PERCEPTIONS OF A GUIDED WILDERNESS TRAIL

By

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ABSTRACT

Personal recorded interviews with past and present guides of the Wilderness Leadership School were used to identify four important factors in a successful guided wilderness trail. Using postal questionnaires, guides and members of the Wilderness Leadership School were asked to rank nine trail scenarios. The technique of conjoint analysis yielded the relative importance, as perceived by the guides and trailists, of each of the four factors. It was shown that the most important attribute for both groups of respondents was how the trailists interacted with one another. Next in importance was an increase in awareness, by the trailists of their interdependence with their environment. This was followed by the personality of the guide and finally signs of modern man's impact in the wilderness area. There was an important difference in perception between the guides and the trailists; the trailists placed more emphasis on the group interaction and less on an increase in awareness. There were also differences in perception between the different categories of guides and trailists. Lists of activities and related experiences relative to a successful trail are included in the report.

PREFACE

This research has involved the study of people's perceptions about guided wilderness trails. Over 4 500 years ago the writer of the Epic of Gilgamesh has been translated as saying:

> "So the goddess conceived an image in her mind, and it was of the stuff of Anu of the firmament. She dipped her hands in water and pinched off clay, she let it fall in the wilderness and noble Enkidu was created. He was innocent of mankind; he knew nothing of the cultivated land." (Sandars 1960).

It is in part through the expansion of our populations, wants and hence cultivated lands that we have lost contact with our natural environment. This research is dedicated to those who help us to regain that contact and in particular to those guides of the Wilderness Leadership School who have taken me on trail - Don Richards, Jim Feeley and Ian Player.

I acknowledge the assistance given to me during this research by the following:
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CHAPTER ONE

1. INTRODUCTION

The need to conserve the South African natural environment has become more important as human impact upon it has increased (Hey 1976). Many strategies have been formulated to increase conservation of the environment. (Barkhuizen 1979; I.U.C.N. 1980; Anon 1984). These and other strategies emphasised the need for people's awareness of conservation principles to be increased. In such awareness promotions the target population has generally been school children (Irwin 1982; Clayton 1982), and efforts have been made to introduce environmental education into formal education curricula (Hurry 1982). More recent educational efforts have been aimed at adults via the non-formal education sector. In South Africa this has taken the form of congresses, workshops, research programmes, and interpretative facilities in natural areas and game reserves (Preston 1983). This research is aimed at improving the value of an educational activity that may take place in a natural area or game reserve, namely, the experience of wilderness.

The results of effective education are shown in the development of concepts, skills, attitudes and values in participants (Prof R Conacher, Rector, Johannesburg College of Education). These changes take place in the affective domain (Bloom 1956), and are best brought about by active involvement of the participant in the learning process (Steinaker and Bell 1978). To initiate, increase or reinforce a participant's awareness of the need for nature conservation requires active participation and not simply an intellectual or cognative understanding of the processes involved.

One way of achieving such active participation is by the use of guided trails. The guide can interpret the local environment for the participants (trailists), expose them to activities within the environment and increase their knowledge of the processes taking place.

A complete educational experience resulting in a change, or reinforcement, of attitude, values and behaviour is most likely to occur when participants are exposed to a subject, fully involved in related activities, identify important elements, internalize the experience, and disseminate their perspectives (Steinaker and Bell 1978). An effective learning experience is also likely to occur when dissonance occurs within the mind of the individual : for instance on becoming aware that a new experience clashes with a past understanding. (Festinger 1957; James 1921).

These factors are all combined in a wilderness experience, where participants are divorced from their normal life support systems of transport, shelter and heating and are instead directly dependent on the natural environment. Thus a guided wilderness trail, during which participants are exposed to a new understanding of themselves and their dependeance on their environment is postulated to be one of the most effective means of helping people to become more aware of the need to conserve their environment.

1.1 TERMINOLOGY

The following terms are discussed to clarify and contain the scope of this study.

TRAIL "A path or track worn by the passage of persons travelling in a wild or uninhabited region." (Oxford English Dictionary)

In the context of this report the trails have usually been worn by wild animals, and are not man made paths or tracks. In addition, the

word trail, does not only refer to the physical phenomenon but also to the totality of the experience.

GUIDE

"One who leads or shows the way, especially to a traveller in a strange country; one who is hired to conduct a traveller and to point out objects of interest". (Oxford English Dictionary)

In addition the guide has an interpretive role to play. Outdoor interpretation can be defined as that branch of human communication which has to do with explaining things out-of-doors in meaningful terms to man. The process is both an art and a technique. Closely involved are the processes of education and enlightenment.

Marsh, in his book Man and Nature written in 1864 said "to the natural philosopher as well as to the common observer the power most important to cultivate, and, at the same time, hardest to acquire, is that of seeing what is before him". It is this power that the guide must have and be able to impart to participants.

WILDERNESS

"A wild or uncultivated region or track of land, uninhabited, or inhabited only by wild animals; a tract of solitude and savageness". Oxford English Dictionary.

Concepts of Wilderness are coloured by one's culture, personal experiences and background.

For Bob Brown the wilderness is "a region of original Earth where one stands with the senses entirely steeped in nature or, alternatively,

where one experiences a complete sensory deprivation of modern technology (Brown 1982).

Laurens van der Post once described wilderness as "the original church of life in which they (people) have been converted and healed, and from which they have emerged transformed in a positive manner" (Van der Post 1982).

The U S A Wilderness Act of 1964 defines wilderness in the following terms :

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;
(2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation;
(3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and
(4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

The Australian Conservation Foundation combines size, perception, condition and ecological needs in its definition of Wilderness - "a large tract of primitive country with its land and waters and its native plant and animal communities substantially unmodified by humans and their works. Large size and spaciousness are the essential characteristics of wilderness.

In contrast the Australian New South Wales National Parks and Wildlife Service subscribes to the view that it is impossible to define wilderness in any specific manner. They recognize a number of basic components - a sustainable resource, with genetic diversity, in natural conditions, sufficient in size, location or quality to allow the human experience identified by John Muir ("we feel ouselves part of wild nature, kin to everything") to be felt. But the most important factor is the capacity to provide that unique experience to the individual, because if that criterion is met then it should be automatic that the other values are being met and protected also (Armstrong 1982).

In South Africa a Wilderness area has been defined in the Forest Act 1984 section 15 (1) (a) as meaning state forests, or parts of them, which have been set aside as such. There is no indication of the size, or characteristics of such an area. Ackerman (1982) has stated that "In selecting wilderness areas the following criteria will be applied.

1) A wilderness area must be an undeveloped area uninhabited by man. It should retain an intrinsically wild appearance and character or be capable of rehabilitation to such a condition.

2) It must give the general impression that the particular area has resulted from the combined effects of natural forces.

3) The area must be large enough probably at least 1 000 hectares to give visitors a feeling of isolation from the outside world."

Glavovic (1985) has reviewed the act, identified the need for a comprehensive definition of wilderness areas, suggested that they be regarded as another form of land use and has recommended that the Council for the Environment, draft a specific Wilderness Act.

It is apparent that there is no universally accepted definition of Wilderness as the perception of it varies predominantly according to culture.

> For the purpose of this work a wilderness area is regarded as any natural area which is currently, and can remain, free of signs (sight, smell, sound) of modern man's activities. This implies no restraints on ones mobility, and that one can experience solitude.
>
> Thus a guided wilderness trail is taken to mean an experience in natural surroundings which have no signs of modern man's influence, during which a guide interprets the landscape for the trailists.

1.2 AIM

The aim of this research is to determine whether or not guides and trailists have the same perceptions regarding the relative importance of different factors that combine to make a successful trail.

The reason for wanting to establish important factors and the difference in attitude towards them (if any) is to enable the guides to take these into account when leading a trail. Their trails should thus become more effective.

1.3 APPROACH

An active organisation involved in guided wilderness trails, The Wilderness Leadership School, was selected for the study.

In the context of the Wilderness Leadership School programme a trail normally involves among many other factors the following distinguishing features:

Trailists - walk; carrying all their requirements.
- prepare their own food on an open fire;
- sleep on the ground under the stars (or a tent if raining);
- keep night watch;
- have periods of silence and solitude.

Routes followed are those of wild animals.

Guides know the area intimately.

Group size is kept to a maximum of 8 people.

In this study past and current guides were interviewed (Appendix I), to determine what factors they believed led to a successful Wilderness experience for the trailists. A successful experience was defined as an increase in awareness of the trailist's interdependency with his environment. The results of these interviews were condensed to produce four factors each with different levels of perception :

a) Guide's Personality (GUIDE)

This was regarded as being positive (+) if the guide displayed a sympathetic or supportive role and neutral (0) if he did not.

b) Human Impact (IMPACT)

This related to signs of modern man's activity in the wilderness area where the trail occurred. No impact was regarded as neutral (0) and signs of impact were taken as negative (-).

c) Increase in awareness (AWARENESS)

This factor reflected, at three levels, the degree to which the trailist was influenced by the experience. No influence was signified by a

negative sign (-). An influence in the cognative domain, viz. increased knowledge, by a neutral sign (0) and, an influence in the affective domain by a positive sign (+).

d) Type of group interaction (GROUP)

This factor considered the way in which members of the group related to one another - there were three levels : (+) good group interaction, (0) no group interaction, (-) poor group interaction.

These four factors, 2 at 2 levels and 2 at 3 levels, were then transformed into nine different trail scenarios. (Section 2.5.2). Each scenario contained all four factors mentioned once only. The scenarios differed depending on which levels of each factor were portrayed.

All the guides and a random sample of members of the Wilderness Leadership School, who were assumed to be ex trailists, were sent questionnaires (Appendix IV & V) which involved personal information and a request that they rank, in order of preference, the nine different trail scenarios.

The responses were then processed and analysed using the technique of conjoint analysis (Section 2.3) to obtain each group's order of preference for the four factors. These are then compared to determine whether or not the guides and trailists had the same perception of the relative importance of the different factors. (Chapter 3)

This chapter has served as an introduction to the nature of this research. Initially the need to increase mankinds awareness to conserve our environment was referred to. Education was highlighted as one of the primary ways of meeting this need. The objectives and effective methods of achieving educational aims were discussed and reference was made to the degree to which a Guided Wilderness Trail meets these methods. The chapter also contains a definition of a Guided Wilderness Trail.

Chapter 2 will discuss the method involved in determining the different perceptions of the guides and trailists. Chapter 3 will record and analyse the results while the final Chapter draws conclusions.

CHAPTER TWO

In Chapter one the premise that all peoples should be educated about the need to conserve our natural environment was addressed. The processes involved in education were considered and the conclusion drawn that guided wilderness trails will successfully fulfil the requirement of educating for a conservation ethic. The aims of this project were also formulated. The purpose of this chapter is to elaborate on the steps outlined in chapter one, which led to the set of results which will be evaluated in chapter three. The steps which will be discussed are :

1) The choice of samples from which to elicit the required information.

2) The interviews with guides to determine factors that are important to a successful trail.

3) The choice of a method to analyse guides and trailists perceptions of the importance of these factors.

4) The selection of four attributes (salient factors).

5) The design of a questionnaire to evaluate the factors.

6) The administration of the questionnaire.

7) The evaluation of the replies.

The first six steps are described in detail in this chapter.The evaluation of the replies is covered in chapter three.

2.1 CHOICE OF SAMPLES

2.1.1 Choice of organisation

There are a number of organisations operating guided trails in Southern Africa. (The National Parks Board, Natal Parks Board, Wilderness Leadership School, Educational Wildlife Expeditions). Some profit orientated private groups are also involved. The Wilderness Leadership School was chosen as the organisation to be studied for the following reasons:

a) the author's past involvement with the Wilderness Leadership School (as a trailist, supporter and trainee guide);

b) the fact that this organisation was the first in South Africa to organise guided wilderness trails (starting in 1963);

c) it has good records of past trailists; and

d) was prepared to cooperate in the research.

There are recognised weaknesses in using only one organisation. Points of weakness are :

1) Testing guides and trailists from the same organisation will reduce the diversity of opinion that may be expressed.

2) Other organisations might have different philosophical perspectives on trails.

3) The trailists for the Wilderness Leadership School are recruited by referals and no advertising is done. Thus it can be assumed (a) that only people who enjoyed their Wilderness Experience (or on whom the objective of the trail was a success) are respondents to the questionnaire; (b) they are likely to be from a similar socio-economic group and thus not

necessarily representative of the South African population.

4) Wilderness Leadership School members are likely to be adults.

2.1.2 Choice of guides.

The names of twelve current and ex guides were obtained from the Wilderness Leadership School, of these ten were interviewed and by a referal system a further nineteen guides were traced so that twenty-nine participated in the final questionnaire.

2.1.3 Choice of trailists.

A computer printout of the 1983 membership list of the Wilderness Leadership School was obtained - 672 names and addresses. From this list a sample was obtained by the random generation of a label position. Questionnaires were sent to 300 South African residents. (The names of overseas members were not used).

2.1.4 Discussion

The author's concern is predominantly with evaluating how best to reach decision makers. This work does not attempt to include children, other groups, or the population at large. The use of the Wilderness Leadership School as a source for all data is therefore appropriate. This organisation provides a source of trailists with the same background and who have shared a similar experience. Their perceptions are thus likely to be similar.

The guides, all current or ex guides of the school, also tend to have the same background so their perceptions are also likely to be the same.

It is therefore anticipated that the difference within each group will be small but that there may be a difference

between the groups. Testing the difference in perception between the groups is the main aim of this research. A secondary aim is to establish the factors which are seen as being important in a successful guided wilderness trail.

2.2 INTERVIEWS WITH GUIDES

Current and ex guides include both professional and volunteer guides. The professional guides carry a firearm and lead trails in areas which have few signs of modern man's activities for periods of four or more days. The volunteer guides lead trails over weekends to areas having some signs of human impact (usually that of sound). They do not require a weapon as the animals likely to be encountered are not regarded as being dangerous.

Five day trails are run in the Umfolosi and Timbavati reserves and two day trails in the Doorndraai and Nylsvlei reserves. (Weekend trails were introduced in the Pilansberg reserve in 1982. These trails although run by volunteers, require qualified guides as Rhino may be encountered, a firearm is carried.)

The interviews with guides were of an unstructured nature. The guides were asked what they felt was important about a guided wilderness trail. Probing occurred to elicit those experiences and activities that would lead to a successful trail. The purpose of the interview was (Riley 1963 pg. 16):

> "To serve as a basis for constructing a more highly structured questionnaire by showing the general framework within which respondents think, the kinds of words they use and the types of incidents that have meaning to them."

Of the ten guides interviewed six were current or past professional guides and four were current volunteer guides.

Except for A Warberton and L Wright all interviews were tape recorded and notes were written during the interview.

A recorded interview can have the effect of inhibiting the person being interviewed (Babbie 1973). However the guides were known to the interviewer and permission was requested before the recording was started.

The advantages of a taped interview are that :

- all points that have been stated can be noted;
- the person being interviewed tends to take the interview more seriously; and
- the interviewer is left free to probe particular points which may be missed if he is obliged to continually record the entire discussion in writing.

It was felt that the advantages of a taped interview would outweigh the disadvantages. Only one person found the tape recorder inhibiting and requested that it be turned off.

The amount of information obtained during the interviews was not uniform. Guides who had considered the role of trails in conservation education tended to be more comprehensive in their replies as will be noted from the responses in Appendix I.

Immediately after each interview a written record was made of the important points. The tape recording was played back and further points picked up. Appropriate quotations were noted.

The interviews were then summarised under three headings :

PARTICIPANTS EXPERIENCE
RELATED ACTIVITY
GUIDES ATTRIBUTES

These three groupings were chosen because a learning experience in the affective domain requires active participation by the trailists. For each experience that the participant has, there should be a related activity.

The PARTICIPANT EXPERIENCE and the RELATED ACTIVITY reported by the guides (See Appendix 1A) were usually linked, but there are examples where either the experience or an activity are given without the relationship between them being mentioned.

The written summaries of the interviews, rearranged under the headings, were shortened to highlight the points made. The abbreviated record of the interview was returned to the guide for comments regarding the accuracy of the recording. The guide's replies were noted and alterations made where appropriate. (That is to add extra points and correct spellings, impressions or terminology). There were no substantial changes to the abbreviated records as a result of the feedback from the guides.

The names of the guides interviewed are given in Appendix I. The interviews contained a number of common themes. These were noted and grouped under the following eight factors :

1) General aims of trail experience.
   These points ranged from specific points that need to be taught, to the spiritual aspects of the participant's experience.
2) Guides attributes.
   These were all factors that related to the guides knowledge and personality
3) Trailists' attributes.
   These points related to the expectations and experiences of the trailists.
4) Group interaction.
   Related to points raised in relation to the way in which the participants related with one another and the guide.
5) Night watch, solitude, camp-fire.
   These points reflected the guide's feelings about the nature and importance of the three activities, keeping night watch, having a

period of solitude and sitting around a camp fire.

6) Knowledge.

This related to the type and degree of information that needs to be taught.

7) Hiking

The degree to which physical activity played a role in a successful trail.

8) Physical Environment.

The type of environment traversed by the trail and the signs of modern man's impact upon it.

All the comments concerning these eight themes were collated and are recorded in Appendix II.

2.3 METHOD OF ANALYSIS

The use of surveys to investigate social behaviour is well developed (Riley 1963; Babbie 1973; Moser and Kalton 1972). Weiss (1975), reviewed research into the validity of respondent's answers (in questionnaires) and showed how responses are affected among other things by the formulation of the question, expectations of the interviewer and social desirability.

Dijkstra and Van der Zouwen (1977) attempted to ascertain in a systematic way the limits wherein the interview is a useful method of data-gathering. According to them, researchers using the survey-interview, assume a number of so called auxiliary hypotheses to be true. Some assumptions concern the relationship between the (unobservable) opinion of the respondent and the answer he gives. These assumptions are essentially untestable as far as characteristics which are not directly observable, such as opinions and attitudes, are concerned.

A recent development in the evaluation of concepts and perceptions has been the use of conjoint measurement first mentioned in 1964 by Luce and Tukey. It is usually used to measure how people make trade-offs among different attributes that describe a given object. For example the marketing manager of a tyre company may want to know which characteristics of a tyre are most highly valued by the customer - i.e. tyre life, cost, or adhesion to road surface. Each characteristic or factor is given a range of possibilities such as those set out in table 2.1.

Table 2.1 Tyre characteristics

Factor	Range of possibilities		
Tyre life (km)	50 000	65 000	80 000
Cost (R)	50,00	57,50	65,00
Road Adhesion	Fair	Good	Excellent

These factors and their various ranges are combined in different ways and tested for preference. For example the following combinations represent three of the 27 possible combinations.

Example 1	Tyre life	50 000 km
	Cost	R57,50
	Road Adhesion	Excellent
Example 2	Tyre life	80 000 km
	Cost	R65,00
	Road Adhesion	Good
Example 3	Tyre life	50 000 km
	Cost	R50,00
	Road Adhesion	Good

Normally the technique of conjoint measurement presents alternatives (example 1, 2 & 3) to the respondent, who then ranks the alternatives in order of preference. From this ranking the importance of each factor (eg. price, life and

adhesion) can be obtained. It is not necessary to present all 27 alternative combinations.

Using the technique of Conjoint measurement the researcher can not only establish which factors are regarded by the respondents as being most important, but also the relative worth of each of the other factors. The manufacturer can thus adjust his production and advertising to meet the customer's perceived preferences.

It was felt that the technique of Conjoint measurement could be applied to the evaluation of a Guided Wilderness Trail, even though the use of conjoint measurement has predominantly been used for physical objects.

In order to evaluate the possibility of applying this technique, Adrienne Shall, an Honours student in the Department of Mathematical Statistics at the University of Cape Town, studied the problem as an Honours project (Shall 1984). Shall's work gives an overview and covers the theory of conjoint measurement and its application to this research. Details of that work are included in Appendix III.

The advantages and disadvantages of conjoint measurement have been covered by Shall and she concludes by stating:

"Like any new set of techniques, conjoint measurement's potential is difficult to evaluate at the present stage of development and application.

It does, however, have a number of advantages:

(i) The procedure is flexible and can be modified to many specific needs.

(ii) It attempts to include most of the 'traditional' measures of concept evaluation, thus assuring the derived continuity of, and comparison with, previous research.

(iii) The concepts are evaluated in a realistic setting.

(iv) The procedure integrates a wide variety of analytical techniques into a coherent and organized research design.

(v) One can quantify the importance of each of the components which make up the concept.....

Conjoint measurement seems to have great potential in modeling human judgement in general."

In order to be able to use the technique of conjoint measurement the important factors or attributes of the trail have to be presented to participants for ranking. The interviews with the guides had produced eight factors. (Appendix II) If each factor had just two levels of intensity, (i.e. good group interaction and poor group interaction), there would then be a total of sixteen levels and 256 possible combinations. By using a fractional factorial design (Appendix III pg. 15) the number of combinations can be reduced. Pre-tests showed that the ranking of more than 10 combinations resulted in respondents ignoring variations. It was thus decided to use a maximum of 9 combinations. This was achieved by using four factors (or attributes), two at two levels, and three at three levels. This requires reducing the eight factors to four.

The eight factors were : General aims of trail experience; Guide's attributes; Trailist's attributes; Group interaction; Nightwatch, solitude, campfire; Knowledge; Hiking; and Physical environment.

2.4 THE SELECTION OF FOUR ATTRIBUTES

Having decided to use the Conjoint Method to analyse replies and requiring only four factors, the following criteria were used for the selection of important attributes.

a) The attributes would be chosen from the group of eight factors identified from the guide's interviews.

b) Where possible factors would be combined.

c) Attributes should, where possible, be neutral so as not to evoke expected differences in response from guides and trailists.

d) Attributes should be of a generalised nature and not specific activities.

In the light of these selection criteria the original eight factors are reviewed. The symbols +, 0, - are used to represent a positive, neutral or negative impact of the attribute under consideration. The symbols are introduced in order to assist with the later presentation and interpretation of the results.

1) The general aims of the trail experience were not included as one of the important attributes as it was felt that these would be different for guides and trailists. It would be preferable to identify attributes which would be neutral to both the guide and the trailists so that differences could not be readily foreseen.

2) The guides tended to emphasize that the guide should be a sympathetic person and so one of the attributes chosen was that of the GUIDE'S PERSONALITY (GUIDE). This was identified as being either
(+) sympathetic, or
(0) neutral.

3) It was felt that an evaluation of trailist attributes by the trailists themselves would not yield the sort of information that could help direct guides in the operation of their trails. This factor was thus

excluded although it is included indirectly in group interaction.

4) Group interaction was regarded as a neutral factor and so included as GROUP INTERACTION (GROUP). This factor was given three levels of interaction viz.
   (+) a good group interaction,
   (0) little or no group interaction.
   (-) poor group interaction.

5) Nightwatch, solitude and campfire are all activities which have some archetypal significance, (Dr I C Player, Wilderness Leadership School, Bellair. Natal). They are generally acknowledged as being important but are specific activities and it was thus felt that they should be excluded as it would be difficult to evaluate these specific factors in the light of the others which were of a generalised nature. The exclusion of these three activities should not be interpreted as a diminution of their importance to a successful guided wilderness trail; they are excluded to provide a more balanced and more easily evaluated set of inputs for conjoint measurements.

6) All guides indicated that some knowledge of the local environment is important. The type and amount of knowledge varied, and thus one of the factors identified for evaluation was an increase in AWARENESS. This factor reflected the type of awareness that occurred within the individual while on trail. Three levels were noted :
   (+) an awareness occurring in the affective domain (i.e. influencing the trailist's attitudes and values),
   (0) an awareness occurring in the cognitive domain (i.e. an increase in factual knowledge),
   (-) no change in either form of awareness by the trailist.

7) Hiking, as with night watch, solitude and campfire, is regarded as a specific activity and so was also left out of the final four factors.

8) The physical environment is generally believed to play a very important role, (Mr J Feeley, Guide of Wilderness Leadership School, Department of Botany, University of Transkei). The area in which the "guided wilderness trail" takes place should ideally be a wilderness, however, this is seldom the case and signs of human impact are often noticed. Thus the fourth factor identified was that of IMPACT, which occurred at two levels:

(+) if there were no signs of impact, and

(0) if there were some signs of impact.

The factors GUIDE, IMPACT, AWARENESS and GROUP were thus selected. These attributes are not the only ones that could have been obtained but they are of a generalised nature and they have relevance to both guides and trailists. The importance of each attribute to the success of a trail is generally accepted but the degree of importance is not immediately obvious.

Prior to administering the survey a pilot study on 12 individuals who had never been on a formal guided wilderness trail was undertaken. The test group was asked the order in which they would rank the four factors. This test showed that the concepts were easily understood by the participants and that they could distinguish and rank the factors. (The order of ranking did not agree with the Final Survey of either the guides or trailists).

2.5 DESIGN OF THE QUESTIONNAIRE.

Four attributes of importance to the successful operation of a guided wilderness trail have been identified (Guide,

Impact, Awareness and Group) and a test procedure has been selected (Conjoint Measurement).

Each attribute has different levels of importance and conjoint measurement will give, not only a ranking of attributes but also a ranking of all the different levels, ten in all. (cf. Appendix III)

The four attributes, two at two levels and two at three levels contain 2 x 2 x 3 x 3 = 36 combinations. These combinations are given in Appendix III A1. The orthogonal array of these combinations contains only nine combinations. (Appendix III A2) Using these selected nine combinations the full thirty-six combinations can be determined and the conjoint analysis performed.

The nine combinations need to be presented to the respondents so that they can rank them in order of preference. From individually ranked combinations of attributes and levels, the conjoint method of analysis allows one to obtain the individual or combined order of preference of each attribute and each level.

These nine combinations are shown in table 2.2.

Table 2.2 Chosen subset of all possible combinations.

GUIDE	IMPACT	AWARENESS	GROUP
+	0	+	+
+	-	0	-
+	0	-	0
0	0	0	0
0	-	-	+
0	0	+	-
+	0	-	-
+	-	+	0
+	0	0	+

\+ represents a positive impression i.e. a sensitive guide; an increase in awareness in the affective domain; good group interaction; an unspoilt wilderness area.

0 represents a neutral impression i.e. a neutral guide; an increase in the cognitive domain; no particular group interaction; an impacted wilderness area.

\- represents a negative impression i.e. no increase in awareness; poor group interaction.

2.5.1 Presentation of attributes and levels.

The manner of presenting attributes and levels for evaluation can vary. They could be presented as follows, for the second combination :

Guide : +

Impact : -

Awareness : 0

Group : -

This would require an explanation for each word (attribute) and symbol (level). Alternatively the same combination could be presented as :

Guide	: Sympathetic
Impact	: Sign of human activity.
Awareness	: Increase in knowledge.
Group	: Poor interaction.

This alternative is easier to react to and needs less reference to accompanying explanations.

In pre-tests using the above format on colleagues, it was found to be very difficult to select between some of the combinations. Participants were confused by :

(a) the number of options within the nine combinations, and
(b) by the differing perceptions they had of the meaning of each word.

A new format for presentation of the combinations was tried. This involved the creation of a scenario in which:

(a) the order in which the factors were presented was varied;
(b) the words used to describe the levels were changed; and
(c) the words used for attributes and levels were linked to form a meaningful description of a trail.

The scenario for the second combination was thus rendered as:

> Despite the continued efforts of one trailist to "do his own thing" the guide was able to relate well to your needs. He gave you many new facts and drew a lesson from a helicopter flying overhead.

The use of a scenario has the following advantages:

1) It is easier to assimilate.
2) It requires no supporting explanations.
3) It has more appeal to the participant.

The disadvantages are:

1) An untried format of presentation.
2) The interpretation of the scenario is open to discrepancies as;
   a) there are a greater range of undefined words and
   b) the adjectives may have different meanings for different people.

After trying both formats of presentation on eleven colleagues it was clear that the scenarios were preferred by all. This format was therefore adopted.

2.5.2 The scenarios used.

Using the orthogonal array i.e. Table 2.5 nine scenarios were generated. Each was given a letter and a number. The letter was used for identification by the respondents and the number for identification by the computor.

The number of original words used to describe each factor and level was increased by finding alternative words. This was achieved by the use of a Dictionary of Synonyms (Collins Gem Dictionary of Synonyms and Antonyms. 1964)

Where possible the adjectives chosen were those that had been used by the guides in their interviews. The resulting combination of nouns (attributes) and adjectives (levels) were arranged to form, where possible, a sentence describing a guided wilderness trail. The result was the desired scenario. These scenarios were given a letter for identification. The letters were chosen to be distinctive. The scenarios generated were as follows:

Scenario H, Number 7.

Guide : + (sensitive)
Impact : + (unspoilt area)
Awareness : + (increase in affective domain)
Group : + (good interaction)

> A sensitive guide led your group into a remote natural area. Whilst there you got on well with the other members and gained a new awareness of, and love for, the wilderness.

Scenario N, Number 5.

Guide : + (sensitive)
Impact : 0 (signs of modern man)
Awareness : 0 (increase in cognitive domain)
Group : - (poor group interaction)

> Despite the continued efforts of one trailist to "do his own thing", the guide was able to relate well to your needs. He gave you many new facts and drew a lesson from a helicopter flying overhead.

Scenario D, Number 9.

Guide : + (sensitive)
Impact : + (unspoilt area)
Awareness : - (no increase in awareness)
Group : 0 (neutral interaction)

> Even though the guide was a caring person, and the area through which you walked was isolated, his knowledge of the environment was poor and the group did not interact well.

Scenario T, Number 8.

Guide : 0 (neutral)
Impact : + (unspoilt area)
Awareness : 0 (increase in cognitive domain)
Group : 0 (neutral interaction)

> There was little group interaction and even though the guide did not give much of himself, he was very knowledgeable about the true wilderness through which you hiked.

Scenario L, Number 2.

Guide : 0 (neutral)
Impact : 0 (signs of modern man)
Awareness : - (no increase)
Group : + (good interaction)

You gained little new information as neither the trainee guide nor the other trailists could answer your queries, however the group got on well together and even joked about the smell from a far off factory.

Scenario C, Number 3.

Guide : 0 (neutral)
Impact : + (unspoilt area)
Awareness : + (increase in affective domaine)
Group : - (poor interaction)

Despite friction within the group and an indifferent guide, the pleasure of being in a wilderness area enabled you to feel a "oneness with nature."

Scenario S, Number 6.

Guide : + (sensitive)
Impact : + (unspoilt area)
Awareness : - (no increase)
Group : - (poor interaction)

Although there was a lot of tension within the group and you did not learn much, this was compensated for by the sensitivity of the guide toward you and the remoteness of the area in which you walked.

Scenario V. Number 1.

Guide : + (sensitive)
Impact : 0 (signs of modern man)
Awareness : + (increase in cognitive domaine)
Group : 0 (neutral)

> Throughout this trail you felt a growing awareness within you of your place in the environment. This feeling was supported by a sensitive guide but was marred by the sight of powerlines and by the lack of interaction within the group.

