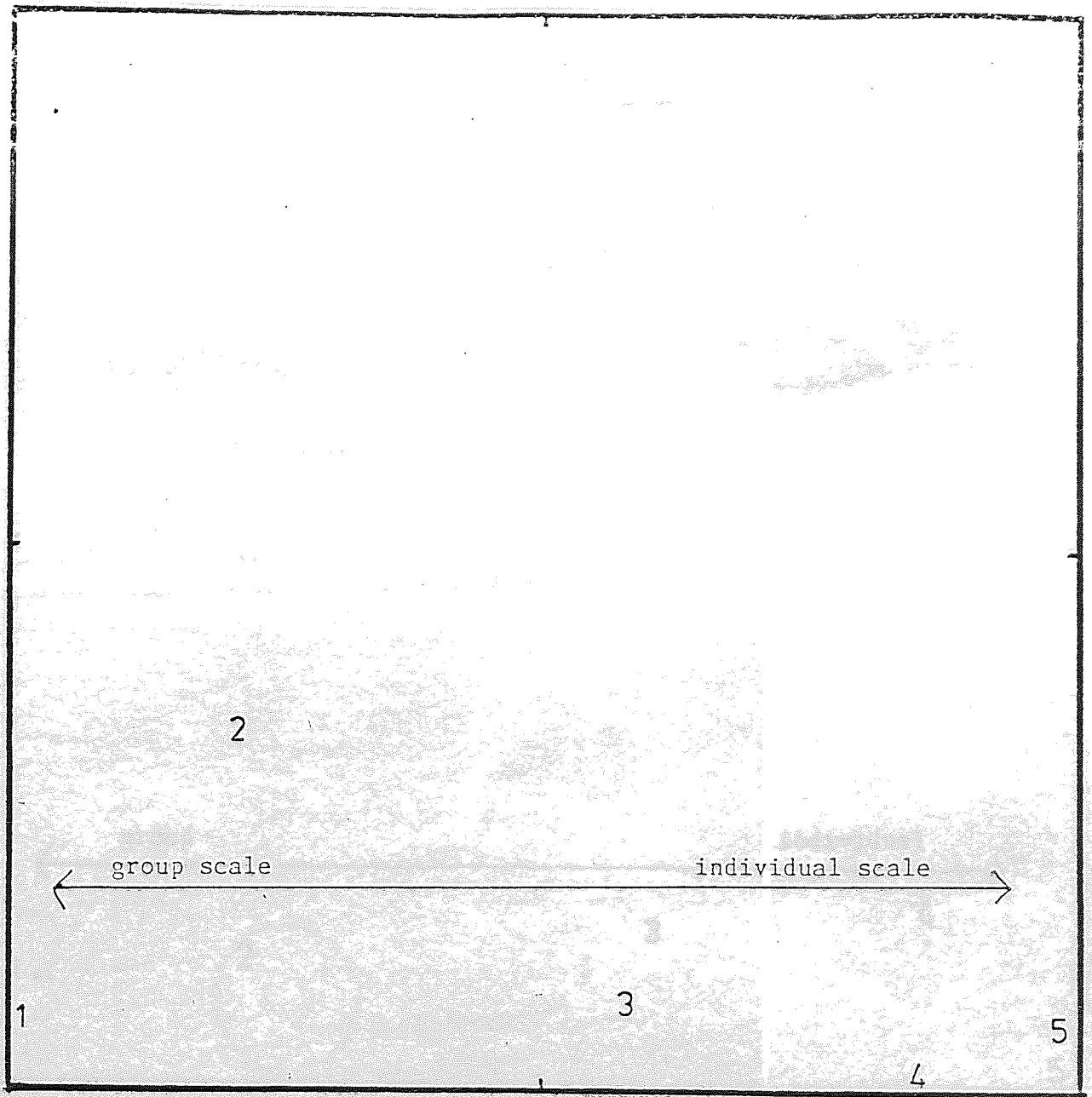


subject 7.



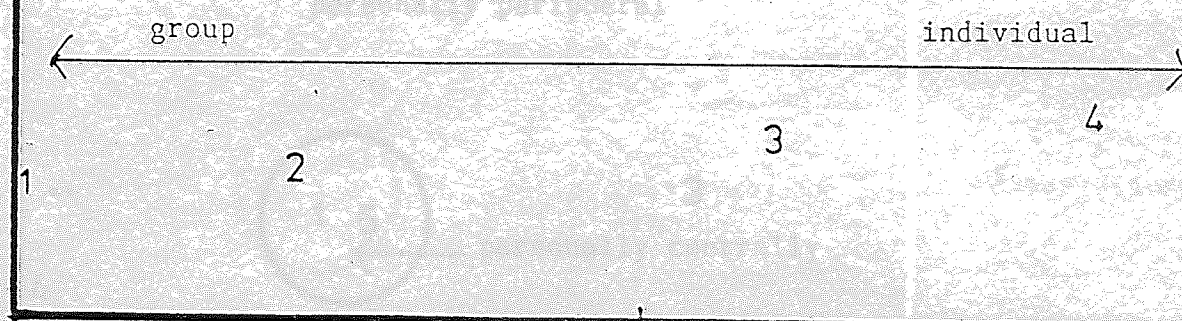
subject 8.

GL 0.11



subject 8.

1

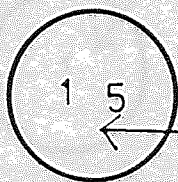


subject 8.

2

2

personally peripheral

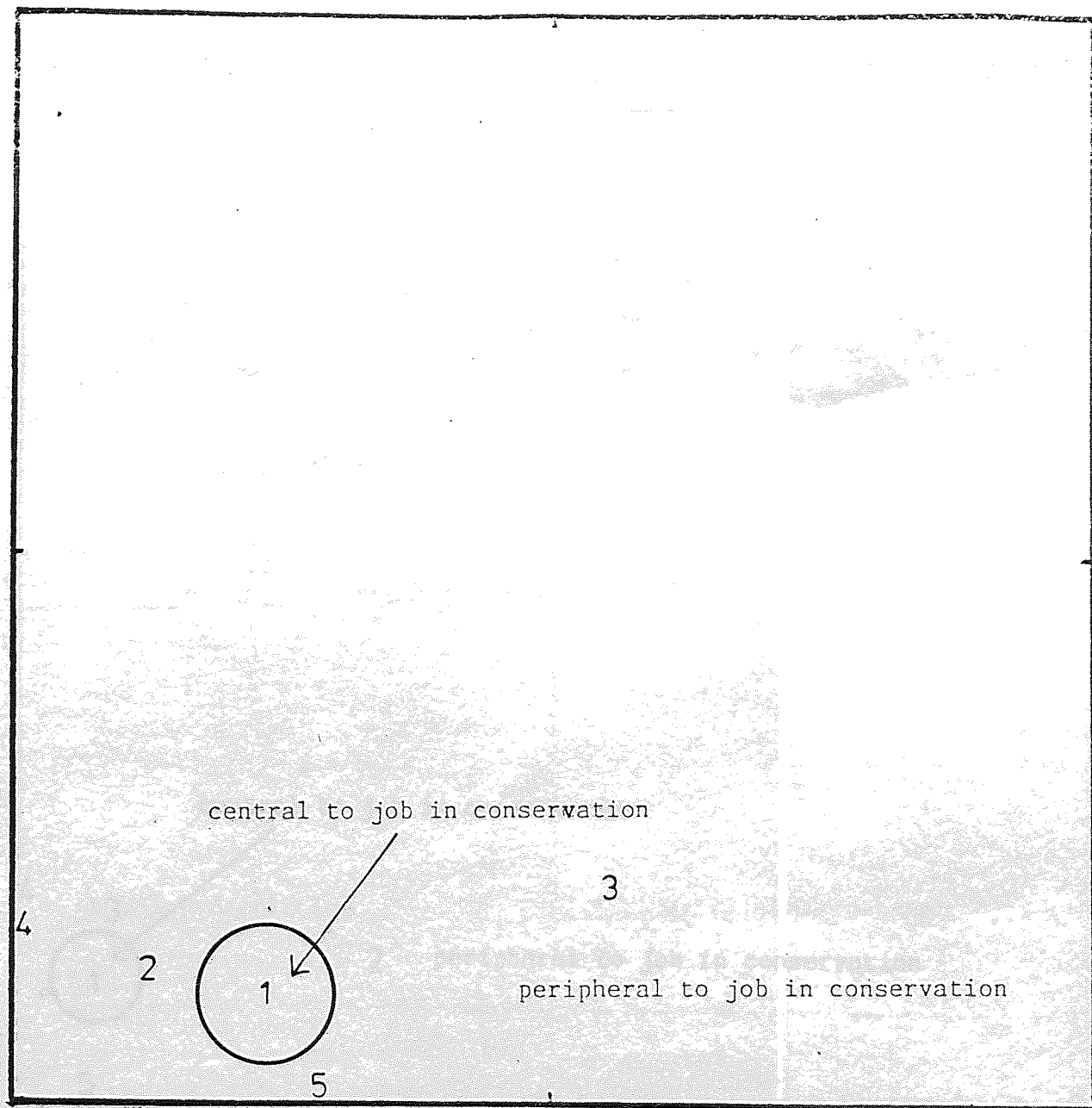


3

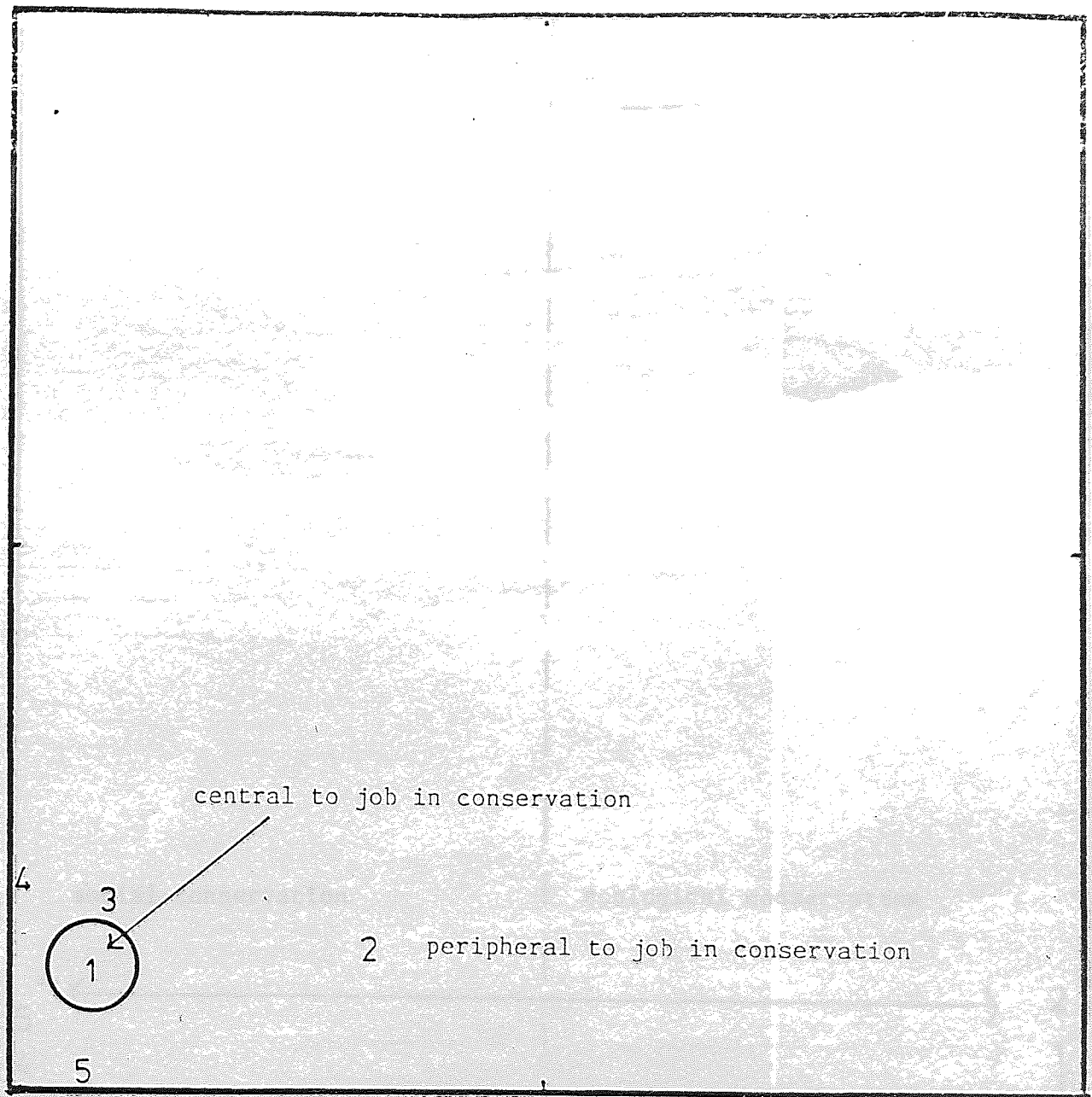
personally centrally

4

subject 8.



subject 8.



subject 8.

1

social conservation

ecological conservation

5
42
1
6

GL 0.08-

subject 9.

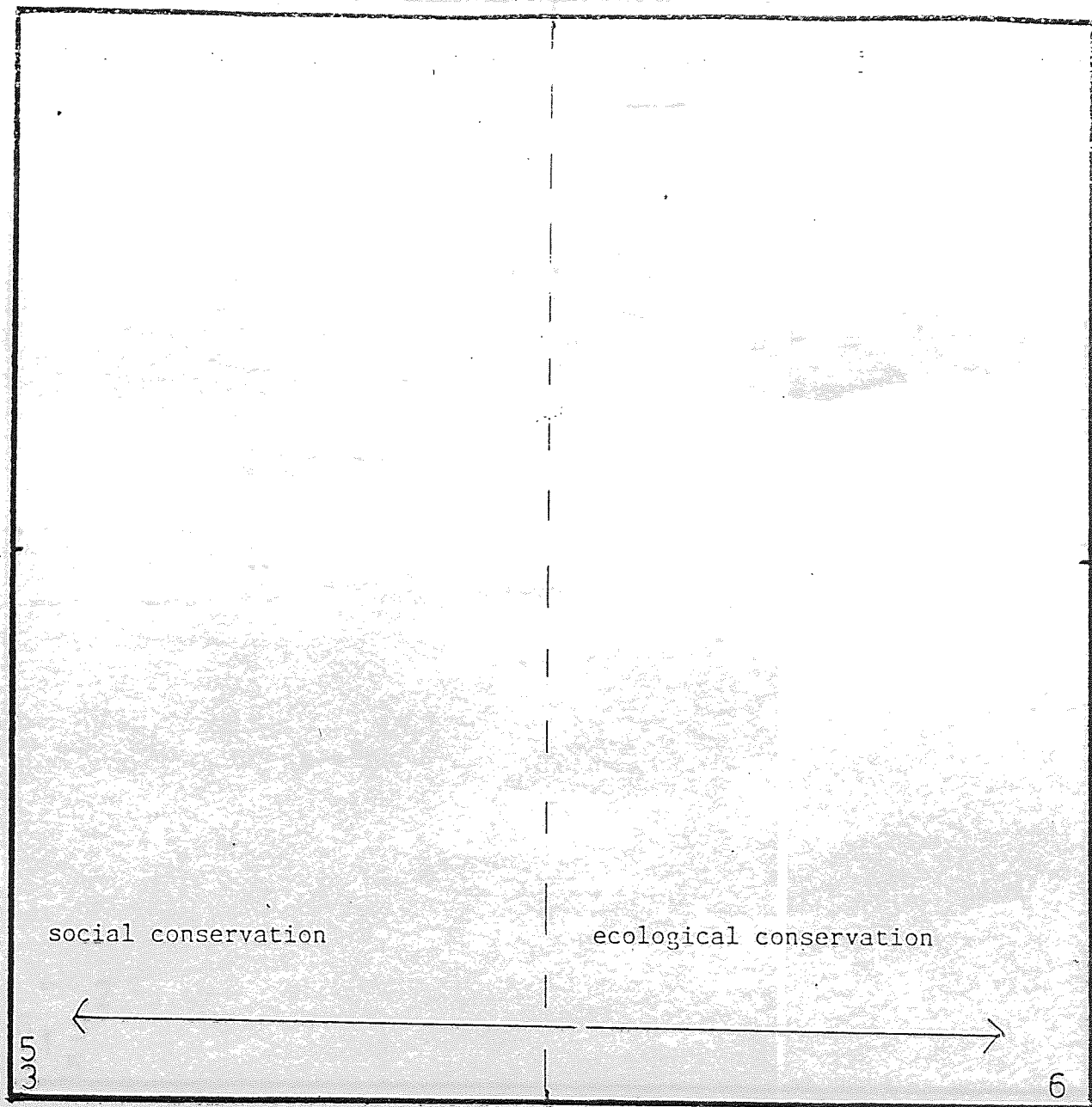
1

social conservation

ecological conservation

4
52
6
1

subject 9.

