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CHANGES IN INFORMATION PROCESSING IN CHILDREN
AND THEIR IMPLICATIONS FOR MARKETING STRATEGY

By

Ashley Marwick Flett

A Thesis Submitted for the Degree of
Doctor of Philosophy

The Interdisciplinary Higher
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THE UNIVERSITY OF ASTON IN BIRMINGHAM

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To My Parents

THE UNIVERSITY OF ASTON IN BIRMINGHAM

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SYNOPSIS

This thesis examines children's consumer choice behaviour using an information processing perspective, with the fundamental goal of applying academic research to practical marketing and commercial problems. Proceeding a preface, which describes the academic and commercial terms of reference within which this interdisciplinary study is couched, the thesis comprises four discernible parts.

Initially, the rationale inherent in adopting an information processing perspective is justified and the diverse array of topics which have bearing on children's consumer processing and behaviour are aggregated.

The second part uses this perspective as a springboard to appraise the little explored role of memory, and especially memory structure, as a central cognitive component in children's consumer choice processing. The main research theme explores the ease with which 10 and 11 year olds retrieve contemporary consumer information from subjectively defined memory organisations. Adopting a sort-recall paradigm, hierarchical retrieval processing is stimulated and it is contended that when two items, known to be stored proximally in the memory organisation are not recalled adjacently, this discrepancy is indicative of retrieval processing ease. Results illustrate the marked influence of task conditions and orientation of memory structure on retrieval; these conclusions are accounted for in terms of input and integration failure.

The third section develops the foregoing interpellations in the marketing context. A straightforward methodology for structuring marketing situations is postulated, a basis for segmenting children's markets using processing characteristics is adopted, and criteria for communicating brand support information to children are discussed. A taxonomy of market-induced processing conditions is developed.

Finally, a case study with topical commercial significance is described. The development, launch and marketing of a new product in the confectionery market is outlined, the aetiology of its subsequent demise identified and expounded, and prescriptive guidelines are put forward to help avert future repetition of marketing misjudgements.

Key Words: Consumer; Children; Organisational Processing; Marketing; Advertising.

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Chapter 1

RESEARCH BACKGROUND AND PROBLEM DEFINITION

1.1. Introduction and Overview

This first chapter presents the background against which this research has been conducted. Its aim is to put into context the commercial and academic perspectives which have been present throughout this work and which have had a significant bearing on both the research design and its execution.

The research has been conducted under the auspices of the Interdisciplinary Higher Degrees (IHD) Scheme of Aston University. This department specialises in reconciling commercial problems with academically based approaches. Accordingly, the thesis has two fundamental goals. The first is to put forward a piece of work which has academic standing in its own right. The second is to apply some of these academic findings to a contemporary, commercial environment, in a practical and relevant way.

Although these goals appear to be commensurate, this task is complicated because the terms of reference in which academic and commercial research are steeped are so different. Academic research may generate results which can feasibly represent unproven propositions; very rarely do such propositions justify commercial expenditure. Moreover, in the commercial environment independent market factors are difficult to forecast and impossible to effectively control. In such dynamic environments, companies must remain flexible enough to change policy and to quickly adapt to market conditions, if

they wish to remain competitive and profitable. Consequently, commercial research initiated one week may be rendered ineffectual, or superfluous the next. Such ephemeral flexibility is more difficult to achieve academically.

A third factor which complicates the research task concerns the nature of the research itself. Commercial, especially marketing and market research, is generally tactical work which aims to isolate and improve specific product-market combinations and strategies. Academic, especially consumer research, is much more broadly based, but typically draws upon a diverse number of disciplines and sub-disciplines. Thus, an eclectic, academic research base is often difficult to apply to the specific and tactical marketing problems which typify commercial situations.

These three factors, different terms of reference, dissimilar research environments, and differences in the nature of the research itself, inevitably complicate the marriage between the academic and commercial research perspectives. Despite these implicit difficulties, a diligent appraisal and recognition of these discordant goals allows their reconciliation.

This chapter describes the commercial environment of the sponsoring company, Nicholas Laboratories plc, and defines the nature and context of the commercial problem which this research initially addressed. Due to market forces, the product-market characteristics of Nicholas Laboratories fundamentally changed, inherently altering the context and posture of this research. This evolution is described, the nature of

the redefined problem is discussed, and the chapter concludes by detailing the overall structure of this thesis.

1.2. The Commercial Background

Nicholas Laboratories plc was the UK subsidiary of the Australian based multinational company Nicholas International Ltd. In 1981 the multinational company employed approximately 2,750 people worldwide and had a turnover of \$A 158m. In 1982, as a response to a rapidly changing business environment, Nicholas International was merged with "Kiwi", another Australian based multinational company. A contributory factor in this merger was the collapse of a sugar confectionery product called Ipsos, upon which the future growth of Nicholas International, spearheaded by the growth of its UK subsidiary company, was to have been based. This chapter is initially concerned with Nicholas Laboratories plc, the UK based subsidiary company, and events prior to its merger with Kiwi in 1982.

Nicholas Laboratories (and today Nicholas-Kiwi plc) manufactures, distributes, and markets a wide range of pharmaceutical and parapharmaceutical products, in the home medicines, prescription medicines, and toiletries markets. Many products, Aspro-Clear, Rennie antacids, Radox Bath, and Almay hypo-allergenic skin products, are household-name brand leaders. Many others, Albucid, Claradin, Neutradonna, and Genticin, are less well-known, but equally respected prescription medicines, used in the treatment of a diverse range of human ailments.

In organisational terms, Nicholas International was subdivided into a number of global operating regions, each region being managed

independently, although all were ultimately directed by, and fundamentally responsible to, the Australian Head Office.

Financially, the company's performance over the decade 1971 - 1981 has been difficult to assess, simply because the trading environment is worldwide, because each country had a unique product portfolio, and because each market operated under an idiosyncratic set of marketing and economic conditions. Nevertheless, in the mid 1970's Nicholas International encountered fundamental and perturbing financial problems, attributable to worldwide economic recession. In the later 1970's, profit margins remained steady, sales increased, and by 1979 a marked improvement in the company's performance was noticed. However, the underlying causes of the company's fluctuating financial performance were deep rooted; they are more clearly understood in terms of the characteristics of the United Kingdom's pharmaceutical industry, within which Nicholas Laboratories operated.

1.3. Characteristics of the Pharmaceutical Industry

In terms of the pharmaceutical industry as a whole, a number of specific characteristics hold true for any one firm operating in the United Kingdom. These are important when understanding Nicholas' corporate strategy.

The first characteristic is that drugs are prone to obsolescence because of technical innovation; a firm must therefore endeavour to generate sales of its products as quickly as possible. This is why most pharmaceutical firms are multinational organisations; a multinational has rapid access to a large market potential.

Secondly, the industry is research based, for the search and discovery of an effective new product can be so vital in terms of profitability and competitive advantage. Research, of course, is very expensive to conduct and must be funded by the company's other operations; so it can be seen that a small company cannot compete as effectively as a large one, both in terms of research scope and depth.

The third, and perhaps most distinctive characteristic of the UK pharmaceutical industry is that doctors, employed by the National Health Service, control the consumption of drugs through their prescribing habits. In other words, the consumer cannot have a free choice as to what drugs he should take; the price of drugs is fixed in the public interest by the Pharmaceutical Price Regulation Scheme, and in this way the marketing of an ethical pharmaceutical product is very much different from the marketing of other consumable products.

One pharmaceutical market in which traditional competitive forces do operate is that of Over-the-Counter (O.T.C.) medicines. O.T.C. medicines, such as analgesics and antacid preparations, are bought by the consumer through the normal retail outlets and, unlike ethical products, are subject to fewer legislative controls. O.T.C. products can generate lucrative returns and therefore represent desirable markets for a pharmaceutical company to enter and develop.

Overall, a profitable and expanding pharmaceutical firm must aim to research and develop a diverse number of pharmaceutical products, to market them on a worldwide scale, and to have a sufficiently diverse product base to withstand sudden competitive innovation.

1.4. Nicholas, Diversification and Confectionery

Nicholas Laboratories' pharmaceutical product portfolio has been constantly diversified, both by the sale of over-the-counter medicines and by the addition of Almay make-up range and novel bath additives. This strategy reduces commercial risk.

However, as mentioned previously, the company's performance in 1976 was disappointing and despite record sales, net profit compared with 1975, fell by 46%. Although these results could be attributable to adverse trading conditions in Australia and Britain, it was recognised that such a performance indicated a decreasing efficiency in the allocation of resources, and simultaneously reflected an increasing competitiveness in pharmaceutical markets.

Essentially, a worldwide drop in the frequency of discovery of new drugs, a doubling of the time lag between discovery and launch of drugs (due to stringent government regulations) and a restriction of freedom in the pricing of new drugs, combined to squeeze margins.

Only the largest pharmaceutical companies could now afford to fund speculative research for new products under such conditions. Nicholas' reaction was to close its UK based research facility, enabling research to be concentrated in Australia. More importantly, a search to find new products in new markets was initiated.

In the Annual Report of 1975, Nicholas' chairman stated:

"Our traditional expertise has been in the fields of home medications and toiletries and we have decided to concentrate our major energies into these and other consumer product areas. As a result research and development will be directed towards these areas."

1.5. Confectionery and Ipso

Against this background of being a small multinational pharmaceutical company, and in congruence with its accelerated diversification Policy, Nicholas decided to enter the confectionery market in the mid 1970's. In Australia, the route taken involved the acquisition of James Chocolates, a small confectionery company producing a range of chocolate and sugar confections. In the United Kingdom, product licencing - which involves marketing but not manufacture of a product - represented the method of entry which Nicholas adopted. Here, initial market entry was achieved with the launch of "Whistling Pops" in 1977, and several other licenced products were quickly introduced to diversify the confectionery range.

It would seem strange for a pharmaceutical company to enter a market as detached as confectionery is from its own familiar markets, but such a strategy can easily be explained. The company could not afford the risks involved in remaining totally in a specific set of traditional markets, which were becoming increasingly competitive, very vulnerable in terms of product obsolescence and very expensive to exploit. Any market in which the risks were lower and the returns on investment better, represented a viable commercial proposition. If a market was international, then so much the better.

The confectionery market fulfilled these conditions and its overall market potential looked good. In 1977, the total UK confectionery market was worth £1,252m at Retail Selling Price (R.S.P.) with chocolate sales representing £781m and sugar £471m. The sugar sector was especially diversified in comparison to the oligopolistic nature of

the chocolate sector and there appeared to be several market openings in which Nicholas' resources could perhaps be better utilised. Indeed, a 1% share of the UK sugar confectionery market in 1977 represented a sales turnover of £5m per annum, which compared very favourably with the mature Aspro and Rennie markets. Internationally, market potential was enormous.

As a method of market entry, product licencing had inherent marketing advantages and disadvantages. The major advantages enabled Nicholas to become acquainted with the forces involved in the confectionery market, without the necessity of investing precious capital into machinery and production capacity. Similarly, with a sales force already operating in chemists and grocers, an immediate method of distribution at little extra cost to that already being incurred was ensured. The market could be perused without commitment to any one sector and the specific anomalies and characteristics could be learnt internally; additionally, the market could be tested with the minimum of risk involvement.

The major disadvantage inherent in marketing a licenced product is that profit margins are lower. Because company pricing philosophy was typically one of heavy branding and high pricing - a creaming strategy - a strong stimulus to produce and sell an internally developed product existed.

The response to this stimulus was "Ipso", a pellet confection marketed in a novel lock-together box and produced on already existing tableting machinery. It extended the range of confectionery products, despite the fact that ex-factory sales of the licenced products constantly

lagged behind budget. Ipso represented an in-house product and marked Nicholas' entry into the sugar confectionery market.

1.6. Early Research Problem Definition

It was against this background, basically a pharmaceutical company diversifying into a confectionery market with a product called Ipso, that the original research problem was defined. A long term strategy in the confectionery market requires that range additions are constantly made, for the product life cycle of most novelty products is short compared with pharmaceutical and toiletry products.

The UK per capita consumption for confectionery was the highest in the world and as the country was emerging from recession, it was felt that a detailed appraisal of new market and new product openings, based on the success of Ipso, should be undertaken.

The original research problem definition was "the technical and marketing problems of product diversification" and the long term objectives of the newly created Confectionery Division included "a need to exploit the success of Ipso with a carefully timed programme of support brand introductions."

1.7. The Demise of Ipso

The business and marketing problems involved in the management and sale of Ipso were numerous. As in every new business venture a number of initial problems were to be expected and in the case of Ipso many undoubtedly occurred.

In analysing how and why Ipso eventually lagged behind budget expectations, many explanations can be used and the validity of each one would depend upon any individual's involvement with the Ipso project.

Initially, production and technical problems meant that the product was in short supply and sometimes of poor quality. Inexperience in all aspects of managing a confectionery product led to overestimation of demand, resulting in erroneous, inflexible purchasing contracts being entered into. Distribution was noted as being poor, both in terms of number of sales calls made and in terms of geographical distribution. Price was perhaps a major flaw in the marketing mix, yet for financial, and no doubt internal political reasons, price became inflexible. Accumulating commercial errors meant that the wholesale trade became demoralised and sales fell.

Whatever the reasons behind lagging budget expectations, the consumer demand for the product undoubtedly faded. Plausibly, the major cause of this drop in demand could be attributable to the consumer's reaction to Ipso as being a novel, but expensive sweet, and in these terms Ipso merely followed the usual short life-cycle which many other confectionery products had previously experienced.

In 1981, the UK sales force for confectionery was dispersed and it was decided that the large residual stock of Ipso should be distributed by a larger and more established confectionery company. Unfortunately this arrangement met with minimal success, and Nicholas then set in motion plans to market the product in the large but new market of the

United States. The withdrawal from the UK and European markets effectively terminated Nicholas UK's role in the management of Ipso, which was transferred to Australia.

1.8. The Need for Problem Redefinition

The necessity for Nicholas International to remain profitable had resulted in the curtailment of its original, corporate confectionery plans. Clearly, the commercial and academic goals of this research could not remain congruent under such conditions. There was no longer any need to identify market opportunities, to develop new products within these market segments, nor indeed to formulate hypothetical marketing strategies for Nicholas Laboratories. In short, it was futile to search for and isolate product-market openings for a company which did not intend to launch any new confectionery products and which had, in fact, divested from this specific market. Such research would be academic in the strictest sense of the word. A change in the objectives of the thesis, combined with a total redefinition of the problem in the light of these fundamentally different commercial conditions, was now necessitated.

Several factors and issues impacted upon this redefinition. First, a strictly academic piece of research was precluded as this contradicted the primary IHD goal of providing commercially worthwhile research. Nevertheless, the absence of the specific commercial problem - formerly to develop new confectionery products for Nicholas Laboratories - implicitly reduced the commercial input into the research design. The commercial application of any new research would necessarily be much more broadly based.

Secondly, it was important to structure a piece of research which had both broad applicability across marketing situations, but which also had direct bearing and value to Nicholas Laboratories.

Thirdly, having already tried to isolate market openings and position new products in children's markets, it became clear that very little research has specifically addressed children's consumer behaviour. Undoubtedly, there is a vast body of literature which explores all aspects of children and child development. Moreover, because children's markets are commercially important, specific companies and their personnel have acquired a depth of marketing experience and have initiated substantial and extensive statistical appraisals of children's markets. Nevertheless, the way in which children acquire, comprehend and use consumer information, and the way in which children react to marketing communications has been relatively unexplored. Only in the specific context of the effect of television upon children is the academic-commercial rift bridged.