Scenario P, Number 4.

Guide : + (sensitive)
Impact : + (unspoilt area)
Awareness : 0 (increase in cognitive domaine)
Group : + (good group interaction)

> The group, led by a guide who related well with all of you, built up a good team spirit and you learnt many new facts as you walked through the isolated bush.

2.5.3 Ranking of scenarios

In order to obtain the difference in perception (if any), between the guides and the trailists, of the different attributes, the scenarios would need to be ranked in order of preference.

The scenarios, were ranked fairly easily by colleagues but it was felt that an aid to the process of ranking should be incorporated into the procedure. This should reduce the frustrations of having to choose between closely ranked scenarios.

Rating of the scenarios would help the respondent to rank them. A rating scale with seven levels was chosen. Since there were nine cards a rating scale with five levels would result in too many ties. Seven levels would still have at least two ties. A scale with nine levels would be unlikely to aid the respondent as the choice of rating would be more difficult. The advantage and disadvantage of different rating scales is covered by Moser and Kalton (1972) and these were noted. The respondents were asked to choose between the following seven scale points. These levels describe the success of the relevant trail.

Level	Abbreviation
Very successful	VS
Successful	S
Moderately successful	MS
Neutral	N
Poor	P
Very poor	VP
Disastrous	D

The different scenarios were printed on separate cards. The letter identifying the scenario was placed in the upper left hand corner of the card. The rating scale, together with abbreviations, was placed below the scenario. The card for Scenario D looked like this :

D Even though the guide was a caring person, and the area through which you walked was isolated, his knowledge of the environment was poor and the group did not interact well

--- --- --- --- --- --- ---
VS S MS N P VP D

The respondents were asked to rate each scenario, having done this a ranking could easily be obtained. A choice still has to be made between those scenarios rated equally. Written instructions were drawn up for the rating and ranking of the scenarios. These were tested, together with the questionnaire, in a pilot study.

The pilot study resulted in changes to the wording and layout of the instructions and the inclusion of Step 1, Step 2 etc., to ensure greater clarity. The final instructions given to the respondents were as follows :

RATING AND RANKING OF SCENARIOS

The nine enclosed cards depict different scenarios for a guided "wilderness trail". Each scenario has a capital letter in the top left hand corner to identify it, as well as a rating scale below it. The rating scale is there to record your impression of the scenario - how successful a trail it would be.

LEVEL	ABBREVIATION
Very successful	VS
Successful	S
Moderately successful	MS
Neutral	N
Poor	P
Very poor	VP
Disastrous	D

The rating scale looks like this on each card:

---- ---- ---- ---- ---- ---- ----
VS S MS N P VP D

PLACE AN X ABOVE THE PLACE THAT YOU FEEL MOST ACCURATELY REPRESENTS THE LEVEL OF SUCCESS OF THE TRAIL SCENARIO.

If for example, you believe the trail will be moderately successful place the X here:

		X				
VS	S	MS	N	P	VP	D

For a poor trail the X should be placed here:

				X		
VS	S	MS	N	P	VP	D

The above are just two examples. Your X can occupy anyone of the seven places on the scale. Since there are nine cards, at least 2 and possibly more, will have a similar rating.

STEP 1 Please read through one scenario at a time, having read it, place an X in that part of the rating scale that you feel is most representative of your reaction to the scenario.

STEP 2 Having rated all nine scenarios, sort the cards into an order from 'Very successful' down to 'disastrous'. Where there is more than one card with the same rating (level of success), re-read the cards, and decide which of these scenarios appeals to you the most. Place it higher in the ranking order. Repeat this until all the cards are in order of preference (including those having the same rating).

STEP 3 You now have an order of preference for the scenarios, re-read them and if you are unhappy with the order, revise it until you are satisfied that it records your best judgement.

STEP 4 Note the letter representing the most successful scenario (top left hand corner) and place it below the number 9 in the RANKING TABLE (on the reverse side of this sheet). Place the letter of the next most successful scenario below the number 8, and so on until all 9 scenarios have been recorded. The least successful one (with a level of 'Very poor' or 'Disastrous') will be under number 1.

2.5.4. Additional data

The main data required was the ranking of the scenarios by the guides and traillists. This was done by a self administered test. The following additional data was collected to try and determine biographical details that may have affected the respondents perception. Each question was checked to ensure that it had the important qualities of "reliability" and "validity". (Weisberg and Bowen, 1977)

Question : Approximately how many years since your last guided wilderness trail?

Data : Years since last trail.

This, the first question asked, was aimed at establishing the time lapsed since their most recent trail. It was anticipated that there may be a difference in perception depending on the duration of this lapse in time.

Question : For how many days did the trail last?

Data : Duration of trail.

Many guides claimed that the longer the trail, the more likely the participants were to have a changed perception.

Question : Where was the trail run?

Data : Locality.

The locality was considered important, Doorndraai and Nylsvlei have signs of man's impact, the Umfolosi and Timbavati could be regarded as free of modern man's activities.

Question : What was the name of your guide?

Data : Guide.

This question was asked to establish whether those people who recall the guide's name had a different perspective to those who did not. The former may rank the guides personality more highly than the latter.

Question : About how many guided trails have you been on?
Data : Number of trails.
The point of this data was to establish whether or not those people who went on many trails had a different perception to those who had only been on trail a few times.

Question : Which aspect of the trail meant the most to you?
Data : General.
This question was asked in order to solicit the respondents preference about aspects of the trail. The respondents were not given a list of points from which to chose because the question was aimed at generating a list of preferences which may yield information of use to the guides.

Question : To what extent did the trail experience influence your life?
Data : Influence.
This is a very subjective and emotive question and was included to see if there is a difference in perception between those that claim to have had a strong, moderate or insignificant experience.

The remaining data gathered concerned the sex, age, home language, education and income of the participant. The complete questionnaire for the trailists is shown in Appendix V.

The questionnaire for the guides had different questions which related more to their experience.

Question : About how many trails have you led?
Data : Number of trails led.

This question hoped to establish whether the more experienced guides have a different perspective to the newer guides.

Question : How many have been for 4 or more days?
Data : Duration of trail.
The duration of the trail that they take (weekend as opposed to 5 day trails) may affect their perspective.

Question : In which area do you usually lead a trail?
Data : Locality.
The area in which the trail takes place may influence the guide. There may be a relationship between the perspective of both the guide and the trailist which is dependent on the locality or duration of the trail.

Question : Which aspect of the trail means the most to you?
Data : General.
The responses to this question will be compared to the information gathered during the interviews and the response to the identical question asked of the trailists.

The balance of the questions asked of the guides was the same as that asked of the trailists. The complete guides questionnaire is included in Appendix IV.

In designing the questionnaires the order of the questions was considered to ensure that initial questions were of interest but not threatening while demographic data was placed last, Babbie (1973).

2.6 THE ADMINISTRATION OF THE QUESTIONNAIRE.

Pilot studies were undertaken for the questionnaires. These were sent to seventeen randomly selected Cape Town members

of the Wilderness Leadership School. The responses resulted in the following changes to the original questionnaire:

- A change in the layout of the questions to allow more space and give a neater appearance.

- The elimination of one ambiguous line of questioning viz.
  'Was this your first wilderness experience? If it was do you wish to repeat it? Yes ( ) No ( ). If it was not about how many guided trails have you been on?'
  The single question - About how many guided trails have you been on?

- provide sufficient information to distinguish between trailists who have had repeat experience and those who have not.

- The expansion of the question, Do you believe that your trail experience(s) influence your life? Yes ( ) : No ( ); to include a range of three options : strongly, moderately or insignificantly.
  All respondents had replied in the affirmative.

- Step instructions were included in the narrative of how to rate and rank the scenarios.

Of the 17 people surveyed, 7 completed the questionnaire, 5 did not reply, 2 had never been on trail and 2 had changed their address.

As a result of this information it was decided that the number of people to be sampled should be increased from 200 to 300 out of the possible total of 635. (The membership list had 672 names but the number was reduced due to the elimination of overseas members, duplications and people known to be away at the time of the survey). The

comparisons between the pilot and full test is shown in Table 2.3:

Table 2.3 Comparison of returns - pilot and full surveys.

	Pilot test		Full test	
	Number	%	Number	%
Questionnaires sent out	17		300	
Returned completed	7	41,1	121	40.3
Returned wrong address	2	11.8	13	4,2
Returned never been on trail	2	11,8	18	6,2
Did not reply	6	35,3	148	49,3

Babbie (1977) states that a response rate of at least 50 percent is adequate for analysis and reporting. A response of at least 60 percent is good and a response of 70 percent or more is very good. He points out that these values are only rough guides, they have no statistical basis, and, demonstrated lack of response bias is far more important than a high response rate. He then says:

"It is accepted practice to omit all those questionnaires that could not be delivered"

It is felt that only those questionnaires that could have been completed should form the basis for calculating the response rate. The net sample size is thus 300 initial questionnaires less 13 returned wrong address, less 18 returned never been on trail i.e. 269. This gives a response rate of 45%.

Babbie (1977 pg. 164) reports that: "A consistent pattern of returns has been found. Within two weeks after the first mailing, approximately 40 percent of the questionnaires are returned; within two weeks of the first follow up an additional 20 percent are received and within two weeks after the final follow up an additional 10 percent are received."

This response rate could have been improved if follow up mailings had been done. Neither time nor finances enabled this to happen.

The guides questionnaires were sent to 29 guides, 26 replied of the remaining 3 guides two were away and one had moved. The guides questionnaires were followed up with telephone calls to maximize the response rate.

The questionnaires were sent out at the end of August, 1984 and replies were asked for by the 21st September. A stamped and addressed envelope was included with each questionnaire. The number of returns received daily was monitored, the peak being reached on the 22nd September with a rapid tailing off thereafter. The last questionnaire included in this survey was received by the 15th October, 1984.

A follow up survey was done of those trailists who had not responded. Copy of letter in Appendix V. The results of this survey are discussed in the next chapter.

The returned questionnaires were numbered sequentially and coded for data processing. The data was originally captured on cards, then processed on the University of Cape Town's Sperry Univac computer and finally transferred for the Conjoint Analysis to the Prime computer at the Graduate School of Business Administration.

The results and their interpretation form the subject of the next chapter.

CHAPTER 3

RESULTS AND THEIR INTERPRETATION

The preceding chapter examined the method used to generate data about the guides' and trailists' perceptions of a guided wilderness trail. This chapter presents and interprets the results. A general introduction is given covering the limitations of the study and how the data was processed. The results, in the form of tables and graphical displays, are then presented and discussed.

3.1 INTRODUCTION

The data obtained from the questionnaires were (i) biographical and (ii) a ranking of a set of scenarios. It is essential to consider the context and limitations of this data before it is interpreted so that false or misleading impressions are not obtained.

3.1.1 The source of data.

The data is in the form of a ranking of the nine different scenarios. Each return was examined for logical correctness, this resulted in the rejection of 3 three out of 150 returns. Such a rejection was a consequence of incomplete or repeat numbers having been used in the ranking table. The final sample included 26 guides and 121 trailists.

3.1.2 Evaluation of the data

The data was analysed by the method of conjoint analysis as outlined in Chapter 2. The results may be queried for a number of reasons. These are discussed below.

3.1.2.1 Representativeness of samples

This point has been covered in 2.6: the data gathered is

representative of the guides and members of the Wilderness Leadership School but not of the general public. A follow up survey was done to test if those who did not respond to the first circular were from the same population as those who did answer. The results of this survey are discussed in section 3.3. This test showed that the results can be interpreted as being representative of all members of the Wilderness Leadership School.

3.1.2.2 Relevance of data.
The conditions under which the respondent completed the questionnaire may have resulted in a distortion of their true preferences. This is not thought to be significant as the results have a logical interpretation and only two were rejected as being incorrectly completed.

3.1.2.3 Use of averaging of individual responses.
Blake (1982) warns that researchers should be cautious when working with the average of several individual responses. This average is generated by the MONANOVA programme used; the various levels or part-worths generated show how the 'average' respondent makes trade-offs in a multi-attribute decision. In this research averages have been used and the results have been checked for different groupings of respondents. The interpretations may not be the same for individual trailists.

3.1.2.4 Test of reliability and of validity.
These are discussed on pages 49 - 50 of Appendix III. These tests were not performed during this research. Thus there could be some doubt as to the reliability and validity of the data, however, the results of this project are reasonable and appear valid.

3.1.2.5 Statistical inferential tests.
No statistical tests currently exist for conjoint measurement (Green and Tull 1975). This, according to Blake (1982), hampers appropriate model specification, particularly where interaction terms are involved. In

comparing the results of two different sets of conjoint analysis the use of statistical inferential tests would be even less appropriate and differences can only be considered from a descriptive standpoint. The interpretation of the data in this research is made using graphical displays.

3.1.2.6 Choice of measurement model

To date conjoint measurement has been used almost exclusively in marketing research, it has not been used as a test for peoples' preferences of experiences. Thus the validity of the choice of measurement model cannot be substantiated. However, Green and Srinivasan state that conjoint measurement is a fairly robust procedure for treating an individual's preferences (Green and Srinivasan 1978). In addition, as previously mentioned, the results seem to make sense, so the model chosen and the results obtained appear to be correct.

3.1.2.7 Evaluation of perceptions.

This research is aimed at establishing the perceptions of the Guides and Trailists from their preferences of different trail scenarios. Although the scenarios offered endeavour to create a single impression from the different attributes, the method of analysis is of necessity reductionistic. The additive model used assumes "that the various attribute levels have no interaction effects on the respondents utility (i.e. the sum of the whole is the simple sum of its parts)" Blake (1982). The holistic view maintains that "the properties and functions of the psyche cannot be comprehended by reducing them to isolated elements ..." Capra (1982). This research acknowledges that the interpretations given to the analysis can only be a part of the truth. It is hoped that the portion of truth that may be illuminated will lead to further understanding of the processes involved during a guided wilderness trail.

The above points restrict the interpretation of the results to a descriptive technique and the interpretation can only

be regarded as valid for the two groups of respondents, viz the guides and all members of the Wilderness Leadership School. The results may be true for a wider population but cannot be interpreted as such. Validation of the technique used and the conclusions drawn should be obtained by repeating the exercise with a completely different sample.

The primary value of the results of this study will be to act as a stimulus for guides to evaluate their perceptions against those that appear to be held by trailists. A re-assessment of individual preferences by guides could lead to a change in the manner in which trails are operated. This change is likely to enhance the educative value of the experience for trailists.

3.2 AVERAGE RESULTS FOR GUIDES AND TRAILISTS

3.2.1 Guides' results

The manner in which results are obtained, presented and interpreted will be described in detail for the guides. The results of the trailists, and groupings of trailists, will not be covered in the same detail as the approach is identical.

The guides information was transferred onto computer data cards, and processed to supply a listing of all the information recorded. A copy of a printout is shown as Table 3.1

This data was checked to see that there was no duplication of numbers in the ranking and that the rank order had not been reversed. (In case one of the guides had misinterpreted the instructions). It was noted that the scenarios with the most positive aspects viz. H or P i.e. No. 7 & 4 were generally ranked first, while the scenarios L and D, numbered 2 and 9 were generally ranked last. Note the typographical error in Guide No. 528 where the number 1

has been recorded as]. Note also that Guide No 508 has been recorded as having ranked scenario 6 twice. This was traced back and the correct order should be 7 8 3 4 5 1 6 9 2. Such errors were corrected.

Table 3.1 Guide's Data

Sequence	Guide Number	Ranking
1.	528	745168392
2.	527	471653892
3.	526	478159632
4.	525	745631892
5.	524	741658932
6.	523	748153672
7.	522	745136829
8.	521	476158392
9.	520	743865219
10.	519	741568392
11.	517	716345982
12.	516	713654829
13.	515	472519836
14.	514	458713629
15.	513	715436829
16.	512	714583629
17.	511	718456392
18.	510	714365829
19.	509	743156289
20.	508	786451692
21.	507	475618392
22.	506	743562198
23.	505	471569832
24.	504	745318629
25.	503	714586239
26.	501	478152693

The data was then subject to the conjoint analysis programme. The programme is part of the Multidimensional Scaling Programme Package of Bell Laboratories. Before being processed the data had to be presented in the correct format for the programme; this required the deletion of the sequence and guide numbers and the insertion of a comma between each ranking. This data is shown in Table 3.2.

Table 3.2 Guide's Data for Monanova Programme

7,4,5,1,6,8,3,9,2
4,7,1,6,5,3,8,9,2
4,7,8,1,5,9,6,3,2
7,4,5,6,3,1,8,9,2
7,4,1,6,5,8,9,3,2
7,4,8,1,5,3,6,9,2
7,4,5,1,3,6,8,2,9
4,7,6,1,5,8,3,9,2
7,4,3,8,6,5,2,1,9
7,4,1,5,6,8,3,9,2
7,1,6,3,4,5,9,8,2
7,1,3,6,5,4,8,2,9
4,7,2,5,1,9,8,3,6
4,5,8,7,1,3,6,2,9
7,1,5,4,3,6,8,2,9
7,1,4,5,8,3,6,2,9
7,1,8,4,5,6,3,9,2
7,1,4,3,6,5,8,2,9
7,4,3,1,5,6,2,8,9
7,8,3,4,5,1,6,9,2
4,7,5,6,1,8,3,9,2
7,4,3,5,6,2,1,9,8
4,7,1,5,6,9,8,3,2
7,4,5,3,1,8,6,2,9
7,1,4,5,8,6,2,3,9
4,7,8,1,5,2,6,9,3

The details of the operation of this programme and its interpretation are covered in Appendix III. The complete computer printout for the Guide's results is presented in Appendix V. The section of the computer printout which deals with the calculated part worths of each level is highlighted in Table 3.3.

Table 3.3 Guides' Part-worths of each level for the four attributes.

```
  230        4.00000    2    2    3    1
  231        1.00000    2    2    3    1
  232        2.00000    2    2    3    1
  233        3.00000    2    2    3    1
  234        4.00000    2    2    3    1
OHISTORY OF COMPUTATION.

 ITERATION STRESS     SRAT   SRTAVG CAGRGL   COSAV   ACSAV
         0  0.436  1.2000  1.2000  0.000   0.000   0.067
         1  0.410  1.0624  1.1523  0.415   0.277   0.299
         2  0.408  1.0056  1.1012 -0.574  -0.291   0.482
         3  0.404  1.0089  1.0695 -0.924  -0.713   0.777
         4  0.399  1.0137  1.0505  0.972   0.410   0.907
         5  0.400  0.9977  1.0326 -0.953  -0.498   0.937
         6  0.399  1.0024  1.0224  0.996   0.498   0.977
         7  0.398  1.0011  1.0153  0.980   0.819   0.979
         8  0.398  0.9998  1.0101 -0.986  -0.384   0.984
         9  0.398  1.0003  1.0068  0.997   0.536   0.993
        10  0.398  1.0001  1.0046  0.986   0.836   0.988
        11  0.398  1.0000  1.0030 -0.989  -0.380   0.989
        12  0.398  1.0000  1.0020  0.997   0.538   0.994
        13  0.398  1.0000  1.0014  0.980   0.832   0.985
        14  0.398  1.0000  1.0009 -0.996  -0.387   0.992
        15  0.398  1.0000  1.0006  0.999   0.537   0.997
 ITERATION STRESS     SRAT   SRTAVG CAGRGL   COSAV   ACSAV

 GUIDES
   2  0.916 -0.916
   2  0.596 -0.596
   3  1.065  0.399 -1.464
   3  1.666 -0.901 -0.766

                0.6000     1.4800     2.3600     3.2400
                *. ****. ****. ****. ****. ****. ****. ****. ****
          4.52  .
          4.41  *
          4.29  *
          4.18 ..
          4.07  *
          3.96  *
          3.84  .
          3.73  *
          3.62  *
          3.50 ..
          3.39  *
```

The first number in each line (a 2 or 3) gives the number of levels for that attribute. This is followed by the calculated part-worths for each level. The part-worth values indicate the relative importance of each level.

The part-worth values can be allocated as follows:

GUIDE	+	0	
IMPACT	+	0	
AWARENESS	+	0	-
GROUP	+	0	-

(See chapter 2.4 for explanation of symbols)

The values of the part-worths attributable to each level are shown in Table 3.4.

Table 3.4 Guides' part-worth values for each level.

ATTRIBUTE	SYMBOL		
	+	0	-
GUIDE	0,916	-0,916	-
IMPACT	0,596	-0,596	-
AWARENESS	1,065	0,399	-1,464
GROUP	1,666	-0,901	-0,716

The range of part-worths for any one attribute indicates the importance placed on that attribute. Thus, for the guides, the importance can be reflected as:

GUIDE	0,916	- (-0,916)	=	1,832
IMPACT	0,596	- (-0,596)	=	1,192
AWARENESS	1,065	- (-1,464)	=	2,529
GROUP	1,666	- (-0,901)	=	2,567

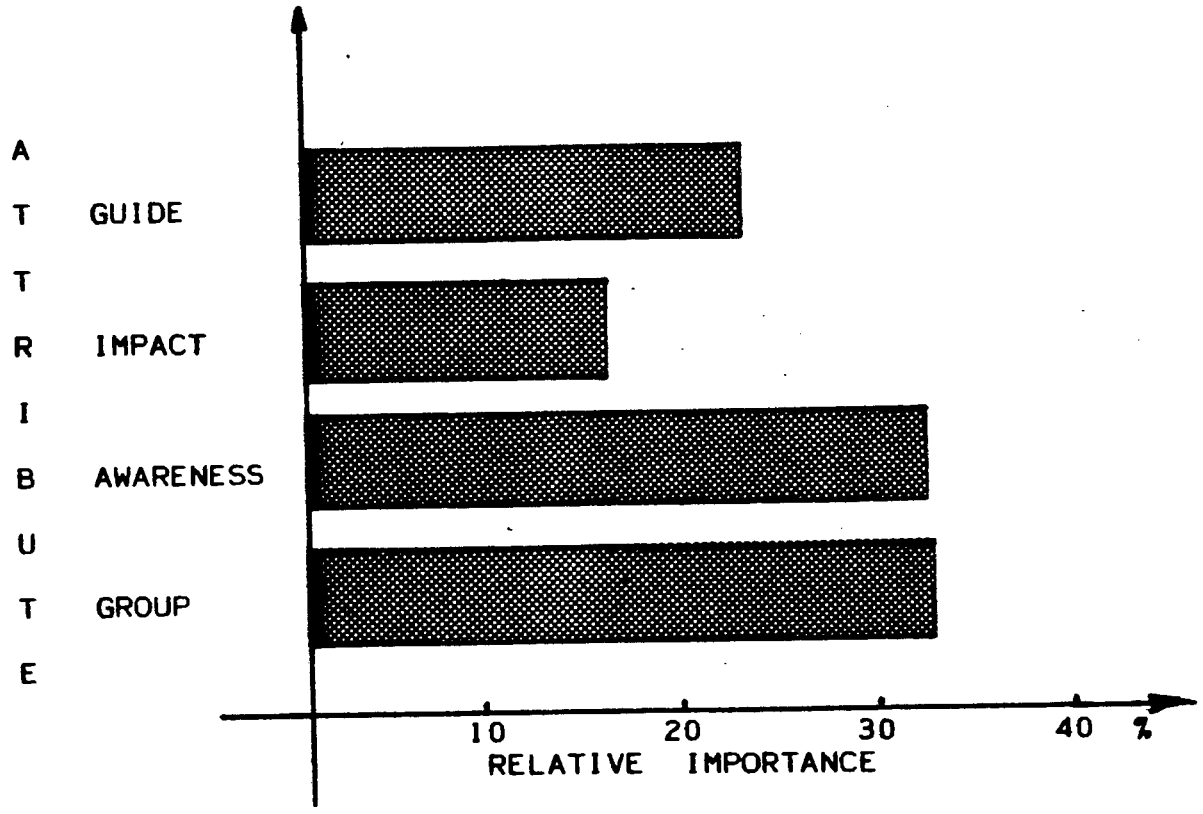
The importance of any one attribute relative to the others can be expressed as a percentage, as in Table 3.5.

Table 3.5 Guides Average Perception

ATTRIBUTE	Range	Relative Importance
GUIDE	1,832	22,56%
IMPACT	1,192	14,68%
AWARENESS	2,529	31,15%
GROUP	2,567	31,61%
Total	8,120	100%

This can also be represented graphically as in Fig. 3.1.

Fig. 3.1 Guides Perception of Attributes



The results are now in a format which can be interpreted. From Fig. 3.1 it is evident that the guides place an equal emphasis on the importance of increasing the trailists AWARENESS and on the GROUP interaction. The guides regard

the personality of the GUIDE as less important and evidence of man's IMPACT on the environment as the least important attribute.

It should be noted that IMPACT is interpreted as meaning some sign of modern man's activity in an area which is regarded as a wilderness. Both trailists and guides assumed that the trail was operated in a wilderness area. The last placed ranking of IMPACT implies that signs of modern man's activities in a wilderness area is not as important to the success of a trail as the guide's personality, increase in awareness, or group interaction. Nevertheless this ranking of IMPACT should not be interpreted to mean that a trail could be operated with equal success in an area which has few wilderness characteristics.

From Table 3.4 it is also possible to obtain the relative importance of each level (Shall 1984). This was done by :

i) adding 2 to each part worth so that they are all positive;
ii) dividing each by the largest value (unitising the values),
iii) ranking the levels in the order indicated by the resultant part worths.

This unitising process does not alter the relative importance of the levels but it does reduce the values used to a common scale so that they can be compared with the part-worths generated by, for example, the data of the trailists.

From Table 3.4 for the Guides we have:

Step (i) Table 3.6 Guides' positive part-worths

ATTRIBUTE	PART-WORTHS +	0	-
GUIDE	2,916	1,084	-
IMPACT	2,596	1,404	-
AWARENESS	3,065	2,399	0,536
GROUP	3,666	1,099	1,284

Step (ii) Table 3.7 Guides' unitised part-worths for each level.

ATTRIBUTE	PART-WORTHS +	0	-
GUIDE	0,795	0,296	-
IMPACT	0,708	0,383	-
AWARENESS	0,836	0,654	0,146
GROUP	1,000	0,300	0,350

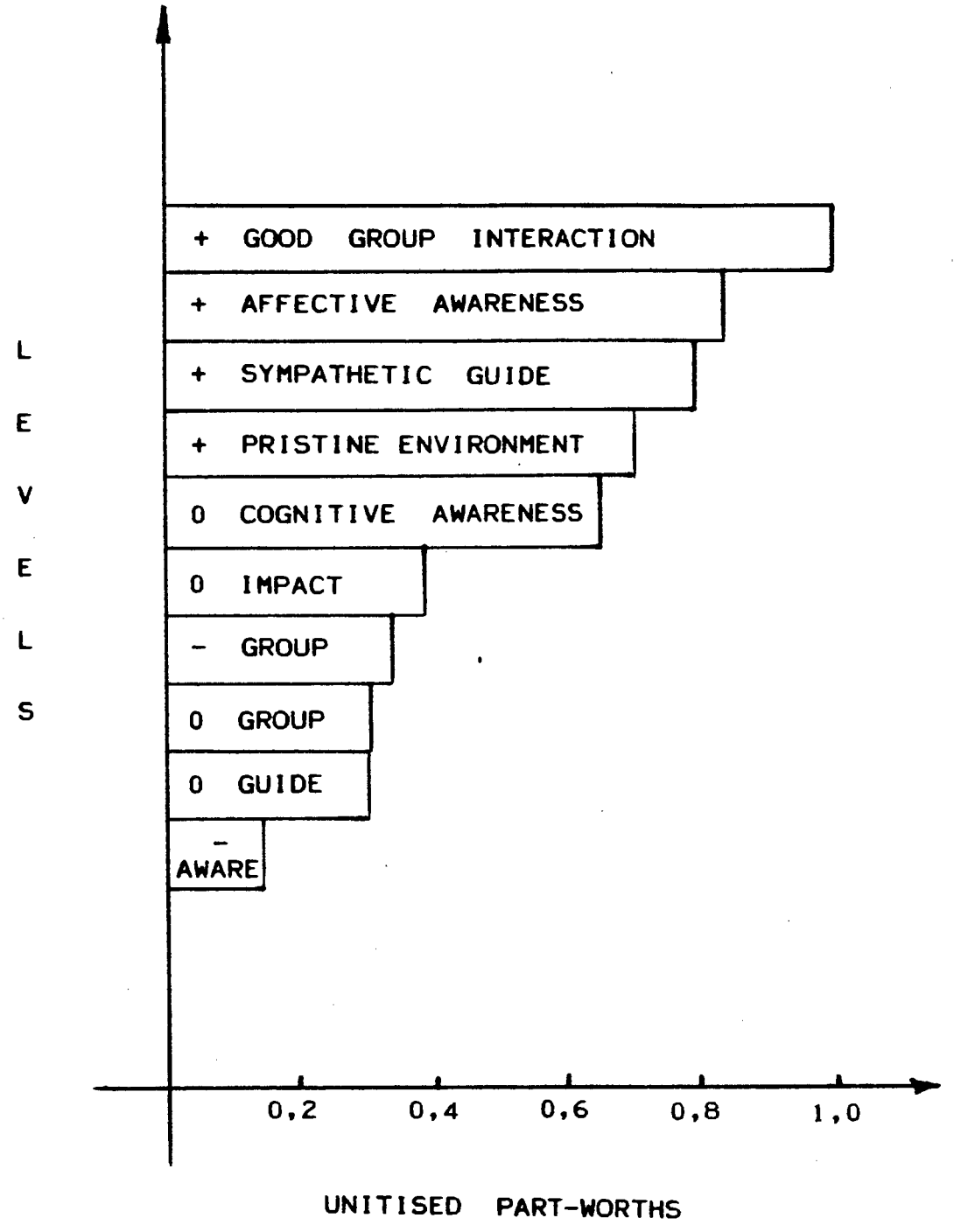
Table 3.7 allows interpretation of the guides' perception of the importance of the different levels that formed part of the scenarios. The part-worths have been transferred to a graphical representation as shown in Fig. 3.2.

It would appear that :

a) Guides place the highest value on good group interaction. This level is ranked well above the next most important level.

b) The next four rankings, affective awareness, sympathetic guides, pristine environment and cognitive awareness are all levels which are beneficial to the experience. They are ranked well below good group interaction but well above

Fig. 3.2 Guides unitised part-worths



signs of impact, poor group interaction, no group interaction and a neutral guide. These parameters are ranked fairly closely to one another and are not beneficial to the experience. The difference between the part-worths of these levels and that of the last ranked level is important. It would seem to indicate that although these levels are not beneficial they are not seen as being detrimental to a successful trail. Poor group interaction and no group interaction have values twice that of no increase in awareness. This would seem to indicate that the guides regard the absence of any increase in awareness as detrimental to a successful trail.

c) All the positive symbols are rated higher than any neutral or negative symbols. This is logical and indicates that the analysis produces realistic results. One would also anticipate that for each attribute the positive symbols would have more worth than the neutral symbols and that the neutral symbols a greater worth than the negative symbols. This is seen to be the case except for GROUP INTERACTION where the poor group interaction is ranked slightly above no group interaction. This can be explained by considering the effect of poor group interaction on the participants. Poor group interaction is usually the result of one or two individuals not cooperating in group activities, they then tend to be ignored by the rest of the group who form a closer bond, which can lead to a more successful trail. Successful, that is, from a guide's perspective of increasing the trailists' awareness of their (the trailists) interdependence with their environment. As far as the trailists are concerned poor group interaction is unlikely to be seen to have more worth than no group interaction.