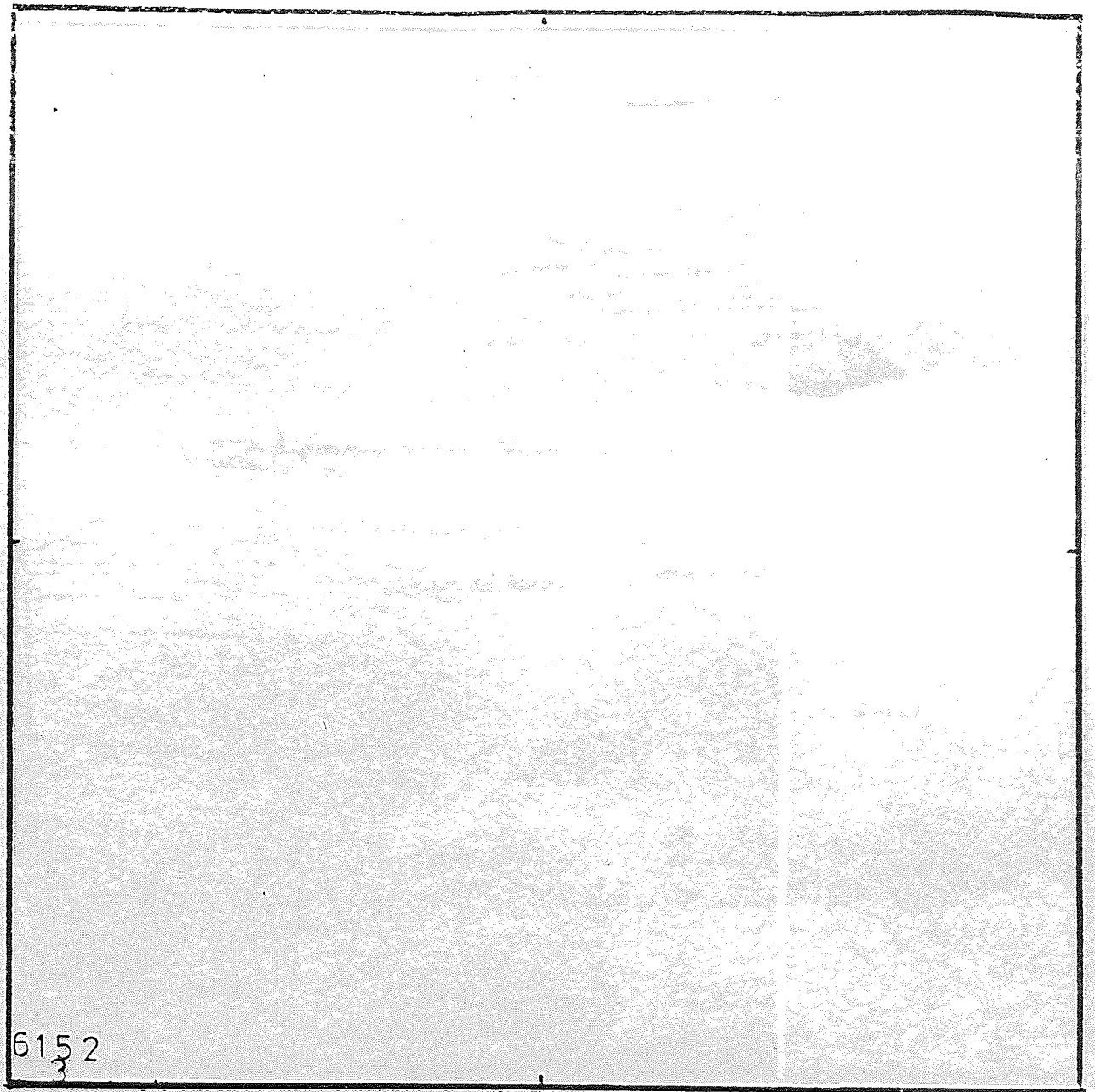


subject 9.

2

6 1 3 2
5

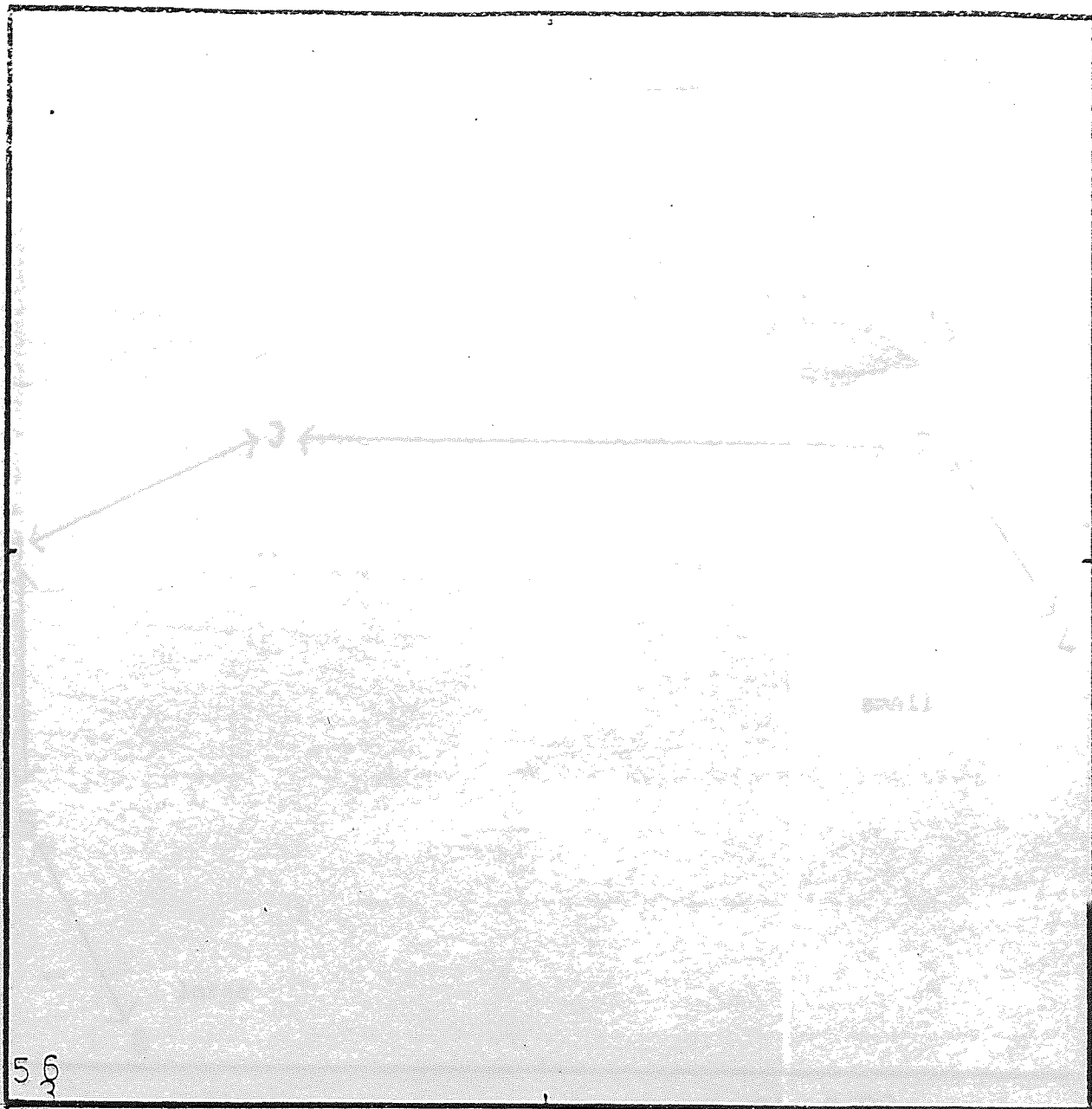
subject 9.



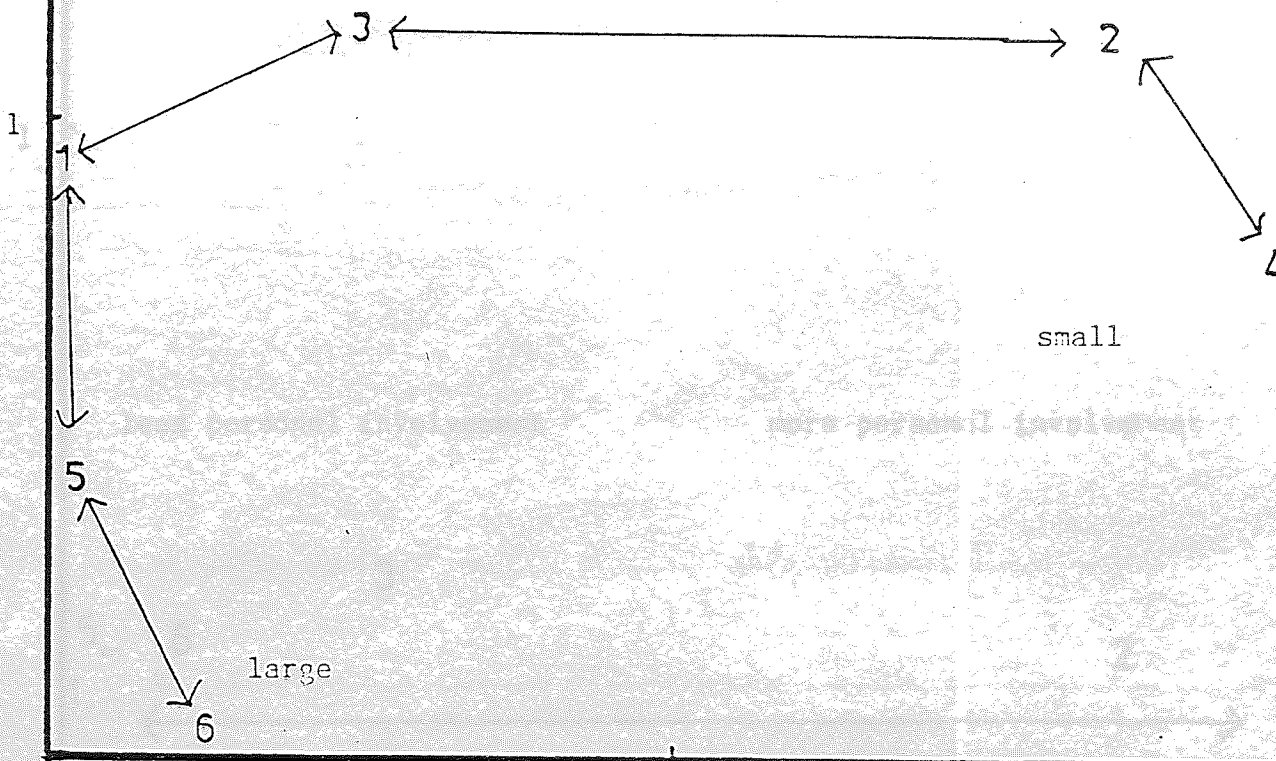
2

6152
3

subject 9.



subject 9.



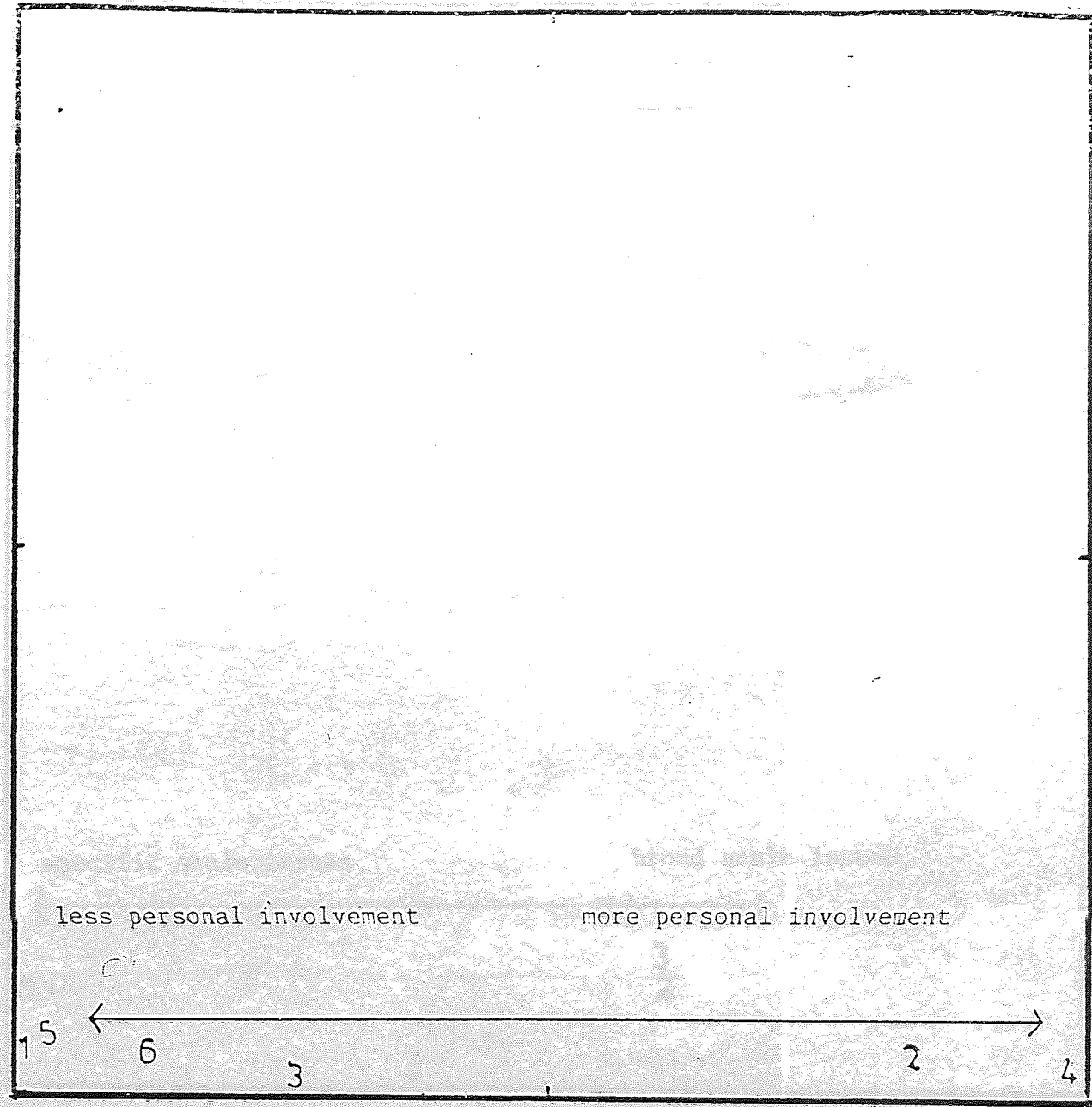
GL 0.09

subject 10.