Moreover, a hindsight view of the Ipsos project succinctly demonstrated the importance of understanding how children behave with respect to products. The need to understand how and why children select products, why novelty, absence of brand loyalty, and short life cycles typically characterise children's products, and why traditional marketing philosophy is difficult to apply to children, is a vital prerequisite to commercial success. In the absence of this understanding, it is difficult to aggressively market children's products. Indeed, with the disadvantage of no previous experience, the effects of changes in marketing strategies remain difficult to gauge, for experience acts as

a template against which strategies may be evaluated. In short, the marketing of products to children is not merely a question of simplifying the pre-existing strategies used to address adult markets; children do not represent simplified adults.

Thus, the need to redefine the terms of reference of this research stemmed from the collapse of Ipsos and the inherent irrelevancy of identifying hypothetical new product opportunities. The focus of the research was directed upon the role of children as consumers. This topic had direct commercial application, would be valuable to the sponsoring company and had been little explored in the academic and marketing literature.

1.9. The Problem Redefined

One feature, above all others, characterises the research base which potentially has bearing upon "the role of children as consumers". The research base is prodigious but it is also multi-faceted, fragmented and implicitly interdisciplinary.

This situation is analagous to the spokes of a wheel radiating from the central hub. If the hub of the wheel represents the role of children as consumers, then the spokes represent the numerous research disciplines, sub-disciplines, topics and theories which have some bearing on the focal subject. Moreover, each line of research represents an integral whole by itself and has evolved, usually independently, from its application to children's consumer behaviour.

Thus, children's consumer behaviour may be studied using a cognitive perspective (Ward, Wackman and Wartella 1978), a social perspective (Churchill and Moschis 1979), or in terms of personality (Hoffman 1977; Kassarian and Robertson 1981). Moreover, consumer behaviour typically involves choice and children's consumer behaviour is therefore a subset of behavioural decision theory (Einhorn and Hogarth 1981). In turn, the moral and ethical considerations involved in persuading children to buy products has stimulated considerable activity in the field of television viewing and its effects (Adler 1977; Adler et al 1980; Roberts and Bachen 1981).

Within each of these fields a welter of research perspectives have been taken. Consumer behaviour clearly develops and is therefore pre-emptive of adult behaviour. Accordingly, the term "developmental" can be appended to all the research areas noted above. In this respect the arguments which take place within main-stream psychology spill over, or are at least applicable to consumer behaviour and children's consumer behaviour (Masters 1981; Fowler 1980; Hilgard 1980; Kassarian 1982).

In attempting to understand consumer behaviour, the major contemporary perspective has strongly adopted the view that consumers act as cognitive processors of information. Inevitably, this perspective has drawn wholeheartedly upon cognitive theories and concepts. What has happened is that the role of memory, perception, processing capacity, cognitive processes and heuristics, have been explored in the context of adult consumer behaviour (McGuire 1976; Bettman 1979a). Generally, however, the exploration of cognitive processes in relation to children and in the specific context of consumer task situations, has not yet

occurred with such ferment. This is despite the widespread cognitive research base which has addressed processing of information by children (Ornstein 1978; Farnham-Diggory 1972; Flavell 1982; Scandura and Brainerd 1978; Pressley 1982; Cavanaugh and Perlmutter 1982).

Against this extensive research base, this research and thesis has been aligned in order to concur with, and to fulfil the academic and commercial objectives outlined previously. An information processing approach is adopted as a comprehensive, flexible, and valuable theory within which children's consumer choice behaviour may be analysed. Such a theory is perspicaciously outlined by Bettman (1979a).

In terms of commercial application, it is perhaps more important to understand why and how children behave as they do, then to simply observe and describe the actual behaviour itself. Payne (1980) notes that, "an information processing theory approach to cognition has the greatest potential for helping to achieve a better understanding of the psychology of decisions". Moreover, the way children use product related information is fundamental to the marketing philosophy adopted by a manufacturer. Market research tries to uncover what salient information is used by target consumers when selecting a product. Often such information is descriptive in nature; the marketer typically needs prescriptive information to formulate marketing strategies. This type of information can be generated using information processing theory.

Focusing on the integral cognitive components of processing theory, it is clear that memory is a fundamentally important concept. Memory represents the store of consumer information, acts as a data bank for

cognitive functioning and its structure and characteristics impact upon consumer behaviour directly. Memory functioning is complex, reiterative, and developmental. Accordingly, it would be possible to describe cognitive development, consumer experience, socialisation, perceptual processes, language development and responses to marketing communications as components, if not subsets of memory functioning. Taken to an extreme, a memory-less person is non-adaptive, non-mediating and implicitly cognitively simple person.

One aspect of memory functioning involves the recall of stored information. Arguably, stored information has some representational pattern or structure and, in turn, this structure has some bearing upon how easily stored information items, or configurations, are retrieved. This research is concerned with the storage of consumer information by 10-11 year old children and the ease with which items of consumer information are retrieved from predetermined, dissimilarly oriented memory hierarchies. By quantifying memory structure, and by evaluating the ease with which information is retrieved from such memory organisations, the role of memory in consumer choice situations is explored. If specific relationships can be identified, and the concepts of encoding specificity and concreteness are evoked (Thomson and Tulving 1970; Slovic 1972), then it is theoretically possible to structure consumer information arrays with the aim of enhancing desired memory organisations and manipulating processing. In short, the nature of consumer choice tasks can be used to manipulate children's cognitive processing. As Pitz (1980) points out:

"Because encoding strategies vary as a function of task differences, the encoding should be modifiable by changes in the task setting that might alter the choice of strategy. Suitable changes in the wording of

a problem, or in the context in which the problem is presented, or in the sequence of problems presented, can all affect the task maker's strategy".

As will become apparent in the following chapters, the academic problems involved in identifying what is effectively unconscious and unobservable stored information, and then appraising the ease with which information is retrieved from its stored position in the memory are numerous. These problems are accentuated because the role of memory in consumer choice situations is a relatively new topic in consumer research (Lynch and Srull 1982). In short, the principles addressed by the cognitive and developmental literature and those outlined by memory researchers need to be applied in a consumer context using the vehicle of information processing theory.

Thus, in redefining the basis and nature of this research, the problem may be synthesised in terms of four components of increasing scale. The research deals with retrieval processing of differentially structured consumer information stored in the memory; memory is seen as an integral component of an information processing approach to behaviour; an information processing approach is one, albeit an important theory of choice; finally, consumer choice is just one aspect of "the role of children as consumers".

1.10. An Outline of the Following Chapters

In Chapter 2 behavioural decision theory is discussed and the way in which models of choice have impacted upon consumer choice research is outlined. The information processing theory of consumer choice, which acts as a foundation upon which this research is based, is broadly

outlined. This perspective of consumer choice is fully detailed in Appendix 1.

Chapter 3 discusses important research which has bearing upon children's consumer behaviour but which does not naturally dovetail with the information processing perspective. Consumer socialisation is discussed. So is research which has focused upon the child-television relationship. Piaget's stage-related theory of cognitive development is also outlined. More cognitively oriented aspects of developmental psychology and an appraisal of cognitive functioning in terms of units of analysis do, however, concur with an information processing approach. The chapter draws together these various topics using memory as a common denominator.

Against this background, Chapter 4 draws upon cognitive and consumer research with the specific aim of describing the role of memory in a consumer information processing context. Remembering that children are the research subjects, and using the preceding discussion as a basis, the research methodology and design is outlined.

The research hypotheses are generated in Chapter 5, after both the research design and the techniques which are used to analyse the research data have been explained. This chronological anomaly is deliberate. It is easier to understand the derivation of the research hypotheses having first explained the distinction between memory process and memory structure, and having also demonstrated how retrieval processing ease is evaluated, than to invert this process.

In Chapter 6, the research findings are discussed and integrated into the body of consumer and cognitive research. In Chapter 7 a more practical and commercial discussion of information processing theory takes place. The chapter describes how marketers may develop strategies which allow effective marketing of products in children's markets. This involves consideration of the processing limitations, requirements, and abilities of children, and matching the task characteristics of the consumer choice environment, product, and marketing communications with these needs. Marketing strategies can be tailor-made for specific marketing situations and guidelines which allow suitable and effective marketing strategies to be formulated are put forward.

In Chapter 8, the Ipso case study is described and the implications for future new product development are discussed using the case study as an example.

In Chapter 9, areas and topics which may be addressed by future researchers are delineated and finally, in Chapter 10, the strategic appraisal of this research in hindsight is carried out. The salient findings and conclusions are presented.

1.11. Summary

This chapter has introduced the terms of reference upon which this research is based. Initially, the research objective involved identifying new product-market opportunities in the confectionery market for Nicholas Laboratories. However, due to the unprofitability of Ipso, this initial research objective was discarded.

Three factors influenced the evolution of a second research design. The research needed to have commercial application, to be of value to the sponsoring company, and to have academic expediency. The role of children as consumers represented a suitable research topic in this context.

The information processing perspective was selected as an appropriate research framework and the memory component in the information processing theory of consumer choice was focused upon. Two interrelated components of memory, memory retrieval processes and memory structure, are examined in this research. More specifically, the ease with which items of consumer information are retrieved from dissimilarly structured memory organisations is explored. Ten and eleven year old children are used as the research subjects.

In summarising this chapter, Bower and Hilgard (1981) make a most relevant and succinct comment concerning the relationship between academic research and its practical application:

"Current studies of human learning and forgetting have continued in a highly analytical phase, with attention on progressively finer analysis of smaller aspects. As happens during analytical phases in other specialities, synthesis of the knowledge into a broader conception of the phenomena has been shunted aside. As a result, the possible uses of our scientific knowledge for solving practical problems have been only cursorily explored, and then in an often stumbling fashion" (Pg. 164).

This statement is assiduous in the context of marketing to children.

An underlying feature and fundamental objective of this research is to apply some of the clearly relevant academic principles in the commercial context of marketing to children.

Chapter 2

THEORIES OF CHOICE

2.1. Introduction and Overview

Choices are often made in environments in which an enormous amount of information, both directly relevant and incidental to choice, is present. In trying to understand the rationale underlying consumer-decision making, it is important to examine how the individual manages to make sense out of a potentially confusing array of important and unimportant stimuli.

A substantial quantity of research has addressed this problem. Early theories of choice were mathematically based and they modelled choice by assigning statistical probabilities to choice alternatives. These, and other early theories, proved to have little applicability outside the situations for which they were developed. As a consequence, more recent choice models have incorporated cognitive concepts and this has inherently made them more flexible. Most recently, the decision maker has been characterised as a cognitively active problem solver and in these terms, choice represents the outcome of an individual's cognitive processing of information.

In this research, it is this robust, information processing perspective which is adopted as a framework for analysing consumer choice. The goal of this chapter is to demonstrate that such a perspective is justifiable both academically, by indicating the implicit shortcomings of previous choice theories, and contextually, by considering those factors which characterise consumer decision making.

2.2. Behavioural Decision Theory

Behavioural decision theory appraises the way in which judgements and choices are made. It is a uniquely interdisciplinary subject which draws upon economics, statistics, mathematics, philosophy, operations research and psychology (Wallsten 1980).

Earlier decision research has generally been concerned with developing, testing, and reformulating relatively sophisticated normative models.

Indeed, Wallsten characterises much decision research as:

"testing various axioms from which the normative models flow, as measuring subjective probability and utility, and as developing probabilistic models to pit against the normative algebraic ones" (Wallsten 1980, Pg. 10).

More recently, the trend has been to shift reliance from these mathematical and economic models and to incorporate and emphasise the role of cognitive psychology in decision making. The basic rejection of normative models stems from their inability to reflect decision making in situations other than those for which the models were specifically developed. That is, decision rules which hold for one specific situation are typically inapplicable in a second. Clearly, the reason for this inapplicability lies in the fact that people do not make decisions in a uniform manner. Varying external conditions which are salient in decision making, causes an individual to respond. It is the inability to predict the nature of this response which has made it impossible to establish laws of preferential choice behaviour (Payne 1980).

In order to deal with this dynamic aspect of decision making, the perceptual and cognitive processes involved in making a choice have been incorporated into contemporary decision making research. Slovic, Fischhoff and Lichtenstein (1977) recognise that decision making is a "complex cognitive task, frequently situation dependent, which humans perform in a manner determined by their limited memory, retention and information processing capacities". Moreover, Einhorn and Hogarth (1981) emphasise that contemporary research into decision behaviour involves "determining what information people actually use when making choices". Breaking this assumption down, it can be seen that choice involves a person understanding and responding to the environment, that is, integrating perception and cognition.

Some of the reasons for rejecting these normative models can also be levelled against gross psychological models which have attempted to develop an overall view of choice. The stimulus-response approach to choice is based on drive theory (Hull 1952) and proposes that behaviour is caused by a stimulus which is either found in the environment, or is biologically generated (eg. hunger, thirst). The model states that a stimulus leads to a state of drive in an individual and that the way in which an individual responds to this drive is based upon his existing habit strength. Those responses which have been most rewarded in the past will have the highest habit strength: habit strength is based upon patterns of reward or punishment. Behaviour, therefore, represents an interaction between the intensity of the drive and the strength of the habit.

The major shortcoming of this approach is that choice is simply not such an inflexible process. The model assumes that individuals are passive receivers of information and that they only behave when a stimulus is present. Clearly, humans actively acquire and process information, which may then lead to further acquisition. Secondly, it is apparent that stimuli do not have a fixed meaning. Stimuli are interpreted differently by the same person over time and, of course, the same stimulus is rarely identically responded to by different individuals. In short, the nature of the task markedly influences decision making (Estes 1980; Einhorn and Hogarth 1981). Thirdly, stimulus-response approaches do not consider the processes which acquire, process and manipulate salient information during choice. In short, the stimulus-response model is an inadequate framework for dealing with consumer choice.

A second group of theories which account for choice are those in the expectancy-value category. In these models, behaviour is determined by two components, expectancy and value. The basic model defines expectancy as an individual's belief that an action will lead to a certain outcome. The value component refers to the value which the individual attributes to this outcome. The behaviour, or choice alternative which is adopted by the decision maker, maximises this expectancy-value summation (Lewin 1938; Slovic et al 1977).

The essence of the expectancy-value model can be expressed in the formula:

$$A_i = \sum_{j=1}^n a_{ij} b_j$$

where the choice of an alternative (A_i) will lead to various outcomes (a_{ij}), each weighted with the subjective importance of these outcomes (b_j). More simply, the overall evaluation of an alternative depends upon the sum of the expectations.

This class of models has important advantages over those based on drive theory. The key difference is that individuals are now seen as trying to evaluate alternatives and as having preconceptions that actions may lead to goals.