Such explanation of the results of conjoint analysis can be applied to any set of analysed data and will next be applied to that of the trailists.

3.2.2 Trailists' results

Trailist data was treated in a similar manner to that of the guides. The 121 valid responses were prepared for the MANANOVA programme. Unfortunately the programme can only handle a maximum of 55 respondents. This meant that all trailists' replies could not be processed simultaneously. The first 55 replies received and the last 55 replies received were processed separately. It was predetermined that if there appeared to be no major difference in the responses between the two groups the mean would be taken as an indicator of trailists' responses.

Trail A, the first 55 replies received, produced the results shown in Table 3.8. The complete computor printout for trail A is presented in Appendix VI A.

Table 3.8 Trail A part-worth values

ATTRIBUTE	PART-WORTHS		
	+	0	-
GUIDE	0,866	-0,866	
IMPACT	0,656	-0,656	
AWARENESS	0,762	0,475	-1,237
GROUP	8,880	-0,905	-0,975

From this information the unitized part-worths were obtained - Table 3.9.

Table 3.9 Trail A Unitized part-worth values.

ATTRIBUTE	PART-WORTHS		
	+	0	-
GUIDE	0,739	0,292	-
IMPACT	0,685	0,346	-
AWARENESS	0,712	0,638	0,197
GROUP	1,000	0,282	0,264

From Table 3.8 the Trail A Average Perception can also be obtained as shown in Table 3.10.

Table 3.10 Trail A Average Perception of attributes

ATTRIBUTE	RANGE	RELATIVE IMPORTANCE
GUIDE	1,732	21,9%
IMPACT	1,312	16,6%
AWARENESS	1,999	25,3%
GROUP	2,895	36,2%
TOTAL	7,898	100%

Presentation of the remaining data, will be in the form of a table combining the respondents perception of the relative importance of each attibute and the unitized part-worths for each level. This will enable direct comparisons to be made.

From Table 3.9 and 3.10 we can obtain table 3.11 which reflects the perceptions of Trail A. The relative importance value has been rounded off to one decimal place and the part-worths to two decimal places.

Table 3.11 Trail A Average Perceptions

ATTRIBUTE	RELATIVE IMPORTANCE %	UNITIZED PART-WORTHS +	0	-
GUIDE	21,9	0,74	0,29	-
IMPACT	16,63	0,69	0,35	-
AWARENESS	25,33	0,71	0,64	0,20
GROUP	36,22	1,00	0,28	0,26

Table 3.11 shows how the first 55 trailist respondents perceived the importance of the different selected components of a guided trail. Before discussing these perceptions, the results of the last 55 responses received, and the follow up survey, will be noted.

The last 55 respondents are identified as Trail B and their results are shown in Table 3.12. The complete computer printout is shown in Appendix VI B.

Table 3.12 Trail B Average Perceptions

ATTRIBUTE	RELATIVE IMPORTANCE %	UNITIZED PART-WORTHS +	0	-
GUIDE	20,5	0,71	0,30	-
IMPACT	17,5	0,68	0,33	-
AWARENESS	23,8	0,69	0,61	0,29
GROUP	36,2	1,00	0,28	0,26

The follow up survey was done to assess whether or not there was an important difference between the trailists who had initially replied and those who had not. This group of trailists was identified as Trail F.

Their results are shown in Table 3.13 and the computer generated results are shown in Appendix VI C.

Table 3.13 Follow up trailists' perceptions.

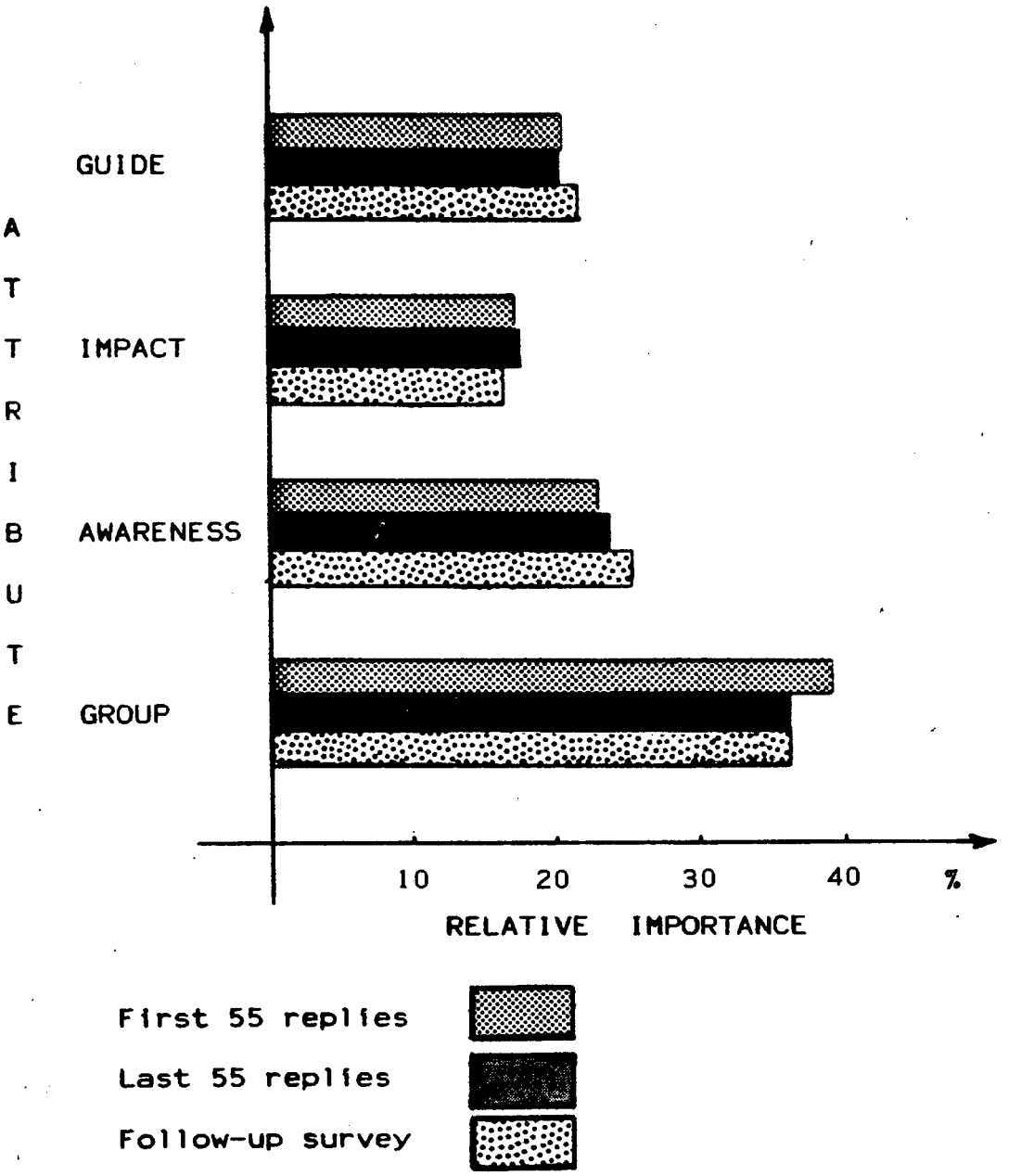
ATTRIBUTE	RELATIVE IMPORTANCE %	UNITIZED PART-WORTHS		
		+	0	-
GUIDE	20,7	0,71	0,30	-
IMPACT	17,3	0,69	0,33	-
AWARENESS	22,9	0,67	0,61	0,22
GROUP	39,1	1,00	0,27	0,23

The values obtained for the attributes from Trail A, Trail B and the follow up Trail F are shown graphically in Fig. 3.3.

Fig. 3.3 shows that there is no major difference in the perception of the relative importance of the four attributes by the three groups of trailists. However, it would appear that those who responded early placed more emphasis on AWARENESS and less on GROUP INTERACTION than the following two groups. The first group also placed more importance on the GUIDES PERSONALITY and less on IMPACT than the remaining two groups. Due to the progressive nature of this change in emphasis it could be inferred that those who have not responded are likely to be from a different population. However, the size of the difference in value of the attributes as perceived by trail F compared to trail B, is less than the difference between trail A and trail B. This seems to indicate that there is less of a difference between group F and B and more of a difference between group A and B. This could be due to the fact that group A, those who responded early, were more enthusiastic about the questionnaire having experienced a more successful trail.

Those who did not respond can be assumed to have a response similar to group F. However, none of the differences appears to be large. The inference is therefore made that the respondents, group A and B, may be regarded as representative of all trailists to whom a questionnaire was sent, and also of all members of the Wilderness Leadership School.

Figure 3.3 Comparison of Trails A, B, & F Perceptions



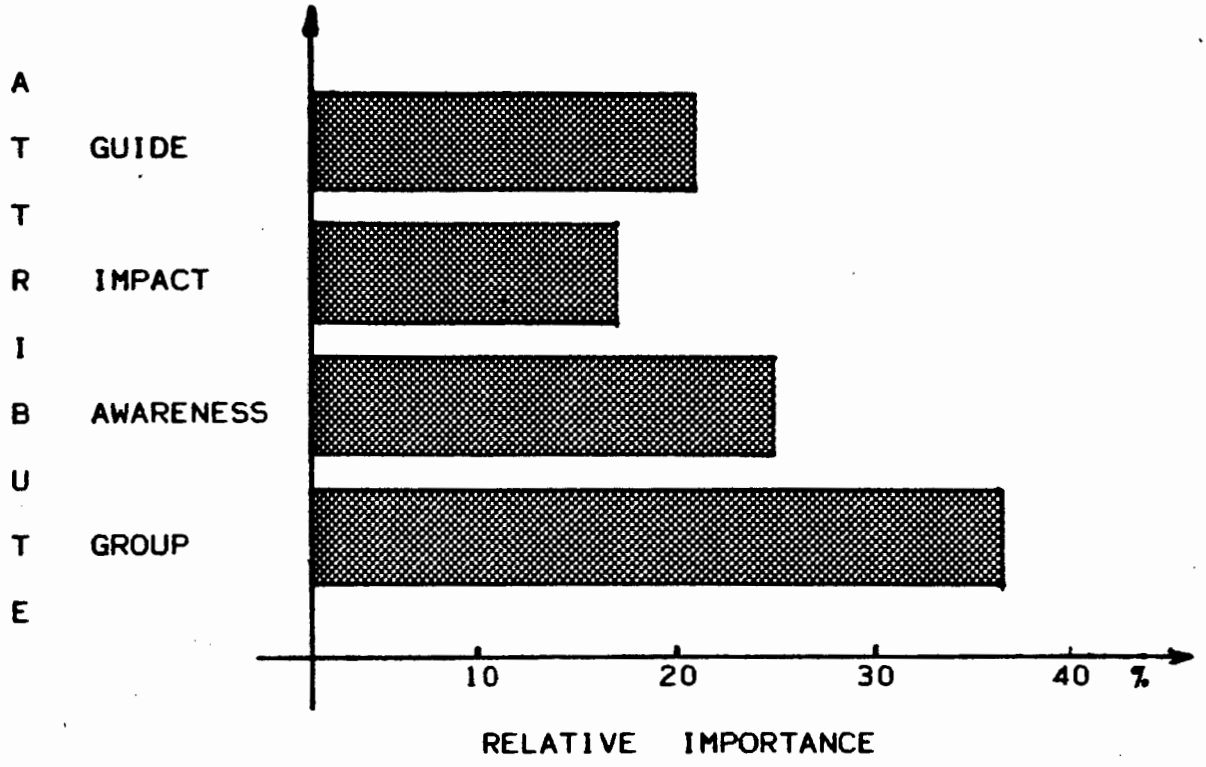
The trailists average results are taken to be the mean of the results of trail A and trail B. These are shown in Table 3.14.

Table 3.14 Trailists Average Perception

ATTRIBUTE	RELATIVE IMPORTANCE %	UNITIZED PART-WORTHS +	0	-
GUIDE	21,2	0,73	0,30	-
IMPACT	17,0	0,69	0,34	-
AWARENESS	24,6	0,70	0,63	0,25
GROUP	37,2	1,00	0,28	0,25

From Table 3.14 it can be noted that the trailists perceived the GROUP INTERACTION to be most important. The last important attribute is IMPACT on the environment. Fig. 3.4 graphically illustrates the relative importance of the different attributes as perceived by the trailists.

Figure 3.4 Traillists Perception of Attributes



The difference between the highest ranked attribute, GROUP INTERACTION, and the next,AWARENESS is 12,6 points; the difference between the second attribute, AWARENESS and the attributed ranked last, IMPACT, is 7,5 points. This seems to indicate that the traillists place far more emphasis on GROUP INTERACTION than they do on any of the other attributes. Although the traillists have ranked the attributes in the same order as those of the guides, there is an important difference. This can be seen studying Fig. 3.5 which combines the guides and traillists perceptions. The guides perceptions are obtained from Table 3.15 which has combined Tables 3.5 and 3.7.

Table 3.15 Guides Average Perception

ATTRIBUTE	RELATIVE IMPORTANCE %	UNITIZED PART-WORTHS +	0	-
GUIDE	22,6	0,80	0,30	-
IMPACT	14,7	0,71	0,38	-
AWARENESS	31,2	0,84	0,65	0,15
GROUP	31,6	1,00	0,30	0,34

Figure 3.5 Comparison of Guides' & Trailists' Perceptions

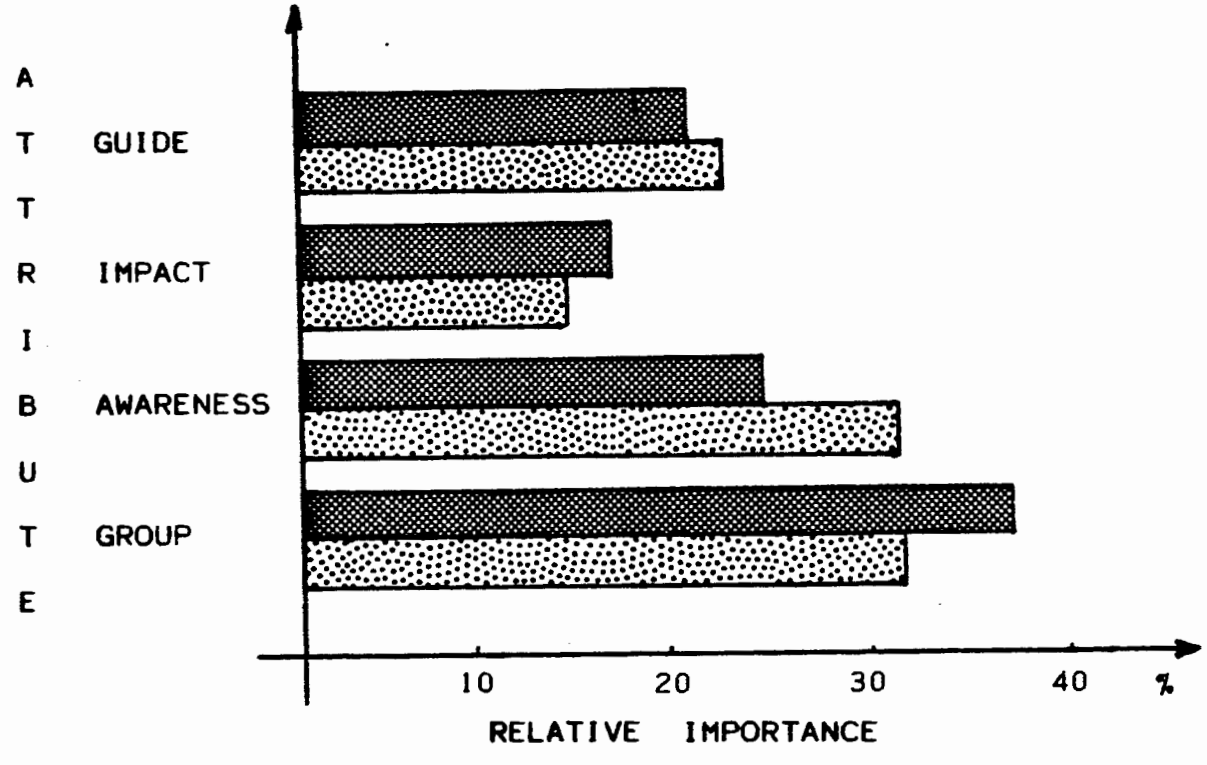


Fig. 3.5 shows the important differences in perception between the guides and the trailists. These may be summarised as :

GUIDES	TRAILISTS
Rank GROUP INTERACTION and AWARENESS on a par	Emphasize GROUP INTERACTION above all other attributes.
Place a lot more emphasis on AWARENESS	Rank AWARENESS as being similar in importance to the GUIDE'S PERSONALITY
Are less concerned than trailists about IMPACT	Are more concerned than guides about IMPACT

These differences imply that the guides and trailists have a different perception as to how important the various attributes are to a successful trail. They nevertheless have a similar perception concerning the importance of the GUIDE'S PERSONALITY.

This research has not endeavoured to study the reasons behind the differences in perceptions, for such an analysis requires an understanding of the human psyche. Nevertheless a few observations could help explain these differences. The guide and trailist probably have different approaches to a trail. The guide hopes to help the trailist "become one with his environment". The trailist does not go on a trail expecting such an experience; the trailist's aim is generally to get away from normal routines. Once the trailist is aware of his or her own place in the landscape (be it wilderness or town) then the reason for going on trail changes to one of renewing that sense of oneself. The wilderness has great value in facilitating this renewal. Members of the Wilderness Leadership School and guides are likely to have experienced a sense of their place in their environment and thus their perceptions could be anticipated as being similar. The fact that trailists emphasize GROUP INTERACTION at the expense of AWARENESS could be interpreted as meaning that they see this (GROUP INTERACTION) as the means to their end. A good group interaction helps the individuals, within that group, to know themselves better and this can then lead to a re-evaluation of the self and the persons place within their environment. This will lead

to an increase in AWARENESS in the affective domain. The guides on the otherhand see GROUP INTERACTION and AWARENESS as playing equal roles in achieving the same goal - an increase in AWARENESS in the affective domain or "a oneness with nature". The difference between the guides and trailists could thus be seen as one of a difference in perception of HOW to achieve a successful trail rather than what IS a successful trail. This distinction is important as it can help the guides re-evaluate their own way of operating a trail. It would appear that the guides should place more emphasis on GROUP INTERACTION.

The part-worths as given by the guides and trailists also yield information as to how they each perceive the various levels within the attributes. Table 3.16 shows this comparison.

Table 3.16 Comparison of Guides' & Trailists' Part-worths

LEVEL	GUIDES	TRAILISTS	DIFFERENCE
Good group interaction	1,00	1,00	0,00
Affective awareness	0,84	0,70	0,14
Sympathetic guide	0,80	0,73	0,07
Pristine environment	0,71	0,69	0,02
Cognitive awareness	0,65	0,63	0,02
Signs of impact	0,38	0,34	0,04
Poor group interaction	0,35	0,25	0,10
No group interaction	0,30	0,28	0,02
Neutral guide	0,30	0,30	0,00
No increase in awareness	0,15	0,25	0,10

Table 3.16 has been derived from the data gathered by the research and interpreted by the conjoint measurement programme. The technique of unitizing values so that they

may be compared is often used but it can lead to incorrect conclusions. In this instance GOOD GROUP INTERACTION appears to be ranked with equal importance by the guides and the trailists. If the attempt at finding a common point on the two interval scales (with common unit, but arbitrary origins), starts at the smallest number rather than at the largest number then, in this case, the guide and trailists would rank no increase in awareness as equal. Guides would then give a value of 6,7 and trailists a value of 4,0 to good group interaction. This would imply that the guides place a lot more value on good group interaction than the trailist. This is in conflict with the information generated about the attributes. Thus the unitizing process, whether at the highest or lowest values would seem to make comparisons less valid. The data generated by the conjoint measurement programme is centred around a neutral point at a value of zero. This is near the centre of the range of values. The range of values for the trailists at 3,104 is similar to that of the guides at 3,130 (less than 1% point difference). Meaningful comparisons can best be made by assuming the values, at the centre of the range of perceptions of the two groups are equal. Thus the original information generated by the conjoint measurement programme will be used for comparative purposes.

The part-worths of the guides has been given in Table 3.4. That of the trailists was taken as the mean of the part-worths of trail A and trail B. The comparison and differences are shown in Table 3.17.

Table 3.17 Comparison of Guide and Trailist Part-worths based on original output.

LEVEL	TRAILISTS	GUIDES	DIFFERENCE
Good group interaction	1,917	1,666	0,25
Affective awareness	0,754	1,065	0,31
Sympathetic guide	0,838	0,916	0,08
Pristine environment	0,673	0,596	0,08
Cognitive awareness	0,434	0,399	0,04
Signs of impact	-0,673	-0,596	0,08
Poor group interaction	-1,017	-0,716	0,30
No group interaction	-0,901	-0,901	0,00
Neutral guide	-0,838	-0,916	0,08
No increase in awareness	-1,187	-1,464	0,28

Table 3.17 yields a greater range of differences then Table 3.16. The differences in perception are either greater than 0,20 or less than 0,10.

The levels which show an important difference in value between the perception of the guides and the trailists are:

Good group interaction,
Affective awareness,
Poor group interaction, and
No increase in awareness.

The levels which show little or no difference are:

Sympathetic guide,
Pristine environment,
Cognitive awareness,
Signs of impact,
No group interaction, and
Neutral guide.

The areas of difference are the same as those previously discussed, namely GROUP INTERACTION and AWARENESS and provide the detail of how the broader attribute differences were derived. The trailists rated good group interaction higher than the guides, but the trailist also implied that poor group interaction was more detrimental to a successful trail. The guides placed more emphasis on the value of an increase in awareness in the affective domain and less importance on no increase in awareness. Thus in both cases the spread between the + and - levels was emphasised and this resulted in the difference in importance shown for the attributes.

Table 3.17 also shows that the order of ranking of the levels is different for the guides and trailists. This rank order is shown in Table 3.18.

Table 3.18 Rank order of levels for guides and trailists

GUIDE	PART-WORTH	TRAILIST	PART-WORTH
Good group interaction	1,666	Good group interaction	1,917
Affective awareness	1,065	Sympathetic guide	0,838
Sympathetic guide	0,916	Affective awareness	0,754
Pristine environment	0,596	Pristine environment	0,673
Cognitive awareness	0,399	Cognitive awareness	0,434
Signs of impact	-0,596	Signs of impact	-0,673
Poor group interaction	-0,716	Neutral guide	-0,838
No group interaction	-0,901	No group interaction	-0,901
Neutral guide	-0,916	Poor group interaction	-0,017
No increase in awareness	-1,464	No increase in awareness	-1,187

This table again highlights the important value given to good group interaction by the trailists. At a part-worth of 1,917 it is over 1 unit above the next most important level.

The guides rated good group interaction at 0,6 units above their next most important level.

Although the trailists ranked a sympathetic guide second, its part-worth at 0,838 was less than that given the guides, at 0,916, when ranking it third. Further minor inferences can be drawn from table 3.18 but they do not yield material information.

This comparison of the guides and trailists perceptions has shown their similarities in the ranking of the attributes and their differences in the emphasis placed on the GROUP INTERACTION and AWARENESS attributes.

3.3 DIFFERENCE IN PERCEPTIONS WITHIN THE GROUPS (GUIDES AND TRAILISTS)

It has been established that there is an important difference in perception between the Guides and Trailists. It would be interesting to note the differences within the groups of respondents and to determine whether this difference was as great as that between the guides and trailists. The guides' questionnaire is shown in Appendix IV and information obtained from the replies shows that they are predominantly (over 90%) english speaking males. There are differences in the number of trails that have been led, the duration and locality of these trails, as well as the age, education and income of the guides. Tests could be run for the differences between each of the groupings but it is evident from an analysis of the replies that, the guides may be grouped into two major categories.

a) The Professionals.

These are experienced professional guides who have taken more than 20 trails, for four or more days at a time in the Umfolozi or Timbavati areas. These guides are all over 35 years old, the majority of them (67%) have no university education and their family income is below R3 200 per month (45% earn less than R1 600 per month). There are nine guides in this category.

b) The Volunteers.

These are less experienced, but enthusiastic volunteer guides who have taken fewer than 20 trails, which are run over week-ends to Doorndraai and Nylsvlei. These guides tend to be under 31 years old (75%), have some university education (75%) and only 6% have a family income below R1 600 per month while 56% have an income of over R3 200.

The remaining four guides were volunteers who had far more experience than most of the other volunteer guides and led trails into the Pilansberg reserve.

The number of guides in each category is small and thus the results of an analysis may not be very reliable.

An analysis of the trailists' replies (see Appendix VIII) shows that the respondents (and hence members of the Wilderness Leadership School) were:

English speaking	90%
men:	69%
over 35 years old	86%
with a tertiary educational experience; and	56%
earning an income of more than R1 600 p.m.	86%

The respondents had been on trail:

on one or two occasions;	55%

Their last trail was run:

over a period of four or five days;	56%
in the Umfolozi Game Reserve;	63%
within the last three years.	56%

Since there were sufficient trailists to ensure reliable information about the different categories, an analysis was considered for the following groupings of trailists.

3.3.1 The number of years since the respondent's last trail.

a) Those who had been on trail within the last year;
b) The trailists who had been on trail two to four years ago;
c) The trailists who had been on trail five or more years ago.

3.3.2 The number of days taken for the trail

a) The duration of the trail was less than four days;
b) The duration was four days;
c) The duration was five days;
d) The trail lasted six or more days.

3.3.3 The locality of the trail.

a) Nylsvlei or Doorndraai nature reserves;
b) Umfolozi, Timbavati ot Pilansberg reserves.

3.3.4 The respondents who could or could not recall their guides name.

3.3.5 The number of trails attended by the respondents.

a) One;
b) Two;
c) Three or more.

3.3.6 The amount of influence that the trail had on the respondents.

a) Strong;
b) Moderate;
c) Insignificant.

3.3.7 The sex of the traillists.

a) Female.
b) Male.

3.3.8 The age of the traillists.

a) 14 t0 19 years;
b) 20 - 25 years;
c) 26 - 35 years;
d) 36 - 45 Years:
e) 46 years and over.

3.3.9 The home language of the traillists.

a) Afrikaans;
b) English;
c) Other.

3.3.10 The level of education of the traillists.

a) Those who had attended or completed high shcool;
b) Those who had attained a diploma or attended university;
c) Those who had obtained a university degree.

3.3.11 The level of the traillist's family income .

a) Up to R1 600 per month;
b) R1 601 to R3 200 per month;
c) R3 200 and over per month.

The responses of the above categories of traillists were analysed. The results and an interpretation of the results is given in Appendix VIII.

The interpretation has been based on the difference placed, by each category of respondents, on the relative importance of each attribute. Since the sum of the relative importance

of all the attributes must always be 100, the sum of the difference between categories must always be zero. Thus the importance of the difference is the emphasis it places on one attribute relative to the others. It was predetermined that for the initial interpretation of the trailists' responses, the difference between categories would be regarded as important if the value of the difference was greater than one unit. (This represents about 5% of the average value of any one attribute). Many differences have been shown in this analysis. After an analysis of the two categories of guides (professional and volunteer) the major differences between the categories of trailists will be discussed.

3.3.12 The differences in perceptions between the guides.

The perception of the two groups of guides is shown in Table 3.35. (Tables 3.19 to 3.34 appear in Appendix VIII).

Table 3.35 Perceptions of professional and volunteer guides.

RELATIVE IMPORTANCE	ATTRIBUTE			
	GROUP	AWARENESS	IMPACT	GUIDE
Professionals	28,4	35,2	15,7	20,7
Volunteers	35,3	29,1	10,6	25,0
Difference	-6,9	+6,1	+5,1	-4,3
All Guides	31,6	31,2	14,7	22,6
All Trailists	37,2	24,6	17,0	21,2

These results show a major difference between the professional and volunteer guides. The Professional guides

place more emphasis on an increase in AWARENESS than they do on a good GROUP INTERACTION. They are the only group to place AWARENESS above GROUP INTERACTION. There is a difference of 10,6 units between the professionals and the average trailists' perception of the importance of AWARENESS. This is the largest difference noted between any two groups for any attribute. On the other hand the trailists (and the volunteer guides) emphasise the importance of a good GROUP INTERACTION. This difference in perception was discussed in Section 3.3 where it was suggested that each group has a different answer to the question of how to achieve a successful trail. For the professional guides a successful trail is primarily achieved by an increase in awareness of the trailists' perceptions about their relationship with their environment. For the trailists and volunteer guides a successful trail is achieved via a good GROUP INTERACTION. It is likely that both answers are correct for the increase in AWARENESS will be preceeded by a good GROUP INTERACTION. However this does not mean than an increase in AWARENESS must be preceeded by a good GROUP INTERACTION; it could also be the result of other factors, (particularly, as suggested by the guides, being in a wilderness area and confronting archetypal images).

This interpretation of the process of experiencing a successful trail is substantiated by the relative importance placed by the professional guides on the remaining two attributes. They emphasise the quality of the wilderness area. In addition the professionals do not value the attribute of the guide's personality, GUIDE, as highly as do the volunteer guides. Both these perceptions seem to indicate that the professionals place great emphasis on the nature of the physical environment in which the trail takes place.

The magnitude of the difference between the two categories of guides could be exaggerated by the small sample size used to obtain their perceptions. However, the range of variation between the greatest and least values of the attributes for the professionals (at 19,5 units) is about the same as that for all the trailists (at 20,2 units). This would seem to support the conclusion that the professional guides do have a major difference (compared to other categories) in their perception as to what makes a successful trail.

3.3.13 Major differences in perception between the different categories of trailists.

The minimum difference in perception between the professional and volunteer guides is 4,3 units for the GUIDES PERSONALITY. It was thus decided to increase the magnitude of the difference for the trailists perception from 1 to 2,5 units. Any difference between the relative importance of any one attribute as determined by an analysis of the different categories of trailists that is greater than 2,5 units (or 10% of the average value of any one attribute) will be regarded as a major difference. From Appendix VIII the following are the major differences in perception of each attribute for the different categories of trailists.

An increase in AWARENESS is perceived to be more important by trailists who:

a) go on a four day trail compared to those whose trail is less than four days;
b) have been on two trails;
c) are over the age of 19 years;
d) have received a university education; and
e) have a family income above R3 200 per month.