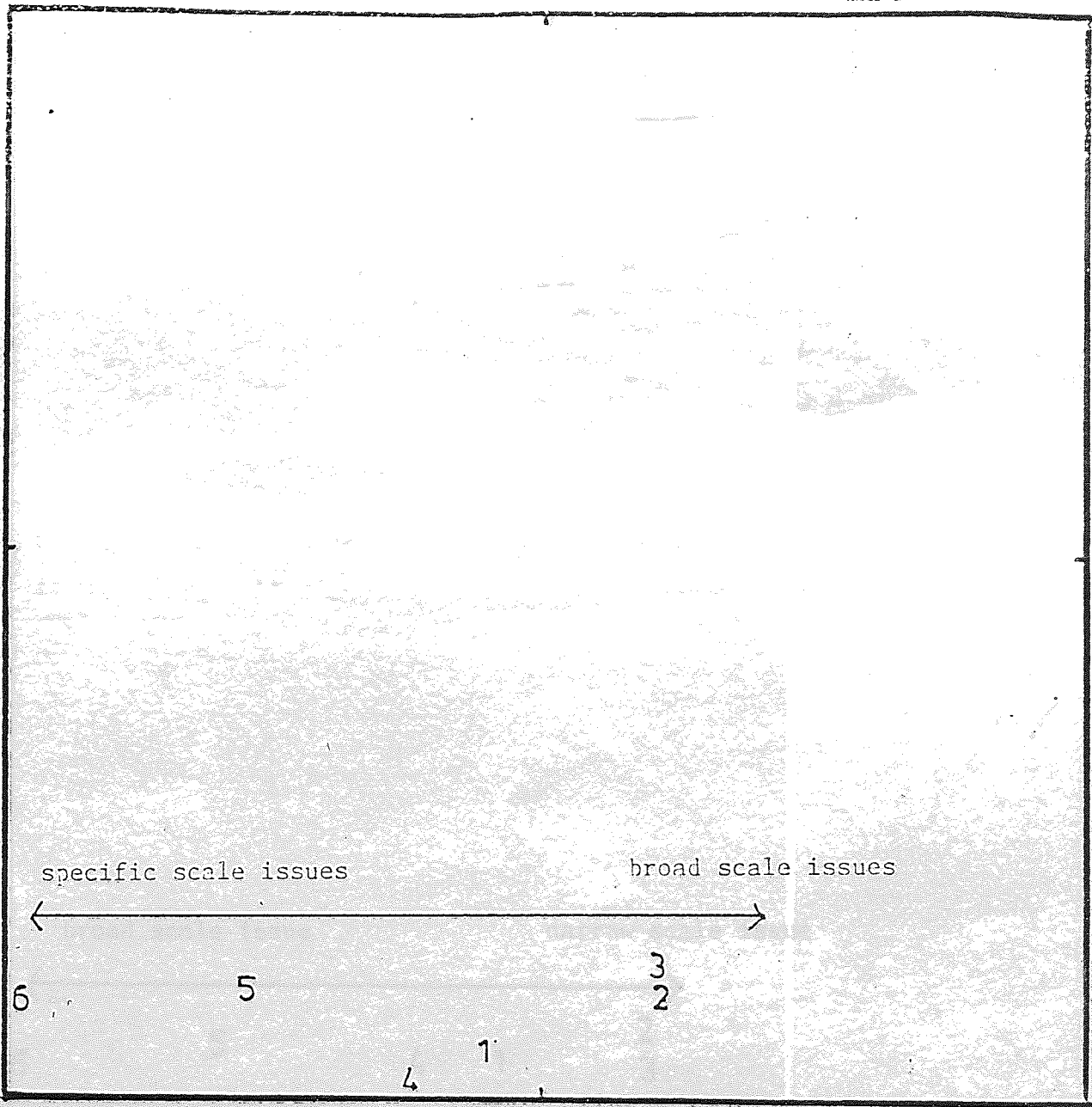
subject 10.

1



subject 10.

2



subject 10.

broad scale issue

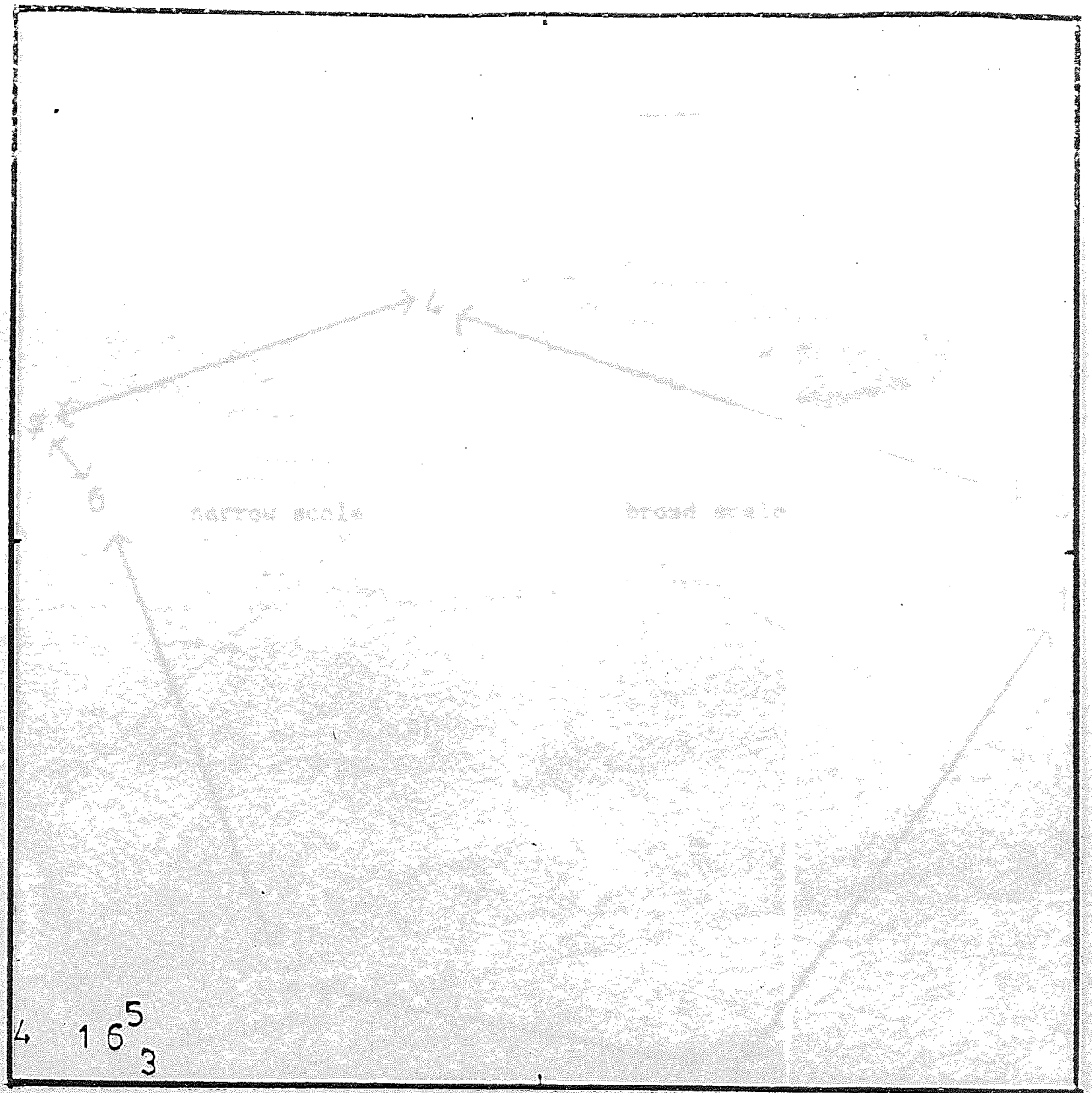
narrow scale issue

6 5 4 1 2 3

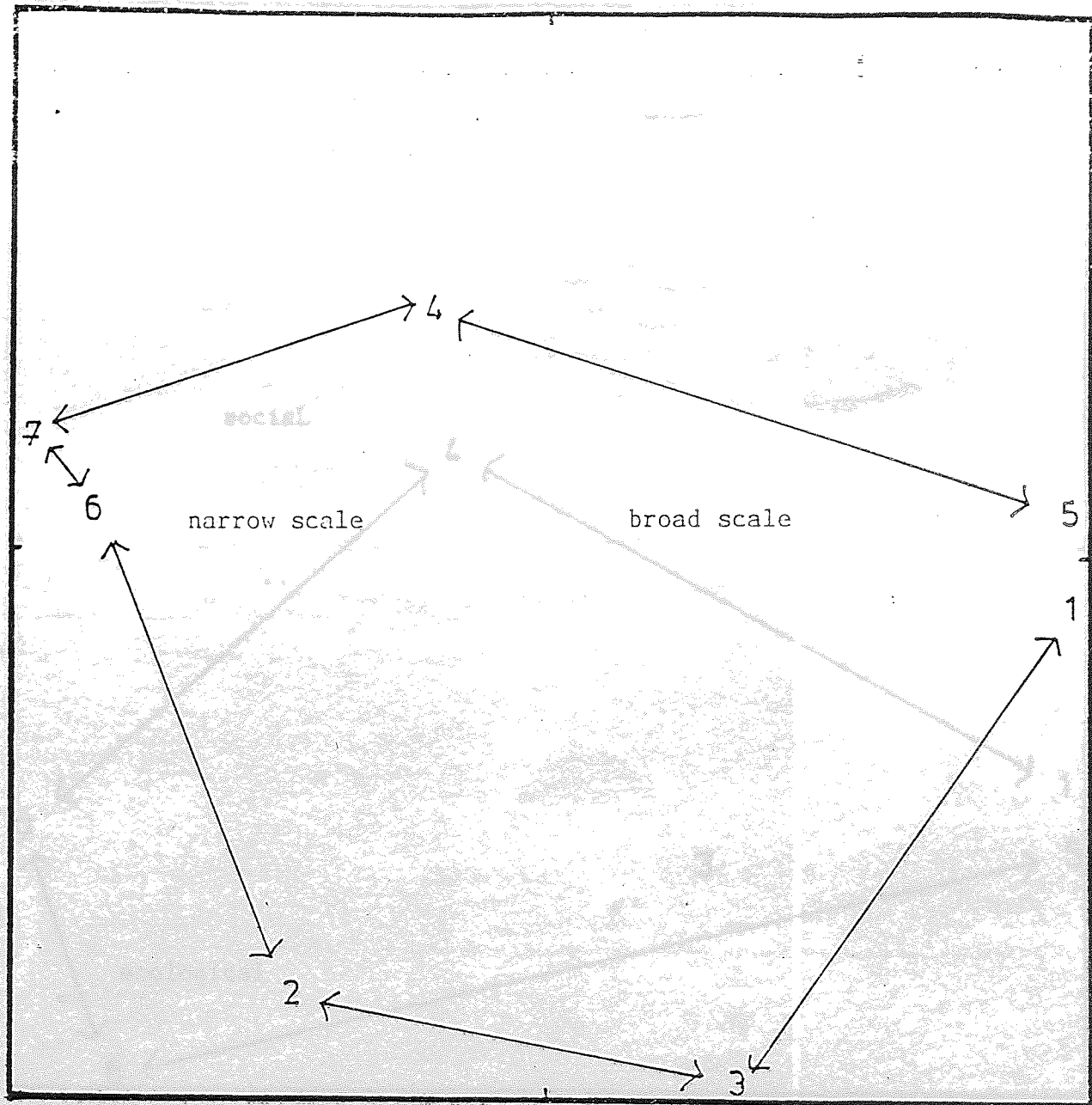
narrow scale issue

A horizontal number line with arrows at both ends. Below the line, there are tick marks labeled 6, 5, 4, 1, 2, and 3 from left to right.

subject 10.