The class of models does however, have several shortcomings. First, the method of comparing alternatives (ie. the expectancy-value interaction) is a very laborious process, unless the choice set is small. The majority of decision making would, therefore, involve substantial allocation of processing capacity. The model ignores the fact that consumers use heuristics to simplify decision making and to minimise cognitive strain. Secondly, despite the fact that logarithmic, exponential, multi-attribute and weighted functions have been incorporated into more complex models (Hansen 1976), expectancy-value models focus on only a small portion of the choice process. The role of memory and the decision maker's allocation of attention to subjectively important information is not considered. Neither is the effect of choice outcomes on future decision making. Moreover, the process of deriving expectancies and of attributing evaluations must, logically, involve cognitive processes. Again, these expectancy-value models do not consider such processes. It is reasonable to regard such models as parochial interpretations of choice.

The foregoing discussion does not aim to thoroughly review the numerous and diverse topics and approaches which are enveloped by behavioural decision theory (Slovic et al 1977; Wallsten 1980; Einhorn and Hogarth 1981). The preceding discussion does, however, attempt to demonstrate that the mechanistic and normative theories and models of choice have implicit weaknesses. Undeniably, such models have been useful, but their application has been constrained and tempered by the specificity of their findings. The need has been to develop more flexible, dynamic and broader based choice theories. These cognitive approaches inherently allow a more strategic appraisal of decision making to occur.

2.3. Consumer Choice Research

Clearly, because consumer psychology is a very much younger discipline than mathematical and cognitive psychology, the trends which have been observed in the context of behavioural decision theory have been reflected in consumer choice research.

The mechanistic stimulus-response class of choice models were initially used to appraise consumer choice behaviour. However, these studies were superseded by consumer research which analysed the relationship between the demographic characteristics of consumers and the type of products purchased. Variables such as age, sex and income were used to categorise consumers with the aim of predicting purchase patterns of similar consumers. Occasionally, such crude segmentation indices are used today (Dickens and Chapell 1977; Douglas and Urban 1977).

By the 1960's, studies of motivational factors in relation to choice were carried out (Dichter 1964) and these were accompanied by psychoanalytical appraisals of the role of personality on choice (Kassarjian 1971). However, these in turn gave way to a prolonged and intense focus upon the role of attitude formation and attitude change in consumer choice behaviour. The majority of these studies took place under the umbrella of expectancy-value theories (Fishbein and Ajzen 1972; 1975) and the paradigm is still used today (Crosby and Taylor 1981).

The basic expectancy-value formulation has been outlined above, but with hindsight it has been regarded by consumer researchers as being a "bit simplistic" (Kassarjian 1982). As a consequence, Fishbein's extended attribute behaviour model was developed. In this model, it was argued that the purchase of a product by a consumer, over a specified period of time, could be predicted by measuring the consumer's attitude towards actually performing this purchase behaviour. Clearly, this evaluation is subtly different to measuring a person's attitude towards the goal object itself, that is, the product which is intended to be purchased (Ajzen and Fishbein 1981).

In short, it was argued that the best way to predict consumer behaviour was to analyse the consumer's intention to perform this behaviour. This intention would be affected by the decision maker's significant references, such as friends and groups around him. They would arguably influence decision behaviour simply because the decision maker would think that his significant references felt that a particular behaviour

should be performed. The decision maker would be influenced by his perception of social norms.

The attempt to combine cognitive and interpersonal influences into a single model of choice has, however, had "limited predictive success" in the context of choice behaviour (Ryan and Bonfield 1975). Thus, although the approach generated a massive literature (Lutz and Bettman 1977; Slovic et al 1977), it has been superceded by contemporary research which adopts an information processing approach to consumer behaviour.

The central focus of the information processing perspective is on viewing consumers as cognitively active problem solvers. Information processing approaches to consumer choice aim to identify what strategies and plans consumers use, and to understand how these lead to product purchase and choice between brands (Mitchell 1978).

The basic idea that individuals act as processors of information is not a new concept in psychology. Stimulated by Newell, Shaw and Simon's (1958) treatment of problem solving in an information processing context, topics such as motivation (Weiner 1972), attention (Kahneman 1973), memory (Norman 1969) and learning (Estes 1975) have, to some degree, been explored using this perspective. The tendency, however, was not to integrate these specific topics into a strategic model of choice; the research tended to be fragmented (Jacoby 1976).

Newell and Simon (1972) developed the information processing model of problem solving and characterised individuals as possessing input and

output mechanisms, processes for interpreting and indeed processing information, and memories for storing and retrieving information. Yet their work focused upon solving well structured problems, such as chess, in which salient information is typically unambiguous and precise. Thus, whereas the structure of this model is extremely useful as a framework for appraising decision making, its early applications could not be readily applied to consumer choice. The variety and complexity of the consumer choice environment overstretched these early processing frameworks.

McGuire (1976) however, specifically integrated cognitive concepts into an information processing framework and applied this perspective to consumer decision making. Consumer choice was thus described in terms of eight successive stages; exposure, perception, comprehension, agreement, retention, retrieval, decision making and action. The basis of this approach is that incoming consumer information enters the short-term memory where it is encoded and transferred to the long-term memory. This process involves cognitive effort and the allocation of processing capacity. A decision is made by retrieving consumer information from the memory and combining this stored data with incoming information. Behaviour is therefore the outcome of processing information. Choice is a function of processing.

Clearly, the information processing approach to consumer behaviour has broad terms of reference and these have created numerous research niches. The role of cognitive processes in choice and decision behaviour has been pronounced (Wallsten 1980; Lockhead 1980). Indeed, so much so, that the actual processes of choice (choice heuristics and

decision processes) may be regarded as representing one component in an information processing model of choice (Estes 1980). The role of memory (Lynch and Srull 1982; Bettman 1979b), experience (Bettman and Park 1980) and techniques for studying information acquisition, eg. verbal protocols, eye movement analysis and information display boards (Kassarjian 1982; Lehmann and Moore 1980), have also been explored in relation to consumer choice.

Moreover, a welter of research in sister disciplines has direct bearing on consumer behaviour. Simon (1979) considers information processing in the context of problem solving; Bower and Hilgard (1981) document the numerous developments in cognitive learning theories which have resulted from adopting information processing perspectives; Tybout, Calder and Sternthal (1981) apply information processing to the design of marketing strategies. The broad range of topics to which information processing theory can be applied is best demonstrated by reviews related to this subject (Posner and McLeod 1982; Kassarjian 1982; Scandura and Brainerd 1978; Masters 1981; Schank and Abelson 1977).

Comprehensive Theories of Consumer Choice Against the background outlined above, several major comprehensive theories of consumer choice have been developed: Nicosia (1966); Engel Blackwell and Kollat (1978); Hansen (1972); Howard and Sheth (1969) and Bettman (1979a). Each theory has attempted to account for consumer choice behaviour. It is clear, however, that these theories were formulated using the perspective of then-contemporary research. As research has evolved and emphasis changed, the applicability of the respective theories has

gradually diminished. Howard and Sheth's model, for example, was steeped in the stimulus-response approaches, whilst Hansen's model adopted the expectancy-value conceptualisation of choice.

Bettman (1979a), in reviewing the differences between the theories contends that, despite their respective shortcomings in relation to contemporary information processing theory, the comprehensive choice models have certain common characteristics:

- (i) a focus on choice as a process as opposed to representing the purchasing act;
- (ii) a view that choice behaviour is purposive, with the consumer actively seeking information both in the environment and from the memory;
- (iii) a belief that behaviour is caused and can therefore be explained;
- (iv) a belief that consumers limit the amount of information taken in, and that as the process of choice proceeds general information is winnowed down to specific criteria;
- (v) the notion that feedback, based upon outcomes of previous choices, impacts upon subsequent choices.

Undoubtedly, the view of consumer choice, at present, is concomitant with Bettman's information processing theory in which consumers act as cognitively active problem solvers. It is this framework which is adopted in this research.

2.4. Information Processing and Consumer Choice: A Macroview

The discussions above have concentrated on the evolutionary progression of decision research. Before providing a macroview of the information processing theory of consumer choice, it is important to reiterate the reasons behind adopting this perspective.

First, reduced to its most simplistic form, consumer choice involves a person deciding to purchase a product from a set of fundamentally similar, competing products. Despite this fundamental similarity, products are typically regarded as being different. This individuality is caused by the idiosyncratic nature of previous product experience, combined with the subjective definition and evaluation of product attributes. It is reasonable, therefore, to regard consumers as active processors of information and, moreover, it is commonsense to adopt an academic approach which is able to accommodate these processing perspectives.

Secondly, a conspicuous characteristic of the consumer choice environment is its task complexity. The diversity of products is matched only by the diversity of strategies which consumers may potentially use to respond to these products. Accordingly, choice rules developed using studies of probability, or ideal risk, are simply too constrained to be widely applicable in the majority of consumer decision making contexts. Changes in task situations are, however, reconcilable using an information processing perspective.

Thirdly, an information processing framework is one which has wide application and which can readily incorporate cognitive and

developmental concepts. In the study of children's consumer behaviour, the structure of the framework is robust enough to act as a valid and powerful analytical base.

Finally, one component of commercial success is effective marketing and one aspect of effective marketing is the provision of "correct" information to consumers. In aiming to achieve this goal, it is clearly important to understand how consumers interpret and process product information. Only when this knowledge is acquired, can correct information be provided to consumers using advertising, on-product information and in-store displays. Information processing theory of consumer choice has direct bearing on marketing strategies and is therefore important in a commercial context.

Bettman (1979a) has developed a comprehensive framework within which consumer choice can be analysed. In the following section, a macroview of this theory is given, but a much more detailed account can be found in Appendix 1 (A1).

This structure has been deliberately adopted. Although this present research will focus upon one component - the role of memory - in children's consumer choice, Bettman's information processing theory of consumer choice emphasises an integrated, multi-component approach. It would be inappropriate, therefore, to review Bettman's model by describing in isolation the memory component which is salient to this research. Thus, an overview of the theory is presented here; the theory itself is described in more detail in A1, and the memory

component is focused upon in subsequent chapters, as one component in a fully integrated processing system.

In describing the structure of the processing model, a number of basic components can be identified; processing capacity, motivation, attention and perceptual encoding, information acquisition and evaluation, memory, decision rules and processes and, finally, consumption and learning (Figure 2.1).

Within this framework, consumers are seen to make choices in order to accomplish goals and therefore motivation is an important entity in the choice process. Given a set of goals, a consumer pays attention to information which is available and relevant to attaining these goals. The consumer then interprets this information in the light of previous knowledge and within the context which the information was obtained. In other words, the consumer determines the meaning of the information which is attended to.

In this goal-directed behaviour, it is clear that processing capacity is allocated as a prerequisite to achieving goals. However, novel or surprising events in the environment may distract the consumer and disrupt processing. Attention is transferred from goal-oriented behaviour under these distracting circumstances and is allocated in order to deal with the interrupt.

However, in some choices the information which the consumer possesses may not be sufficient for the consumer to make a decision. Accordingly, a process of search for additional information will take place. This

search may be internal, in which case the long-term memory will be accessed, or external, in which friends, advertisements, packages or reports may be consulted. Again, this information is interpreted and attributed meaning.

As this process of taking in information proceeds, the consumer actively compares alternatives. Yet consumers have a limited capacity to deal with information and cannot physically process every piece of information which is potentially relevant to choice. Thus, during the processing of information and the comparing of alternatives, consumers do not typically indulge in laborious, complex calculations and analyses. What does happen is that consumers use choice heuristics, or simplifying rules, which help them deal with complex choice situations more effectively and without extensive processing. Heuristics streamline choice processing. Moreover, heuristics vary from individual to individual as a function of many factors, including an individual's experience with a specific choice situation, his processing capacity characteristics, and upon the nature and complexity of the choice itself.

Finally, after a choice has been made and the specific alternative has been selected and consumed (or alternatively rejected) the outcome of choice can provide vital information which affects future choice processes. The impact of such an outcome on subsequent choices will vary according to how well the product has actually performed, compared to how the decision maker expected it to perform. Thus, consumption provides feedback to the choice process.

Obviously, some choices are made frequently and, after a period of time, become second nature. Thus, after a build-up of experience choices may be made almost subconsciously and may involve negligible choice processing.

The fundamental feature of this information processing theory of consumer choice is that the processes which consumers use prior to actually making a choice are reiterative and flexible. Nevertheless, specific factors impact upon the functioning of the theory; time pressure, the presence of friends whilst shopping and the effect of social norms may affect the processes used and the outcome of choice. Similarly, individual differences such as level of prior experience with a class of product, the propensity to construct and indeed follow a goal hierarchy, and the varying characteristics of processing capacity also affect the operation of the theory.

One feature which is invariant, however, is that the theory focuses upon the processing strategies which consumers use during choice processing and not simply the outcome of those processes.

2.5. Consumer Behaviour in Perspective

In one of the most recent reviews of consumer psychology (Kassarjian 1982), the subject was subdivided into three segments; a physiological approach to consumer behaviour, a cognitive orientation, and an analysis based upon the social aspects of consumer behaviour.

In preceding discussion, one topic (choice behaviour) was focused upon using a cognitive approach. It is clear, therefore, that an

information processing approach to consumer choice behaviour is merely one, albeit important facet of consumer psychology. Moreover, to a social or experimental psychologist, or in terms of the economic or marketing disciplines, consumer psychology represents one of the many research sub-disciplines.

Thus, whilst accepting the contemporary emphasis on the cognitive functioning of individuals (Hilgard 1980), it would be erroneous not to emphasise that consumer research embraces many actively explored topics. For example, pricing (Zeithaml 1982), media communication effects (Roberts and Bachen 1981) especially television (Comstock et al 1978), as well as data collection and market research techniques (Worcester and Downham 1978) represent just a few topics relevant to consumer psychology. It is within this perspective that consumer decision making is focused upon.

Finally, Kassarian (1982) notes that "there has been a reaction to the overdependence on cognitive psychology from several directions". The argument that flow chart models "trap empiricism within narrow confines" is possibly justifiable. However, a sound criticism of information processing theory is that under low-involvement conditions consumers do not allocate processing capacity and a substantial portion of these purchases involves no decision making whatsoever. For example, the purchase of an inexpensive product arguably involves negligible risk and if the product is unknown, a consumer may indeed act as an "uninvolved muddler". Robertson (1976) develops this idea of low-involvement consumer behaviour, which is difficult to account for in terms of an ever-processing cognitive framework. This criticism of

the cognitive processing approach to consumer choice behaviour has been recognised, but has barely been incorporated into the mainstream of consumer literature.

In the light of these criticisms, it is perhaps prudent to regard information processing theory as the latest and most developed approach to consumer choice behaviour, but as the latest approach in an ongoing evolutionary sequence.

2.6. Summary

This chapter has justified adoption of an information processing approach when analysing consumer choice. The mechanistic and normative models of choice, which dominated behavioural decision research, were questioned by decision theorists for being inapplicable in situations other than those for which they were developed.

Consumer choices take place in environments which are inherently complex and clearly, it would be erroneous and difficult to analyse such decision making using inflexible models. The emphasis in contemporary consumer research has been to adopt an information processing framework, which is readily able to incorporate cognitive concepts. Within this dynamic theory, consumers are seen to be goal directed processors of information, carefully allocating limited processing capacity to salient choice-related information and learning from previous choice outcomes.

This processing theory is robust and flexible and forms a springboard from which children's consumer choice behaviour may be analysed.