A good **GROUP INTERACTION** is perceived to be more important for trailists who:

a) have only been on one trail;
b) are under 20 years of age;
c) have a university education; or
d) whose family income is less than R3 200 per month.

The **GUIDE'S PERSONALITY** is perceived as being more important for those trailists who:

a) are under 20 years of age; or
b) have a family income of more than R3 201 per month.

Signs of modern man's **IMPACT** in the wilderness area are perceived as being more important for those trailists who:

a) have only been on one trail;
b) are female;
c) are over 19 years of age; or
d) have a family income of less than R3 201 per month.

An interpretation of these differences is not attempted here for explanations have been given in Appendix VIII and the purpose of this research has been to determine whether or not such differences do occur.

This chapter has shown how the information obtained from the respondents was analysed. The conclusions drawn from these analyses are given in the final chapter, (Chapter 4).

CHAPTER 4

CONCLUSIONS

The aim of this work has been to determine, whether guides and trailists have the same perception of the relative importance of the different attributes, that combine to make a successful wilderness trail.

Guides of the Wilderness Leadership School were interviewed to determine the important factors that are present in a successful trail. From Appendix I these are seen to be:

1) A knowledgeable guide who is sensitive to the trailists' needs and has the ability to interpret the environment;

2) An experience by the trailist of archetypal situations such as : sitting around a campfire, being alone in a wilderness area, crossing a dangerous river, or facing wild animals.

3) The trailists should feel remote from their normal way of life : in time, distance and mode of shelter, travel and survival.

4) The trailists should be exposed to some form of stress, both physical in the form of hiking and emotional when confronted with unfamiliar situations requiring a reassessment of their previously held beliefs.

5) The trail should take place for a period of four or more days in a wilderness area with a maximim of seven trailists and one guide.

6) The trailists should gain new knowledge about their interdependency with their environment.

7) There should be a good interaction between the participants on the trail.

From these factors, four attributes were chosen for the tests which were analysed by the conjoint method of analysis. These attributes were:

- the nature of the interaction within the group of trailists - GROUP
- the degree to which the trailist's awareness, of their interdependence on their environment, was increased - AWARENESS;
- the personality of the guide - GUIDE; and
- signs of modern man's activities in the wilderness area - IMPACT.

This research has shown that there is a difference in perception between the guides and the trailists as to what makes a successful trail. The research has also shown major differences in perception between volunteer and professional guides and important differences between the different groups of trailists.

A comparison of the analysis for all the guides and all the trailists shows that :

GUIDES	TRAILISTS
Rank GROUP INTERACTION and AWARENESS on a par. (31,6% and 31,2%)	Emphasize GROUP INTERACTION above all other attributes. (37,2%)
Place more emphasis on AWARENESS than trailists. (31,2% vs 24,6%)	Rank AWARENESS as being similar in importance to the GUIDE'S PERSONALITY (24,6% and 21,2%)
Appear less concerned than trailists about IMPACT (14,7%)	Appear more concerned than guides about IMPACT (17,0%)

These differences, reflecting the average difference for each group, are made up of the differences within the groups. This difference is most notable for the professional guides (those who are paid to take trailists to more remote areas for four or more days) and the volunteer guides (those who are unpaid and take groups to areas which

have signs of modern man's activities, for a period of two days).

The professional guides rated an increase in AWARENESS as more important (at 35,2%) than a good GROUP INTERACTION (at 28,4%). These attributes were followed by the personality of the GUIDE (20,7%) and signs of modern man in the wilderness - IMPACT (15,7%). In comparison the volunteer guides reversed the order of importance of the first two attributes, rating a good GROUP INTERACTION (35,3%) above an increase in AWARENESS (29,1%). The personality of the GUIDE was ranked third (25,0%) and least important was signs of IMPACT (10,6%). This difference, between the professional and amateur guides indicates a difference in approach to, and success of, their trails. This is substantiated by the analysis of the trailists' responses which showed that less than 10% of the respondents (and hence people who had joined the Wilderness Leadership School) had been on trail with a volunteer guide. In response to the question, "which aspect of the trail means the most to you?" the majority of trailists referred to some aspect of an increase in knowledge or awareness. The professional guides' replies indicated that they found most meaning in developing "an awareness in the trailists of themselves (the trailists) in nature". They thus met the needs of the trailists. The volunteer guides emphasised "interaction of the group and introduction of the uninitiated to wilderness". These responses support the differences indicated by the conjoint analysis. This difference in emphasis is probably due to the different amount of time that the professional and volunteer guides have spent leading trails in unspoilt wilderness areas. It is recommended that volunteer guides should regularly attend five day trails led by professional guides.

An analysis of the trailists' replies showed that :-

1) The majority of the respondents had been :

on trail in the Umfolosi game reserve	(63%);
on one or two occasions	(55%);
over a period of four or five days	(56%);
within the last three years	(56%).

Most trailists were:

english speaking	(90%);
men	(69%);
over 35 yrs old	(62%);
in the middle to upper income group	(86%);
with tertiary educational experience	(56%)

The respondents are not representative of the population at large although they may be representative of decision makers in the commercial and industrial sectors of South Africa.

2) There was no change in rank order of the relative importance of any attribute due to the different groupings of trailists. However within the same rank order perceptions did differ as follows:

- The longer the duration of the trail the less important was the personality of the guide.
- Females placed emphasis on maintaining a wilderness area free from modern man's activities. Men emphasised the importance of increasing the awareness of the trailists towards their dependency on the environment.
- Teenagers stressed the importance of good group interaction as well as a guide with a sympathetic personality.
- University graduates emphasised an increase in awareness at the expense of a good group interaction.

- With increasing levels of income, trailists reduced the importance of the group interaction and signs of man's activities in the wilderness but they increased the imporatance of an increase in awareness and the personality of the guide.

3) Trails to be effective, should be at least four days long, and operated by a knowledgeable guide in an undisturbed wilderness area.

These differences should be noted by the guides so that through their leadership they can reach each trailist as an individual. The choice of activities and interpretation of the wilderness must be aimed at the needs of the specific people on the trail

The conclusion is drawn that there are differences in perception between the different groups analysed. The professional guides appear to have taken note of these differences and have learnt how to cater for the individual needs of each trailist. The volunteer guides' trails are less effective due to the locality (the areas have more signs of modern man's activities) and duration of the trail. (the trails are run over a weekend), and the experience of the guide.

One of the most important factors of any trail is inherently present in a weekend trail, that is, the enthusiasm of the guide. All weekend trail guides are volunteers. Nevertheless it is recommended that the details of the operation of these weekend trails should be reviewed to ensure that:

1. The volunteer guides are familiar with:
a) the manner in which the professionals operate their trails, (Appendix I and II)
b) the different perspectives held by the various categories of trailists, (Annexure VIII) and
c) different aspects of a trail that mean the most to the trailists (Annexure IX).

2. The structure of the trail is checked so that :

a) where possible signs of modern man's activities are minimised,

b) the trailists do not camp next to their transport,

c) archetypal situations are included (where appropriate),

d) the guides knowledge of the area is adequate, and

e) the trailists should be exposed to some form of stress.

Guided wilderness trails do play an important role in educating people about the need to conserve their environment. The Wilderness Leadership School only reaches a select group of people. The School's example has been adopted by some other organisations but it needs to be applied in many more unspoilt natural areas so that a wider range of people can benefit from the experience it provides.

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APPENDIX I

INTERVIEW WITH GUIDES

This appendix contains a summary of the interviews of ten guides. All guides currently, or in the past, led trails for the Wilderness Leadership School. The interviews were tape recorded and then salient points relating to the success of the trail were noted under two broad categories. Firstly the PARTICIPANT'S EXPERIENCE and the RELATED ACTIVITY which led to that experience and secondly the GUIDE'S PERSONALITY.

Name of guides interviewed

B CLEMENTS	Past Professional Guide
H DENT	Past Professional Guide
J FEELY	Past Professional Guide
I PLAYER	Founder of Wilderness Leadership School
D RICHARDS	Past Professional Guide
B STATHOULIS	Current Volunteer Guide
C WALKER	Past Professional Guide
A WARBERTON	Current Volunteer Guide
A WEDDERBURN	Current Volunteer Guide
L WRIGHT	Current Volunteer Guide

INTERVIEW WITH GUIDE A

PARTPARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Feel independent of society.	Walk to campsite carrying all needs.
Feel dependent on local environment.	Collect own firewood, and collect own water.
Feel independent of man imposed time.	
Appreciate wilderness area.	Don't wear watches. Due to relaxation, can be free of facades and be themselves. Don't have to be defensive.
Feel close to the environment.	Sighting animals close by.
Alertness of senses via element of danger.	Night watch.
Realisation of responsibility for others.	Night watch.
Free time to do as they wish (within safety limits).	At lunch.
Additional knowledge above that expected.	Map reading and orienteering.
Self discovery.	Discussion periods and solitude.
Learn something new about the environment.	Guide's interpretation of the environment.
Self discipline and awareness of group interdependence.	Volunteering for chores.
Group interaction with leader and environment.	Whole trail.

GUIDE'S ATTRIBUTES

Must know area and have general plan for activities.

Don't be too structured.

Sensitive to participants.

Activity dictated by the environment.

Find out participants' interests and use and emphasize them.

Explain School's philosophy and emblem.

Be aware of different nationalities perspectives.

INTERVIEW WITH GUIDE B

PARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Unlocking something within them results that in attitudinal change towards conservation and a personal awareness "of spiritual oneness with nature and God". Become aware of change from normal way of life.	This is Purpose of trail: - Length of trail five days better than two days. - Night watch. - Solo solitude. - Sunrise. - Water discipline.
Feeling of solitude.	Walk to camp, don't use Combi to store things.
Group participation.	Campsite manners.
	Cook around campfire.
Encourage feeling of timelessness.	Try not to use watches.
Keys to "unlocking the door".	Sighting of game or something unusual.
	Of geology or use of a theme for the day.
- increase knowledge.	Biomas pyramid (Trophic levels).
- elation at success.	Physical stress-hard hike.
- feeling of responsibility.	Night watch and finding camp.
- feeling of discovery.	Tummy time and relate what is seen.
- awareness of contrasts.	Explain difference between natural and man made cycles.
- new emphasis or interpretation.	Explain and interpret in different ways.

GUIDE'S ATTRIBUTES

Give good impression.	Be tidy, professional.

Get to know people.

Swop seating on way out.

Prepare for trip.

Knowledge, logistics, food.

Help participants to relax and then become sensitive to the new environment.

Discuss history and geography of area on way to venue.

Above activities reinforced by expression of feelings.

Ability to take leadership role, particularly in time of crisis.

Know ideals and aims of Wilderness Leadership School.

INTERVIEW WITH GUIDE C

PARTICIPANTS' EXPERIENCE	RELATED ACTIVITY
Atavism - signs of primitive forces.	Sitting round camp fire, shooting buck, cooking.
Conversion of participants to active participation in conversation.	Overall trail objective.
Reduce expectations of trail.	Thereafter activities are more exciting.
Maximum change in ones lifestyle, back to ones origins.	Sleep on ground, bush clothes, cold water.
Feel less dependant on society, more independent.	Carry all requirements to site.
Feeling of first person in area, sense of wonder and discovery.	No signs of other people, basic camp to be neat.
Feel disorientated and isolated.	Area must be large and isolated.
Feel physical fatigue, tired and hungry and thus earning the experience.	Length of hike must extend the participants.
Small group promotes cohesion.	Solitude - night watch, solo walks.

GUIDE'S ATTRIBUTES

Must be sensitive to trailists.

Ability to lead discussion.

INTERVIEW WITH GUIDE D

PARTICIPANT"S EXPERIENCE	RELATED ACTIVITY
Sense of healing of social pressures and complexes which leads to awareness of need for Wilderness areas hence for conservation.	Exposure to Wilderness, awareness of environment and beauty via guides and interpretation.
Curiosity about the environment.	Interpretation by guide of environment (but not too much scientific information).
Awareness of need for discipline and application to personal life.	By guide's example and observation of examples in the environment (seed disposal).
Be aware of beauty of nature.	Watch dawn and sunrise.
Feeling of aloneness, responsibility for others.	Night watch.
Become attuned to night and its sounds.	Night watch.
Fear of danger and risks.	Find way back to camp in pairs and map it.
Feel affinity for group.	Share chores.
Awareness of existence of Creator.	(Beware of worshiping creation).
Feeling of first people into the Wilderness area.	Avoid signs of others, tracks, litter.

GUIDE'S ATTRIBUTES

Self disciplined because natural environment is disciplined.

Relate to participants (poor guides remain remote and anti people).

Be knowledgeable about the bush and able to interpret its rhythm and cycles.

Enthusiastic; "blend into the environment"; have a belief in the importance of this task.

Intellectual knowledge is not the key but is important (second to enthusiasm).

Patience - father, doctor, cook.

Be a teacher i.e. "a guide to discovery" via direction given and questions asked.

INTERVIEW WITH GUIDE E

PARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Exposure to Wilderness area.	Experience of the trail.
Exposure to natural conditions.	Maintain primitive camp, no frills.
Feeling of interdependence with one another.	All at same "level" - on foot, weather, danger.
Time for consciousness of own identity.	Walk in silence.
Appreciation of landscape which results in commitment to preserve it. (Wilderness - unspoilt landscape).	Period of interpretation of landscape by guide in new ways; also sit still and absorb in silence- alert like an animal.
Feel relaxed.	Be free of pressures.
Be aware of contrasts.	Discussion and observation of day and night.
Feel alone.	Night watch (people who are asleep - unconscious - are not aware of others, hence feeling of being alone).
Allow intuition to take over.	Don't force discussion of experiences.
Feeling lost and orienteering.	Find way back from "signs of the wild".
Awakening of awareness.	Explain interdependance of birds, insects, plants and small animals to show importance in the broader scheme of things.

GUIDE'S ATTRIBUTES

Sufficient local knowledge to fill time of trail.

Basic scientific knowledge necessary - but extensive knowledge unnecessary.

Preferably awareness of personal relationship to landscape (shape, colour, mood).

Enthusiasm for Wilderness.

Be sensitive.

Avoid distractions.

Guide is an interpreter of the environment.

INTERVIEW WITH GUIDE F

PARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Therapeutic effect of Wilderness.	Objective of trail achieved by guides enthusiasm and interpretation of the environment, its joy and its fears.
"The spark" that is within us all is fanned into flame.	
An awareness that nature on the inside is just as important as nature on the outside, and that what you do to your surroundings is precisely what you do to yourself. These are two sides of the coin of life and the message of all religions.	Operate in big game country, the original African Environment. Keep camp facilities as basic as possible, to minimise insulation from the environment.
Fears of being alone, and of the dark.	Night watch.

GUIDE'S ATTRIBUTES

"The most important thing on trail is not what the trail leader says, but the attitudes to nature that he reveals on that trail i.e. what he himself is".

Enthusiasm and dedication for his cause, and an understanding of it.

Don't try and impart a lot of facts, but know them so as to be able to answer questions.

Realisation by guide that "you can't conserve the environment without conserving the spirit, the two are not separate things - science finds it convenient to separate them for analysis, but they are part of the whole". ("No man is an island etc., Donne").

Intimate knowledge of his environment and its hazards - prevention of and extrication from dangerous situations.

Realisation that he is a guide giving people a glimpse of a new view from a new window, he is not a missionary trying to sell that view.

Realisation that environmental problems will exist for as long as man is on earth for the problem is man and therefore the battle cannot be won, only continually fought.

INTERVIEW WITH GUIDE G

PARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Feel removed from daily life and pressures.	Be in bush away from family business and responsibilities.
Experience a physical contact with environment.	Walking - self reliance the - not too physical.
Awareness of endangered species.	Guide's explanation.
Awareness of population pressures, litter.	Guide's explanation.
Realise that Wilderness is a scarce commodity and hence support conservation organisations.	
Experience fear or nervousness where possible (not artificially induced).	Night watch.
Responsibility for others.	Night watch.
Feel alone, think.	Night watch.
Express own feelings - "the poor man's psychiatrist" (fire).	Sit around the fire (it is symbolic).
Group interaction.	Limit to eight participants.

GUIDE'S ATTRIBUTES

Dedication, exhibited via his enthusiasm.

Good at handling people (very important).

Identify with people.

Have broad based knowledge, not necessarily scientific.

INTERVIEW WITH GUIDE K

PARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Sharing - identification with other trailists.	Shared experience, knowledge and work with the group and with no outsiders.
Expressing one's feelings.	Shared reflections on experiences.
Awareness of interdependency of Creator, Man and Environment.	Explanation of School emblem.
Identification with one's past (this is the catalyst).	Night watch - (Silence is a time of communication).
Identification with other trailists.	
Feeling of reverence for the area.	Guide's attitude and behaviour. Read Chief Seattle's letter.
That each day is a gift.	Use it and enjoy it.
Convergence of interests.	Silence on trail (talk creates a divergence of interests).
Feeling of fear (greatest catalyst, people more receptive).	
Increased observation.	Walk 50 paces and then record what is seen.
Sense the miracle of nature.	Guide's interpretation (don't repeat TV stories).

GUIDE'S ATTRIBUTES

A successful trail depends on how it is led not that it is done.

Ability to handle "loud mouth trailists" as this "kills" a trail.

Identify stimulation traillists need and meet but don't saturate it. Find this out by questions on first night and listen to response.

Give to each individual - be close to them - touch (engenders feeling of security).

Relief from group stress.	Solitude and night watch.
Feeling of remoteness.	Walk from vehicle, don't drive to camp.
Sharing of the experience.	Discussion groups and verbalisation.

GUIDE'S ATTRIBUTES

Guide must be sensitive to the group and sense when to explain reasons for activity and when to impose it (i.e. walk in silence).

Gauge approach to experience of participants.

Incorporate archetypes into trail to heighten experience - fire, river crossing, dominant leader.

Share his time equally with participants (avoid jealousies).

Realisation that "the individual is the receptacle of life" and we must reach the individual and not the masses. Society does not regard us as individuals but we do.

Avoid giving too much information.

Know in own mind what you are trying to put across (viz. trees and birds, their interrelationship and our personal responsibility).

"True teacher sparks off the desire so that there is self actualisation - beyond the naming."

INTERVIEW WITH GUIDE P

PARTICIPANT'S EXPERIENCE	RELATED ACTIVITY
Fear of destruction of all species and ourselves.	Guide's explanation - this is greatest motivating force.
Must feel stimulated.	Actual venue.
Realisation of own awareness of environment and need for conservation.	This is purpose of week-end trail.
Feeling of discovery.	Guide to point out one facet at a time, not all at once.

GUIDE'S ATTRIBUTES

Ability to assess and communicate with group and help entire group to communicate. Success of trail depends on group.

Get group to contribute - by initiating questions.

Guide is a catalyst not a teacher.

Don't try and get across too much.

Be able to take control, but ask don't command participants to help.

Don't stereotype sexes.

APPENDIX II

Summary of the eight major factors that were collated from the interviews with the guides. The use of these eight factors is discussed in Chapter 2.

The factors are:-

2.1 General aims and feelings
2.2 Guides' attributes
2.3 Trailists' attributes
2.4 Group interaction
2.5.1 Nightwatch, solitude
2.5.2 Camp fire
2.6 Knowledge
2.7 Hiking and physical activities
2.8 Physical environment

These factors could help new guides appreciate how the more experienced guides view the different aspects of a trail. In addition to the Wilderness Leadership School guides mentioned in Appendix I, four other people were interviewed. Their interviews were not incorporated into the main work of this research but the opinion of these people could be of interest and so have been included in this appendix.

DR JOHN CLAYTON	Educator & Principal of School in the Wilds.
JANEE LEVY	Author and consultant on the design of hiking trails.
EVAN MORKEL	Teacher and Operator of guided Commercial Trails.
PETER SLINGSBY	Cartographer and Honorary organiser of Hawekwas trails.

2.2.1 General aims & feelings

Guide A Trailists appreciate importance of Wilderness because they enjoyed experience since they can relax, be themselves, don't have to be defensive.

Use school's emblem for discussion.

Ignore man imposed time restraints - leave watches in Combi.

Guide B Unlock something within each Trailist which leads to attitudinal change towards conservation and an awareness at a personal level "of spiritual oneness with nature and God".

Success due to - length of trail five days better than two days,
- degree of change from normal.

Encourage feeling of timelessness try not to use watches.

Guide C Atavism - sitting round campfire, shooting buck, cooking - signs of primitive forces.

If no game or fear on trail then it requires more preparation.

Aim for maximum change in life style.

Taking people back to their origins.

Guide D Beware of worshipping creation and not creator - pantheism.

Guide E Objectives - to gain support of Trailist for appreciation of landscape, unspoiled beauty and commitment to preserve it.

Don't need to verbalise experience "it kills it" - leave it to intuition.

Guide F Objective - "urbanised people have got to be brought to realise that nature on the outside is jsut as important as nature on the inside - that they are two halves of the coin of life and what you do to your surroundings is precisely what you do to yourself" ("this is the message of all religions").

Wilderness experience is part of the necessary therapy - the breeze that fans the spark that is within all of us.

Guide G "The essence is to take people away from their normal lives and bring them down to the level of ordinary people"
It is - a physical contact with the environment
- emotional and aesthetic experience
- educational
- social experience.

Objective - to increase an awareness of endangered species and population pressures and realise wilderness is a scarce commodity which results in changed behaviour and leads to support for conservation organisations and awareness of litter.

Guide H Big game thrill assists success of trail even if guide is weak.

The mountains can teach you everything - ecology, first aid, interrelationships, safety, responsibility, development of personality, curiosity, sensitivity, awareness, landscapes.

In wilderness one is vunerable because you are not in your own element.

Length is important to let people unwind. Can be too long.

Guide I Experience must be enjoyable. "Conservation can't start until you are aware of what is there".

Guide J In a hike (seven days) people are committed to the group and make an effort, on short weekend trails less commitment and so less effort to group.

Important to publish structure of trail; people want to know what will happen and stimulates want of experience.

Guide P Two day trail to start awareness - chain reaction
Five day trail to continue and reinforce
Fear is a great motivating force - fear of destruction of all species and ourselves.

Guide K How a trail is run influences the success not that it occurs.
Trail killed by loud mouthed individual.

School emblem : Man to God - solitude, nightwatch, self discovery/and God.

Man to man - dialogue and communication via interest factors help give wider/holistic perpective.

Man to earth - environmental interdependence.

Fear is greatest catalyst - primeval man - people more receptive.

Guide L Wilderness experience always occurs - can be subconscious and only roused to level of consciousness later - wilderness a mirrow of our subconscious.
Experience the "oneness with nature".

Archetypes: Danger, man in command,
Sitting around a camp fire,
Crossing a river,
Sitting around a water hole.

Jung "The individual is the receptical of life" we must not try for the masses but go for as many individuals as possible (as priests should but don't do). Society does not regard each person as an individual but we regard ourselves as such.

Guide M All trails a success since some beneficial value to Trailists.

Tight bond between physical, intellectual and spiritual aspects.

2.2.2 Guides' attributes

Guide A Must know the area very well - plan activities but be flexible to circumstances and not rigid.

Find interests of Trailists and use and emphasize these.

Guide B Watch own campsite manners (tidy, no waste, litter etc.,)

Swop position in Combi on outward trip to break journey and get to know trailists.

Discuss history, geography of areas passed through on way to site.

Prepare for trip, logistics, food, knowledge.

Explain/highlight contrasts between man and natural cycles.

Aim to remove stress and relax trailists then they become sensitive to the new environment. (Automatic on 5 day trail, must be worked at on 2 day trail). (i.e. stress - relax - sensitive - stress - expression of feelings).

Guide C Sensitive to trailists otherwise could build up antipathy.

Reduce expectations so that any experience a bonus.

Ask questions to lead discussion.

Create sense of wonder.

Guide D Must interpret the environment.

Enthusiastic, belief in task is vital to "convert" others.

Blend into environment.

Poor guides remain remote and anti people, good guides mix and sympathise with all.

Knowledge of bush and area (not academic) for interpretations - rhythms, cycles etc.,

Patience - father, doctor, cook on duty 24 hours a day.

Teacher i.e. guide to discovery via questions and direction

Stimulate senses, hearing, touch, smell, taste.

Create feeling of first people into area - avoid signs of others.

Disciplined since natural environment disciplined and teach application of discipline.

Bear personal witness only if valid.

Guide E Requires limited knowledge, enough to fill time of trail.

Enthusiasm for Wilderness, its infectious.

Explain programme in outline, also dangers.

Relax trailists.

Contrast day and night.

Don't be insensitive.

Awakening of awareness (of natural environment) by whittling away awareness (of unnatural environment) and other wrong things.

No need to know detail just feel it, be aware of it.

Guide F "The most important thing on a trail is not what the leader says but the inner convictions that he reveals through his actions".

Enthusiasm - is a sign of conviction.

Should have long practice, experience and knowledge of the environments he operates in, and of its hazards, and how to avoid them himself. Also how to prevent his group from making hazardous mistakes in their ignorance. Also how to extricate himself and them from the truly unavoidable hazards.

Realisation that he is a guide, giving people a glimpse of a new view from a new window, but not a missionary trying to sell that view. It is their perogative and fate how they react to the experience. He can only hope that they will come to love it in their way as he does in his - he can not make them do so and should not try.

Realisation that the environmental problems will exist for as long as man is on earth, for the problem is in man. Thus it is not a battle that can be won, only continually fought.

Guide G Dedication is required.

A guide is essential to the exprience.

Good at handling people.

Broad based knowledge (not academic).

Safety.

Cater to individuals.

Guide H Personality is very important - sets tone, emphasis via example i.e. habits, smoking, stepping on logs, noise, attitudes.

Must be sensitive to trailists, manage and relate to them.

Don't oversell conservation.

Discuss current issues and relate them to what is seen. Be realsitic not academic.

Teach trailists to like the experience, that's the first step.

Guide I Needs to enjoy people, teaching.

Core knowledge of area. Adapt to changed opportunities, don't be rigid.

Enthusiasm.

Guide N Guide should be open and extrovert or rather a true leader, friendly, keen to communicate - not the strong silent type.

Should be able to exploit the environmental opportunities, know history of the area, conversant with vegetation, interpretive ability.

Admit lack of knowledge.

Capable of surviving in the bush - outdoor skills.

Don't show intention to convert people.

Guide J Leader to help people feel at ease.

Not macho but relaxed.

Dont force issues.

Find out why client on trail and give direct personal experience.

Ability to work with people.

Be able to handle an emergency.

Strong character with easygoing attitude - considerate.

Relax participants.

Be sincere and show care.

Communicate what to do or will happen.

Guide P Must assess group.

Communicate.

Guide a catalyst not a teacher.

Don't stereotype sexes.

Be able to take control.

Courteous not bossy.

Guide K Identify trailists' needs, and meet that need but don't saturate it.

Listen to trailists.

Regard area as sanctified ground.

Each day as a gift (Quote Rubiat "Drink the cup of life ere the cup be dry").

Give to each individual.

Engender security via touch.

Get traillists to share their knowledge.

Guide L Guides must be sensitive to group and sense when to explain reasons for activity and when to impose activity (i.e. walking in silence).

Watch for archetype reactions and build these into trail. Be aware of own archetype reaction as a guide.

Trail need not be as long if archetype situations present but don't over manipulate.

Spend equal time with each person, sex, spouse, otherwise jealousies.

2.2.3 Trailists' attributes

Guide A Come because they want to enjoy the experience.

Repeat the experience to "recharge their battery"

Say they enjoy - the solitude, tranquility, beauty, knowledge gained and new philosphical perspective.

Seem to require - Self discipline and volunteering to help in group activity.
- realisation of interdependency of participants.

Seem to gain - tolerance to city life
- relax
- interest in small creatures -insects.

Guide B Often aware of facts but gain new perspectives (empahsis on interpretation).

Guide C Apprehension of experience.

Guide D "The process" - Trailists from cities with complexes and fears. Exposure and interpretation leads to healing and remolding to local environment, (via awareness and beauty and hence to appreciation and protection and need for conservation of the environment).

Guide E Trailist come with curiosity and expectations they are exposed to some natural conditions and learn dependance on one another.

Guide F Trailists remember the field officer, not the details, rather his dedication.

Trailists go on trail because of friends' advice and seeking something.

Guide G People go because they feel emotionally stirred by the experience 80% come via referals 20% by adverts.

2.2.4 Group Interaction

Guide A Depends on group but also on guide's input - via questions

Guide D Get traillists to do group chores,this leads to team spirit

Guide G A trail is a social experience with unknown people. Six to eight people maximum, so that they can sit around fire and the guide can cater for individuals.

Guide H The atmosphere between the people influences their feelings towards their enjoyment of their experience and their attitude towards the guide, locality and memories.

Guide N Give group something to look forward to.

Guide K A successful trail is a shared one within the Group and with no outsiders.

Guide L Have as mixed as possible - sex, race, age, knowledge & attitudes.

2.2.5.1 Nightwatch - solitude

Guide A Element of danger helps alertness of senses

Realisation of responsibility

Lunch time - free (if safe), for a few hours.

Guide B "Key" - nightwatch and solos, sunrise.

Nightwatch leads to sense of responsibility.

"Tummy time" lie on tummy and relate what is seen.

Guide D Sun rise - compare nature to city and be devil's advocate to need to preserve.

Nightwatch - alone, responsible, awareness, attuned.

Solitude - fear.

Guide E Alone - others sleep and hence not conscious of watchers actions.

Solitude - contemplation try to sit still, like an animal if watched - still, alert.

Nightwatch - useful as cut off for bedtime (night watch more valuable than discussion).

Guide F Fear of being alone.

Guide G Responsibility for others.

Alone, thinking.

Guide I Sense of responsibility, sensitivity and useful as cut off point for bed.

Guide K Have period of reflection.

Nightwatch helps to identify with ones past, this is a catalyst.

Read Chief Seattle's letter at bed time.

Guide L Silence is a very important factor - talk distracts - nightwatch is enforced silence.

Before bed read from appropriate book - helps actuate thoughts.

2.2.5.2 Camp fire

Guide A Cooking around the fire aids group participation and conversation.

Guide C Atavision - sitting around fire , cooking.

Guide G "The poor man's psychiatrist" - it is symbolic.

Guide H - review things seen

- spiritual aspect
- conversation to be about conservation (during the day talk about ecology).

Guide I Open camp fires to cook own food.

Guide N Must be present as one of the elements of the trail.

Guide L This is important since it is an archetype.

2.2.6 Knowledge

Guide A Orienteering - something new and not anticipated.

Guide B Of geology, theme for the day, Biomass pyramid - trophic levels, web of life.

Guide D Teach cycles, orienteering via signs of the veld. Not too much.

Guide E Scientific knowledge not required rather interpretations of environment and man's place in it - shapes, colours, mood.

Guide F Don't try and impart lots of facts.