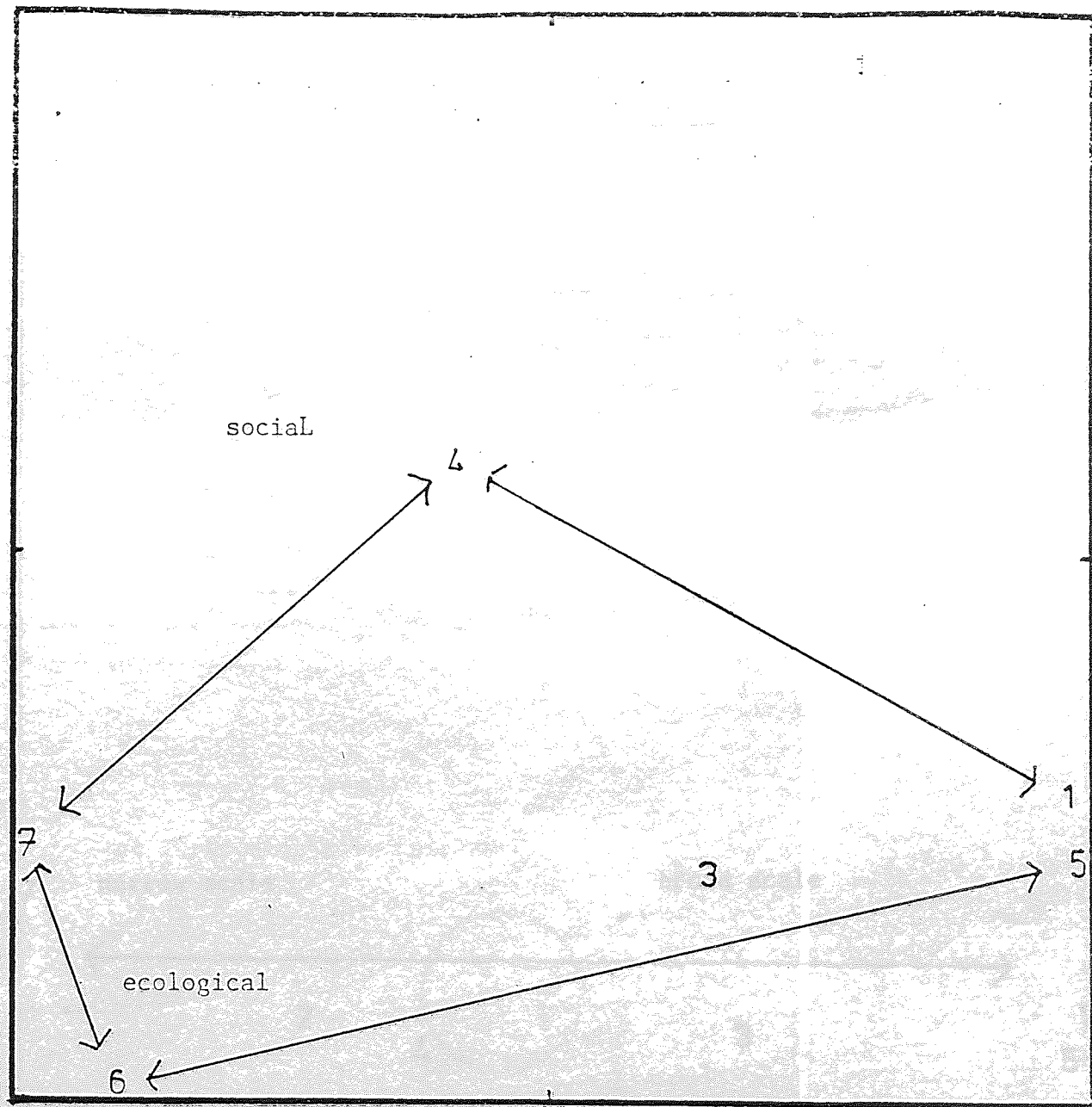


subject 10,

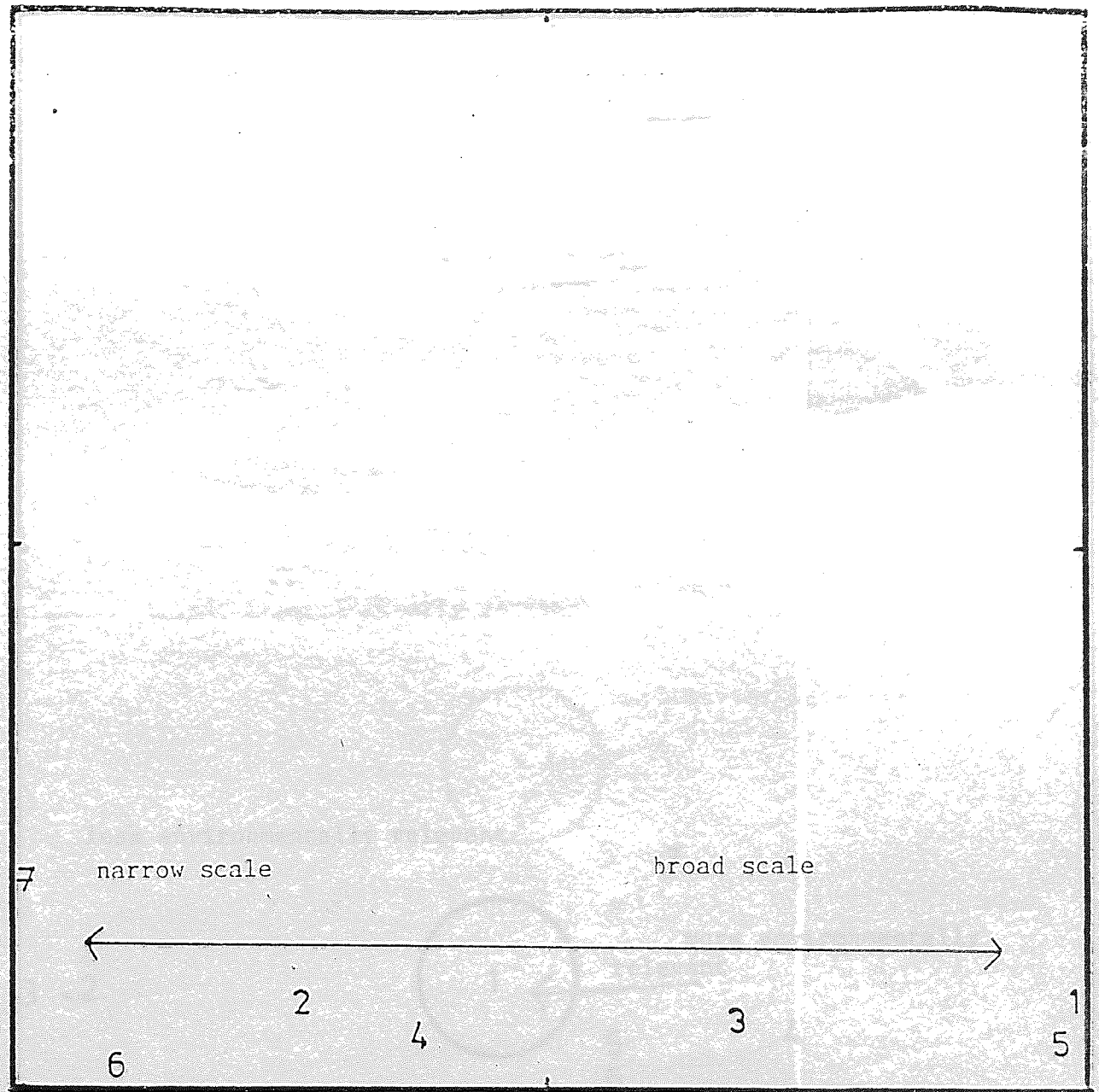


GL 0.05

subject 11.



subject 11.



subject 11.

2

less environmentally relevant

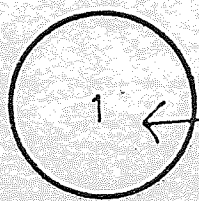
more environmentally relevant

less environmentally relevant

7

more environmentally relevant

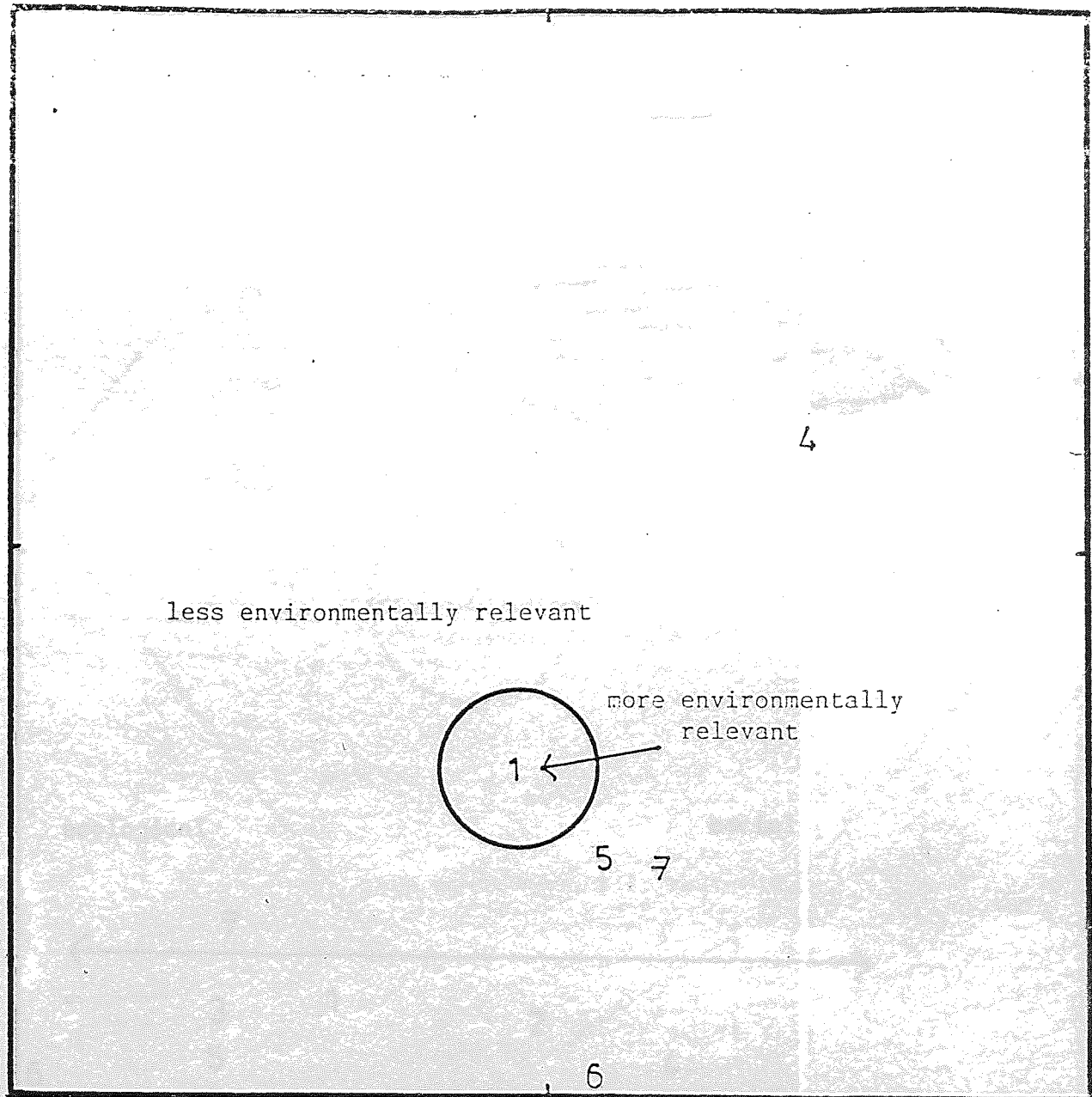
3 2



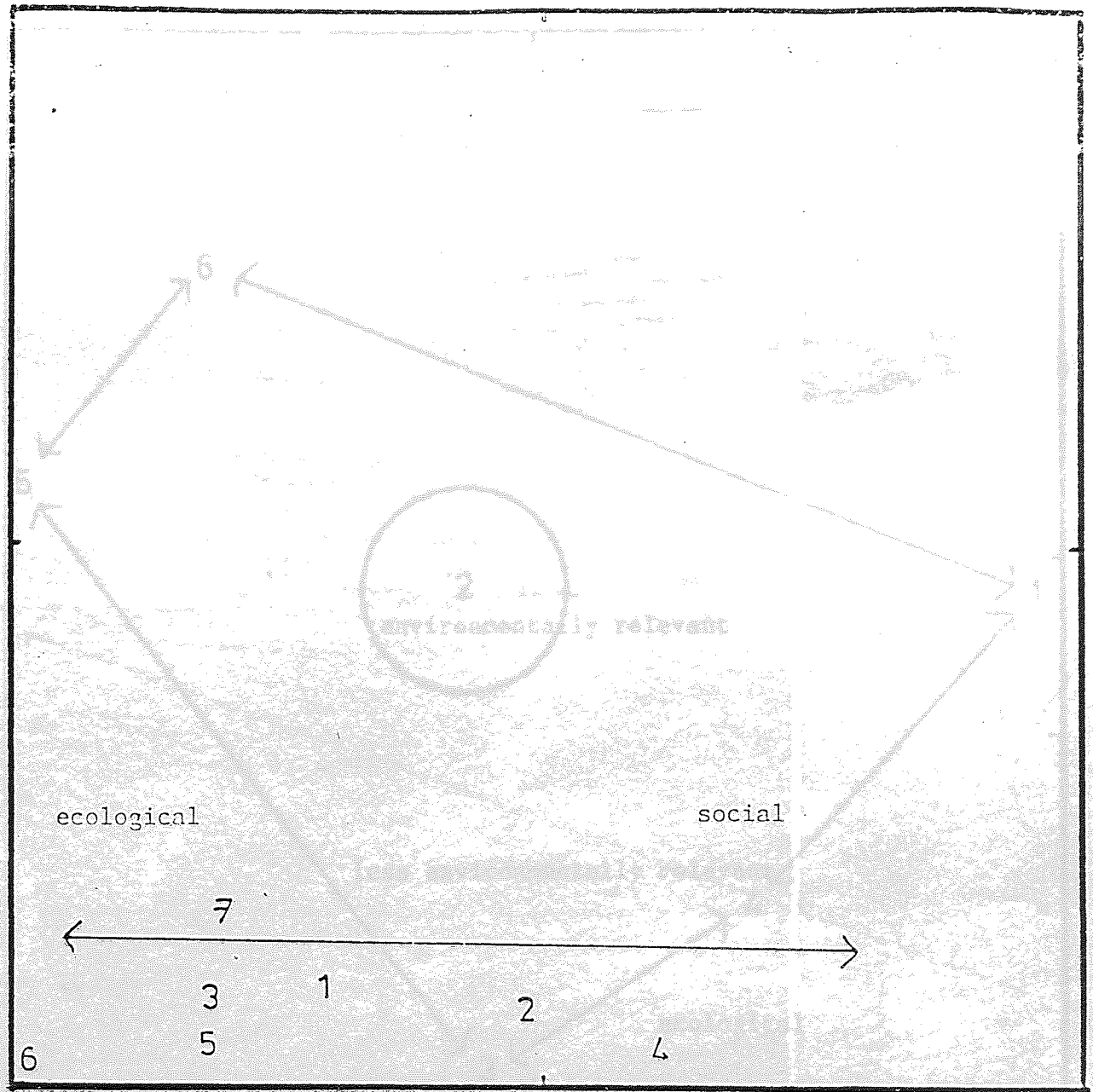
5
6

4

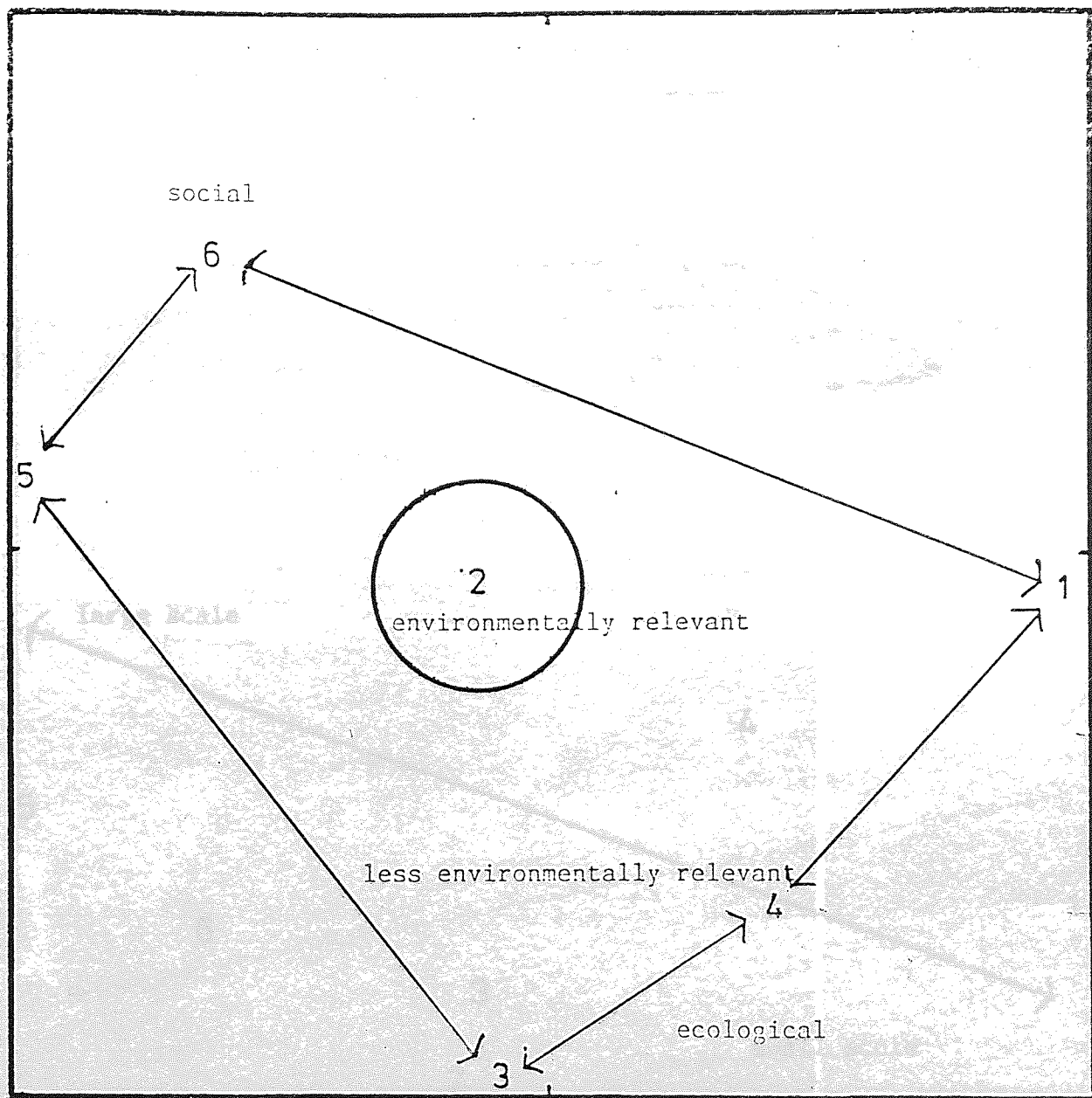
subject 11.



subject 11.

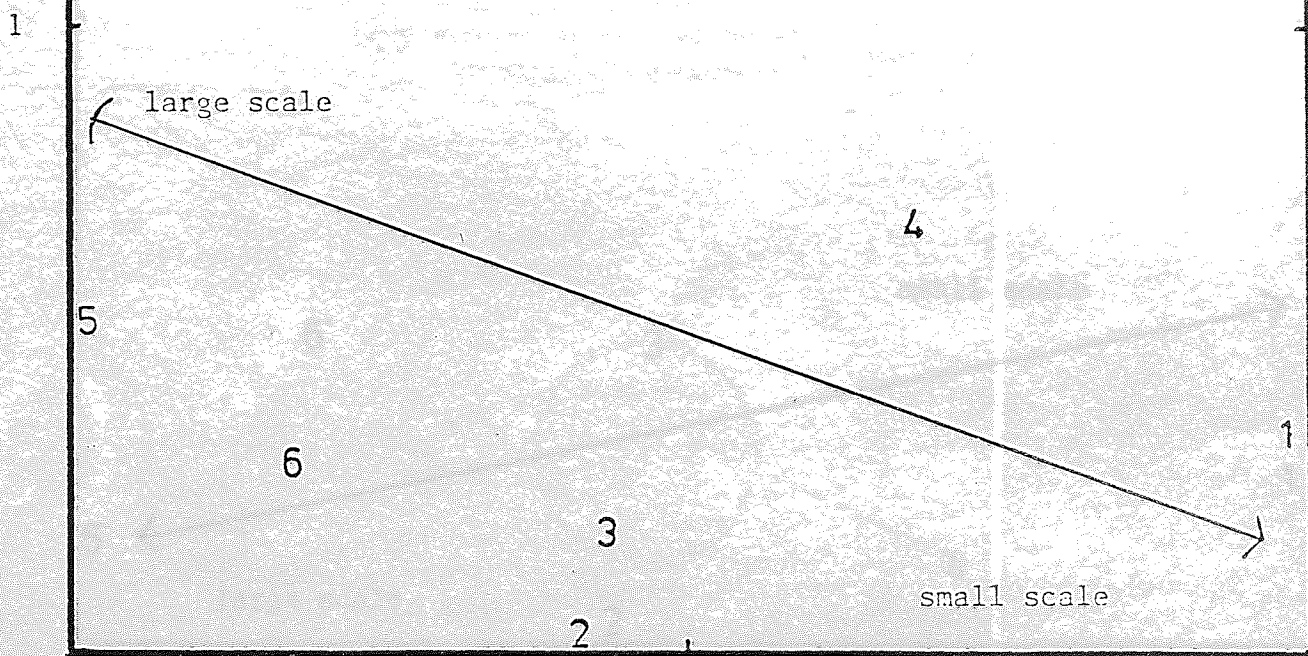


subject 11.