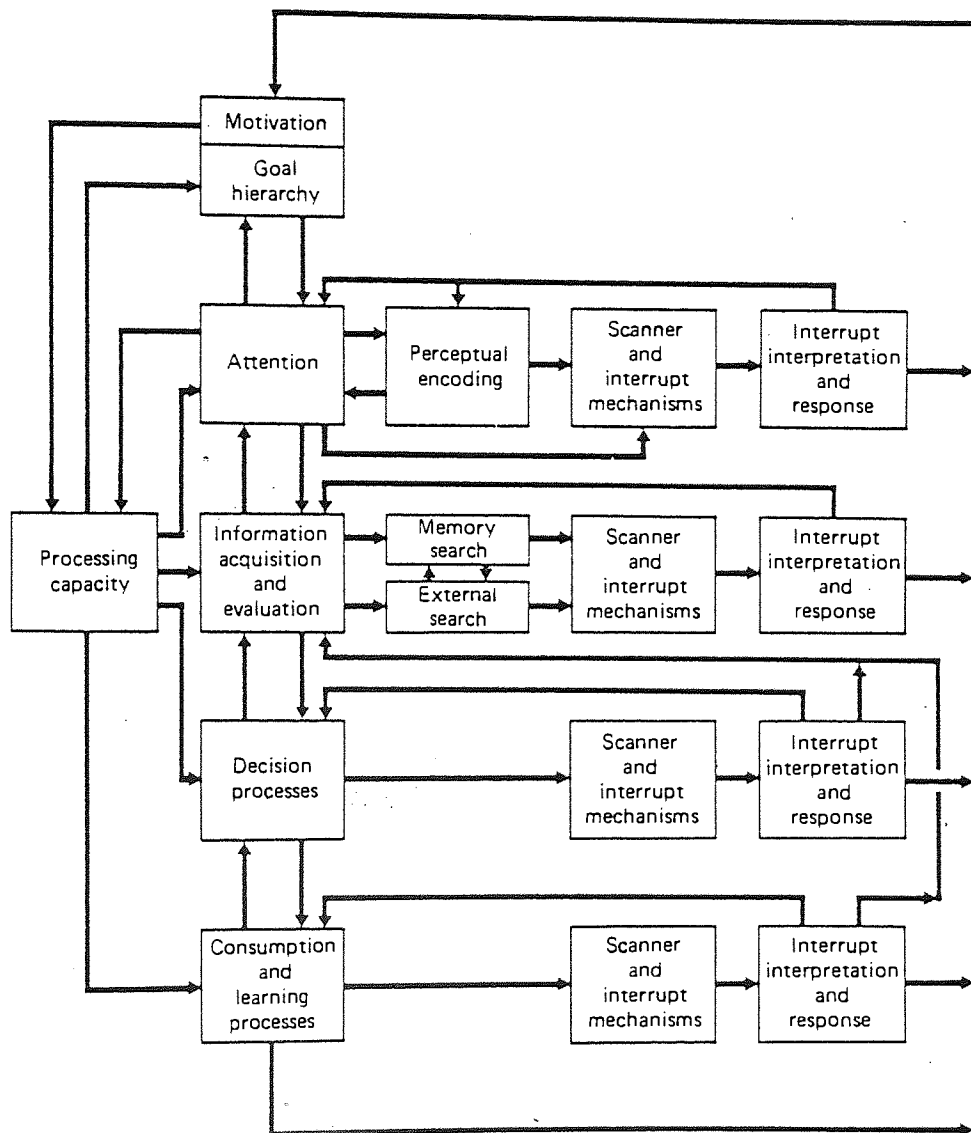


Figure 2.1. The Information Processing Theory of Consumer Choice. Source : Bettman 1979a.

Chapter 3

CHILDREN AND CONSUMER CHOICE

3.1. Introduction and Overview

The first two chapters have presented the rationale behind adopting the information processing theory of consumer choice and, as noted previously, the theory is presented in its entirety in Appendix 1. A substantial amount of cognitive research is incorporated into this choice theory; but the theory itself elaborates adult consumer choice behaviour, paying no specific attention to factors which are relevant to children.

This chapter redresses this imbalance by considering several areas of research which have either addressed, or are important in understanding children's consumer choice. No single discipline, or sub-discipline, entitled "children's consumer behaviour" exists and consequently the research base is fragmented. Nevertheless, because children are implicitly young adults, the issues which impact upon developmental psychology also have bearing on children's consumer behaviour. Recognising this fact, whilst accepting that "developmental psychology" is a gross term, a synopsis of Piaget's stage-related theory of cognitive development is outlined. Fowler's (1980) distinction between generalist, behaviouralist and mental testing approaches to the study of cognitive development, and his contention that concepts and rules establish common units for comparing and interrelating all types of cognitive functioning is also discussed.

The idea that cognitive systems develop is a perspective which is relatively easily related to the view that consumers are active processors of information. In this light, the degree to which children process information is clearly restricted by their level of cognitive skill development. This theme has been taken up by Ward, Wackman and Wartella (1978) who have analysed children's consumer behaviour as a combined function of cognitive development, socialising influences and in terms of information processing.

Consumer behaviour is not purely a cognitive domain. Accordingly, research within the sociology discipline, in particular the view that children's consumer behaviour may be regarded in terms of the process of socialisation, is discussed. One of the factors which has been analysed as both a socialising factor and from a cognitive perspective, is the role of television. Undoubtedly, this television-children interaction is a very active research topic and a considerable amount of work has concentrated upon this relationship. In accordance with the general trend in cognitive psychology, it is the information processing approach which has dominated this research field and these findings are reviewed.

The chapter concludes by drawing together the information and issues presented in these first three chapters and focusing them upon the role of memory in children's consumer behaviour.

3.2. Piaget's Theory of Cognitive Development

That Piaget's stage theory has made an enormous and unmatched contribution to the field of cognitive development "obviously needs no

arguing" (Flavell 1982). Nevertheless, although the theory is to some extent prescriptive, in that children become more cognitively complex, and despite the fact that Piaget's work has provided a backbone to some research into children's consumer behaviour (Wackman and Wartella 1977), it is structured in a manner which is difficult to apply to practical marketing situations. In this section, the underlying rubric of the theory is described. The question of the marketing applicability of the theory is left until Chapter 7, where the relevance of specific cognitive skill acquisition is considered.

Piaget considered cognitive development in children as representing a distinct progression through five developmental stages and that during each phase, a relatively homogeneous pattern of thinking exists.

During each phase a pseudo equilibration takes place until, in the final formal operations phase, a near perfect equilibration is achievable. Equilibration can be understood as the process which occurs when an individual tries to understand a new experience by using what he already knows. When present comprehension does not sufficiently explain this new experience, the individual will be predisposed to change any existing conception so that the new experience is fully understood within the personal conception of events. In this way, repeated experiences with these new forms of thinking lead to new ways of thinking.

Piaget defines several terms relevant to cognitive development. Adaption is the intellectual aspect of a change in behaviour which takes place when an individual interacts with a changing environment.

Assimilation is simply the mental process of experiencing an event in terms of past (and internal) experience. Accommodation, conversely, is the adjustment of the individual to incorporate the environment so that events are understood within present levels of thought.

Two other terms are important. Schema can be best described as the "tool" of thinking which places information into similar classes. Operations refers to the mental processes which connect schema.

Piaget's five phases of development are:-

- | | | |
|-------|---------------------|---------------|
| (i) | Sensorimotor | 0 - 2 years |
| (ii) | Preconceptual | 2 - 4 years |
| (iii) | Intuitive thought | 4 - 7 years |
| (iv) | Concrete Operations | 7 - 11 years |
| (v) | Formal Operations | 11 - 14 years |

The theory of cognitive development is detailed and integrated but can be summarised as follows (Maier 1978).

- (i) Development is continuous within the same sequential progression, though the rate of development and at what chronological point it occurs in a child's development vary.
- (ii) Development proceeds through a continuous process which includes structuring, bringing into hierarchical order, consolidation and equilibration. Equilibration involves the transformation of previous understanding into new comprehension.
- (iii) Each progression of development depends on the progression of previous learning. Each developmental phase and substage has roots in a previous phase and contains precursors for the following one. Thus,

cognitive development entails an evolutionary process of continuous development.

(iv) Each phasal development entails a period of formation and a period of attainment. New patterns of thinking, constituting a provisional equilibration, replace previous levels of cognition. These changes are cumulative and irreversible. Thus, cognitive development is discontinuous as well as continuous.

(v) The sequence of development (the progression of developmental phases and substages) creates a hierarchy of cognitive experience. Each novel pattern entails a more complex and effective form of thinking. Once such a new form of thinking is achieved, the capacity to do so leads to new, more advanced perspectives of cognition. Each aspect which comprises knowledge - object, permanency, cause and effect, space, time, moral judgement and so on (that is mental perspective and abstraction), has to proceed through its own developmental prone progression. In summary, each developmental period is defined by new questions whilst at the same time poses new questions.

(vi) Each individual is likely to achieve a different level of cognitive development. Although each individual has the biological brain capacity, every development is not necessarily realised by each person.

The overriding point concerning Piaget's theory of cognitive development is that as a child grows older, more knowledge is progressively acquired and this is used to appraise new situations. Early cognitive development is therefore very important in directing the course of future development.

Using Piaget's work as a foundation, Ward, Wackman and Wartella (1978) found that developmental theory was highly relevant in appraising children's consumer behaviour; it accounted for younger children's tendencies to respond more to the immediate perceptual aspects of stimuli, their less flexible and more constrained selection of consumer information relevant to choice, and their increasing use of attribute information with age.

Ward et al's monograph addresses a range of issues salient to children's acquisition of consumer skills. Their research analysed children's money usage and saving skills and recognised that the role of parents in children's consumer skill acquisition was important.

Parents provide a model for various consumer behaviours. They directly interact with children in both parent and child-initiated consumption situations and provide children with independent opportunities for consumption and for exposure in choice environments. Moreover, the child-mother relationship was explored and here a mother's own consumer behaviour, her education goals and attitudes, and her propensity to interact with the child and to allow children independence in consumer choice situations, was seen to vary across social class, the age of the child, and as a function of the type of products under scrutiny.

In short, children were regarded as being processors of information, as cognitively developing and as being affected by a number of independent variables, parents and television representing two such factors. Generally, cognitive development theory "provided a basis for predicting specific age-related approaches to consumption and the data

conformed quite closely to developmental predictions" (Ward et al 1978).

Despite these findings, which demonstrate the increasing complexity of children's consumer processing skills with age, several general shortcomings in the application of Piaget's theory to children's consumer information processing are apparent (Calder, Robertson and Rossiter 1975). The two most salient criticisms point out that cognitive development theory does not account for the dynamics of information processing in terms of explaining how or why a child uses task-specific choice heuristics; secondly, because the process of equilibration involves defining essentially biologically determined cognitive structures, as opposed to cognitive structures which are derived from real events, experience cannot be seen to control the course of biological development.

Bias in Cognitive Developmental Research In the light of the preceding discussion, combined with the nature of other approaches to cognitive development, an integrated theory of cognitive development is difficult to set up. Fowler (1980) identifies three sources of bias which cause this difficulty.

The generalist bias, typified by Piaget's work, stresses that an overriding set of characteristics common to all human functioning exists, regardless of time, place, situation, and culture. Sullivan (1969) and Flavell (1982) argue that this homogeneous approach to cognitive development does not treat experience as a mechanism which can alter the course of development, or vary cognitive competence at

each developmental level. Neo-Piagetian theorists, (Case 1978; Pascual-Leone 1976) introduce cognitive style and processing capacity (M-space) as factors which do affect the direction of cognitive development. It is these ideas which are more practically oriented, for children are likely to be extremely familiar with specific product classes and task situations. The generalist bias however, typically under-emphasises the role of experience.

The behaviouralist approach to cognitive development focuses upon environmental conditions and individuals' responses to them as factors which principally control cognitive development. The weakness of choice theories based on such assumptions has already been outlined, but the underlying criticism of behavioural theories is their inability to accept that cognitive processes and structures are able to transform, rather than simply respond to environmental events.

The third bias is the mental testing one, in which all mental acts and behaviours have "equivalent value". This prevents any conceptualising about the mechanisms which lead to the observably different types and levels of cognitive competence. Taken to its extreme, the mental testing approach evaluates each aspect of cognitive competence in terms of unit values. Overall cognitive competence is measured by simply summing the values derived for each scale. Thus, the number of passes achieved by each subject may be used to define the developmental level of that subject. Moreover, successively aged subjects score differently in terms of the number of passes achieved and their developmental level is assessed accordingly (Meyers and Dingham 1960).

The requirements of universality, uniformity and invariance in developmental order are difficult to reconcile with individual and cultural differences in cognitive development. Consequently, an integrated general developmental theory of cognition is difficult to attain. One approach is to define units of analysis which can then be applied in the study of cognition (Fowler 1980).

Contemporary research into cognitive development centres around the concept of metacognition (Masters 1981). Metacognition is used to highlight the individual's own consideration of his or her cognitive processes and strategies. Flavell (1978) and Kavanaugh and Perlmutter (1982) show that as children grow older they engage in more metacognitive efforts and activities and show a growing awareness of strategies to improve cognitive and memory performance. Gelman (1978) suggests that the appropriate stance for researchers to take is one which determines what children can do, relative to older children, as opposed to what they cannot do.

The fundamental point which can be drawn from the preceding discussion is that cognitive development is a very important factor which influences the way in which children process consumer information. Moreover, it is clear that the bias inherent in the generalist, behaviouralist, and mental testing approaches to cognitive development, make it difficult to consider children's consumer behaviour using any one of these approaches in isolation. Thus, a problem exists: how to relate cognitive development into an information processing perspective. One solution to this problem is couched in the idea of "cognitive units of analysis" (Fowler 1980).

3.3. Units of Cognitive Analysis

One approach which aims to assess cognitive development from an integrated and unbiased stance involves the use of common units of cognitive analysis or, more specifically, "concepts" and "rules" (Fowler 1980). A concept is defined as any representation of phenomena, or as a basic cognitive unit which pulls things together into a mental construction of phenomena. A concept is the fabric of mental life (Flavell 1970). A rule is defined as the operative aspect of a concept; a rule specifies the action required to demonstrate the characteristics of a concept (Fowler 1980).

Concepts are not uniform and vary in both type and level. The development and organisation of concepts follows a "logic" which is based upon the interaction between biological control of mental processes and upon the characteristics of environments. The type and level of concepts which exist at any particular time is therefore representative of an individual's cognitive structure. Thus, concepts effectively define cognitive structure. Three types of concepts, knowledge concepts, coding concepts and problem solving concepts have been distinguished.

Knowledge concepts have been broken down into two categories, formal and information concepts. Formal concepts represent mental constructions which concern the general nature and physics of things, whereas information concepts specify the "content, features and functions of plants, animals, cultural artefacts and institutions, and of other domains of the real and ideal worlds". Information concepts are specific to different environments and an individual builds up a

repertoire of information concepts depending upon his experience within environments. Thus, formal concepts such as identity, seriation, time, conservation, number and transitivity, transcend the content or information concepts of specific environments.