Guide G Don't overstress the educational aspect.

Lower importance is knowledge of birds etc., higher is knowledge of human systems, the business of survival and other poeple's perceptions (those who live in the area).

Guide H Teach for the moment - not detailed prepared talk but respond to local environmental factors.

Emphasis depends on local environment.

Be realistic and relevant not academic.

Guide I For children use worksheets, games.

Guide N Don't make trip too educational.

Guide P Don't try and get too much across, don't give all information at same time let trailists draw it out of guide. Ask questions to stimulate interest/discussions.

Guide K Get trailist to share their knowledge.

2.2.7 Hiking and activities

Guide A Sighting animals close by is a thrill, brings people closer to environment, enjoy it and so want to preserve it.

Orienteering for additional experience/knowledge.

Guide B No excessive walking.

Water discipline.

Food discipline but not for two day trails or first timers.

Key Sighting of game or something unusual.

Physical stress and elation of success.

Orienteering (responsibility).

Guide C Distance hiked should be :-
pleasant for two people, too far for two, too short for two!

Sense of physical fatigue - tiredness, hunger - earning the experience.

Guide E No talking gives time for consciouness of own identity and appeals to their sensitivity and appreciate landscape in new way.

Expereince of being lost - stop, recall, orientate, seek native sign posts.

Guide G Own nobility (independance of cars) self reliance.

Walk as soon as possible to drop urban mantle.

Not too physical but have fear or nervousness where possible.

Guide H Entrinsic thrill near big game, no barriers, rare expereince and so attracts people.

Degree of exertion is relative to personal fitness, exertion can detract from sensitivity to other expereinces.

Physical exertion (to reach and peak) is acceptable - achieve something - but not on a continual basis.

Hiking does not require a lot of equipment vis-a-vis other sports.

Guide I For children organise "Rest" periods during which worksheets used to recall what has been learnt and learn new points.

Silence on trail to aid what may be seen.

Guide N Activities depend on leader. Create awareness by asking trailists to look out for - some activity.

Guide J Emphasis is on recreation, educational aspect is informal.

Guide K Silence while hiking - talk results in divergence of interests.

Do observation exercise - walk 50 paces and record/relate what you have seen.

Stop within 50 paces of camp - show miracles of nature, don't repeat T.V. stories.

Guide L Not too structured.

Silence is a very important factor (but difficult to control)

Experience must be as spontaneous as possible.

Physical exertion is good but don't overdo it - feed biltong, walk, limit water, discuss water.

Guide M A little physical stress is necessary - as if they need to prove themselves.

2.2.8 Physical environment

Guide A It should feel remote - walk the last 30 min of the journey

One must feel dependant on it - hence use some local resources (firewood)

Take only basics and carry all of it.

Guide B Feeling of isolation - combi not parked in camp and don't use it to store things.

Guide C Carry all requirements to site : less dependant on society more independant and isolated.

Create feeling of first person in the area - must be large enough to feel disorientated - isolated - remote.

Degree of Wilderness depends on prior experience of trailists.

Guide D Be opposite of what trailists know, have beauty, danger.

Guide E Maintain primitive camp - avoid frills.

Guide F Keep camp and facilities as basic as possible.

Guide G In Western Cape increase level of wilderness to compensate for lack of game, fire, etc.,

Guide H The mountains can teach you everything

It may take longer to unwind if one is too comfortable (also weather).

Guide I Simple campsite, sleep on groundsheets (in tents).

Should be remote, natural and have areas of excitement.

Guide N Need attraction other than environment to get people interested and then shift it to the environment. Attraction must be exciting.

Natural elements - beauty, contrasts, enjoyable, fun, nice bed and braai, enough sleep, well equipped.

Guide P The venue must be stimulating to the guides.

Guide L Restrict facilities to absolute basics - i.e. sleep on ground not stretcher, sit on log not camp stool.

Must walk from vehicle even if only 50 yds.

APPENDIX III

This Appendix contains details of the use of Conjoint measurement for concept evaluation. The work recorded here is a copy of the project done by A Shall in fulfilment of a B.Sc. Honours degree in Operations Research, in the department of Mathematical Statistics at the University of Cape Town.

Shall's work has been partially based on a Technical Report produced by Geoffrey Peter Blake for the Graduate School of Business at the University of Cape Town (Blake 1982). Readers seeking additional information on the advantages and disadvantages of the technique of Conjoint Analysis are referred to Blake's work.

Chapter 5, Appendix B and Apendix E of Shall's project have been omitted from this Appendix. Chapter 5 contains the interpretation of results. The results used were ten ficticious responses. The interpretation used is similar to that adopted in Chapter 3 of this research. Appendix B is a copy of the Questionnaires used in this research and are included as Appendix IV and Appendix V in this research. Appendix E is a copy of the computor printout of the analysis of the ficticious responses. A similar printout is shown for the guides in Appendix VI.

Where a comment has been made in Shall's work by this researcher it has been added to the original in brackets and marked - Ed.

CONJOINT MEASUREMENT

FOR

CONCEPT EVALUATION

BY

ADRIENNE SHALL

UNIVERSITY OF CAPE TOWN

DEPARTMENT OF MATHEMATICAL STATISTICS

SEPTEMBER 1984

TERMS OF REFERENCE

This project
has been done in fulfilment of a
B.Sc. Honours degree
in
Operations Research.

It was done in conjunction
with the
Department of Environmental Studies
in order to assess
the important attributes
of a
Wilderness trail.

CONTENTS

SYNOPSIS

Conjoint measurement, a new procedure for concept evaluation, was introduced in order to evaluate the important attributes of a wilderness trail.

A general overview of conjoint measurement was given, and also the specific experimental design used in determining the correct design for the analysis.

A comprehensive User Manual for the program MONANOVA has been prepared and is included in APPENDIX C. This is the program used to evaluate conjoint measurement.

The theory of conjoint measurement is discussed in detail and is related to the MONANOVA output.

Since the full data set was not available at the time of submission, the results of only ten respondents have been analysed.

CHAPTER 1

1.0 INTRODUCTION

This project discusses the use of conjoint measurement in the evaluation of concepts and perceptions regarding a wilderness trail. Conjoint measurement is a powerful descriptive technique for analysing preference and perceptions data. It is used to measure how people make trade-offs among different attributes that describe a given object.

The project was done in conjunction with the Department of Environmental Studies. The objective of the project was to identify the most important attributes for the success of a wilderness trail as seen from a guide's point of view and a trailist's point of view. The results obtained from both groups are then to be compared and attain whether they are correlated at all. The requirement is to see whether the guides on wilderness trails are successful in giving correct information to the participants so as to increase their awareness of interdependence with the environment. (This is not correct, the objective was to see if there is a difference in percention between the guides and the trailists. - Ed.)

The sample of guides chosen was made up of:

(1) Guides currently with the "Wilderness Leadership School" in the Eastern Cape. (Throughout South Africa - Ed.)

(2) Ex-guides from the "Wilderness Leadership School".

(3) Other people involved in guided trails.

The sample of trailists was chosen from adults who have been on at least one guided trail. (Actually current members of the Wilderness Leadership School - Ed.)

The first step was to identify the important attributes of a wilderness trail. This was done by personal interviews with the guides, ascertaining their impressions on important attributes. There were approximately 18 interviews. From the interviews a list of attributes was drawn up and sent back to the guides for verification.

The list of attributes was narrowed down to four specific attributes, two of which having 2 levels and two having 3 levels. These were then incorporated into a questionnaire using the principles of experimental design discussed in Chapter 3. The questionnaire was in the form of scenarios. Each scenario described a wilderness trail using one level of each attribute, as can be seen in FIGURE 1.1.

The group, led by a guide who
related well with all of you,
built up a good team spirit
and you learnt many new facts
as you walked through the
isolated bush.

FIGURE 1.1

The questionnaires were then sent to both the guides and the trailists, who were asked to rank the different scenarios from most to least preferred.

The replies were processed by the conjoint measurement program MONANOVA. Chapter 5 contains the results of these replies.

Unfortunately, the full data set was not available at the time of submission of the project. Thus the replies of only ten (imaginery - Ed.) trailists were analysed. The remaining trailists and the guides could be analysed in the same manner. The results of both groups could then be compared to achieve the objective.

CHAPTER 2

2.0 OVERVIEW OF CONJOINT MEASUREMENT

The history of conjoint measurement is brief. The first paper dealing with the formal nature of the subject appeared as recently as 1964, although various scholars from statistics and mathematical psychology provided the roots for these new developments. The first paper was written by Luce and Tukey[1]. This was followed by a paper written in the same year by David M. Krantz [2]. Following this groundwork many more papers were published. Some of these are listed in the Bibliography.

2.1 The Conjoint Measurement Technique

Conjoint measurement is a descriptive technique that can aid a researcher in discovering how people make choices among multiattribute alternatives. It is a technique for measuring a respondent's part-worths for each of the attributes that together define his or her preference for a particular object. Part-worths are the effects of the independent variables. They measure how the respondent makes trade-offs among the attributes. They model respondent preferences among multiattribute variables. [3]

Conjoint measurement measures the joint effect of two or more independent variables. These variables might be unmeasurable if taken one at a time. This measurement is done on the ordering of a dependent variable (overall liking) [4, 5]. For example, one's preference for a clothing store may depend on the joint influence of such variables as price, range of clothes, service and returns. Suppose each attribute is considered at a number of levels. A set of multiattribute alternatives will contain each attribute at one of its levels as seen in TABLE 2.1.

TABLE 2.1

PRICE	RANGE	SERVICE	RETURNS
discount	narrow	self-service	none
average	medium	personal assistance	liberal
high	wide	personal assistance	liberal

If the consumer then ranks these alternatives in order of preferences, conjoint measurement can calculate a numerical part-worth that the consumer has for each level of each attribute.

2.2 The Main Components of Conjoint Measurement.

The two main components of conjoint measurement are:-

(1) A technique of data collection requiring a respondent to consider 'trade-offs' among desirable alternatives.

(2) A computational method which derives 'part-worths' accounting as nearly as possible for each respondent's choice behaviour.

Conjoint measurement requires a basic assumption or 'measurement model', regarding the ways in which attributes of objects are related. From the standpoint of multiattribute decision making, the additive composition model appears most relevant. This

additive model is analagous to the absence of interaction in the analysis of variance, involving two (or more) attributes in a completely crossed design.

The additive conjoint model entails the following assumptions:-

(i) The data matrix contains elements that can be at least weakly ordered (may contain ties).

(ii) Each derived cell value represents an additive combination of separate (real valued) functions of the row and column effects.

(iii) Each numerical cell value, in the derived solution, comes as close as possible to maintaining the rank order of the input data.

Thus the additive conjoint model is a monotone analogue of main effects analysis of variance.

Suppose, for example, that there are three attributes being considered. Each attribute has three levels. The total number of all possible attribute combinations is 3 x 3 x 3 = 27. This set is called a full factorial design. If a respondent is asked to rank all 27 alternatives, then not only the individual (or main) effects of each attribute could be measured, but also all two-way and three-way interactions between attributes. If four attributes are being measured, each at three levels, a total of 3 x 3 x 3 x 3 = 81 ranks would be required for a full factorial design. Such a task would become rapidly onerous for the respondent.

Assuming an additive preference model, a fractional factorial design can be used. This design measures all main effects while neglecting all interactions. Such designs greatly reduce the number of ranks (evaluations) required from respondents [6]. Fractional designs are discussed in further detail in CHAPTER 3.3.

2.3 Stimulus Presentation and Evaluation

The stimulus presented to the respondent is in the form of a set of combinations of the product attributes. These can be presented as verbal descriptions, scenarios or product prototypes. The respondents are asked to examine each set of combinations and rank or rate them on the selected dependent variable. Although conjoint measurement requires only rank-order data, it produces measurements which are stronger than rank orders, that is, interval scaled output.

Since each stimulus is a combination of attributes, the ranking or rating of combinations reflects the respondents' trade-offs among conflicting attributes. These rankings serve as the input to the conjoint measurement algorithm. The typical output consists of the determination of the part-worths for the various discrete levels of the attributes that are used to generate the respondents' preference structure. It consists of the simultaneous measurement of the joint effect and separate independent variable contributions to that joint effect, all at the level of interval scales with common unit.

Conjoint measurement starts with the respondents' overall or global judgements about a set of complex alternatives. Then, given some type of decomposition rule, it 'decomposes' the overall evaluation of the multiattribute alternatives into specific part-worths for each attribute. Being able to separate overall judgements into psychological components, in this manner, can provide valuable information about the relative importance of the various attributes. It can also provide information about the value of various levels of a single attribute [7]. The researcher can then determine what really is important to the respondents and what they could easily do without. Thus conjoint measurement is both descriptive and prescriptive.

Because different people often have substantially different preferences, conjoint measurement is usually carried out at the individual level. The form of the preference model (composition rule) is generally assumed to be the same for all individuals. The parameters of the model, that is, the part-worths, however, are permitted to vary across the sample of individuals from the relevant target population. Thus the researcher may obtain average attribute part-worths of any desired market segment contained in the sample.

Conjoint measurement is used almost exclusively in marketing research, though it does have broader uses. The "Wilderness Trail" experiment is an example of this.

2.4 Attributes and Levels of Wilderness Trail

In the "Wilderness Trail" experiment, there are four attributes in question.

The first attribute is the guide's personality. This attribute has two levels. Level 1 is that the guide has a sensitive personality towards the trailists' needs and relates well to people. Level 2 is that the guide has a neutral personality and is not very sensitive.

The second attribute is the type of environment in which the trail takes place. The first level of this attribute is an isolated environment. On this level, the trail will take place in a remote natural area without any sign of human impact. The second level is an environment which is not totally remote. Some human impact can be felt, for example, one may hear the sounds of cars on the freeway or the sound of a train passing by.

The third attribute concerns awareness. This attribute has three levels. The first is where the participant gains intellectual awareness and physically acts due to this awareness, that is, conative (affective - Ed.). The second level is where the respondent gains intellectual awareness only, that is, cognitive. The third level is where there is no change in awareness.

The fourth attribute is group interaction. There are three levels for this attribute. The first level is good group interaction. This means that all the participants in the group relate well even if amongst non peer groups and strangers. The second level is little group interaction where most of the participants get on well together, but not all of them. Finally, the third level of this attribute is no group interaction. This means that nobody in the group gets on particularly well with anybody.

The different attributes and levels are summarized in TABLE 2.4.

TABLE 2.4

ATTRIBUTE	LEVEL 1	LEVEL 2	LEVEL 3
GUIDE'S PERSONALITY	SENSITIVE	NEUTRAL	-
ENVIRONMENT	ISOLATED	HUMAN IMPACT	-
AWARENESS	AFFECTIVE	COGNITIVE	NO CHANGE
GROUP INTERACTION	GOOD	LITTLE	NONE

CHAPTER 3

3.0 EXPERIMENTAL DESIGN

Particular emphasis must be paid to the design of the research to be performed, since this is critical to the achievement of meaningful results. The first stage in conjoint analysis is identifying those attributes which are most frequently regarded as relevant to respondents in forming their preferences. A more difficult and often subjective task is to reduce the number of attributes to a manageable size so that the estimation procedures are reliable while at the same time accounting for respondent preferences sufficiently well. Typically, there should not be more than 4 (or at most 5) attributes, each measured at 5 or less intervals.

The following outlines the steps involved in the design of the research:

- Selection of a model of preference
- Data collection method
- Stimulus set construction for the full-profile method
- Stimulus presentation
- Measurement Scale for the dependent variable
- Estimation method.

3.1 Selection of a Model of Preference

The model chosen for this analysis is the 'Part-worth Function Model'. This is a simple additive composition model stating that the part-worth for a given multiattribute offering is the sum of the part-worths for each of the attribute levels. It assumes that the various attribute levels have no interaction effects on respondents' part-worths. This type of model, therefore, is one which tests for main effects only. The part-worth function is represented as a piecewise linear curve. Interpolation is used to calculate the part-worth for an attribute level within the range of estimation. This will be discussed in CHAPTER 4. Conjoint measurement models are decomposition models in the sense that part-worths for individual attribute levels are estimated from data on total object evaluations.

Alternative methods for conjoint measurement are the vector model and the ideal point model. The part-worth function model was chosen above the other two for the following reasons:-

(i) It can consider either continuous or discrete attribute types.

(ii) The results are unidimensional and hence very easy to interpret.

The alternative models, however, require one dimension for each attribute of the multiattribute alternatives. The vector model also has the requirement for continuous type attributes.

3.2 Data Collection Method

For the collection of data a full-profile approach was used. This utilizes the full set of attributes in each alternative. The major limitation of this approach is that evaluation

problems of realistic complexity have a way of quickly generating a large number of multiattribute profiles.

The problem results in the possibility of information overload. The respondent may be tempted to simplify the experimental task. This is done by either ignoring variations in the less important attributes or by simplifying the attribute levels themselves.

Thus the full-profile approach is implemented by various kinds of fractional factorial designs. A fractional factorial design is a carefully chosen subset of all possible attribute combinations. Because only a subset is used, respondents are more likely to be able to complete the task of ranking the combinations. In other words, respondents are required to make fewer judgements.

The full-profile approach in the "Wilderness Trail" experiment would mean that respondents would have to rank 2 x 2 x 3 x 3 = 36 combinations. Using a fractional factorial design, the respondents have only 9 combinations to rank.

3.3 Stimulus Set Construction for the Full-Profile Model

For fractional factorial designs the ranges of the attribute values play an important role. They must be made larger than reality, but not so large as to be unbelievable. The reason for this is that the extreme strategy has the disadvantage of loss of accuracy in estimation, while the alternative extreme strategy of using values much larger than reality has the disadvantage of decreasing the validity of the respondents' preference judgements.

Therefore, in defining a number of levels for each of the attributes over the range of attribution, it must be ensured

that they are far enough apart to be perceived as realistically distinct by the respondent.

In using fractional factorial designs, one trades off the measurement of all possible interaction effects. This is done in order to obtain a smaller number of stimuli in which all main effects can be estimated. By using this class of designs, it is assumed that all higher order interactions are negligible.

The fractional factorial design chosen for this experiment is the orthogonal design. These designs are highly fractionated designs that achieve measurement of all main effects while neglecting all interactions. The test combinations are selected so that the independent contribution of all the attributes are balanced.

In the case of orthogonal arrays, there is a necessary and sufficient condition for the main effects of any two attributes to be uncorrelated. This is that each level of one attribute must occur with each level of another attribute with proportional frequencies.

Symmetric orthogonal arrays are arrays in which the attributes all have the same number of levels. In asymmetric orthogonal arrays, the attributes may have different numbers of levels. Asymmetric arrays are usually developed by collapsing levels of certain symmetric arrays, while observing the condition of proportionality described above.

Both the full-profile and the orthogonal array used in the "Wilderness Trail" experiment can be found in APPENDIX A.

3.4 Stimulus Presentation

The four attributes, two with two levels and two with three levels, were presented to the respondents in the form of scenarios. Each scenario was printed on a separate card. The scenarios, representing different wilderness trails, consisted of a combination of one level from each of the attributes. An orthogonal design of 2 x 2 x 3 x 3 was developed, resulting in 9 different scenarios.

The respondents were asked to first rate the scenarios on a scale from 1 to 7 with 1 being the most preferred and 7 being the least preffered [8]. After having completed the ratings, the respondents were asked to sort the cards into one of three categories:-

(i) A generally desirable alternative.

(ii) A generally undesirable alternative.

(iii) Those alternatives which might or might not be desirable.

Following this sorting into the three categories, the respondents were asked to rank the cards within each pile, from most preferred to least preferred. The ranking should result in the most preferred scenario having the highest rank of 9 down to the least preferred scenario having the lowest rank of 1. This procedure results in a strict rank order of all cards for each respondent. (The actual procedure adopted was altered & described in Chap. 2 of the main Report - Ed.)

The scenarios were incorporated into a questionnaire which included several questions requiring facts about the age, gender and previous trail experience of each respondent. These questionnaires were administered by post.

A specimen questionnaire is included in APPENDIX B.

3.5 Measurement Scale for the Dependent Variable

The measurement scale for the dependent variable can be classified as nonmetric (paired comparisons, rank order) or metric (rating scales assuming approximately interval scale properties).

In this case the chosen scale is nonmetric using rank order. The respondent ranks the alternatives from most to least preferred. This method has the advantage over the rating scale approach in that the ranked data are more likely to be reliable. This is due to the fact that it is easier for a respondent to choose which combination is preferred as compared to expressing the magnitude of the preference.

There are two approaches to adopt with respect to ties in the input data. The primary approach to ties assumes that the respondent does not really mean strict equality, but simply did not take the time or trouble to differentiate between the alternatives. Ties are thus arbitrarily broken in such a way as to optimize goodness of fit. The secondary approach to ties assumes that the respondent does, in fact, judge the two dissimilarities to be equal, and this equality is maintained by the solution.

3.6 Estimation Method

There are two computer programs which analyse conjoint measurement. They are MONANOVA (Monotone Analysis of Variance) [9] and UNICON (Unidimensional Conjoint Measurement). The two programs produce quite different results from the same sets of input data. After a comparative evaluation the manual recommends that MONANOVA is the more reliable program [10]. For this reason MONANOVA is chosen for the analysis.

Using the MONANOVA package can lead to accurate recovery of each respondent's (and the average respondent's) part-worths

for the various levels of each factor concerned in a multi-attribute offering. MONANOVA can work equally well on either a rank order or a rating of the multiattribute alternatives.

Due to the manual [10] being unclear and not self-explanatory a more intelligible user's-manual has been written. This can be found in APPENDIX C.

MONANOVA analyses factorial experiments by searching over all monotone (ascending) transformations of the input data, picking the 'best' one. This means the monotone transformation which results in the greatest percentage of variance being accounted for by the main effects. The algorithm seeks to minimize the 'stress'. The stress can be thought of as the residual variance divided by the total variance. The algorithm uses an iterative numerical method of steepest descent (method of gradients). These concepts are discussed in further detail in the following CHAPTER.

This version of MONANOVA accommodates data from factorial experiments with up to four attributes, up to one hundred levels per attribute, and unlimited replication within cells. The total number of data values, however, is limited to five hundred. Any number of observations may be missing from the design.

CHAPTER 4

4.0 THEORY AND DISCUSSION OF CONJOINT MEASUREMENT

Conjoint measurement can be thought of as a technique for taking judgements (preference rankings) about objects. Each judgement is characterized by a set of attributes. It then converts that input information into information on the importance an individual assigns to each attribute and the trade-offs one would make among them.

To explain the process of conjoint measurement, consider the tests on the guides and trailists about the important attributes of wilderness trails. There are four attributes involved in the test. Two of the attributes have two levels and two have three levels.

4.1 The Measurement Procedure

Consider the rankings of one individual at a time denoted by y. The objective is to find a set of effects for the attributes, that is, for guide's personality, environment, awareness and group interaction, that can be used to explain the respondent's rank orderings.

For an example of the rank orderings for two respondents, see TABLES 4.1.1 and 4.1.2 which follow.

TABLE 4.1.1

RANK ORDERINGS OF RESPONDENT 1

PREFERENCE RANKING	TRAIL DESCRIPTION			
	GUIDE'S PERSONALITY	ENVIRONMENT	AWARENESS	GROUP INTERACTION
9	SENSITIVE	ISOLATED	AFFECTIVE	GOOD
8	SENSITIVE	ISOLATED	COGNITIVE	GOOD
7	SENSITIVE	ISOLATED	NO CHANGE	LITTLE
6	SENSITIVE	ISOLATED	NO CHANGE	NONE
5	SENSITIVE	HUMAN IMPACT	CONATIVE	LITTLE
4	SENSITIVE	HUMAN IMPACT	COGNITIVE	NONE
3	NEUTRAL	ISOLATED	COGNITIVE	LITTLE
2	NEUTRAL	HUMAN IMPACT	NO CHANGE	GOOD
1	NEUTRAL	ISOLATED	CONATIVE	NONE

TABLE 4.1.2

RANK ORDERINGS OF RESPONDENT 2

PREFERENCE RANKING	TRAIL DESCRIPTION			
	GUIDE'S PERSONALITY	ENVIRONMENT	AWARENESS	GROUP INTERACTION
9	SENSITIVE	ISOLATED	AFFECTIVE	GOOD
8	SENSITIVE	ISOLATED	COGNITIVE	GOOD
7	SENSITIVE	ISOLATED	NO CHANGE	NONE
6	SENSITIVE	ISOLATED	NO CHANGE	LITTLE
5	NEUTRAL	ISOLATED	COGNITIVE	LITTLE
4	SENSITIVE	HUMAN IMPACT	CONATIVE	LITTLE
3	SENSITIVE	HUMAN IMPACT	COGNITIVE	NONE
2	NEUTRAL	HUMAN IMPACT	NO CHANGE	GOOD
1	NEUTRAL	ISOLATED	CONATIVE	NONE

Conjoint measurement is used to find a value for the effect on an individual of each level of each attribute simultaneously.

Let

gp_i = the effect of the i^{th} level of guide's personality

en_j = the effect of the j^{th} level of environment

s_k = the effect of the k^{th} level of awareness

g_ℓ = the effect of the ℓ^{th} level of group interaction

Now consider a specific trail, marked by the i^{th} level of guide's personality, the j^{th} level of environment, the k^{th} level of awareness and the ℓ^{th} level of group interaction. By adding together the effects of each of these attributes for an individual under study, a score called $\hat{Z}$ is obtained.

$$\hat{Z} = gp_i + en_j + s_k + g_\ell$$

The $\hat{Z}$ values are required to be as close to, or explain, the original preference values in an ordinal sense. In other words, if y takes a larger value on one observation (trail) than another, then $\hat{Z}$ must be at least as great for the first trail as for the second.

In practice, it is often not possible to have the $\hat{Z}$ (predicted values) be additive combinations of effects and at the same time explain the y's in an ordinal sense. For that reason, residuals are introduced to measure lack of fit. It is assumed that there

are residuals (e) which can be added to the $\hat{Z}$ values to give Z values which are, in fact, explanations of the y's in an ordinal sense.

$$Z = \hat{Z} + e$$

In technical terms, the Z's are transformations of the y's satisfying the following condition. If one y is strictly larger than a second y it must correspond to a Z that is at least as large as the Z for the second y.

The $\hat{Z}$'s are found by addition of the appropriate effects. The Z and $\hat{Z}$ values are as close to one another as possible.

In measuring the relation between the Z's and the $\hat{Z}$'s a squared error criterion is used, making the sum of the squares of the residuals (e) as small as possible.

The job of conjoint measurement is to find Z's and additive effects which satisfy these conditions. This definition involves two types of fit. In considering how well the y's and the Z's fit, only an ordinal or ranking criterion is used, and in that sense a perfect fit is insisted upon. In considering the fit between the Z's and $\hat{Z}$'s a squared error criterion is used. This squared error criterion is to be minimized [11].

4.2 Fit in Conjoint Measurement

Consider now the relation among y's, Z's and $\hat{Z}$'s in general. In particular, consider the relationship between the $\hat{Z}$'s and the Z's. Suppose in some hypothetical problem a possible set of effects has been identified to use in explaining (in an ordinal sense) the values of a dependent variable y. The values of y and of the $\hat{Z}$'s are shown in TABLE 4.2 which follows.

TABLE 4.2

y	$\hat{Z}$
1	1.0
2	1.9
3	3.1
4	2.5
5	5.0
6	6.0
7	7.2
8	8.1
9	8.9
10	10.0
11	11.5
12	11.4
13	11.0
14	14.1
15	15.0
.	.
.	.
.	.

To find the values for the residuals in the equation

$$Z = \hat{Z} + e$$

the values for the Z's which are as close as possible to the $\hat{Z}$'s must be found. At the same time, however, the Z's must have the desired ordinal relationship to the y's. For this purpose it is useful to construct a graph plotting the y's against the $\hat{Z}$'s.

Such a graph is given in FIGURE 4.2.1. The y's are shown along the horizontal axis and the $\hat{Z}$'s along the vertical.

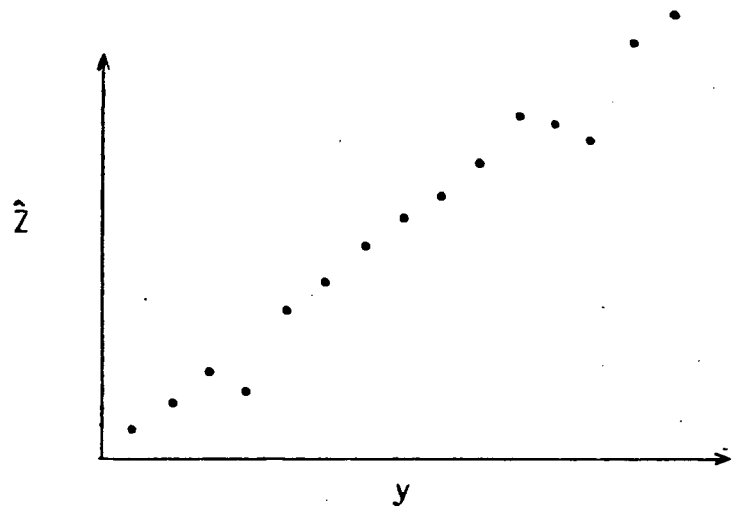


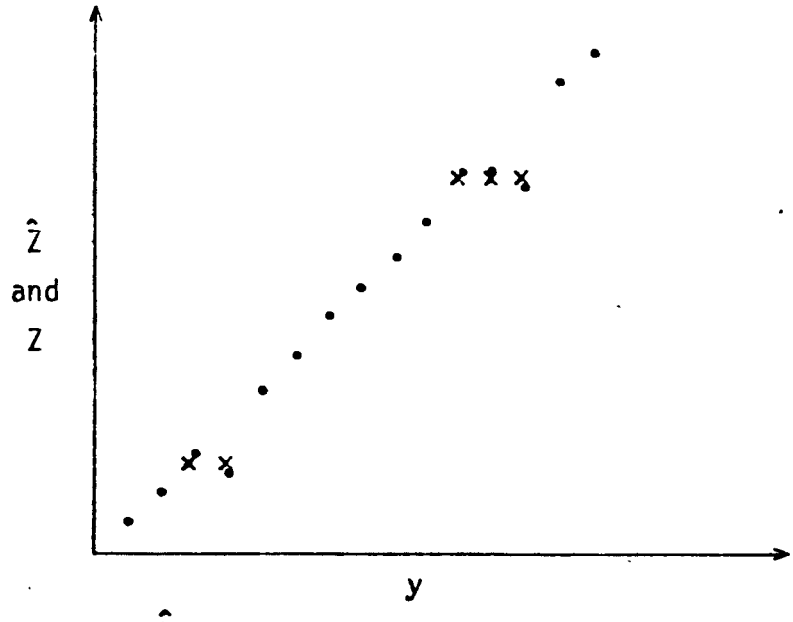
FIGURE 4.2.1

It is required to construct a set of Z's which are as close as possible to the $\hat{Z}$'s and yet which agree in an ordinal sense with the y's. For the values of Z at y values of 1 and 2 there is no problem. It is possible to let $\hat{Z} = Z$ and satisfy the ordering conditions. For the Z's corresponding to y's of 3 and 4 there is some trouble.