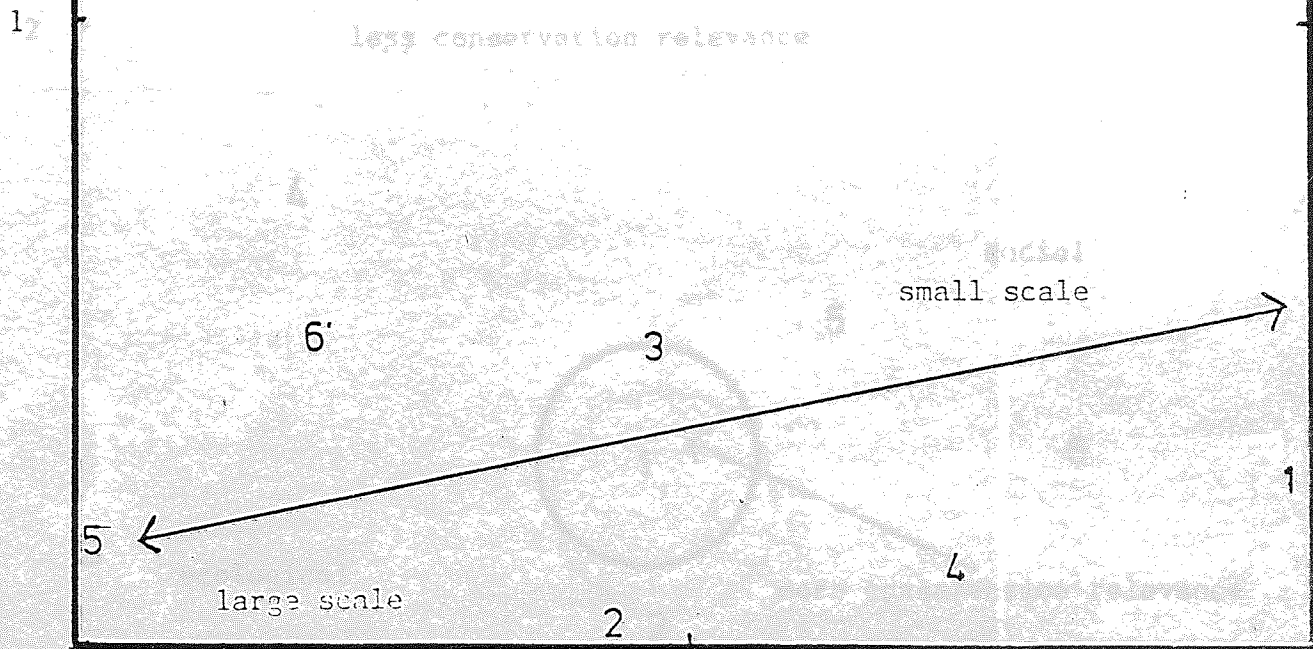


GL 0.03

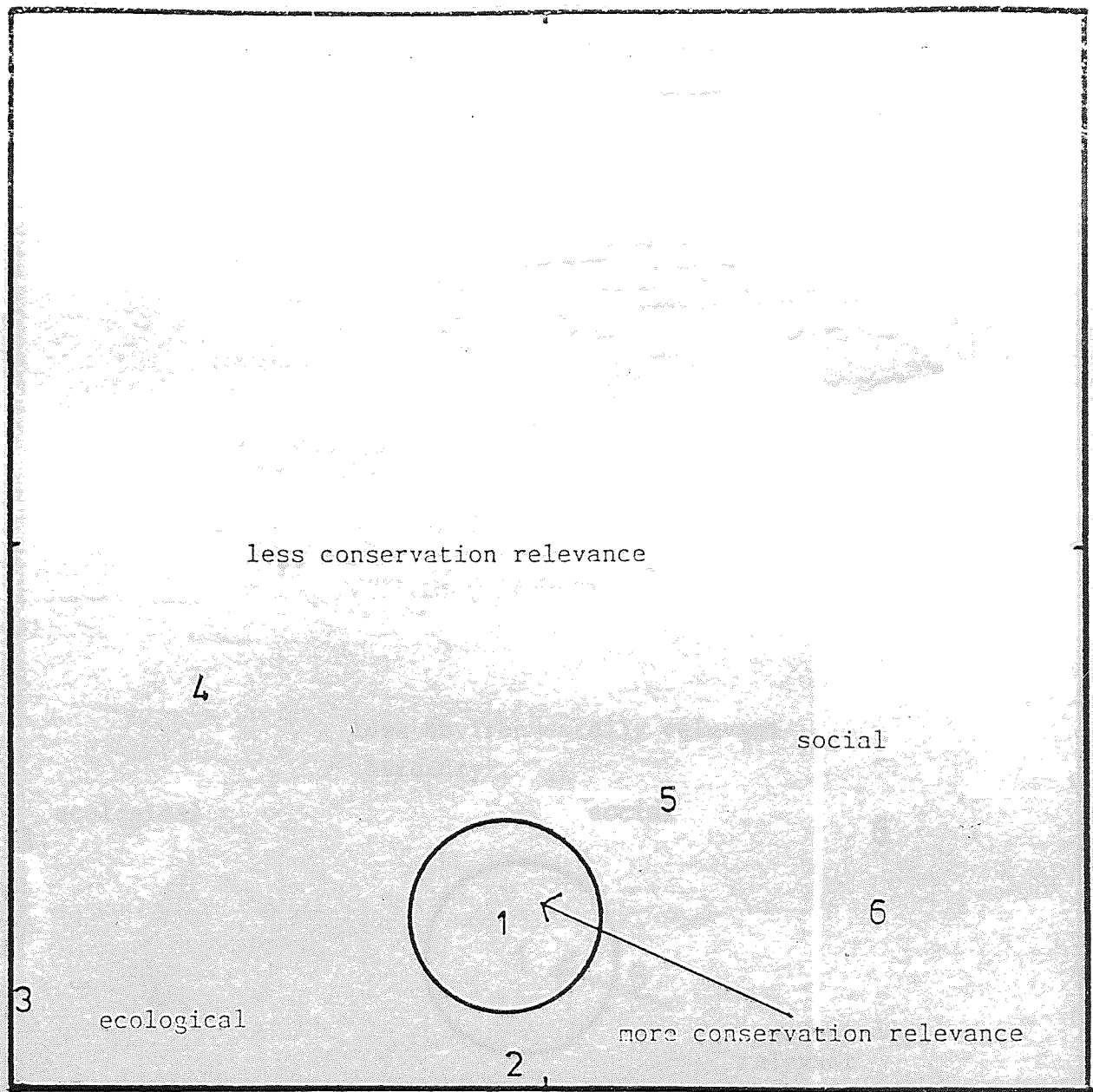
subject 12.



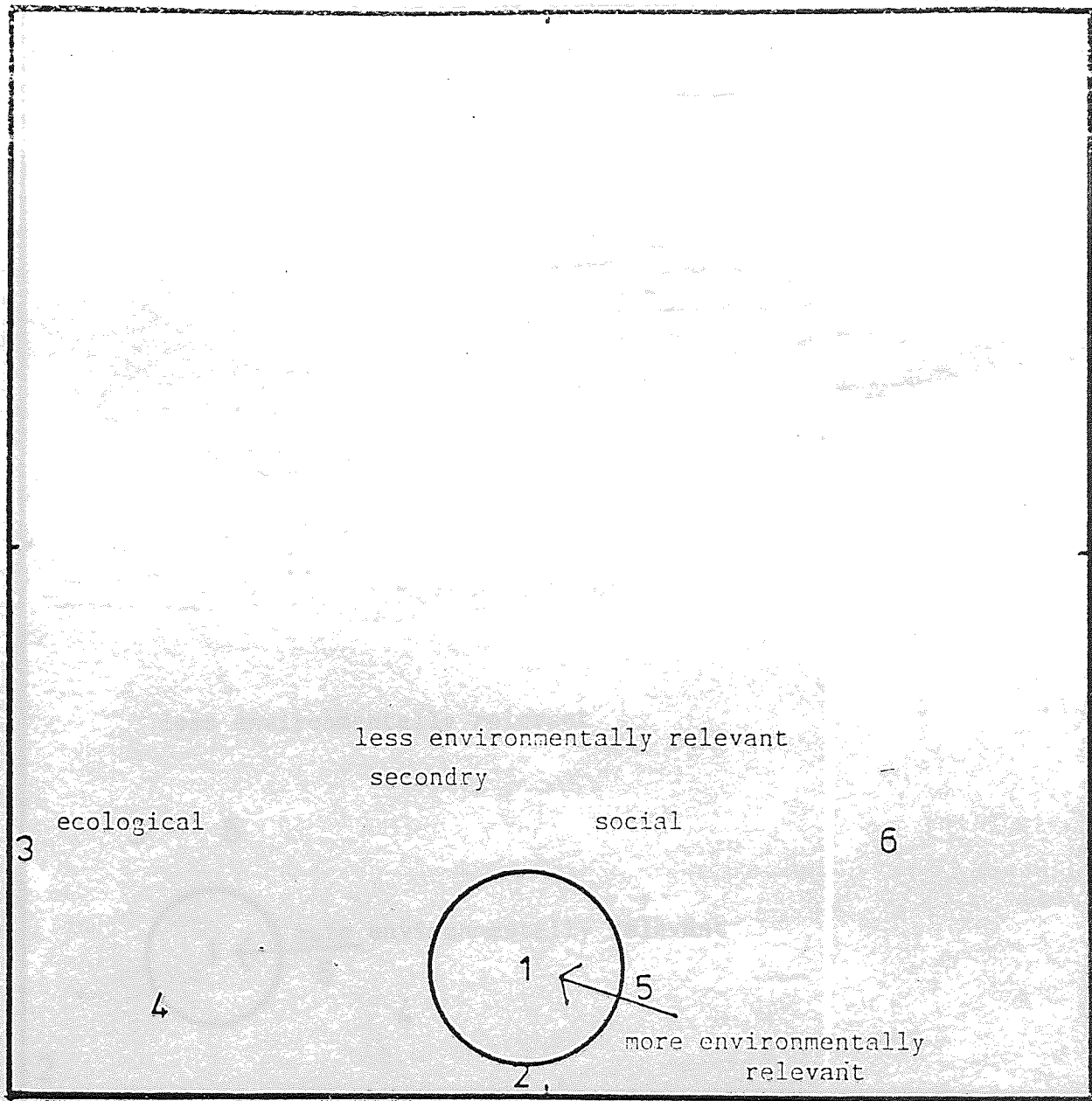
subject 12.



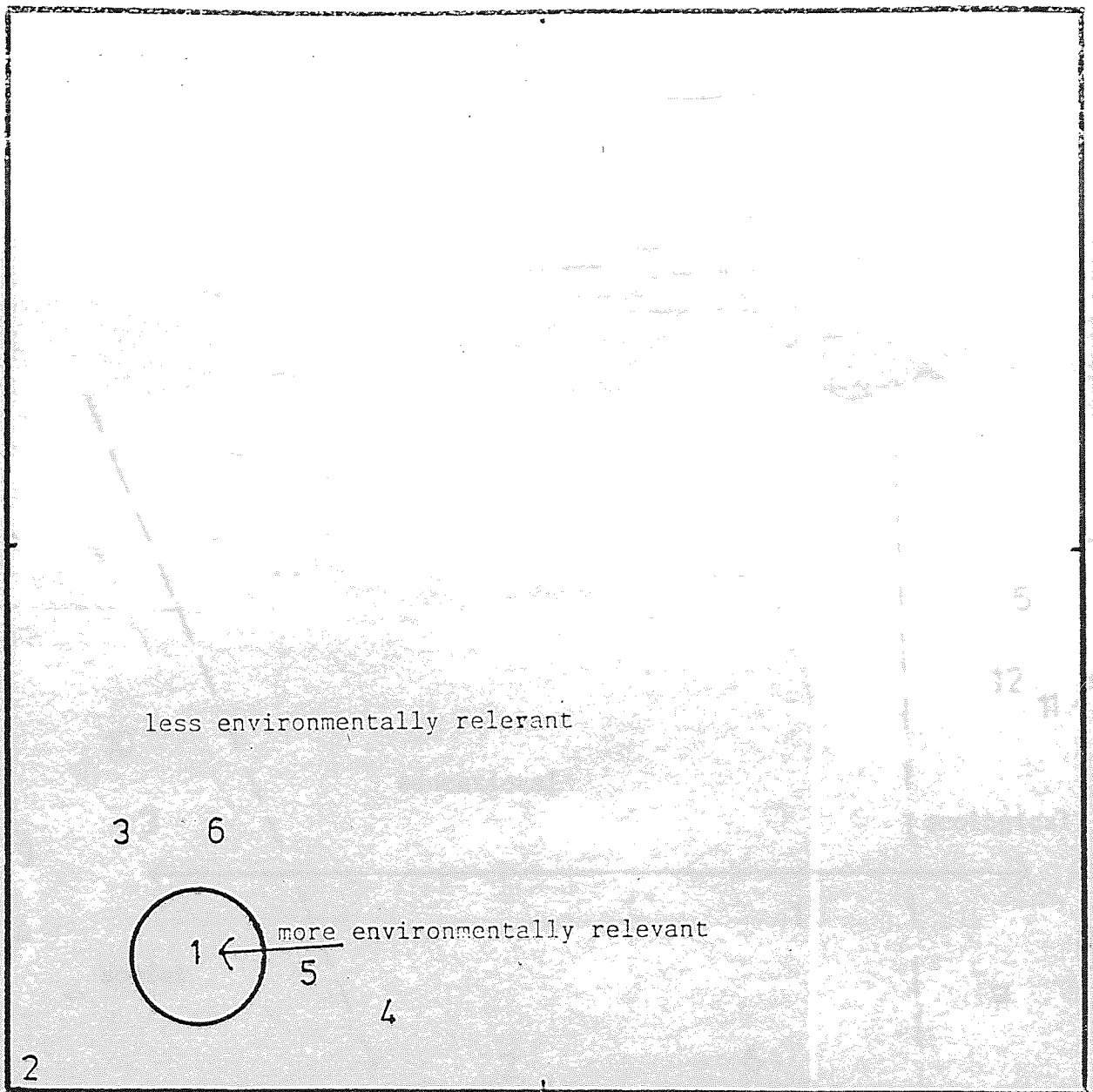
subject 12.



