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An Exploratory Study of Consumer Psychology

Using the Process Descriptive Approach.

A thesis presented in partial fulfilment
of the requirements for the degree of
Master of Arts in Psychology at
Massey University.

Patrick Alfred Smyth.

1985.

ABSTRACT.

Information chunking under Brand Name and the ability to predict attribute preference were investigated, using a simple paired comparisons test with an expected value decision criteria, and a behavioural search process. Subjects in condition one were presented with eight different product attributes (including Brand and Manufacturer's Name), while subjects in condition two were given only six different attributes (Brand and Manufacturer's Name were unavailable). Both groups completed a simple paired comparison test and two weeks later each subject was allowed to select product information, item by item, from an information displayboard corresponding to the experimental group to which they belonged. Evidence for the chunking of information under the guise of the Brand Name attribute was found - more information was sought when Brand Name was available than when it was not. It was also found that Brand Name information was accessed more than any other type of product information, and when this information was not available, attribute preferences changed and Cents/gram information was accessed most. This caused a change in product selection. Subjects were found to adopt a satisficing approach to the information search task, accessing only a small subset of the total available information, and only a subset of the attributes presented to them. The simple paired comparison test with its expected-value decision criteria accurately predicted the order of attribute selection in the behavioural search. The results suggest the existence of choice heuristics for consumer decision making as outlined by the information processing approach to consumer psychology.

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Chapter One :

Introduction.

1.1 OVERVIEW.

The process descriptive approach to the study of consumer behaviour was developed by Jacob Jacoby (1975) and the members of the research team at Purdue University. The approach is part of the information processing approach to consumer psychology and was developed in response to a number of problems resulting from the use of verbal protocols and the modelling methodology within the use of decision nets by Bettman (1974).

Traditional approaches to studying information acquisition behaviour have relied on self-administered questionnaires and interviews with recent buyers. Such approaches have a number of weaknesses:

- (1) they measure what consumers say they do, and not what they actually do in the purchase situation. (Jacoby, Chestnut, and Fisher, 1978)
- (2) the correlation between self-reports and behaviour provides a low positive correlation. (Jacoby, Chestnut, and Fisher, 1978)
- (3) self-report measures misrepresent the search process by collapsing the flow of information acquisition into a static cross-sectional mould. That is, data relevant to selective exposure and the sequencing of information acquisition are obscured by the process. The investigator is left to draw inadequate inferences about what actually happened in the temporal sequence leading up to the purchase decision. (Jacoby, Szybillo, and Busato-Schach, 1977)
- (4) interviews and questionnaires provide, at best, only crude micro-assessment, in that consumers typically remember only the

outlines of their behaviour, not the item by item search.
(Jacoby, Szybillo, and Busato-Schach, 1977)

The process descriptive approach assumes the expectancy-value approach, as it attempts to discover the value imparted by consumers to certain types of product information.

In an attempt to answer why the decision-makers behaves as they do, the process descriptive approach can be enhanced by integration with psychological scaling methods. Depending on the scaling technique, it is possible to obtain prior estimates of an individual's preferences for items of information ultimately accessed during predecision information search. The approach allows the researcher to study information search and product choice under the condition of the self-selection of information when the preference for the information acquired is already known.

Previous attempts to link scaling techniques with the process descriptive approach have been made by Sheluga, Jaccard, and Jacoby, (1979), with some success. As a result of this, the present study will, in an exploratory fashion, attempt to provide a more parsimonious method of obtaining attribute preference ratings (using the simple paired comparisons test) than that provided by Sheluga, Jaccard, and Jacoby, (1979).

The present study will also look at a number of findings made by researchers using the process descriptive approach, with a view to adding support to previous research.

1.2 CONSUMER PSYCHOLOGY

Consumer psychology as defined by the bylaws of the Division of Consumer Psychology (Division 23) of the American Psychological Association is:

"The study of human behaviour as it relates to the consumption of goods and the use and acceptance of services." (Twedt, 1965)p.266.

Possibly the greatest similarity that consumer psychology has with any other branch of psychology is with organisational psychology. In the process of trying to understand human behaviour, both consumer and organisational psychology trace a large amount of their conceptual and methodological heritage back to social psychology. While consumer psychology has drawn very heavily from social psychology in the areas of attitudes, communication and persuasion, organisational psychology has also used social psychological studies of leadership and group behaviour as a basis.

A second similarity is that both of these fields of study have provided excellent testing grounds for general social psychology propositions. Together, the working-producing and buying-using contexts account for most human waking hours. It is only natural, then, that social psychological concepts be incorporated into and tested in these domains in order to establish construct validity, or the generality of the findings.

Since both consumer and organisational psychology have developed out of social psychology, what can be said of their relationship to each other? Firstly it must be emphasised that it has only been in the last

ten years that there has emerged a systematic, programmatic orientation to consumer behaviour research. Because of this there exists a lack of replication of many of the discoveries made by researchers. There also exists a questionable generality concerning findings. As such, many findings should be regarded more as hypotheses than verified statements of fact.

A second point to note about the relationship between consumer and organisational psychology is that while they have existed for a comparable length of time, both the speed of development and the amount of published literature differs. Organisational psychology has easily surpassed consumer psychology in these aspects. Reasons for this may be:

- 1) that while business firms may be willing to share knowledge gained about the management of people, they are less willing to divulge information about consumer reactions and promotional developments.
- 2) it was not until the early 1960's that the Journal of Advertising Research and the Journal of Marketing Research were developed. It is only relatively recently (1974) that the Journal of Consumer research has appeared.

Finally, in considering the relationship between organisational psychology and consumer psychology it is noted that some of the discoveries made in consumer psychology may be considered as out of date to organisational psychologists. Jacoby (1969) views this as a desirable state of affairs since it reflects a certain degree of construct validity for both fields.

Numerous different approaches have been taken in the investigation of this area of human behaviour. Some of these will now be outlined.

The psychobiological approaches to consumer behaviour.

This approach looks at the relationship between behaviour and the physiological processes of the nervous system, in particular the physiological processes which take place in the brain. Psychobiology emphasises that psychological processes originate from physiological ones and that there are biological limits to the conscious and deliberate control of behaviour. (Kroeber-Riel, 1979) This rationale supplies a number of insights for consumer research. The most prominent insight is that to a large extent the consumer responds automatically according to biologically determined patterns of behaviour.

The main practitioner criticisms of the approach are that it is too costly in terms of both time and money, it is too complicated requiring specialist skills, and the equipment used is very expensive to implement.

A behaviourist approach to consumer behaviour.

Much of the work performed by behaviourists in consumer research is based around the Pavlovian learning model, with its four components of drive, cue, response, and reinforcement.

Behaviourism within consumer research suggests the pairing of environmental stimuli with the attributes of a particular product, brand, or store (Ehrenberg, Goodhardt, and Collins, 1975). The approach does not provide a complete theory of behaviour. For instance it leaves out such considerations as the role of perception, the subconscious, and

interpersonal influences.

The use of attitude research in respect to the consumer.

The area of attitude research has received more attention and interest from consumer researchers than any other. Most research conducted along these lines has been centered around the Fishbein Extended Attribute Behaviour Model (Fishbein and Ajzen, 1975).

$$A_j = \sum_{i=1}^n b_{ij} \times a_{ij}$$

where,

A_j = the individuals attitude toward an object j,

b_{ij} = the individuals belief that object j is associated

with some other object i,

a_{ij} = the individuals affective orientation towards that

that object,

n = the number of salient beliefs about object i.

In these models, consumer behaviour is seen as simply being a human action which involves a choice among various alternatives and for which no hidden or unique processes have to be invoked in order to account for the behaviours displayed. It is believed that the needs or motives a person has, influence the information that a person seeks about a product. These

needs also influence the person's attention to, and perception of the product's attributes. However, these needs and motives can also be changed or modified by means of exposure to the product, to the advertising, or to other social and cultural forces.

The cognitive response approach to the study of consumer behaviour.

Cognitive response is an attempt to develop a conceptual understanding of the psychological processes which mediate attitudinal acceptance of the information provided by marketers. (Wright, 1973)

Cognitive response, especially as proposed by Wright (1973), assumes the model of perception proposed by Gibson (1966). It contends that if the receiver is an active information seeker and processor, then the person can be expected to attempt to compare the external information to his or her existing structure of beliefs and values. These relational activities are seen as generating a body of cues (spontaneous cognitive responses, or critical thoughts) which research suggests are the actual primary mediators of message acceptance.

The use of an attribution theory approach to consumer research.

Attribution theory attempts to describe the information people use in making causal inferences and how they use that information, by dealing only with the processes by which attributions are derived from information input (Kelley, 1967).

In respect to consumer behaviour, attribution theory states that an

individual will attribute observable events to their underlying causes on the basis of covariation of cause and effect. For example, a persuasive message such as an advertisement can be regarded as an observable effect by the receivers of the message. Principal among the causes to which it might be attributed are:

- a) the desire of the advertiser to sell his product,
- b) the actual characteristics of the product being advertised.

If the brand is always being praised by the advertiser, and if the message content does not vary over product characteristics, then the effect would covary with the advertiser and would be attributed to the advertiser's desire to sell the brand of product. If, instead, the advertiser claimed that the product was superior to some other products in some respects and not in others, then the effect would be seen to covary with the characteristics of the product, rather than with the advertiser. The message would be attributed to the actual characteristics of the product, and would lead to a higher degree of certainty about the claims made about the product and an increased probability of purchase. (Settle and Golden, 1974)

Cognitive dissonance in consumer research.

The application of the theory of cognitive dissonance to consumer research was made by Festinger (1976). Festinger claimed that the individual strives toward being consistent. The individual's opinion and attitudes tend to exist in clusters that are internally consistent. Consistency is regarded as being the desirable state of affairs within the individual, that is, the state the individual strives to attain.

However, when an individual encounters inconsistencies which cannot be rationalised, psychological discomfort or dissonance occurs. The person is then motivated to resolve such states of tension.

The application of this theory to consumer behaviour can be viewed in a number of ways. For example, a consumer purchasing an item will seek to buy that item which will cause the least possible dissonance with his or her beliefs about the attributes that a product of this kind should have. Dissonance may also occur between what a consumer expects of a certain product and what the product is actually like. In such cases dissonance reduction is attempted by further study of the advertised attributes or by changing to another brand of that product.

In another case, a consumer may be faced with the following situation. Person A may like person B. Person B may also like brand X, however person A may dislike this brand. What then is person A to do? If person A buys brand X to please person B, then this will cause dissonance, but also not buying brand X will cause dissonant feelings for person A. In this case person A's desire to buy brand X will be weighed up against the desire to remain entirely consistent with feelings towards person B.

The family decision making approach to the study of consumer behaviour.

As of yet no overall theories have been constructed to guide this approach. However research seems to have progressed along three distinct lines.

- 1) the involvement of family members in economic decisions.
(Davis, 1976; Kassarian and Robertson, 1981)

- 2) the process by which family decisions are made.
(Robertson and Zielinski, 1981; cited in Kassarian, 1982)

- 3) the consequences of different family structures and decision making styles. (Alderson, 1965)

The study of pupil dilation in the consumer.

The idea of taking pupillary dilation as a measure of the amount of load on memory and the amount of effort involved in the storing of information was devised by Hess and Polt (1960). Initially the approach was very popular, however the inability to replicate many findings caused it to fall into disuse (Rice, 1974). Recently (Watson and Gatchell, 1979) it has been used together with measures of electrodermal activity and heart rate to good effect.

Brain hemisphere lateralisation.

This approach studies the differing activities of right and left brain hemispheres and relates this to consumer behaviour (Weinstein, Appel, and Weinstein, 1980). It has been known for some time that humans show some specialisation in the use of the right and left hemispheres of the brain. The left hemisphere is primarily responsible for traditional cognitive activities relying on verbal information, symbolic representation, sequential analysis, and the ability to be conscious and to report what is happening. The right hemisphere is more concerned with pictorial, geometric, timeless, and non-verbal information (Hansen and Lundsgaard, 1981; cited in Kassarian, 1982).

From research in this area it has been proposed that, even when attention is not present, the individual is still able to receive and store information. This process is regarded as being particularly efficient with respect to pictorial material, since it is stored in a holistic, unedited, and non-verbal fashion (Hansen and Lundsgaard, 1981).

While this list is by no means exhaustive, it does serve to emphasise the large number of approaches that have been taken from within psychology to the study of consumer behaviour.

Probably the most widely respected approach to the study of consumer behaviour is the information processing approach. The approach has provided the basis for much research and is also the foundation for the present study. A description of the approach is therefore necessary for an understanding of the present research.

Chapter Two :

Consumer

Information

Processing.

2.1 INTRODUCTION.

Consumers are involved in many different kinds of choices: which brand to buy, which store to shop at, which information to examine and so on. While the specific focus within each decision may differ, the basic element of selection between alternatives does not. Choice among alternatives is the central unifying concept behind an information processing theory of consumer behaviour.

An information processing approach views the consumer as a processor of information. The consumer is seen as interacting with their choice environment, searching for and taking in information from sources, processing this information, and finally making a selection between choices.

At least two reasons exist for adopting an information processing perspective. Firstly, some of the major phenomena related to consumer choice concerns the provision of information to consumers and their reactions to that information. How that information is reacted to, interpreted and integrated with other information has a crucial impact on choice. Hence, decisions on what, how much, and how to provide that information, require knowledge of how consumers process, interpret, and integrate information in making choices. Given this, information processing is a central component of choice behaviour.

Secondly, previous research on choice, despite its contributions to the explanation of consumer behaviour, is unable to provide an account of how consumer information is reacted to, interpreted, and integrated with other information.

2.2 PSYCHOLOGICAL RESEARCH ON CHOICE.

One shortcoming with psychological research on consumer choice is that, in many cases, only limited aspects of the choice process are considered in any particular research stream. For example, research has considered areas such as motivation (Weiner,1972); attention (Kahneman,1973); memory (Norman,1976); and learning (Estes,1975) from an information processing perspective. Yet none of these topics have been integrated into a model of consumer choice which utilises all of the concepts together.

Some psychological research has attempted to formulate an overall model of choice. Examples of these are as follows:

Stimulus-response approaches to choice.

The stimulus-response approach attempts to characterise the links between stimuli and responses, the most specific approach being drive theory (Hull,1952, Spence,1956). Drive theory contends that behaviour is instigated by the onset of stimuli, which then leads to a state of drive. Depending upon past rewards and punishments, the individual will possess various degrees of habit strength for potential responses to the stimuli. Behaviour is seen as being determined by the interaction of the level of drive with habit strength.

Problems exist in this approach. Firstly, humans are considered to be 'stimulus-bound'. The consumer is regarded as being in an inactive state until presented with the stimulus. However, as Atkinson (1964), Gibson (1966) and others have pointed out, this may be an erroneous conception.

Human beings are better viewed as being active, searching the environment for information and moulding it to suit their purposes more precisely.

Secondly, since this information must always be interpreted by the consumer in the light of the situation in which it is presented, the meaning of particular pieces of information cannot be considered as fixed. This seems to be outside the views of drive theorists who did not consider such interpretation processes.

The information processing approach solves both of these problems. It views the consumer as actively selecting and acquiring information, and actively deciding how much processing to engage in, whether the information be internal or external.

Expectancy-value approaches to choice.

In this approach, behaviour is determined by two components, expectancy and value. The expectancy component (E_i) refers to beliefs that actions will lead to certain outcomes, while the value component (V_i) refers to the value of these outcomes. The overall value for an action is given by $E_i \times V_i$ and the action chosen would be that action which maximises the expectancy-value summation.

This can be represented algebraically as :

$$V_j = \sum_{k=1}^n (V_k \times I_{jk})$$

where

V_j is the valence of outcome j (that is, the affective orientation to the outcome).

I_{jk} is the cognised instrumentality of outcome j for the attainment of outcome k .

V_k is the valence of outcome k .

n is the number of outcomes.

The model views individuals as having anticipations about whether actions will lead to goals (expectancies), and as evaluating alternatives.

While this approach takes some important steps not found in drive theory it still has several shortcomings. First, the model assumes a fixed method for comparing alternatives.

Second, the expectancy-value approach, when applied to choice, has focused on static phenomena, that is, given a set of alternatives, the consumer evaluates expectancies and values from memory, and makes a choice. Processes such as attention, information search, memory, and so on, are not considered. Thus only a limited portion of the overall choice

process is examined.

The information processing approach overcomes the first problem associated with expectancy-value models by incorporating the use of a variety of simple heuristics by the consumer. The second problem is overcome by a complete incorporation of all the processes relevant to choice in its theory.

Information processing approaches.

While many information processing approaches have considered only a limited range of phenomena and have not focused on choice, some research has taken a more overall view of choice. McGuire (1976) examined aspects such as exposure, perception, comprehension, agreement, retention, information search and retrieval, decision making, and actions.

In discussing exposure, he considered the factors which influence the kinds of information a consumer will be exposed to, including both demographic and psychological characteristics. In the treatment of perception, examination was made of attention levels and selective perception. Comprehension considered the issues of encoding and understanding, while the agreement component involved considering how information was evaluated.

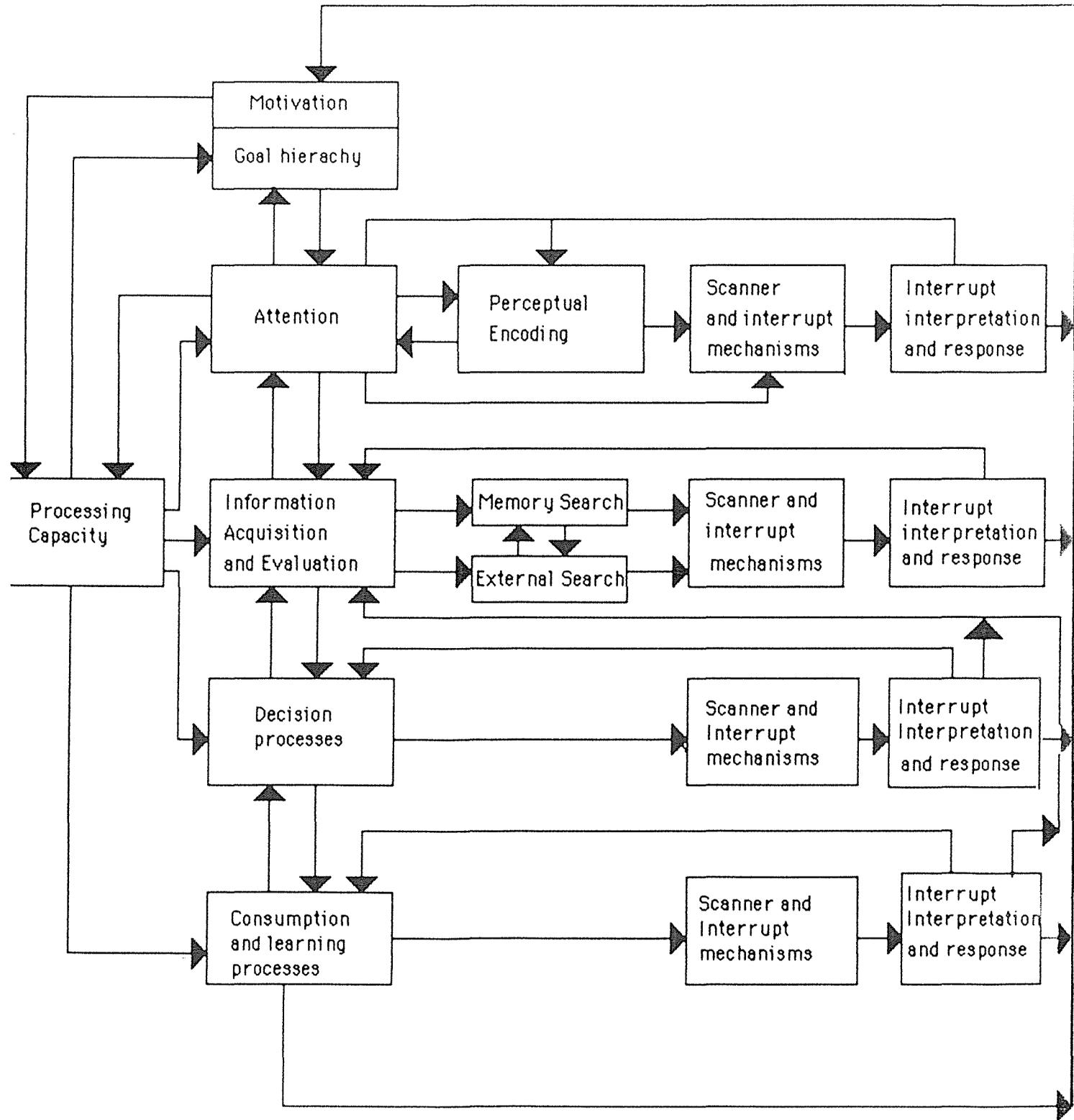
Retention and information search and retrieval were found to be mainly concerned with memory and search strategies. McGuire also considered the use of choice strategies and how information is integrated into the consumer's decision making component. These components are presented as successive steps in the processing of information.

Newell and Simon (1972) also considered an information processing theory of choice. In their conception the individual is visualised as having both information input and output mechanisms, processes for interpreting and processing information, and memories for storing and retrieving information. Their work has been very successful in modelling problem-solving behaviour, since it emphasises the use of simple heuristics, the impact of goals, and the impact of properties of the choice task. Despite its success, the work of Newell and Simon does not provide a readily usable framework for understanding consumer choice, since the model focuses largely on well-structured problems. Such problems are not characteristic of consumer choice.

2.3 BASIC CONCEPTS OF THE INFORMATION PROCESSING THEORY OF CONSUMER CHOICE.

Figure 2.1 presents the model utilised in the theory. The basic concepts of the model are processing capacity, motivation, attention and perception, information acquisition and evaluation, use of memory, decision rules and processes, and consumption and learning. In addition, mechanisms for continually examining the environment (a scanner) and interrupting current behaviour if necessary. As well, means for handling conflict are incorporated.

FIGURE 2.1
 THE BASIC STRUCTURE OF AN INFORMATION
 PROCESSING THEORY OF CONSUMER CHOICE



Although it is not shown in figure 2.1 , the operation of the model is influenced by three other factors. Individual differences and situational influences play a role in the way the components of the theory operate, as does the effect due to the same individual reacting differently to different types of stimuli. These three types of influences modify how the various components operate and interact for any specific choice.

Processing capacity.

It has been hypothesised that human beings have a limited capacity for processing information (Simon, 1974: Lindsay and Norman, 1972: Norman and Bobrow, 1975). This implies that humans cannot make complicated computations or engage in extensive processing without a good deal of effort. Humans also tend to be limited in their ability to carry out many different activities at the same time. Such limitations therefore affect the kinds of strategies or rules that are feasible for consumers to use in various choice situations.

This limited processing capacity also has an affect on the other stages in the choice process. Kahneman (1973) raises basic questions which must be considered in respect to this:

- 1) what influences the demands upon capacity that a particular task makes?
- 2) how is capacity allocated among competing activities?
- 3) what are the effects when activities compete for capacity?

One basic effect is that the consumers develop heuristics, simple rules of thumb that enable them to deal with complex situations without requiring more processing capacity than is available. For example, consumers often limit the number of brands or attributes considered to simplify choice.

Motivation.

Motivation is a crucial concept in any theory of choice. Motivation is not only directive, affecting the choice of one behaviour over another, but also refers to the energizing and influencing of the intensity of actions.

In developing a specific notion of motivation, the choice process is depicted theoretically as a process of moving from some initial state toward some desired state (Newell and Simon, 1972). At the beginning of some choice process, the consumer is characterised as having some amount of information (possibly none) relevant to the choice. The consumer must progress from this initial state to the desired state, which usually culminates in making a purchase. In going from this initial state, to intermediate states, and eventually to the desired state, the consumer uses strategies and heuristics.

From this view of choice, motivation is pictured as a set of mechanisms for controlling the movement from one state to another (Simon, 1967). The particular mechanisms involved are a hierarchy of goals, and an interrupt mechanism and "scanner".

A goal is defined as a specific state which, when attained, is instrumental in reaching the desired end state : the goal object. If a set of goals is depicted as a set of intermediate states which must be attained to move toward the goal object, then the choice process may be viewed as

the consumer's progress through such a set of goals. Since any goal can be broken down into more detailed sub-units, the concept of a sub-goal is necessary. Sub-goals may be directly related to the concept of plans (procedures/actions taken to achieve a goal).

Although goals may have some natural sequencing, progress can often be made on several goals simultaneously (Reitman, 1965). This use of the term 'goal hierarchy' differs from that of Maslow (1954) whose hierarchy of motives implies that one motive must be satisfied before another becomes relevant.

The hierarchy of goals functions to direct behaviour. The goals themselves may be developed through a procedure where goals at some level are considered as an end, and more specific plans (subgoals) are developed for attaining that end. This type of procedure has been called means-end analysis by Newell and Simon (1963). In general a goal hierarchy is continually being constructed and developed as a choice process proceeds, rather than being developed in its entirety, stored in memory, and retrieved as a whole. There are differences in the extent of hierarchy development which occur both between individuals and between different choices for the same individual.

A second important facet of goal hierarchies is the extent to which such hierarchies must continually be consciously constructed. For many choices, the consumer will possess a strategy which has proven success, or the consumer will utilise learned rules and simple strategies that can be applied in many situations. However, in other situations consumers may need to develop hierarchies when their knowledge is limited and the development of such a hierarchy is considered to be worth the effort.

Often the consumer decides how much processing capacity to allocate and how detailed a process to follow, but such a conscious decision does

not always occur. The choice environment itself may influence intensity. In general, though, the point at which processing occurs is a function of the choice environment and the amount of processing desired by the consumer, a priori. Prior experience also influences processing intensity: habitual decisions use a learned response strategy, while unfamiliar decisions may require more extensive processing.

The description so far implies that consumers progress methodically from goal to goal till the attainment of the goal object. This would be an inadequate depiction without some process for interrupting goal progress when necessary, and without some procedure for distractibility. Simon (1967) proposes a 'scanner', a mechanism for continuously monitoring events occurring in the environment which notices when conditions require changes in current activities. In addition, he proposes an interrupt mechanism which can halt progress on current activities and initiate responses to the conditions encountered. Both of these mechanisms facilitate adaption to changing conditions, meaning that the goal hierarchy can be reconstructed in response to the demands of the moment.

A major source of interrupts is the change of environmental conditions from those expected. In respect to the consumer, when this happens a decision must be made as to whether current goals still make sense, or whether a change in the goal hierarchy is required.

Motivation is a pivotal concept; the goal hierarchy provides direction for other stages in the theory, and feedback from these other stages leads to changes in the goal hierarchy. While consumer behaviour is often goal-directed and requires active decision making, it is not regarded as being necessarily passive and responsive to the stimulus. The response resides within the consumer, not within the stimulus.

Attention and perceptual encoding.

Kahneman (1973) distinguishes between two basic types of attention: voluntary and involuntary. Voluntary attention refers to the conscious allocation of processing effort to activities related to current goals and plans. That is, given a goal hierarchy, the particular goal being pursued leads the consumer to focus attention on those aspects of the environment relevant to attaining that goal. Involuntary attention is the allocation of effort to stimuli based more upon automatic mechanisms than upon current goals.

Perceptual encoding is regarded as the process by which the individual, having attended to some stimulus, interprets that stimulus. That is, the individual develops some notion of the meaning of the information to which he or she has given attention.

It is proposed (Lindsay and Norman, 1972) that an interpretation is actively constructed using both information from memory and the perceptual input itself. Such a process implies that individuals may look for and see what they expect; and that this has an influence on attention.

There are two types of interrupting events relevant to attention and perceptual encoding : conflicts and learning about the environment. Conflicts arise because an individual possesses competing and incompatible response tendencies (Berlyne, 1957). Conflict during perceptual encoding and attention are due to parts of the environment competing for attention, disagreement between what was perceived and what was expected and so on. This conflict leads to an interrupt (Berlyne, 1961) where the effects of such an interrupt depend on the state of the individual at the time.

In considering this point several theories (e.g., Hansen, 1972; Howard and Sheth, 1969) of consumer choice propose optimal level theories. That is, there is some optimal level of conflict such that if conflict is below this optimal level actions will be taken to increase the conflict. If conflict is above the optimal level, actions are taken to decrease the conflict. In theories where no optimal level notion is incorporated conflict is regarded as being assessed. Decisions are made about whether it can be tolerated, and if not how it can be handled.

While this notion of an active conflict response strategy, as opposed to the fixed pattern of response (optimal level theories), makes theorising more difficult, it safeguards the flexibility of human responses to conflict, rather than limiting them to a single pattern of responses.

The second major type of interrupt event, learning about the purchasing environment, is different in nature since it occurs when not directly relevant to current purchases. Within psychology such a phenomenon is discussed as latent learning (Hilgard and Bower, 1966).

Such learning can arise from interrupts which attract the consumer's attention. The effects of interrupts such as conflict and learning about the environment upon the choice process is dependent upon the strategies followed by the consumer, but often they lead to changes in the goal hierarchy. Mintzberg, Raisinghani, and Theoret (1976) provide evidence on interrupts and their effects in relation to organisational decision making.

Two major sequences in the attention and perceptual encoding process, which both assume that attention is allocated, are incorporated into the theory : voluntary attention to and perceptual interpretation of information relevant to current goals and, involuntary attention to and perceptual interpretation of interrupt events. There is also evidence which indicates that learning about the environment can occur with

minimal conscious allocation of attention (Krugman, 1965: Robertson, 1976: McLaughlin, 1965). While the approaches taken by these researchers may differ in definitions and research methods, they all refer to the idea of learning about the environment passively, with little conscious involvement, and without such learning being connected with a current goal.

Information acquisition and evaluation.

Information acquisition and evaluation are heavily influenced by motivation, attention, and perception. In the habitual choice situation where an immediate decision is made, there is no need for further information beyond what is necessary to actually choose the item. However in the complex choice situation, a specific goal for information search exists and more information may be needed.

Initially this search may be internal with memory being searched for information. The retrieval may not always require conscious effort, since information may be readily accessible through strong association with a stimulus. However, in other situations, a more conscious processing effort may be required.

The consumer may find that insufficient information is possessed so, further information is sought externally. Such an action may require changing the immediate goal hierarchy and redirecting attention and perceptual encoding until the process is completed and enough information is obtained.

The decision regarding when to cease the information search is influenced by many factors, including : the original goal concerning the depth and extent of the process, information availability, perceived cost

of obtaining information, the value of the information in helping choice, as well as the conflict response strategies used by the consumer. These processes are based on the assumption that an active search for sources of information takes place.

Information is also taken in while the consumer is not actively searching and because such learning occurs (that is, learning without a specific information search goal) studies of information search during the purchase process are very misleading if only external search is monitored. Internal search for previously learned information is extremely important.

As information is acquired by the consumer, it is actively processed and evaluated, and if necessary put into memory. The scanner and interrupt mechanisms also affect information search and retrieval. A major cause of an interrupt may be some form of conflicting information :

- a) from differing external sources;
- b) between an external source and information in memory; or
- c) between expectations and an external source.

Lack of information can act as a further source for interrupts. In all of these cases a decision is made concerning how to handle the conflict: to continue or to seek more information. Ultimately, if an interrupt provides a sufficiently strong conflict, a revision of the consumer's goal hierarchy and information processing may be required.

Decision processes.

The major focus of the decision processes component is on comparison and selection of alternatives - consumers use heuristics, or rules of thumb to accomplish these comparisons. While it is possible to argue that these heuristics are simply one level in the goal hierarchy, it is best to consider these decision processes as a separate component of the theory.

Limitations in processing capacity lead to the development and use of heuristics rather than the use of detailed and complex computations. Heuristics such as testing earlier selections to see if new criteria are met are quite common in consumer choice because they allow the complex tasks to be handled more simply than if extensive processing were undertaken.

Different heuristics may be used by different individuals or by the same individual involved in a number of different choices. Because of this there are important impacts due to the specific choice task properties and individual differences, on how the alternatives are compared. Specifying these different heuristics is not the only characterisation of 'decision processes' within this model. Examination needs to be made of how a choice heuristic is implemented.

There are two views concerning the nature of this implementation. The first contends that the consumer already possesses a repertoire of decision rules in memory, as well as a process which calls on these strategies when required. The heuristic to be used is already constructed, and exists in complete form in memory. It is acknowledged that some calculation or processing may go on in order to carry out this pre-existing rule, but at no time is this rule changed or built up.

The second view proposes a construction of heuristics (Neisser, 1967) from elements (beliefs, evaluations, combination rules, simple heuristics, and so forth) existing in memory. Choice heuristics are not seen as being stored in their entirety in memory: they exist only as subparts, which are put together constructively at the time of processing. Because of this continual reconstruction, rules may differ from one situation to the next, depending on how the fragments are combined and which elements are more salient in the situation. These rules are developed simultaneously with the search, as information is gathered.

It seems that both of these methods are probably used to implement choice heuristics. Construction of heuristics may well occur when a choice is made for the first time, or when previously developed rules are inapplicable. When the consumer has prior experience with a particular choice, the elements may exist in memory. If used frequently, the elements may become organised into an overall response strategy in memory. In this sense the use of stored rules is seen to be the result of learning as the constructive process is repeated.

Finally interrupts can also occur at the decision process stage. Conflict between criteria, and the lack of information for the development of a heuristic are two major interrupts that may occur at this stage.

Effects of consumption and learning.

After the purchase and the consumption of the chosen alternative the outcomes experienced become a source of information to the consumer. The possibility of future choices depends on how the outcome is interpreted, that is, on the specific inferences made about what caused the outcome. Two types of changes in choice heuristics are possible. If the consumption

experience was as expected, simplifications in the choice heuristics are made. If the experience was not as expected the consumer may elaborate on their choice criteria for discriminating among products.

Other factors.