Coding, or representative concepts, are the means whereby humans summarise ideas and concepts about phenomena and establish common currencies for communication (Fowler 1980). Codes make possible the representation, storage, retrieval, and exchange of knowledge. In this context, Bruner et al (1966) emphasise three modes of representational coding in a developmental sequence, a model which has now fallen somewhat from repute (Pressley 1982). The enactive system is essentially one in which learning takes place through action; it is inherently a wordless method of learning. The iconic code is based upon representation using perceptual means; the idea of mental maps provides an example of iconic coding. Moreover, the importance of this system of information representation is readily demonstrated by observing the developmental lag in blind children (Fraiberg and Fraiberg 1977). The third coding system is the symbolic mode. Using this code, knowledge concepts can be manipulated and experience can be translated into words. It is these symbolic codes which coincide with and permit abstract thought.

Fowler distinguishes problem solving concepts, or cognitive styles, as the means by which humans are able to adapt. Problem solving strategies are used by individuals to explore, evaluate, hypothesise, and construct methods to solve problems. On an individual level, an impulsive or reflective style of cognitive processing is important in

determining the processing strategies used during problem solving (Lawry, Welsh and Jeffrey 1983) . Bruner (1966) developed the "analysis and synthesis" style and Kagan (1965) has focused on the "tempo" of information processing. In general, the development of cognitive style may be regarded as a movement from perceptual to conceptual levels of processing. Fowler, dealing with this subject states:

"development proceeds from the degree of concrete focal attention in perception, through the degree of field articulation (in which organisation of a perceptual field comes into play), followed by levelling versus sharpening (in which perceptual differentiation is mediated by memory of past perceptions) and, finally, by differences in equivalence range (or the extent of exemplars included in abstract classificatory tasks)" (1980, Pg. 185).

To summarise the nature of concepts therefore, knowledge concepts map out the environment, coding concepts condense and transform this knowledge into manageable forms, and cognitive styles bring together information and actions which allow individuals to adapt to environmental problems.

Using these common units of analysis, the mechanism for learning and development can be defined as the cognitive learning of rules; problem solving involves manipulating known rules and acquiring novel rules to facilitate solutions. Accordingly, cognitive learning is a process of acquiring rules and concepts in response to problem solving, followed by integration of these new rules into novel, higher level concepts. Over time and experience, complex concept systems develop and the rules, which inherently specify each concept system, can be further used in the appraisal of new environmental situations. Thus, the cognitive system becomes more complex and differentiated.

The fundamentally important point of discussing cognitive development in terms of rules and concepts is to relate the information processing perspective in terms of cognitive development. Numerous similarities are common to the two perspectives; the use of choice heuristics corresponds broadly to cognitive style; memory structure corresponds to the relationship between knowledge concepts; the perception component of the information processing approach is representative of Fowler's coding concepts. Moreover, Bettman's processing framework may be enriched by combining the two perspectives. Instead of regarding information processing in terms of a number of cognitive components - the relationship between which changes during processing, the processing components themselves can be seen to develop. Thus, processing capacity varies structurally with age, as well as temporally with changes in processing complexity. The nature of perception changes with age as each coding system is differentially used. Furthermore, the idea of perceptual encoding may be applicable to information attended to using any, or all of the coding systems. Moreover, selective attention, the use of choice heuristics, the quality of active synthesis, the propensity to use memory, and indeed the knowledge that memory may be advantageously used, are all skills which develop. In short, the marriage of these two approaches is complimentary; the information processing framework is made additionally flexible and, to some extent, the combination counters criticism levelled at information processing approaches that they "trap empiricism within narrow confines", as mentioned earlier. Clearly, the idea of a developing information processor is a flexible and profitable approach to adopt in relation to children's consumer behaviour.

Finally, the strict definition that information processing automatically involves mediation, is difficult to wholeheartedly adhere to in relation to young children. A more appropriate perspective to take involves viewing children as processors of information, but qualified by their developmental - in the broadest sense of the word - and hence constraining cognitive skills.

3.4. Consumer Socialisation

Another approach to children's consumer behaviour revolves around the study of "consumer socialisation", or the processes by which young people acquire consumer-related cognitions and behaviours (Churchill and Moschis 1979). A number of factors which are important in determining consumer socialisation have been defined as socialising agents. These include children's interaction with parents, peers, school, and television (Moschis and Moore 1979).

Sociological research has shown that young people learn the symbolic meaning of goods from peers and that social motives for consumption are derived from peer interaction (Saunders, Salmi and Tozier 1973). The importance of interaction with peers and parents has also been defined as a vital component in theories of behavioural development, especially in Sears' view that personality is "a product of a lifetime of dyadic action which has modified the individual's potentiality for further action" (Maier 1978). A child interacts with socialising agents, and may build up cognitions through the processes of modelling which involves imitating behaviour, reinforcement which involves reward or punishment, and through social interaction which involves a combination of both modelling and reinforcement. Other antecedent factors,

including age, sex, birth order and social class, are also seen as factors which influence the process of socialisation (Moschis and Churchill 1978).

The outcome of a child's interaction with these various socialising agents is the learning of consumer skills, such as spending, saving and product decision making (Arndt 1975; Runyon 1977). Several studies have tried to quantify the relationships between each factor and the process of socialisation (Kohlberg 1969; Moore and Stephens 1975), but the relationships are not often empirically validated (Churchill and Moschis 1979). Moreover, it is clear that an implicit difficulty exists in actually evaluating the specific effects of diverse arrays of socialising factors.

Consumer socialisation is a useful theory for defining those factors which control the build up of consumer skills. However, because these relationships are difficult to validate, they are therefore difficult to apply to complex choice situations. The model lacks dynamicism and tends not to view behaviour as being goal directed; it pays little attention to those cognitive processes involved in consumer choice behaviour and ignores the importance of memory structure and functioning upon the use of choice strategies. In short, the model is static and overgeneralised.

Nevertheless, the moral and ethical implications of advertising to children have stimulated a large body of research into the role of television and its effects upon children. The efficacy of this

research has been enhanced by the contemporary focus upon individuals as cognitive information processors. Accordingly, one socialising agent, television, has been the centre of numerous research studies. Conveniently, this research bridges the gap between cognitive information processing perspectives and socialisation research. Television is a socialisation agent and its cognitive effects on children are being evaluated using an information processing posture (Greer et al 1982).

3.5. Children's Information Processing of Television

Television represents one of the socialising agents which affects the development of consumer skills in children (Moschis and Churchill 1978). Some research has concentrated on the effects upon children of television within the framework of social learning theory (Liebert and Schwartzberg 1977). Most recent research has, however, tended to take a developmental perspective of the influence of television on children, and recognises that age-related developmental changes do affect the way which children attend to and understand information in television broadcasts (Roberts and Bachen 1981). Such an information processing approach has important implications for children's consumer behaviour, as television represents an undoubted source of information about products (Ehrenberg and Barwise 1983).

Purposive viewing of television begins in children as young as two and a half years old (Anderson and Levin 1976), and factors which cause pre-school children to pay attention to, and conversely stop attending to television have been studied (Anderson et al 1979). Transition points or "bit changes", which represent connecting material between

segments of programmes, strongly correspond with changes in attention, whether this involves elicitation or termination (Wartella and Ettema 1974; Anderson et al 1979). Similarly, the visual and auditory presence of women, children's voices and sounds such as laughter and applause, attract attention. Sound is an integral component in gaining attention in pre-school children, irrespective of visual attributes. Male voices, animals, slow music and still photographs tended to be negatively related to attention.

One conclusion drawn from this data is that young children's attention is highly responsive to perceptual variations in content, but much less responsive to conceptual variations. The implication is that for older children conceptual changes become more important (Ward, Wackman, Wartella 1978).

Anderson et al (1979) describe the tendency shown by television viewers to continue looking at the television, irrespective of content, and as a function of the amount of time which attention had previously been maintained. This "attention inertia" is thought to be a result of processing information at progressively higher conceptual units of thought, thus reducing the number of opportunities for allocation of capacity (attention) to stop. Attention inertia may also be a function of cognitive development, in that the ability to deal with larger conceptual units increases with age (Anderson et al 1981; Mendelson 1983).

Research into the influence of television on social behaviour has led to the conjecture that age affects the way in which identical

information is processed. Collins (1979) conceptualises "mature" comprehension as a three phase process comprising selection of essential information from a programme, ordering the essential scenes according to some organisational scheme and then making inferences which relate discrete units of information into a meaningful whole. Younger children selected different information from older children, failed to use the dramatic framework to understand the narrative scenes, and also made fewer inferences about the relationships between programme elements (Collins et al 1978).

Newcomb and Collins (1979) found that children understood programmes as a function of the degree to which the context portrayed was similar or different from their own backgrounds. This influence was greater amongst younger children. Collins (1979) interpreted these findings in terms of "scripts" (Schank and Abelson 1977) and argues that younger children's comprehension is dominated by personal scripts, whereas older children are more able to apply a wider variety of scripts which depart from their own social circumstances.

Many studies have shown that young children respond to advertisements by asking their parents for products (Atkin 1978, Burr and Burr 1977). These requests decrease as the child grows older, but a relationship between the amount of television watched and an increase in requests has been found (Galst and White 1976; Comstock et al 1978). Adler (1977) states that commercials are moderately successful in fostering positive attitudes towards products, and Robertson and Rossiter (1974) suggest that pre-school children were more disappointed than older children when their requests for toys at Christmas were refused.

Goldberg and Gorn (1978) studied some of the consequences of television advertising to children and concluded that commercials may cause children to select material objects as opposed to socially oriented ones.

Children's understanding of commercials has also been studied (Robertson and Rossiter 1974; Roberts et al 1978) and evidence suggests that children younger than seven cannot recognise that commercials aim to persuade children to buy products, nor that they differ from other types of information message (Ward and Wackman 1973). Moreover, evidence suggests that a change from perceptual to conceptual analysis takes place as children grow older (Wartella and Ettema 1974). As a result, it is implied that children's understanding of commercials increases with age, as does their ability to recall the content of commercials and to integrate message elements meaningfully (Ward et al 1978).

As children grow older they mistrust commercials (Adler 1977; Comstock et al 1978), yet at the same time studies indicate older children are more frequently influenced by commercials than younger children (Adler 1977). This could be a function of peer pressure, past experience with products or due to a more sophisticated understanding of commercials (Roberts and Bachen 1981; Calvert et al 1982). More precisely, children's processing of television content may depend first on their attention to the formal features of the medium (ie. physical features of characters, sound effects, dialogue and specific visual effects) and second, on the extent to which these features aid their selection of

content for comprehension, or provide modes of representation which they can encode (Wright and Huston 1981).

3.6. Central Theme Development: Memory, Information Processing and Children's Consumer Choice Behaviour

A position has now been reached where it is feasible to integrate the information and concepts outlined so far in a concrete and succinct manner. Thus, the gross commercial and academic perspectives involved in this thesis can be placed into context. The central area of study which has emerged from, or has been implicit in the previous discussion, is the organisation and functioning of memory in relation to consumer behaviour in children.

In terms of information processing theory, memory has a central role to play in the process of consumer choice. Memory affects information acquisition in terms of the depth and scope of information required. This, in turn, may affect motivation and the construction of the goal hierarchy and may lead to reallocation of processing capacity and possibly alteration of decision and learning processes. Any interrupt involves automatic reference to the information stored in the memory and induces recycling around the processing framework. Memory represents the vital mediational factor in information processing systems.

The active synthesis of information also involves modification or restructuring of information stored in the long-term memory (LTM) and here experience plays an important role in determining the organisation of information. With experience, higher order memory units are

developed and this process of "chunking" knowledge concepts automatically imparts an increase in cognitive complexity.

The connection and interrelationship between memory and cognitive development is strong; indeed, so much so that the information processing account of consumer choice rests within theories of cognitive development. Although developmental theories vary in their approaches to child development, one common denominator can be seen to connect each one. This is the fact that experience, or the storage of information in the memory, plays an integral part in the development of children's cognitive skills.

As cognitive complexity increases, so does a child's ability to adapt to the environment. Development is, however, a process which is affected by many factors and if the environment is redefined as the consumer choice environment, then many specific factors socialise children; television, parents, and advertisements are all known socialising agents; so are shops, packages, and specific products themselves. Thus, experience, memory, and the marketing environment are all interrelated factors which impact upon the development of consumer choice in children.

Turning to the commercial perspectives inherent in this research, it can be seen that the buying behaviour of children is vitally important in the marketing context, not only in terms of specific contemporary child markets, but also in terms of the development of adult consumer choice behaviour. The marketing strategies and philosophies which companies formulate, aim to most effectively and efficaciously allocate

their scarce resources in order to boost sales and profits. Clearly, an understanding of the child, not simply as a consumer but as a developing processor of marketing information, is an important prerequisite to formulating marketing policies. In short, an understanding of children's consumer behaviour, allows knowledgeable marketing decisions to be taken and reduces business risk.

In terms of development of consumer behaviour in children, two features are important here. First, the nature of market segmentation with respect to children may be based upon different criteria and is potentially more complex than segmentation of adult markets. Children cannot be regarded as simple adults; inherently, children's markets are sophisticated. Secondly, strategies which children use must plausibly pre-empt those which adults use. Theoretically, it should be possible to foster favourable dispositions towards particular products in children, and have these carried forward into adulthood. Brand loyalty, therefore, may be a function of consumer behaviour development in children.

Finally, a prior knowledge of children's consumer behaviour is a demonstrably important prerequisite to commercial success. The acquisition of business experience in children's markets can be an extremely costly process. It is inherently better to pre-empt business problems than to undertake lag decision making.

3.7. Summary

Having completed a gross review of the academic research which addresses children's consumer behaviour, and having outlined the

initial commercial reasons for selecting this particular research topic, it is now possible to focus more particularly on memory and its role and functioning in consumer behaviour.

Chapter 4

RESEARCH ORIENTATION AND EXPERIMENTAL DESIGN

4.1. Introduction and Overview

Perhaps the most fundamental characteristic of decision making is its idiosyncratic nature. This fact has confounded progress towards the goal of establishing hard and fast rules which govern consumer choice behaviour, for a superficially identical decision is invariably preceded by a drastically different pattern of information processing.

The multi-component information processing theory of consumer choice presents a theoretical rubric which accommodates these unique information processing patterns. But undoubtedly the principal limitation in the quantification of consumer choice processing is the nominal, almost impotent manner in which the covert components of the processing model are analysed. Whereas the nature of environmentally occurring consumer information is overt and hence to some extent both observable and controllable, the same argument cannot be said to apply to a consumer's processing strategies, his memory structure, or their interaction. These are unobservable entities and are difficult to manipulate with any rigour.

It is unfortunate that despite the existence of numerous theoretical appraisals of the role of memory in consumer decision making, relatively few methodologies have been used to test such hypotheses. Consumer researchers note this one-sided development: Bettman (1979a) notes "a lack of basic information on what consumers have in memory and how it is organised"; Johnson and Russo (1978) note "an absence of

studies which have investigated the relation between the encoding of product information and its organisation in memory". More recently, Lynch and Srull (1982) state that "very few researchers have demonstrated a high level of sophistication in adapting the methodologies of cognitive psychology to their theoretical propositions".

This research addresses and evaluates the role of memory in the context of children's consumer behaviour. Four problems confront this appraisal. First, because memory structure and memory processes are unconscious entities, their study involves translating unobservable cognitive transactions into an observable data source. Second, a potentially infinite number of cognitive transactions are possible and, as this research cannot plausibly appraise the entire integrated system, two significant constituent entities are focused upon. This research justifies the existence of two particular memory structures, stimulates and inherently identifies such structures, and subsequently assesses the ease with which items of information are retrieved from such structures. Third, the only feasible method of appraising memory functioning is through the analysis of content using the vehicle of language recall. Inevitably, one can question the capability of this vehicle to accurately convey the nature of cognitive processing. Finally, because children represent the experimental subjects, age related developmental characteristics which have bearing in the appraisal of memory, must be considered and accounted for.