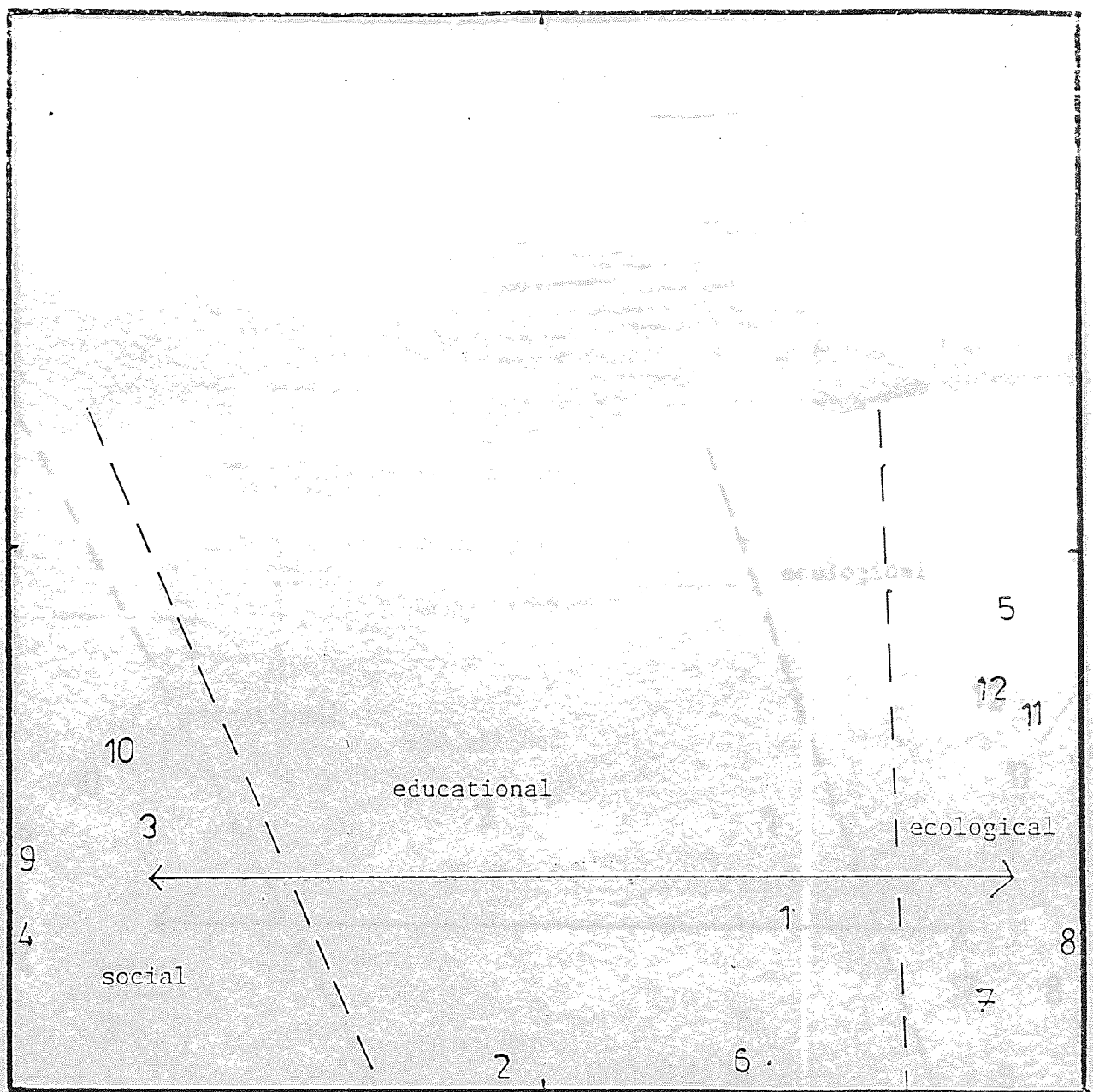
subject 12.



subject 12.

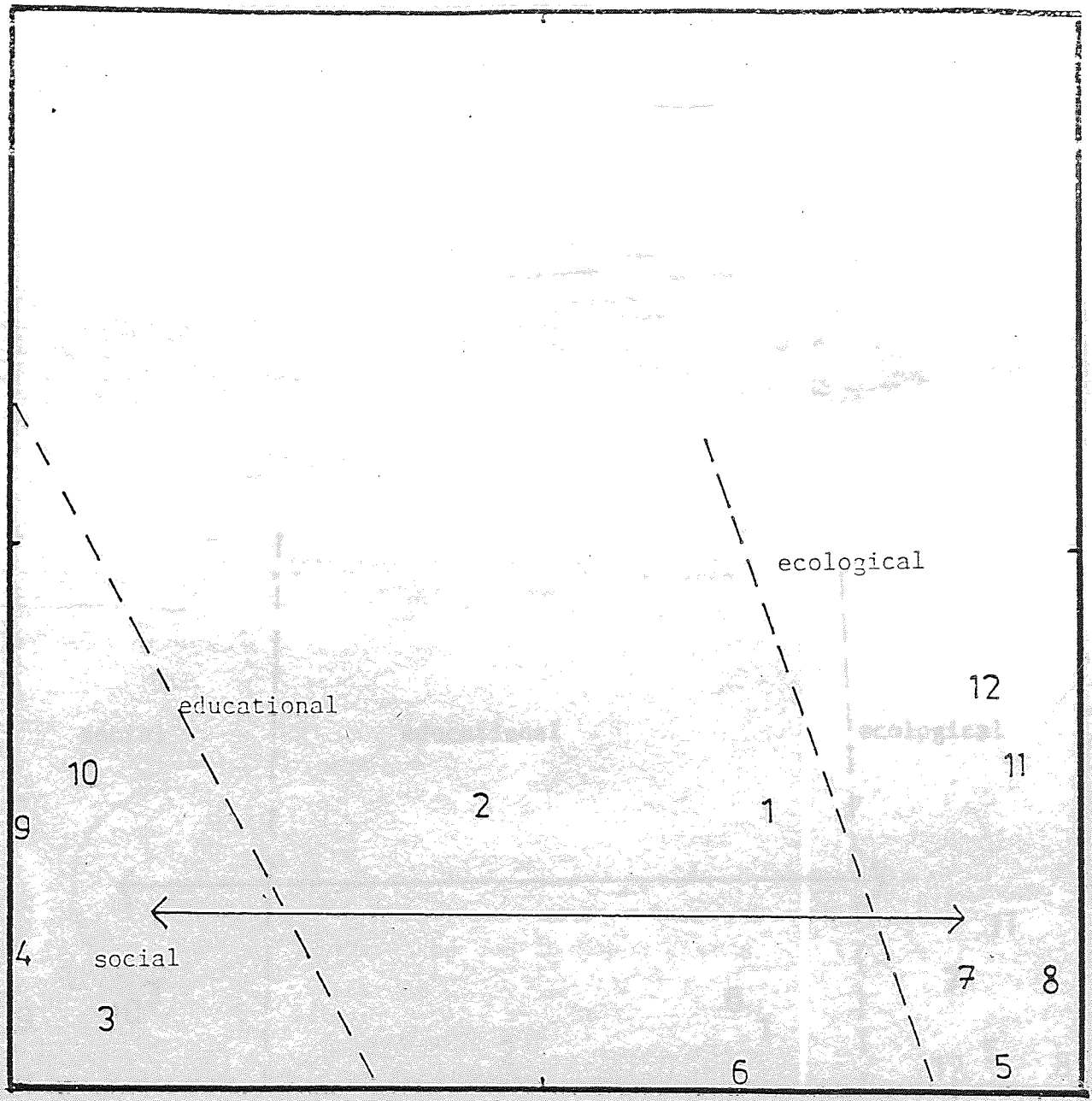


subject 12.

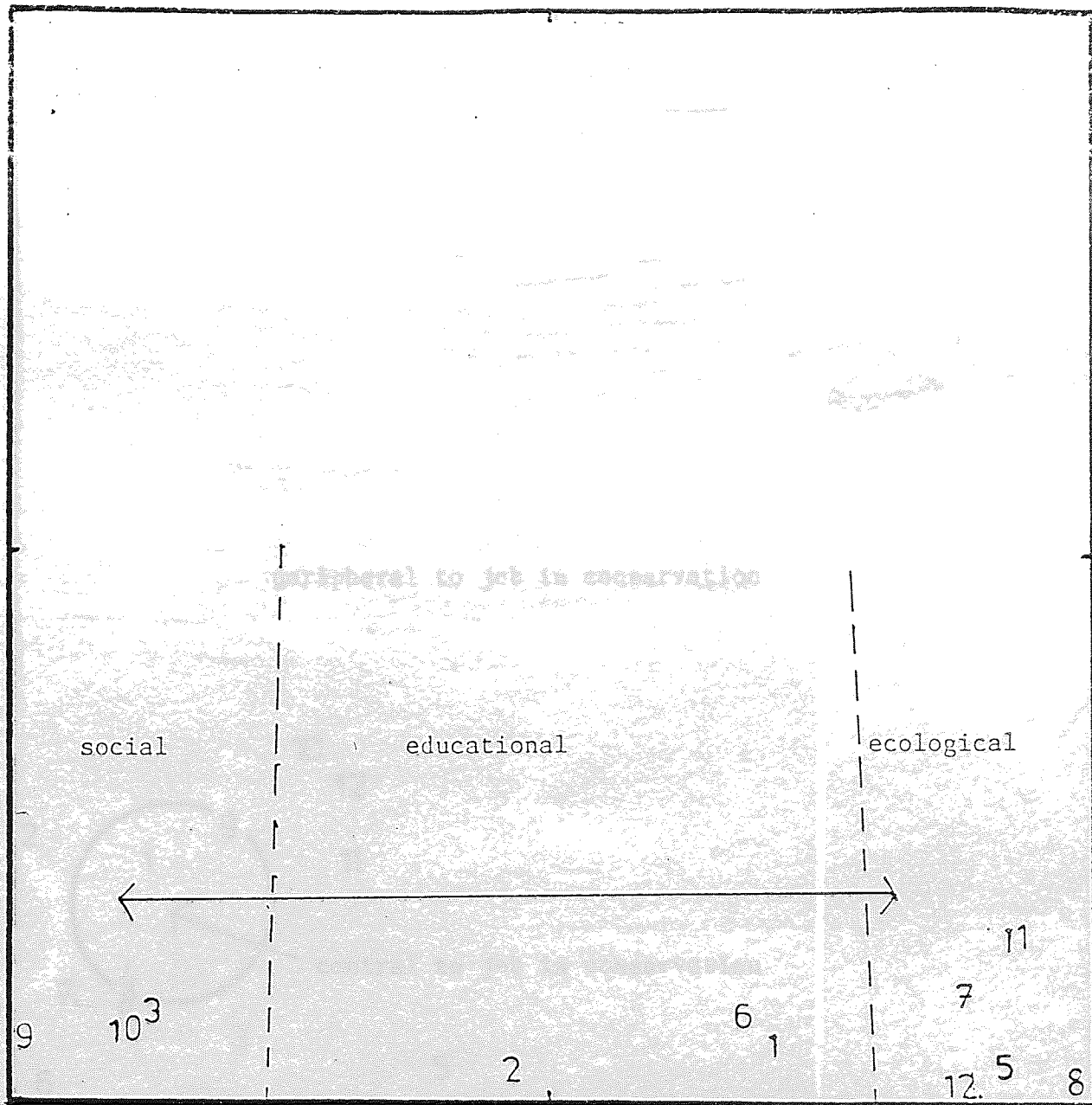


GL 0.09

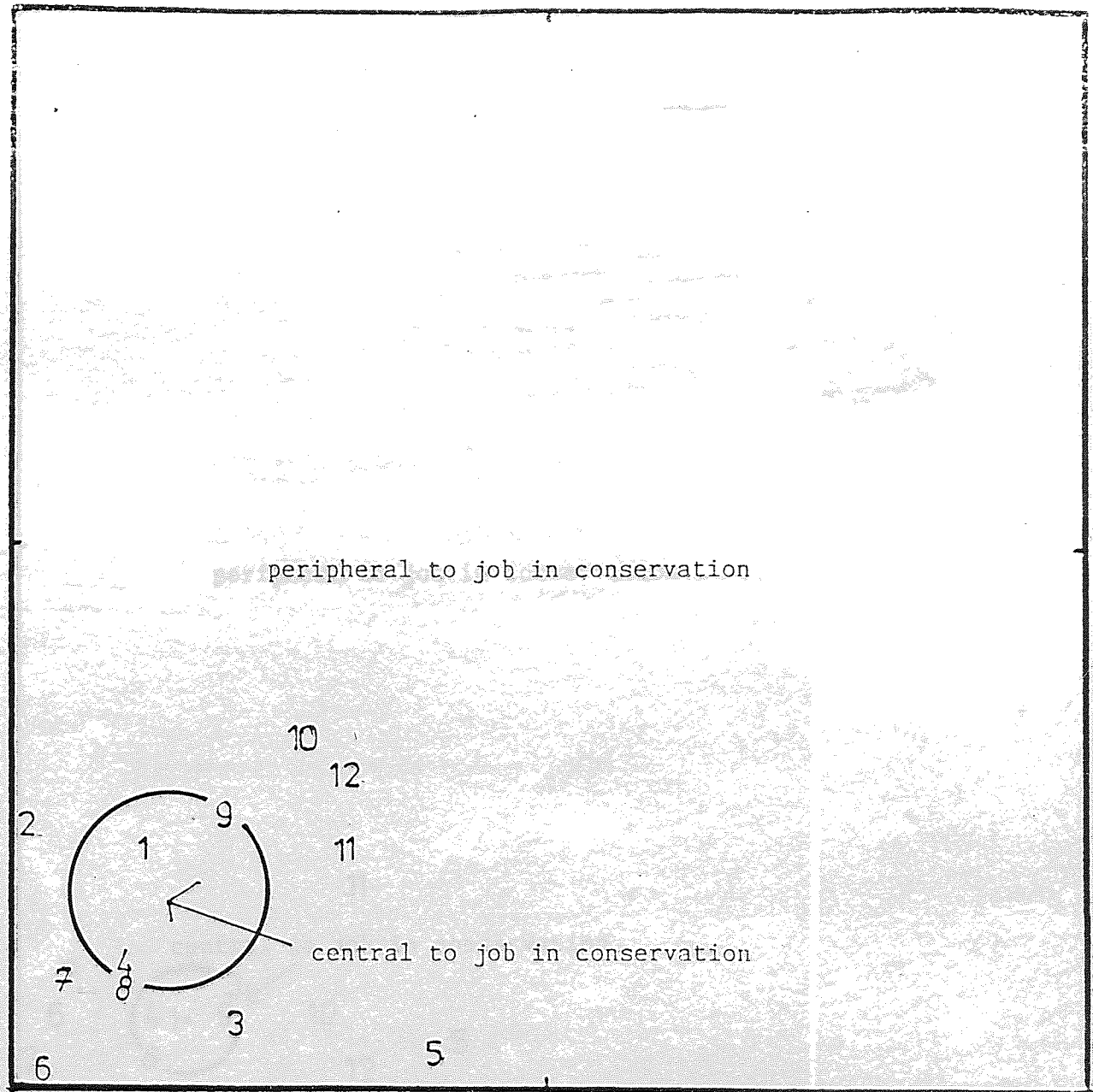
subject 13.



subject 13.



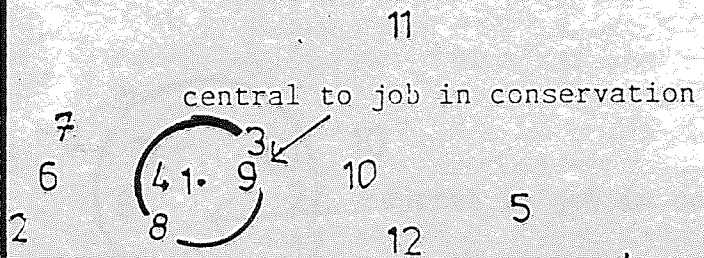
subject 13.



subject 13.

2

peripheral to job in conservation



subject 13.

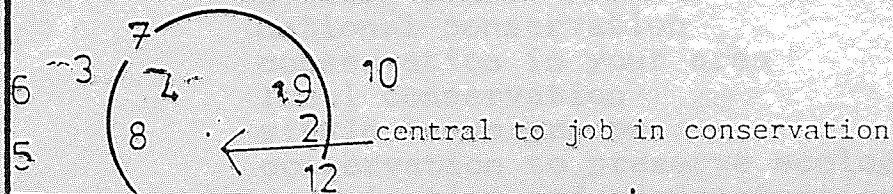
ANNUAL REPORT 1982

Summary
Work of conservation and
education
and nature ethics
ecological people
green world
information systems

3

peripheral to job in conservation

11



subject 13.

LIST OF GRID ELEMENTS
(INDIVIDUAL REPERTORY GRID STUDIES).

ELEMENTS.