While factors such as individual personality or predispositions, specific choice task or situational factors, and effects due to particular types of stimuli have not been explicitly considered, it is necessary to state that their influence is very important. The choice of conflict management strategies, the ability to use memory and so on, are clearly personal factors, and the different types of choice task may require the adoption of different processes.

Summary of the information processing model of consumer behaviour.

Within this information processing model of consumer behaviour a goal hierarchy is seen as guiding the choice process, with interruptions for conflicting stimuli, unexpected events, and so on. Thus the process is considered to be goal-directed requiring active consumer participation. The goal hierarchy may be continually constructed, expanded, simplified, or modified, as the process progresses. Attention is guided by these goals and by perceptions. Memory retrieval is crucial in interpreting perception, guiding and interpreting the results of external search. Finally, decisions are continually being made at various points of the process.

The choice process is depicted as being of a complex interactive

nature. The choice process is not strictly sequential, but consists of a continual branching and looping operation. For example, attention and encoding may be interrupted by an unexpected stimulus, which implies memory search to interpret it, perhaps decision processes, and cycling back to a revised goal hierarchy.

2.4 OVERVIEW OF INFORMATION PROCESSING RESEARCH.

Research on how consumers manage their information processing search has followed three distinct theoretical lines.

Classic economic theory.

Drawing on classic economic theory of consumer behaviour and associated econometric techniques has resulted in the development of econometric models of information processing. These models are compromised by many measurement problems which require that simplifications be made which are not consistent with the model. Probably the greatest limitation in such an approach is the time inconsistency between the models and the data (Dominquez, 1974).

Methods are still to be developed that will provide dynamic measures of concepts such as awareness, attitudes, and choice in the marketplace. However, after considering the rigor of econometric analysis and its construction from many fragments of behavioural concepts, its modest results seem to lead to the conclusion that the analysis may not really be worth the effort (Hughes, 1972).

Research utilising the Schroder, Driver, and Streufort model.

Research has been generated using the human information processing model proposed by Schroder, Driver, and Streufort (1967). This model views processing as a series of levels in which each level draws on combinations of attributes in lower levels. This combination is formed by the use of both fixed and flexible rules that compare and combine simple attributes into higher order dimensions. The essential concern of the Schroder, Driver, and Streufort theory is how people use conceptual structures such as attitudes for processing purposes.

Research based on the Newell, Shaw, and Simon model.

Using the human information processing theory proposed by Newell, Shaw and Simon (1958), research into the area of Decision Net models of consumer behaviour has been undertaken. These models trace the rules used by a decision-maker as they manipulate data to arrive at a choice that will achieve a prescribed goal. The strength of these models is the depth in which they describe an individual's processing of information. Decision net models are more dynamic since they examine the process of choosing particular products.

Newell and Simon (1972) define an information processing system as:

"A system consisting of a memory containing symbol structures, a processor, effectors, and receptors." (p. 20)

They go on to say:

"...With respect to the central aspects, we can lay down a number of inter-related definitions and postulates:

1. There is a set of elements, called symbols.
2. A symbol structure consists of a set of tokens (equivalently, instances or occurrences) of symbols connected by a set of relations.
3. A memory is a component of an information processing system capable of storing and retaining symbol structures.
4. An information process is a process that has symbol structures for (some of) its inputs and outputs.
5. A processor is a component of an information processing system consisting of:
 - a) a (fixed) set of elementary information processes (eip's);
 - b) a short-term memory (STM) that holds the input and output symbol structures of the eip's;
 - c) an interpreter that determines the sequence of eip's to be executed by the information processing system as a function of the symbol structure in STM.
6. A symbol structure designates (equivalently, references or points to) an object if there exist information processes that admit the symbol structure as input and either:

- a) affect the object; or
 - b) produce, as output, symbol structures that depend on the object.
7. A symbol structure is a programme if:
- (a) the object it designates is an information process and
 - (b) the interpreter if given the programme can execute the designated process (literally this should read, "if given an input that designates the program.")
8. A symbol is primitive if its designation (or its creation) is fixed by the elementary information processes or by the external environment of the information processing system."
(p.20 -21)

Compared to the Schroder, Driver and Streufort model, this formulation is considered a more 'individual' based view of information processing (Bettman, 1979).

2.5 DECISION NET METHODOLOGY OF INFORMATION PROCESSING.

Research within the decision net framework of information processing attempted to model particular choices in various buying situations. A great deal of work has used what is called a 'Verbal Protocol' technique. Each individual thinks 'out loud' as they are actually performing the

behaviour being modelled. Given these protocols a model of how the individual processes information and makes choices is developed.

Clarkson (1962, cited in Bettman, 1979) developed the first model depicting rules used by a trust investment officer to select stock portfolios. From his study he concluded that the trust officer's behaviour could be modelled as a sequential choice procedure with acceptable level decision rules. That is, he used a 'discrimination net' or branching structure of cues pertaining to the stock to represent the choice processes.

Bettman (1970) has provided a detailed model of two consumers' grocery product choices, based on protocols from shopping over a six - eight week period. Russ (1971) examined buyer brand evaluations of small household appliances within an experimental setting. He also examined various types of model structures to see which predicted the subjects' choices best. He found that a modified satisficing model was most accurate, performing better than additive models. (Russ, 1971)

Montgomery (1972; cited in Hughes & Ray, 1974) developed a 'gate-keeping' model of supermarket buying committee accept/reject decisions for new products. Using a heuristic tree-growing procedure he developed decision nets after obtaining cues for the nets by observing buying committee decisions and from interviews. The decision net was reported to have classied 93% of decisions correctly.

Several problems exist with decision net models in the area of data-collection and modelling methodology. Protocols are extremely time consuming to obtain the volumes needed for model inference. Once the protocols are obtained protocol analysis is quite informal.

There exists a problem with reliability of both the protocol and the

model building effort. Fishbein (1967) points out that the behaviour itself must be examined for reliability. Haines (1969) discusses this point, emphasising the effects of motivation on process order and the amount of processing.

Another broad problem area deals with the generality of the buyer decision net models. Because of the concern with models of the individual, it must be considered whether by their nature buyer decision net models are doomed to be idiosyncratic and ungeneralisable. If they are not, then a problem exists in how to develop general models of consumer information processing based on the individual models.

Chapter Three :

Process

Descriptive

Approach.

3.1 RESEARCH USING THE PROCESS DESCRIPTIVE APPROACH TO THE STUDY OF CONSUMER BEHAVIOUR.

Given the problems associated with the decision net approach, outlined above, researchers in the information processing approach to consumer behaviour proceeded to overcome these difficulties by developing a behavioural process methodology. The behavioral process or process descriptive methodology provides a new procedure for collecting data, which describes a decision-maker's information seeking behaviour prior to reaching a decision. The method focuses on describing how a decision-maker behaves prior to choice, by observing information acquisition patterns under the condition of self-selection of information.

A programme of research utilising this process descriptive approach was developed in the early 1970's at Purdue University under the direction of Jacob Jacoby. The motivation for this programme of research came from a desire to challenge the view that the provision of more product information to the consumer would result in better decisions being made.

Friedman (1966) in a study of consumer confusion in the selection of supermarket products, found that consumers were confused when asked to select the most economical package for each of 20 products. He concluded that the confusion resulting from the subject's difficulty in determining the least price for the largest amount of a product, was due to differences in packaging practices by manufacturers. This began a call for a standardised formula for package information.

Granger and Bilson (1972) in a laboratory study of 200 housewives found that while prices were of importance to the subjects when determining the selection of package size, many housewives did not have a clear idea of relative value measured in terms of cents per kilogram or other such

measures. Within their study they provided a group of housewives with cents per gram information and observed that a significant change in their choice distribution occurred. The resulting behaviour mirrored that which economic theory suggests. That is, that each subject will select the cheapest product.

From this the argument for unit pricing became straightforward. First, the adoption of unit pricing was believed to eliminate any confusion caused by price calculation, especially across packages of different size. Secondly, this removal of calculation problems was seen as facilitating meaningful price comparisons and resulting in more purchasing of economical items.

The argument for unit price information very quickly broadened into a call for even greater amounts of product information to be displayed on the packages of each product. This call was echoed by many consumers and government officials who claimed that more information would enable better choices to be made.

Viewed from an information processing perspective such a claim seemed, at least initially, to be dubious, and in the light of research into information overload, the assertion became questionable.

A four phase research programme was developed in order to combat the claim that more information is better. Phase one looked at the assertion that more information is not necessarily better. Phase two attempted to refine the understanding of the information overload question. Phase three concerned the development of the process methodology that would be used to examine what information consumers actually choose and what they do with that information. Phase four involved the developments of new directions for the study of consumer information processing. These four phases will now be outlined in greater detail.

3.2 PHASE ONE: MORE INFORMATION IS NOT NECESSARILY BETTER.

The first three studies (Jacoby, Speller, and Kohn, 1974; Jacoby, Speller, and Berning, 1974; Jacoby, Kohn, and Speller, 1973) within this phase concentrated on actual supermarket package information from which displays of information were developed. The procedure of the studies involved the consumers being asked to indicate how they used various product attributes in arriving at an 'ideal brand'. The consumers were then asked to make choices from among a number of hypothetical brands which were each represented as a card bearing an identifying letter along with indications of the brand's attributes. At the end of each session the consumers answered a series of questions related to their subjective evaluation of the process.

The major independent variable, information load, was operationally defined in terms of the total amount of information the subject was given and with which they had to contend in arriving at a purchase decision. This total amount of information was divided into basic components such as, the number of brands, and the number of items of information per brand.

The first study (Jacoby, Speller, and Kohn, 1974) in this phase of the programme involved testing 153 students who were presented with either 2, 4, or 6 items of information in respect to 4, 8, or 12 brands of laundry detergent. In respect to information load this meant that a subject in an experimental condition of 4 items of information and 8 brands of the product had a total of (4x8=) 32 items of information available. The range of information items available was 8 - 72.

From the results of this study it was found that as the information

quantity (that is, the number of pieces of information made available) increased, there occurred first an increase and then a decrease in the subjects ability to pick their most preferred brand. This result suggested the possibility of information overload. At the same time the subjective states questions indicated that as available information increased, subjects became more satisfied, more certain and less confused by the decision making task.

The second study in this phase (Jacoby, Speller and Berning, 1974) attempted to replicate the study previously described. A larger and different sample population was used and the test product was also changed. In this study 224 housewives were tested using prepared dinners as the test product. In this experiment the subjects received 4,8,12 or 16 different brands of product. This gave an information range of 16 to 256 items.

The results obtained in this study were similar to those of the first, that is, as the quantity of available information increased ,there occurred an increase, then a decrease in the subjects' ability to pick their most preferred brand. Subjective states questions indicated that as available information increased subjects became more satisfied, more certain and less confused by the decision making task.

The conclusions of the first two studies were criticised by Russo (1974), Wilkie (1974), and Summers (1974), all of whom showed that the data had been incorrectly analysed. All of these authors contended that the correct analysis demonstrated that more information produces better decisions.

The third study (Jacoby, Kohn, and Speller, 1973; cited in Jacoby, 1975) attempted to reproduce the first two studies, but this time using the correct data analysis procedure. Again 224 housewives were tested in respect to preferences for packages of instant rice.The experimental

procedure and conditions were exactly the same as for Jacoby, Speller and Berning (1974).

The study concentrated on the time of information input as well as the total time of the decision process. It was found that the total time taken in the decision process increased in direct relation to the number of brands. However, the time taken to make a decision also increased and then decreased as the amount of information per brand increased. Thus it appeared that consumers were "tuning out" (Jacoby et al., 1973) at higher levels of information per brand.

3.3 PHASE TWO: DEFINING INFORMATION QUANTITY.

During and after the three studies previously described, a series of studies were undertaken to refine the understanding of the information overload question.

Deering (1974, cited in Jacoby, 1975) using a series of four product information tasks, found that an individual's ability to distinguish stimulus variations and to associate reliably variations with overall product evaluation increased as the number of values in a single information dimension went from two to eight. However, it was also found that an individual's performance in these tasks substantially decreased at 10 values per dimension.

Similar indications were obtained by Speller (1974, cited in Jacoby, 1975). Incorporating a sub-series of items into the Jacoby, Speller, and Berning (1974) investigation, he found that innovation proneness decreased as a function of information load. (Innovation proneness refers to the consumer's perception of a new product as a 'new' product, and not just an

invention of the researcher.)

At this stage the term information quantity was standardised and described in terms of three basic components:

- 1) the number of purchase alternatives (brands)
- 2) the number of information dimensions provided for each alternative
- 3) the number of values articulated along each information dimension

An item or piece of information, then, was defined as the value for a particular attribute dimension, on a specific purchase alternative.

3.4 PHASE THREE: PROCESS METHODOLOGY.

Most of the early studies had made use of hypothetical brands and product information rather than actual brands and actual product information. In these studies, subjects were provided with fixed amounts of product information and were required to arrive at a purchase decision based only on information provided to them. However such a situation is in direct contrast to actual supermarket shopping situations. In these situations the consumer is free to select as much or as little information as they wish prior to making any purchase decisions.

The designs, then, were rather static in nature and did not permit the examination of the ongoing dynamic processes that underlie consumer decision making. In an attempt to correct this shortcoming, a number of

process-oriented techniques were developed. The development of these techniques was not just a milestone in the study of consumer behaviour, they also served to shift the focus of much research. This shift involved a move away from the narrow issue of information load to the much broader and more interesting area of information acquisition.

The process approach is concerned with answering the question of why an individual engages in one particular activity at a specified time out of the wide variety of activities of which they are capable. That is, why did the person's behaviour take the specific direction that it did? As such, the process approach is closely aligned to expectancy theory, (see chapter 4.3) a cognitive process theory, which also attempts to predict the force or motivation for a person's behaviour.

It is easy to apply the basic expectancy model to consumer behaviour. As an illustrative example, consider the purchasing of toothpaste. The alternative courses of action that the individual can take are represented by a set of specific brands or products that can be bought. If for the individual who intends to purchase a single brand from an array of different brands, it is assumed that all of the brands are viable alternatives, then knowing the first level outcomes (that is, lessening tooth decay, having fresh breath, and so on) for this commonly purchased item, it becomes possible to set up realistic tests of the model.

Hansen (1969) attempted to do this. In a series of six experiments, he found that outcome desirability and perceived expectancy are predictive of both preference statements and choice behaviour in simulated purchasing situations. However, when taken separately, neither outcome desirability nor perceived expectancy was as good a predictor as the two combined.

At the time of the development of the process methodology the reassessment of previous research (Jacoby and Olson, 1972) had suggested

that consumers tend to use a variety of information processing strategies to limit the amount of information which they permitted to enter into their decision-making process. On the one hand there was evidence to suggest that consumers paid attention to a limited number of product dimensions (attributes) when making purchase decisions. On the other hand, there was evidence to suggest that consumers paid attention to only a limited number of brands only when making their purchase decisions.

A further related influence at this stage was identified in Miller's (1956) paper on the description of information chunking. In considering how this might apply to consumer behaviour the idea was formulated that brand name may serve as a basis for information chunking.

As a result of these various inputs the study of consumer behaviour within this research programme took on a new direction.

The first study in the new series was that conducted by Jacoby, Szybillo, and Busato-Schach (1977). Instead of using hypothetical products as the previous research had done, this study employed real products and product information. It also permitted subjects to select as much or as little information as they wished. The study incorporated a process methodology which allowed subjects to pick various types of information in the process of decision making. The primary focus of the investigation was on the amount, type, and order of information selected.

The basis of the experiment was a 3 x 2 between-subject factorial design. Eighty-four female undergraduates were required to arrive at a single purchase decision given either 4, 8, or 12 purchase alternatives. Half of the subjects were permitted to acquire as much information as they wished from among 18 dimensions of information (including brand name and manufacturer name) provided across all the alternatives. The other half of the subjects were able to acquire information from only 16 dimensions, with

brand name and manufacturer name being deleted from the original set of 18 attributes.

It was predicted that the subjects would select only a small proportion of the information available under these free selection of information conditions. A second hypothesis to be tested was that if brand name serves as an information chunking device then less information would be selected when brand name was available than when it was not. Finally, based on the belief that brand name was the most potent cue in judgements made concerning product quality it was predicted that brand name would be chosen more often and earlier in the information acquisition process than would price information.

The results confirmed all three hypotheses. When permitted to select information freely from the array, consumers selected only a subset of the available information. The subjects were also found to have selected significantly less information in the brand name and manufacturer name available condition than in the condition where such information was not available. Finally, it was also found that brand name was chosen more often than price information.

3.5 PHASE FOUR: NEW DIRECTIONS.

Results obtained from the many studies within this research programme were considered. It was concluded that while much important information had been discovered about the nature of consumer behaviour, there was still no answer to one basic question: 'why was it important to measure the ideal brand?' The answer to this problem started to be resolved only when a re-evaluation was made of the theory behind the approach.

While reconsidering the human information processing approach set out by Simon (March and Simon 1958, cited in Jacoby 1975) it was discovered that within this approach to information processing there existed the conception of human behaviour reflecting a satisficing rather than a maximising orientation. Such a conception seemed quite in line with the psychology of the consumer. From this conception then, it can be seen that consumers do not search until they find the very best product or brand that is available (maximising). Instead they tend to engage in a relatively limited search and accept alternatives which they find satisfying (that is, which meet their basic criteria) under the circumstances (satisficing).

It was believed that the costs in terms of time, convenience, money, and effort were seen by the consumer as not being worth the returns of being a maximiser. Such an outcome was never considered by the previous research methodologies, but despite this the results seemed to be pointing to this conclusion.

Gleuck (1974), in an experiment concerning occupational choices, put this distinction between maximisers and satisficers to the test. In his study, 51 male senior undergraduates students majoring in business and engineering were interviewed in respect to their choice of work organisations for future employment. Gleuck classified the search and choice procedures as follows:

- 1) a maximising (comprehensive) search process,
- 2) a validating (moderate) search process,
- 3) a satisficing (restricted) search process.

Only thirty subjects completed the experiment. An examination of the

21 not completing the decision indicated that they were not systematically different from the 30. From the interviews Gleuck found that 14 of the subjects followed a maximising search and decision process. Nine subjects were judged to be using a validating search pattern, and the remaining seven searched using a satisficing search pattern.

While these results indicate that the March and Simon (1958) proposal of either a satisficing search behaviour, or a maximising search behaviour, may be too narrow it must be remembered that two very different types of decisions are being made. Buying toothpaste every month is different from deciding where one would like to be employed. The routine activity of purchasing commonly used consumer products may very well polarise the search process.

As a result of these findings, the research programme began to look for a methodology which would allow a better test of maximising versus satisficing behaviour. An adaption of the Jacoby, Szybillo, and Busato-Schach (1977) study was made as follows:

- 1) instead of the subjects acquiring all information values on a particular dimension for all brands at once, as was done in the (1973) study, the subjects were allowed to acquire information values one at a time as they desired.
- 2) the subjects were forced to work from memory to a greater extent. This was done by removing the accessed product information before any further information could be obtained.

These adaptations were put together in a study by Jacoby, Chestnut, Weigl, and Fisher (1976). In this study subjects were confronted with a matrix of information regarding breakfast cereals and were instructed to

select as much or as little information as they desired prior to arriving at a purchase decision. The names of 16 brands of cereal which had the biggest market share at the time were arranged across the top of the matrix. Thirty-five different dimensions of information about the breakfast cereal were alphabetically listed down the left- and right-hand sides of the matrix. The cells of the matrix were pockets containing 10 cards on which were printed the specific brand-X information value for the brand and information dimension intersecting at that point.

The procedure involved subjects accessing this information by picking up the card situated in that cell and reading the information printed on it. The matrix contained (16 x 35 =) 560 cell positions or items of information. Sixty subjects were used in this experiment and the following findings were obtained.

- twelve of the 60 subjects accessed no information from the matrix in making their decision. That is, they made their purchase decision solely on the 16 available brand names.
- thirty-four of the 60 subjects accessed information on 4 or fewer dimensions, with the mean number of dimensions accessed being 4.92.
- the mean number of different brands considered across all subjects was 3.35, while the mean number of total information values accessed across all brands was 11.20. This was a very small proportion of the 560 different items of information that were available.

This finding, despite the change in procedure from the Jacoby, Szybillo, and Busato-Schach (1977) study, is consistent with the latter's results, that on average 5.05 information dimensions were accessed.

The adapted study also attempted to determine whether the subjects were satisficers or maximisers. In response to the question, (were you motivated to make the best possible choice, or did you feel that you were motivated to make just a satisfactory choice?) 50% of the subjects replied that they were motivated to make only a satisfactory choice while 23.3% of the subjects said that they were motivated to make the best choice possible.

It was also noted that while the subjects rated an average of 9 of the 35 information dimensions as being either very or extremely important, only approximately half of this number of dimensions (4.92) were actually acquired during the behavioural choice task. Whether or not such a result reflects nonindependence among dimensions, or a discrepancy between what people say and what people do, is not known.

Following on from this programme Sheluga, Jaccard, and Jacoby (1979), have attempted to enhance the process descriptive approach by integrating it with modern scaling methods. The integration enables the calculation of prior estimates of each individual's preferences for certain items of information that may be accessed during a pre-decision information search. In addition to this, preferences for product alternatives can be gleaned from this previous measure of attribute preference.

When this scaling method is combined with the process descriptive approach, information search and the resulting product choice can be examined under the condition of a self-selection of information, while already knowing the utility of the information acquired by the subject.

Sheluga, Jaccard, and Jacoby (1979) tested three approaches that could be used to estimate the utility of a product attribute:

- 1) The expectancy-value approach which stems from attitudinal approaches (Fishbein, 1967)
- 2) The conjoint measures approach.
- 3) The method of graded paired comparisons.

The first method obtained the utilities of attributes by eliciting verbal reports from individual subjects on an affectively based rating scale. It was concluded that the individual's evaluative response to a particular attribute was the best estimate of its utility. The second component of the model, belief strength, was assumed not to affect choice if the subjective probability that a particular product contained a given attribute was constant across all attributes and all individuals. As a result of this assumption, affective value was believed to completely determine the consumer's attitude toward the product.

This reduced model is expressed algebraically:

$$A_{jk} = \sum_{i=1}^n U_{ijk}$$

where,

A_{jk} is the attitude toward product j , for person k

U_{ijk} is the affective value of attribute i of product j for

person k .

n is the number of attributes in product j

This reduced model is a simple linear additive model of consumer product evaluations in which the utility of each attribute is estimated from rating scale responses.

As mentioned, the model is a reduced version of a more general model:

$$A_{jk} = a_i \times b_{ij} \times u_{ijk}$$

where,

A_{jk} is the evaluation of product j for person k

a_i is the utility of attribute i

b_{ij} is the individual's belief that attribute i is associated with
product j

u_{ijk} is the affective value of attribute i of product j , for
person k

n is the number of attributes in product j .

This general model can be seen as analogous to the combined expectancy valence model developed by Vroom (1964) (discussed in chapter 4.3). In this case, a_i is equivalent to the concept of valence (V_k), b_{ij} is equated to the idea of expectancy (E_{ij}), and u_{ijk} is comparable to the conception of instrumentality (I_{jk}).

The second approach taken to estimate the utility of a product attribute was based on conjoint measurement. In this approach, preferences for products were obtained by ordinal ranking procedures. The subjects ranked the stimuli (line drawings of cameras) in order of preference. This was done first by making categorical orderings, then by performing finer comparisons until a complete ordering was achieved. The

overall utility for the product was then decomposed into the various 'part-worth' contributions, of the product attributes. These attribute preference utilities were estimated by means of Johnson's monotone regression algorithm (Johnson, 1975). This provided estimates of each attributes relative preference utility.

The third approach taken was the use of the method of graded paired comparisons. This method was based on an unpublished working paper written by Huber and Sheluga (1977); cited in Sheluga, Jaccard, and Jacoby, (1979). The approach is claimed to extend the methodology of simple paired comparisons, and to update the corresponding analytical procedures by the use of multiple regression.

The technique involved the modification of the simple comparative judgements, that is each paired comparison, to include measures of the direction and intensity of preference for one attribute over the other. This magnitude of preference measure was assessed on a graded rating scale, which in this case was marked off in five dollar increments. A multiple regression decomposition of these graded paired comparisons judgements was used to decompose the pairwise preference judgements into part-worth utilities for the attributes contained in the camera stimuli. These provided estimates for the utility of each of the attributes of the test product. These attribute preference utilities were obtained within rather than across individuals.

Thus the evaluation of a given product j , which is made up of n attributes, can be expressed as a general linear model:

$$U_j = B_o + B_1 X_{1j} + B_2 X_{2j} + \dots + B_k X_{kj} + e$$

where,

U_j is the utility of product j

B_o is the regression constant

B_k is the regression coefficient indicating the utility of

attribute X_i

X_{ij} is the i th attribute of product j

After testing each of these models, Sheluga et al. (1979) concluded:

"Only the attribute utilities, estimated through graded paired comparisons, correlated significantly with the behavioural search and subjective importance measures. Further, graded pairs preference predictions were 100 percent accurate in the prediction of choice in the information search and decision task.... Future studies of this nature will utilise only one of the scaling tasks employed in this study (graded paired comparisons)" (p. 176).

The three studies previously outlined, Jacoby, Szybillo, and Busato-Schach (1977), Jacoby, Chestnut, Weigl, and Fisher (1976), and Sheluga, Jaccard, and Jacoby (1979) form the basis for the present study.

Chapter Four :

Present

Study.

4.1 INTRODUCTION TO THE PRESENT STUDY.

The present study has been designed along the lines of the research programme started at Purdue University. It attempts to replicate some of the findings that were made in that programme and to locate them within the New Zealand setting. Some difficulties are anticipated since it seems that in this different cultural situation there is not the same emphasis on brand buying as there is in the United States. However, if information chunking does occur in consumer decision making, then it still seems reasonable to assume that this will occur under the guise of brand name.

The research undertaken in this study draws mainly on the studies conducted by Jacoby, Szybillo, and Busato-Schach (1977) and by Sheluga, Jaccard, and Jacoby (1979).

An attempt was made to integrate the basic methodologies of both studies. The result is a research method that on the one hand provides a prior estimation of an individual's preferences for particular product attributes and on the other, information gained under a 'self-selection' of information condition.

4.1.1 EXTENSIONS MADE IN THE PRESENT STUDY.

Jacoby, Szybillo, and Busato-Schach (1977) make two points that are particularly relevant to the present study. These are discussed in the following two sections.

Adapation of the preference estimates technique: Sheluga, Jaccard, and Jacoby, (1979).

"Also of interest is the potential that process methods have for interfacing with and contributing to the traditional static methodologies. Considerable recent attention has focused on explicating a variety of value-expectancy models (Bettman, Capon, and Lutz, 1975; Fishbein and Ajzen, 1975; Jacoby, 1976b; Ryan and Bonfeld, 1975). An important issue in this research is how to select attributes and/or derive attribute importance weights..." (Jacoby, Szybillo, and Busato-Schach, 1977, p.215).

Because little work has been conducted in the area of attribute importance wieghts, it was thought that such a task would be of benefit in this study. However, it was decided that only an analysis of attribute importance would be attempted. No attribute weighting would be attempted because it was the intention of the study only to compare attribute search behaviour with stated attribute preference.

In relation to the above discussion Sheluga, Jaccard, and Jacoby, (1979) have also commented on the use of scaling methods as follows:

"Only the attribute utilities, estimated through graded paired comparisons, correlated significantly with the behavioural search and subjective importance measures..... Future studies of this nature will undoubtedly utilize only one of the scaling tasks employed in this study..... Conjoint measurement and graded pairs appear to be more predictively valid than rating scales for this type of research. In turn graded pairs produce less errors in prediction than does conjoint measurement." (Sheluga, Jaccard, and Jacoby, (1979) p. 176)

After considering this conclusion, a decision was made to make use of the method of paired comparisons in an attempt to obtain attribute preferences.

The method of paired comparisons would provide rankings of each individual's preferences for certain attribute information. These rankings could then be considered as prior estimates of each individual's preferences (see chapter 4.2). In order to see how well this measure of preference, taken from a questionnaire type test, complied with the individual's actual information acquisition preferences, a displayboard device similar to that of Jacoby, Szybillo, and Busato-Schach, (1977) was constructed. This displayboard allowed subjects to make a self-selection of information as they attempted to make a choice of product. By recording the order of information acquisition it was also possible to make a record of each subject's search for subjectively preferred information.

The psychological approach to the study of consumer behaviour assumes an additive formulation of the expectancy-value perspective of motivation. This is different from the original proposal made by Vroom (1964) which was multiplicative. To illustrate this difference both the original conception and the adaptation made consumer psychology are outlined in chapter 4.3 . The two formulations are not to be tested in the present study, but are of possible interest to the results.

The repertory grid technique.

Wilkie and Pessemier (1973) in a review of the use of multi-attribute attitude models in consumer research make the following point:

"Basic criteria for specification of attribute lists require that they be exhaustive, semantically meaningful, subject to unidimensional interpretation, and reflect possible variations in choice or use contexts. Methods for attribute generation include expert judgement and unstructured group or depth interviews in combination with procedures such as Kelly's repertory grid.

Few marketing articles discuss desired characteristics of attributes. Sheth (1969), Hansen (1969) and Pessemier (1972) agree that attributes must reflect consumer perceptual dimensions rather than product characteristics directly measurable and controllable by the marketing manager."

(Wilkie and Pessemier, 1972, p.212)

The use of Repertory Grid in conjunction with the development of a market research type project, while serving to provide a useful list of attributes and beliefs about products, also establishes validity for the

attributes used since they can be located in the consumer's perception of the products in question.

Respecting the validity of the Wilkie and Pessemier comment it was decided that use would be made of the repertory grid technique in the present study in an attempt to give a degree of additional validity to the product attributes that were used (see chapter 4.4).

Adaptation of the information acquisition methodology: Jacoby, Szybillo, and Busato-Schach, (1977).

The second point made by Jacoby et al., (1977) related to adaptations of the basic methodology which they had employed.

"A word regarding the flexibility of behavioural process methodology is also in order. The strip pulling technique employed here is one of the simplest behavioural process techniques available. More complex approaches permit access to single values rather than forcing the acquisition of entire dimensions." (Jacoby et al., 1977, p. 215)

As a final comment they add that the entire strip pulling technique is not very appropriate for studying the brand name chunking hypothesis.

Given this recommendation that further research should utilise a piece by piece information acquisition procedure, it was decided that this present study would employ the use of an information display board that allowed the access of information in single items.

Since it was intended only to test the ability of the paired comparison test to predict actual choice preference, no time constraints were imposed on this information acquisition. As well, once a piece of information was accessed it remained uncovered and available to each subject for the duration of the session.

By recording the order in which each piece of information was accessed, it was possible to trace the information search from attribute to attribute and from product to product. A ranking of preference for attributes was taken for each subject by recording the successive order in which they accessed information about that attribute. This ranking was compared to that obtained from the paired comparison test to see how strong a correspondence existed.

Given the extensions that are to be made to the studies of Jacoby, Szybillo, and Busato-Schach, (1977), and to Sheluga, Jaccard, and Jacoby (1979), it is necessary that the method of simple paired comparisons, expectancy theory, and the repertory grid technique be outlined before the design and hypotheses of the present study are considered.

4.2.1 THE METHOD OF PAIRED COMPARISONS.

In 1927 Thurstone published two important articles in which he developed his law of comparative judgement. The law of comparative judgement was important because it provided a rationale for the ordering of stimuli along a psychological continuum. This applied even in cases where there is no known physical continuum to which the values of the stimuli on the psychological continuum might be related. Thus, the law made possible a quantitative investigation of all kinds of values and subjective experiences.

Since Thurstone's initial contribution, new methods for the scaling of stimuli have been developed. These methods are generally known as psychological scaling methods. They are differentiated from psychophysical methods, which relate scale values of stimuli on a psychological continuum to those on a physical continuum.

4.2.2 THE LAW OF COMPARATIVE JUDGEMENT

The law of comparative judgement assumes that for any given stimulus, i , there is an associated modal discriminial process on a psychological continuum. A discriminial process S_i is a theoretical concept and represents the experience or reaction of an individual when confronted with stimulus i , and asked to make a judgement of some attribute. Thurstone describes this discriminial process as:

"..whatever it is that goes on when we make a discrimination or response involving a judgement of some attribute."

(Thurstone 1927a, p.275)

It is not assumed that a stimulus always evokes the same discriminial processes. It becomes necessary to make some assumption concerning the distribution of these discriminial processes. Thurstone makes this assumption by stating that the distribution of all discriminial processes aroused by stimulus i , is normal about the modal discriminial process.

For any normal distribution the mean, median and mode all have exactly the same value. Therefore, the modal discriminial processes will also be the same as the mean or median. This is taken as the scale value of the stimulus \bar{S}_i . Thurstone refers to the standard deviation of the distribution of discriminial processes as the 'discrimial dispersion'. It is designated sigma.

In his formulation, Thurstone mentions that any stimulus possesses to a varying and unknown degree many attributes which may be of interest. The modal discriminial process and discriminial dispersion for any given stimulus will, therefore, depend upon the particular attribute that is being judged.

What happens when a second stimulus is entered? Let attribute i be held constant and a second stimulus, j be introduced which also has to be judged with respect to the same attribute. Again it is assumed that stimulus j has associated with it a modal discriminial process for this attribute. The corresponding distribution is normally distributed about the modal discriminial process \bar{S}_j with its associated discriminial dispersion σ_j . For the same attribute then, two stimuli, i and j , may differ with respect to their modal discriminial processes, \bar{S}_i and \bar{S}_j with respect to their discriminial dispersions σ_i and σ_j .