This chapter outlines how these four problems are reconciled in the development of a research design which aims to assess how easily a

given choice rule is executed using a compatible memory structure. Two methodologies may be used to study cognitive structure. In the category and subjective clustering paradigms, memory structure is examined as a function of the characteristics of recalled data. These paradigms have implicit shortcomings, not the least being their inability to distinguish the effects of memory structure from those of retrieval processes.

Accordingly, the sort-recall paradigm is adopted in this research. Moreover, it is assumed that consumer information is stored in the memory in hierarchically oriented structures. By identifying the semantic content of the structures, a much more flexible, prophetic experimental approach is facilitated. The characteristics of recalled information can now be used to reflect processing ease. The rationale underlying this statement is straightforward. Logically, if the relevant memory structure is predetermined, and two items of information which are stored adjacently are not recalled adjacently, then this discrepancy must reflect a characteristic of retrieval processing. In this way, it is possible to assess how the organisation of consumer information in the LTM influences the retrieval processes used in its recall.

This chapter is broadly subdivided into three parts. The first section draws upon consumer and cognitive research to describe the role of memory in a consumer information processing context. The way in which consumer information is utilised, the factors which influence memory usage and the organisation of the LTM are expounded. The second

section describes the formulation of the research design. Finally, the methodology inherent in the research design itself is outlined.

4.2. Research Orientation

The Morphology of Mediational Processing In order to focus upon the role and functioning of memory, the components of input, sensory perception, memory and output, can be used to describe the basic features of an information processing model (Figure 4.1.). An individual acquires information from the environment using representational concepts, processes or mediates this data, and in some way responds to it. This response may be manifested as behaviour, or may be implicit in verbal recall.

Information is clearly a gross term which embraces auditory, visual, tactile, or verbal events. In the consumer research context two types of verbal information occur. Brand information is the manufacturer's allotted name for a product; attribute information represents a specific feature of a product. Clearly, each individual consumer is likely to characterise any product in terms of its brand name and a series of subjectively defined attribute features.

An implicit feature of the black box model of Figure 4.1. is a distinction between memory processes and memory stores. This memory morphology has been described using different perspectives. The levels of processing approach (Craik and Lockhart 1972) considers that the permanence of memory traces is governed by the depth at which information is encoded. Information may therefore be encoded at a variety of different levels, ranging from a shallow sensory, to a deep

semantic analysis. Alternatively, the multiple store theory (Atkinson and Shiffrin 1968) proposes the existence of distinct multiple stores of information.

These theoretically dissimilar orientations can be reconciled in terms of function (Figure 4.2.). Thus, memory processes represent the active portion of memory; this short-term memory (STM) is an impermanent "store" and, during consumer information processing (CIP), the STM acquires, retrieves, places and modifies consumer data. Conversely, memory structure represents the permanent information store, the LTM, comprising deeply processed information. Information is placed into, retrieved from, and structurally organised in the LTM.

Memory-Based Versus Stimulus-Based Judgements Focusing on the characteristics of decision making, Lynch and Srull (1982) have distinguished between memory-based, stimulus-based, and mixed decisions. The criteria used in this distinction represents the source from which information is obtained prior to decision-making. Thus, in a memory-based decision, all the information required prior to making a decision is extracted purely from the LTM. Conversely, in a stimulus-based decision, all the information required to make a decision is obtained from the environment at the time the particular judgement is made. Logically, a mixed decision uses information derived from both the internal and external memories. An example of a memory-based decision would be the writing of a shopping list whilst at work, whereas purchasing goods using a mail-order catalogue represents a stimulus-based decision.

Using these distinctions as a framework, it seems reasonable to classify memory processes in these terms. Accordingly, those processes which acquire and place information into the LTM may be distinguished from those which acquire information from the consumer choice environment. Atkinson and Shiffrin (1971) describe those processes which transact information internally as "memory control processes"; rehearsal and retrieval are two such processes. Bettman (1979a) broadly identifies those strategies which acquire environmental consumer information as "forms of processing". Moreover, a further distinction between choice by processing brands (CPB) and choice by processing attributes (CPA) has been made.

In CPB, a consumer specifically selects a brand and subsequently assesses the relevant attributes of that brand. A second brand is then selected and the process is repeated. A choice is made on the basis of these overall evaluations. In CPA, the process is inverted. A consumer selects a particular attribute this time, and compares all brands of the evoked set using this attribute. A second attribute is selected, comparisons are again made and this process continues until a choice is reached. These processing forms are elaborated in Appendix 1 (A1.8.).

It is pertinent here to relate memory control processes, forms of processing, choice heuristics and problem solving strategies, for all these terms describe CIP and all involve STM functioning (Figure 4.2). The tendency in consumer research has been to describe the process of choice as a function of choice heuristics. Bettman (1979a) characterises choice heuristics as comprising three components;

processing form (CPA or CPB); the process of assigning some value to an alternative; and the process of choosing one alternative from a set of alternatives. Fowler's description of problem solving strategies is analogous to this definition of choice heuristics, and of course all the work on conjunctive, lexicographic and disjunctive heuristics is germane in this context. These descriptions, however, cut across the distinction between forms of processing and memory control processes; the internal-external distinguishing criteria is ignored.

It is apparent therefore, that in trying to examine the ease with which consumer information is retrieved by retrieval processes from the LTM, this cognitive interaction represents merely one stage in the highly integrated and iterative processing system. Moreover, it is within this broader conceptualisation that the majority of consumer research has taken place. Accordingly, before the particular aspect of memory which concerns this research may be addressed, an integrated view of CIP must be first presented.

Integrated Consumer Information Processing A central theme of contemporary consumer decision research (Lynch and Srull 1982, Pg. 23) argues that:

- (i) the format of external information and task goals at the time of exposure to that information can affect certain voluntary aspects of processing, which in turn affect the nature of encoding (Figure 4.2. interactions 1 → 2);
- (ii) the encoded representation of the external information determines the form of the representation in the long-term memory (Figure 4.2. 2 → 3);

(iii) the memory representation can then engender certain processing strategies in subsequent choice tasks making use of the information stored in the memory (Figure 4.2. 4 → 5 → 6).

The research upon which these maxims are based is extensive. The selective acquisition of environmental information has been described in terms of perceptual readiness (Kahneman 1973) and its amalgamation with already stored data represents the well-defined process of active synthesis (Lindsay and Norman 1972). The number of alternatives in the task domain, more commonly referred to as information load, impacts upon the forms of processing used by individuals (Payne 1976; Scammon 1977). Indeed, the non-equivalence of brand and attribute information in terms of creating information load has been examined (Lussier and Olshavsky 1979). The format of external information is also an influencing factor in determining the form of processing which individuals use (Bettman and Kakkar 1977; Bettman and Zins 1979; Biehal and Chakravarti 1982a; 1983). Additionally, the actual level of prior experience with products has observable effects on processing forms (Bettman and Park 1980; Johnson and Russo 1978; Punj and Staelin 1983), and upon choice heuristics (Park and Lessig 1981).

The concept of encoding specificity (Thomson and Tulving 1970) emphasises the iterative and sequential nature of CIP. The concept states that if a cue is to be effective in eliciting an items retrieval, the cue must be encoded with that item at time of study. Anderson and Bower (1973) interpreted retrieval in terms of different semantic features being aroused by different contexts at study relative to testing. Moreover, Slovic's (1972) principle of concreteness is

also important here;

"Concreteness represents the general notion that a judge or decision maker tends only to use the information that is explicitly displayed in the stimulus object and will only use it in the form in which it is displayed. Information that has to be stored in memory, inferred from the explicit display, or transformed, tends to be discounted or ignored (1972, Pg.12)".

Applying some of these findings, it can be argued that if an attribute or brand oriented environmental information display occurs, then an individual is likely to process that information using CPA and CPB respectively. Yet, the nature of environmental information format is not a governing factor in the acquisition of information and its subsequent processing. As mentioned in the previous chapters, the information processing framework is merely an analytical framework; processing is idiosyncratic within that framework. Therefore, consumers can be seen to be goal-directed (Bettman 1979a) and may decide to use CPA and CPB episodically, in isolation, or interchangeably. Variations in processing style cause differences in the selectivity and intensity of the attentional processes individuals use (Kahneman 1973). Indeed, in the developmental context the availability of cognitive skills will govern the ability of individuals to undertake selective attention (Miller and Weiss 1983). Moreover, processing takes place within the umbrella of processing capacity limitations (Case 1978), as a function of prior experience with the task situation (therefore influencing use of choice heuristics) and even as a function of the phase reached in the decision process itself (Bettman and Park 1980).

In short, the nature of external and internal factors impacts upon form of processing, and form of processing acts upon and is impacted upon by environmental information characteristics (ie. 1 → 2 and 5 → 6 in Figure 4.2.).

The Role of Memory If the acquisition of information from the environment is regarded as an overt aspect of CIP, then the movement of information into and out of the memory represents a covert component of CIP. Yet whereas the overt aspects of CIP have been explored, the covert aspects of memory have not received as much attention by consumer researchers. The reason for this bias is self-evident; covert and generally unconscious memory features (Lachman, Lachman and Butterfield 1979) are inordinately more difficult to isolate and to study.

Undoubtedly, much of the work cited above has bearing upon the transfer of information into and out of the LTM. Indeed, the designations "STM" and "LTM" are used as heuristic devices to characterise memory functions and should not be interpreted as separate anatomical stores. Thus, it could be argued that the relationship between environmental data, processing forms, memory control processes and the LTM should be redefined in simpler terms. That is, the nature of LTM is not mediated by the STM per se, and the characteristics of external information displays are directly represented in the LTM (Wicklegren 1981).

This argument aside, an important feature of memory is that information which is available is not always accessible (Tulving and Pearlstone 1966). This statement is founded on the fact that once information is

encoded it is always available. Clearly, the reason why information is not always accessible relates to factors which affect attention and encoding, and consumer research which addresses this issue need not be reiterated.

However, the functional capacity of the STM (Pascual-Leone and Smith 1969) effectively restricts the amount of information which can be retrieved at any one moment in time. Similarly, Lynch and Srull (1982) suggest that the two most important factors which influence information accessibility, are the amount of competing information learned in the same content domain and the self-generated retrieval cues present at that time. Importantly, it is widely recognised that information accessible in one context may simply not be accessible in a second and, moreover, that information accessible at one time will not necessarily be accessible at another time. This is essentially the reason why invariable rules of choice behaviour are difficult to generate.

An extensive research base addresses the developmental changes in the use and role of memory. A fundamental distinction is made between production and mediational deficiencies. Children with production deficiencies have the ability to use storage and retrieval strategies as a means for remembering information, but this ability is only used when they are specifically prompted to do so. Children with mediational deficiencies can follow instructions to use storage and retrieval strategies, but cannot utilise the strategies to enhance remembering (Flavell 1970). In this light, instructions to use a learning strategy correct the problems exhibited by children with

production deficiencies, but do not overcome the problems faced by children with mediational deficiencies.

This changing use of memory as a function of age has been examined in terms of the central-incident learning paradigm developed by Maccoby and Hagen (1965). Young children are unable to process central information selectively and they often process peripheral information which is irrelevant to task performance (Roedder 1981). This effect has already been outlined in the context of changes from perceptual to conceptual processing with age. Moreover, the effects of prompting children, so that they process central but not incidental information, has also been shown to vary with age (Hagen 1967; Zukier and Hagen 1978).

More specific research has considered the effect of verbal labelling on recall. Having 5-10 year old children label the information presented to them increased their recall ability, whereas no effect was observed for 10-14 year olds (Wheeler and Dusek 1973; Hagen, Meacham and Mesibov 1970). Labelling not only effects the amount of information stored, but also affects the kind of storage. Hagen and Kingsley (1968) found that labelling facilitated learning of items presented last in a serial order but not items presented first. This research implies that labelling affects short-term storage as opposed to involving rehearsal.

Turning to rehearsal, several findings are important; rehearsal improves recall, as would be expected; older children (10-13) spontaneously rehearse several words together and recall more words than younger children (6-9); older children recall more words in a

primacy position and when they are prevented from rehearsing, their recall ability falls (Bray, Justice, Ferguson and Simon 1977; Naus, Ornstein and Kreshtool 1977; Ornstein, Naus and Liberty 1975).

Other metamemorial issues concern the ability of children to use available cues to access information, the effect of prompting retrieval, the ability of children to effect memory search, and children's varying ability to construct memory categories. Again these memory functions typically improve with age (Flavell and Wellman 1977; Kee and Bell 1981; Bjorklund and Zeman 1982). These issues are addressed presently in more detail.

The distinction between recognition and recall is regarded as one which involves different use of memory (Anderson and Bower 1972; Walsh and Jenkins 1973; Tversky 1973). According to the generation-recognition theory, recognition represents a single-stage discriminatory process in which an individual need only distinguish one stimulus from a set (ie. by-passing retrieval), whereas recall involves the actual retrieval and reconstruction of the stimulus (Watkins and Gardiner 1979).

A comprehensive review of this research base is formidable. Bettman (1979a; 1979b), Lynch and Srull (1982), Einhorn and Hogarth (1981), Ornstein (1978) and Bower and Hilgard (1981) explore the numerous facets extensively. Despite this fact, relatively few studies have addressed the nature and organisation of consumer information in the LTM. Moreover, to date, there are no studies which explore the LTM organisation of consumer information with respect to children.

Against this background, two studies which have explored this issue using adults (Johnson and Russo 1978; Biehal and Chakravarti 1982a) are discussed. Subsequently, cognitive models of LTM organisation and their application to this research are outlined.

The Organisation of Consumer Information in the LTM Johnson and Russo (1978) used recall times as a method of analysing memory organisation. Their procedure was straightforward and involved two brand-attribute information matrices, one for air conditioners and the second for brands of cooking oil.

For each of these product classes four brands were selected; and for each of these four brands, four attributes were also selected and evaluated as being fair, good or excellent. Thus, 16 pieces of information characterised each product class.

This information was then structured into brand-oriented and attribute-oriented configurations. In a brand-oriented configuration, a four-page booklet was constructed. On the first page the name of a brand was presented and each of its four evaluated attributes were listed. For example, "Admiral" (brand name) and the attributes (price - good, circulation - fair, energy use - good, indoor noise - fair) were listed. Each of the four brands were presented on a separate page.

In the case of attribute-oriented configurations, a single page of a booklet listed one attribute (circulation) and the four evaluated brands ("Admiral" - fair, "Carrier" - good and so on).

Each subject was then presented with an attribute or brand-oriented booklet containing information about one product class and asked to learn the information. Subsequently, a recall task was administered by presenting the subject with a brand or attribute prompt. If the prompt was an attribute name, subjects were required to recall all the appropriate brand names and their values; for a brand name prompt, subjects were required to recall all the attributes and the values for that brand. The time taken for a subject to complete the recall task was noted and for each booklet the subject received four attribute prompts and four brand prompts. In the second recall task, the same procedure was adopted, but if the first booklet had been brand-oriented, then the second booklet was attribute-oriented. Similarly, if information about cooking oils was used in the first trial, information about air conditioners was used in the second.