Awareness
morals of conservation and ethics
education
man and nature ethics
ecological morals
green morals
information services
campaigning
advertising
worldview / thoughtfulness
rural conservation
political role
pressure groups
green sites and nature as peoples choice
people involved in nature
government involved in nature conservation
economic role
preservation of gene stock
practical ground work
British conservation
national conservation
conservation in your area
local conservation
single issue groups
conservation to preserve ecology and species
organisation and administration of conservation
large scale projects
small scale projects
rural and urban conservation
natures beauty
emotions
natures intrinsic beauty
healthy living
life style
self sufficiency
commercial aspects
social problems
habitat protection
species protection
personal or individual involvement
personal effect
personally motivated
ineffective
group related
mental work

APPENDIX A.2 (cont)

involvement of external agencies
exploitative, anti-conservation
essential
direct action / influence
indirect action / influence
effective / significant
doing / active
initiating agency
excludes public
informed choices and responses
emotional choices
responses
conservation studies
man's effect upon the environment
global effects / wider concern
global action / wider action
long term action / effect
short term action / effect
narrow / personal concern
conservation related
conservation as elitist / scientific
produces pollution
is fulfilling
? ins't fulfilling
just human
socially useful
ethical considerations
disregards ethics
sustainable
primary issue
superficial conservation
open mind to conservation
external agencies working in conservation
involves whole life
small part of life
nature conservation solves social problems
people give nature conservation their mandate
conservation without mandate
receives publicity
receives no publicity
behind the scenes
progressive area where influence is occurring
dead-end for conservation
children involved
children not involved
conservation as a model

APPENDIX A.3

REPERTORY GRID AND INSTRUCTIONS

(INDIVIDUAL REPERTORY GRID STUDY).

Elements were identified during prolonged conversations with the respondents. The elements thus identified were then entered into a blank repertory grid (see over).

Constructs were then elicited using triadic sort technique. These were entered along the left hand column of the grid. The contrast to this emergent construct pole was then requested and was entered along the right hand grid side.

Each element was then rated along each of the construct scales (details of this procedure is given on the front page of the standard Environmental Conservation Repertory Grid in appendix A.4).

REPGRID FORM.

Name

APPENDIX A.4

1. 2. 3. 4. 5. 6.

I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I
I	I	I	I	I	I

* * *

* * *

* * *

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* * *

APPENDIX A.4

STANDARD REPERTORY GRID AND INSTRUCTIONS.

(GROUP REPERTORY GRID STUDY).

ENVIRONMENTAL CONSERVATION RESPONSE GRID.

PLEASE READ THESE INSTRUCTIONS CAREFULLY.

Please complete all scales. All information given will be treated totally confidentially. Please complete this form without the aid of other people, ie friends or work colleague etc - IT IS YOUR RESPONSE THAT IS WANTED, AND WHICH IS OF VALUE TO US.

In the "GRID" that follows you will see printed along the top of each sheet, a series of 19 actions or "AREAS" of work associated with environmental conservation. Printed down the right and left hand sides of each sheet are a series of 48 "SCALES".

The statement on the left hand side of each pair of words is one end of a "SCALE". The right hand statement opposite this is the other end of this "SCALE"; it is the opposite or contrasting statement to the right hand statement.

What you have to do is to look at both ends of the first scale and think what this scale means to you. Then look at the "AREAS" along the top of the sheet - decide which one of these "AREAS" is most or best described or represented by the statement on the LEFT HAND side of this scale.

When you have done this, write a number "1" in the box on the "SCALE" directly beneath the "AREA" you decided. For instance, if you decided that "AREA" number "3" was the one that you most felt fitted the LEFT HAND end of this SCALE then you would have written a number "1" beneath this AREA - as in the stage 1 diagram below -

STAGE "1"

When you have done this, then decide which of the remaining "AREAS" best fits or is represented by the RIGHT HAND SCALE which is opposite the LEFT HAND SCALE you were just looking at. Give this a score of "19".

ENVIRONMENTAL CONSERVATION RESPONSE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ENVIRONMENTAL CONSERVATION RESPONSE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

For instance, in our example, the RIGHT HAND SCALE is "An area in which I have had personal involvement". If you decided that "AREA" number "3" best fitted this SCALE, then you would write a number "19" beneath it - as shown in stage 2.

APPLIED PSYCHOLOGY DIVISION.

UNIVERSITY OF ASTON.

ASTON TRIANGLE. B4 7ET.
BIRMINGHAM

021 - 359 3611 ext 4613.

The next stage is to decide which of the remaining "AREAS" along the top of the sheet is the one which is the next best described or represented by the LEFT HAND SCALE. You then give this a score of "2" in its box on the SCALE beneath the chosen "AREA".

Then choose the next AREA most like the RIGHT HAND SCALE and give this a score of "18".

For instance, your scale may now look like this-

ENVIRONMENTAL CONSERVATION RESPONSE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ENVIRONMENTAL CONSERVATION RESPONSE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Carry on doing this, finding the AREA next most associated with the LEFT and RIGHT hand scales and giving them the next score until you have given each AREA a score from 1 to 19 along this SCALE. You now have a SCALE like the one below -

11	6	2	5	13	19	10	12	16	3	8	15	17	14	9	4	18	2	7
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When you have finished you should find that the AREAS that you have numbered 16,17,18,19, are the ones that you feel are most associated with the description at the RIGHT HAND end of the SCALE. The AREAS you have numbered 1,2,3,4, are best described by the LEFT HAND SCALE description, and the AREAS numbered 7,8,9,10,11, are equally well described by both SCALE ends.

When you have done this, move down to the next SCALE. Read the two SCALE ends and rate the 19 AREAS in terms of their "closeness" to the RIGHT and LEFT hand SCALE ENDS (as you did before). You will now have another line of numbers 1 to 19 written along this second SCALE.

Continue doing this until you have done this for each of the 48 SCALES on the 7 pages.

Thank you for taking the time to complete this grid -

Paul Mackrell,
UNIVERSITY OF ASTON

ENVIRONMENTAL
CONSERVATION
RESPONSE
GRID.



PAGE 1 of 7.

RIGHT HAND

SCALE S.

AN AREA IN WHICH I HAVE
HAD NO PERSONAL
INVOLVEMENT.

AN AREA WHICH INVOLVES
PHYSICAL OR PRACTICAL
WORK.

AN AREA WHICH DOES NOT
INVOLVE URBAN NATURE
CONSERVATION.

AN AREA WHICH INVOLVES
SMALL SCALE PROJECTS.

AN AREA NOT INVOLVING
HABITAT PROTECTION.

A BEHIND THE SCENES
NATURE CONSERVATION
ACTIVITY - RECEIVES
NO PUBLICITY.

AN AREA WHICH IS NOT
PERSONALLY FULFILLING.

HABITAT PROTECTION.

19

ECOLOGICAL
ETHICS AND MORALS BEHIND
ENVIRONMENTAL CONSERVATION

18

GLOBAL / ECOSPHERE
CONSERVATION.

17

SPECIES PROTECTION.

16

COMMUNITY AND LOCAL INVOLVEMENT
IN LOCAL "GREEN" AREAS.

15

GOVERNMENT ACTIONS AND NATURE
CONSERVATION POLICIES.

14

LIFE STYLE ISSUES -
HEALTHY, SELF SUFFICIENT LIVING.

13

URBAN NATURE CONSERVATION.

12

NATURE CONSERVATIONS POLITICAL
ROLE - PRESSURE GROUPS.

11

PRESERVATION AND PROTECTION OF
THE NATURAL ENVIRONMENT.

10

AWARENESS CREATION AND
EDUCATION.

9

"SINGLE ISSUE" GROUPS AND
NATURE CONSERVATION.

8

LARGE PHYSICAL SCALE PROJECTS
INVOLVING LARGE SCALE
ORGANISATIONAL ACTIONS.

7

ADVERTISING AND CAMPAIGNING.

6

NATIONAL OR BRITISH NATURE
CONSERVATION STRATEGIES.

5

NATURES BEAUTY AND INTRINSIC
VALUE - EMOTIONS.

4

RURAL NATURE CONSERVATION.

3

GREEN POLITICS.

2

SMALL PHYSICAL SCALE PROJECTS
INVOLVING SMALL SCALE
ORGANISATIONAL ACTIONS.

1

A R E A S .

LEFT HAND

SCALE S.

AN AREA IN WHICH I HAVE
HAD PERSONAL
INVOLVEMENT.

AN AREA WHICH INVOLVES
MENTAL OR INTELLECTUAL
WORK.

AN AREA WHICH INVOLVES
URBAN NATURE
CONSERVATION.

AN AREA WHICH INVOLVES
LARGE SCALE PROJECTS.

AN AREA WHICH INVOLVES
HABITAT PROTECTION.

AN AREA WHICH RECEIVES
PUBLICITY.

AN AREA WHICH IS
PERSONALLY FULFILLING.

LEFT HAND S C A L E S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	RIGHT HAND S C A L E S	INVOLVES INDIRECT NATURE CONSERVATION ACTION WITH INDIRECT EFFECTS.	ACTIONS IN THIS AREA HAVE NO PERSONAL EFFECT.	INVOLVES PRACTICAL WORK.	A SECONDARY AREA OR ISSUE FOR NATURE CONSERVATION.	NATURE CONSERVATION WHICH PAYS LITTLE REGARD TO NATURE CONSERVATION ETHICS.	AN AREA WHICH INVOLVES SHORT TERM ACTIONS AND EFFECTS.	INVOLVES JIL CREATION.
HABITAT PROTECTION.																											
ECOLOGICAL ETHICS AND MORALS BEHIND ENVIRONMENTAL CONSERVATION																											
GLOBAL / ECOSPHERE CONSERVATION.																											
SPECIES PROTECTION.																											
COMMUNITY AND LOCAL INVOLVEMENT IN LOCAL "GREEN" AREAS.																											
GOVERNMENT ACTIONS AND NATURE CONSERVATION POLICIES.																											
LIFE STYLE ISSUES - HEALTHY, SELF SUFFICIENT LIVING.																											
URBAN NATURE CONSERVATION.																											
NATURE CONSERVATIONS POLITICAL ROLE - PRESSURE GROUPS.																											
PRESERVATION AND PROTECTION OF THE NATURAL ENVIRONMENT.																											
AWARENESS CREATION AND EDUCATION.																											
"SINGLE ISSUE" GROUPS AND NATURE CONSERVATION.																											
LARGE PHYSICAL SCALE PROJECTS INVOLVING LARGE SCALE ORGANISATIONAL ACTIONS.																											
ADVERTISING AND CAMPAIGNING.																											
NATIONAL OR BRITISH NATURE CONSERVATION STRATEGIES.																											
NATURES BEAUTY AND INTRINSIC VALUE - EMOTIONS.																											
RURAL NATURE CONSERVATION.																											
GREEN POLITICS.																											
SMALL PHYSICAL SCALE PROJECTS INVOLVING SMALL SCALE ORGANISATIONAL ACTIONS.																											
A R E A S																											
1. INVOLVES DIRECT NATURE CONSERVATION WITH DIRECT EFFECTS.																											
2. ACTIONS IN THIS AREA HAVE A PERSONAL EFFECT.																											
10. INVOLVES NATURE CONSERVATION STUDIES AND RESEARCH.																											
11. A PRIMARY AREA OR ISSUE FOR NATURE CONSERVATION.																											
12. NATURE CONSERVATION WHICH INVOLVES THE ETHICS OF NATURE CONSERVATION.																											
13. AN AREA WHICH INVOLVES LONG TERM ACTIONS AND EFFECTS.																											
14. AN AREA WHICH DOES FACILITATE LIFE AS USUALLY FOR NATURE CONSERVATION.																											

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RIGHT HAND S C A L E S :		I WOULD NOT FEEL PERSONALLY MOTIVATED TO BECOME INVOLVED IN THIS AREA.		AN AREA OF NATURE CONSERVATION WHICH EXCLUDES THE GENERAL PUBLIC - ELITIST/SCIENTIFI		CONCERN IS JUST FOR HUMANS IN THESE AREAS.		AN AREA OF NATURE CONSERVATION WHICH RECEIVES LITTLE PUBLIC SUPPORT.		AN AREA WITHIN NATURE CONSERVATION WHICH HAS A CLOSED GIRD TO NATURE CONSERVATION.		AN AREA WHICH DOES NOT INVOLVE RURAL NATURE CONSERVATION.		AN AREA WHERE NATURE CONSERVATION HAS LITTLE CONCERN TO NATURE AND ENVIRONMENTAL PRESERVATION	
HABITAT PROTECTION.	19														
ECOLOGICAL ETHICS AND MORALS BEHIND ENVIRONMENTAL CONSERVATION	18														
GLOBAL / ECOSPHERE CONSERVATION.	17														
SPECIES PROTECTION.	16														
COMMUNITY AND LOCAL INVOLVEMENT IN LOCAL "GREEN" AREAS.	15														
GOVERNMENT ACTIONS AND NATURE CONSERVATION POLICIES.	14														
LIFE STYLE ISSUES - HEALTHY, SELF SUFFICIENT LIVING.	13														
URBAN NATURE CONSERVATION.	12														
NATURE CONSERVATIONS POLITICAL ROLE - PRESSURE GROUPS.	11														
PRESERVATION AND PROTECTION OF THE NATURAL ENVIRONMENT.	10														
AWARENESS CREATION AND EDUCATION.	9														
"SINGLE ISSUE" GROUPS AND NATURE CONSERVATION.	8														
LARGE PHYSICAL SCALE PROJECTS INVOLVING LARGE SCALE ORGANISATIONAL ACTIONS.	7														
ADVERTISING AND CAMPAIGNING.	6														
NATIONAL OR BRITISH NATURE CONSERVATION STRATEGIES.	5														
NATURES BEAUTY AND INTRINSIC VALUE - EMOTIONS.	4														
RURAL NATURE CONSERVATION.	3														
GREEN POLITICS.	2														
SMALL PHYSICAL SCALE PROJECTS INVOLVING SMALL SCALE ORGANISATIONAL ACTIONS.	1														
LEFT HAND S C A L E S :		I WOULD FEEL PERSONALLY MOTIVATED TO BECOME INVOLVED IN THIS AREA.		NATURE CONSERVATION WHICH INVOLVES THE GENERAL PUBLIC.		ECOLOGY AND NATURE ARE THE AREAS OF CONCERN.		AN AREA OF NATURE CONSERVATION WHICH RECEIVES PUBLIC SUPPORT.		AN AREA WITHIN NATURE CONSERVATION WHICH HAS AN OPEN ATTITUDE TO NATURE CONSERVATION.		AN AREA INVOLVING RURAL NATURE CONSERVATION.		AN AREA WHERE NATURE CONSERVATION IS CONCERNED WITH ENVIRONMENTAL AND RURAL CONSERVATION.	

LEFT HAND S C A L E S .	S C A L E S .	R I G H T H A N D S C A L E S .					
		1	2	3	4	5	6
29. AN AREA INVOLVING SINGLE ISSUE GROUPS.							
30. NATURE CONSERVATION TAKES A POLITICAL ROLE IN THIS AREA.							
31. INVOLVES NATURE CONSERVATION FOR THE SAKE OF NATURE.							
32. AN AREA WHERE NATURE CONSERVATION IS MAKING PROGRESS.							
33. SOCIALLY USEFUL NATURE CONSERVATION HELPS TO SOLVE SOCIAL PROBLEMS.							
34. NATURE CONSERVATION CHOICES ARE MADE ON THE BASIS OF "SOUND" - "RATIONAL" EVIDENCE.							
35. AN AREA WHICH IS EFFECTIVE IN NATURE CONSERVATION TERMS.							
SHALL PHYSICAL SCALE PROJECTS INVOLVING SMALL SCALE ORGANISATIONAL ACTIONS.	1						
GREEN POLITICS.	2						
RURAL NATURE CONSERVATION.	3						
NATURES BEAUTY AND INTRINSIC VALUE - EMOTIONS.	4						
NATIONAL OR BRITISH NATURE CONSERVATION STRATEGIES.	5						
ADVERTISING AND CAMPAIGNING.	6						
LARGE PHYSICAL SCALE PROJECTS INVOLVING LARGE SCALE ORGANISATIONAL ACTIONS.	7						
"SINGLE ISSUE" GROUPS AND NATURE CONSERVATION.	8						
AWARENESS CREATION AND EDUCATION.	9						
PRESERVATION AND PROTECTION OF THE NATURAL ENVIRONMENT.	10						
NATURE CONSERVATIONS POLITICAL ROLE - PRESSURE GROUPS.	11						
URBAN NATURE CONSERVATION.	12						
LIFE STYLE ISSUES - HEALTHY, SELF SUFFICIENT LIVING.	13						
GOVERNMENT ACTIONS AND NATURE CONSERVATION POLICIES.	14						
COMMUNITY AND LOCAL INVOLVEMENT IN LOCAL "GREEN" AREAS.	15						
SPECIES PROTECTION.	16						
GLOBAL / ECOSPHERE CONSERVATION.	17						
ETHICS AND MORALS BEHIND ENVIRONMENTAL CONSERVATION	18						
HABITAT PROTECTION.	19						

AN AREA WHICH INVOLVES
A WIDER CONCERN.IN THIS AREA NATURE
CONSERVATION DOES NOT
TAKE A POLITICAL ROLE.INVOLVES NATURE AS BEING
SEEN TO HAVE A VALUE
ONLY IN TERMS OF ITS
USEFULNESS TO HUMAN BEINGS.AN AREA WHERE NATURE
CONSERVATION IS MAKING
LITTLE PROGRESS.NATURE CONSERVATION
WHICH SOLVES ECOLOGICAL
PROBLEMS.NATURE CONSERVATION
WHICH INVOLVES ECONOMIC
RESPONSES.AN AREA WHICH IS OF LITTLE
EFFECT IN NATURE
CONSERVATION TERMS.