If a group of individuals are asked to make a comparative judgement about whether i or j is more favourable, three outcomes may occur:

1) i will be judged more favourable than j ($\bar{S}_i > \bar{S}_j$)

2) i will be judged equally as favourable as j ($\bar{S}_i = \bar{S}_j$)

3) j will be judged more favourable than i ($\bar{S}_i < \bar{S}_j$)

By obtaining comparative judgements of this kind, an empirical frequency corresponding to the number of times that i is judged more favourable than j can be calculated. Algebraically this is stated:

$f_{ij} = n_{ij}$ where, n_{ij} is the number of observations for which $i > j$

and,

f_{ij} is the frequency with which i is judged greater than j.

This frequency can be converted into a proportion by dividing by the total number of judgements obtained.

$$p_{ij} = f_{ij} / N$$

where,

p_{ij} is the proportion of times that i is judged greater than j

N is the total number of judgements

The values of p_{ij} can be expressed as unit normal deviates. When this is done, p_{ij} values of 0.500 correspond to 0.000 in z values.

This is in accord with what would be expected when $\bar{S}_i = \bar{S}_j$. When the proportion of comparative judgements is greater than 0.500, then it is assumed that i has a higher modal discriminial process than j . Correspondingly the value of z_{ij} will be positive.

It is assumed that the distributions of discriminial processes for two stimuli, i and j , are normal. The difference between two normally distributed variables is also normally distributed with the standard deviation being:

$$\sigma_{i-j} = \sqrt{(\sigma_i^2 + \sigma_j^2 - 2 \times R_{ij} \times \sigma_i \times \sigma_j)}$$

where,

σ_{i-j} is the standard deviation of the differences, $\bar{S}_i - \bar{S}_j$

σ_i is the standard deviation of the discriminial processes \bar{S}_i

σ_j is the standard deviation of the discriminial processes \bar{S}_j

R_{ij} is the correlation between \bar{S}_i and \bar{S}_j

Thurstone, using this formulation, expresses the scale separation between the two modal discriminial processes \bar{S}_i and \bar{S}_j , and the value of the normal deviate z_{ij} as follows:

$$\bar{S}_i - \bar{S}_j = z_{ij} \times \sqrt{(\sigma_i^2 + \sigma_j^2 - 2 \times R_{ij} \times \sigma_i \times \sigma_j)}$$

In terms of the known z_{ij} values this can be written:

$$z_{ij} = (\bar{S}_i - \bar{S}_j) / \sqrt{(\sigma_i^2 + \sigma_j^2 - 2 \times R_{ij} \times \sigma_i \times \sigma_j)}$$

This above formula indicates that the proportion of comparative judgements p_{ij} , (or the normal deviate z_{ij} corresponding to this proportion) is not only a function of the scale separations, $\bar{S}_i - \bar{S}_j$, but also a function of the standard deviations σ_i and σ_j and the correlation coefficient R_{ij} .

As a first approximation to a solution of the scale separations, it is assumed that the standard deviations of i and j are equal. Algebraically this implies:

$$\begin{aligned} z_{ij} &= (\bar{S}_i - \bar{S}_j) / \sqrt{(\sigma_i^2 + \sigma_j^2 - 2 \times R_{ij} \times \sigma_i \times \sigma_j)} \\ &= (\bar{S}_i - \bar{S}_j) / \sqrt{(2\sigma^2 \times (1 - R_{ij}))} \end{aligned}$$

Next it is further assumed that the intercorrelations between i and j and all other stimuli are equal. From this, the previous formula may be written as:

$$z_{ij} = (\bar{S}_i - \bar{S}_j) / \sqrt{(2\sigma^2 \times (1 - R))}$$

Having made both of these assumptions, it can be seen that $(2.0 \sqrt{1-R})^2$ now becomes a constant. It is thus the common unit of measurement of the scale separations of the (i,j) pair of stimuli. It is also the common unit of measurement for any other pair of stimuli.

Without any loss of generality, the common unit of measurement may be standardised to equal 1.00 . This then implies that:

$$z_{ij} = \bar{S}_i - \bar{S}_j$$

This above formula together with the assumptions involved in its derivation, is referred to as Case V of the Law of Comparative Judgement. (Edwards, 1954)

This Case V of the law of comparative judgement is used in the present study. In this instance, product attributes were taken as stimuli that were to be compared in order to gain a measure of attribute preference. The corresponding techniques of comparison construction and analysis will be outlined in section 5.2.2 of the methods.

4.2.3 TOTAL CIRCULAR TRIAD COUNTS.

The Total Circular Triad (t.c.t.) count is a measure of each subject's internal consistency with respect to the judgements made of the paired comparisons. The logic of the t.c.t. count is based on the consistency of the subject's comparative judgements. For any two item choice, if attribute A is preferred to attribute B and attribute B is preferred to attribute C, then logically, attribute A should also be

preferred over attribute C. The t.c.t. count measures the number of times that this rule is violated. If the number of intransitivities is high then the validity of a subject's responses is questioned. In such cases, the subject is not really judging the comparisons consistently.

A table of t.c.t. counts has been constructed by Kendall (1962). This table gives distributions for random response patterns according to the number of different stimuli used in the comparisons. The number of total possible t.c.t. counts can be calculated by means of the following formula, developed by Kendall (1962):

1) for n = an odd number of stimuli.

$$\text{t.c.t. (max.)} = (n^3 - n)/24$$

2) for n = an even number of stimuli.

$$\text{t.c.t. (max.)} = (n^3 - 4n)/24$$

where,

n = the number of stimuli.

4.2.4 THE TEST OF INTERNAL CONSISTENCY.

It is possible to make a test of the internal consistency of the scale obtained from the analysis of the paired comparison data. Such a check involves comparing the expected proportion of judgements for each pair of stimuli, with those proportions that have experimentally been obtained.

This check of internal consistency will serve as a means of verifying

the assumptions made under Case V of the paired comparison procedure. That is,

- 1) The distributions from which stimulus i and j come from are normal.
- 2) The standard deviations of stimulus i and j are equal.
- 3) The intercorrelations between i and j are equal.

If the assumptions are correct, then good agreement should be found between the expected and obtained proportions with any discrepancy being attributable to sampling error.

Mosteller (1951) proposed a way of making a single chi-square test for the entire matrix of proportions. Such a test is preferable to the only other analysis: a t -test on each of the differences between expected and observed proportions for each individual comparison. This formulation is clearly explained by reference to Guilford (1954).

The first step in the Mosteller formulation requires that a Z' matrix containing the expected scale separations be constructed. This is done by making all possible subtractions of pairs of stimuli using the obtained data. This table of expected scale separations is then converted back to proportions, and the values obtained make up the P' matrix of expected proportions.

Many of the proportions will be close to the value of 1.00. Since they exist in a region where sampling distributions, or proportions, are not considered to be normal, even for large samples, the procedure involves transforming each proportion to a statistic θ . The sampling distribution of this statistic is approximately normal. Such a

transformation allows the obtaining of a constant variance. Theta in this case is the angle whose sine is the square root of p (where p is any of the values in the P' matrix):

$$\theta = \arcsin p'$$

The actual obtained proportions are similarly converted into angles in terms of degrees by the above function.

The formula for chi-square to apply to this situation is:

$$\text{CHI} = N/821 \times (\theta - \theta')^2$$

where,

N is the number of judgements per stimulus pair

θ is the obtained proportions converted into degrees.

θ' is the expected proportions converted into degrees.

The interpretation of this chi-square, depends upon the degrees of freedom which are calculated from the following formula:

$$df = (n - 1) (n - 2) / 2$$

where,

n is the number of stimuli

If the obtained chi-square is significant (at some pre-determined critical value) then it must be concluded that something is wrong with the application of the Case V assumptions, including the law of comparative judgement. In particular this could mean either:

- 1) A lack of normality
- 2) A lack of unidimensionality, or
- 3) Unequal standard deviations.

In such a case, the first step to take would be to retest the chi-square assuming Case III of the law of comparative judgement (that is, that the correlations between responses to pairs of stimuli is zero: Guilford, 1954). A non-significant chi-square under this formulation will point to the problem, that there is an inequality of

dispersions. This is one major cause of a significant chi-square for the Case V analysis.

4.2.5 THE USE OF THE METHOD OF SIMPLE PAIRED COMPARISONS IN THIS PRESENT STUDY.

Previous use of the method of paired comparisons has involved comparisons of products per se, rather than product attributes (Guilford, 1954). However, Sheluga, Jaccard, and Jacoby (1979), used the adapted Graded Paired Comparisons method in respect to product attributes of cameras with success. Because of this it is considered that the use of comparisons in respect to product attributes is a viable use of the method in the present experiment.

The method of paired comparisons will be used in this present study in order to obtain preference rankings for a number of attributes associated with the test product. These preferences for product attributes obtained from the paired comparison test can be summed across subjects to give overall preferences.

The subjects' preferences can also be collected into sub-groupings and summed in order to look for demographic differences. More importantly though, preference rankings can be obtained for each subject, thus allowing knowledge of each individual's preference for certain types of product information. This information is useful for the observation of information search behaviour, since it allows prior knowledge of the value of information to each subject.

4.3.1 EXPECTANCY THEORY.

The origin of expectancy theory in relation to organisational behaviour goes back to Vroom (1964) who built on the earlier work of Georgopoulos, Mahoney, and Jones (1957).

Expectancy theory can be seen as one of a number of similarly classed theories. It is similar to models of choice proposed by: Lewin (1938), Rotter (1955), Peak (1955), Davidson, Suppes, and Siegel (1957), Atkinson (1958b), and Tolman (1959), (cited in Mitchell and Beach, 1976).

The similarities revolve around the idea that:

"The strength of a tendency to act in a certain way depends on the strength of an expectancy that the act will be followed by a given consequence or outcome and on the value or attractiveness of that consequence (or outcome) to the actor."
(Lawler, 1973, cited in Mitchell and Beach, 1976, p.233)

Basically the theories assume that the choices made by a person among alternative courses of action are related to psychological events which occur in connection with their behaviour.

Vroom's depiction of expectancy theory contends that an individual's choice depends upon the degree to which any given alternative is viewed as being more likely to lead to the occurrence of the most valued outcome than any other given alternative. Within this framework, Vroom included both a formula for the prediction of choice (the force toward choice), and a formula for the prediction of choices among effort levels within tasks.

4.3.2 MODEL ONE : FORCE MODEL

Vroom's force model attempts to predict the force toward behaviour. He provides two models for the description of this force. The simplest form of the model is the Motivation model. In this model the force that operates on a person to choose a particular task is seen as a function of two variables: valence and expectancy.

Valence.

Many different terms have been used to refer to preferences. The terms valence, incentive, attitude, and expected utility have all been used to describe this concept. Since this discussion is based on Vroom's conception, the term valence will be used.

The consideration of valence begins with the simple assumption that at any given time, a person possesses preferences among outcomes or states of nature. Valence then, refers to the relationship between the strength of an individual's desire for, or attraction toward or away from, an outcome.

An outcome is simply anything an individual might want to attain. Valence refers to the anticipated satisfaction associated with an outcome and is distinguished from the value of an outcome which is defined as being the actual satisfaction resulting from the attainment of the outcome. This is an important distinction since it is possible that while an individual may desire an object, he or she may derive little satisfaction from attaining it. The valence of an outcome for a person is defined as the individual's positive or negative affective orientation toward it.

Given this conception, an outcome can be classified as positively valenced when the person prefers attaining it to not attaining it. It is considered as having zero valence when the person is indifferent to attaining or not attaining it. Finally the valence is considered negative when the individual prefers not attaining it to attaining it.

Expectancy

The specific outcomes attained by a person are dependent not only on the choices that the individual makes, but also on events that are beyond their control. Whenever an individual chooses between alternatives which involve uncertain outcomes, behaviour is affected not only by their preferences among the outcomes, but also by the degree to which it is believed these outcomes to be probable. Such beliefs have been termed expectancies.

An expectancy is defined as a momentary belief concerning the likelihood that a particular act will be followed by a particular outcome. Expectancies are described in terms of their strength. Maximal strength is evidenced by the subjective certainty that the act will be followed by the outcome. Minimal or zero strength is indicated by subjective certainty that the act will not be followed by the outcome.

Force toward behaviour

Vroom's first model predicts the force toward behaviour, and effectively shows how valences and expectancies combine in determining choice. Behaviour is assumed to be the result of a field of forces each of

which has direction and magnitude.

There exist many ways of mathematically combining valencies and expectancies to yield the hypothetical forces. On the assumption that choices are made by people who are subjectively rational, Vroom conceptualises the force on a person to perform an action as a monotonically increasing function of the algebraic sum of the products of the valences of all outcomes and the strength of the individuals expectancies that the action will be followed by the attainment of these outcomes.

This can be expressed as follows:

$$MF_i = \sum_{j=1}^n (E_{ij} \times V_j)$$

where,

MF_i is the force on the individual to perform action i ;

E_{ij} is the strength of the expectancy that action i will

be followed by outcome j ;

V_j is the valence of outcome j ;

n is the number of outcomes.

This initial formulation contends that:

	(the expectancy that		(the valence, or
The force	= the effort will result	X	perceived value
towards choice	in the attainment of		of the outcomes.)
	the outcomes)		

However, as mentioned, a second model exists. This is the model for the prediction of valences. In doing this the model presents and incorporates the concept of instrumentality.

4.3.3 MODEL TWO : THE PREDICTION OF VALENCES

Instrumentality

Vroom's conceptualisation of expectancy theory suggests that means acquire valence as a consequence of their expected relationship to ends. Peak (1955) hypothesised that in relation to attitudes (affective orientations toward objects) it is possible to distinguish two types of determinants of attitude:

- (1) the cognised instrumentality of the object of the attitude for the attainment of various consequences; and

- (2) the intensity and the nature of the affect expected from these consequences.

If an object is believed by an individual to lead to the desired outcome or to prevent an undesired outcome, then the individual is said to have a positive attitude toward it. The reverse also applies. General support for these predictions has been provided by a number of studies conducted by Peak and her associates (Vroom, 1964).

Cognised or perceived instrumentality is conceptually defined by Vroom as the degree to which the individual sees the outcome in question as leading to the attainment of other outcomes. Two different types of measure have been applied to the instrumentality variable. Some people think of it as a correlation (Vroom) that varies from +1.0 to -1.0 . Others regard it as a subjective probability statement that varies from zero to +1.0 . Campbell and Pritchard (1976) in discussing both arguments conclude as follows:

"Regardless of what metric is used, the instrumentality measure is fundamentally a conditional probability. That is, the model says to ask people to estimate the degree to which an outcome is dependent on performance, given that the performance goal is achieved or given that it is not achieved." (p.82)

Vroom (1964) stipulates that valence and instrumentality combine multiplicatively.

"The valence of an outcome to a person is a monotonically increasing function of the algebraic sum of the products of the valences of all other outcomes and the person's conceptions of its instrumentality for the attainment of these other outcomes" (p.284).

Algebraically this can be stated as:

$$V_j = \sum_{k=1}^n (V_k \times I_{jk})$$

where,

V_j is the valence of outcome j (the affective orientation to the outcome)

I_{jk} is the cognised instrumentality of outcome j for the attainment of outcome k

V_k is the valence of outcome k

n is the number of outcomes

Expectancy and instrumentality are not the same thing. Expectancy is an action-outcome association, Instrumentality on the other hand, is an outcome-outcome association.

4.3.4 THE TWO MODELS COMBINED

If both the force model and the valence model are combined, the resulting product is a formula which calculates the overall motivational force. Algebraically the model is stated:

$$M_i = E_{ij} \times \sum_{k=1}^n (I_{jk} \times V_k)$$

where,

M_i is the motivation to expend a specific level of effort to achieve a specific level of performance on a task;

E_{ij} is the expectancy the action i will be followed by outcome j ;

I_{jk} is the cognised instrumentality of outcome j for the attainment of outcome k ;

V_k is the valence of outcome k ;

Essentially then the motivation to expend a specific level of effort to achieve a specific level of performance on a task is a function of three variables. It is a function of the expectancy that a certain action will be followed by a certain outcome, the cognised instrumentality of the outcome to the attainment of other outcomes, and the value placed on that outcome.

4.3.5 INTEGRATION INTO A PERFORMANCE MODEL

The combined model previously described is easily fitted into a general performance model.

Performance can be regarded as any behaviour which is directed toward the accomplishing of any task or goal. Performance can be expressed as:

$$\begin{array}{r}
 \text{Performance} = \\
 \text{(aptitude level)} \quad X \quad \text{(skill)} \quad X \quad \text{(understanding} \\
 \text{of the task)} \\
 X \quad \text{(choice to expend effort)} \quad X \quad \text{(choice to} \\
 \text{persist)} \\
 X \quad \text{(facilitating and inhibiting conditions not under} \\
 \text{the control of the individual)}
 \end{array}$$

The expression demonstrates that performance is not only equated with ability, and skill. The choice to work on the task, understanding what is to be done, choosing to persist, and environmental constraints all play an important role. The combined model can be viewed within the context of:

- 1) the choice to initiate effort on a certain task
- 2) the choice to expend a certain amount of effort, and
- 3) the choice to persist in expending effort over a period of time.

The motivation component has to do with a set of independent/dependent

variable relationships that, explain the direction, amplitude, and persistence of an individual's behaviour, while holding the effects of aptitude, skill, and task understanding constant.

4.3.6 EXPECTANCY THEORY WITHIN CONSUMER RESEARCH

Within consumer psychology expectancy models adopt what is essentially a pull perspective of motivation. Basically this implies the combination of desired outcomes weighted by their respective expectancies which is seen as attracting the individual to one or even a select few, of the behavioural alternatives. Accompanying this are a number of other motivational factors which also determine the behavioural response.

As an example, consider the purchase of toothpaste. Assuming that the main reasons for using this product are prevention of tooth decay, fresh breath, and clean teeth, it can also be seen that other motivational factors can influence the choice of alternatives. What the individual's dentist recommends is one source of motivational influence, the like or dislike of certain toothpaste commercials is also another factor. Additional influences can be price consciousness and past experience. These factors are not desired outcomes, rather they are to be considered as motivational inputs. Outcomes refer to the consequences perceived as ensuing from having taken a specific action. Inputs on the other hand are the antecedent factors which push the individual to take certain specific courses of action.

Bearing this distinction between outcomes and inputs in mind, consumer research which utilises expectancy theory divides the term 'values' into two parts. The antecedent value refers to the inputs as described above, and the consequent value describes the outcomes. The partitioning

of the term value into antecedent and consequent components is not meant to imply that these occur at temporally distinct periods in the mind of the individual. The distinction serves only to point out that while some motivational factors push an individual to take a particular action, other motivational forces arise from the consideration of the consequences arising from each of the alternatives.

The notion of functional consequences is critical to this distinction. Outcomes refer to the primary functional aspects of the alternatives in the product set; they are the basic reason for buying and/or using the product. Inputs, on the other hand, are those motivational factors other than perceived functional consequences which influence the selection of one specific behavioural alternative over the other available alternatives.

The model for this conception would be as follows:

$$MF A_a = (SI_i \times LI A_{i a}) + (DO_k \times EA O_{a k})$$

where,

$MF A_a$ is the motivational force of alternative a, (M_i)

SI_i is the significance of input i, (weighting)

$LI A_{i a}$ is the likelihood that input i will lead to selecting

alternative a, (I_{jk})

DO_k is the desirability of outcome k, (V_k)

$EA O_{a k}$ is the expectancy that selecting alternative a will

result in obtaining outcome k. (E_{ij})

(Jacoby, 1969. p.1049)

The similarity of this model with the Vroom proposal is easily seen. In the above formulation the equivalent components from the original formula are set in brackets.

Two noticeable differences exist between this adaptation of the model

and the original formulation. Firstly, the adapted model above draws a distinction, in the valence term, between input and outcome which does not exist in the original proposal. Within the Vroom model, this input distinction would probably best be considered as an additional weighting given to the valence component.

Secondly, the model outlined above is additive, and not multiplicative as in the initial formulation. Vroom stipulated that valence and instrumentality combine multiplicatively. Within this adapted model only the input component of the valence concept combines multiplicatively with the instrumentality component. The second part of the valence component, the desirability of the outcome, is perceived within this model as combining multiplicatively with expectancy, the two products being added together to obtain the motivational force towards the alternative.

4.3.7 PROBLEMS WITH EXPECTANCY THEORY

Campbell and Pritchard (1976) outline twelve problems that confront expectancy theory.

1) A major problem exists in respect to the dependent variable. While the model attempts to predict choice or effort, most research has been directed at the latter.

2) A problem exists with the methods that have been used to measure the independent variables. Generally questionnaire type items using a summated ratings response are used. However, while this has been done, no attempts have been made to establish exactly whether the subjects are using the variable in the way that the researcher intended.

3) While Vroom's theory was originally designed to make within-individual predictions, it has been mostly put to use to discover between-individual predictions. Unless the meaning of a variable is the same across subjects, this type of approach is open to serious response biases, and to differing utility functions which would serve to confuse both the between-subject comparisons and the observed relationships.

4) Citing Mitchell (1974), Campbell and Pritchard (1976) point out that available data concerning the reliability of the Valence-Instrumentality-Expectancy (VIE) component measures suggest a reasonably high internal consistency. However, when measures are made at two different times internal consistency is usually quite low.

5) Another problem arises in regard to the nature of the predictions made by the model. The focus of the model is on the change in the dependent variable as a function of the changes in the independent variables. However attempts to test the model have focused primarily on relating predicted effort to ratings of effort and performance via static correlations.

6) Most studies have used subjects who are all from a single organisation or group. It is possible that such a restricted sample could affect the range of expectancies and instrumentalities measured.

7) The VIE formulation is a process theory and does not specify which outcomes are relevant for particular people in a particular situation. These specifications are left to the researcher's own ingenuity, and as a consequence negative results are explained on the grounds that all the possible relevant outcomes are not included in the study.

8) Most versions of the full VIE formulation contain sums of cross-products between valences and expectancies, and between valences and

instrumentalities. These cross products involve the assumption that there is no interaction between valence and expectancy, or between valence and instrumentality. It seems very unlikely, however, that such an assumption can be justified.

9) If the scores are to be multiplied together then the variables must be measured on a ratio scale. This is generally not done.

10) Most versions of the model assume that outcome valences are additive in some sense. However, this may not mirror reality; individuals may well combine valences in some other fashion.

11) Following on from the previous problem, it seems that there is inherent in the model a general notion that the world is built in a linear, or at the least monotonic, fashion. That is, the higher the expectancy the greater the force, or the greater the instrumentality the greater the force, and so on. All of these linearity assumptions are without empirical support at present.

12) Finally, it seems that research into expectancy theory has adopted a "general factor plus specifics as its view of the 'structure' of expectancy, instrumentality, and valence" (Campbell and Pritchard, 1976 p.95) That is, each variable is made up of a general factor combined with a number of specific other lesser factors. While this conception may be true, it may also be the case that these lesser factors combine and relate to behaviour in functionally different ways depending on the task.

While these comments can be seen to be a strong indictment of the full multiplicative model, Campbell and Pritchard (1976) do believe that they also point the way to more fruitful avenues of motivational research.

4.3.8 THE USE OF EXPECTANCY THEORY IN THE PRESENT STUDY.

In terms of the paired comparison test, if the subjects are asked to indicate preference for product attributes on the basis of the expected value of one attribute over another, then the workings of the combined model above, are thought to be operating here.

$$M_i = E_{ij} \times \sum_{k=1}^n (I_{jk} \times V_k)$$

An individual's motivation to choose one attribute over another is regarded as being a function of:

- 1) the expectancy that the opting for one attribute over another will result in outcome j.
- 2) the perceived instrumentality of outcome j for the attainment of outcome k.
- 3) the valence of outcome k.

However the individual's performance in this task is also a function of other conditions including: aptitude level, skill, understanding of the task, the choice to expend effort, the choice to persist, and the facilitating and inhibiting conditions under the control of the individual.

If subjects prefer one attribute over another on the basis of expected value, then these factors should be in operation and can be referred to in

order to explain individual differences.

4.4.1 THEORY AND TECHNIQUE OF REPERTORY GRID.

Kelly (1955) in his theory of personal constructs makes three assumptions about the universe -

- 1) that it is real,
- 2) that it can be understood only in reference to a time line,
- 3) that it is integral. Given complete knowledge and an all-emcompassing perspective, all events can be seen as being inter-related.

These assumptions have important implications for his psychological theory.

By accepting that the universe contains real events and objects, it is also assumed that events considered internal to a person are equally real. This implies that thoughts about external things possess a reality as much as do the things themselves. Such a conception avoids the groundlessness and subjectivity of a phenomenological or existential approach since it views mankind as testing out his constructions in their ability to predict the world in which he lives.

The second assumption, that the world really exists, implies a state of persistence. Kelly points out that some aspects of the world can only be comprehended if a time perspective is used. e.g. the events of a persons's life may make sense only if the person is understood to be acting in relation to the future as well as to the past and to the present.

Relating the third assumption, that the universe is integral to a psychological view of man, we see Kelly attempting to allow for a psychology where one set of principles can subsume and organise events that seem disparate within other systems. This assumption is both a philosophical statement about the nature of personal construct theory, and a psychological statement referring to mankind's efforts to explore previously unrecognised relationships, in order to construct a more integrated universe.

Kelly recognised that humans possessed a capacity to represent their environment and that they are bound only by their own interpretation of it. Thus humans come to know the world through the constructions they put on it, and are bound to it only by their own lack of ingenuity in reconstruing the events in it. Kelly believed that humans erect a representational model of the world which allows them to make sense of the world and which enables them to chart a course of behaviour in relation to it. Such a representation is only a crude facsimile of many features of the world, but the constructions of reality are tested and modified in order to gain a better base for predictions in the future.

4.4.2 THE THEORY OF PERSONAL CONSTRUCTS.

The theory of personal constructs is presented as a fundamental postulate, accompanied by eleven consistent corollaries. The fundamental postulate states:

"A person's processes are psychologically channelised by the ways in which they anticipate events." (Bannister and Mair, 1968, p.12)

The corollaries of this postulate are, by title, the; construction, individuality, organisation, dichotomy, choice, range, experience, modulation, fragmentation, commonality, and sociality corollaries.

For Kelly, constructs could be analogously described as a set of spectacles through which a person was able to view sections of the world. Some spectacles give people an inappropriate view of the world. When they become aware of this they adjust the lenses so that they may gain a clearer view of the realities involved.

More generally though, a construct is a way in which some things are seen as being alike and yet different from others. A construct therefore is a two-ended affair. It involves a basis for considering likenesses and differences while at the same time excluding things which may be irrelevant to the contrast involved.

Kelly considered a construct to be very different from the notion of a concept. Concepts are described more as a basis for grouping together certain things and distinguishing them from everything else. Constructs on the other hand are more of an interpretation imposed upon events. The reality lies in their use as a device for making sense of the world and anticipating it more fully.

It is not to be considered that constructs exist in isolation. They are, as corollary three points out, linked to other constructs in an orderly manner. This interrelation of constructs differs from individual to individual and a person can be understood to the extent that her/his system of constructs for ordering and anticipating events is understood. By suggesting this, Kelly is stating that behaviour cannot be seen in any meaningful perspective unless the constructions which are being tested by it are appreciated.

Kelly's theory of personal constructs incorporates the notion of a hierarchy of constructs. Superordinate constructs describe constructs which include others as elements. These incorporated constructs are called subordinate constructs. Each construct in any person's system (except those at the very top or very bottom of the system) can be seen as subordinate to many other constructs and also superordinate in respect to others.

One particular grouping of these superordinate constructs, Kelly calls core constructs. He defines them as:

"...those constructs which govern a person's maintenance processes: they enable him to maintain his identity and sense of continuing existence." (Bannister and Mair 1968, p. 30)

While the core constructs may or may not be verbalisable, they can not be changed without disturbing the roots of a person's existence.

4.4.3 THE REPERTORY GRID TECHNIQUE

Kelly developed various methods for eliciting and measuring personal construct systems. His concern was to provide a practical technique for discovering the way people order their view of the world and their own place and actions in relation to it. His techniques focus on eliciting and giving structure to the interwoven pattern of primary role-governing constructs that people have. The most elaborate and fully developed of these practical techniques is the grid form of his Role Construct Repertory Test.

In recent years there has been an upsurge of interest in the Repertory Grid technique especially by industrial users. Repertory Grid supplies the user with a way of doing research into almost any problem. The technique allows more precision, and removes a greater amount of bias, than most other research methods. The Repertory Grid technique allows the interviewer to obtain a clearer picture of how the interviewee views the world, and then to record this with a minimum of observer bias.

Apart from these positive aspects, the usefulness of the Repertory Grid in market research lies in its potential to give a producer descriptions of the product in the consumer's own terms. The technique is useful in that it shows how the product is seen to differ from its competitors in the eyes of the consumer. Repertory Grid can be used by the market researcher for construct gathering only, or it may be used for full individual or group grids.

Use will be made of this technique in the present research to validate the list of product attributes that is to be used in the paired comparison test. The use of such a technique for attribute validation ensures the use of attributes that are perceived by a number of consumers, and not just by one individual.

4.5 RESEARCH DESIGN

The experiment utilised a two factor research design. Subjects were randomly allocated into one of two experimental conditions. In the first condition, subjects were not given the option of knowing the brand name nor the manufacturer's name for all of the test products. In the second condition this information was available.

In this way, it was possible to discover the relative effects of the presence or absence of brand and manufacturer's name information. Such a design allows for the examination of the information chunking hypothesis in consumer behaviour proposed by Jacoby, Szybillo, and Busato-Schach, (1977).

The use of two experimental groups also provided a condition where less information was available to one group of subjects. The results in terms of performance in selecting the most preferred brand, and in terms of the responses made on the subjective states questionnaire could be compared with those of Jacoby, Speller, and Kohn (1974), and Jacoby, Speller, and Berning (1974). Such a comparison could establish whether more information indicated an overload, and whether the subjects were more satisfied, more certain, and less confused with the decision making task when more or less information was made available to them.

After careful consideration it was decided to use toothpaste as the test product for this experiment. The main reasons for this decision were:

- 1) It was considered to be purchased quite regularly by the majority of consumers.
- 2) A large number of competing brands exist in this product market. This would enable a relatively wide range of choice for the subjects.
- 3) Toothpaste is a product which possesses a large number of attributes.

4.6 RESEARCH HYPOTHESES.

A number of research hypotheses taken from the Jacoby, Szybillo, and Busato-Schach (1973) study were incorporated into the present study. In doing this an attempt was made to replicate some of the previous findings made by these researchers. These hypotheses in addition to the main hypothesis of this study are:

Hypothesis 1.

Consumers will acquire less information in arriving at a purchase decision when brand and manufacturer's name is available than when it is unavailable (Jacoby et al., 1977).

Hypothesis 2.

When permitted to acquire information freely from an array of package information, consumers will select brand name information more frequently than any other type of available information (Jacoby et al., 1977).

Hypothesis 3.

When permitted to acquire information freely from an array of package information from which brand name and manufacturer's name is missing, consumers will generally select price information more frequently than any other type of available information (Jacoby et al., 1977).

Hypothesis 4.

When permitted to select information freely from an array of package information, consumers will select only a subset of this information (Jacoby et al., 1977).

Hypothesis 5.

The average size of the information subset acquired, in terms of the number of information attributes accessed, will range from 3 to 7 different information attributes (Jacoby, Chestnut, Weigl, and Fisher 1976).

Hypothesis 6.

Comparison of the preference orders for toothpaste attributes obtained from the paired comparison test with the preference order obtained from the information acquisition procedure, will elicit a substantial number of rank correlations of significant size.

Chapter Five :

Method.

5.1 PILOT STUDY.

Following the development of the questionnaires to be used in the experimental study (see section 5.2.2) all of the measuring instruments were pilot tested on a group of twelve volunteer subjects. The subjects were members of an extramural Stage 2 course in Industrial and Organisational Psychology. The subjects were five males and seven females and their ages ranged from 20 to 37. The subjects were randomly allocated to either the brand and manufacturer's name available condition or to the brand and manufacturer's name unavailable condition and given the paired comparison test to complete. (See appendix A for a copy of the paired comparison test used.)

After completing this test a discussion was initiated about the problems encountered with filling in the questionnaire. The only problem elicited from the group was the inconvenience experienced when circling the preferred attribute, caused by the small spacing between pairs of attributes. This problem was rectified for the test study by substantially increasing the spacing between stimuli in the comparison, and increasing the distance between pairs of stimuli in the test. e.g.

FLAVOUR - BRAND		FLAVOUR	-	BRAND
	became			
COLOUR - GEL/PASTE		COLOUR	-	GEL/PASTE

Three volunteers from each experimental group were then taken through the information display board procedure. At the end of this they were asked to complete the subjective states and general preference questionnaires. From the resulting discussion, no problems were found to have been encountered by any of the subjects and so the procedure used was adopted without modification for the test study.

The analysis of the paired comparison test from the pilot study indicated that the expected dominance of brand name as a preferred attribute was not borne out. By far, GEL/PASTE information was most preferred. BRAND NAME was fifth in overall preference behind GEL/PASTE, CENTS/GRAM, FLAVOUR, and TUBE TYPE.

A closer analysis of the data found a larger preference than expected for MANUFACTURER'S NAME information. This effect was traced to one subject who had preferred MANUFACTURER'S NAME information to all other attribute information. It was possible that this subject was misinterpreting MANUFACTURER'S NAME to mean BRAND NAME. When the results for this subject were re-interpreted as BRAND NAME instead of MANUFACTURER'S NAME, the final results were drastically changed. BRAND NAME, as predicted, was judged the most preferred attribute, overall.

It was recognised that such a reinterpretation was not strictly justifiable. It was, nevertheless, believed that even if the subject did have a strong preference for manufacturer's name information, such a preference would tend to be evened out with a larger sample size. Given this reasoning it was decided that the study should proceed as planned.

Section 5.2 :

Experimental

Study.

5.2.1 SUBJECTS

The subjects used in this experiment were obtained on a voluntary basis from a Stage 2 social psychology course at Massey University. In total, 48 subjects volunteered to take part in the study. Fifteen subjects were males and 33 were females. The ages of the subjects ranged from 19 years to 45 years, with the average age being 22.81 years.