The $\hat{Z}$ for $y = 3$ is larger than the $\hat{Z}$ for $y = 4$. The ordering condition requires that the order of the corresponding Z's not be different from that of the y's. At the same time, the Z's are required to be as close as possible to the $\hat{Z}$'s. The best solution turns out to be a compromise, with $Z = 2.8$ for $y = 3$ and for $y = 4$. Notice that this choice does in fact satisfy the requirement for ordinal fit between the y's and Z's.

For y values of 5, 6, 7, 8, 9 and 10 the $\hat{Z}$'s are in increasing order. The Z's can therefore be chosen equal to the corresponding $\hat{Z}$'s and still fulfil the ordinal fit with y. At $y = 11$ there is a problem again. The $\hat{Z}$ at 11 is larger than the value at 12 and that at 13. To make the Z's fit the y's and yet come as close as possible to the $\hat{Z}$'s the best choice is a compromise among the three $\hat{Z}$ values. Take $Z = 11.3$ for all three values of y. For $y = 14$ and 15, $Z = \hat{Z}$ can be taken without violating the ordering requirements.

FIGURE 4.2.2 shows the Z values on the graph. The Z and $\hat{Z}$ values coincide at 10 values of y and differ at 5 values of y.



Key: • = $y.\hat{Z}$
x = $y.Z$

FIGURE 4.2.2

The residuals between the Z's and the $\hat{Z}$'s can now be found. In order of increasing value of y, the residuals are 0, 0, -0.3, 0.3, 0. 0. 0, 0, 0, 0, -0.2, -0.1, 0.3, 0 and 0 respectively.

This example shows an important property of conjoint measurement. When values of y were found, for which the order of the y's and the order of the Z's did not match, flat or level ranges were introduced in the plot of Z. This was done in order to minimize the sum of the squared errors between the Z's and the $\hat{Z}$'s.

Notice that in such flat areas the $\hat{Z}$'s do not explain the relative y values to which they correspond. In a more extreme case, long flats in the graph of Z against y can result in the $\hat{Z}$'s giving very little information about the y's. The ordering of the $\hat{Z}$'s will imply little about the ordering of the y's.

Such flat areas on the graphs are called degeneracy. It should be clear that degeneracy means that the additive model producing the $\hat{Z}$'s does not explain the y's very closely in any way but the loose ordinal sense.

To understand why these problems of degeneracy might arise, it is important to recall that there are really two steps in conjoint measurement. There is the fit between the additive estimates $\hat{Z}$ and the values of Z, and there is the fit between the Z's and the dependent variable y.

What the above discussion shows is that the $\hat{Z}$'s may fit the Z's well (in the least squares sense) and the Z's may fit the y's well (in the ordinal sense) and yet the $\hat{Z}$'s do not give much information about the y's. In some cases, the $\hat{Z}$'s do in fact tell a great deal about the y's, but in other cases they do not.

4.3 Discussion of Output of Conjoint Measurement

The output from conjoint measurement takes several forms. First, the graph of the y, Z and $\hat{Z}$ values is provided. In addition, the output provides the effects that can be used to find the values of the $\hat{Z}$'s. To find an estimate of the ranking of an object (trail) with some particular configuration of attributes, the appropriate part-worths are added to find a value for $\hat{Z}$. If the $\hat{Z}$ values are close to the Z's, then the $\hat{Z}$ values can be used in an ordinal sense to compare preferences for different objects A higher $\hat{Z}$ corresponds to a most liked trail for the individual under study.

In fact, the part-worths in conjoint measurement tell a good deal about the individual's preferences. The $\hat{Z}$ scores are found by simple addition. Implicit in them is a concept of compensatory value. Changes of a specified magnitude produced by changing the level of one attribute are considered entirely equivalent to changes of the same magnitude produced by changing the level of another attribute. The following example clarifies this statement.

Suppose that in the example, umbrellas are studied. The part-worths for four possible price levels are found to be 0, 3, 4 and 4.8. Suppose that the part-worths for five possible levels of quality are 0, 2, 2.5, 3.3 and 3.7. The $\hat{Z}$ value for an umbrella at the third level of price and the fourth level of quality is thus

$$\hat{Z} = 4.0 + 3.3 = 7.3$$

For the fourth level of price and the third level of quality the corresponding calculation is

$$\hat{Z} = 4.8 + 2.5 = 7.3$$

This calculation shows that for the individual being considered, the change in price from level three to level four is just balanced by the change in quality from level four to level three. Similarly, a change in price from level three to level two would more than offset a change in quality from level three to level four for that individual. Thus, the part-worths provide information about the trade-offs which the individual would make among attributes.

In addition, the ranges of values taken by the effects for different attributes can be usefully compared. In the umbrella example, the range for price is 4.8 while that for quality is 3.7. Therefore, for the set of attribute levels considered, price is slightly more important in that the maximum relevant change in price can produce a larger change in the value of $\hat{Z}$.

To find the relative importance of one attribute with respect to the rest, the range of that specific attribute is divided by the total sum of ranges of all the attributes, that is

$$\text{Relative Importance of Attribute A} = \frac{\text{RANGE A}}{\sum \text{RANGES}}$$

In the above example, if price and quality are the only two attributes, then the relative importance of price is

$$\frac{4.8}{8.5} = 0.5647 = 56.47\%$$

and that of quality is

$$\frac{3.7}{8.5} = 0.4353 = 43.53\%$$

Thus it is noticable that price is more important than quality.

A final important type of output from conjoint measurement describes the fit between the Z's and the $\hat{Z}$'s. Recall that a squared-error criterion is used in measuring that fit. The conjoint summary measures include a measure of this error, called the stress. It turns out that the most obvious measure, the sum of the squared residuals in the equation $(Z = \hat{Z} + e)$ is not the best measure. Instead, what is really required is to know how large the residuals are in relation to the size of the $\hat{Z}$'s.

Therefore, stress is defined in terms of the sum of the squared residuals divided by the sum of the squared differences between the $\hat{Z}$ values and the mean $\hat{Z}$ value. The stress is the square root of this ratio:-

$$\text{STRESS} = \sqrt{\frac{\Sigma(Z-\hat{Z})^2}{\Sigma(\hat{Z}-M(\hat{Z}))^2}}$$

Equivalently, the stress is the square root of the ratio of the variance of the residuals divided by the variance of the $\hat{Z}$'s.

All the results discussed so far have considered one individual at a time. It is fairly common in applications of conjoint measurement to combine data for several individuals. This will be shown in CHAPTER 5 where results of sample data are shown.

CHAPTER 6

6.0 VALIDATION AND CONCLUSION

6.1 Reliability and Validity Tests

The following tests of reliability and validity of conjoint measurement could be performed, after completing the original analysis.

6.1.1 Tests of Reliability

To obtain the reliability of a respondent's input judgements, the researcher can ask for preference judgements on a second set of stimulus cards. This second set contains a subset of the original set of cards. This needs to be done only for a subsample of the respondents after the respondent has completed some intervening task, such as supplying a set of demographic data. The repeated evaluations can be used in determining the test-retest reliability of the input preference judgements. If a respondent shifts his or her weighting substantially when relevant attributes are added to or deleted from the stimulus profiles, the external validity of any desired part-worths is very limited.

To test the reliability at the level of estimated parameters, the researcher can ask a subset of respondents to later repeat the conjoint measurement task on a second set of stimuli. This second set would have the same attributes at the same levels as in the first set, but duplication of stimuli from the first set would be avoided by using a different fractional factorial design.

This second method of reliability testing is more vigorous than the first one, in that it takes into account four sources of error:

(i) inaccuracies by the respondent

(ii) variability in the set of constructed stimuli

(iii) errors in the estimation procedure

(iv) lack of stability (variations from one time period to another).

By contrast, the first method focuses only on the first source of error.

6.1.2 Tests of Validity

The two sets of data obtained from the reliability tests described above, can be used to test the predictive ability of the model and its internal validity. The parameters of the preference function estimated from the first set of preference data can be used to predict the preferences for the second set. The predicted preferences can be correlated to the actual to obtain a measure of cross-validity. The procedure can then be reversed by predicting from set two to set one, thus completing a double cross-validation.

External validity of the model (and, again, its predictive ability) can be tested by comparing predictions against a respondent's actual behaviour with respect to real stimuli.

There are some additional consistency checks to test whether the estimate of part-worths make sense. First, the magnitudes of the part-worths for each attribute (relative to other attributes) should agree with a priori expectation. Second, the parameters derived for different subpopulations (for example, male and female) should differ in the direction that would be expected from prior theory or reasoning.

6.2 Prospects and Limitations of Conjoint Measurement

Conjoint measurement has been largely restricted to the analysis of preference data. Only recently has it been extended to the modelling of similarities or perceptions data.

One of the problems in conjoint measurement is that of data collection relevance. The environmental conditions and the response format may be artificial and contrived. Subjects may not react as they would in the real situation.

No statistical inferential tests currently exist for conjoint measurement [12]. This drawback hampers appropriate model specification, particularly where interaction terms are involved. As it stands now, changes in goodness of fit as related to additional parameters can be considered only from a descriptive standpoint, for example, rank correlations between original data and values predicted by the model.

Emphasis is made concerning the stability of the part-worths derived via conjoint measurement over different embedding contexts. If an individual shifts his or her weighting substantially when relevant factors are added to or deleted from the stimulus profiles, the external validity of any derived part-worth is very limited. Malhotra [13] tested the structural reliability and stability of nonmetric conjoint measurement under conditions of severe structural perturbation and substantial variation in the number of stimulus profiles. He concludes that conjoint measurement is a fairly robust procedure for treating an individual's preferences.

Researchers should exercise caution when performing conjoint measurement on data from an averaging of several individual responses. The part-worths generated might draw erroneous conclusions about how the 'average' respondent makes trade-offs in a multiattribute decision.

6.3 Conclusions

Like any new set of techniques, conjoint measurement's potential is difficult to evaluate at the present stage of development and application.

It does, however, have a number of advantages:

(i) The procedure is flexible and can be modified to many specific needs.

(ii) It attempts to include most of the 'traditional' measures of concept evaluation, thus assuring the derived continuity of, and comparison with, previous research.

(iii) The concepts are evaluated in a realistic setting.

(iv) The procedure integrates a wide variety of analytical techniques into a coherent and organized research design.

(v) One can quantify the importance of each of the components which make up the concept. This provides better insight into the evaluation of results of the concept testing procedure and specific guidelines for further development.

Conjoint measurement seems to have great potential in modelling human judgement in general.

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APPENDIX A

THE FULL PROFILE AND ORTHOGONAL ARRAY

This is the full profile for 4 attributes, two at 2 levels and two at 3 levels. It contains 2 x 2 x 3 x 3 = 36 combinations.

A	B	C	D
1	1	1	1
1	1	1	2
1	1	1	3
1	1	2	1
1	1	2	2
1	1	2	3
1	1	3	1
1	1	3	2
1	1	3	3
1	2	1	1
1	2	1	2
1	2	1	3
1	2	2	1
1	2	2	2
1	2	2	3
1	2	3	1
1	2	3	2
1	2	3	3
2	1	1	1
2	1	1	2
2	1	1	3
2	1	2	1
2	1	2	2
2	1	2	3
2	1	3	1
2	1	3	2
2	1	3	3
2	2	1	1
2	2	1	2
2	2	1	3
2	2	2	1
2	2	2	2
2	2	2	3
2	2	3	1
2	2	3	2
2	2	3	3

A, B, C, D are the 4 different attributes.

1, 2, 3 are the differing levels of the attributes.

The orthogonal array of the 2 x 2 x 3 x 3 = 36 combinations contains only 9 combinations.

A	B	C	D
1	1	1	1
1	2	2	3
1	1	3	2
2	1	2	2
2	2	3	1
2	1	1	3
1	1	3	3
1	2	1	2
1	1	2	1

APPENDIX C

USER'S MANUAL FOR MONANOVA

(i) INTRODUCTION

MONANOVA is part of the Multidimensional Scaling Program Package of Bell Laboratories. It was written by J.B. Kruskal and Frank Carmone.

MONANOVA (Monotone Analysis of Variance) is the conjoint measurement program commonly used to calculate part-worths for the attribute levels for a multiattribute object, given only the preference rank ordering or rating of a carefully chosen set of multiattribute alternatives. This set of alternatives is chosen according to an orthogonal design, which greatly reduces the number of ranks (evaluations) required from each respondent while still enabling estimation of all main-effects. All two-way and higher order interactions are ignored, that is, the respondent's composition rule for evaluating his part-worth for each multi-attribute alternative is assumed to conform to a simple addition (main-effects only) model.

MONANOVA analyses factorial experiments by searching over all monotone (ascending) transformations of the input date, picking the "best" one. This means the monotone transformation which results in the greatest percentage of variance being accounted for by the main effect. The algorithm seeks to minimize the "stress" (which can be thought of as the residual variance divided by the total variance), and uses an iterative numerical method of steepest descent (method of gradients).

This version of MONANOVA accommodates data from factorial experiments with up to 4 attributes, up to 100 levels per attribute, and unlimited replication within cells. The total number of data values, however, is limited to 500. Any number of observations may be missing from the design. Thus it is possible to handle a Latin-square experiment, for example, by considering it in a standard manner as a three-way table with most entries missing.

(ii) DESCRIPTION OF DATA INPUT

There are two types of data input in the MONANOVA run. They are:

i) Alpha
ii) Numerical.

The numerical values are all integers.

There are also two types of cards used:

i) CONTROL CARDS :-

These cards explain what happens.
They are written in upper case.
All control cards are written in free format.

ii) DATA CARDS :-

These are the actual data values to put in such as format statements, parameter values and ranking values.
These cards are written in lower case.

The MONANOVA run is as follows:-

CARD No.	COLUMNS 1-72
1	TITLE
2	title for run
3	PRINT INPUT
4	CUTOFF = 0.0
5	* comment
6	DATA
7	a b c d e
8	format statement
9	data matrix
10	COMPUTE
11	STOP

CARD	EXPLANATION
1	This is an optional control card. It indicates that a title card for the run, specified by the user, will follow on the next line.
2	This card is a user specified title for the computer run. The title is printed where appropriate on the output of results.
3	An optional control card which states that the program should print the input data (for user specification).
4	This is a control card used if there are any missing data values. When using an orthogonal design there are always missing values for the combinations not ranked, for example, for a 3 x 3 x 3 orthogonal design only 9 out of 27 values are present. Values less than or equal to CUTOFF will be discarded. The default cut-off value is -1.23×10^{20}, which implies that the user must enter the CUTOFF = 0.0 statement when a fractional factorial design has been used.
5	Any card preceded by an asterisk (*) is printed but has no effect, that is, it is a comment inserted by the user for his own clarification of the runstream. All comment cards are written in free format.

CARD	EXPLANATION
6	The DATA card is a control card signifying that the parameters and actual values of a data deck will follow.
7	This is a data card specifying the parameters to be used. The format is I 3, which means that each integer is right justified in a field of 3. The first parameter value indicates the number of attributes used in the design. Then follows one parameter per attribute, specifying the number of levels for that attribute. The last parameter indicates the number of replications (that is, the number of respondents).
8	This card is the format card which gives the Fortran format for the data matrix which follows.
9	This card is the data matrix of ranked values given by the respondents. Their arrangement is rigidly specified. Data for each respondent is put into a single column. The length of the column depends on the number of attributes. For example, if there are 4 attributes each at 3 levels the length of the column would be $3 \times 3 \times 3 \times 3 = 81$, that is, 81 rows. The ranked values are inserted into the appropriate positions of the combinations they refer to. The missing values are entered as zeroes. Each successive respondent is stacked side by side as replications for the same run.
10, 11	These last two control cards, COMPUTE and STOP, must always follow the data matrix.

Certain other control cards may be inserted, if desired, after card 3. These include:-

CARD	DESCRIPTION
ITERATIONS = 50	Sets the maximum number of iterations to be performed (default is 50).
TIES PRIMARY	Default case. No restriction is placed by the regression on values which correspond to tied data values, that is, these fitted values need not be equal.
TIES SECONDARY	It is required that if two data values are tied, then their corresponding fitted regression values must be equal.
STRMIN = 0.01	Scaling is terminated if this stress minimum is reached.
STRATST = 0.999	Criteria for deciding if local or global minimum has been reached (for greater stringency use 0.9999; for less use 0.99).

Multiple runs can be executed at one time by repeating cards 1-10 (TITLE through COMPUTE), with a new set of data each time, and ending the whole runstream with a single STOP card.

For details of automatic runstream generation, the user is referred to APPENDIX D of the main project. These are the BASIC coding of programs CONJOINT1 and CONJOINT2.

(iii) A WORKED EXAMPLE AND DISCUSSION OF RESULTS

In this example there are three attributes each at three levels. The approach to ties is the secondary approach. There are 2 respondents in this example.

The runstream is as follows:-

```
TITLE
SAMPLE PROBLEM
PRINT INPUT
TIES SECONDARY
CUTOFF = 0.0
 * SAMPLE DATA
DATA
  3  3  3  3  2
(2 F2. 0)
  5  3
  0  0
  0  0
  0  0
  7  7
  0  0
  0  0
  0  0
  9  9
  0  0
  5  4
  0  0
  0  0
  0  0
  8  8
  5  3
```

```
 0  0
 0  0
 0  0
 0  0
 6  7
 1  1
 0  0
 0  0
 0  0
 5  5
 0  0
COMPUTE
STOP
```

Working on the prime computer at the Graduate School of Business the runstream is entered into a file. This program is run by executing the following statement -

MONANOVA filename

where filename is the name of the file in which the runstream has been entered.

The output of this MONANOVA runstream is as follows:-

```
TITLE
SAMPLE PROBLEM

PRINT INPUT

TIES SECONDARY

CUTOFF = 0.0

*SAMPLE DATA

DATA
 3  3  3  3  2
 (2F2.0)


COMPUTE
```

SECTION 1

SEQ. NO.	DATA	SUBSCRIPTS		
1	5.00000	1	1	1
2	3.00000	1	1	1
3	7.00000	1	2	2
4	7.00000	1	2	2
5	9.00000	1	3	3
6	9.00000	1	3	3
7	5.00000	2	1	2
8	4.00000	2	1	2
9	8.00000	2	2	3
10	8.00000	2	2	3
11	5.00000	2	3	1
12	3.00000	2	3	1
13	6.00000	3	1	3
14	7.00000	3	1	3
15	1.00000	3	2	1
16	1.00000	3	2	1
17	5.00000	3	3	2
18	5.00000	3	3	2

SECTION 2

HISTORY OF COMPUTATION.

SECTION 3

ITERATION	STRESS	SRAT	SRTAVG	CAGRGL	COSAV	ACSAV	GRMAG	GRMULT	STEP
0	0.161	1.2000	1.2000	0.000	0.000	0.067	0.23414	4.02851	0.94325
1	0.078	2.0705	1.4393	-0.846	-0.564	0.586	0.30277	1.96214	0.59408
2	0.088	0.8831	1.2230	-0.917	-0.799	0.807	0.26551	0.81337	0.21596
3	0.033	2.6512	1.5829	0.917	0.345	0.880	0.24330	1.34616	0.32752
4	0.059	0.5643	1.1223	-0.965	-0.528	0.937	0.30640	0.24000	0.07354
5	0.036	1.6177	1.2678	0.999	0.490	0.978	0.30526	0.31026	0.09471
6	0.008	4.5443	1.9402	0.950	0.796	0.959	0.28978	1.00705	0.29183
ITERATION	STRESS	SRAT	SRTAVG	CAGRGL	COSAV	ACSAV	GRMAG	GRMULT	STEP

SATISFACTORY STRESS WAS REACHED

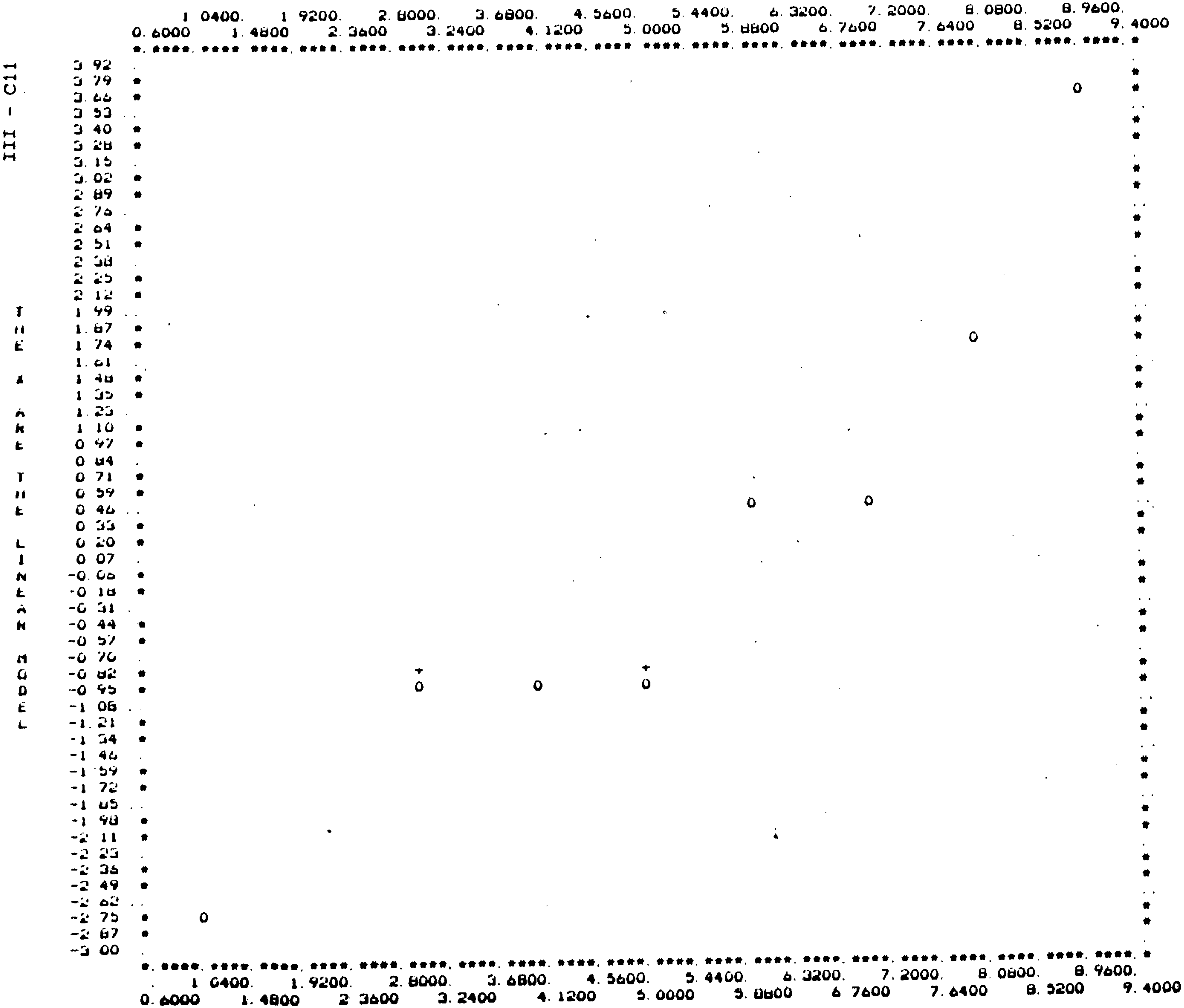
SECTION 4

FINAL CONFIGURATION HAS STRESS OF 0.8 PERCENT.

SAMPLE PROBLEM

3	1.049	-0.001	-1.048
3	-0.446	-0.158	0.604
3	-1.481	-0.468	1.949

SECTION 5



0.6000 1.0400 1.4800 1.9200 2.3600 2.8000 3.2400 3.6800 4.1200 4.5600 5.0000 5.4400 5.8800 6.3200 6.7600 7.2000 7.6400 8.0800 8.5200 8.9600 9.4000
THE X ARE THE LINEAR MODEL
3.92 3.79 3.66 3.53 3.40 3.28 3.15 3.02 2.89 2.76 2.64 2.51 2.38 2.25 2.12 1.99 1.87 1.74 1.61 1.48 1.35 1.23 1.10 0.97 0.84 0.71 0.59 0.46 0.33 0.20 0.07 -0.06 -0.18 -0.31 -0.44 -0.57 -0.70 -0.82 -0.95 -1.08 -1.21 -1.34 -1.46 -1.59 -1.72 -1.85 -1.98 -2.11 -2.23 -2.36 -2.49 -2.62 -2.75 -2.87 -3.00

SECTION 6

Section 1 consists of a repeat of the commands in the user's input runstream, up to the COMPUTE command. It can be seen from the line following DATA that the analysis concerns 3 attributes, each at 3 levels, and that there are 2 replications (that is, 2 respondents). The data has been input as a matrix 3 x 3 x 3 = 27 rows and 2 columns (one column per respondent).

Section 2 is printed if the PRINT INPUT option has been used. These are the non-missing entries in the data. Since a Latin-square fractional factorial design was used (to give 9 ranks out of a possible 27 for each respondent), there are 18 data items. There are as many duplications of each set of subscripts as there are replications in the data. In this case data items 1, 3, 5, 7, 9, 11, 13, 15, 17 come from the first respondent and 2, 4, 6, 8, 10, 12, 14, 16, 18 from the second.

Section 3 consists of the history of compution. This gives a summary of each iteration performed by the MONANOVA program. In this case the program terminated after 6 iterations.

Section 4 is a message to explain why termination occurred. The different messages that may appear are:-

ZERO STRESS WAS REACHED
MINIMUM WAS ACHIEVED
SATISFACTORY STRESS WAS REACHED
MAXIMUM ITERATIONS REACHED

If any one of the first three messages appears then the computations are a success. If the last message appears a failure has occurred.

In Section 5, a statement giving the percentage stress in the final configuration is given. This is followed by the user specified title for the run. The title is then followed by the calculated part-worths with one line per attribute. The first number in each line gives the number of levels for that attribute, followed by the calculated part-worths for each level. Since these part-worths are interval scaled with common unit, but arbitrary origins, the user is urged to adjust the numbers, as shown below, to be more obviously meaningful.

- 0.522	0.000	0.522		0 2 4
- 0.783	-0.261	1.044	becomes	0 2 7
- 2.089	-0783	1.306		0 11 13

This transformation was accomplished by dividing each number by 0.261 to obtain

-2	0	2
-3	-1	4
-8	3	5

and then adding a constant to each row to make 0 the smallest row value.

If the user has output from a number of respondents, each having ranked the same alternatives, he or she should apply exactly the same adjustment to each respondent, so that the part-worth ranges for each attribute are comparable across respondents.

Section 6 is the final part of the output. It consists of the observed values (symbol O) of the dependent variable plotted with the calculated values (symbol X). Overlays are shown if only the O is plotted. The plot should be a straight line from the bottom left to top right corner (strictly monotone increasing). Any "steps" in the graph imply degeneracy in that the calculated values do not very closely explain the observed (in any but the very loose ordinal sense).

APPENDIX D

DATA PREPARATION PROGRAMS

FOR

CONJOINT MEASUREMENT

CONJOINT 1

CONJOINT1 generates MONANOVA runstreams. Rank order data is read in from a data file and a separate runstream is generated for each respondent (that is, individual respondent utilities will be calculated). The program requires modification to run for other than 4 attributes, two at 2 levels and two at 3 levels. Also the rows and column coordinates may need respecification.

CONJOINT 2

CONJOINT2 also generates MONANOVA runstreams. Using this program, a single runstream is generated for all respondents (that is, group respondent utilities will be calculated). With this program each factorial array is "unravelled" (successive columns placed under each other) and the row coordinates must be specified. This program also runs for 4 attributes, two at 2 levels and two at 3 levels. It thus requires 9 rows out of 2 x 2 x 3 x 3 = 36 to be specified.