PAGE 6 OF 7.		RIGHT HAND S C A L E S																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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LEFT HAND S C A L E S .	R I G H T H A N D S C A L E S .							
		AN AREA WHICH HAS NO ECONOMIC ROLE OUTSIDE OF NATURE CONSERVATION.	AN AREA WITHIN NATURE CONSERVATION NOT INVOLVING GOVERNMENT ACTIONS AND POLICIES.	AN AREA NOT INVOLVING AWARENESS CREATION.	AN AREA WHERE NATURE CONSERVATION IS THE INITIATOR OF THE ACTION.	AN AREA INVOLVING AGENCIES EXTERNAL TO NATURE CONSERVATION.	AN AREA OF LITTLE IMPORTANCE TO NATURE CONSERVATION IN TERMS OF ACHIEVING ITS GOALS.	
HABITAT PROTECTION.	19							
ECOLOGICAL ETHICS AND MORALS BEHIND ENVIRONMENTAL CONSERVATION	18							
GLOBAL / ECOSPHERE CONSERVATION.	17							
SPECIES PROTECTION.	16							
COMMUNITY AND LOCAL INVOLVEMENT IN LOCAL "GREEN" AREAS.	15							
GOVERNMENT ACTIONS AND NATURE CONSERVATION POLICIES.	14							
LIFE STYLE ISSUES - HEALTHY, SELF SUFFICIENT LIVING.	13							
URBAN NATURE CONSERVATION.	12							
NATURE CONSERVATIONS POLITICAL ROLE - PRESSURE GROUPS.	11							
PRESERVATION AND PROTECTION OF THE NATURAL ENVIRONMENT.	10							
AWARENESS CREATION AND EDUCATION.	9							
"SINGLE ISSUE" GROUPS AND NATURE CONSERVATION.	8							
LARGE PHYSICAL SCALE PROJECTS INVOLVING LARGE SCALE ORGANISATIONAL ACTIONS.	7							
ADVERTISING AND CAMPAIGNING.	6							
NATIONAL OR BRITISH NATURE CONSERVATION STRATEGIES.	5							
NATURES BEAUTY AND INTRINSIC VALUE - EMOTIONS.	4							
RURAL NATURE CONSERVATION.	3							
GREEN POLITICS.	2							
SMALL PHYSICAL SCALE PROJECTS INVOLVING SMALL SCALE ORGANISATIONAL ACTIONS.	1							
A R E A S .		43. AN AREA WHICH HAS AN ECONOMIC ROLE OUTSIDE OF NATURE CONSERVATION.	44. AN AREA WHERE GOVERNMENT ACTIONS AND POLICIES ARE INVOLVED IN NATURE CONSERVATION.	45. AN AREA INVOLVING AWARENESS CREATION.	46. AN AREA INVOLVING NATURE CONSERVATION RESPONDING TO BAD EFFECTS / INFLUENCES IN THE ENVIRONMENT.	47. AN AREA INVOLVING SOLELY NATURE CONSERVATION GROUPS.	48. AN AREA WHICH IS OF IMPORTANCE TO NATURE CONSERVATION IN TERMS OF IT ACHIEVING ITS GOALS.	

APPENDIX A.5

PARTICIPATING ORGANISATIONS

(GROUP REPERTORY GRID STUDY).

FRIENDS OF THE EARTH (LONDON)

ROYAL SOCIETY FOR THE PROTECTION
OF BIRDS (SANDWELL VALLEY)

URBAN WILDLIFE GROUP (BIRMINGHAM)

BRITISH TRUST FOR CONSERVATION
VOLUNTEERS (LEEDS)

URBAN BASE (BIRMINGHAM)

SERIOUSNESS OF ENVIRONMENTAL
HAZARDS QUESTIONNAIRE.

ENVIRONMENTAL POLLUTION ASSESSMENT FORM: A

Instructions

Below is a statement, please read this and then look at each type of pollution. For each of these put a tick under how serious you think each of these is.

GENDER Male ☐ Female ☐

WORK Employed ☐ Unemployed ☐ Student ☐ Retired ☐

AGE 0-20 ☐ 21-35 ☐ 36-50 ☐ 51-64 ☐ 65+ ☐

HOW SERIOUS AN EFFECT ON OUR ENVIRONMENT DO YOU THINK EACH OF THESE THINGS HAS?

	Very Serious	Quite Serious	Not very Serious	Not at all serious
Noise from aircraft				
Lead from petrol				
Industrial waste in the rivers and seas				
Waste from nuclear power stations				
Industrial fumes in the air				
Noise and dirt from traffic				

URGENCY OF ENVIRONMENTAL
PROBLEMS QUESTIONNAIRE

ENVIRONMENTAL POLLUTION ASSESSMENT FORM: B

Instructions

Below you will again see a statement. This time will you please read this and put a tick under how "urgent" you think each problem is.

In each case 1 = not at all urgent
 2 = not very urgent
 3 = not urgent
 4 = neither urgent nor non-urgent
 5 = slightly urgent
 6 = urgent
 7 = very urgent

HOW URGENT ARE THE FOLLOWING ENVIRONMENTAL PROBLEMS?

	Not at all urgent					Very urgent	
	1	2	3	4	5	6	7
Noise							
Air pollution							
Water pollution							
Over-population							
Solid waste disposal							
Toxic waste							
Nuclear waste							
Destruction of land and townscape							
Repletion of natural resources							
Energy							

THANK YOU
Paul Hackett

APPENDIX A.8

GENERAL ENVIRONMENTAL CONCERN QUESTIONNAIRE.

HOW IMPORTANT DO YOU THINK THAT EACH OF THESE AREAS OF ENVIRONMENTAL /
NATURE CONSERVATION ARE ?

For each of the statements which follow decide how important the area or activity of environmental / nature conservation the statement refers to is. The numbers on the scale below indicate how important you may see an area or activity of environmental / nature conservation to be. 0 is the least important, the higher the number the more important you think it is, up to 5 which is the highest level of importance possible. When you have decided how important you think an area or activity is, write the number you have chosen in the CHOICE column in line with the statement. Please do this for all statements.

	not at all	of little	important	extremely	
	important	0.....1.....2.....3.....4.....5	important	important	
		moderately	very		CHOICE
		important	important		
1	Halting damage and destruction of the atmosphere, damage to the ozone layer acid rain, etc.				_____
2	Highlighting farming practices which may be destructive to the British countryside.				_____
3	Encouraging human beings to see themselves as members of one global family.				_____
4	Supporting agricultural development in developing countries.				_____
5	Controlling traffic levels in cities.				_____
6	Regulating industrial and housing development in the British countryside.				_____
7	Developing local nature areas / green sites in inner cities.				_____
8	Regulating industries rights to exploit the earths natural resources.				_____
9	Saving unspoilt areas, such as: polar regions, tropical forests, the oceans, etc.				_____
10	Regulating international fishing policy.				_____
11	Protecting animal species worldwide.				_____
12	Campaigning for animal rights.				_____
13	Saving habitats and beautiful countryside areas in Great Britain.				_____
14	Facilitating school childrens experiences of nature.				_____
15	Campaigning against the exploitation of mineral resources in developing countries.				_____
16	Encouraging wildlife in cities.				_____
17	Encouraging concern for all environmental issues.				_____
18	Reducing the destruction of tropical rain forests.				_____
19	Petitioning for national policy which controls the levels of lead emissions from car exhausts.				_____
20	Protecting village greens and ponds.				_____
21	Petitioning against the existance of EEC food mountains.				_____
22	Encouraging caring towards all living things.				_____
23	Protecting Britains wildlife.				_____
24	Reducing world population growth.				_____
25	Halting the international trade in animals, eg: Tortoises, Budgerigars, animal fur, Whale products, etc.				_____

HOW EFFECTIVE DO YOU THINK ENVIRONMENTAL / NATURE CONSERVATION HAS BEEN IN
EACH OF THE FOLLOWING AREAS OF ENVIRONMENTAL / NATURE CONSERVATION ?

For each of the statements which follow decide how effective the activities of environmental / nature conservation have been in this area. The numbers on the scale below show how effective environmental / nature conservation may have been. 0 is the least effective, the higher the number the more effective it has been, up to 5 which is the highest level of effectiveness possible. When you have decided how effective it has been in an area or activity, write the number you have chosen in the CHOICE column in line with the statement. Please do this for all statements.

	not at all effective	0	1	Slightly effective	2	3	4	5	completely effective	CHOICE
				moderately effectively			very effective			
26										_____
27										_____
28										_____
29										_____
30										_____
31										_____
32										_____
33										_____
34										_____
35										_____
36										_____
37										_____
38										_____
39										_____
40										_____
41										_____
42										_____
43										_____
44										_____
45										_____
46										_____
47										_____
48										_____
49										_____
50										_____

TO WHAT EXTENT WOULD YOU BE WILLING TO BECOME PERSONALLY INVOLVED IN
EACH OF THE FOLLOWING AREAS OF ENVIRONMENTAL / NATURE CONSERVATION ?

For each of the statements which follow decide how much you would be willing to become involved with the area or activity addressed by the statement. The numbers on the scale below show how much you may become involved. 0 is the least amount of personal involvement, the higher the number the more involvement, up to 5 which is the highest level of personal involvement possible. When you have decided how involved you would be willing to become, write the number you have chosen in the CHOICE column in line with the statement. Please do this for all statements.

	would not become involved	0.....1.....2.....3.....4.....5	sign a petition	distribute leaflets	take other direct personal action.	CHOICE
			write to MP/papers	join protest march		
51						Halting damage and destruction of the atmosphere, damage to the ozone layer acid rain, etc. _____
52						Highlighting farming practices which may be destructive to the British countryside. _____
53						Encouraging human beings to see themselves as members of one global family. _____
54						Supporting agricultural development in developing countries. _____
55						Controlling traffic levels in cities. _____
56						Regulating industrial and housing development in the British countryside. _____
57						Developing local nature areas / green sites in inner cities. _____
58						Regulating industries rights to exploit the earths natural resources. _____
59						Saving unspoilt areas, such as: polar regions, tropical forests, the oceans, etc. _____
60						Regulating international fishing policy. _____
61						Protecting animal species worldwide. _____
62						Campaigning for animal rights. _____
63						Saving habitats and beautiful countryside areas in Great Britain. _____
64						Facilitating school childrens experiences of nature. _____
65						Campaigning against the exploitation of mineral resources in developing countries. _____
66						Encouraging wildlife in cities. _____
67						Encouraging concern for all environmental issues. _____
68						Reducing the destruction of tropical rain forests. _____
69						Petitioning for national policy which controls the levels of lead emmissions from car exhausts. _____
70						Protecting village greens and ponds. _____
71						Petitioning against the existance of EEC food mountains. _____
72						Encouraging caring towards all living things. _____
73						Protecting Britains wildlife. _____
74						Reducing world population growth. _____
75						Halting the international trade in animals, eg: Tortoises, Budgerigars, animal fur, Whale products, etc. _____

LISTED BELOW ARE A SERIES OF AREAS IN WHICH ENVIRONMENTAL / NATURE
CONSERVATION IS ACTIVE. HOW MUCH MONEY WOULD YOU BE PERSONALLY WILLING
TO DONATE TO EACH OF THESE AREAS ?

For each of the statements which follow decide how much of your money you would be willing to give to environmental / nature conservation activity in this area. The numbers on the scale below show how much money you may give. Nothing (0) is the least you may give, rising in 5 pound steps to 25 pounds or more, which is the most you can give. When you have decided how much money you are willing to give to this area or activity, write the amount you have chosen in the CHOICE column in line with the statement. Please do this for all statements.

10 15 110 115 120 125+

CHOICE

- | | | |
|-----|--|-------|
| 76 | Halting damage and destruction of the atmosphere, damage to the ozone layer acid rain, etc. | _____ |
| 77 | Highlighting farming practices which may be destructive to the British countryside. | _____ |
| 78 | Encouraging human beings to see themselves as members of one global family. | _____ |
| 79 | Supporting agricultural development in developing countries. | _____ |
| 80 | Controlling traffic levels in cities. | _____ |
| 81 | Regulating industrial and housing development in the British countryside. | _____ |
| 82 | Developing local nature areas / green sites in inner cities. | _____ |
| 83 | Regulating industries rights to exploit the earths natural resources. | _____ |
| 84 | Saving unspoilt areas, such as: polar regions, tropical forests, the oceans, etc. | _____ |
| 85 | Regulating international fishing policy. | _____ |
| 86 | Protecting animal species worldwide. | _____ |
| 87 | Campaigning for animal rights. | _____ |
| 88 | Saving habitats and beautiful countryside areas in Great Britain. | _____ |
| 89 | Facilitating school childrens experiences of nature. | _____ |
| 90 | Campaigning against the exploitation of mineral resources in developing countries. | _____ |
| 91 | Encouraging wildlife in cities. | _____ |
| 92 | Encouraging concern for all environmental issues. | _____ |
| 93 | Reducing the destruction of tropical rain forests. | _____ |
| 94 | Petitioning for national policy which controls the levels of lead emmissions from car exhausts. | _____ |
| 95 | Protecting village greens and ponds. | _____ |
| 96 | Petitioning against the existance of EEC food mountains. | _____ |
| 97 | Encouraging caring towards all living things. | _____ |
| 98 | Protecting Britains wildlife. | _____ |
| 99 | Reducing world population growth. | _____ |
| 100 | Halting the international trade in animals, eg: Tortoises, Budgerigars, animal fur, Whale products, etc. | _____ |

APPENDIX A.9

CORRELATION MATRIX OF ITEMS FROM THE SERIOUSNESS OF
ENVIRONMENTAL HAZARDS QUESTIONNAIRE

	1	2	3	4	5	6
1	0.00					
2	0.85	0.00				
3	0.62	0.66	0.00			
4	0.65	0.70	0.70	0.00		
5	0.54	0.57	0.67	0.63	0.00	
6	0.40	0.41	0.56	0.47	0.68	0.00

APPENDIX A.10

CORRELATION MATRIX OF ITEMS FROM THE URGENCY OF ENVIRONMENTAL PROBLEMS QUESTIONNAIRE.

	1	2	3	4	5	6	7	8	9	10
1	0.00									
2	0.62	0.00								
3	0.58	0.48	0.00							
4	0.31	0.27	0.53	0.00						
5	0.50	0.59	0.38	0.27	0.00					
6	0.55	0.72	0.47	0.26	0.60	0.00				
7	0.54	0.48	0.48	0.31	0.38	0.52	0.00			
8	0.45	0.58	0.48	0.33	0.47	0.53	0.70	0.00		
9	0.39	0.43	0.70	0.34	0.38	0.45	0.62	0.67	0.00	
10	0.37	0.40	0.51	0.53	0.33	0.42	0.53	0.60	0.68	0.00

APPENDIX A.11

CORRELATION MATRIX OF ITEMS FROM THE GENERAL
ENVIRONMENTAL CONCERN QUESTIONNAIRE.