Of the 48 subjects, 33 resided in flatting accommodation, six lived in their own home, seven lived with their parents, one lived in a university hostel, and one lived in some other unspecified residential situation.

Of the 48 subjects, 42 stated that they had purchased or participated in the purchasing of toothpaste in the three months previous to the research.

Given that this was a student population, and considering the small sample size, it was realised that any results would have to be considered most conservatively, and could only be generalised to other similar populations of university students.

Section 5.2.2 :

Measuring

Instruments .

Paired comparisons questionnaire.

Construction of a paired comparison test was undertaken using the guidelines set out by Guilford (1954). Since there were only six stimuli in experimental condition 1, and only eight stimuli in experimental condition 2, it was decided that a complete paired comparison test would be utilised. The total number of pairs in each of these cases can be calculated from the formula:

$$N = n(n - 1) / 2$$

where,

N = the total number of comparisons for the stimuli set

n = the total number of stimuli.

In each condition the total number of paired comparison judgements to be made was 15 and 28 respectively.

The essentials of a paired comparison test are:

- 1) every stimulus must appear equally often on the right and on the left to control the space error.
- 2) the position of the stimulus should be alternated between left or right.
- 3) no stimulus should appear in two successive pairs - spacing should be as far apart as possible.

(Guilford, 1954)

A list was drawn up of comparisons of each stimulus with every other stimulus. The stimuli were then swapped from left to right in the comparison so that the first criteria would be met.

A paired comparison questionnaire was then constructed bearing in mind (2) and (3) above.

In order to guard against any bias due to the questionnaire order, three different paired comparison questionnaires were constructed for each experimental condition. It was hoped that this would remove any possible bias.

The instructions given to the subjects prior to completing the questionnaire were as follow:

"Consider each of the pairs of toothpaste attributes below.
Information about which one of the two attributes would
be most of most value to you when choosing toothpaste?"
(Circle the preferred attribute of the pair).

Such an instruction was considered to describe adequately the decision basis that was to be used by the subjects. They were to compare both of the toothpaste attributes in the pair, and decide which attribute was of greater personal value to them.

The format of the paired comparison questionnaire was as follows:

- 1) A list and verbal description of each attribute used in the questionnaire.
- 2) The instruction which outlined the decision basis to be used.

3) The list of paired comparisons.

(See Appendix B, for actual examples of the questionnaires used).

Personal information questionnaire.

A brief personal information questionnaire was developed in this study. It sought the following information from each subject.

- name

- contact phone number or address

- age

- sex : male / female

- residential information : whether the subject lived in:
a flat / their own home / a university hostel / their parents'
home/ an other unspecified situation.

- consumer information : whether each subject had purchased or
participated in the purchase of toothpaste in the three months prior
to this research.

(See Appendix C for an example of this questionnaire).

The information displayboard.

An information displayboard was constructed for use in the information acquisition session of the experiment. The information displayboard was made out of a sheet of thick cardboard to which was stapled two thinner, light coloured sheets of cardboard, one on each side. On one side of the board the information for experimental condition 1, (brand and manufacturer's name unavailable) was listed. On the other side was the information for experimental condition 2, (brand and manufacturer's name available).

This array was set out as follows. Along the top of the display was printed the actual toothpaste attributes: that is, brand name, flavour, percentage fluoride, tube type, gel/paste, colour, manufacturer's name, and cents per gram. Brand name was always situated on the far left of the display board but the rest of the attributes were randomly listed.

Below each attribute, and corresponding to the brand of toothpaste listed down the left hand column, was printed the corresponding information value. In the brand and manufacturer's name unavailable condition the manufacturer's name attribute and information was not listed. In this case, under the column for brand name information there was only a list of alphabetical letters. e.g. Type T, Type J, and so on. In this condition the list was left uncovered since it was of no value to the subject. Apart from this, the information used in both experimental conditions was identical.

The information values used in this display board were collected from the actual tubes and packages of toothpaste which were all purchased from the same Palmerston North grocery store on 7 April, 1985. Since most

toothpaste is sold at a reduced price, a note was taken of each product's recommended retail price which is displayed with the reduced price.

To reduce the cognitive load for the subjects, a cents per gram analysis was presented in the display board instead of a separate price and weight category. Such an analysis also solved the problem caused by varying tube sizes within and across products. The decision rule utilised was that where more than one size of product existed, the cents per gram information was based on the most economical package for that brand.

After all of the necessary information had been entered onto the display board, a thick sheet of clear plastic was tightly secured over the whole display.

Small cut out cardboard squares were then used to cover each individual piece of information. These were hinged with adhesive tape. Each square was then numbered, the numbering proceeding across the display board. These covers could easily be removed and reattached to the board without dislodging any other cover. (See Appendix D for a replication of the information displayboards for both experimental conditions).

Subjective states questionnaire.

The subjective states questionnaire was adapted directly from the Jacoby et al. (1977) study. In contrast to that study, only five of the six subjective states were tested. They were:

- 1) Degree of satisfaction with the choice made.
- 2) Degree of certainty that the right decision had been made.
- 3) Degree of confusion experienced while performing the task.
- 4) Desire to have received additional information about the brands.
- 5) Feeling that some other brand would be better than the one chosen in satisfying the subject's desires and expectations.

These subjective states were measured on a five point scale. An example of this questionnaire is included in Appendix E.

The subjects were instructed to mark the space corresponding to the subjective state which most closely expressed what they felt.

General toothpaste preference questionnaire.

A questionnaire was constructed to enable information to be elicited on each subject's actual preference for certain dimensions within the attributes that were used in the study. For example, it was known from the paired comparison test how much a subject preferred gel/paste information over certain other attribute information. However, within that gel/paste attribute it was not known whether the subject preferred a gel type product or a paste type product (that is, dimensions within the attribute).

This questionnaire was designed to collect this information for incorporation into a summary of toothpaste attribute preferences.

Corresponding to each attribute, the possible dimensions were listed. These attributes and corresponding dimensions were:

BRAND : Colgate, Aim, Signal, Ultra Brite, Kolynos, Plain Pack,
Macleans, Woolworths Brand.

FLAVOUR : Mint, Spearmint, Freshmint, Mildmint, Coolmint.

PERCENTAGE FLUORIDE : 75% fluoride, No fluoride.

GEL/PASTE : Gel, Paste.

COLOUR : White, Blue

TUBE TYPE : Plastic, Metal

CENTS/GRAM : Less than one cent per gram,

1.0 to 1.5 cents per gram,

1.5 to 2.0 cents per gram,

Price is not a factor in my decision.

Subjects were instructed to circle the appropriate preferred dimensions. (See Appendix F for a copy of the actual questionnaire).

5.2.3 PROCEDURE

The subjects in the test study were collected into groups of six (there were three different questionnaires for each of the two experimental conditions).

Using surnames in alphabetical order, the subjects within the group of six, were allowed to choose a questionnaire from the set of six questionnaires. These questionnaires were not in any particular order, and the details of each questionnaire were not visible to the subject at the time of selection. This procedure was used for each group of six subjects.

When groups of less than six subjects were encountered, the same procedure was used. The questionnaires left over in this case were not used again.

The subjects were requested to carefully read and complete the paired comparison test. As well, they were asked to record the appropriate details on the personal information sheet that was also attached to the paired comparison test.

After completing these forms, the subjects were given the opportunity to select a convenient time in which to take part in the second part of the experiment, two weeks or more later.

Two weeks after this initial testing, the subjects were individually met by the researcher for the second session of the study. Depending on which experimental condition the subject was in, one of two instruction sheets was given to the subject to read. The instruction sheets differed in only one respect. If the subject was in the brand and manufacturer's name available condition, then the word brand was used. If the subject was

in the brand and manufacturer's name unavailable condition, the word brand was replaced with `type'.

This sheet instructed the subject on how to use the information display board. The instructions read as follows:

" Assume that you have run out of toothpaste and are now in the process of shopping to replenish your supply. Your task is to select one brand (type) of toothpaste from the 10 brands (types) that are about to be presented to you by means of a special information display device.

Read the names of the available information dimensions. You can obtain the actual information values for any of the types of toothpaste on any information dimension listed by simply removing the cover over that information value.

You can acquire as much or as little information as you desire. You can remove none of the covers, you can remove one, several, or all of the covers before making your toothpaste selection"

After reading this the subject was asked if they understood the instructions. If the subject indicated that they did not understand then the instructions were read to the subject and any questions answered. When the subject stated that they understood the instructions they were taken to view the information more closely. If the subject was in the brand and manufacturer's name unavailable condition then the display excluding this information was presented to them. If the subject was in the other experimental condition (brand and manufacturer's name available) then the appropriate display incorporating this information was presented to them.

The subjects were shown how to remove the cardboard covers over the attribute information. They were also shown how to collect the numbered cardboard covers in exactly the same order as they were taken off. (That is, by placing each subsequent cover at the bottom of the pile being collected in the subject's hand). The subject was then left to freely access information until they were able to make a decision about which brand or type of toothpaste they would select.

When the subject had made a choice of toothpaste, the researcher recorded the choice and collected the cardboard covers from the subject. The subject was then given a subjective states questionnaire and a general toothpaste preference questionnaire to complete. While this was being completed, the numbers on the cardboard covers were recorded in the same order as they were collected by the subject. Later these numbers were converted into the corresponding attributes giving a record of the progression of information acquisition taken by the subject in arriving at their choice.

After the completion of the subjective states and general preference questionnaire the subject was debriefed and thanked for their co-operation.

5.3 FOLLOW-UP STUDY.

As previously mentioned the repertory grid technique was used in this research in order to validate the test product attributes considered in this study.

The subjects for this part of the study were six female students from a stage three vocational guidance course, who volunteered to take part. The subjects were considered to be similar on all important variables to those subjects used in the main research. The average age of these subjects was 21.35 years.

The subjects were interviewed individually and the normal process of construct elicitation was undertaken (Stewart and Stewart, 1981). Ten test products were used in all. These it was considered, covered the range of toothpastes normally used by the subjects. It did not include toothpastes such as Smokers toothpaste, or Pearl-Drops. These types of toothpaste were considered outside the range of toothpastes normally purchased.

Each subject in this test was presented with three test products and asked to examine them. After this examination they were asked to suggest ways in which two of the products were similar but different from the third. These similarities and dissimilarities were considered to be the constructs as outlined by the theory. These constructs were recorded by the interviewer. This procedure continued using a mixture of different test products until the subject felt that they had exhausted the range of possible product attributes.

The subject was then asked to state which of each of the two constructs (the similarity and the dissimilarity) they preferred. The preferred construct was marked with a '+' sign. Using a previously constructed grid evaluation form (see appendix G) these constructs were

entered. The constructs receiving the positive evaluation ('+') were entered in the left hand margin, while the other non-preferred construct was entered in the right hand margin.

The subject was then asked to rate each test product (brands of toothpaste) from which the constructs were elicited on a one to seven scale over each of the constructs that were elicited. The guidelines for the seven point rating scale was as follows:

1	2	3	4	5	6	7
Very strong dislike for this attribute in this product.	Strong dislike for this attribute in this product.	Dislike for this attribute in this product.	Neither like nor dislike this attribute in this product.	Liking for this attribute in this product.	Strong liking for this attribute in this product.	Very Strong liking for this attribute in this product.

After the completion of this questionnaire, the subjects were debriefed about the purpose of the study, and the use made of the Repertory grid.

The list of product attributes obtained from these subjects is recorded in the results section 6.9 .

Chapter Six :

Results .

6.1 OVERVIEW OF THE RESULTS.

The results obtained from the tests and questionnaires presented to the subjects are given in this section. First, the results of the pilot study are given.

A second section details all of the results obtained from the paired comparison test and the general toothpaste preference questionnaire. These results are compared with the pertinent results from the information acquisition procedure in an attempt to highlight any differences between the two procedures. This second section also includes a number of attribute preference scales. These scales describe the subject's choice of preferred attributes. The scales also compare experimental group results, as well as the sub-groups within these experimental conditions. This section is concluded with the results of the chi-square test of unidimensionality.

The third section outlines the various results obtained through the use of the information displayboard. These results include a summary of the number of information pieces accessed per attribute, and a total for both experimental conditions. Further analyses of differences in total information acquisition between attributes within experimental groups are also listed.

The fourth section looks at the order of information acquisition. This is done by the use of decision net diagrams.

The fifth section of the results covers the responses made by the subjects to the subjective states questions, which were answered after the information search and acquisition test.

The next section looks at the results of the Spearman Rank Order

Correlation Tests. This Spearman correlation test was performed on each subject's data. The correlation will be between the rank preference for product attributes obtained from the analysis of the paired comparison test and the rank preference obtained from an analysis of the order in which each subject accessed attribute information from the information displayboard.

The final section considers the results of the follow-up study, and outlines the validation obtained for the product attributes used in this study.

It is strongly emphasised that the analysis of these results must be recognised as being purely exploratory in nature. Any conclusions can only be regarded as indicating possible trends, and cannot be taken as definitive. Given this limitation, it is stated that the inferential analysis undertaken is performed only because an attempt is being made to replicate previous findings which have used similar tests. It is acknowledged that because of the exploratory nature of the present study, any analysis of results should, strictly speaking, be performed at a purely descriptive level. This is done where possible.

6.2 PILOT STUDY

A pilot study was undertaken to test the questionnaires and to gain practice in the procedures that were to be followed (see Appendix A for a copy of the test questionnaires used). The attribute preferences obtained from the paired comparison test are listed in figure 6.1. These results were calculated by following the procedure outlined in Guilford (1954).

Figure 6.1
 Scale of attribute preference measured from the paired comparison analysis for subjects in the pilot study.

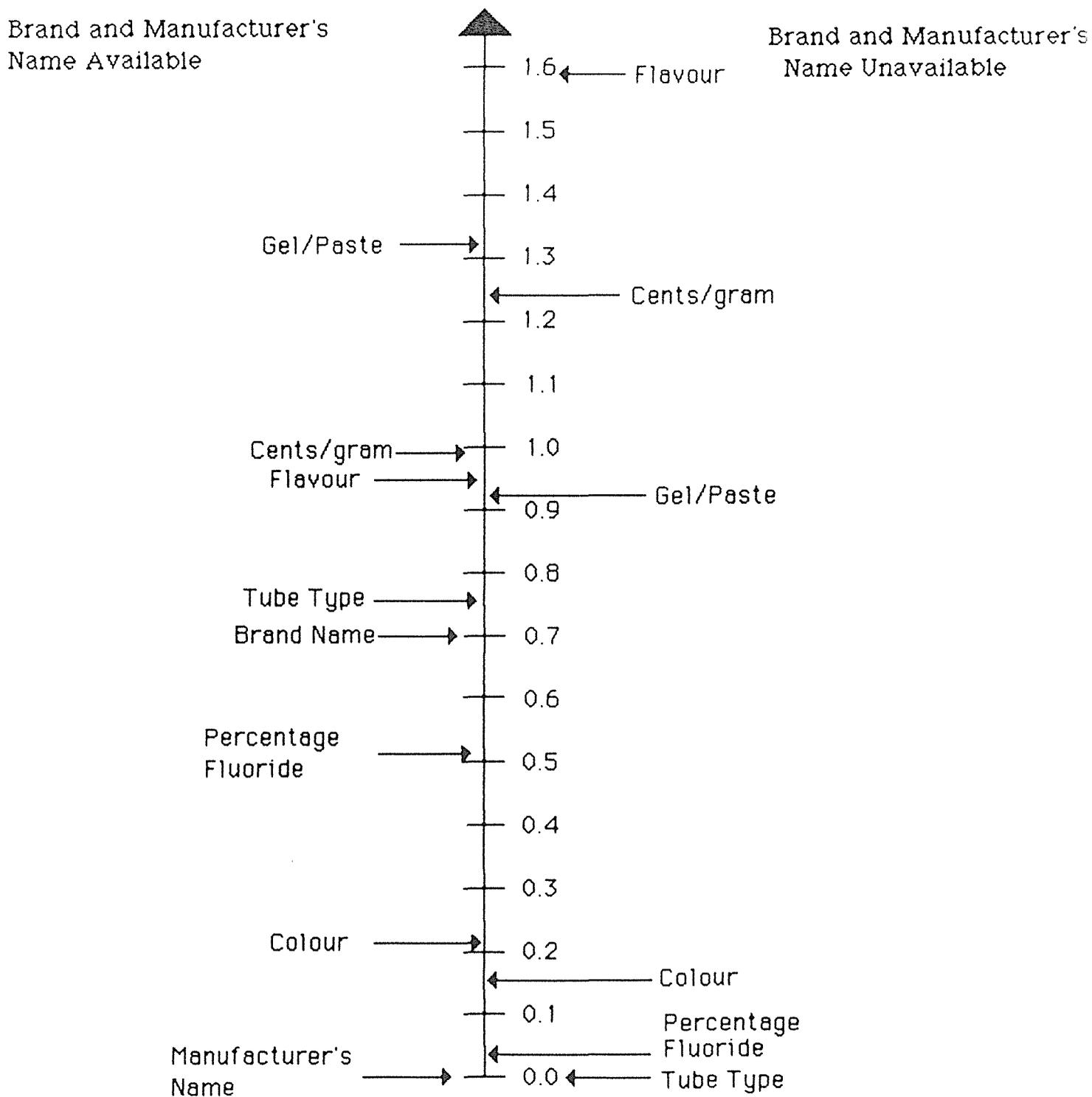


Table 6.1

Summary of the preference orders and scale values for figure 6.1 .

BRAND AND MANUFACTURER'S NAME			
AVAILABLE		UNAVAILABLE	
Attributes	Scale Value	Attributes	Scale Value
Gel/paste	1.367	Flavour	1.597
Cents/gram	0.987	Cents/gram	1.248
Flavour	0.978	Gel/paste	0.914
Tube Type	0.758	Colour	0.146
Brand Name	0.712	-----	
Percentage Fluoride	0.521	Percentage Fluoride	0.020
Colour	0.228	Tube Type	0.000
Manufacturer's Name	0.000	-----	

Figure 6.1 charts the overall preference for the product attributes as expressed by subjects in the pilot study. The positioning of the attributes shows the relative differences in preference between the attributes. Most noticeable is the major preference for GEL/PASTE information in the brand and manufacturer's name available condition. In the brand and manufacturer's name unavailable condition, the major overall preference is for FLAVOUR information.

As noted above in the Methods section, BRAND NAME is not the most preferred attribute: in fact it is only fifth in order of preference. This difference from what was expected was considered to be due to either, incorrect discrimination by one subject, or to the small size of the subject sample that was used. It had been found that the MANUFACTURER'S NAME attribute had been strongly preferred by one subject. It was thought

that this subject may have confused this attribute with the BRAND NAME attribute, and caused a lessening of overall preference for the BRAND NAME attribute. Even if this was not the case, the results were to be viewed with some caution solely because of the small sample size involved in the pilot test.

Within the brand and manufacturer's name unavailable condition there seems to be no noticeable grouping of attributes. This is not the case however in the brand and manufacturer's name available condition. Here CENTS/GRAM and FLAVOUR are close together as too are TUBE TYPE and BRAND NAME attributes.

6.3 THE MAIN STUDY.

6.3.1 THE GENERAL TOOTHPASTE PREFERENCE QUESTIONNAIRE.

Table 6.2 sets out the results of the general toothpaste preference questionnaire in regards to the subjects most preferred brand of toothpaste.

Table 6.2

Table of the most preferred brands as obtained from the General Toothpaste Preference Questionnaire.

BRAND & MANUFACTURER'S NAME.					
AVAILABLE		UNAVAILABLE		COMBINED.	
1.	Macleans	9	Macleans	8	Macleans 17
2.	Colgate	7	Colgate	5	Colgate 12
3.	Signal	4	Aim	4	Aim 7
4.	Aim	3	Plain Pack	3	Signal 6
5.	Plain Pack	1	Signal	2	Plain Pack 4
6.			Ultra Brite	1	Ultra Brite 1
			Kolynos	1	Kolynos 1
TOTAL		24	24		48

The most preferred brand of toothpaste as witnessed by the general toothpaste preference questionnaire was Macleans. This preference was the same over both groups of subjects. The other major preferences are listed in descending order for both experimental conditions and for the combination of these groups.

Table 6.3 can be contrasted with table 6.2 . Table 6.3 sets out the actual brand choices made by the subjects after they had accessed the information required in making a choice. The difference between the two tables is that, in the first, subjects stated what they preferred, whereas the second summarises their actual choices.

Table 6.3

Table of the Brand choices made by subjects in the information acquisition test.

BRAND AND MANUFACTURER'S NAME:			
AVAILABLE		UNAVAILABLE	
1. Macleans	8	Plain Pack	12
2. Plain Pack	5	Woolworths	3
		Signal	3
3. Colgate	4	Macleans	2
		Ultra Brite	2
4. Aim	2	Aim	1
		Signal	1
TOTALS	24		24

In the brand and manufacturer's name available condition, Macleans was once again the most frequently chosen brand of toothpaste. Surprisingly the Plain Pack product was chosen just as often as the Signal brand in this condition. In the brand and manufacturer's name unavailable condition the subjects chose the Plain Pack product most often. The second most frequently chosen brands were the Woolworths and the Colgate products. Macleans was not chosen as often in this condition as it was in the other experimental condition. The difference between these results is attributable to the differences between the experimental conditions. The subjects in the brand and manufacturer's name unavailable condition were given no brand and manufacturer information on which to base their decision.

The correspondence between the preferred brand as stated by the

subjects in the general preference questionnaire and the actual brand that they each chose, is summarised in table 6.4 .

Table 6.4

Table of the degree of correspondence between the subjects choice of preferred Brand and the Brand that they chose in the information search. The number of subjects is given in parenthesis.

	BRAND AND MANUFACTURER'S NAME	
	AVAILABLE	UNAVAILABLE
Males	70% (10)	40% (5)
Females	64.3% (14)	31.5% (19)
Flatters	65.4% (16)	41% (17)
Home Owners	8.3% (3)	4.2% (3)
Living with Parents.	12.5% (5)	0% (2)
Other	----- (0)	0% (2)
OVERALL	66.6%	33%

The results show that those subjects who had the benefit of brand and manufacturer's name information chose their most preferred brand more often than the other experimental group. The table breaks down this correspondence into various sub-categories: male - female, flatters - home owners - those living with parents - those living in other housing accommodation. Within these groups the trend for subjects in the brand and manufacturer's name available condition to be more successful in choosing their preferred brand is apparent.

The major purpose of the general toothpaste preference questionnaire (see Appendix F for a copy of this questionnaire) was to examine the subjects' preferences for toothpaste. The interest was in the preference for certain dimensions within the available attributes. The results for this are shown in table 6.5 .

Table 6.5

Table of the within experimental group preferences for each dimension within the product attributes used. The number of subjects are given in parenthesis.

		BRAND AND MANUFACTURER'S NAME			
		AVAILABLE		UNAVAILABLE	
FLAVOUR					
Spearmint	33% (8)	Mint	29.2%	(7)	
Freshmint	33% (8)				
Mildmint	16.6% (4)	Mildmint	20.9%	(5)	
Coolmint	8.3% (2)	Spearmint	16.7%	(4)	
Mint	8.3% (2)	Freshmint	16.7%	(4)	
		Coolmint	16.7%	(4)	
PERCENTAGE FLUORIDE					
Fluoride	95.8% (23)	Fluoride	87.5%	(21)	
No Fluoride	4.2% (1)	No Fluoride	12.5%	(3)	
PASTE TYPE					
Gel	20.8% (5)	Gel	25%	(6)	
Paste	79.2% (19)	Paste	75%	(18)	
COLOUR					
White	75% (18)	White	71%	(17)	
Blue	25% (6)	Blue	29%	(7)	
TUBE TYPE					
Plastic Tube	92% (22)	Plastic Tube	92%	(22)	
Metal Tube	8% (8)	Metal Tube	8%	(8)	
CENTS PER GRAM					
< 1 cent/gram	25% (6)	< 1 cent/gram	50%	(12)	
1.0 - 1.5 cents/gram	20.8% (5)	1.0 - 1.5 cents/gram	25%	(6)	
1.5 - 2.0 cents/gram	4.2% (1)	1.5 - 2.0 cents/gram	4%	(1)	
Cost is not a factor	50% (12)	Cost is not a factor	21%	(5)	

Spearmint and Freshmint were the most preferred flavours in the brand and manufacturer's name available condition, whereas Mint was most preferred in the brand and manufacturer's name unavailable condition. For both experimental groups fluoride was preferred to no fluoride, pastes were preferred to gels, white colouring was preferred to blue, and the new plastic tubes were preferred to the metal ones.

The answers concerning cost were quite divided. Those subjects in the brand and manufacturer's name available condition responded to this question very differently from those subjects in the brand and manufacturer's name unavailable condition. Of the subjects in the condition where brand name and the manufacturer's name was available, 50% indicated that price was not a factor in their choice. Correspondingly, in the unavailable condition only 4% answered in this way. In this condition 50% of the subjects indicated that they preferred a toothpaste that cost less than one cent per gram.

In summary the important differences between the two groups were:

- 1) the brand and manufacturer's name available group preferred spearmint and freshmint flavours while the brand and manufacturer's name unavailable group preferred mint.
- 2) while half of the brand and manufacturer's name available subjects indicated that cost was not a factor in their choice of toothpaste, half of the subjects in the brand and manufacturer's name unavailable condition stated that they preferred a toothpaste which cost less than one cent per gram.

6.3.2 SCALES OF ATTRIBUTE IMPORTANCE OBTAINED FROM THE ANALYSIS OF THE PAIRED COMPARISON TESTS.

Given the larger number of subjects in the main experiment as opposed to the pilot study, it was decided that the analysis of the paired comparison tests would be done by making use of a computer programme. The PAIRCOMP programme was used to do this (Burroughs, 1975).

Paircomp is a programme for the analysis of paired comparison data. The analysis follows Guilford's (1954) paired comparison procedure, for Case Va assumptions. The procedure makes the assumption that the data are unidimensional and that the distributions of the stimuli in the comparisons have approximately equal standard deviations.

Paircomp requires two sets of input. Input identifying the items in each of the paired comparisons and input giving the choice that the subject made in each case. The output that the paircomp programme gives includes a total circular triad count (t.c.t. count) which is a test of the validity of a subject's data. It also gives a scale of the tested items for each subject (indivfile), a matrix of responses for each subject (matrixfile), a matrix of responses summed across subjects (promatfile), and an average scale for the tested items across subjects (scalefile).

By converting the proportions obtained from the scalefile output into z-scores, the preference proportions may be set out on a scale.

The ranking of attribute preference and the distances between the attributes can be compared and contrasted. These differences provide important information about the attribute preferences which occur when some attribute information is not available, and the preferences which exist in different sub-groups of the population.

Total Circular Triad (t.c.t.) counts for each subject can be generated using this programme.

Kendall (1954) gives a formula for the calculation of acceptable T.C.T. counts. The formula is:

$$\text{t.c.t. (max.)} = (n^3 - 4n)/24$$

where, n = the number of stimuli in the paired comparison set.

In this study, the maximum number of allowable t.c.t. violations permissible is 20 in the brand and manufacturer's name available condition, and eight in the brand and manufacturer's name unavailable condition. After checking each subject's t.c.t. count, all were found to have acceptably low counts. The highest count in the brand and manufacturer's name available condition was nine, and five was the highest count in the brand and manufacturer's name unavailable condition.

Figure 6.2

Scale of attribute preference measured from the paired comparison analysis comparing the brand and manufacturer's name available condition to the brand and manufacturer's name unavailable condition.

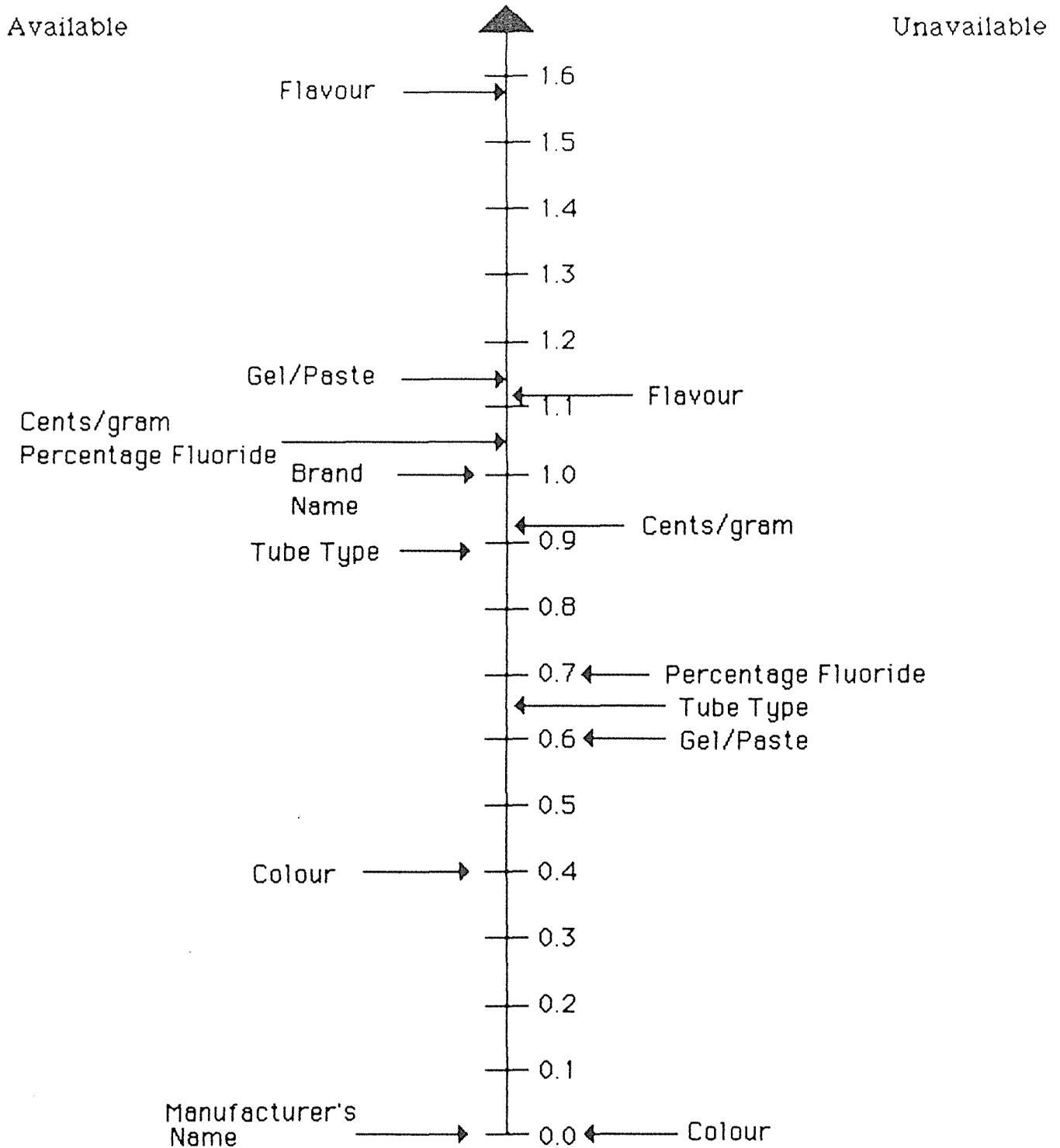


Table 6.6

Summary of the preference orders and scale values for figure 6.2 .

BRAND AND MANUFACTURER'S NAME			
AVAILABLE		UNAVAILABLE	
Attributes	Scale Value	Attribute	Scale Value
Flavour	1.582	Flavour	1.125
Gel/paste	1.146	Cents/gram	0.920
{Cents/gram		Percentage Fluoride	0.709
Percentage Fluoride}	1.051		
		Tube Type	0.656
Brand Name	1.039	-----	
Tube Type	0.908	Gel/paste	0.604
Colour	0.404	Colour	0.000
Manufacturer's Name	0.000		

In both experimental conditions FLAVOUR is regarded as the most preferred attribute, and both have distinct groupings of attributes. In the brand and manufacturer's name available condition FLAVOUR is the most preferred attribute and is situated approximately four and a half points away from the next attribute, GEL/PASTE. This attribute is grouped closely with CENTS/GRAM, PERCENTAGE FLUORIDE, BRAND NAME, and TUBE TYPE. The COLOUR and MANUFACTURER'S NAME attributes are at the bottom of the scale.

The brand and manufacturer's name unavailable condition has a different grouping of product attributes. FLAVOUR is by far the most preferred attribute. CENTS/GRAM is next, quite distinct from FLAVOUR, and the attributes which follow it; CENTS/GRAM, PERCENTAGE FLUORIDE, TUBE TYPE,

and GEL/PASTE. At the bottom of the scale is the COLOUR attribute.

Measures of attribute preference for sub-groups within the brand and manufacturer's name available condition.

The subjects within each experimental condition can be divided into a number of sub-groups on the basis of sex, housing accommodation, and age. Analysis of the attribute preference scales over these sub-groups provides some interesting similarities and differences.

Looking firstly at the brand and manufacturer's name available condition, the scale comparisons for the males and the females within the group is presented in figure 6.3 .

Figure 6.3

Scale of attribute preference measured from the paired comparison analysis comparing males and females in the brand and manufacturer's name available condition.