The major finding of this research was that memory structure was "input bound". Thus, when brand-oriented information was presented memory structure was brand-oriented, and when attribute-oriented information was presented memory structure was attribute-oriented.

Biehal and Chakravarti (1982a) presented product information to two groups of consumers and instructed one group to choose the best brand and the second to memorise the information. Both groups were given unaided free recall tests. The group which had memorised the data was then asked to choose the best brand, based only on the information recalled. An analysis of the transitions in the subsequent verbal protocols for the group who made a choice based upon memorised data,

showed it to be brand organised. An analysis of subjects who had initially chosen the best brand, showed it to be attribute organised.

Biehal and Chakravarti argue that subjects who had been required to initially choose the best brand, undertook attribute-oriented processing and had encoded the information in a manner which induced an attribute-oriented memory organisation. Moreover, they contended that subjects who had been required to make a choice on the basis of memorised information, had initially stored the data in brand-oriented memory organisations. During choice processing, these subjects tended to use attribute-oriented processing to a lesser degree, presumably because their memory structure was brand organised.

In short, Biehal and Chakravarti demonstrated that task goals affect the process of encoding and the structure of memory organisation; and that memory organisation affects forms of choice processing.

Although both these studies are innovative, they are not faultless. First, considerable doubts about the ability of verbal protocols to reflect and indeed distinguish memory structure from retrieval processing effects have been voiced (Nisbett and Wilson 1977). The format of the way information was reported need not necessarily match the format in which it was organised in memory.

Secondly, it is doubtful that the memory structure imposed on subjects in both these experiments is a truly representative memory organisation. It can be reasoned that relations between the stimuli have been generated by the experimenter, that the memoriser simply

encodes these task specific cues, and that such a memory representation cannot represent those more permanent structures which hold and yield information over long-term situations. Memory is plausibly idiosyncratic in both content and association. Finally, these studies give little idea of the specifics of memory structure. They pay little attention to how consumer information is structured and are prepared to accept the "most easily simplified" conceptualisation of memory structure.

The foregoing discussion has reviewed the research which has bearing upon the memory component of information processing models. One topic - the structural organisation of memory - remains to be outlined

Models of LTM Organisation Despite prolific research, it is still true to reiterate Anderson and Bower's (1973) statement that the way information is organised in the memory remains a fundamental problem in cognitive psychology. Aside from arguments and distinctions between various types of memories - short-term versus long-term, acoustic versus visual, and imaginal versus verbal, Tulving (1972) initially made an important and valid distinction between episodic memory and semantic memory. Although the relationship and interfaces between these memory types must be complex and may have far-reaching implications in consumer choice situations, this research initially addresses semantic memory organisation. Three theoretical models of semantic organisation have been postulated: network, dimensional and hierarchical models (Friendly 1977).

In the first approach, memory structure comprises nodes, which represent information concepts and links between nodes, which inherently define the relationship and context of the nodes. This network model (Quillian 1968) can be distinguished from the dimensional model in which information is stored according to its perceived value assessed using a number of discrete or continuous dimensions.

The third, hierarchical model of organisation is based upon Miller's (1956) chunking hypothesis and has been more recently developed by Mandler (1973). In this model, information is stored in the memory using clustered groups of items or sets of categories. Each information cluster acts as a psychological memory unit, or chunk, and is defined using perceptual or conceptual criteria. The model proposes that immediately productive memory is limited, but in terms of the number of chunks of elements, as opposed to the number of single elements. Accordingly, seven single letters, seven one syllable words, or indeed seven two syllable words are all remembered equally well, for each list represents seven chunks of information. The theoretical processing capacity of the system during immediate recall is limited to approximately seven chunks.

In these terms, it is contended that a list of unrelated words which exceeds the processing capacity of the individual, is learned by grouping together lower-order units into seven, or fewer, higher order units. Bower and Hilgard (1981) describe learning in terms of segregating, classifying and grouping lower level units into a smaller number of densely packed chunks. In short, learning is accomplished by organising the materials presented to the subject.

Clearly, this organisational processing must be underlain by a memory structure and a hierarchical model of memory organisation is presumed. A higher order node represents a name or code in the memory, which characterises the cluster of words which it represents at a lower structural level. Importantly, a great deal of information can be stored in this hierarchical structure, for the top node facilitates access to lower hierarchical levels and a movement down a hierarchical level could exponentially increase the size of memory (Wicklegren 1981). A central assumption of this model is that the structural position of information is defined by the subjective meaning of each chunk. Memory structure is not a function of the chronological order in which information is encountered, as some theorists argue (Landauer 1975; 1978).

Applying this hierarchical model in the context of preceding discussion and in the light of Figure 4.2., the LTM can be seen to comprise hierarchically organised semantic structures. The functional capacity of the STM is restricted to the number of chunks activated at any one time, whilst the structural capacity of the STM represents the processing limits of the system (theoretically seven chunks). Moreover, redeployment of functional capacity enables rapid "unpacking" of chunks to occur and an intensive search of the LTM to take place.

Hierarchically Organised Consumer Information Drawing upon consumer research which has defined forms of processing, and upon cognitive research which puts forward a hierarchical model of memory organisation, it is justifiable to propose that consumer information is hierarchically organised in the LTM.

Two specific and antipodal memory structures are postulated in this research (Figure 4.3.). In brand-oriented memory hierarchies, brand data is stored at a higher conceptual level than attribute data. Thus, a brand name characterises a group of attributes. Conversely, in attribute-oriented memory hierarchies, attribute data is stored at a higher level than brand data; an attribute characterises a group of brands.

The conceptualisation of the LTM in terms of simply representing an inactive memory store may now be elaborated. The gross term memory structure may be seen to comprise three closely related components; structure, orientation, and content. Structure refers to the hierarchical organisation of information (words), in contrast to dimensional, or network structures. Orientation refers specifically to the relative position of brand and attribute information within the hierarchical structure. Content refers to the semantic variability inherent in structurally oriented hierarchies.

Plausibly, two individuals may possess brand-oriented hierarchies of consumer information, but the semantic content of these hierarchical structures may be totally dissimilar. The first may comprise information concerning motor cars for example, whilst the second may store data about washing machines. The situation is somewhat compounded if the two structures contain information about the same product class, for it is likely that similar, or identical language, has been used by the individuals to describe that same product class. However, it is extremely unlikely that the semantic associations are identical for both individuals, for the nature of encoding and verbal

learning ensures that even if the content of the structures is identical, the semantic associations are idiosyncratic. In a practical sense, these idiosyncratic associations may be regarded as being differentially important and weighted permutations of stored information, despite the fact that the same language may have been used as the representative base.

In the light of the foregoing discussion, it is now possible to re-appraise and more concretely quantify the term retrieval processing. Clearly, the integrated nature of mediational processing shows that if experience is to be used in choice tasks, then the stored information configurations and inter-item associations must be retrieved from the LTM in a specific manner. That is, the content, structure and orientation of the LTM must be brought to bear during CIP, if it is to play any role in contemporary processing. Implicitly, this retrieval involves retrieval of patterns of information.

Accordingly, if memory structure is brand oriented, then the retrieval of an item of attribute data from its lower hierarchical level implicitly demands that the higher level brand chunk is initially retrieved. This contrasts to the retrieval of information from attribute-oriented memory structures. In this case, lower order brand chunks must be retrieved from their lower hierarchical positions by initially retrieving higher order attribute chunks.

Thus, two forms of retrieval processing can be envisaged. The former method of retrieval is called brand oriented retrieval processing. The

latter pattern is referred to in this research as attribute oriented retrieval processing.

Returning to Figure 4.2., the concept of brand and attribute oriented retrieval may be incorporated into the context of this information processing framework. Environmental information in brand or attribute oriented displays is acquired by CPB and CPA respectively (stimulus → 1). This information is encoded and rehearsed so that a subset of environmental data is structurally represented in the LTM (2 → 3). The processing system is interactive and, as a consequence, brand and attribute oriented memory structures may be retrieved by brand and attribute retrieval processes (LTM → 4), which influences use of CPB or CPA (4 → 5) and causes specific acquisition of consumer information from the environment (5 → 6). Of course, the system is reiterative and cyclical.

It is the effect of memory structure on the retrieval of information stored in the LTM which is the focus of this study. In particular, it is the relationship between brand oriented and attribute oriented memory structures and brand and attribute oriented retrieval processes which is explored. The research goals may now be meaningfully stated.

Research Goals The strategic goal of this research is to assess how easily a given choice rule is executed using a compatible memory structure. Broken into its sub-goals, this research must:

- (i) ensure that the hierarchical model of memory organisation is practically interpreted. This involves identification of brand and attribute oriented hierarchies, which, in turn, demands

- that the idiosyncratic semantic composition which defines 10-11 year old children's mental constitutions is taken into account.
- (ii) ensure that a specific and appropriate choice rule is used by each subject during any experimental procedure. Choice rules are perhaps more easily understood in terms of memory processes (forms of processing, memory control processes) and have been distinguished in terms of attribute and brand oriented choice rules. Hence subsets of forms of processing are CPA and CPB and subsets of memory control processes are attribute and brand oriented encoding and attribute and brand oriented retrieval. "Executing choice rules", as used in this research, describes retrieval of stored consumer information using brand or attribute oriented retrieval processes;
 - (iii) develop a methodology to ensure that an appropriate choice rule is used to retrieve information from a compatible memory structure;
 - (iv) incorporate a technique which permits analysis of the ease with which the respective "types" of retrieval processing take place. This involves translating covert and typically unconscious cognitive transactions into an observable data source.

Summary The first half of this chapter illustrates that a substantial number of cognitive and consumer researchers have explored the definition, role and functioning of memory. Various perspectives have been used to describe the processing of information and its "flow" through the LTM. Variables such as the overt characteristics of

stimulus format, learning goals, information load and level of experience have been seen to impact upon CIP.

A pivotal link in the chain of CIP is the structural organisation of memory. Little research has addressed how, and in which ways memory structure impacts upon contemporary information processing. This is essentially because memory structure is undeniably difficult to elucidate, because memory structure and the functional processes which operate upon that structure have an apparently inextricable relationship, and because methodologies to test complex hypothetical assumptions concerning the role of memory have been found to be inadequate.

In the absence of a wide consumer research base, and in an attempt to address these issues, it was proposed that consumer information is structured in brand and attribute oriented memory hierarchies. The fundamental aim of developing such conceptualisations is to test a central theoretical issue in consumer psychology. Arguably, memory structure is an historic representation of past CIP and markedly affects contemporary forms of processing and encoding strategies.

Crystallised in terms of goals, this research aims to assess the ease with which a specific brand or attribute oriented choice rule (retrieval process) is executed using a compatible (brand or attribute oriented hierarchy) memory organisation.

4.3. Formulation of the Research Design

Methods for Studying Retrieval Processes and Memory Organisation This research adopts the "organisational approach" to memory (Lange 1978). Inherent in this approach is the view that memory organisation is not simply a retrieval phenomenon. It is assumed to occur:

"as the measurable end product of an integrated series of cognitive processes that determine not only how stored contents are generated correctly at retrieval but also how the perceived stimuli become organised and encoded as such for storage. That is, the memoriser must activate, either consciously or nonconsciously, those processes that enable him to distinguish, recognise, search for and/or impose understood relations among the stimuli he studies, if he is to store and recall the materials in an organised manner" (Lange 1978 Pg.103).

Accordingly, the study of retrieval processes and memory organisation is complicated by the fact that these cognitive features are essentially synonymous (Ornstein, Trabasso and Johnson-Laird 1974), that they are covert and typically unconscious, and that they may only be studied by analysing the characteristics of recalled data. Such processed data must, by necessity, manifest the integrated influence of both memory organisation and structure (Checile, Richman, Topinka and Ehrensbeck 1981).

One methodology which has been used to study retrieval processing has focused upon subjects' different responses to recall and recognition test items. In the generation-recognition theory, any variable which affects recall performance but not recognition performance, must be one which influences retrieval processing. In this context, Kintsch (1970) demonstrates that memory organisation is an extremely important variable which impacts upon retrieval, for organisation affects recall responses but not recognition. In the same light, words which are in

frequent everyday use are easier to retrieve than infrequently used words. The argument which justifies this assertion is that frequently used words are easier to recall but more difficult to recognise than low frequency words. Moreover, the presence of associative cues is helpful for recall but not for recognition, and explicit instructions to learn a list of words typically produces greater levels of recall than semantic orienting tasks - ie. determining the synonymity of each word in a list (Watkins and Gardiner 1979; Mandler 1973; Lachman and Forsberg 1981).

A second methodology used in the analysis of retrieval is the Sternberg paradigm (Sternberg 1966). A subject is given a list of items to memorise, the items are removed and the subject is then presented with a probe. The subject's task is to indicate whether or not the probe item was a member of the original list. The set size can be altered and the subjects response time is measured in this methodology. Results show that the more items there are in the acquisition set, the more comparisons need to be made and the longer a subject takes to complete the task. Moreover, it is implied that memory search is not terminated as soon as an item is located in the memory; retrieval processing is a serial, exhaustive process (Russo and Johnson 1978).

The paradigm can and has been extended in several ways; items from two distinguishable categories have been included in the acquisition set; subjects have been required to conceptually organise the acquisition set; and pairs of probes have been used requiring the subject to indicate whether one or both of the probes formed part of the acquisition set (Lynch and Srull 1982).

In the context of the present research, it is important to consider methodologies which deal with organisation and retrieval processes in children. These fall into perhaps two classic paradigms (Lange 1978); the category clustering paradigm and the subjective clustering paradigm.

The category clustering methodology typically involves children studying experimenter-defined sets of taxonomically related words or pictures, usually presented in random order, and then recalling the items from memory a minute or so later, in a single trial of verbal free recall. The organisation of recall is then measured using a technique which quantifies the degree to which instances of the same categories are recalled adjacent to each other.

The major shortcoming of the category clustering methodology is that the categories defined by the subject are likely to be totally dissimilar to those imposed by the experimenter. The task can therefore be deemed as unrepresentative of the subjects' "usual" retrieval processing. In order to overcome this fundamental shortcoming, the subjective clustering paradigm has been developed. In this methodology, subjects are presented with unrelated stimuli over repeated study-recall trials and organisation of memory is inferred by analysing a subjects tendency to structure the output order of the recalled items on adjacent trials.

A welter of developmental literature has used one or other of these research paradigms as a basis for analysing children's memory organisation and retrieval processing (Scribner and Cole 1972; Moely

and Jeffrey 1974; Kobasigawa 1974; Worden 1975; Checile, Richman and Ehrensbeck 1981; Kee and Bell 1981; Bjorklund and Zeman 1982). Moreover, it is these basic paradigms which have been adopted by consumer researchers, although consumer researchers have used verbal protocols (Biehal and Chakravarti 1982a) and recall times (Johnson and Russo 1978) as their primary data sources. The tendency to use verbal protocols in consumer studies has been prevalent and can be attributed to the difficulty of using single or multi-trial free recall protocols to infer decision processing in semantically rich domains (Simon 1979). The arguments surrounding the use of verbal protocols and the difficulty of coding ambiguous statements are discussed by Bettman and Park (1980) and Biehal and Chakravarti (1982b).