For the above programs, each line of the input data file must be of the form 6, 5, 8, 7, 4, 3, 9, 1, 2 where the 6th alternative is the most preferred and the 2nd alternative is the least preferred (and they are assigned ranks 9 and 1 respectively, since higher ranks imply greater preference).

```
100 '*****CONJOINT1 ***************************************************
120 PRINT '*************************************************************
130 PRINT 'PROGRAM TO GENERATE MONANOVA RUNSTREAMS (FOR CONJOINT ANALYSIS) '
140 PRINT
150 PRINT '(CURRENT PROGRAM LIMITS ARE FOR 4 FACTORS )
160 PRINT
170 PRINT 'SEPARATE UTILITIES WILL BE CALCULATED FOR EACH RESPONDENT
171 PRINT
172 '*************************************************************************
180 ' DATA IS READ IN FROM THE SPECIFIED DATA FILE & PLACED INTO A
190 ' FULL FACTORIAL ARRAY
200 ' THE POSITIONS THAT THE DATA FIT INTO THIS ARRAY ARE READ AS ROW
210 ' COORDINATES INTO THE X VECTOR & COLUMN COORDINATES INTO THE Y VECTOR
220 '
240 ' ON SUBMITTING THE RUNSTREAM TO MONANOVA, CHECK THE MONANOVA PRINTOUT
250 ' TO ENSURE THAT THE INPUT DATA HAS BEEN CORRECTLY POSITIONED
260 '
290 ' IT IS ASSUMED THAT THE INPUT DATA IS IN RANK ORDER OF ALTERNATIVES.
300 ' i e . MOST PREFERRED FIRST, THEN IN DECREASING ORDER OF PREFERENCE
310 '*************************************************************************
320 DIM A(12,3),L(9),X(9),Y(9)
330 '**************************
340 '         READ ROWS
350 '**************************
360 FOR I=1 TO 9
370    READ X(I)
380 NEXT I
390 DATA 4,12,7,2,5,3,1,8,3
400 '******************************
410 '         READ COLUMNS
420 '******************************
430 FOR I=1 TO 9
440    READ Y(I)
450 NEXT I
460 DATA 2,1,3,1,3,3,1,2,2
470 '*************************************
480 INPUT 'ENTER OUTPUT FILE NAME ',F$
490 INPUT 'ENTER INPUT FILE NAME  ',T$
500 INPUT 'ENTER TITLE ',Z$
510 DEFINE FILE #1 = F$
520 DEFINE FILE #2 = T$
530 C=0
540 '*************************************************
550 '           READ DATA AND CREATE MONANOVA RUNSTREAM
560 '*************************************************
570 ON END #2 GOTO 740
580 MAT READ #2,L
590 C=C+1
600 WRITE #1, 'TITLE'
610 WRITE #1, Z$
620 WRITE #1,'CUTOFF = 0.0'
625 WRITE #1,'PRINT INPUT'
630 WRITE #1,'DATA'
640 WRITE #1,'  4  2  2  3  3  1'
650 WRITE #1,'(3F3.0)'
660 FOR I=1 TO 9
670   A(X(L(I)),Y(L(I)))=10-I
680   NEXT I
690 FOR I=1 TO 12
700 WRITE USING ' ## ## ##', #1 , A(I,1),A(I,2),A(I,3)
710 NEXT I
720 WRITE #1,'COMPUTE'
730 GOTO 570
740 WRITE #1,'FINISH'
750 PRINT USING ' ### INDIVIDUAL MONANOVA RUNSTREAMS NOW IN FILE   ',C
760 PRINT F$
770 END
```

```
100 '****** CONJOINT2 ********************************************************
110 PRINT '*****************************************************************'
130 PRINT 'A PROGRAM TO GENERATE MONANOVA RUNSTREAMS                         '
140 PRINT 'UTILITIES CALCULATED FOR ALL RESPONDENTS JOINTLY                  '
150 PRINT '(SEE CONJOINT1 FOR CALCULATING INDIVIDUAL UTILITIES)              '
160 PRINT
170 PRINT 'TOTAL # OF DATA VALUES INPUT MUST BE < 500                       '
180 PRINT
210 PRINT '(CURRENT LIMITS ARE SET FOR FOUR FACTORS, 2@2 LEVELS, 3@3 LEVELS)'
220 PRINT
230 '*****************************************************************************
240 ' DATA IS READ FROM THE SPECIFIED DATA FILE & PLACED INTO A
250 ' FULL FACTORIAL ARRAY.
260 ' THE POSITIONS THAT THE DATA FIT INTO THIS ARRAY ARE READ AS COLUMN
270 ' COORDINATES (i e., DATA FOR EACH RESPONDENT IS PUT INTO A SINGLE
280 ' COLUMN OF LENGTH 2x2x3x3=36, AND SUCCESSIVE RESPONDENTS ARE STACKED
290 ' SIDE BY SIDE AS REPLICATIONS FOR THE SAME RUN)
300 '
320 ' ON SUBMITTING THE RUNSTREAM TO MONANOVA, CHECK THE MONANOVA PRINTOUT
330 ' TO ENSURE THAT THE INPUT DATA HAS BEEN CORRECTLY POSITIONED
340 '
350 ' IT IS ASSUMED THAT THE INPUT DATA IS IN RANK ORDER OF ALTERNATIVES,
360 ' i e , MOST PREFERRED FIRST, THEN IN DECREASING ORDER OF PREFERENCE.
390 '*****************************************************************************
400 DIM A(36,70),X(9),L(9)
410 '************************
420 '        READ ROWS
430 '************************
440 FOR I=1 TO 9
450   READ X(I)
460 NEXT I
470 DATA 11,34,21,4,15,9,1,23,6
480 '************************************
490 INPUT 'ENTER OUTPUT FILE NAME ',F$
500 INPUT 'ENTER INPUT FILE NAME  ',I$
510 INPUT 'ENTER TITLE FOR RUN    ',T$
520 DEFINE FILE #1 = F$
530 DEFINE FILE #2 = I$
540 FOR I=1 TO 36
550 FOR J=1,70
560 A(I,J)=0
570 NEXT J
580 NEXT I
590 R=0
600 '*****************************************************************************
610 '        READ DATA AND PUT INTO SUCCESIVE COLUMNS FOR LATER OUTPUT
620 '*****************************************************************************
630 ON END #2 GOTO 730
640   MAT READ #2, L
650   R=R+1
660   FOR J=1 TO 9
670     A(X(L(J)),R)=10-J
680   NEXT J
690 GOTO 630
700 '*****************************************************
710 '       WRITE MONANOVA RUNSTREAM TO SPECIFIED FILE
720 '*****************************************************
730 WRITE #1,'TITLE'
740 WRITE #1,T$
750 WRITE #1,'PRINT INPUT'
755 WRITE #1,'CUTOFF = 0.0'
760 WRITE #1,'DATA'
770 WRITE USING '  4  2  2  3  3 ##', #1 ,R
780 WRITE USING '( ##F1.0)7, #1 ,R
790 '************************************
800 '      WRITE DATA VALUES
810 '************************************
820 FOR J=1 TO 36
830 FOR I=1 TO R
840 WRITE USING '#', #1 ,A(J,I);
850 NEXT I
860 WRITE #1
870 NEXT J
880 WRITE #1, 'COMPUTE'
890 WRITE #1,'STOP'
900 PRINT USING ' ## REPLICATIONS FOR MONANOVA WRITTEN TO FILE    ',R
910 PRINT F$
920 END
```

APPENDIX IV

Guides' Documentation

This appendix contains a copy of the letter, questionnaire and instructions sent to the guides.

The size of the original documents was A4 but they have been reduced so that sufficient space was maintained to ensure that they can be read once they have been bound in this report.

UNIVERSITY OF CAPE TOWN

(WITH WHICH IS INCORPORATED THE SOUTH AFRICAN COLLEGE)

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TELEX 57-22208

UNIVERSITY PRIVATE BAG
RONDEBOSCH, 7700
SOUTH AFRICA

SCHOOL OF ENVIRONMENTAL STUDIES

31st. August 1984

Dear guide,

I am currently involved in researching those factors that make a guided "wilderness trail" a success. Various current and ex-guides have been interviewed.

Some of the factors highlighted by these guides have been incorporated into 9 different trail scenarios (the enclosed green cards).

I now which to establish the various perceptions that different people have of what makes a trail a success. I have sent out a questionnaire to a random sample of Wilderness Leadership School members, and would appreciate it if you could complete a similar excercise.

By analysing the similarities and differences in perceptions I hope to be able to highlight those factors which should be incorporated in a guided trail to increase its effectiveness.

Please assist me by completing the attached questionnaire and excercise (the rating and ranking of the 9 green cards) when you can spare 20 minutes of uninterrupted time.

A stamped and addressed envelope is enclosed for your use; please return the questionnaire to me as soon as possible but no later than the 21st. September 1984.
I appreciate the time you will spend helping me and wish to assure you that all information supplied will remain anonymous. Should you have any queries please contact me at (021) 698531 Ext 187 or (021) 655608.

Yours sincerely,

John Raimondo

PLEASE LEAVE FREE FOR DATA PROCESSING

1 [ ][ ][ ]

PERCEPTIONS OF A GUIDED WILDERNESS TRAIL

Please answer the following questions or tick the appropriate brackets.

Background Information

About how many trails have you led? Less than 20 []: 20 or more [].

How many have been for 4 or more days? Less than 25% []: 25% or more [].

4 [ ][ ]

In which areas do you usually lead a trail?

Nylsvlei and Doorndraai [];

Umfolosi, Timbavati or Pilansberg [].

6 [ ]

Which aspect of the trail means the most to you? .....

.....

Current Information

Surname & Initials: .....

Sex: Female []: Male [].

7 [ ]

Your age: 14 - 19 []: 20 - 25 []: 26 - 35 []: 36 - 45 []: 46plus [].

Home language: Afrikaans []: English []: Other .....

Highest education completed: High school []: High school completed [].

10 [ ]

Post school diploma []: Some university []: University degree [].

Family income Rands per month:

Up to R 1600 []: R 1601 to R 3200 []: R 3201 & over []

11 [ ]

THANK YOU FOR COMPLETING THIS SECTION

PLEASE

Read the instructions on the back of this page

BEFORE completing the ranking table below.

12 [ ][ ][ ][ ][ ][ ][ ][ ][ ]

20

RANKING TABLE

Rank / Order	9	8	7	6	5	4	3	2	1
Scenario Letter									

(9 = Most successful trail)

(1 = Least successful trail)

RATING AND RANKING OF SCENARIOS

The nine enclosed cards depict different scenarios for a guided "wilderness trail". Each scenario has a capital letter in the top left hand corner to identify it, as well as a rating scale below it. The rating scale is there to record your impression of the scenario - how successful a trail it would be.

There are seven levels of success for any one trail, and they are:

LEVEL	ABBREVIATION
Very successful	VS
Successful	S
Moderately Successful	MS
Neutral	N
Poor	P
Very poor	VP
Disatrous	D

The rating scale looks like this on each card:

```
|---|---|---|---|---|---|---|
 VS   S  MS   N   P  VP   D
```

PLACE AN X ABOVE THE PLACE THAT YOU FEEL MOST ACCURATELY REPRESENTS THE LEVEL OF SUCCESS OF THE TRAIL SCENARIO.

If for example, you believe the trail will be moderately successful place the X here:

```
        X
|---|---|---|---|---|---|---|
 VS   S  MS   N   P  VP   D
```

For a poor trail the X should be placed here:

```
                X
|---|---|---|---|---|---|---|
 VS   S  MS   N   P  VP   D
```

The above are just two examples. Your X can occupy anyone of the seven places on the scale. Since there are nine cards, at least 2 and possibly more, will have a similar rating.

STEP 1 Please read through one scenario at a time, having read it, place an X in that part of the rating scale that you feel is most representative of your reaction to the scenario.

STEP 2 Having rated all nine scenarios, sort the cards into an order from 'Very successful' down to 'Disastrous'. Where there is more than one card with the same rating (level of success),re-read the cards, and decide which of these scenarios appeals to you the most. Place it higher in the ranking order. Repeat this until all the cards are in order of preference (including those having the same rating).

STEP 3 You now have an order of preference for the scenarios,re-read them and if you are unhappy with the order, revise it until you are satisfied that it records you best judgement.

STEP 4 Note the letter representing the most successful scenario (top left hand corner) and place it below the number 9 in the RANKING TABLE (on the reverse side of this sheet). Place the letter of the next most successful scenario below the number 8, and so on until all 9 scenarios have been recorded. The least successful one (with a level of 'Very poor' or 'Disastrous') will be under the number 1.

STEP 5 Place the completed questionnaire and ranking table in the addressed envelope and return it to me as soon as possible, but no later than the 21st. September.

THANK YOU FOR YOUR TIME AND HELP.

APPENDIX V

Traillists Documentation

The documentation sent to the traillists were :-

The initial covering letter;

The questionnaire;

A set of instructions on the reverse of the questionnaire;

A set of cards and an addressed and stamped envelope, (which are not included in the Appendix), and

A follow-up letter.

These documents have been reduced in size (from A4 format) so that they can still be read when bound in this report.

UNIVERSITY OF CAPE TOWN

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TELEGRAMS "ALUMNI CAPE TOWN
TELEX 57-22208

UNIVERSITY PRIVATE BAG
RONDEBOSCH, 7700
SOUTH AFRICA

SCHOOL OF ENVIRONMENTAL STUDIES

30th August 1984

Dear W.L.S. Member,

I am currently doing research on differing perceptions of guided wilderness trails. Your name and address has been obtained from the membership list of the Wilderness Leadership School.

I have interviewed a number of trail guides and have identified various factors that they believe to be important to the success of a trail. I would now like to establish which factors people, who have been on a guided trail, regard as important to its success.

By completing the questions, and rating and ranking the different trail scenarios (on the 9 enclosed green cards), you will enable me to determine the importance of the various factors. I will then check how different people perceive the importance of the factors and see whether or not the guides and trailists have the same perception and, if not, where and why differences occur. These findings will then be brought to the attention of the guides so that they may become more effective in their rôle as a guide.

Please complete the attached exercise when you can spare 20 minutes of uninterrupted time and then return it to me as soon as possible, but no later than the 21st September 1984.

A stamped and addressed envelope is enclosed for your use. Should you have any queries regarding this questionnaire please phone me at: (021) 698531 Ext 187.

I appreciate the time you will spend helping me, and wish to assure you that all information supplied will remain confidential.

Yours sincerely,

Signed by candidate

John Raimondo.

PLEASE LEAVE FREE FOR DATA PROCESSING

TRAILISTS PERCEPTIONS OF A GUIDED WILDERNESS TRAIL

Please answer the following questions or tick the appropriate box.

Background information.

Approximately how many yeara since your last guided wilderness trail? ....

For how many days did the trails last? .....

Where was the trail run? .....

What was the name of your guide?..... Don't recall [].

About how many guided trails have you been on ? .....

Which aspect of the trail(s) means the most to you? .....

.....

To what extent did the trail experience influence your life?

Strongly []: Moderately []: Insignificantly [].

Current information.

Surname & Initials: .....

Sex: Female [] Male [].

Your age: 14 - 19 []: 20 - 25 []: 26 - 35 []: 36 - 45 []: 46 plus [].

Home language: Afrikaans []: English []: Other .....

Highest education completed: Some High school []: High school completed.

Post school diploma []: Some university []: University degree [].

Monthly family income:

Up to R1600 []: R1601 to R3200 []: R3201 & over [].

Thank you for completing this section.

PLEASE

Read the instructions on the back of this page

before completing the ranking table below.

RANKING TABLE

Rank / Order	9	8	7	6	5	4	3	2	1
Scenario Letter									

(9 = most successful trail) (1 = least successful trail)

RATING AND RANKING OF SCENARIOS

The nine enclosed cards depict different scenarios for a guided "wilderness trail". Each scenario has a capital letter in the top left hand corner to identify it, as well as a rating scale below it. The rating scale is there to record your impression of the scenario - how successful a trail it would be.
There are seven levels of success for any one trail, and they are:

LEVEL	ABBREVIATION
Very successful	VS
Successful	S
Moderately Successful	MS
Neutral	N
Poor	P
Very poor	VP
Disatrous	D

The rating scale looks like this on each card:

```
|---|---|---|---|---|---|---|
 VS   S  MS   N   P  VP   D
```

PLACE AN X ABOVE THE PLACE THAT YOU FEEL MOST ACCURATELY REPRESENTS THE LEVEL OF SUCCESS OF THE TRAIL SCENARIO.

If for example, you believe the trail will be moderately successful place the X here:

```
|---|---|---|---|---|---|---|
 VS   S  MS   N   P  VP   D
```

For a poor trail the X should be placed here:

```
|---|---|---|---|---|---|---|
 VS   S  MS   N   P  VP   D
```

The above are just two examples. Your X can occupy anyone of the seven places on the scale. Since there are nine cards, at least 2 and possibly more, will have a similar rating.

STEP 1 Please read through one scenario at a time, having read it, place an X in that part of the rating scale that you feel is most representative of your reaction to the scenario.

STEP 2 Having rated all nine scenarios, sort the cards into an order from 'Very successful' down to 'Disastrous'. Where there is more than one card with the same rating (level of success),re-read the cards, and decide which of these scenarios appeals to you the most. Place it higher in the ranking order. Repeat this until all the cards are in order of preference (including those having the same rating).

STEP 3 You now have an order of preference for the scenarios,re-read them and if you are unhappy with the order, revise it until you are satisfied that it records you best judgement.

STEP 4 Note the letter representing the most successful scenario (top left hand corner) and place it below the number 9 in the RANKING TABLE (on the reverse side of this sheet). Place the letter of the next most successful scenario below the number 8, and so on until all 9 scenarios have been recorded. The least successful one (with a level of 'Very poor' or 'Disastrous') will be under the number 1.

STEP 5 Place the completed questionnaire and ranking table in the addressed envelope and return it to me as soon as possible, but no later than the 21st. September.

THANK YOU FOR YOUR TIME AND HELP.

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RONDEBOSCH 7700
SOUTH AFRICA

SCHOOL OF ENVIRONMENTAL STUDIES

9 November 1984

Dear member,

At the beginning of September I sent out a survey to 320 members of the Wilderness Leadership School. Over half of the members returned their survey. Some people said they could not complete it because they had never been on a guides wilderness trail, while others were unable to meet the dealine set or did not receive the survey having recently moved house. Naturally there are also some people who do not wish to participate in a survey.

It is important for me to establish if their is a difference between the opinion of those people who did, and those who did not, respond to the survey.

My records indicate that I have not received a reply from you and I would appreciate it if you could now spare the time to complete the survey. For your convenience I enclose the original survey.

As I can only canvass a small sample of people it is important that I receive as many replies as possible. Please help me by doing so as soon as possible.

Thank you,

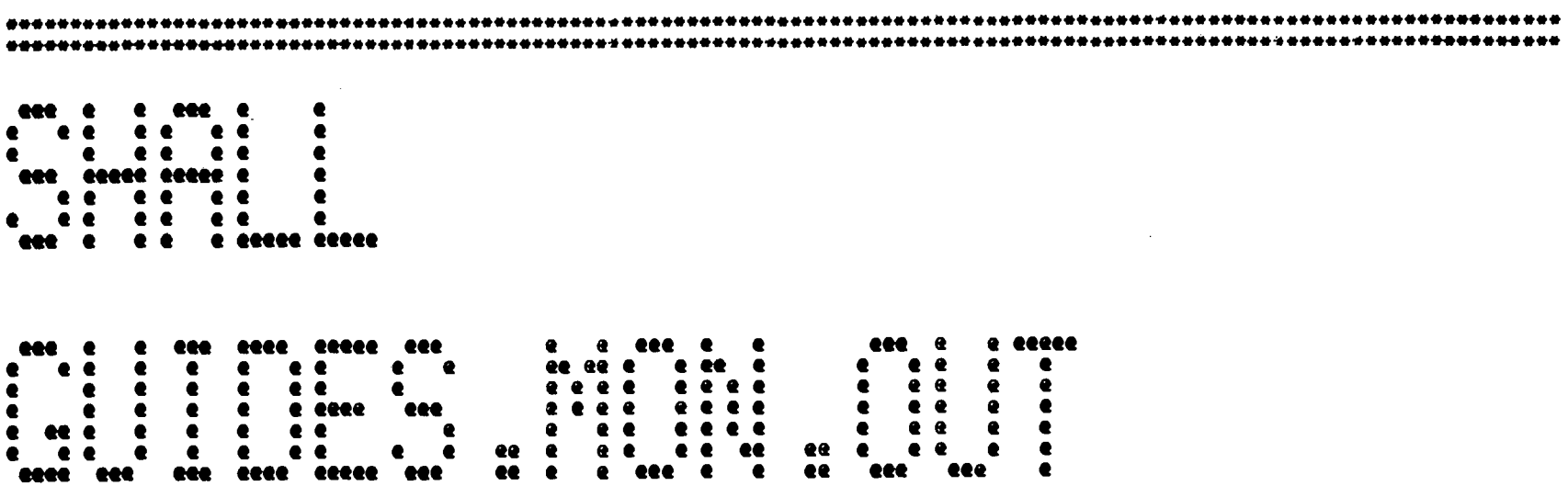
Signed by candidate

APPENDIX VI

Appendix VI contains the results of the conjoint analysis and mananova programme for the guides. The complete computer printout is given. This shows the history of the computation. Fifteen iterations were required to find an acceptable solution. The programme terminated because an approximate minimum was reached. The "stress" at 39.8 percent is acceptable. For a detailed explanation of the interpretation of a set of results see Appendix III pg C1. The interpretation of the part-worths generated by the guides is given in section 3.2.

User: SHALL -at

<QSB002>MISC>SHALL>QUIDES.MON.OUT



Label: PRT001 -form

Pathname: <QSB002>MISC>SHALL>QUIDES.MON.OUT
File last modified: 85-07-30.09:33:20.Tue

Spooled: 85-09-10.15:42:12.Tue [Spooler rev 19.1.0]
Started: 85-09-10.15:42:20.Tue ON: PR1 BY: PR1 h

```
1
OTITLE
 GUIDES
OCUTOFF = 0.0
OPRINT INPUT
ODATA
  4  2  2  3  3 26
  ( 26F1.0)

OCOMPUTE
```

1 SEQ. NO.	DATA	SUBSCRIPTS			
1	9.00000	1	1	1	1
2	8.00000	1	1	1	1
3	8.00000	1	1	1	1
4	9.00000	1	1	1	1
5	9.00000	1	1	1	1
6	9.00000	1	1	1	1
7	9.00000	1	1	1	1
8	8.00000	1	1	1	1
9	9.00000	1	1	1	1
10	9.00000	1	1	1	1
11	9.00000	1	1	1	1
12	9.00000	1	1	1	1
13	8.00000	1	1	1	1
14	6.00000	1	1	1	1
15	9.00000	1	1	1	1
16	9.00000	1	1	1	1
17	9.00000	1	1	1	1
18	9.00000	1	1	1	1
19	9.00000	1	1	1	1
20	9.00000	1	1	1	1
21	8.00000	1	1	1	1
22	9.00000	1	1	1	1
23	8.00000	1	1	1	1
24	9.00000	1	1	1	1
25	9.00000	1	1	1	1
26	8.00000	1	1	1	1
27	8.00000	1	1	2	1
28	9.00000	1	1	2	1
29	9.00000	1	1	2	1
30	8.00000	1	1	2	1
31	8.00000	1	1	2	1
32	8.00000	1	1	2	1
33	8.00000	1	1	2	1
34	9.00000	1	1	2	1
35	8.00000	1	1	2	1
36	8.00000	1	1	2	1
37	5.00000	1	1	2	1
38	4.00000	1	1	2	1
39	9.00000	1	1	2	1
40	9.00000	1	1	2	1
41	6.00000	1	1	2	1
42	7.00000	1	1	2	1
43	6.00000	1	1	2	1
44	7.00000	1	1	2	1
45	8.00000	1	1	2	1
46	6.00000	1	1	2	1
47	9.00000	1	1	2	1
48	8.00000	1	1	2	1
49	9.00000	1	1	2	1

50	8.00000	1	1	2	1
51	7.00000	1	1	2	1
52	9.00000	1	1	2	1
53	2.00000	1	1	3	2
54	2.00000	1	1	3	2
55	4.00000	1	1	3	2
56	2.00000	1	1	3	2
57	3.00000	1	1	3	2
58	2.00000	1	1	3	2
59	1.00000	1	1	3	2
60	2.00000	1	1	3	2
61	1.00000	1	1	3	2
62	2.00000	1	1	3	2
63	3.00000	1	1	3	2
64	1.00000	1	1	3	2
65	4.00000	1	1	3	2
66	1.00000	1	1	3	2
67	1.00000	1	1	3	2
68	1.00000	1	1	3	2
69	2.00000	1	1	3	2
70	1.00000	1	1	3	2
71	1.00000	1	1	3	2
72	2.00000	1	1	3	2
73	2.00000	1	1	3	2
74	2.00000	1	1	3	2
75	4.00000	1	1	3	2
76	1.00000	1	1	3	2
77	1.00000	1	1	3	2
78	2.00000	1	1	3	2
79	5.00000	1	1	3	3
80	6.00000	1	1	3	3
81	3.00000	1	1	3	3
82	6.00000	1	1	3	3
83	6.00000	1	1	3	3
84	3.00000	1	1	3	3
85	4.00000	1	1	3	3
86	7.00000	1	1	3	3
87	5.00000	1	1	3	3
88	5.00000	1	1	3	3
89	7.00000	1	1	3	3
90	6.00000	1	1	3	3
91	1.00000	1	1	3	3
92	3.00000	1	1	3	3
93	4.00000	1	1	3	3
94	3.00000	1	1	3	3
95	4.00000	1	1	3	3
96	5.00000	1	1	3	3
97	4.00000	1	1	3	3
98	3.00000	1	1	3	3
99	6.00000	1	1	3	3
100	5.00000	1	1	3	3
101	5.00000	1	1	3	3
102	3.00000	1	1	3	3
103	4.00000	1	1	3	3
104	3.00000	1	1	3	3
105	6.00000	1	2	1	2
106	7.00000	1	2	1	2
107	6.00000	1	2	1	2
108	4.00000	1	2	1	2
109	7.00000	1	2	1	2

110	6.00000	1	2	1	2
111	6.00000	1	2	1	2
112	6.00000	1	2	1	2
113	2.00000	1	2	1	2
114	7.00000	1	2	1	2
115	8.00000	1	2	1	2
116	8.00000	1	2	1	2
117	5.00000	1	2	1	2
118	5.00000	1	2	1	2
119	8.00000	1	2	1	2
120	8.00000	1	2	1	2
121	8.00000	1	2	1	2
122	8.00000	1	2	1	2
123	6.00000	1	2	1	2
124	4.00000	1	2	1	2
125	5.00000	1	2	1	2
126	3.00000	1	2	1	2
127	7.00000	1	2	1	2
128	5.00000	1	2	1	2
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154	7.00000	1	2	2	3
155	6.00000	1	2	2	3
156	5.00000	1	2	2	3
157	3.00000	2	1	1	3
158	4.00000	2	1	1	3
159	2.00000	2	1	1	3
160	5.00000	2	1	1	3
161	2.00000	2	1	1	3
162	4.00000	2	1	1	3
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164	3.00000	2	1	1	3
165	7.00000	2	1	1	3
166	3.00000	2	1	1	3
167	6.00000	2	1	1	3

170	4.00000	2	1	1	3
171	5.00000	2	1	1	3
172	4.00000	2	1	1	3
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174	6.00000	2	1	1	3
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185	7.00000	2	1	2	2
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220	2.00000	2	2	3	1
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223	2.00000	2	2	3	1
224	2.00000	2	2	3	1
225	1.00000	2	2	3	1
226	2.00000	2	2	3	1
227	3.00000	2	2	3	1
228	1.00000	2	2	3	1

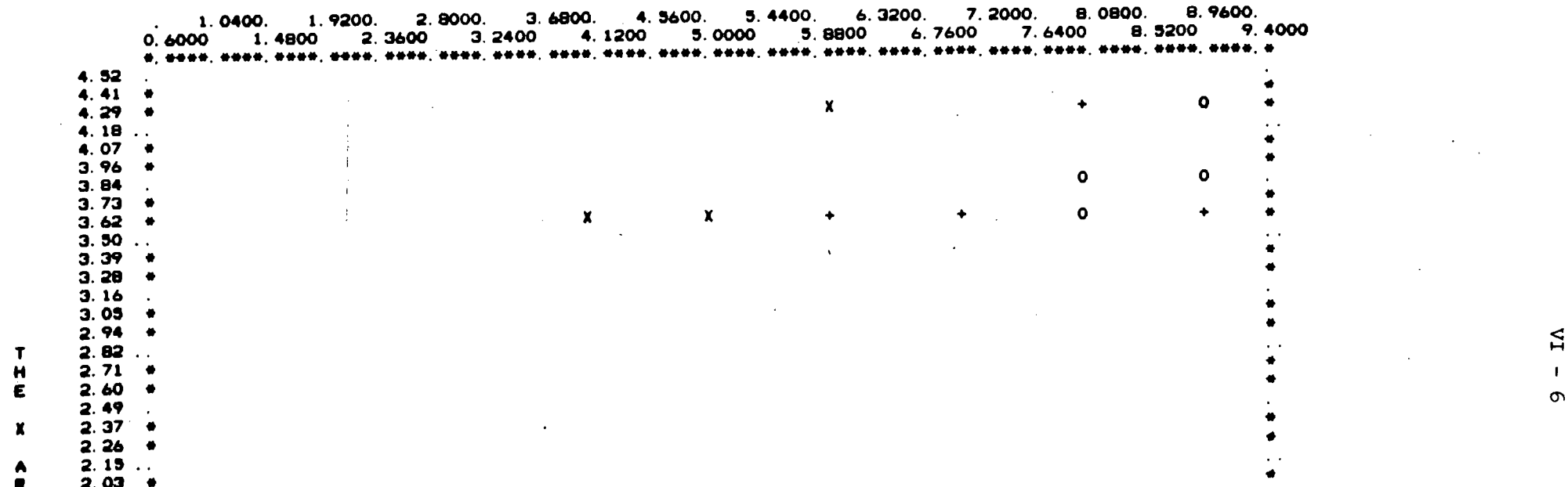
230	4.00000	2	2	3	1
231	1.00000	2	2	3	1
232	2.00000	2	2	3	1
233	3.00000	2	2	3	1
234	4.00000	2	2	3	1

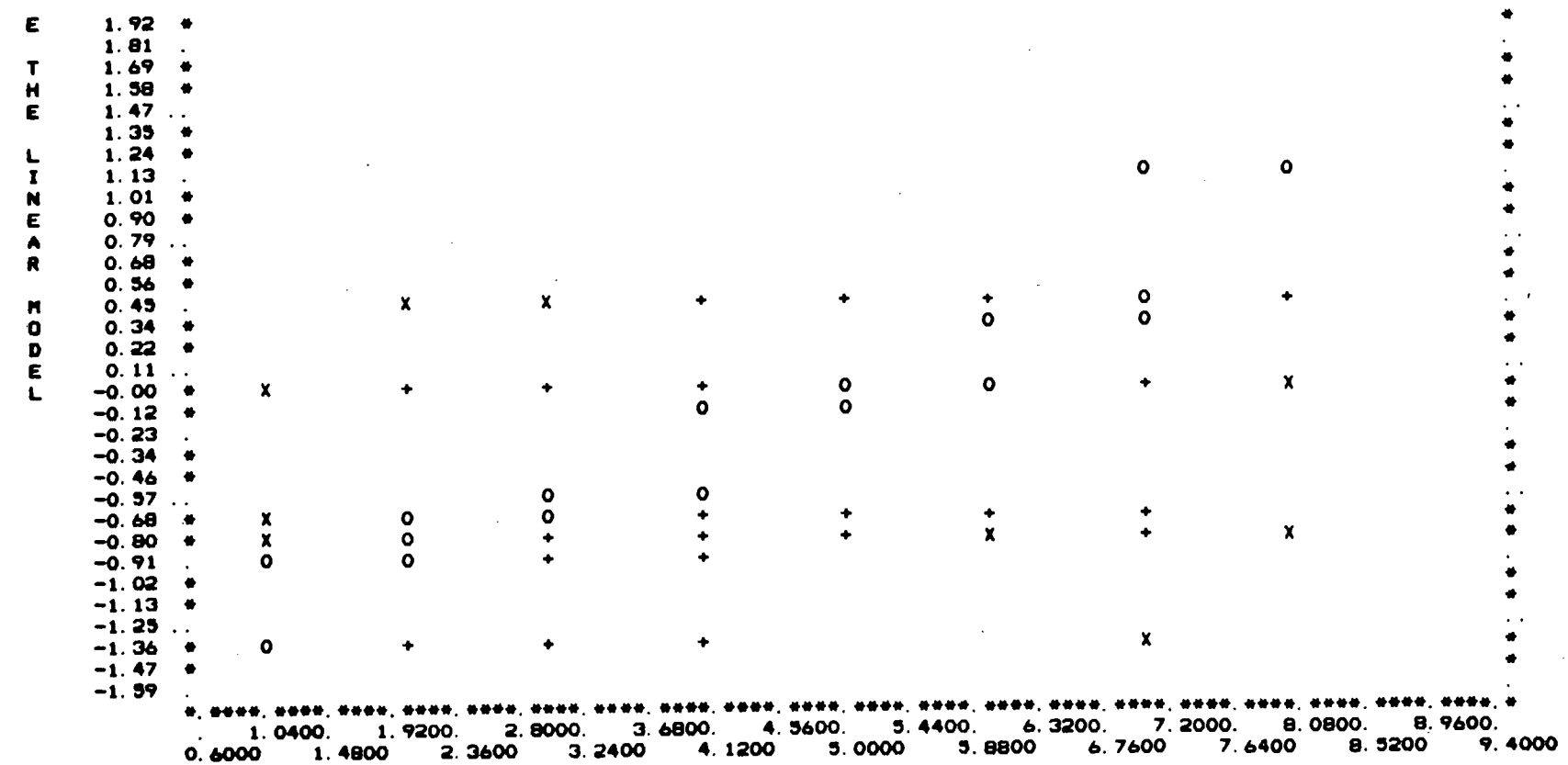
OHISTORY OF COMPUTATION.