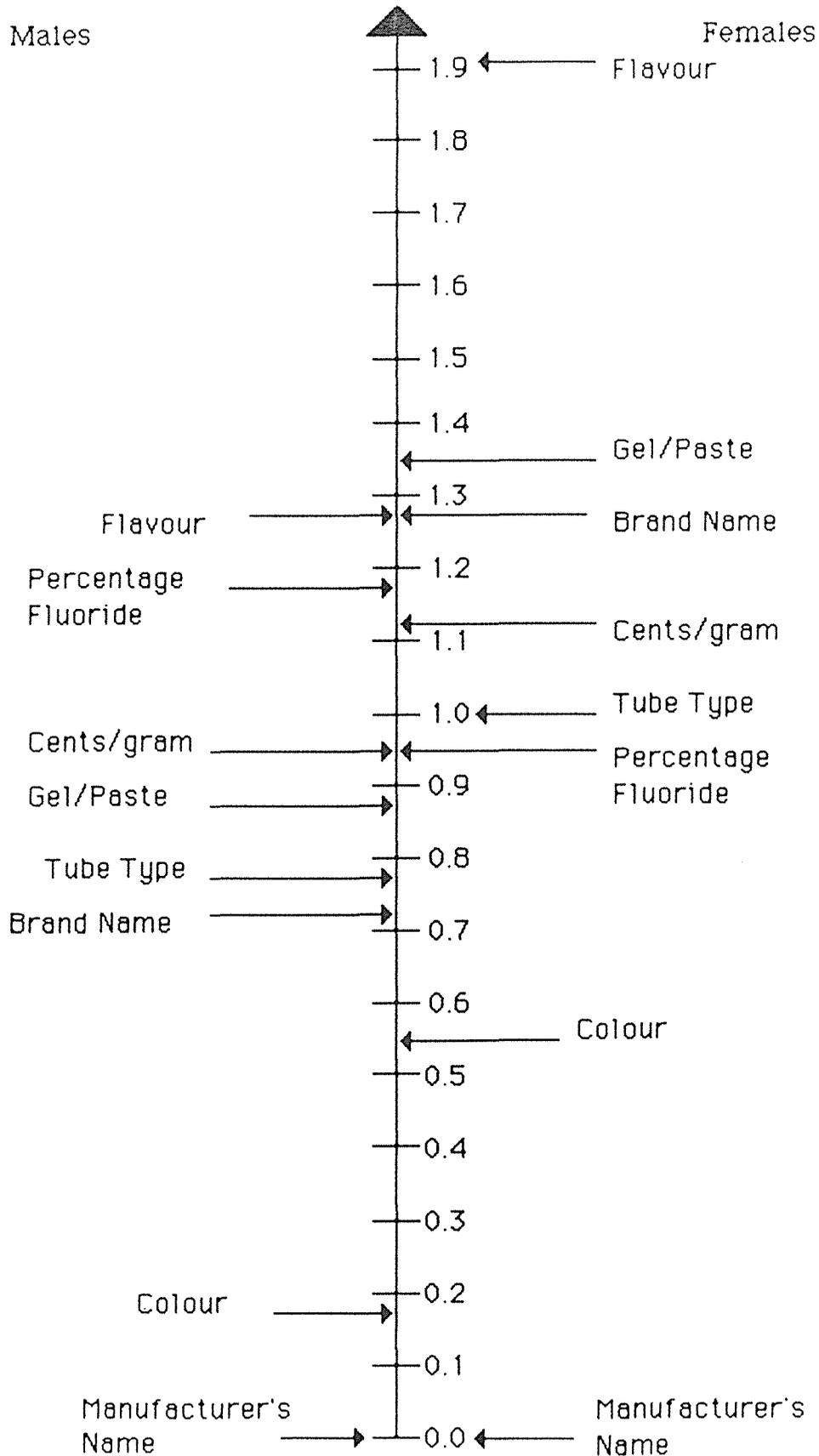


Table 6.7

Summary of the preference orders and scale values for figure 6.3 .

MALES n=10		FEMALES n=14	
Attributes	Scale Value	Attributes	Scale Value
Flavour	1.279	Flavour	1.821
Percentage Fluoride	1.176	Gel/paste	1.347
Cents/gram	0.944	Brand Name	1.276
Gel/paste	0.881	Cents/gram	1.141
Tube Type	0.788	Tube Type	1.005
Brand Name	0.722	Percentage Fluoride	0.983
Colour	0.196	Colour	0.563
Manufacturer's Name	0.000	Manufacturer's Name	0.000

Noticeable different attribute preferences exist between the males and the females within this condition. For both groups, FLAVOUR is the most preferred attribute. PERCENTAGE FLUORIDE is closely preferred behind FLAVOUR for males. There is a five and a half point difference between FLAVOUR and GEL/PASTE which is the next most preferred attribute for females.

For both groups the BRAND NAME attribute is well down in the order of preference, although it is preferred more highly by females than males. The order of preference and the distance between attributes is shown in figure 6.3 .

The next sub-grouping to be examined is housing accommodation. Subjects living in flatting accommodation (flatters) are compared to those subjects living in any other accommodation (home owners, those

living with parents, those living in the university hostels, or those living in any other unspecified accommodation.) This distinction was made because flatting was the most common type of living accommodation within both experimental groups. It was of interest whether living situation caused any differences in preference for toothpaste attributes.

Figure 6.4
 Scale of attribute preference measured from the paired comparison analysis comparing those in flattening accommodation and those in any other accommodation situation in the brand and manufacturer's name available condition.

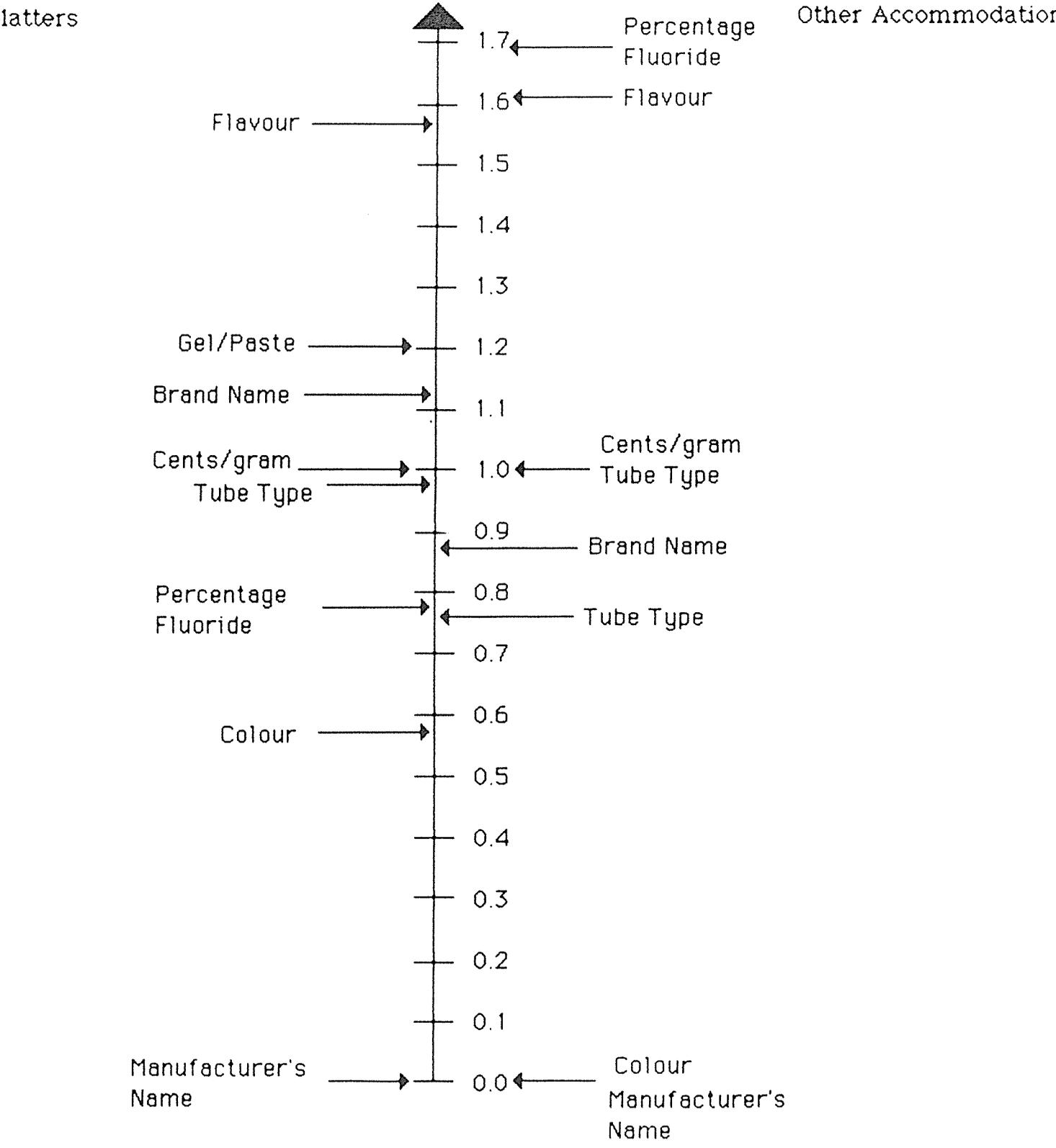


Table 6.8

Summary of the preference orders and scale values for figure 6.4 .

FLATTERS n=16		OTHERS n= 8	
Attributes	Scale Value	Attribute	Scale Value
Flavour	1.565	Percentage Fluoride	1.661
Gel/Paste	1.192	Flavour	1.611
Brand Name	1.112	{Cents/gram Gel/paste}	1.044
Cents/gram	1.053	Brand Name	0.885
Tube Type	0.973	Tube Type	0.767
Percentage Fluoride	0.777	{Colour Manufacturer's Name}	0.000
Colour	0.575		
Manufacturer's Name	0.000		

A difference exists between these two groups of subjects with regards to the most preferred attribute. For the subjects in flatting accommodation, FLAVOUR is the most preferred toothpaste attribute. However, for the subjects living in any other housing accommodation (home owners, those living at home with parents, hostellers, other) PERCENTAGE FLUORIDE is the most preferred attribute.

Once again the BRAND NAME attribute is some distance from the most preferred attribute in both cases. The preference orders are also dissimilar for the two groups. This can be seen readily by reference to figure 6.4 and the summary of the preference orders listed above.

The final sub-grouping to be considered within this condition is those subjects aged 21 years or less and those subjects aged over 21 years. This distinction was made in order to compare the attribute preferences of those subjects who were attending university straight from college, and those who had not come immediately after their secondary education.

Figure 6.5

Scale of attribute preference measured from the paired comparison analysis comparing subjects aged 21 years or less, to those aged over 21 years in the brand and manufacturer's name available condition.

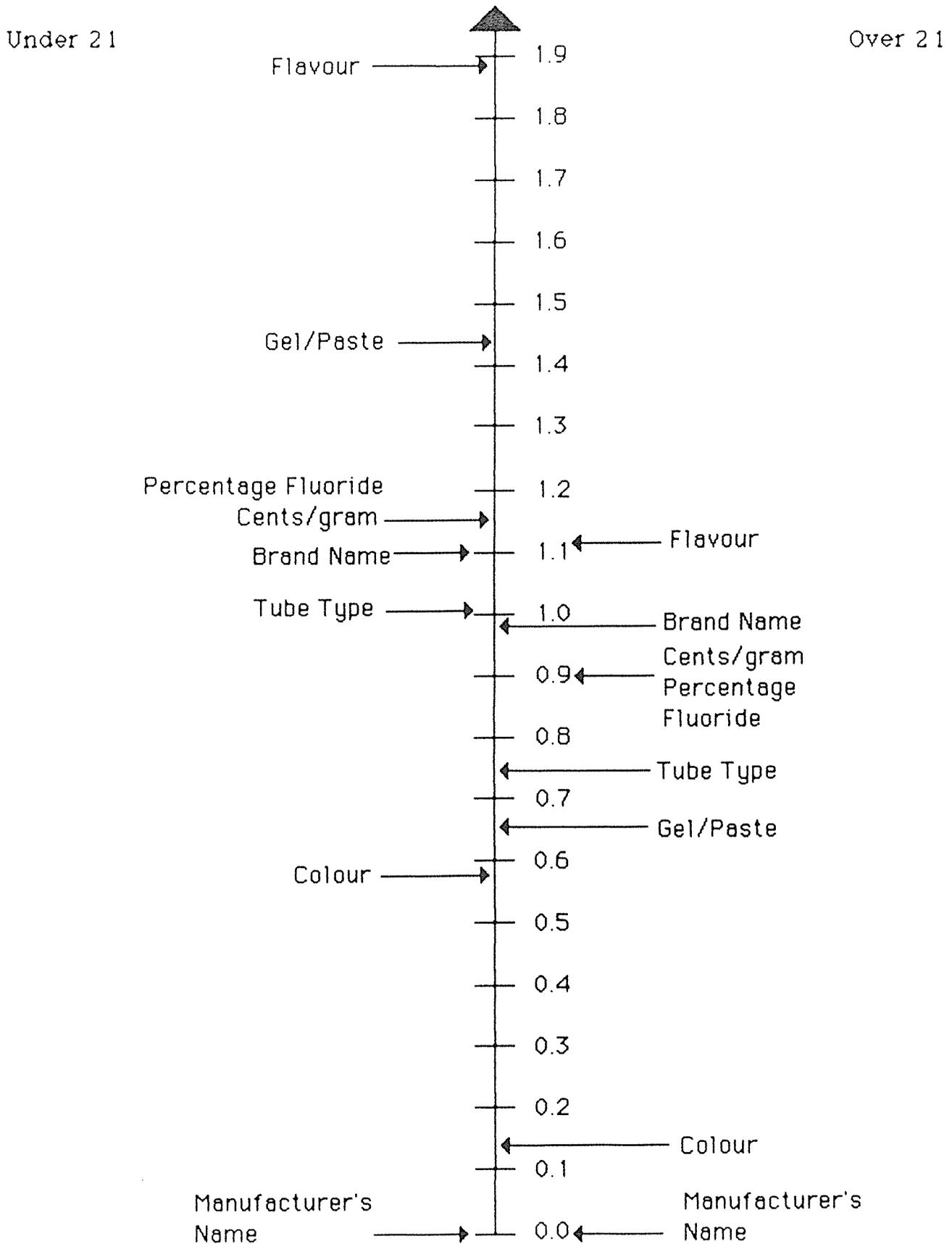


Table 6.9

Summary of the preference orders and scale values for figure 6.5 .

UNDER 21 n=15		OVER 21 n= 9	
Attributes	Scale Value	Attributes	Scale Value
Flavour	1.881	Flavour	1.148
Gel/paste	1.450	Brand Name	0.961
{Cents/gram		{Cents/gram	
Percentage Fluoride}	1.147	Percentage Fluoride}	0.925
Brand Name	1.107	Tube Type	0.750
Tube Type	1.021	Gel/paste	0.679
Colour	0.589	Colour	0.129
Manufacturer's Name	0.000	Manufacturer's Name	0.000

The attribute preferences for both of these groups are similar in two respects. Both groups have FLAVOUR as the most preferred toothpaste attribute, and there is a similar grouping of product attributes in both.

For both the group of subjects aged 21 or less and those aged over 21 years, FLAVOUR is the most preferred product attribute. Both groups have similar groupings of attributes: PERCENTAGE FLUORIDE, CENTS/GRAM, and BRAND NAME, are all ranked very closely, and in both cases are preferred to TUBE TYPE informationf. Examination of the scales figure 6.5 provides a clear picture of this as well as the order of the other attributes.

Summary.

FLAVOUR was the most preferred toothpaste attribute in all but one of the sub-groupings analysed (that is, the only group for whom it was not first preference was the non-flattering sub-group), and for them it was only 0.05 units away from the most preferred attribute, PERCENTAGE FLUORIDE.

Noticeably in all sub-groupings, the BRAND NAME attribute did not rate as highly in preference as was expected. In fact it rated in the top three attributes within each of the six sub-groupings only three times.

This is illustrated by reference to Figure 6.6 . The graph shows the overall ranked positions for the FLAVOUR and BRAND NAME attributes in the sub-groupings for the brand and manufacturer's name available condition. As can be seen from the graph, FLAVOUR is always ranked among the top three attributes, while BRAND NAME is ranked in this position by only three sub-groups (females, flatters, and those over 21 years of age).

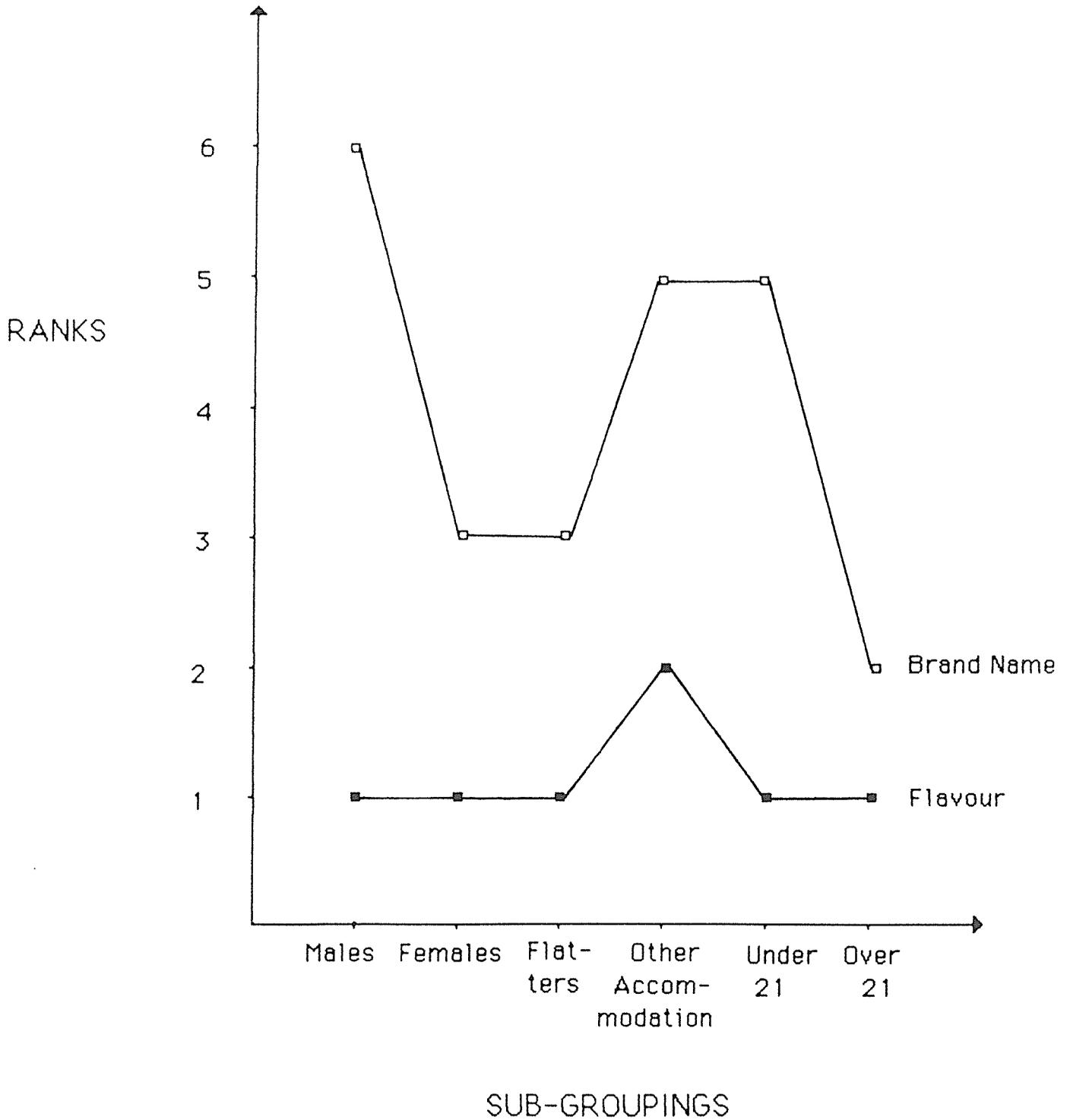


Figure 6.6 Graph summarising the rankings for FLAVOUR and BRAND NAME attributes obtained from the analysis of the paired comparison test for subjects in the Brand and Manufacturer's Name available condition.

Measures of attribute preference for sub-groups within the brand and manufacturer's name unavailable condition.

The same sub-groupings as analysed in the brand and manufacturer's name available condition are also used in considering the brand and manufacturer's name unavailable condition.

Again the male and female preference scales are the first to be considered.

Figure 6.7

Scale of attribute preference measured from the paired comparison analysis comparing the males and females in the brand and manufacturer's name unavailable condition.

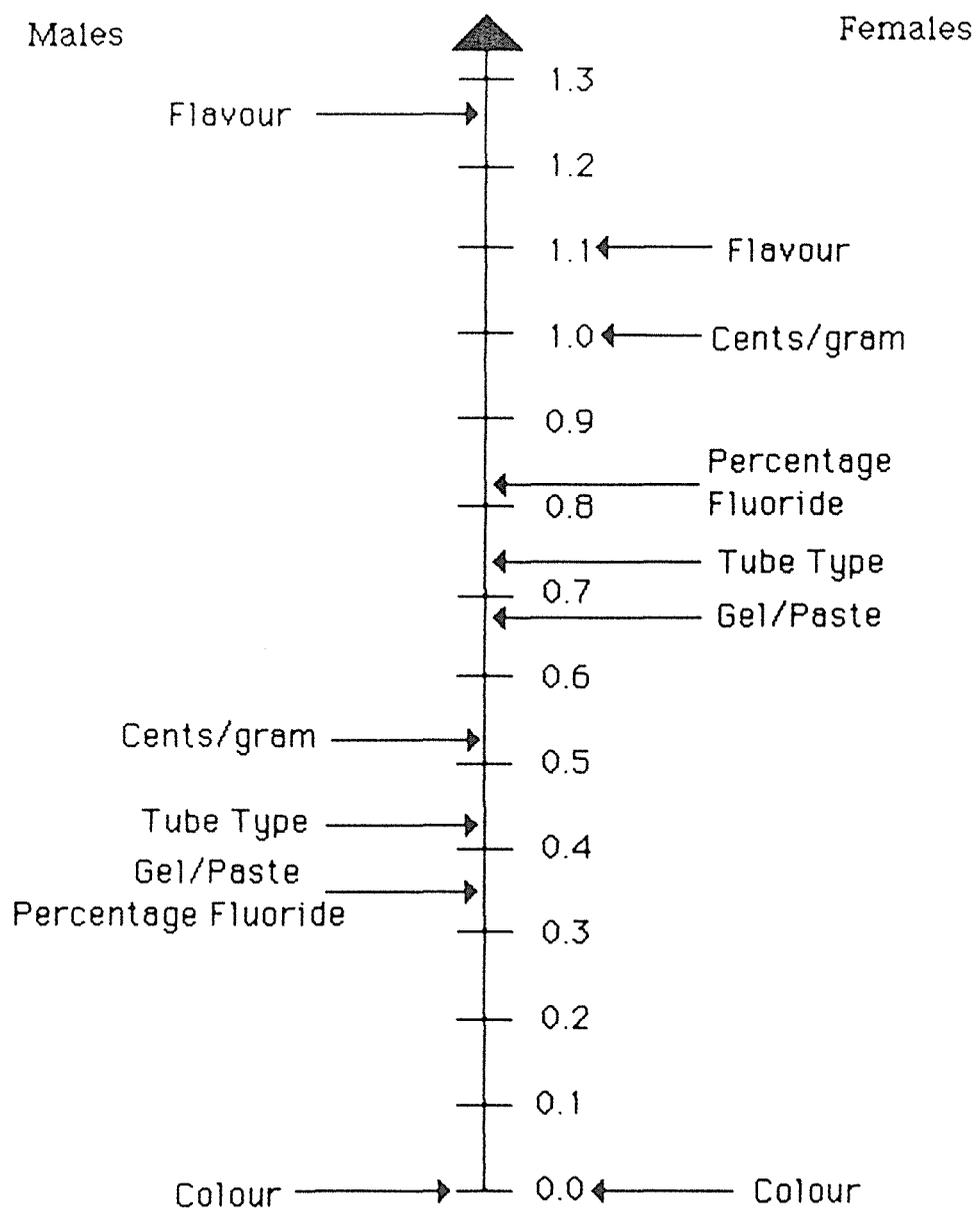


Table 6.10

Summary of the preference orders and scale values for figure 6.7 .

MALES n= 5		FEMALES n=19	
Attributes	Scale Value	Attributes	Scale Value
Flavour	1.258	Flavour	1.104
Cents/gram	0.519	Cents/gram	1.032
Tube Type	0.433	Percentage Fluoride	0.810
{Gel/Paste		Tube Type	0.722
Percentage Fluoride}	0.350		
		Gel/paste	0.677
Colour	0.000	Colour	0.000

The scales for the two groups of subjects shows a similarity in attribute preference. For both males and females, FLAVOUR is the most preferred product attribute and CENTS/GRAM is the second most preferred attribute. TUBE TYPE, GEL/PASTE, and PERCENTAGE FLUORIDE are grouped together in both groups with COLOUR at the bottom of both scales.

The next sub-grouping to be considered within this condition is the flatters and other accommodation comparison. Here the same criteria as was used in the brand and manufacturer's name available condition is adopted. (That is, 'other accommodation' implies home owners, those living with parents, those living in the university hostels, and those living in other unspecified accommodation.)

Figure 6.8

Scale of the attribute preference measured from the paired comparison analysis comparing those subjects in flattening accommodation to those in any other accommodation situation in the brand and manufacturer's name unavailable condition.

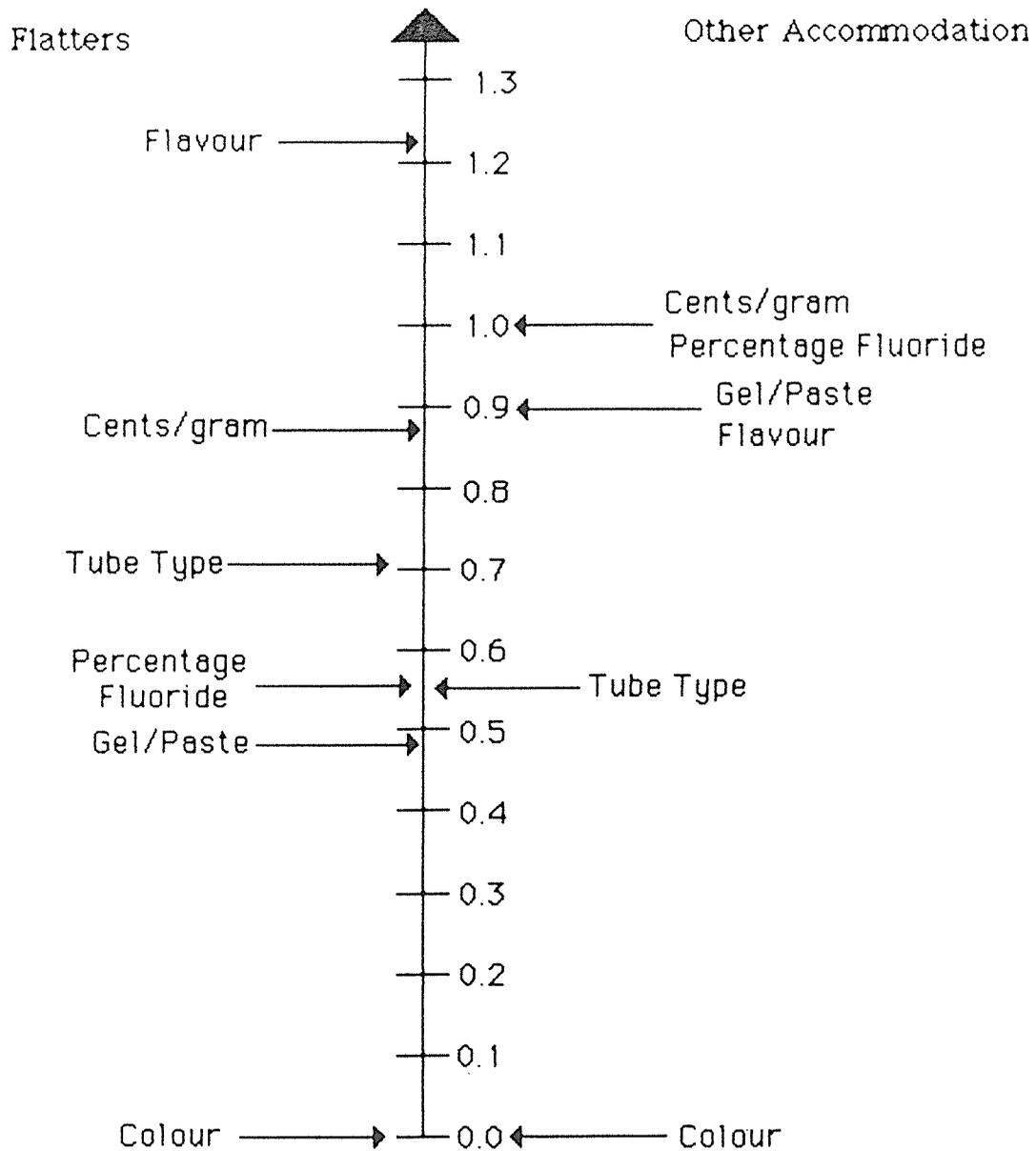


Table 6.11

Summary of the preference orders and scale values for figure 6.8 .

FLATTERS n=17		OTHER n= 7	
Attributes	Scale Value	Attributes	Scale Value
Flavour	1.229	Percentage Fluoride	1.087
Cents/Gram	0.878	Cents/Gram	1.024
Tube Type	0.706	Gel/paste	
		Flavour	0.903
Percentage Fluoride	0.558		
Gel/Paste	0.482	Tube Type	0.542
Colour	0.000	Colour	0.000

The scales for the two groups are very different. In the flatters group FLAVOUR is the most preferred attribute, whereas PERCENTAGE FLUORIDE is most preferred in the other group.

For both sub-groups, CENTS/GRAM is the second most preferred attribute. The rest of the preferences for both groups are dissimilar in order, as can be seen on figure 6.8 . The exact scale values are given in the summary of preference orders above for this figure.

The final comparison examines the age sub-grouping. Here the subjects are divided into those 21 years of age and under, and those over 21 years of age.

Figure 6.9

Scale of attribute preference measured from the paired comparison analysis comparing those subjects under 21 years of age to those over 21 years of age in the brand and manufacturer's name unavailable condition.

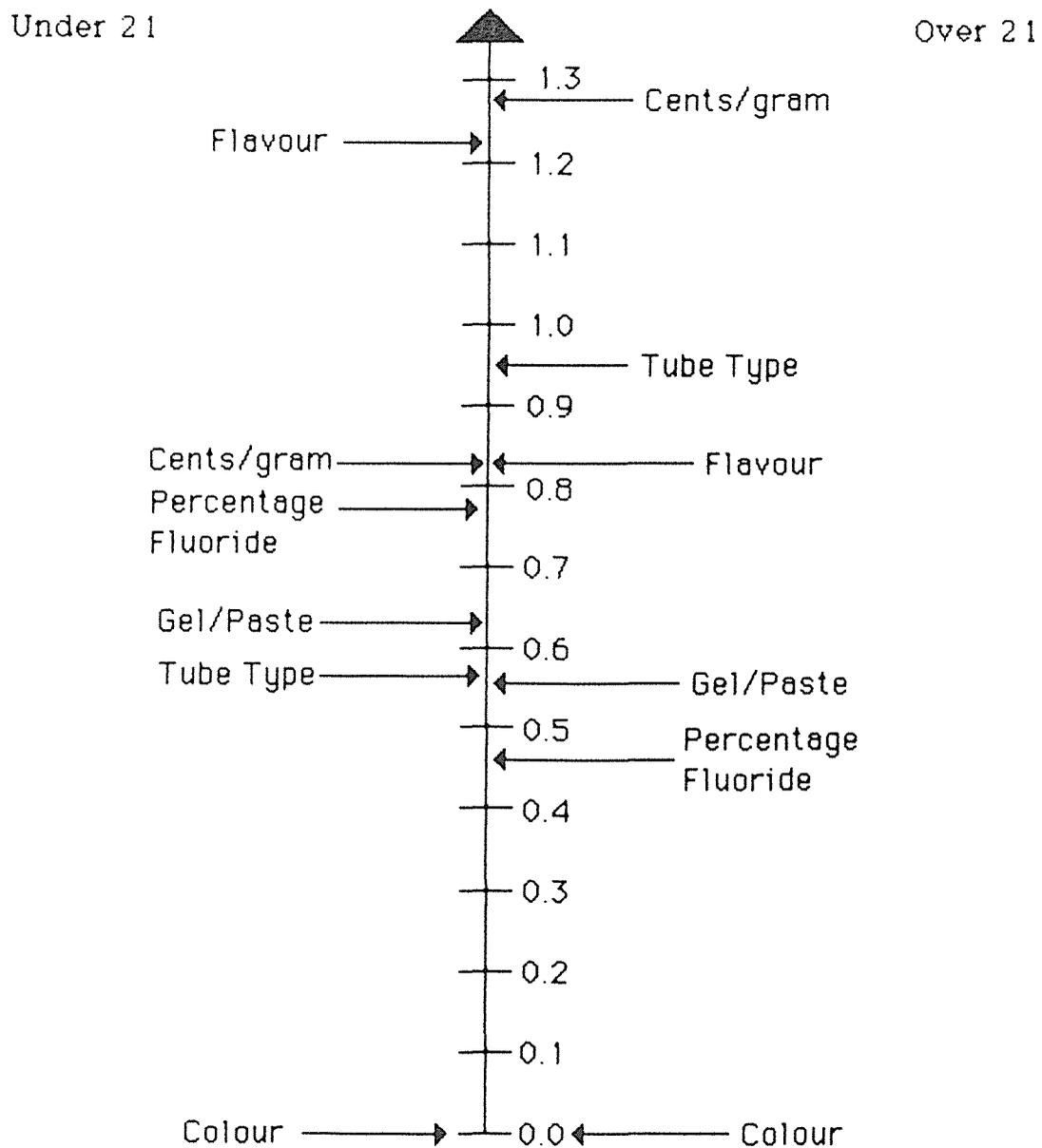


Table 6.12

Summary of the preference orders and scale values for figure 6.9 .

UNDER 21 n= 8		OVER 21 n=16	
Attributes	Scale Value	Attributes	Scale Value
Flavour	1.236	Cents/Gram	1.263
Cents/gram	0.815	Tube Type	0.956
Percentage Fluoride	0.790	Flavour	0.815
Gel/Paste	0.626	Gel/Paste	0.533
Tube Type	0.790	Percentage Fluoride	0.464
Colour	0.000	Colour	0.000

Once again the two scales of attribute preference are dissimilar. The subjects aged 21 years or less, have FLAVOUR as their most preferred toothpaste attribute while those over 21 have CENTS/GRAM as their most preferred attribute. Within this over 21 group, FLAVOUR is ranked only third in overall preference. Examination of figure 6.9 and the associated summary shows the other order differences between the two groups.

Summary.

Overall, the FLAVOUR attribute was preferred above any other attribute quite regularly (in four sub-groups out of six). The CENTS/GRAM attribute was preferred above all other product attributes by those over 21 years of age, and in the rest of the sub-groupings, was ranked in the top three attributes, see figure 6.10 . The graph shows that both the FLAVOUR and CENTS/GRAM attributes together occupy the top two rank positions across all sub-groupings, except in the case of the other accommodation sub-group.

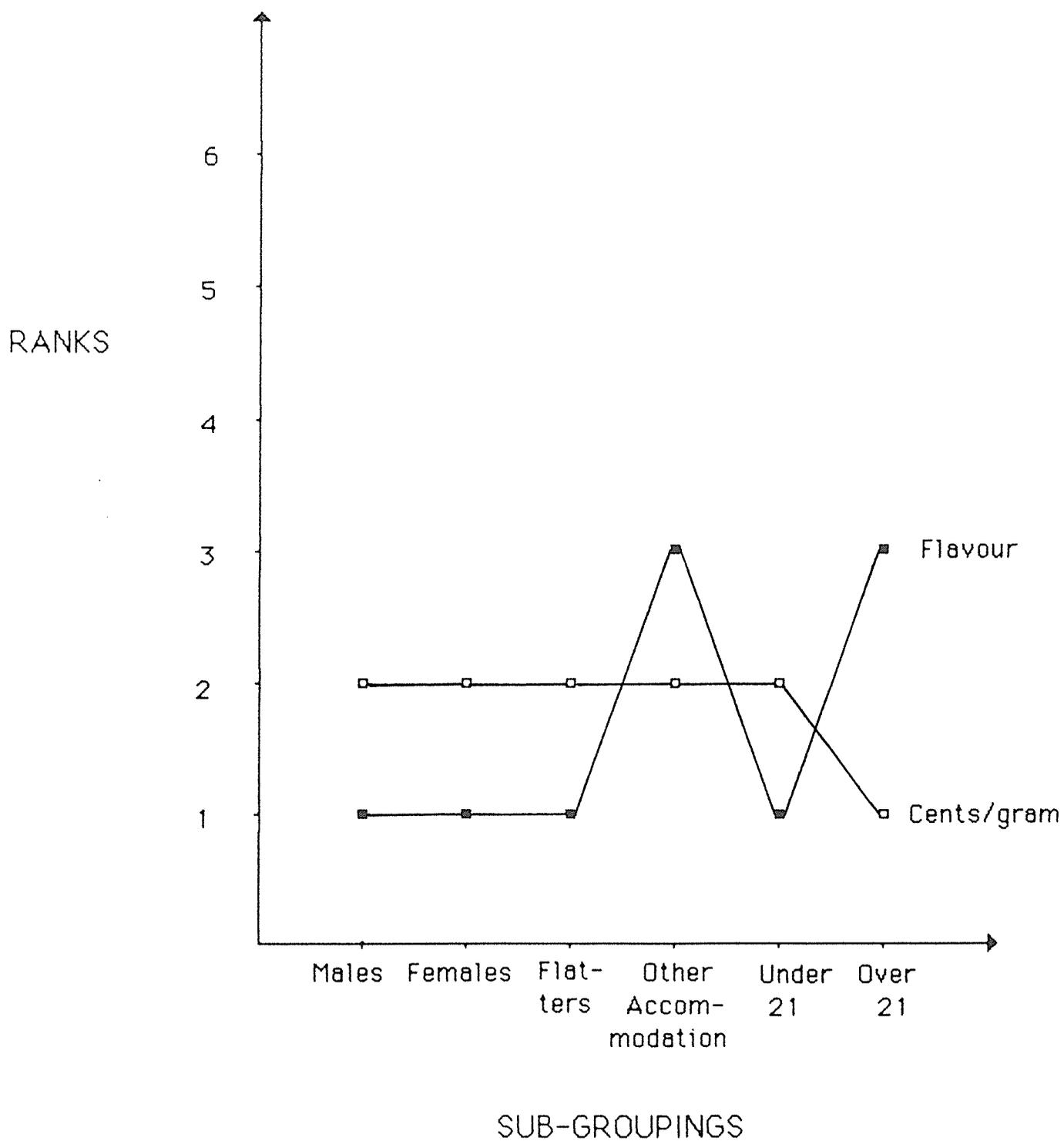


Figure 6.10 Graph summarising the rankings for FLAVOUR and CENTS/GRAM attributes obtained from the analysis of the paired comparison test for subjects in the Brand and Manufacturer's Name Unavailable condition.

6.3.3 THE CHI-SQUARE TEST OF UNIDIMENSIONALITY

An important test in regards to the paired comparison data is the chi-square test of unidimensionality.

This test indicates whether the obtained scale of preferences differs significantly from what would be expected given the assumptions that this case of the paired comparison test carries. If the calculated chi-square value is greater than the critical value then it is concluded that the obtained scale is significantly different from what would be expected using the normal probability curve. A result such as this would indicate that the assumptions made under Case Va of the law of comparative judgement were correct. If this were so, then this result would also imply that the scale may not be unidimensional, that is, that the subjects were basing their judgements on something other than the one dimension of expected value.

Table 6.13

Table summarising the results of the chi-square test of unidimensionality.

CONDITION	CALCULATED CHI	CRITICAL CHI
Brand and Manufacturer's Name Available	23.79703544	38.932 (p<.01), 21 df)
Brand and Manufacturer's Name Unavailable.	4.81230533	23.797 (p<.01), 10 df)

d.f. = $((n - 1) \times (n - 2)) / 2$ where n is the number of attributes in the set.

As can be seen from table 6.13 both of the calculated chi-squared values are less than the corresponding critical values. Thus it is concluded that the assumptions made under the Case Va of the law of comparative judgement were correct. Most importantly this means that the subjects were making their decisions on one dimension, that of value.

6.4 RESULTS FROM THE INFORMATION SEARCH AND ACQUISITION PROCEDURE.

The results pertaining to the information search and acquisition test are next to be summarised. It was hoped that from this procedure, it could be shown that:

- 1) significantly more information would be accessed in the brand and manufacturer's name unavailable condition than was in the brand and manufacturer's name available condition.
- 2) brand name information would be accessed significantly more often than any other type of attribute information within the brand and manufacturer's name available condition.
- 3) cents/gram information would be accessed significantly more often than any other type of attribute information within the brand and manufacturer's name unavailable condition.
- 4) when permitted to select information freely from an array of package information, consumers will select only a subset of this information.

- 5) the size of the information subset acquired, in terms of the number of information attributes, will range somewhere between 3 and 7 information attributes.

Table 6.14 outlines the results of the information search and acquisition procedure in respect to the total number of times information concerning each attribute was accessed.

Table 6.14

Table summarising the total number of information pieces acquired from the information displayboard for both the brand and manufacturer's name available and unavailable groups. (Percentage of total acquisition in each group is given in parenthesis).

Attributes	BRAND AND MANUFACTURER'S NAME	
	AVAILABLE	UNAVAILABLE
	Number of pieces of information.	
Flavour	76 (16.7)	111 (22.33)
Cents/gram	78 (17.15)	120 (24.14)
Percentage		
Fluoride	62 (13.65)	96 (19.31)
Gel/Paste	51 (11.20)	71 (14.28)
Tube Type	49 (10.76)	53 (10.66)
Colour	36 (7.92)	44 (8.85)
Brand Name	94 (20.65)	
Manufacturer's		
Name	9 (1.97)	
TOTAL	455	497

Table 6.14 shows the number of times a piece of information was taken about each of the attributes across all products. The table shows that more information was accessed by subjects in the brand and manufacturer's name unavailable condition than in the condition where this information was available to the subjects.

In order to test whether more information was accessed under the brand and manufacturer's name unavailable than under the available condition, a t-test was performed on the total number of information pieces accessed by each subject between the two experimental groups.

Jacoby, Szybillo, and Busato-Schach (1977) in their analysis of an equivalent hypothesis, had performed an F-test for the difference between the two groups. In an attempt to replicate the finding made by these researchers, a t-test was performed on the present data to establish whether a statistically significant difference existed between the information acquisition behaviour of subjects in either experimental condition.

The results of this test show that there is no significant difference between the information acquisition of subjects in the brand and manufacturer's name available condition and the brand and manufacturer's name unavailable condition ($t=0.5088$; $df=46$; $p>.05$).

Figure 6.11 shows the exact nature of the difference in information acquisition for each attribute over both experimental conditions. The graph shows that in every comparable case, more information was accessed in the brand and manufacturer's name unavailable condition.

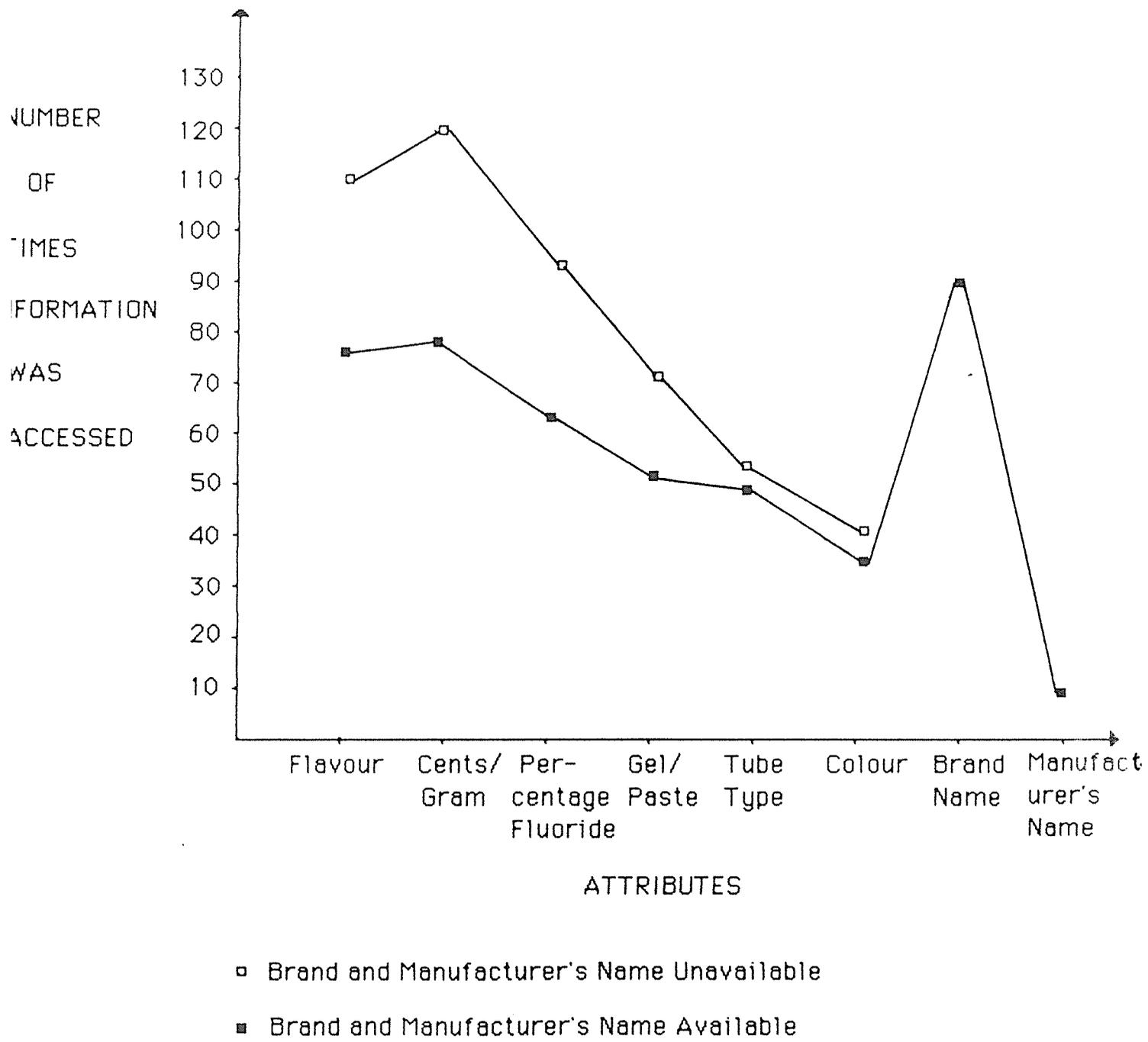


Figure 6.11 Graph comparing the total number of information pieces accessed for each attribute by subjects in either the Brand and Manufacturer's Name available or Brand and Manufacturer's Name Unavailable Conditions.

The manipulation in this experiment involved the comparison of subjects' information preference and acquisition when brand and manufacturer's name information was made available, and when it was not made available. If an effect caused by the availability or unavailability of brand and manufacturer's name information is to be tested, it is more relevant to compare experimental groups on the acquisition totals of only those attributes that were common to both groups. Incorporation of information acquisition totals for brand name, and manufacturer's name serves only to inflate one total, and is not of importance in the comparison. What is of importance, is whether the acquisition rate of; FLAVOUR, CENTS/GRAM, GEL/PASTE, PERCENTAGE FLUORIDE, TUBE TYPE, and COLOUR information changes when BRAND NAME and MANUFACTURER'S NAME is included, and when it is not.

To do this it makes more sense not to include the BRAND NAME and MANUFACTURER'S NAME totals. This was not done in the Jacoby, Szybillo, and Busato-Schach (1977) study, and despite this, their difference in total information acquisition was significant.

Given the above reasoning, a reanalysis of the information acquisition rates for each subject (a list of acquisition rates for each subject in each condition is given in Appendix H) provides a significant result ($t=1.8676$; $df=46$; $p<.05$). The result of this test indicates a significant increase in the acquisition of FLAVOUR, CENTS/GRAM, GEL/PASTE, PERCENTAGE FLUORIDE, TUBE TYPE, and COLOUR information when BRAND NAME and MANUFACTURER'S NAME acquisition rates are not available, as compared to the acquisition rates for these attributes when BRAND NAME and MANUFACTURER'S NAME information is available.

Within the brand and manufacturer's name available condition, BRAND

NAME information was accessed more times than information about any other attribute.

CENTS/GRAM information was accessed most from those attributes available to subjects in the brand and manufacturer's name available condition. Both of these observations imply that hypotheses two and three may be considered 'confirmed by inspection'.

Analysis of the number of attributes accessed.

The fourth hypothesis tested in this study concerned the question of the use by subjects, of only a subset of the product information. Table 6.15 summarises the information relevant to this issue.

Table 6.15

Summary of the average number of information items accessed by subjects in the brand and manufacturer's name available and unavailable conditions (Percentage of total available information is given in parenthesis).

	BRAND AND MANUFACTURER'S NAME	
	AVAILABLE	UNAVAILABLE
Average Number of information items accessed	18.9583 (23.69)	20.7083 (34.51)
Total Number of information items available	80	60

Table 6.15 clearly shows that on average only a subset of the available information was selected by subjects in each experimental condition. For subjects in the brand and manufacturer's name available condition, only 23.69% of the information presented was accessed on average. For those in the brand and manufacturer's name unavailable condition, 34.51% of the information presented was accessed. Such a result gives support to the prediction made in hypothesis 4, that only a subset of the available information would be accessed.

The fifth hypothesis in this study looked at whether the subset of attribute information selected from the array would be between three and seven different attributes. Considering the data from the information search and acquisition test, attributes used by each subject when accessing information were counted. These tallies are summarised in Table 6.16 .

Table 6.16

Table of the number of attributes that information was accessed from in the information search and acquisition stage of the experiment.

Number of attributes Accessed.	Number of subjects Accessing this number of attributes.	
	Available	Unavailable
	BRAND AND MANUFACTURER'S NAME	
	Available	Unavailable
1	0	2
2	1	1
3	3	4
4	1	1
5	4	2
6	7	14
7	3	--
8	5	--
TOTALS	24	24
AVERAGE NUMBER OF ATTRIBUTES ACCESSED	5.75	4.75
STANDARD DEVIATION	1.775	1.750
95% CONFIDENCE INTERVAL	5.000 to 6.499	4.010 to 5.489

As can be seen from the table 6.16 , in both experimental groups, on average, only a subset of the total number of attributes were used as sources of product information. In the brand and manufacturer's name available condition, on average 5.75 out of 8 possible attributes were accessed. In the brand and manufacturer's name unavailable condition, 4.75 attributes were on average accessed, out of 6 possible attributes. The 95% confidence intervals evidence this tendency of the subjects to draw only on a subset of attributes in their information search. Such a result gives support for the correctness of the fourth experimental hypothesis: that subjects when permitted to select information freely from an array of package information, will select only a subset of this information.

Both Jacoby, Chestnut, Weigl, and Fisher (1976), and Jacoby, Szybillo, and Busato-Schach (1977), had found that the average size of the subset of available product attributes that is accessed by subjects, will range from three to seven information attributes.

The results summarised in Table 6.16 show that this hypothesis was supported. In the brand and manufacturer's name available condition, the average number of different attributes accessed was 5.75. In the brand and manufacturer's name unavailable condition the average number of different attributes accessed was 4.75. Even allowing for a 95% confidence interval for each of these averages, results still permit the conclusion to be drawn that the hypothesis was correct, and that the average subset of different attributes accessed was between three and seven. Thus the fifth test hypothesis was supported.

6.5 ANALYSIS OF THE ORDER IN WHICH INFORMATION WAS ACCESSED.

By taking note of the order in which subjects accessed attribute information from the information display board, it was possible to draw up a tree diagram to illustrate the various courses that their information acquisition took. In many cases the subjects used one of two approaches. In the first case subjects would access all of the information available on one attribute before moving on to seeking information about other attributes. In the second case the subjects would seek attribute information for a single product. However in many instances this was done in a routine and repetitive manner.

From both of these strategies it was possible to obtain a rank order of each subject's preference for attribute information. For example, a subject using the first outlined strategy, and accessing all brand information and then all flavour information and then all cents/gram information, the attribute preference order was listed as:

1) brand name

2) flavour

3) cents/gram.

For the subject using the second strategy the order of attribute information acquisition was recorded as their attribute preference ranking.

For the few subjects who did not follow such a pattern as described above, it was quite easy to reconstruct the pattern that was used, from the recorded information acquisition order. As an example consider the order of information selection taken by one subject. The order was as follows:

Colour, Tube Type, Percentage Fluoride, Gel/paste, Flavour, Flavour,
 Colour, Gel/paste, Flavour, Cents/gram, Cents/gram, Cents/gram,
 Percentage Fluoride, Cents/gram, Percentage Fluoride, Percentage Fluoride,
 Cents/gram.

In this case the preference order was taken as the first time each attribute was accessed and determined to be;

- | | | |
|--------------|--------------|------------------------|
| 1. Colour | 2. Tube Type | 3. Percentage Fluoride |
| 4. Gel/paste | 5. Flavour | 6. Cents/gram |

In this manner the preference ranking for attribute information was listed by recording the changes from one attribute to another in their information seeking.

6.6 DECISION NETS

Within each experimental conditions it was possible to construct a decision net diagram which outlines the patterns of attribute information acquisition used by all of the subjects. In a number of cases very similar patterns of acquisition were found. These will now be outlined in respect to both experimental groups.

6.6.1 DECISION NETS WITHIN THE BRAND AND MANUFACTURER'S NAME AVAILABLE CONDITION

The decision net for the brand and manufacturer's name available condition will be described first. Analysis of the attribute acquisition orders found that for 18 out of the 24 subjects in this condition the first attribute to be accessed was either BRAND NAME or FLAVOUR (a table

listing the changes in attribute acquisition, that is, from attribute to attribute, for this condition is supplied in Appendix I). Given this result these two attributes were considered to be the two main sources of information search.

Figure 6.12 shows the attribute information acquisition patterns taken by the subjects who started off their information search by firstly accessing BRAND NAME information. Of the nine subjects, four sought FLAVOUR information as their next source of different attribute information. Two subjects sought GEL/PASTE information and of the remaining three subjects, one each sought PERCENTAGE FLUORIDE, COLOUR, and CENTS/GRAM attribute information. The subsequent attributes that were accessed along all of these paths can be seen from the diagram.

Figure 6.12

Decision net obtained from the analysis of the information acquisition order for subjects in the brand and manufacturer's name available condition.

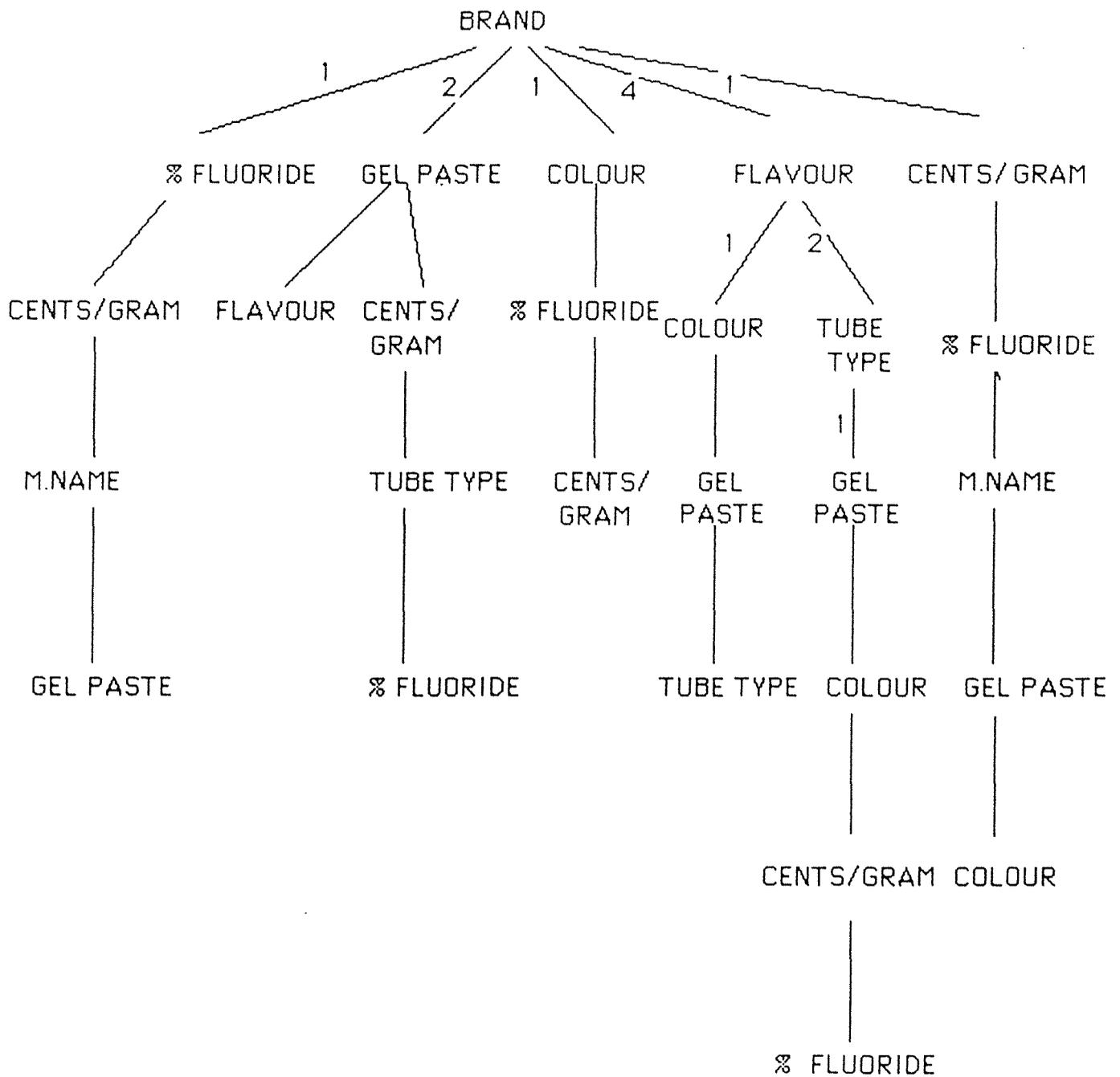


Figure 6.13 shows the decision net for the nine subjects who started the information search by selecting FLAVOUR information. Of these, four next preferred TUBE TYPE information, and three PERCENTAGE FLUORIDE information. The remaining two subjects preferred CENTS/GRAM and BRAND NAME information. The subsequent paths of attribute information acquisition can be followed on the diagrams provided.

6.6.2 DECISION NETS WITHIN THE BRAND AND MANUFACTURER'S NAME UNAVAILABLE CONDITION.

The information acquisition behaviour of the subjects was very different in this condition from the previous one. In the brand and manufacturer's name available the two main initial starting attributes were BRAND NAME and FLAVOUR. In this brand and manufacturer's name unavailable condition a majority (13) of the subjects started their information search by accessing FLAVOUR information. Of the other eleven subjects in this condition, five accessed PERCENTAGE FLUORIDE information first, three opted for the CENTS/GRAM attribute, and each of the remaining three subjects selected GEL/PASTE, TUBE TYPE, and COLOUR attributes as their first source of information.

Of the 13 who chose FLAVOUR information, Figure 6.14 , four of the subjects next chose the CENTS/GRAM attribute as their second attribute. Three subjects of the 13 selected the GEL/PASTE attribute. Two of the remaining six subjects selected TUBE TYPE, PERCENTAGE FLUORIDE, and COLOUR as their second preferred source of information.

Summary.

Taking the decision nets from the two experimental groups together, it can be seen that both FLAVOUR and BRAND NAME are major starting points in the subjects' information search. Such a result supports the results obtained from the paired comparison test where FLAVOUR was the overall most preferred attribute for both experimental groups.

6.7 RESULTS FROM THE SUBJECTIVE STATES QUESTIONNAIRE.

The subjective states questionnaire attempted to elicit five pieces of information from the subjects. Firstly, it attempted to find out how satisfied the subjects were with their decision about which brand/type of toothpaste they would choose given the information presented by way of the information displayboard.

Next, the subjective states questionnaire sought to find out how certain the subjects were that they had made the best decision. The third question enquired into the confusion the subjects felt in performing the tasks involved in using the information displayboard.

The fourth subjective state question concerned the subject's desire for more information. In this they could indicate whether they desired more information than was provided on the displayboard.

The final question asked the subjects to state the degree to which they felt that another type of toothpaste would have been just as good as the one that they had selected, in satisfying their desires and expectations.

The subjects responded to each question using a five point scale.

The analysis of the responses from these questions, took the form of calculating a 95% confidence interval for the mean response on each subjective state. The five point scale that was utilised in this questionnaire had at its middle point a completely neutral statement in respect to the subjective state that was being tested. It was assumed that if the confidence interval for each subjective state did not encompass this middle score (that is, three) then it could be concluded that there was a significant effect in the subjective state. If the mean for the subjective state was below 3.0 , then the subjective state was considered to be negatively judged. If the mean was greater than 3.0 then this implied that there was a positive response in regard to this subjective state.

Table 6.17 presents the means and confidence intervals for each subjective state for both experimental conditions.

Table 6.17

Table of the means and 95% confidence intervals for the subjective states tested in both experimental conditions.

BRAND AND MANUFACTURER'S NAME AVAILABLE.

SUBJECTIVE STATE	MEAN	STD. DEVIATION	95% CONFIDENCE INTERVAL*
Satisfaction	4.166	0.761	3.899 - 4.432
Certainty	3.833	1.059	3.462 - 4.203
Confusion	3.583	0.721	3.330 - 3.835
Desire For More Information	3.791	0.834	3.499 - 4.079
Another Toothpaste Just As Good.	2.458	1.261	2.016 - 2.899

BRAND AND MANUFACTURER'S NAME UNAVAILABLE

SUBJECTIVE STATE	MEAN	STD. DEVIATION	95% CONFIDENCE INTERVAL*
Satisfaction	4.333	1.090	3.951 - 4.714
Certainty	3.580	1.167	3.171 - 3.988
Confusion	3.791	0.928	3.466 - 4.115
Desire For More Information	3.500	0.977	3.158 - 3.841
Another Toothpaste Just As Good	3.125	0.977	2.783 - 3.466

* the 95% confidence interval was calculated using the formula:

$$\bar{x} + t_{.95} \times (\sigma / \sqrt{n})$$

the degrees of freedom for t are (n-1) (that is, 23 d.f. in this case).

The 95% confidence intervals for the subjective states for both experimental conditions show that the subjects were satisfied with their decision and that they were certain that they had made the right choice. Further there is evidence from the confidence intervals that the subjects in both experimental conditions were not confused by the task involved in selecting information. The test also supports the conclusion that in neither experimental condition did the subjects desire information that was not already available to them.

However, in the brand and manufacturer's name available condition the subjects felt that another toothpaste in the list of those available would be just as good as the one that they had chosen. This subjective state differed significantly from the neutral position, thus making it a significant feeling.

A similar conclusion can be drawn concerning this subjective state for the brand and manufacturer's name unavailable condition. The confidence interval for this subjective state encompassed the 3.0 value, thus showing neither a positive or negative response to the question of whether another toothpaste would be just as good as the one chosen.

It was of interest to discover whether subjects in the brand and manufacturer's name available group were more satisfied, more certain, less confused, desired less additional information, and did not regard another toothpaste as being more capable of satisfying their desires and expectations, than the subjects in the brand and manufacturer's name unavailable condition. Some t-tests were performed on the mean subjective states ratings for each experimental group, and the results of these tests are summarised in Table 6.18 .

Table 6.18

Table of the results of the t-tests on the subjective states between the brand and manufacturer's name available experimental group, and the brand and manufacturer's name unavailable experimental group.

Subjective State	Calculated t	critical t (46)d.f.	Significance
SATISFACTION	-0.6152	1.6801	N/S
CERTAINTY	0.7871	1.6801	N/S
CONFUSION	-0.8667	1.6801	N/S
DESIRE FOR ADDITIONAL INFORMATION	1.1097	1.6801	N/S
AN OTHER TOOTHPASTE JUST AS GOOD	-2.0474	2.0147	**

** significant at the 0.025 level.

From reading the table it can be seen that significant differences in subjective states were not found in respect to satisfaction, certainty, confusion, and desire for more information. A significant difference was found between the two groups however, on one subjective state. Subjects in the brand and manufacturer's name available condition were significantly surer than the subjects in the unavailable condition that an other toothpaste would have been equal to or better than the one they had chosen in satisfying their desires and expectations.

6.8 CORRELATION BETWEEN THE ATTRIBUTE PREFERENCE ORDER OBTAINED FROM THE PAIRED COMPARISON TEST AND THE ATTRIBUTE PREFERENCE ORDER OBTAINED FROM THE INFORMATION SEARCH AND ACQUISITION TEST.

In an attempt to establish how well the paired comparison test

predicted each subjects attribute preference when they searched for information via the information display board, a Spearman's Rank Correlation Coefficient was calculated for each subject. To do this, each subject's attribute preference order obtained from the paired comparison test was ranked. This ranking consisted of numbering the attributes one through six or eight, depending on the experimental condition that they were in. One was designated as the most preferred attribute, and six or eight as the least preferred attribute. Next the attribute preference order obtained from the analysis of the record of their information search was also ranked in a similar fashion.

Spearman's Rank Correlation Coefficients were calculated for each subject in the two experimental conditions. Table 6.19 lists the range of coefficients for each experimental condition.

Table 6.19

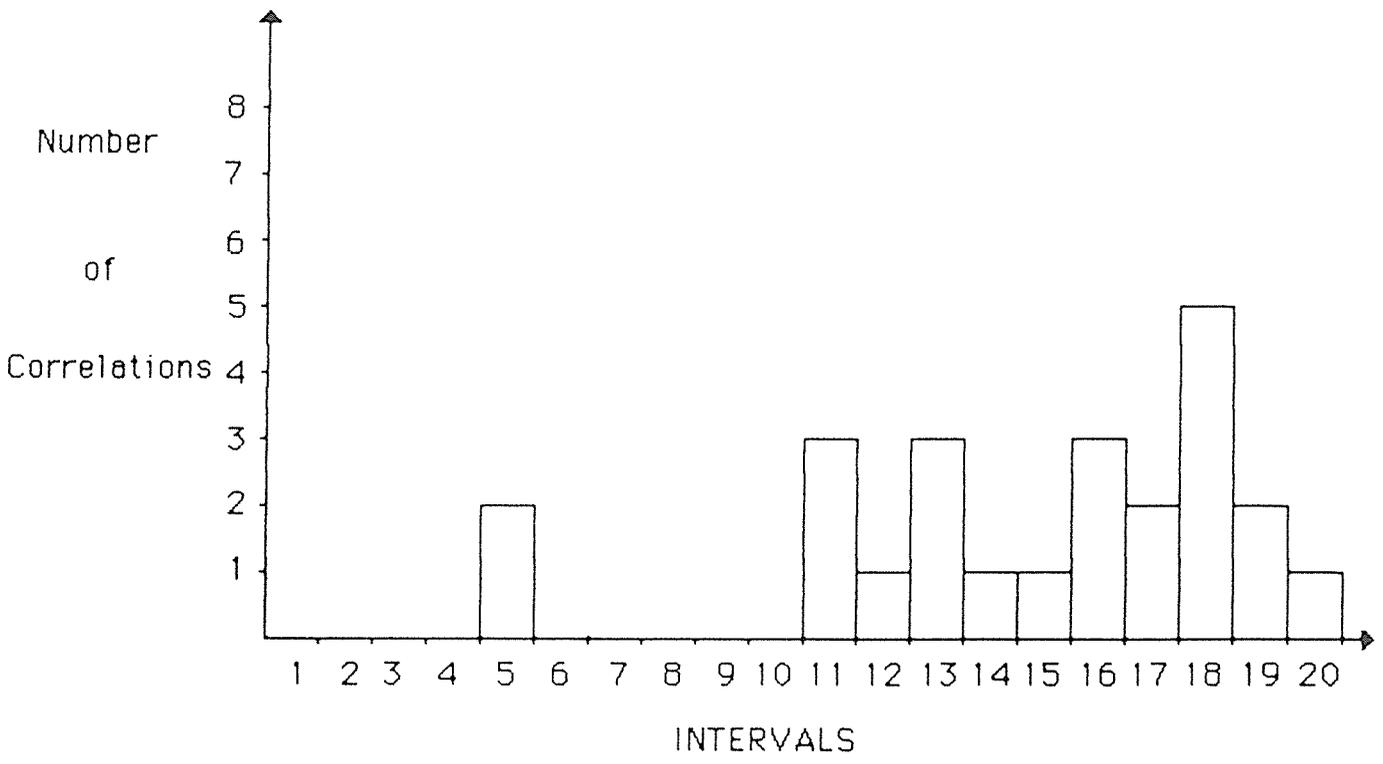
Table of the range of the Spearman Rank Order correlation coefficients calculated from the two attribute preference orders obtained in the paired comparison test and in the information search and acquisition test.