ITERATION	STRESS	SRAT	SRTAVG	CAGRGL	COSAV	ACSAV	GRMAG	GRMULT	STEP
0	0.436	1.2000	1.2000	0.000	0.000	0.067	0.06135	10.89319	0.66829
1	0.410	1.0624	1.1523	0.415	0.277	0.299	0.03370	31.19300	1.05121
2	0.408	1.0056	1.1012	-0.574	-0.291	0.482	0.04800	14.19652	0.68149
3	0.404	1.0089	1.0695	-0.924	-0.713	0.777	0.03535	6.62218	0.23407
4	0.399	1.0137	1.0505	0.972	0.410	0.907	0.01090	21.31842	0.23242
5	0.400	0.9977	1.0326	-0.953	-0.498	0.937	0.01975	3.04709	0.06017
6	0.399	1.0024	1.0224	0.996	0.498	0.977	0.01146	4.73582	0.05427
7	0.398	1.0011	1.0153	0.980	0.819	0.979	0.00420	19.82317	0.08318
8	0.398	0.9998	1.0101	-0.986	-0.384	0.984	0.00659	3.15929	0.02081
9	0.398	1.0003	1.0068	0.997	0.536	0.993	0.00385	4.74071	0.01824
10	0.398	1.0001	1.0046	0.986	0.836	0.988	0.00149	17.54688	0.02610
11	0.398	1.0000	1.0030	-0.989	-0.380	0.989	0.00185	3.45303	0.00638
12	0.398	1.0000	1.0020	0.997	0.538	0.994	0.00102	5.41212	0.00551
13	0.398	1.0000	1.0014	0.980	0.832	0.985	0.00032	25.33381	0.00801
14	0.398	1.0000	1.0009	-0.996	-0.387	0.992	0.00068	2.79585	0.00192
15	0.398	1.0000	1.0006	0.999	0.537	0.997	0.00044	3.67252	0.00163
ITERATION	STRESS	SRAT	SRTAVG	CAGRGL	COSAV	ACSAV	GRMAG	GRMULT	STEP

APPROXIMATE MINIMUM WAS REACHED.
OFINAL CONFIGURATION HAS STRESS OF 39.8 PERCENT.
GUIDES
2 0.916 -0.916
2 0.596 -0.596
3 1.065 0.399 -1.464
3 1.666 -0.901 -0.766

1




THE LINEAR MODEL
1.92
1.81
1.69
1.58
1.47
1.35
1.24
1.13
1.01
0.90
0.79
0.68
0.56
0.45
0.34
0.22
0.11
-0.00
-0.12
-0.23
-0.34
-0.46
-0.57
-0.68
-0.80
-0.91
-1.02
-1.13
-1.25
-1.36
-1.47
-1.59
0.6000
1.4800
2.3600
3.2400
4.1200
5.0000
5.8800
6.7600
7.6400
8.5200
9.4000

1
OSTOP

APPENDIX VII

This appendix contains the computor generated part-worth values for

Trail A (the first 55 respondents),

Trail B (the last 55 respondents),

Trail F (the responses received on the follow-up survey).

Each printout records all the computations and was about 12 pages long. Only the part-worth values have been shown.

```
TRAILA
  2   0.866 -0.866
  2   0.656 -0.656
  3   0.762  0.475 -1.237
  3   1.880 -0.905 -0.975

TRAILB
  2   0.810 -0.810
  2   0.690 -0.690
  3   0.745  0.392 -1.137
  3   1.953 -0.896 -1.058

TRAILF
  2   0.809 -0.809
  2   0.677 -0.677
  3   0.675  0.434 -1.108
  3   1.982 -0.909 -1.073
```

APPENDIX VIII

Interpretation of biographical information from trailists

This Appendix can be read in conjunction with Chapter 3 and gives the details of the analysis of the trailist's responses according to their biographical details. The exact questions asked are shown in Appendix V. The numbering adopted is a continuation of that used in Chapter 3.

3.3.1 Years since last trail.

All 121 trailists completed this information. The percentage of trailists who participated in trails over different times is shown in Table 3.19.

Table 3.19 Trailists - years since last trail

No. of years	No. of responses	% of respondents
1	44	36.4
2	13	10.7
3	11	9.1
4	12	9.9
5	4	3.3
6	12	9.9
7	6	5.0
8	2	1.7
9+	17	14.0
Total	121	100.0%

A large proportion of trailists have been on trail within the last year - 36.4%. About half the trailists had been on a trail within the last two years while over 30% had not been on trail in the last 5 years. This would seem to indicate that most trailists go on trails fairly regularly. (The alternative, that they joined the school quite recently is not correct according to school personnel, as membership numbers have remained fairly constant). The low percentage at 5 years was due to fewer trails being run in that year. The proportion shown for 9 years is actually for 9 or more 7 years since last trail.

The groupings of trailists were chosen on the following basis:

1) The number of trailists in any one group should be at least 20 so that a meaningful analysis of their perceptions can be made, and
2) The groupings are such as to have the potential for yielding useful information to the guides should differences in perception be shown to occur.

An analysis of the perceptions of these trailists was made by grouping them into 3 groups.

Group A The 44 trailists who had been on trail within the last year;

Group B The 37 trailists who had been on trail two to four years ago; and

Group C The 40 trailists who had been on trail five or more years ago.

Table 3. Trailists Perception according to time since last trail

RELATIVE IMPORTANCE	ATTRIBUTE			
GROUP	AWARENESS	IMPACT	GUIDE	
Group A 1 year	37,7	23,9	16,6	21,8
Difference	+0,3	-0,6	+0,9	-0,7
Group B 2-4 years	38,0	23,3	17,5	21,1
Difference	-1,8	+2,3	+0,1	-0,6
Group C 5+ years	36,2	25,6	17,6	20,5
All Trailists	37,2	24,6	17,0	21,2

In order to interpret this table, and similar ones which could be produced for other groupings of the trailists, it is necessary to establish a basis on which to evaluate the data. Trends can be determined by looking at the differences between the results. For example the relative importance of the attribute GUIDE appears to diminish in respect of the time since the last trail - the greater the time the less the importance attached to it. However, the magnitude of this change is small thus it is unlikely that one can conclude that the relationship is an important one. It was decided that trends would be regarded as important if:

i) There is a progressive difference between the calculated values for the attribute of each group, and

ii) Each calculated value was greater than one unit, which represents about 5% of the average value of any one attribute.

Based on these criteria the trends in table 3 are not regarded as important, even though they do show that over time trailists seem to place less importance on the GUIDE'S PERSONALITY and more on the nature of the environment - the IMPACT.

3.3.2 Duration of trail

Table 3.21 shows the duration of the trail in number of days. The school generally offers weekend trails - reflected as two or three days - as well as week trails reflected as four or five day trails.

Table 3.21 Duration of trail in days

No. of days	No. of responses	% of respondents
1	0	0.0
2	9	7.4
3	19	15,7
4	25	20,6
5	44	36,4
6	5	4,1
7	14	11,6
8	2	1.7
9+	3	2,5
Total	121	100.0%

It is evident that most respondents participated on the four or five day trails. There are very few cases where trails of 6 or more days are operated. The inference could be made that the longer the duration of the trail the more likely it was that the trail would be a success (hence the traillists would support the school and be members). The weekend trails were introduced more recently than the week long trails and so the total number of participants that have been on each type of trail is not the same. The conclusion that most respondents go on the longer trails could thus be due to the non availability of three day trails. Tests on the perceptions of the traillists were carried out in the following four categories:

Group A : Duration of trail less than four days - 28 respondents

Group B : Duration of trail four days - 28 respondents

Group C : Duration of trail five days - 44 respondents

Group D : Duration of trail six or more days - 24 respondents

The results are shown in Table 3.22

Table 3.22 Trailists perceptions according to duration of trail

RELATIVE IMPORTANCE	ATTRIBUTE			
	GROUP	AWARENESS	IMPACT	GUIDE
Group A -4 days	37,5	23,3	15,8	23,4
Difference	-1,0	+3,67	-0,63	-2,0
Group B 4 days	36,5	26,9	15,2	21,4
Difference	+1,0	-2,7	+2,4	-0,6
Group C 5 days	37,5	24,2	17,6	20,8
Difference	+0,5	-0,7	+1,6	-1,6
Group D 6+ days	38,0	23,5	19,2	19,2
All Trailists	37,2	24,6	17,0	21,2

It would appear as though there is a strong trend showing a decreasing importance of the GUIDE'S PERSONALITY with increasing length of trail.

An increasing importance is attached to the IMPACT on the environment as the trailist spends more time on the trail. These trends appear related. The more time a trailist is on trail the more he or she will come to associate with the different attributes of the trail. If the change in perspective was consistent for all four attributes then the relative importance of the attributes would remain constant. However, it would appear that there is an important change in perspective relative to the rating of AWARENESS from group A to group B. If this change results in the trailists becoming more aware of their place in their environment and hence experiencing a "oneness with nature" then they are

likely to place more emphasis on the environment. This is seen to be the case for groups C and D relative to group B.

The change in trailists' perspective of their place in the environment will also affect their perception of their relationship with the guide. The trailists will have more confidence in themselves and hence feel less dependent on the guide. This interpretation of the results could explain the apparent trend of decreasing importance of the guide's personality with increasing length of trail. Whether or not this particular interpretation is correct, it would still seem that in order to achieve an important change in the perception a trailist has of his or her relationship with the environment, the length of the trail should be at least four days.

3.3.3 Location of trail

Table 3.23 shows where the respondent had been on trail.

Table 3.23 Locality of trail

LOCATION	NUMBER OF RESPONDENTS	% OF RESPONDENTS
Umfolozi	76	62,8
Timbavati	18	14,9
Pilansberg	8	6,6
Doorndraai	1	0,8
Nybulei	2	1,7
Other	16	13,2
Total	121	100,0

Trails were initially operated in the Umfolozi area and so most 5 day trails were operated there. The Umfolozi area is by far the most successful area in which trails are operated. This could be due to a number of factors:

1) The type of guides - they tend to be more experienced than the guides for the other areas;

2) The duration of the trail - the Umfolozi and Timbavati are 5 day trails;

3) The type of wilderness - the Umfolozi has the least signs of modern mans' impacts;

4) The type of game encountered - rhino and lion are encountered on the Timbavati and Umfolozi trail, rhino on the Pilansberg trail. No dangerous game are encountered on other trails.

5) The greatest number of trails have been run in the Umfolozi area since the Pilansberg, Doorndraai and Nylsvlei trails have only been operational for three years.

The number of participants in the Timbavati, Pilansberg, Doorndraai and Nylsvlei trails is too small to provide a meaningful analysis of their perceptions. The low response rate for all areas except the Umfolozi could be due to three additional factors :

6) Umfolozi trails normally end at the School's head quarters and guides ask trailists to consider supporting the School.

7) Timbavati and Umfolozi trailists receive follow up material soliciting support,

8) Pilansberg, Doorndraai and Nylsvlei trails are led by

volunteer guides who may not have solicited support for the school.

It should be noted that trailists were responding to the question "where was (your last) trail run?" Thus they could also have been on trails to other areas. The "other" category referred to trails in Botswana (where the School used to operate for a number of years) and to trails which were not run by the Wilderness Leadership School.

Despite the many mitigating factors it is felt that the nature of the trail in the Umfolozi area is such that a higher percentage of trailists have a successful trail and thus join the Wilderness Leadership School. This would imply that points 1 to 4 are important for a successful trail and should be incorporated into guided wilderness trails.

3.3.4 Recall name of guide

102 trailists (84%) recalled the name of their guide and 19 (16%) did not. This implies that the guide's name is being recalled by some trailists more than five years after having been on trail with that guide. The two groups perceptions were not analysed.

3.3.5 Number of trails

Table 3.24 shows the number and percentage of respondents who have been on one or more trails.

Table 3.24 Number of times respondents have been on trail

No. of trails	No. of responses	% of respondents
1	38	32,5
2	26	22,5
3	14	11,7
4	11	9,2
5	5	4,2
6	8	6,6
7	2	1,7
8	1	0,8
9	2	1,7
10 - 19	8	6,6
20 and over	3	2,5
Total	120	100,0

This shows that two thirds of the respondents have been on trail more than once although more than half have only been on a trail once or twice. Twenty percent have been on trail over five times. In order to check for a difference in perceptions these respondents were grouped as follows :

Group A - 38 respondents who have only been on trail once.

Group B - 26 respondents who have been on trail twice.

Group C - 56 respondents who have been on trail three or more times.

Their results are shown in table 3.25

Table 3.25 Perceptions of trailists dependent on number of trails

RELATIVE IMPORTANCE	ATTRIBUTE			
	GROUP	AWARENESS	IMPACT	GUIDE
Group A 1 trail	39,5	20,9	19,6	20.0
Difference	-4,6	+6,7	-3,9	+1,8
Group B 2 trails	34,9	27,6	15,7	21,8
Difference	+2,6	-3,5	+1,4	-0,5
Group C 3+ trails	37,5	24,1	17,1	21,3
All Trailists	37,2	24,6	17,0	21,2

The greatest number of respondents (56) fall within group C and their results are inevitably similar to those of the average of all the trailists.

Since the sum of the relative importance of all the factors must always be 100 the sum of the differences between two groups must always be zero. Thus the importance of the difference is the emphasis it places on one attribute relative to the other. Table 3.25 shows the greatest range of differences of either of the two preceding tables (Table 3.22 and 3.20). The respondents who had never repeated a trail certainly appear to have different perceptions to those who have been on trail more than once. (Group B and C) These differences may be summarised as follows :

Been on trail once	Been on trail repeatedly
Rank the GROUP interaction as the most important attribute; placing the greatest emphasis of any section of the respondents on this attribute. (Ranked 19 units above any other)	Rank GROUP interaction as the most important attribute but not to the exclusion of other attributes.
Rank the remaining three attributes, AWARENESS, IMPACT and GUIDE on a par.	Place more emphasis on AWARENESS than on GUIDE or IMPACT. Rank IMPACT as the least important attribute.

This would imply that the initial response of trailists to their first trail experience is one of appreciation of the GROUP INTERACTION. This aspect so dominates their impressions that the other attributes are all ranked equally. On subsequent trails they have more confidence about what to expect (and perhaps themselves) and they then start to place more emphasis on AWARENESS as they personally gain more knowledge and a deeper understanding of their place in the environment. GROUP INTERACTION then plays a far less important role and IMPACT is also perceived as being less important. By the time of their third trail the participants value the importance of the attributes according to the average response.

3.3.6 Influence of trail

This question was not expected to yield meaningful results but was included, since many guides claimed that a guided wilderness trail can influence a person's life. The exact question was "To what extent did the trail experience influence your life?" There were three choices - strongly, moderately and insignificantly. A number of respondents said that the experience did not influence them because they

were already "heavily oriented towards wild-life". Only three people did not respond to this question. Many people may have given the answer they thought was being elicited from them - viz. strongly. One respondent stated that the trail experience had influenced his life insignificantly but had strongly influenced his attitude and understanding. In retrospect it would have been better to have posed the question - "To what extent did the trail experience affect your attitude towards conservation?" In addition it would have been more appropriate to give a choice of five rather than three answers. The actual replies are reflected in table 3.26 of the 11 people who replied that the experience had an insignificant influence on their life, five had been on two or more trails.

Table 3.26 Trails influence on respondents

	STRONG	MODERATE	INSIGNIFICANT	TOTAL
Number	61	46	11	118
Percentage	51,7	39,0	9,3	100

The perceptions of the three groups of respondents is shown in Table 3.37.

Table 3.27 Perceptions of the influence of the trail.

RELATIVE IMPORTANCE	ATTRIBUTE			
	GROUP	AWARENESS	IMPACT	GUIDE
Strongly	36,8	24,3	18,1	20,8
Difference	+0,8	0,8	-1,8	+0,2
Moderately	37,6	25,1	16,3	21,0
Difference	+3,0	-3,1	-1,7	+1,8
Insignificantly	40,6	22,0	14,6	22,8
All Trailists	37,2	24,6	17,0	21,2

The above table shows small variations between the "average" trailist and those who claimed some form of influence of the trail on their lives. The table also shows an important difference between the "average" trailist and those who claim not to have been influenced by the trail. This latter group placed more emphasis on GROUP INTERACTION and GUIDE but less importance on IMPACT and AWARENESS. The table also shows that the stronger the influence of the trail the less importance is attached by respondents to the GROUP INTERACTION and GUIDE and more importance is attached to IMPACT. This could be interpreted to mean that the 90% of respondents claiming that the trail had an influence on their lives were infact influenced by it. Their attitude towards their environment is different to the other group in that they cared less about GROUP INTERACTION and the GUIDE and more about the IMPACT on the environment.

3.3.7 Sex of trailists

37 or 31,4% of the respondents who completed the questionnaire were women and 81 or 68,6% were men. (3 people did not indicate their sex) An analysis of their perceptions is shown in Table 3.28

Table 3.28 Perceptions of trailists according to their sex

RELATIVE IMPORTANCE	ATTRIBUTE			
	GROUP	AWARENESS	IMPACT	GUIDE
Female	37,7	22,4	19,4	20,5
Difference	-0,1	+1,9	-2,6	0,8
Male	37,6	24,3	16,8	21,3
All Trailists	37,2	24,6	17,0	21,2

The females give GROUP INTERACTION and GUIDE the same importance as do the males. There is however an important difference in perception between the two sexes. The females have placed more emphasis on IMPACT and less on AWARENESS.

3.3.8 Age of trailists

The ages of the trailists was broken down into different categories which are shown in table 3.29.

Table 3.29 Age distribution of trailists

Age Range	No. of responses	% of respondents
14 - 19	12	9,9
20 - 25	11	9,1
26 - 35	23	19,0
36 - 45	37	30,6
46 plus	38	31,4
Total	121	100,0

The first two groups were combined to give 23 respondents and these together with the remaining three groups were analysed. Their responses are shown in Table 3.30.

Table 3.30 Perceptions of trailists dependant on age

RELATIVE IMPORTANCE	ATTRIBUTE			
Age Range Years	GUIDE	IMPACT	AWARENESS	GROUP
14-25	20,5	16,9	24,3	38,3
Difference	-0.2	+1,2	-1,0	0,0
26-35	20,3	18,1	23,3	38,3
Difference	+1,6	-1,4	+1,0	-1,2
36-45	21,9	16,7	24,3	37,1
Difference	-0,9	+0,9	+0,7	-0,7
46 plus	21,0	17,6	25,0	36,4
All Trailists	21,2	17,0	24,6	37,2

The above table shows that the age group 26-35 years has a different perspective to the following age group in that they place more emphasis on GROUP INTERACTION and IMPACT and less on AWARENESS and the GUIDE.

An analysis was also performed on the 14 - 19 and 20 - 25 year old groups to see how their perceptions differed from the results of all the trailists. This analysis is shown in Table 3.31

Table 3.31 Perceptions of age groups 14-19 and 20-25 years

RELATIVE IMPORTANCE	ATTRIBUTE			
Age Range Years	GUIDE	IMPACT	AWARENESS	GROUP
14-19	22,5	14,9	22,9	39,7
Difference	-2.7	+2,9	+3,1	-3,3
20-25	19,8	17,8	26,0	36,4
All Trailists	21,2	17,0	24,6	37,2

Despite the small sample size it is assumed that there is an important difference in perception between these two groups. The teenagers stress the importance of GROUP INTERACTION and the GUIDE'S PERSONALITY while placing less importance on IMPACT and AWARENESS. This result can be explained by the fact that people in their late teens are generally very sensitive as to the impression they create with other people.

3.3.9 Home language of trailists

Most respondents, 109 or 90% were English speaking, 4% were Afrikaans speaking and 6% spoke a European language (mostly German). No analyses of perceptions were made on these groups.

3.3.10 Level of education of trailists

There were five levels of education. These and the number of responses are shown in Table 3.32

Table 3.32 Level of education of trailists

EDUCATION	NO. OF RESPONDENTS	% OF TRAILISTS
High School	12	10.0
High School completed	13	10,7
Post School diploma	30	24,8
Some university	15	12,4
University degree	51	42,1
Total	121	100,0

This shows that the respondents were generally very well educated.

The respondents were combined into three groups for the analysis:

Group A - 27 respondents who had attended or completed high school.

Group B - 44 respondents who had attained a diploma or attended university.

Group C - 50 respondents who had obtained a university degree.

Their analyses are shown in Table 3.33.

Table 3.33 Perceptions according to level of education

RELATIVE IMPORTANCE	ATTRIBUTE			
Education	GUIDE	IMPACT	AWARENESS	GROUP
Group A High School	22,0	17,3	23,5	37,2
Difference	-2,0	+1,3	-1,1	+1,8
Group B Diploma	20,0	18,6	22,4	39,0
Difference	+1,8	-2,2	+4,2	-3,8
Group C University	21,8	16,4	26,6	35,2
All Trailists	21,2	17,0	24,6	37,2

The respondents with a university education have a different perspective to the other two groups. The difference can be regarded as important. Degreed respondents placed less emphasis on GROUP INTERACTION and more on AWARENESS. They also placed less emphasis on signs of man's IMPACT on the environment. Their perspective on AWARENESS is the highest recorded for trailists and it seems to indicate the graduates greater appreciation of the need for self actualisation, Maslow (1962).

Group A, respondents who had the least education, gave values for the attributes which were similar to the average value.

3.3.11 Level of income of trailists

The respondents were asked to indicate one of three ranges for their family's monthly income. The results are shown in Table 3.34.

Table 3.34 Level of income of trailists

LEVEL OF INCOME	NO. OF RESPONDENTS	% OF RESPONSES
Up to R1 600	16	13,6
R1 601 to R3 200	49	41,5
R3 201 and over	53	44,9
Total	118	100,0

This shows that an equal proportion of respondents were in the middle and upper income groups. The proportion of trailists in the upper income group 44,9% is similar to those who have a university degree 42,1%. A check of the upper income group shows that infact 24 out of the 53 respondents did not have a university degree - they should therefore be analysed separately. An analysis of the respondents perceptions according to their level of income is shown in Table 3.35.

Table 3.35 Perceptions according to level of income

RELATIVE IMPORTANCE	ATTRIBUTE			
Income	GUIDE	IMPACT	AWARENESS	GROUP
Up to R1 600	20,0	19,9	21,8	38,3
Difference	+0,3	-0,9	+0,6	0,0
R1 601 to R3 200	20,3	19,0	22,4	38,3
Difference	+2,5	-4,5	+5,1	-3,1
R3 201 and over	22,8	14,5	27,5	35,2
All Trailists	21,2	17,0	24,6	37,2

Table 3.33 shows that there appears to be a change in perspective on all four attributes depending upon the level of income of the respondents. This change is regarded as important because it is the only analysis (out of the nine different groupings of trailists) that has shown a progressive change in all four factors. The initial change between the lower and middle income groups is small but the change between the middle and upper income groups is large.

With increasing levels of income there is :

a) A reduction in the importance of GROUP INTERACTION;
b) A major reduction in the importance of IMPACT - signs of modern man in the environment;
c) An increase in the importance of AWARENESS, and
d) A greater emphasis is placed on the GUIDE'S PEROSNALITY.

The respondents in the upper income group showed a perception which was the closest of all trailists to that of the GUIDES. Table 3.36 shows the comparison.

Table 3.34 Comparison of Guides and Upper Income Group Perceptions

RELATIVE IMPORTANCE	ATTRIBUTE			
Group	GUIDE	IMPACT	AWARENESS	GROUP
Guides	22,6	14,7	31,2	31,6
Upper income	22,8	14,5	27,5	35,3

For a summary of the major differences in perception between the different groups of Guides and Trailists see section 3.3.12 and 3.3.13.

APPENDIX IX

This appendix contains the replies (111) of those traillists who responded to the question -

"Which aspect of the trail(s) means the most to you?"

These answers have been grouped (very roughly) under the same headings as those used for the test of perceptions - namely:

GROUP INTERACTION,
IMPACT OF MAN ON THE ENVIRONMENT,
INCREASE IN AWARENESS

The attribute GUIDE'S PERSONALITY was not used as although the guide's personality was mentioned it was always linked with one of the other attributes and it was only mentioned six times. IMPACT and GROUP INTERACTION were mentioned less than 20 times each and the balance of the reasons given can be credited to the attribute AWARENESS.

It would seem that in response to the survey on which attribute contributes most to a successful trail the answer has been GROUP INTERACTION but, when reflecting at home on what aspect (attribute) currently means the most, the answer is AWARENESS. This apparent contradiction is explained by the fact that the two questions are not the same. The one is asking for the component that contributes to a successful trail, while the other is referring to the aspect of the trail that appeals to the individual.

It is in sharing a wilderness experience, (which has been facilitated by a good guide) that the trailist has gained an increase in awareness. This is the essence of a guided wilderness trail.

GROUP INTERACTION

Good guide, interesting area and good group interaction.
Confidence in the guide and happy atmosphere within the group.
I enjoyed the relaxed outdoor life, meeting other people and the walks and observing the behaviour of the animals.
Fellowship.
Good trails officer and good fellowship.
Good group interaction in a stimulating and natural environment.
Being in the veld with an appreciative group.
Adventure - time for reflection - enjoyment of scenery and people.
Becoming aware of nature, getting to know group of individuals and their reaction in nature.
Isolation, team spirit amongst guide and trailists, lack of civilization! Simple life.
Getting to know the people one is with and to get to know about nature.
The guide was impressive also the wilderness area and the fun of the group experience.
Interaction among trailists.
People and guide and what we get to see of wildlife.
Exercise and lack of city (smells, noises etc.).

IMPACT

No cars, no phones - just bush and animals.
Getting away from the rush of the city and its filth.
Being in the bush.
Basically the feeling of total freedom and nature.
Relaxing atmosphere.
Roughing it - getting back to basics. (I am "Bushwise" having grown up in the Zoutpansberg in the 30's)
Bush life.
Birdwatching; walking; being "away from it all".
Being out in the bush.
Being in the bush away from everything and in wild natural surroundings.
Isolation from "civilization".
To be completely separated from "civilization".
Unspoilt form of nature and no interference from outside world.
Being in nature away from city and noise.
The "getting away from it all" feeling.
Being out in the open away from urban and city distractions.
Being able to be part of nature entirely i.e. no electricity, water or such "civilized" ways of living. I enjoyed the free feeling.

AWARENESS

Learning about the ecological inter-relationships between plants, animals and their environment.
Night watch duty.
It helped clarify my plans for my career and directed me into my present field - that of Animal Physiology/Environmental Physiology.
Man to Nature. I have a better understanding of nature and man's impact upon it.
Ever continuing gathering of knowledge of bush and wildlife - exercise.
Getting to grips with nature.
The chance to broaden my knowledge.
Learning new things insitu.
Learning to appreciate things not noticed before e.g. birds, as opposed to big game, and to a lesser extent flora and fauna.
An increased awareness of and love for the wilderness.
The idea of being alone in the wilderness. The need to protect our wilderness areas.
Wilderness situation.
Being in the wilderness.
Being in an unspoiled environment.
The awareness of how little wilderness remains.
The opportunity of being able to appreciate being in a natural environment
Greater awareness/knowledge of the environment
Get back to nature.
Real exposure to the magnificence of nature.
Relating to nature as it was before man interrupted it.
Taking off my watch and not having to worry about time.
The ability of the environment to cope with anything if one excludes man's influence.
Stillness and peace in nature-silence - few people - learning of nature's balance - harmony.
Being out in the bush with nothing but unspoilt nature around you.
The opportunity to commune with nature in company with expert leaders and congenial companions.
The opportunity of come to one with nature, harmony of the out-of-doors.
The wild life and wilderness.
Solitude; peace, opportunity to study bird life.
The wilderness experience - being out and away from the city.
Unspoiled wilderness and solitude.
Appreciating God in His creation.
Being out in the open in quiet, wild places and getting there on foot.
Being in a wilderness area and learning a little of nature's ways.
Wilderness awareness.
Having my <u>six</u> senses sharpened!
Becoming aware of, and at one with nature.
Unspoilt, true nature, wilderness & a knowledgeable guide.
Promoting awareness of wilderness/oneness with nature.

The beauty, serenity, being close to nature and learning so much.
The feeling of getting close to nature/God.
Awareness of nature and the complexity which is involved.
The feeling of being in the wilderness and learning more of nature.
All the rhythms.
Knowledge of environment gained and isolation.
Development of the individual's awareness of the importance (psychological + ecological) of the wilderness. This can be transmitted to others in ordinary life.
Getting down to a real appreciation of nature/animals/wilderness.
Walking and consequently seeing more facets of nature.
Unspoilt (relatively) wilderness freedom and education received.
It is in the freedom of the animals and the beauty of the wilderness, that I see the beauty of God.
Experiencing the wilderness just as it is.
The experience of wilderness.
Being out in the bush with someone who can explain things.
The opportunity to commune with nature away from the trappings of everyday and professional life.
Living simply and in the open - the awareness of natural things - the silence that speaks.
The proximity to nature as a result of being on foot and the tranquility and loneliness of the wilderness.
Being close to nature, in the right environment.
The sense of oneness with nature and the creator.
The aspect of being far from noise and the feeling of being close to nature.
Area of trail and leader.
Feeling at one with the wilderness and on a par with the game.
Ability to be in the wilderness, with a small group, uninterrupted by outside influences
Being able to view wildlife from such close quarters; having everything explained.
The wilderness, beauty, sharing experience with people of similar concern for nature.
Wilderness experience with an informed, sensitive guide.
The <u>whole</u> aspect of "Man to Earth : Man to Man : Man to God".
Watching animals in absolute quietness and getting the feeling of being part of the Wilderness.
Observing animals whilst sitting somewhere, preferably alone.
The solitude - being alone - the quietness.
Quietness, times on my own, birds.
Remoteness & naturalness of natural systems however the Guide must be knowledgeable.
Tranquility.
Solitude and peace and quiet.
The peace - stress free environment.
The total lack of noise pollution and being able to walk and observe and listen in silence.
Solitude spiritual, restoring nature of wilderness.

The quiet time allowed in the wilderness.
Appreciating natural beauty and having silent times to think.
The peace and quiet of the bush.
Peace (natural noises), walking.
Solitude and being reduced to a small part in the whole of nature.
My dependence on the basic elements, water, fire, shelter and the experience of solitude 1,000 years old.
The stillness and using all one's senses to identify what is going on around you, and how it all meshes together (including oneself).