NUMBER OF RANK CORRELATIONS WITHIN EACH RANGE FOR BRAND AND MANUFACTURER'S NAME		
	AVAILABLE	UNAVAILABLE
-1.00 to -0.31	1	0
-0.30 to 0.00	0	5
+0.01 to +0.30	7	1
+0.31 to +1.00	16	18
TOTAL	24	24

The range of correlation coefficients are quite similar in both experimental groups. (A complete summary of the rank correlation coefficients calculated for each experimental group is included in Appendix J). In the brand and manufacturer's name available condition the coefficients range from -0.5645 to +0.9694, and in the unavailable condition the range is from -0.4587 to +1.00.

Figure 6.15 shows the distribution of correlations for the brand and manufacturer's name available subjects. The graph illustrates a skew in the distribution which is expected to centre on the point 0.00. The skew

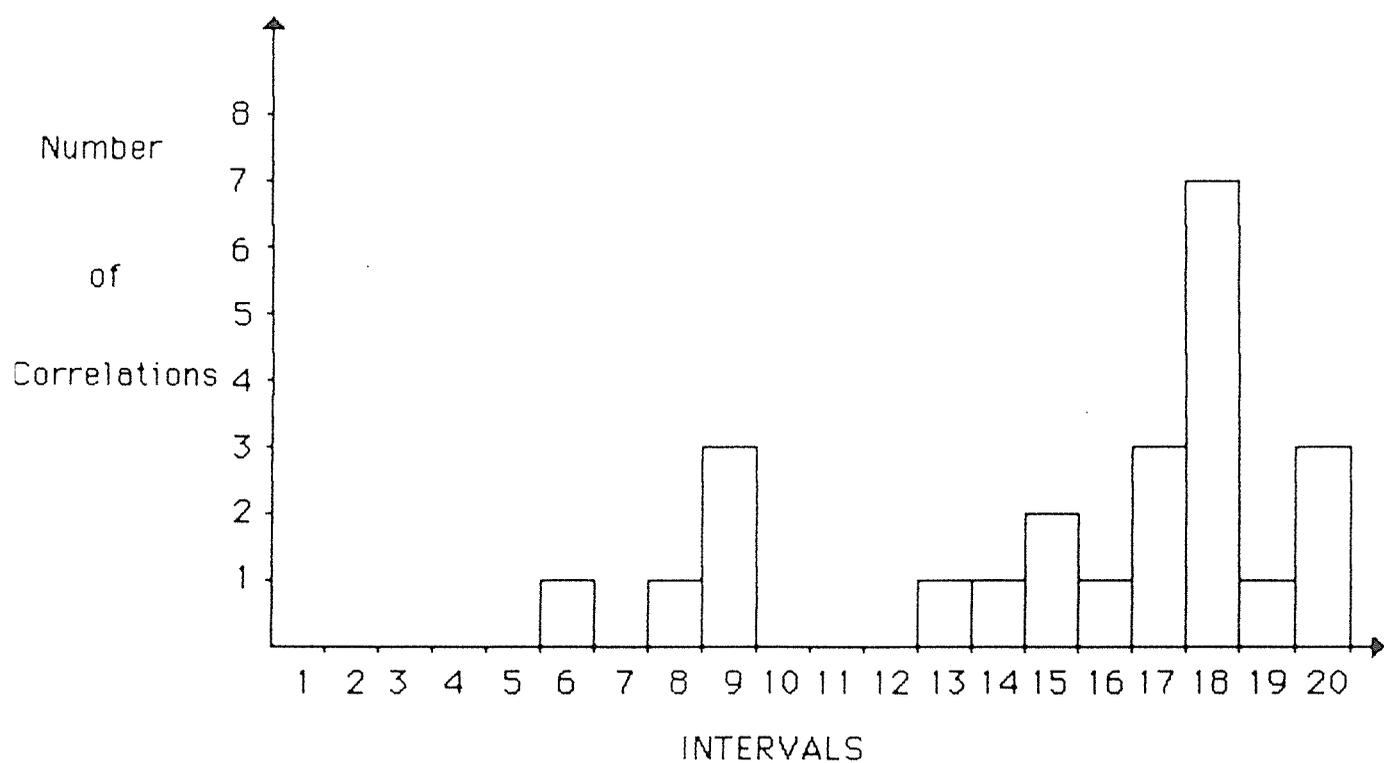
is towards the positive correlations. A sign test performed on the correlations showed the chance of getting 23 positive correlations out of 24 total correlations to be less than 0.001 .



INTERVALS			
1 -1.00 to -0.91	6 -0.50 to -0.41	11 +0.01 to +0.10	16 +0.51 to +0.60
2 -0.90 to -0.81	7 -0.40 to -0.31	12 +0.11 to +0.20	17 +0.61 to +0.70
3 -0.80 to -0.71	8 -0.30 to -0.21	13 +0.21 to +0.30	18 +0.71 to +0.80
4 -0.70 to -0.61	9 -0.20 to -0.11	14 +0.31 to +0.40	19 +0.81 to +0.90
5 -0.60 to -0.51	10 -0.10 to 0.00	15 +0.41 to +0.50	20 +0.91 to +1.00

Figure 6.15 Histogram showing the distribution of Spearman rank correlations for the Brand and Manufacturer's Name Available Condition.

Figure 6.16 graphs the distribution of correlations for the subjects in the brand and manufacturer's name unavailable condition. Again the distribution is skewed to the right, in the direction of the positive correlations. A sign test here, showed the chance of obtaining 19 positive correlations out of 24 total correlations to be 0.032 .



1 -1.00 to -0.91	6 -0.50 to -0.41	11 +0.01 to +0.10	16 +0.51 to +0.60
2 -0.90 to -0.81	7 -0.40 to -0.31	12 +0.11 to +0.20	17 +0.61 to +0.70
3 -0.80 to -0.71	8 -0.30 to -0.21	13 +0.21 to +0.30	18 +0.71 to +0.80
4 -0.70 to -0.61	9 -0.20 to -0.11	14 +0.31 to +0.40	19 +0.81 to +0.90
5 -0.60 to -0.51	10 -0.10 to 0.00	15 +0.41 to +0.50	20 +0.91 to +1.00

Figure 6.16 Histogram showing the distribution of Spearman rank correlations for the Brand and Manufacturer's Name Unavailable Condition.

Given this trend in both groups it is possible to test whether there is a significant correlation between the ranking of attributes for each activity (that is, the paired comparison test and the displayboard analysis), based on the average rank for each attribute. Table 6.20 sets out the average ranks calculated for each attribute across subjects in the experimental conditions.

Table 6.20

Summary of the average ranks calculated across subjects both for the paired comparison test and the attribute importance rankings obtained from the analysis of the information search (Rankings for these averages are given in parenthesis).

BRAND AND MANUFACTURER'S NAME :

AVAILABLE.	PAIRED COMPARISONS	INFORMATION SEARCH
Flavour	2.4791 (1)	2.5416 (1)
Cents/gram	4.0833 (4)	4.6458 (6)
Percentage Fluoride	3.8541 (3)	4.5625 (5)
Gel/paste	3.6667 (2)	4.0833 (3)
Tube Type	4.2916 (5)	4.0625 (2)
Colour	6.0625 (7)	5.5208 (7)
Brand Name	4.3958 (6)	4.1458 (4)
Manufacturer's Name	7.2083 (8)	6.4375 (8)
UNAVAILABLE		
Flavour	2.4583 (1)	2.3125 (1)
Cents/gram	2.9375 (2)	3.6041 (3)
Percentage Fluoride	3.3958 (3)	3.1458 (2)
Gel/paste	3.7083 (5)	4.0208 (5)
Tube Type	3.5625 (4)	3.7708 (4)
Colour	4.9791 (6)	4.1458 (6)

Medians rank values were calculated for each attribute, in an attempt to check the ability of the average rank to estimate the central tendency

of the distribution. It was found that when the median values were ranked, they did not differ from the averages, and did not effect the overall result.

The averages were ranked to give an overall preference ranking for each attribute. A Spearman rank correlation comparing the attribute ranks obtained from the paired comparison test and the information search attribute importance analysis, provided a rho for the brand and manufacturer's name available group, of +0.7380 . When compared to the table of critical values of rho, the rank correlation was found to be significant at the 0.05 level.

A similar calculation and test for the brand and manufacturer's name unavailable condition gave a rho of +0.8857, significant at the 0.05 level.

The analysis shows that there is an association between the overall preference order obtained through averaging the ranks for attributes obtained from the paired comparison test, and the overall preference order obtained from the average ranks for attributes in the information search.

6.9 REPERTORY GRID ANALYSIS.

Use was made of the repertory grid technique primarily in an attempt to validate the product attributes that were initially chosen for this experiment. It was considered that if the chosen attributes (FLAVOUR, BRAND NAME, PERCENTAGE FLUORIDE, and so on) were elicited frequently from a group of subjects similar to those to be used in the main experiment, when they were asked to examine actual products, then this would provide sufficient validation for the use of these attributes in the main study.

Table 6.21

Table of attributes elicited using the Repertory Grid technique.

Constructs	Frequency (out of 6)
Plastic - Metal	6
Nice Flavour - Not Nice Flavour	6
White - Coloured	5
Paste - Gel	5
Brand Name - Company Name (Known brand - Unknown brand) (Liked brand - Unliked brand)	5
Fluoride - No Fluoride	4
Preferred Manufacturer - Non-Preferred Manufacturer (Familiar Manufacturer - Unfamiliar Manufacturer)	3
Cheap - Expensive	3
Costly Relative to Size - Cheap Relative to Size	2
States 'Fights Tooth Decay' - No Statement	1
Easy Access (top) - Difficult Access	1
Soft Texture - Hard Texture	1
Dull Packaging - Bright Packaging	1

Table 6.21 lists the product attributes elicited from subjects using the repertory grid technique. These attributes give a good indication of how the consumers perceive the products. In this case very strong validation was obtained for the TUBE TYPE and FLAVOUR attributes used in the study.

Strong support is gained for the use of COLOUR, GEL/PASTE, and BRAND NAME as attributes for the main study. Support also exists for the use of the PERCENTAGE FLUORIDE attribute. When the elicited attributes,

cheap-expensive and costly relative to size-cheap relative to size, are combined, strong support is obtained for the use of the CENTS PER GRAM attribute. The MANUFACTURER'S NAME attribute also receives supporting validation, but only slightly so in respect to the other test attributes.

Chapter Seven :

Discussion.

7.1 DISCUSSION

The discussion will be presented in five separate sections. The first section will discuss the results of the six hypotheses, and the implications following from each result. Following this an examination will be made of the differences between the subjects' choice of most preferred toothpaste, obtained from the general preference questionnaire, and the choice they made by means of accessing information from the information displayboard.

The third part of this discussion will consider matters associated with the scales of attribute preference, and the chi-square test of the assumptions made under Case Va of the law of comparative judgement. Following this, the subjective states results will be discussed and the question of whether the provision of more information results in the subjects feeling more satisfied, more certain, and less confused will be considered. The fifth section will look at the derived decision nets. Finally, the validation obtained using the repertory grid technique will be discussed.

7.2 DISCUSSION OF THE RESEARCH HYPOTHESES.

Hypothesis One: Information chunking.

The first hypothesis to be tested concerned the question of information chunking under the guise of the BRAND NAME attribute.

In an attempt to address this issue, this study employed two experimental groups, the brand and manufacturer's name available group, and

the brand and manufacturer's name unavailable group. Like Jacoby, Szybillo, and Busato-Schach (1977), it was expected that such a design would facilitate the discovery of any chunking. If chunking occurred, the subjects who were not able to access any brand or manufacturer's name information, would be forced to compensate for this lack of an attribute under which to chunk product information. This compensation would take the form of accessing greater amounts of information. This experimental condition contrasted with one in which brand and manufacturer's name information was available to the subject. Here it was expected that the presence of the BRAND NAME attribute, under which information chunking could occur, would serve to reduce the total information search.

A t-test of the mean number of information pieces accessed in each condition was used to establish the validity of this first hypothesis. Jacoby, Szybillo, and Busato-Schach (1977) found a significant difference in the number of information items accessed by subjects in either of the experimental conditions. The present study also obtained a difference in the total number of information items accessed by both groups in the predicted direction.

When this difference was tested on the same basis as Jacoby, Szybillo, and Busato-Schach (1977) (that is, leaving in the totals for acquisition of BRAND NAME and MANUFACTURER'S NAME information), no significant difference was observed ($t=0.5088$; $df=46$; $p>.05$). However it was reasoned that a more appropriate comparison for the hypothesis would be between the total information acquisition for both groups, based on the attributes that were held in common. In other words, leaving the BRAND NAME and MANUFACTURER'S NAME totals out of the brand and manufacturer's name available total.

Once again it is reiterated that the incorporation of information acquisition totals for BRAND NAME and MANUFACTURER'S NAME in the analysis

only serves to inflate one total, and distorts the true extent of any information chunking which may occur. A more fitting analysis would look at the effect arising from the manipulation of the independent variables, BRAND NAME and MANUFACTURER'S NAME. If chunking of information under BRAND NAME occurs, then when this attribute is not available, the acquisition of other attribute information should substantially increase to compensate for the lack of the chunking device.

Given this rationale, a further t-test was performed and it was found that there was a significant increase in the acquisition of FLAVOUR, CENTS/GRAM, PERCENTAGE FLUORIDE, GEL/PASTE, TUBE TYPE, and COLOUR information when BRAND NAME and MANUFACTURER'S NAME were not included in the list of available attributes ($t=1.8676$; $df=46$; $p<.05$). This result was taken as supporting the hypothesis predicting that less information would be acquired in arriving at a purchase decision, when brand and manufacturer's name is available than when it is unavailable.

This conclusion, while supporting the hypothesis tested, points to the occurrence of some form of chunking of product information under the guise of the BRAND NAME attribute. This information chunking was perhaps in terms of facilitating information retrieval from long term memory. There are other possible explanations for the decrease in the amount of information acquired in the brand and manufacturer's name available condition. Firstly, most of the brand names were highly familiar to the subjects. This could have caused them to believe that they knew more about these brands than they actually did, thereby causing a situation of 'false security' which resulted in their acquiring less information.

A second possible explanation relates to the perception of the brand and manufacturer's name unavailable condition as a novel situation. Such a perception could possibly have induced a greater desire for and attention to information. The third possible explanation for the trend in

these results, relates to a possible perception of the brand and manufacturer's name unavailable condition as being unrealistic. If this was the case, it is reasonable to expect that a game-like approach to the decision task would be taken by subjects. This would imply the adoption of a more rational, problem-solving cognitive set than is used by consumers in the real world when making choice decisions.

While all of these reasons remain as possible explanations for the trend in these results, it is noted that there is a high degree of association between the displayboard attribute preferences and the preferences obtained from the paired comparison test. It seems unlikely that the subjects in the brand and manufacturer's name unavailable condition took a game-like approach to the paired comparison test. In fact very few recognised the experimental manipulation (lack of brand and manufacturer's name attributes) until it came to the displayboard procedure when the lack of this information was pointed out to them.

This being the case, it appears that the correspondence between the paired comparison test and the behavioural search, may diminish much of the force that any of the above explanations may have.

While it is still admitted that the three explanations may account for some degree of the effect observed, the fact still remains that knowing BRAND NAME does seem to affect information acquisition behaviour. Such a result is readily explained by the information processing approach. If consumers tend to develop choice heuristics because of limitations in processing capacity, then it is reasonable to expect that a choice heuristic exists for the selection of toothpaste.

The present results point to the existence of a choice heuristic which has been simplified by the chunking of product information under the BRAND NAME attribute. When this attribute information is unavailable, a new

unsimplified choice heuristic is developed, or an existing choice heuristic is modified to fit the choice situation. With this new heuristic, there comes a change in the order of attribute importance when searching for information, and more product information is sought. This change in attribute search importance and the quantity of information acquired can be seen by reference to figure 6.11 .

While FLAVOUR remains the most important product attribute in both groups, the absence of BRAND NAME and MANUFACTURER'S NAME information causes an increase in the quantity and importance of PERCENTAGE FLUORIDE, and CENTS/GRAM information.

Hypothesis Two: BRAND NAME as the most accessed attribute.

The second hypothesis followed from the first. If the BRAND NAME attribute serves as the attribute under which information chunking occurs, then it was realistic to expect that this attribute would be accessed more frequently than any other type of attribute within this experimental condition.

By observation of the greater number of times that BRAND NAME information was accessed compared to any other attribute in the brand and manufacturer's name available condition, the second hypothesis was considered to be supported. This result gives added emphasis to the conclusion that information is chunked under BRAND NAME.

Despite BRAND NAME'S poor preference rating in the paired comparison test, the true value of this information to the subject is only realised when the information search is embarked upon. The result also confirms the importance of BRAND NAME as an information chunking device in the

development of choice heuristics. Its availability elicits a higher degree of use than any other attribute, and causes a significant decrease in the search for other attribute information values.

Hypothesis Three: CENTS/GRAM as the most accessed attribute.

The third hypothesis was also developed from the first hypothesis concerning information chunking. It was predicted that when brand and manufacturer's name information was not present, the CENTS/GRAM attribute would tend to be the most accessed attribute compared to the others in this experimental set.

Once again this hypothesis was supported by observation of the relevant totals in Table 6.14 . CENTS/GRAM information was accessed more than any other product information, even more than FLAVOUR. The result points to a greater emphasis being placed on the CENTS/GRAM attribute in the information search, when brand and manufacturer's name information is not available. This result also supports the idea that a new choice heuristic is developed when BRAND NAME and MANUFACTURER'S NAME attributes are not available. This new heuristic gives added importance to the CENTS/GRAM attribute information in the behavioural search. The implications of this for marketing are explained in the conclusions.

Summary.

Taken together, the results of these three hypotheses indicate the existence of the construction/adaptation and use of choice heuristics, as outlined by the information processing model. Information search using the previously developed and existing search heuristic for the selection of

toothpaste makes use of BRAND NAME in order to chunk certain product information and personal evaluations. When this search heuristic is not inhibited (that is, brand and manufacturer's name information is available) BRAND NAME information is accessed in greater numbers than any other product information, and is presumably used in the choice decision.

When this search heuristic is inhibited by the absence of brand and manufacturer's name information, a new choice heuristic is developed or a general choice heuristic is adapted to the new task, by the subject. This heuristic gives increased importance to CENTS/GRAM INFORMATION, and lacks the economy of the previous heuristic, as more information values are sought in the behavioural search. This change in attribute importance induces choice behaviour similar to that expected under a purely economic choice perspective, that is, selection based primarily on cost.

This is an important point to note. It highlights the inability of many econometric approaches to successfully predict choice behaviour, based on the simplified choice heuristic. Only when this heuristic is inhibited does an economic perspective predominate. As it stands, other non-economic factors chunked under BRAND NAME are considered within the product choice behaviour and are primary and influential in importance. Some of these non-economic factors concern product attributes such as TUBE TYPE, PERCENTAGE FLUORIDE, GEL/PASTE, and COLOUR, and some others are more psychological in nature (e.g. does it make me feel good? Is it what other people whom I respect use? and so on). Further investigation might attempt to establish what these factors really are, and which ones are most important.

Hypothesis Four: The use of a subset of the available information.

The fourth experimental hypothesis attempted to discover whether subjects would select only a subset of the total available information. It was found that on average 23.69% of the available information was accessed in the brand and manufacturer's name available condition, and that 34.51% of the information made available to subjects in the brand and manufacturer's name unavailable condition, was accessed. As well as supporting the fourth hypothesis, this result gives strength to the belief that consumer search behaviour is satisficing in approach. The subjects in neither condition found it necessary to access a very large proportion of the available information. Instead their search behaviour can be seen as more satisficing than maximising.

In regards to the brand and manufacturer's name available condition, the search behaviour was also more satisficing than validating (that is, using a moderate search approach).

Hypothesis Five: The average subset would be between three and seven different attributes.

The fifth experimental hypothesis was based on the findings of Jacoby's (1975) re-evaluation of the original data which showed that consumers pay attention to only a limited number of attributes when making a purchase decision.

This feature of consumers' information searches seems to be well documented. Jacoby, Chestnut, Weigl, and Fisher (1976) found that out

of the 60 subjects in their experiment, 12 had accessed no information in making their decision, and 34 of the others had accessed information on four or fewer different attributes. The overall mean number of different attributes accessed was 4.92 out of 35 different attributes. Jacoby, Szybillo, and Busato-Schach (1977) were also able to show that the subjects in their experiment had only accessed a subset of the available information. The mean number of attributes selected across all subjects was 5.05 out of 16 different attributes.

Given these results it was hypothesised, as in Jacoby, Szybillo, and Busato-Schach (1977), that the average size of this subset would be between three and seven different attributes.

The results from the present study show a similar trend table 6.16 In the brand and manufacturer's name available experimental group the average number of attributes accessed was 5.75 out of eight attributes, and when brand and manufacturer's name is not available the average was 4.75 out of six attributes. Such a result lends support to the observation that consumers generally use only a subset of the available attributes when selecting information, and provides evidence in support of the fifth hypothesis.

The first point of interest as regards this present result concerns the larger mean value for the number of different attributes accessed, than in any previous study. Jacoby, Chestnut, Weigl, and Fisher (1976) obtained an overall mean of 4.92 different attributes accessed out of 35 possible attributes, and Jacoby, Szybillo, and Busato-Schach (1977) averaged 5.05 different attributes out of 17 accessed, over all subjects. The present study obtained mean values of 5.75 in the eight attribute condition, and 4.75 in the six attribute condition, giving an over all subjects mean of 5.25 out of seven attributes.

The trend of the two Jacoby et al. studies (1976, and 1977) suggests that as the number of available attributes increases, the size of the attribute search decreases. If this is the case then the overall mean from the present study would seem to be consistent with this trend. However, the trend of these individual experimental condition results is contrary to this. Here the mean for the eight attribute condition is greater than that for the six attribute condition : the reverse was expected.

Jacoby, Szybillo, and Busato-Schach (1977) obtained averages for the number of attributes accessed in the predicted direction, 4.24 for brand and manufacturer's name available (18 attributes) and 5.86 for brand and manufacturer's name unavailable (16 attributes).

The apparent difference in the trend of the present results is due to there being only six attributes in the brand and manufacturer's name unavailable condition. Re-examining table 6.16 it can be seen that 14 of the 24 subjects in this study accessed information from six different attributes. It is believed that if more attributes had of been available they would have been accessed by many of these 14 subjects, thus giving a larger mean for the brand and manufacturer's name unavailable condition and bringing the present results in to line with the trends noted by other researchers.

The second point to note about this choice of a subset of information is that it also lends support to the argument regarding consumers being satisficers in terms of their search behaviour. Here again, the subjects displayed satisficing rather than maximising search behaviour. Within the brand and manufacturer's name available condition only three of the 24 subjects accessed information from eight different attribute, and 14 of the 24 subjects in the brand and manufacturer's name unavailable condition accessed information about all six different attributes. This result shows that when permitted to use the normal heuristic for selecting toothpaste,

the subjects took more of a satisficing approach. Only when the heuristic was inhibited was the satisficing approach abandoned, and more of a maximising approach taken.

Summary.

Together these two results provide further evidence of the chunking of information under the BRAND NAME attribute and the use of a satisficing approach to information search by subjects. The difference between the amounts of information accessed in both experimental conditions (34.51% when brand and manufacturer's name is not available, and only 23.69% when they are available) suggests that the presence of BRAND NAME information reduces the information search by over 31%. This lessening of the volume of information search is due to the chunking of information related to certain products under the BRAND NAME attribute.

The use on average of less than 25% of the available information in the brand and manufacturer's name available condition indicates some degree of satisficing behaviour. This is consistent with the information processing approach and is subsumed under the tendency for consumers to simplify their search heuristics, by considering only a small subset of the available products and product information.

Hypothesis Six: The association between the rank order obtained from the paired comparison test, and the order of attribute selection.

The final hypothesis related to the attempt made to develop a paired comparison test which would quickly and accurately predict a consumer's attribute acquisition order.

The averaging of ranks for each attribute in relation to both the paired comparison and displayboard procedure served to give a more accurate estimate of the overall rank ordering for each attribute. As stated in the results, the average rank for each attribute was not substantially different from the corresponding median rank values, and did not cause a change in the overall rank positions given, or in the value of the Spearman Rank Correlation Coefficients for each experimental group.

The Spearman rho based on the rankings given to these overall averages, provided a significant correlation in respect to both experimental conditions.

This result is consistent with that obtained by Sheluga, Jaccard, and Jacoby (1979). These researchers found that a graded paired comparisons test was a good predictor of attribute choice behaviour. It was thought that this method of graded paired comparisons may have tended to be confusing and open to bias on the part of the subjects. In the previously mentioned study, the average Spearman rank correlations between the attribute utilities obtained from the scaling method and that observed from the ordering of the behaviourally ranked set for the rating scale method, the conjoint measurement method, and the graded paired comparisons, were +0.61, +0.81, and +0.82 respectively. These correlations were based on data from 35 subjects in respect to six attributes, not including BRAND

NAME. The present study obtained a Spearman rank correlation of +0.8857, for a similar situation (the brand and manufacturer's name unavailable condition), and a correlation of +0.7380 for a set of eight attributes including brand and manufacturer's name.

On the basis of these results and the design of the present experiment, it is not possible to determine whether this higher correlation (+0.8857 vs +0.82) was due to the less complicated procedure of the simple paired comparison test. However, it does seem that the analysis of the simple paired comparison test used in the present study is less involved than that of the graded paired comparisons test used by Sheluga, Jaccard, and Jacoby (1979), and that it provides a better estimate of behaviour. As such, the method of simple paired comparisons is regarded as being more parsimonious than the method of graded paired comparisons as described by Sheluga, Jaccard, and Jacoby (1979).

This high degree of correspondence between the paired comparison test and the information search behaviour exhibited by the subjects, demonstrates the ability of expectancy theory to predict behaviour. Preference for one attribute over another was based on the higher expected value that information about one attribute had over a second attribute. This was a successful formulation in both cases (that is, when brand and manufacturer's name information was available or not available), and illustrates the robustness of expectancy theory.

The two formulations of expectancy theory (chapter 4.3) were not tested, however it would be of considerable interest if further research was to test the application of each formulation. This would ascertain the respective merits of both the additive and multiplicative formulations, and give a deeper understanding of behaviour as exhibited in this study.

7.3 EXAMINATION OF THE DIFFERENCES BETWEEN THE RESULTS OBTAINED FROM THE GENERAL TOOTHPASTE PREFERENCE QUESTIONNAIRE AND THE TOOTHPASTE'S CHOSEN AFTER THE BEHAVIOURAL SEARCH.

A close examination of the information summarised in tables 6.2 and 6.3 , raises a number of interesting issues.

Table 6.2 lists the brand preferences expressed by the subjects in the general toothpaste preference questionnaire. The table summarises what brand of toothpaste is preferred and used by the subjects in the experiment.

Table 6.3 on the other hand, lists the brands of toothpaste chosen by the subjects after using the information display board to search for product information. Comparison of the two tables provides some differences which require comment.

Firstly, in the brand and manufacturer's name available condition, Macleans is both preferred and chosen most frequently. However a surprising difference occurs in respect to the second most preferred and second most chosen attribute. Whereas Colgate is the second most preferred toothpaste, the Plain Pack product is the second most chosen type of toothpaste. The Plain Pack product contained many of the most preferred dimensions described in table 6.5 (Mint flavour, 75% fluoride, White Paste, Plastic tube). It was also the cheapest product in respect to the cents/gram analysis. The remaining order of toothpaste preference and choice for this condition, in respect to both tables is similar, excepting a minor discrepancy between Colgate and Signal.

A more dramatic but similar situation exists in the brand and manufacturer's name unavailable condition. The Plain Pack brand jumps

from being the fifth most preferred brand, to being the overwhelmingly favourite choice of toothpaste. The next most frequently chosen brand was the Woolworths brand, which is identical to the Plain Pack product, except for its packaging and higher price per gram.

Both of these results give support to the conclusion drawn by Granger and Bilson (1972). These researchers found that by giving subjects CENTS/GRAM information about products they caused a significant change in consumer's stated preference, and what they actually chose. Their study was one of the first to use a CENTS/GRAM analysis, and the authors concluded that the provision of this CENTS/GRAM information had caused a significant change in their subjects' choice distribution.

It appears that a similar effect occurred in the present study. The provision of information in this form has contributed to the change in choice, from each subject's stated preference. CENTS/GRAM information is not provided by any manufacturer or grocery store in New Zealand.

Even though the provision of CENTS/GRAM information has had an effect on the subjects choice behaviour, the actual effect observed in the brand and manufacturer's name unavailable group was larger. Evidence for this can be found from a re-examination of Table 6.5 . By studying both the attribute dimension preferences and the associated support given to them it can be observed that both experimental groups are rather similar. Given this similarity, it is reasonable to assume that the impact of the CENTS/GRAM attribute upon both groups would be similar. However the results of Table 6.3 show that this is not so. The Plain Pack brand has risen in the choice order much more in the brand and manufacturer's name unavailable condition.

This additional increase in choice for this product points to a compensatory effect due to the unavailability of brand name information for

this group. Quite possibly, added weighting is given to the value of the CENTS/GRAM information when BRAND NAME information is not available. This explanation would account for the large increase in the choice of the cheapest product by this experimental group.

7.4 SCALES OF ATTRIBUTE PREFERENCE.

The results obtained from the paired comparison test, as analysed by means of the PAIRCOMP programme provide some interesting differences. It must be noted that while the comparison of the sub-category scales may highlight some differences, these differences must not be taken as being of any significance. The sub-categories used in these parts of the analysis of the results are not independent of each other. Only the comparison of scales obtained from the two experimental groups is an independent comparison. Further it should also be remembered that in many cases there are rather small sub-group sizes. This implies that any differences cannot be regarded as conclusive.

The attribute importance comparison of most interest is that between the two experimental groups. The respective rank ordering of attributes, omitting brand and manufacturer's name for each group can be viewed from the summary of preference orders outlined in Figure 6.3 .

In both experimental groups FLAVOUR is the most preferred attribute. Further examination of Figure 6.3 shows that the distances between scale points for the attributes is quite different also.

Comparison of the magnitudes of the distances between scale points for each attribute from the FLAVOUR attribute for each group, shows some important differences. If it is assumed that the subjects in both

experimental groups are similar in all respects, then the differences between these attribute preference orders and the magnitude of the distances from the FLAVOUR attribute, can only be explained by the differences in experimental conditions, that is, either having brand and manufacturer's name available or not available.

In most cases the distances of attributes from the FLAVOUR attribute are comparable and equivalent for both experimental groups. This is so for the COLOUR, PERCENTAGE FLUORIDE, and GEL/PASTE attributes. Substantial changes occur with the CENTS/GRAM and TUBE TYPE attribute separations. These distances from FLAVOUR markedly decrease when brand and manufacturer's name information is not available.

This difference suggests that when BRAND NAME information is not available a greater importance is placed on the CENTS/GRAM and TUBE TYPE information. Conversely, it implies that BRAND NAME may subsume this information, i.e. CENTS/GRAM and TUBE TYPE information is chunked under the BRAND NAME attribute. At the very least it can be concluded that the availability of BRAND NAME information reduces the value of the CENTS/GRAM and TUBE TYPE attribute information when brand and manufacturer's name information is available.

Granger and Bilson (1972) found that the provision of CENTS/GRAM information to subjects who had never encountered such information before, causes a bias in preference towards this information. While this may have occurred here, it is noted that this new information format was given to both experimental groups, thus balancing any effect which may have occurred. It is concluded then, that this added effect in the brand and manufacturer's name unavailable condition must have been caused by something other than the novelty of the information attribute.

The various sub-category attribute preference orders while being of

some descriptive interest, are not of much theoretical value. The sub-categories are not independent, and are based on small numbers per category. For this reason this aspect of the results will not be considered in detail.

The final point of interest concerning the paired comparisons test, concerns the chi-square test of unidimensionality.

The chi-square test for both experimental groups supports the following assumptions:

- a) the distributions from which the stimuli come from are normal.
- b) the standard deviations of stimuli in the paired comparison set are equal.
- c) the intercorrelations between the stimuli are equal.

Given that these assumptions can be accepted it is concluded that the scale was unidimensional, that is, the subjects were basing their judgements on the expected value of each individual attribute in turn.

This result is important since it verified the decision basis used by the subjects. A significant proportion of the subjects were following the instructions and making their decision on one dimension at a time. It is reasonable to assume that this dimension was as stated above.

The rank correlations obtained between the average rank preferences for attributes obtained from the paired comparison test and the behavioural search (+0.8857 for six attributes, and +0.7380 for eight attributes) evidence the ability of the paired comparison test with the expected value

formulation to predict behaviour search in respect to the attributes chosen. The subjects in completing the paired comparison test were asked to indicate their preference for one attribute over another, using expected value as the decision basis. These high rank correlations and the results of the chi-square test of unidimensionality emphasise the usefulness of the joint approach.

The process descriptive approach attempts to examine the consumer's information preferences, and as such is used in co-ordination with expectancy theory, since expectancy theory attempts to predict the force or motivation for a person's behaviour.

In relation to the present experiment, the alternative courses of action that the individual could take were represented by the specific products that could be chosen from. By obtaining individual preferences for certain types of product attributes, it was possible to establish links between this preference obtained from a psychological test and the actual information search behaviour. If a much larger sample size had been used and the same results obtained, it would be possible to state that knowing these preferences leads to the accurate prediction of behavioural search patterns.

The present study, like Hansen's (1969), supports the general formulation of expectancy theory. Hansen found that outcome desirability and perceived expectancy were predictive of both preference statements and choice behaviour in simulated purchasing situations. When taken separately, Hansen found that neither outcome desirability nor perceived expectancy was as good a predictor as the two combined.

The present experiment found that the expected value of one product attribute over another, judged in a paired comparison test, is a good predictor of behavioural search information preferences.

7.5 SUBJECTIVE STATES RESULTS

An important finding within the process descriptive approach to consumer behaviour has been that the provision of more information to consumers results in their being more satisfied with their decision, more certain that they had made a good decision, and less confused about the experimental procedure. Such findings were obtained both by Jacoby, Speller, and Kohn (1974), and Jacoby, Speller, and Berning (1974).

Jacoby, Szybillo, and Busato-Schach (1977) reported that:

- 1) Subjects were more satisfied with their decision under the brand and manufacturer's name available condition than under the unavailable condition.
- 2) Subjects were less certain about having made a good decision under the brand and manufacturer's name unavailable condition.
- 3) Subjects were more confused during the acquisition task in the brand and manufacturer's name unavailable condition.
- 4) Subjects in the brand and manufacturer's name unavailable condition desired more information than those in the available condition.
- 5) No significant difference between experimental groups was found concerning the subjects' reports as to whether they felt that one of the other non-selected brands was better.

These five subjective states were tested in the present study and contradictory results were obtained. No significant differences were found between the two experimental groups in reference to satisfaction with their choice, certainty that the best decision had been made, confusion experienced during the task, and the desire for more unprovided information. A significant difference between the two experimental groups was found in connection with reported feelings that another toothpaste that had not been selected would have been just as good in satisfying their desires and expectations, as the one chosen. What was most interesting in this regard was that it was subjects in the brand and manufacturer's name available condition who felt this most strongly.

In the case of all the subjective states excepting the last one, 95% confidence intervals showed that the subjective feelings were all in a significantly positive direction. The subjects in both experimental groups were satisfied with their decisions, certain that they had made the best decision, not confused during the information acquisition procedure, and did not desire any unprovided product information.

The contradiction between the findings of the second and fifth subjective states is most difficult to explain. On the one hand, the subjects indicated that they were certain that they had made the best decision and on the other they also reported that some other toothpaste would probably have been just as good as the one they had chosen.

It is possible that this apparent discrepancy is indeed a conception held by consumers. Possibly they conceive many brands of toothpaste as being similar to each other, and therefore equally as good. Possibly the subjects feel that 'tastes' or preferences for toothpaste can change quite frequently, making some brands just as good as others. Perhaps too, this apparent contradiction is what makes toothpaste and its many

manufacturers part of a thriving multi-million dollar industry!

7.6 DECISION NETS

The decision net approach to consumer research makes use of branching diagrams to describe an individual's search and decision strategies. This approach has been criticised because of its completely individual approach. Critics point out that while such an approach describes in detail the search and decision strategies of each tested individual it has great problems in confronting the problem of generality. Therefore few people have followed the lead given in this area by James Bettman (1974).

Accepting this problem associated with the decision nets individual approach, it is still possible to make use of the general structure of the approach, (that is, the construction of the decision nets). This was done with good effect in this present study.

Figures 6.13, 6.14, and 6.15, represent the progression of the attribute information search taken by subjects in this experiment. Examination of the search processes undertaken in both experimental groups elicited some distinct search starting points for each experimental group.

The two most accessed starting points for subjects within the brand and manufacturer's name available condition were the FLAVOUR attribute, and the BRAND NAME attribute. Together they represent the first attribute acquisition for 18 (75%) of the subjects in this group. While this point is of interest, it is at the second choice of attribute information that an important difference in search strategies is found. The types of attributes that are accessed are all the same except that where TUBE TYPE information is accessed in the FLAVOUR set, it is not accessed in the BRAND

NAME set at all. Here within this BRAND NAME set, GEL/PASTE information is accessed, whereas it is not accessed in the FLAVOUR set.

For subjects who select BRAND NAME information first, most select FLAVOUR information second. However, when subjects select FLAVOUR first, most choose TUBE TYPE as their second type of attribute information. This disregard for TUBE TYPE information after initially selecting BRAND NAME, and the discovery that TUBE TYPE is accessed under the FLAVOUR first set, could be a source of further evidence for the chunking of TUBE TYPE information under the BRAND NAME attribute (that is, accessing BRAND NAME reduces the need to access TUBE TYPE information. On the other hand, when FLAVOUR is accessed, TUBE TYPE information must be accessed).

The major search starting point in the brand and manufacturer's name unavailable condition was FLAVOUR. This attribute accounted for the first steps taken in the attribute information search by 54% of the subjects. This result is consistent with the preference ranking obtained from the paired comparison test analysis. There it was found that FLAVOUR was the most preferred product attribute. Within this search strategy, four of the 13 subjects selected CENTS/GRAM as their next choice of attribute. No other attribute was accessed more at the secondary level. This occurrence also points to a similarity with the results obtained from the paired comparison test. There it was found that after FLAVOUR, CENTS/GRAM was the next most preferred attribute. This correspondence again indicates some association between the paired comparison test and the search strategy used by the subjects.

7.7 FOLLOW-UP STUDY.

The results obtained from the analysis of the repertory grid data,

evidenced varying degrees of validation for the product attributes used in the study. The frequency with which the eight attributes used in the study were commonly perceived as toothpaste attributes by subjects is illustrated in table 6.21 . This frequency serves to strengthen the value of the approach taken in the study, and also gives added support and verification to the results obtained.

The use of the repertory grid technique is endorsed by Wilkie and Pessemier, (1973), and was supportive to the results obtained in this study.

Chapter Eight : Conclusions .

8.1 CONCLUSIONS OF THIS STUDY.

Six hypotheses were tested in this experiment and all obtained results similar in direction to those made by other researchers.

Some evidence indicating information chunking under the BRAND NAME attribute was obtained. Taken together the first three hypotheses point to this feature of the consumer's behaviour. The BRAND NAME attribute is accessed more than any other attribute, and when this attribute information is not available, consumers seem to compensate for its absence by accessing other product information in greater amounts. When subjects were not given paired comparison choices involving brand and manufacturer's name attributes, a greater importance was put on CENTS/GRAM and TUBE TYPE information.

This observation is supported by the results of the information search procedure in the brand and manufacturer's name unavailable condition as analysed by the decision nets. Here FLAVOUR and CENTS/GRAM were found to be accessed together in this order, more than any other pair of attributes. Taken together these pieces of evidence point to the storage of some product knowledge under the BRAND NAME attribute.

The results point to the existence and use by subjects of choice heuristics. These heuristics are used because of the limited processing capacity that humans possess. In one respect, these heuristics limit the number of brands and attributes considered, so as to simplify choice. In another respect, they cut down the time and extent of the information search for the subject.

An important finding in this regard was the observation that when the BRAND NAME chunking device was removed, a greater importance was placed on

the CENTS/GRAM attribute in the behavioural search. This event suggests that the choice heuristic can be inhibited and that a new heuristic, based on different criteria is either constructed or adapted from some other situation. The implication of this being that buying behaviour can be manipulated by the removal of certain types of product information.

In support of the information processing approach it was also found that when allowed to freely access product information, subjects selected only a small subset (23.69%) of the total information presented, and only a subset of the available attributes. This supported the observation that consumers tend to adopt a satisficing, rather than maximising or validating approach to information search.

The use of expectancy theory provided a means of accurately predicting consumer preferences for attribute information. Expectancy theory is assumed in consumer psychology and received further validation in this research.

Finally, it was found that within both experimental conditions the subjects were all satisfied with their decisions, certain that they had made the best decision, not confused during the test procedure, and did not desire any other information from that which was presented to them. It was found however that in both experimental groups, the subjects felt that some other unselected toothpaste may have been just as good as the one that they had chosen.

Future research would be fruitful in this area if it continued the use of the paired comparison test, but with more stimulus items. Also research testing the application of the multiplicative formulation and the additive formulation of expectancy theory would be of great benefit for the understanding of the consumer's decision making process. The adoption of an information display board allowing the free selection of information,

one piece at a time, is highly encouraged. Such displayboards are easily constructed, and are readily understood by subjects. They allow for a reduction in experimenter effects since the subject can be left relatively unsupervised while accessing information.

Further research which looked at whether the choice heuristics already existed in complete form in memory, or are constructed from elements existing in memory for each choice situation, would be advantageous. Also, investigation of what types of information is chunked under the BRAND NAME attribute would be of benefit to marketers and producers alike.

Finally, the use of consumer behaviour as a field of research is strongly urged. It allows for the testing of many psychological theories in an environment conducive to the development of theory, and the advancement of applied knowledge.

APPENDICES :

Appendix A.

ATTRIBUTES

Brand Name - The name by which the product is known. e.g. Colgate, Aim, Kolynos, Signal,...

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price)

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,.....

Tube Type - Is the toothpaste tube plastic or metal.

Manufacturer's Name - Who makes, or manufactures the product.

Colour - What colour the toothpaste is. e.g. White, Blue.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste?"

(Circle the preferred attribute of the pair).

Percentage Fluoride - Gel/paste

Colour - Tube Type

Flavour - Cents/gram

Tube Type - Percentage Fluoride

Brand Name - Flavour

Percentage Fluoride - Manufacturer's Name

Cents/gram - Brand Name

Flavour - Colour

Gel/paste - Tube Type

Colour - Percentage Fluoride

Manufacturer's Name - Cents/gram

Brand Name - Gel/paste

Tube Type - Manufacturer's Name

Cents/gram - Colour

Gel/paste - Flavour

Percentage Fluoride - Brand Name

Flavour - Tube Type

Colour - Gel/paste

Manufacturer's Name - Flavour

Gel/paste - Cents/gram

Brand Name - Colour

Flavour - Percentage Fluoride

Tube Type - Brand Name

Colour - Manufacturer's Name

Cents/gram - Tube Type

Manufacturer's Name - Gel/paste

Percentage Fluoride - Cents/gram

Brand Name - Manufacturer's Name

ATTRIBUTES.

Brand Name - The name by which the product is known. e.g. Colgate, Aim, Kolynos, Signal,.....

Percentage Fluoride - The amount of toothpaste that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs. (Based on the Recommended Retail price).

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,...

Tube Type - Is the toothpaste tube plastic or metal.

Manufacturer's Name - Who makes, or manufactures the product.

Colour - What colour the toothpaste is. e.g. White, Blue.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste?"

(Circle the preferred attribute of the pair)

Percentage Fluoride - Cents/gram

Colour - Gel/Paste

Cents/gram - Tube Type

Brand Name - Colour

Flavour - Percentage Fluoride

Tube Type - Manufacturer's Name

Gel/Paste - Flavour

Percentage Fluoride - Brand Name

Manufacturer's Name - Cents/gram

Colour - Tube Type

Brand Name - Manufacturer's Name

Tube Type - Percentage Fluoride

Manufacturer's Name - Gel/Paste

Flavour - Colour

Cents/gram - Brand Name

Percentage Fluoride - Manufacturer's Name

Brand Name - Flavour

Gel/Paste - Tube Type

Colour - Percentage Fluoride

Tube Type - Brand Name

Flavour - Cents/gram

Brand Name - Gel/Paste

Manufacturer's Name - Flavour

Cents/gram - Colour

Flavour - Tube Type

Gel/Paste - Cents/gram

Colour - Manufacturer's Name

Percentage Fluoride - Gel/Paste

ATTRIBUTES.

Brand Name - The name by which the product is known. e.g. Colgate, Aim, Kolynos, Signal,.....

Percentage Fluoride - The amount of toothpaste that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs. (Based on the Recommended Retail price).

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,...

Tube Type - Is the toothpaste tube plastic or metal.

Manufacturer's Name - Who makes, or manufactures the product.

Colour - What colour the toothpaste is. e.g. White, Blue.

Consider each of the pairs of toothpaste attribute below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste?"

(Circle the preferred attribute of the pair)

Brand Name - Manufacturer's Name

Percentage Fluoride - Cents/gram

Manufacturer's Name - Gel/Paste

Cents/gram - Tube Type

Colour - Manufacturer's Name

Tube Type - Brand Name

Flavour - Percentage Fluoride

Brand Name - Colour

Gel/Paste - Cents/gram

Manufacturer's Name - Flavour

Colour - Gel/Paste

Flavour - Tube Type

Percentage Fluoride - Brand Name

Gel/Paste - Flavour

Cents/gram - Colour

Tube Type - Manufacturer's Name

Brand Name - Gel/Paste

Manufacturer's Name - Cents/gram

Colour - Percentage Fluoride

Gel/Paste - Tube Type

Flavour - Colour

Cents/gram - Brand Name

Percentage Fluoride - Manufacturer's Name

Brand Name - Flavour

Tube Type - Percentage Fluoride

Flavour - Cents/gram

Colour - Tube Type

Percentage Fluoride - Gel/Paste

ATTRIBUTES

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price).

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,....

Colour - What colour the toothpaste is. e.g. White, Blue.

Tube Type - Is the toothpaste tube plastic or metal.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste."

(Circle the preferred attribute of the pair).

Tube Type - Cents/gram

Colour - Flavour

Gel/paste - Tube Type

Flavour	- Percentage Fluoride
Cents/gram	- Gel/paste
Percentage Fluoride	- Colour
Gel/paste	- Flavour
Tube Type	- Percentage Fluoride
Flavour	- Cents/gram
Percentage Fluoride	- Gel/paste
Colour	- Tube Type
Cents/gram	- Percentage Fluoride
Gel/paste	- Colour
Tube Type	- Flavour
Colour	- Cents/gram

ATTRIBUTES

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price)

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint, ...

Colour - What colour the toothpaste is. e.g. White, Blue.

Tube Type - Is the toothpaste tube plastic or metal.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste."
(Circle the preferred attribute of the pair).

Colour - Flavour

Tube Type - Cents/gram

Gel/paste - Colour

Cents/gram	- Percentage Fluoride
Colour	- Tube Type
Percentage Fluoride	- Gel/paste
Flavour	- Cents/gram
Tube Type	- Percentage Fluoride
Gel/paste	- Flavour
Percentage Fluoride	- Colour
Cents/gram	- Gel/paste
Flavour	- Percentage Fluoride
Gel/paste	- Tube Type
Colour	- Cents/gram
Tube Type	- Flavour

ATTRIBUTES

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price).

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,....

Colour - What colour the toothpaste is. e.g. White, Blue.

Tube Type - Is the toothpaste tube plastic or metal.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste."

(Circle the preferred attribute of the pair).

Colour - Cents/gram

Tube Type - Flavour

Gel/paste - Colour

Cents/gram	- Percentage Fluoride
Colour	- Tube Type
Percentage Fluoride	- Gel/paste
Flavour	- Cents/gram
Tube Type	- Percentage Fluoride
Gel/paste	- Flavour
Percentage Fluoride	- Colour
Cents/gram	- Gel/paste
Flavour	- Percentage Fluoride
Gel/paste	- Tube Type
Colour	- Flavour
Tube Type	- Cents/gram

APPENDICES :

Appendix B.

ATTRIBUTES

Brand Name - The name by which the product is known. e.g. Colgate, Aim, Kolynos, Signal,...

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price)

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,....

Tube Type - Is the toothpaste tube plastic or metal.

Manufacturer's Name - Who makes, or manufactures the product.

Colour - What colour the toothpaste is. e.g. White, Blue.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste?"

(Circle the preferred attribute of the pair).

Percentage Fluoride - Gel/paste

Colour	-	Tube Type
Flavour	-	Cents/gram
Tube Type	-	Percentage Fluoride
Brand Name	-	Flavour
Percentage Fluoride	-	Manufacturer's Name
Cents/gram	-	Brand Name
Flavour	-	Colour
Gel/paste	-	Tube Type
Colour	-	Percentage Fluoride
Manufacturer's Name	-	Cents/gram

Brand Name	-	Gel/paste
Tube Type	-	Manufacturer's Name
Cents/gram	-	Colour
Gel/paste	-	Flavour
Percentage Fluoride	-	Brand Name
Flavour	-	Tube Type
Colour	-	Gel/paste
Manufacturer's Name	-	Flavour
Gel/paste	-	Cents/gram
Brand Name	-	Colour
Flavour	-	Percentage Fluoride

Tube Type	-	Brand Name
Colour	-	Manufacturer's Name
Cents/gram	-	Tube Type
Manufacturer's Name	-	Gel/paste
Percentage Fluoride	-	Cents/gram
Brand Name	-	Manufacturer's Name

ATTRIBUTES.

Brand Name - The name by which the product is known. e.g. Colgate, Aim, Kolynos, Signal,.....

Percentage Fluoride - The amount of toothpaste that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs. (Based on the Recommended Retail price)

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,....

Tube Type - Is the toothpaste tube plastic or metal.

Manufacturer's Name - Who makes, or manufactures the product.

Colour - What colour the toothpaste is. e.g. White, Blue.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste?"

(Circle the preferred attribute of the pair)

Percentage Fluoride - Cents/gram

Colour	-	Gel/Paste
Cents/gram	-	Tube Type
Brand Name	-	Colour
Flavour	-	Percentage Fluoride
Tube Type	-	Manufacturer's Name
Gel/Paste	-	Flavour
Percentage Fluoride	-	Brand Name
Manufacturer's Name	-	Cents/gram
Colour	-	Tube Type
Brand Name	-	Manufacturer's Name

Tube Type	-	Percentage Fluoride
Manufacturer's Name	-	Gel/Paste
Flavour	-	Colour
Cents/gram	-	Brand Name
Percentage Fluoride	-	Manufacturer's Name
Brand Name	-	Flavour
Gel/Paste	-	Tube Type
Colour	-	Percentage Fluoride
Tube Type	-	Brand Name
Flavour	-	Cents/gram
Brand Name	-	Gel/Paste

Manufacturer's Name	-	Flavour
Cents/gram	-	Colour
Flavour	-	Tube Type
Gel/Paste	-	Cents/gram
Colour	-	Manufacturer's Name
Percentage Fluoride	-	Gel/Paste

Percentage Fluoride	-	Cents/gram
Manufacturer's Name	-	Gel/Paste
Cents/gram	-	Tube Type
Colour	-	Manufacturer's Name
Tube Type	-	Brand Name
Flavour	-	Percentage Fluoride
Brand Name	-	Colour
Gel/Paste	-	Cents/gram
Manufacturer's Name	-	Flavour
Colour	-	Gel/Paste

Flavour	-	Tube Type
Percentage Fluoride	-	Brand Name
Gel/Paste	-	Flavour
Cents/gram	-	Colour
Tube Type	-	Manufacturer's Name
Brand Name	-	Gel/Paste
Manufacturer's Name	-	Cents/gram
Colour	-	Percentage Fluoride
Gel/Paste	-	Tube Type
Flavour	-	Colour
Cents/gram	-	Brand Name

Percentage Fluoride	-	Manufacturer's Name
Brand Name	-	Flavour
Tube Type	-	Percentage Fluoride
Flavour	-	Cents/gram
Colour	-	Tube Type
Percentage Fluoride	-	Gel/Paste

ATTRIBUTES

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price).

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,....

Colour - What colour the toothpaste is. e.g. White, Blue.

Tube Type - Is the toothpaste tube plastic or metal.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste."

(Circle the preferred attribute of the pair).

Tube Type - Cents/gram

Colour - Flavour

Gel/paste	-	Tube Type
Flavour	-	Percentage Fluoride
Cents/gram	-	Gel/paste
Percentage Fluoride	-	Colour
Gel/paste	-	Flavour
Tube Type	-	Percentage Fluoride
Flavour	-	Cents/gram
Percentage Fluoride	-	Gel/paste
Colour	-	Tube Type
Cents/gram	-	Percentage Fluoride
Gel/paste	-	Colour

Tube Type

-

Flavour

Colour

-

Cents/gram

ATTRIBUTES

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price)

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint, ...

Colour - What colour the toothpaste is. e.g. White, Blue.

Tube Type - Is the toothpaste tube plastic or metal.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste."
(Circle the preferred attribute of the pair).

Colour - Flavour

Tube Type - Cents/gram

Gel/paste	-	Colour
Cents/gram	-	Percentage Fluoride
Colour	-	Tube Type
Percentage Fluoride	-	Gel/paste
Flavour	-	Cents/gram
Tube Type	-	Percentage Fluoride
Gel/paste	-	Flavour
Percentage Fluoride	-	Colour
Cents/gram	-	Gel/paste
Flavour	-	Percentage Fluoride
Gel/paste	-	Tube Type

Colour	-	Cents/gram
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Tube Type	-	Flavour
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ATTRIBUTES

Percentage Fluoride - The amount of fluoride that is contained in the toothpaste.

Cents/gram - How much one gram of the toothpaste costs.
(Based on the recommended retail price).

Gel/paste - Is the product a gel or a paste.

Flavour - What flavour the toothpaste is. e.g. Mint, Spearmint, Mildmint, Coolmint,.....

Colour - What colour the toothpaste is. e.g. White, Blue.

Tube Type - Is the toothpaste tube plastic or metal.

Consider each of the pairs of toothpaste attributes below.

"Information about which one of the two attributes below would be of most value to you when choosing toothpaste."

(Circle the preferred attribute of the pair).

Colour - Cents/gram

Tube Type - Flavour

Gel/paste	-	Colour
Cents/gram	-	Percentage Fluoride
Colour	-	Tube Type
Percentage Fluoride	-	Gel/paste
Flavour	-	Cents/gram
Tube Type	-	Percentage Fluoride
Gel/paste	-	Flavour
Percentage Fluoride	-	Colour
Cents/gram	-	Gel/paste
Flavour	-	Percentage Fluoride
Gel/paste	-	Tube Type

Colour - Flavour

Tube Type - Cents/gram

APPENDICES :

Appendix C .

DEMOGRAPHIC INFORMATION.

NAME : _____

CONTACT PHONE NUMBER OR ADDRESS : _____

AGE : _____

Circle the appropriate category.

SEX : Female Male

RESIDENTIAL INFORMATION : Where do you live?

In a Flat In a Hostel At Home with Parents Own Home Other

CONSUMER INFORMATION : Have you bought or participated in the buying
of toothpaste in the last three months? (i.e. since March)

If there are any comments that you would like to make about any of
your responses, please do so on the reverse side of this questionnaire.

APPENDICES :

Appendix D.

Information Display Board Used For The Information Search In The Brand And Manufacturer's Name Available Condition.

BRAND NAME	FLAVOURS	PERCENTAGE FLUORIDE	CENTS/GRAM	COLOUR	TUBE TYPE	PASTE /GEL	MANUFACTURER'S NAME
Signalus	Freshmint	0.75%	1.55	White	Plastic	Paste	Levers N.Z. Ltd
Cool-mouth's	Mint	0.75%	1.09	White	Plastic	Paste	L.D.Nathans Co. Ltd.
Mainack	Mint	0.75%	0.73	White	Plastic	Paste	L.D.Nathans Co Ltd.
Polynos	Mint	New Formula	1.29	White	Metal	Paste	Home Products N.Z. Ltd
icleans	Freshmint Mildmint Spearmint	0.75 %	1.47	White	Plastic	Paste	Beecham N.Z. Ltd
Signalus	Freshmint	0.75 %	1.93	Blue	Plastic	Gel	Levers N.Z. Ltd.
m	Spearmint	0.75 %	1.55	Blue	Plastic	Paste	Levers N.Z. Ltd.
Colgate	Coolmint	0.75 %	1.63	Blue	Plastic	Gel	Colgate / Palmolive
raite	Mint	Not Stated	1.17	White	Metal	Paste	Colgate/ Palmolive
Colgate	Freshmint Mildmint	0.75%	1.47	White	Plastic	Paste	Colgate/ Palmolive

Information Display Board Used For The Information Search In The Brand and Manufacturer's Name Unavailable Condition.

TYPE	FLAVOURS	PASTE /GEL	COLOUR	PERCENTAGE FLUORIDE	TUBE TYPE	CENTS/GRAM
J	Mint	Paste	White	0.75%	Plastic	1.09
R	Freshmint	Paste	White	0.75%	Plastic	1.55
N	Mint	Paste	White	New Formula	Metal	1.29
L	Mint	Paste	White	Not Stated	Metal	1.17
F	Spearmint	Paste	Blue	0.75%	Plastic	1.55
H	Freshmint Mildmint Spearmint	Paste	White	0.75%	Plastic	1.47
T	Coolmint	Gel	Blue	0.75%	Plastic	1.63
Q	Mint	Paste	White	0.75%	Plastic	0.73
D	Freshmint	Gel	Blue	0.75%	Plastic	1.93
B	Freshmint Mildmint	Paste	White	0.75%	Plastic	1.47

APPENDICES :

Appendix E .

SUBJECTIVE STATES.

1. How satisfied were you with your decision?

_____	:	_____	:	_____	:	_____	:	_____
Very		Quite		Neither		Quite		Very
Dissatisfied	:	Dissatisfied	:	Satisfied nor	:	Satisfied	:	Satisfied
				Dissatisfied				

2. How certain were you, that you had made the best decision?

_____	:	_____	:	_____	:	_____	:	_____
Very		Quite		Neither		Quite		Very
Certain	:	Certain	:	Certain nor	:	Certain	:	Uncertain
				Uncertain				

3. How confused did you feel while performing the task?

_____	:	_____	:	_____	:	_____	:	_____
Very		Quite		Neither		Quite		Very
Confused	:	Confused	:	Confused nor	:	Clear	:	Clear
				not confused				

4. Did you desire to receive additional information about the different types of toothpaste?

_____	:	_____	:	_____	:	_____	:	_____
Definitely		No desire		Neither		Desired		Definitely
Not	:	for more	:	desired nor	:	more	:	needed more
		information		rejected more		information		information
				information				

5. Did you feel that one of the other types of toothpaste would be equal to or better than your choice in satisfying your desires and expectations?

_____	:	_____	:	_____	:	_____	:	_____
Very		Quite		Neither likely		Quite		Very
Likely	:	Likely	:	nor unlikely	:	Unlikely	:	Unlikely
				that one of the				
				other tooth-				
				pastes would be				
				better than or				
				equal to my				
				choice.				

APPENDICES :

Appendix F.

GENERAL TOOTHPASTE PREFERENCE.

Circle the attribute dimension that you prefer.

BRAND - Colgate Aim Kolynos Plain Pack

 Macleans Ultra Brite Woolworths Signal

FLAVOUR - Spearmint Freshmint Mildmint Coolmint Mint

PERCENTAGE FLUORIDE - 0.75% Fluoride No Fluoride

GEL OR PASTE - Gel Paste

COLOUR - White Blue

TUBE TYPE - Plastic Metal

CENTS/GRAM - Less than 1 cent per gram

 1.0 - 1.5 cents per gram

 1.5 - 2.0 cents per gram

 Price is not a factor in my decision.

APPENDICES :

Appendix G .

AIM

COLGATE

KORINOS

MCCLENNANS

COLGATE GEL

SIGNAL

ULTRA BRILL

WOLWERTHS

SIGNAL GEL

APPENDICES :

Appendix H.

Summary of the number of information items accessed per attribute by subjects during the information search, in the brand and manufacturer's name available condition.

SUBJECT	FLAVOUR	CENTS/ GRAM	PERCENTAGE FLUORIDE	GEL/ PASTE	TUBE TYPE	COLOUR	BRAND NAME	MANUFACT- URER'S NAME
1	0	8	4	2	0	0	10	1
2	10	4	5	2	3	4	0	0
3	1	0	0	1	0	0	8	0
4	1	2	0	1	1	1	0	1
5	2	0	0	1	1	3	1	0
6	8	4	5	8	0	5	10	0
7	3	4	7	2	2	0	4	0
8	1	0	0	0	1	0	5	0
9	3	10	10	2	4	0	1	0
10	10	2	2	2	10	2	10	2
11	8	10	5	2	8	5	7	1

12	1	1	2	1	1	1	1	1
13	5	1	0	6	3	2	2	0
14	1	5	3	1	1	1	1	0
15	1	10	1	1	1	1	1	1
16	1	0	1	0	1	0	0	0
18	5	1	4	6	4	3	1	0
19	4	5	4	3	1	3	8	1
20	3	4	4	0	1	0	0	0
21	0	2	2	2	2	0	6	0
22	2	3	1	2	0	0	1	1
23	2	2	2	2	2	2	8	0
24	1	0	0	0	0	0	5	0

Summary of the number of information items accessed per attribute by subjects during the information search, in the brand and manufacturer's name unavailable condition.

SUBJECT	FLAVOUR	CENTS/ GRAM	PERCENTAGE FLUORIDE	GEL/ PASTE	TUBE TYPE	COLOUR
1	2	8	10	2	3	3
2	10	10	10	10	10	10
3	10	5	5	1	2	1
4	10	0	0	0	0	0
5	2	2	0	0	0	0
6	10	5	10	10	0	10
7	6	10	2	0	0	0
8	6	0	0	1	1	1
9	2	1	3	7	4	1
10	0	8	10	0	0	0
11	2	6	9	2	2	2
12	1	10	3	0	0	0

13	10	6	1	1	3	1
14	2	2	2	10	1	2
15	5	1	0	1	0	0
16	3	2	3	4	4	2
17	5	0	0	0	0	0
18	4	7	3	2	3	1
19	2	5	7	2	2	2
20	5	10	4	4	6	3
21	1	3	5	1	1	1
22	10	4	3	2	6	0
23	3	5	4	2	1	2
24	10	2	2	9	2	2

APPENDICES :

Appendix I .

Summary of the number of subjects in the brand and manufacturer's name available condition accessing different attributes at each attribute search change.

	1	2	3	4	5	6	7	8
FLAVOUR	9	7	3	1	1	1	0	0
CENTS/ GRAM	2	1	5	2	3	3	1	0
PERCENTAGE FLUORIDE	1	4	4	1	5	1	1	0
GEL/ PASTE	2	3	4	6	2	1	2	0
TUBE TYPE	0	7	5	3	2	1	1	0
COLOUR	0	0	2	5	4	2	0	1
BRAND NAME	9	1	0	1	2	4	1	2
MANUFACTURER'S NAME	1	1	0	1	0	2	1	1
TOTAL	24	24	23	20	19	15	7	4

Summary of the number of subjects in the brand and manufacturer's name unavailable condition accessing different attributes at each attribute search change.

	1	2	3	4	5	6
FLAVOUR	13	2	3	1	1	2
CENTS/ GRAM	3	3	8	1	2	5
PERCENTAGE FLUORIDE	5	3	5	4	2	0
GEL/ PASTE	1	6	0	3	4	4
TUBE TYPE	1	5	2	5	4	0
COLOUR	1	3	3	3	3	3
TOTAL	24	22	21	17	16	14

APPENDICES :

Appendix J .

SUMMARY OF THE SPEARMAN RANK CORRELATIONS OBTAINED BETWEEN THE ATTRIBUTE PREFERENCE ORDER OBTAINED FROM THE PAIRED COMPARISON TEST AND THE ORDER OBTAINED FROM THE ANALYSIS OF THE INFORMATION SEARCH PROCEDURE, FOR SUBJECTS IN THE BRAND AND MANUFACTURER'S NAME AVAILABLE CONDITION.

SUBJECT	SPEARMAN RANK CORRELATION.
1	+0.500
2	+0.083
3	+0.518
4	-0.564
5	+0.072
6	+0.064
7	+0.236
8	+0.670
9	+0.969
10	+0.239
11	+0.619
12	+0.590

13	+0.557
14	+0.433
15	+0.341
16	+0.745
17	+0.857
18	+0.707
19	+0.831
20	+0.120
21	+0.700
22	+0.785
23	+0.228
24	+0.701

SUMMARY OF THE SPEARMAN RANK CORRELATIONS OBTAINED BETWEEN THE ATTRIBUTE PREFERENCE ORDER OBTAINED FROM THE PAIRED COMPARISON TEST AND THE ORDER OBTAINED FROM THE ANALYSIS OF THE INFORMATION SEARCH PROCEDURE, FOR SUBJECTS IN THE BRAND AND MANUFACTURER'S NAME UNAVAILABLE CONDITION.

SUBJECT	SPEARMAN RANK CORRELATION.
1	+0.771
2	-0.827
3	+0.542
4	+0.695
5	+0.937
6	+0.428
7	+0.273
8	+0.782
9	+0.485
10	+0.777
11	-0.485
12	+0.637
13	+0.885

14	-0.142
15	+0.758
16	+0.600
17	+0.392
18	+1.000
19	-0.085
20	+0.771
21	+1.000
22	+0.771
23	-0.085
24	+0.794

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