Aside from the category and subjective clustering paradigms, a more specific appraisal of the factors which are responsible for children's recall organisational failures can be undertaken using a sort-recall procedure. In this methodology, subjects are required to sort the materials presented to them into subjectively meaningful groups. The stimuli are then removed from view, a "filler" task is administered to discourage item rehearsal, and subjects are then asked to freely recall the items from memory. This methodology has been used to analyse the extent to which the pre-established memory organisation facilitates the verbal recall task (Lange and Griffith 1977). Again, the methodology has been modified by using category blocking (members of conceptually related pairs always follow one another in the presentation phase of the recall testing), control blocking (unrelated pairs follow each other) and by using unblocked conditions (order of presentation randomly altered across trials). Various manipulations to the sort-

recall procedure have been undertaken (Lange 1978). One noteworthy modification (Moely, Olson, Halwes and Flavell 1969) involved subjects being encouraged to sort items into appropriate taxonomic categories, labelling these categories accordingly, and counting the numbers in each category.

The Selection of an Appropriate Research Methodology A confounding factor in organisational approaches to memory, involves the difficulty of experimentally isolating the effects of memory structure from those of retrieval processes. Anderson, J. (1978) maintains that it is always possible to change one's assumptions about the processes operating on the stored knowledge base in order to produce the observed responses.

Although this point is dealt with in Chapter 5, it is worth briefly illustrating the precarious ambiguity of using recall protocols to evaluate the nature of retrieval processes or memory structure. Thus, consider two individuals whose memory structure, orientation, and semantic content is identical. Each uses this structure as a retrieval plan during recall. Despite this fact, retrieval of information from the LTM may not take place in a uniform manner, resulting in different output orders in their respective recall protocols.

These inconsistencies, either in order of output or as variable inter-response latencies, might be interpreted as reflecting memory structure; clearly, the conclusion that memory structures are different is derived, but it is an erroneous conclusion. What has happened is

that heterogeneous retrieval processes have operated on homogeneous memory structures.

Of course, this situation may be inverted. Memory may be heterogeneous in structure and orientation across individuals, may have similar content, and may again be used as a retrieval framework during recall. Yet it is theoretically plausible for each individual to retrieve a superficially identical series of words, so that the recall protocol has a stable order of output, or identical inter-response latencies. In this case, the recall protocol might be deemed to reflect homogeneous memory structures, again a clearly erroneous interpretation. In short, content and retrieval processes are able to mask structure in the LTM.

These potentially misleading interactions are clearly to be avoided in selecting an appropriate research methodology and this goal is fulfilled by adapting the sort-recall procedure. It is contended here that by identifying the hierarchical nature, orientation, and specific semantic composition of an individual's memory organisation, the relative stored position of consumer information in the LTM is determined.

A simple sorting procedure would allow this identification of LTM structure. Moreover, with such strong assumptions about memory structure made possible, a much more rigorous appraisal of recall output orders could now occur. Thus, if two items which are known to be stored together in the same, subjectively defined memory category are not recalled adjacently, then this discrepancy must logically reflect a characteristic of retrieval processing. In this way, the

output order of the recall trials may be used as an indicator of retrieval processing ease. These contentions are more fully elucidated in Chapter 5. Having considered the "sort" phase of the sort-recall methodology, the "recall" phase can now be detailed. In this way, the gross characteristics of the experimental methodology used in this research is concluded.

Multitrial Free Recall In a typical multitrial free recall (MFR) test, the subject is presented with a list of words in the input phase of the trial and is asked to recall as many of these words as possible in the output phase. The subject is allowed to recall the list in any order; hence the designation free recall. Similarly, the same set of words is presented on several successive trials but in a different and random order; hence the term multitrial.

Two things happen during MFR. First, the number of words recalled increases and second, the order in which the words are recalled becomes stereotyped. Because the order of presentation is randomised, this increasingly organised recall order reflects the subject's processing of the list of words, or his subjective organisation (Tulving 1962).

In terms of the constant chunking hypothesis, combined with the implications of limited processing capacity, any input list which exceeds processing capacity will be recalled by grouping items into higher order, subjectively defined chunks. Sternberg and Tulving (1977) hypothesise that higher order units are recalled first, followed by the constituent words of each unit. Thus, although the number of words recalled over successive trials increases, the number of higher

order chunks recalled may remain unchanged. Moreover, words from the same higher order units are recalled either adjacently or in close proximity.

Mervis and Rosch (1981) illustrate how membership of an object in a category varies both with age and with the representativeness of the object. They note that whilst representative category members are established at an early age, less typical objects are more difficult to categorise. Moreover, Cohen (1966) notes that retrieval processing is serial and exhaustive and that retrieval of categories occurs in a "some or none" fashion.

Evidently, the process of requiring each subject to create groups of alike items, effectively generates categories of items, underlain by memory categories which are representative. Moreover, in the light of the characteristics of subjective organisation, it seems clear that hierarchical retrieval processing may be pre-empted by careful selection of target items.

Thus, by selecting lower order items from the specific groups identified by each subject (ie having these represent target items) brand or attribute oriented hierarchical retrieval processing is effectively stimulated. A higher level chunk would be recalled prior to its lower level components. Furthermore, by selecting 10 items, 2 "alike" items from 5 different groups, a specific hierarchical pattern of retrieval processing is stimulated, and the process of chunking the 10 items into their 5 respective groups effectively brings the recall task within processing limitations.

In summary, the selection of a sort-recall methodology was deemed an appropriate procedure to analyse retrieval processing in children. The methodology and its execution are now described.

4.4. Method

Subjects The sample frame of 110, ten and eleven year old children was selected on the basis of three criteria. Developmentally, children capable of conceptual thought, corresponding to Piaget's concrete operations stage of development were required, and thus a lower age limit of seven was defined. However, as seven year old children do not tend to make consumer decisions independently from parental control (Ward, Wackman and Wartella 1978), the 10-11 year old age bracket was selected. Moreover, this particular age group was important in terms of Ipso and its target market segment.

The children were pupils of both sexes from St Edward's Middle School, Windsor, Berkshire. The recall protocols of 107 children were used, for three interviews were abrogated; one child was unable to complete both parts of the sort-recall procedure at one sitting; one child was unfamiliar with 11 of the presentation stimuli; the third subject misunderstood the instructions and persistently recalled brand names irrespective of their validity. The sample comprised 40 ten year old and 70 eleven year old children.

Materials Two sets of 8cm x 12cm index cards were used as stimuli. The first set comprised 30 items of brand information and the second comprised 30 items of attribute information. A facsimile of these items is reproduced in Figure 4.4.

Each brand name or attribute feature was typed onto an individual index card. This format of information presentation was necessitated by an inability to visually represent attribute data in a manner which brand data can be (eg Rolo versus hard filling). The attribute data was not evaluated (ie as good or bad) but simply equated with a product dimension.

The thirty best-selling confectionery products as defined in the Manufacturing Confectioner (1979) were used as brand stimuli. These would arguably be as equally familiar to children as possible and information concerning these products would plausibly have been previously processed. Attribute data was also selected using a familiarity criteria. The thirty most frequently occurring dimensions of confectionery products, as defined by children during pretesting of a former research design were used.

These stimuli may seem to be superficially dissimilar. However, this dissimilarity is inherent in the choice environment and directly reflects realistic CIP of confectionery products. Moreover, in the light of the constant chunking hypothesis, attribute phrases may be treated as information chunks in the same way that a single brand word is. The alternatives to using a sort-recall procedure involve imprinting an experimenter-defined information array on subjects, or using nonsense words, homogenised in terms of syllable length and form. The former option cannot reflect a child's naturally occurring conceptual memory organisation and the recall protocols derived for the latter option would be difficult to interpret in the context of contemporary CIP.

Procedures A sort-recall methodology was used in this research (Figure 4.5.). Each subject was interviewed separately in a quiet classroom. On entering the room, the subject was asked to sit in front of a table and a brief anxiety-reducing discussion followed. Subsequently, one set of stimulus cards was placed in random order, face-up, onto the table. The subject was then asked to look at the 30 items of information and to point out any items which were unclear or unfamiliar. Any unfamiliar items were replaced until the subject was familiar with the entire stimulus set.

The subject was next asked to organise the cards on the table into groups so that each item in a group had "something in common with all the other members in the group". In the case of attribute presentation stimuli, the task was explained by asking the subject to "think of the name of a sweet which could be described by some of the features written on the cards, pick out these features and place them into a separate group". In the case of brand data, the task was explained by asking each subject to "think about something which you like about sweets, pick out any sweet's name in front of you which could be described by your feature, and place these features into a separate group". The subject was then asked if he had understood what the task entailed. If the subject showed uncertainty the instructions were repeated and the subject was prompted until the instructions were clear. The subject was then asked to complete this task as quickly as possible. The time taken to complete the sorting procedure was noted.

Having constructed a number of brand or attribute oriented groups, each subject was asked to read aloud the members of each group and was asked

to tell the experimenter the name of the sweet which characterised the group of attributes, or alternatively the name of the attribute which characterised the group of brands. Any items which had not been grouped were recorded as a "don't know" group.

Although subjects at this point were theoretically unaware that they would be required to recall any items, subjects were then asked about school-life to discourage item rehearsal. Later-tested subjects became aware of the nature of the experimentation having asked earlier tested subjects, but the filler task generally avoided overt rehearsal.

A MFR test then followed. Ten items of attribute or brand information were selected as target data. If attribute information had been sorted previously, then ten items of attribute data were selected as target items and similarly for brand information. Two items of data were selected from each of five constructed groups. In short, ten items of information which belonged to five different, subjectively defined hierarchical clusters were selected to represent the to-be-remembered items. The target items were presented in random order.

The subject was then instructed that the experimenter would read out ten items of information which had been selected from those set out previously on the table. After the experimenter had finished reading out these items, the subject would then be asked to remember as many of these items as possible. At this point, some subjects were prompted. Prompted subjects were told that the items to be read aloud had been taken from the groups which they had been previously constructed, and that during recall, items which belonged to the same group should be

recalled in those groups. Thus, subjects in the prompted condition were specifically required to use the predetermined hierarchical groupings, indicative of memory structure, as a retrieval framework during recall.

The majority of the subjects readily understood the instructions but in order to ensure such comprehension, the first recall trial was designated as a "practice trial". In total, ten recall trials per subject were administered. The experimenter noted down the responses for each trial. Each trial was denoted as completed when, after 30 seconds of no-response and after an interjection "can you remember any others", no further recall was forthcoming. On completion of the tenth recall trial, the subject was informed that his/her performance was very good and was rewarded with a bar of chocolate. The experimentation was completed. The procedure usually lasted 20-40 minutes depending upon the time subjects took to complete the sorting task.

Design Two variables were crossed in the design; attribute versus brand oriented memory structure and prompted versus non prompted conditions. Four research conditions were therefore created (Figure 4.6.).

The effect of memory structure on retrieval processing represents the primary analytical goal of this thesis. Accordingly, 30 subjects were allotted to research conditions 1 and 2 (prompted brand oriented and prompted attribute oriented retrieval) and 25 subjects were allotted to

research conditions 3 and 4 (non-prompted brand oriented and non-prompted attribute oriented retrieval).

Due to a procedural error 10 subjects were erroneously allocated to condition 2 instead of condition 4. As noted above 3 interviews were abrogated.

Although it would have been desirable for each subject to have been used in each research condition, the limitations of retroactive interference (Tulving and Psotka 1971) precluded such a design. Moreover, it is clear that the prompted and non-prompted conditions are mutually exclusive. However, because processing ease is assessed using subjectively meaningful retrieval frameworks, it was possible to compare one individual's retrieval processing, executed using his idiosyncratic retrieval framework, with a second individual's processing, which had similarly been accomplished using a peculiar, meaningful retrieval framework.

4.5. Summary

This chapter has outlined the development of an experimental procedure to assess how easily specific consumer choice rules are executed using compatible memory structures.

In the absence of appropriate research concerning this topic, the role of memory functioning and structure was discussed as an integral component of a strategic processing model. Shortcomings in experimental procedures used to study memory were detailed and it was consequently decided to establish in each experimental subject, the

memory organisation which could subsequently act as a retrieval framework. Semantic recall could therefore be used to reflect the ease of retrieval processing.

The hierarchical model of memory organisation was related to consumer information storage and a hierarchical retrieval framework was postulated. Consumer research, which had defined two different information acquisition strategies, enabled brand-oriented and attribute-oriented retrieval frameworks to be hypothetically distinguished.

In the sort-recall research design, children sorted consumer information into hierarchical clusters prior to recalling specifically chosen items of stored information. This sorting task identified in a practical manner the hierarchical mode, orientation and composition of the proposed retrieval frameworks. The specific choice rules were inherently animated by selecting lower level hierarchical data as the recall-target material.

In this way, the ease with which 10 to 11 year old children recalled consumer information from brand or attribute oriented memory organisations using brand or attribute retrieval processing rules, was facilitated.

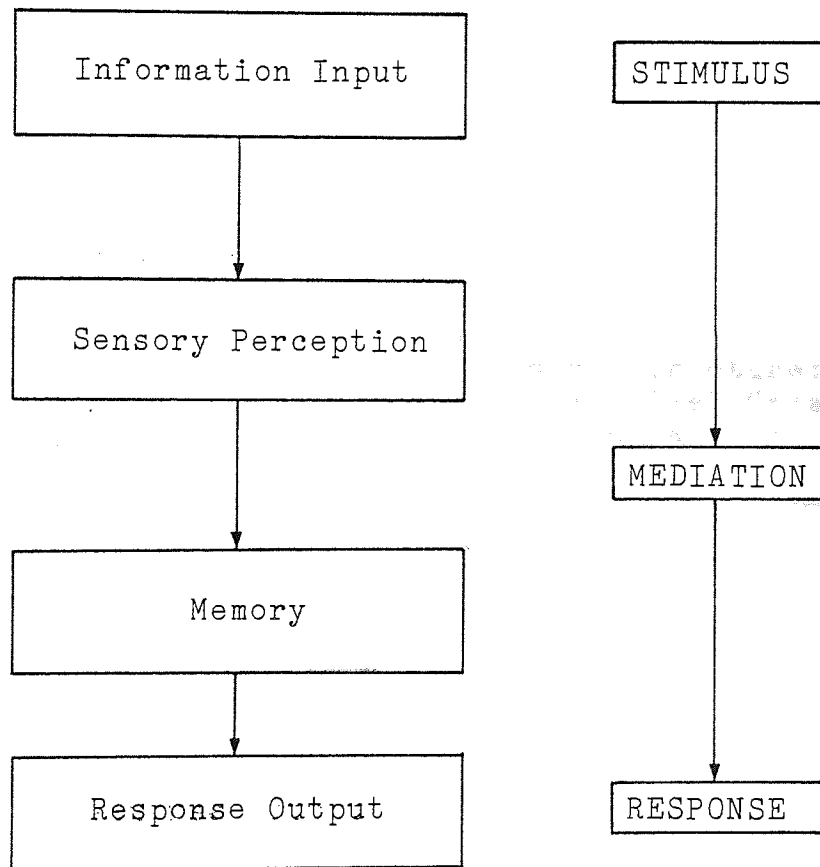


Figure 4.1. The Fundamental Features of an Information Processing System.

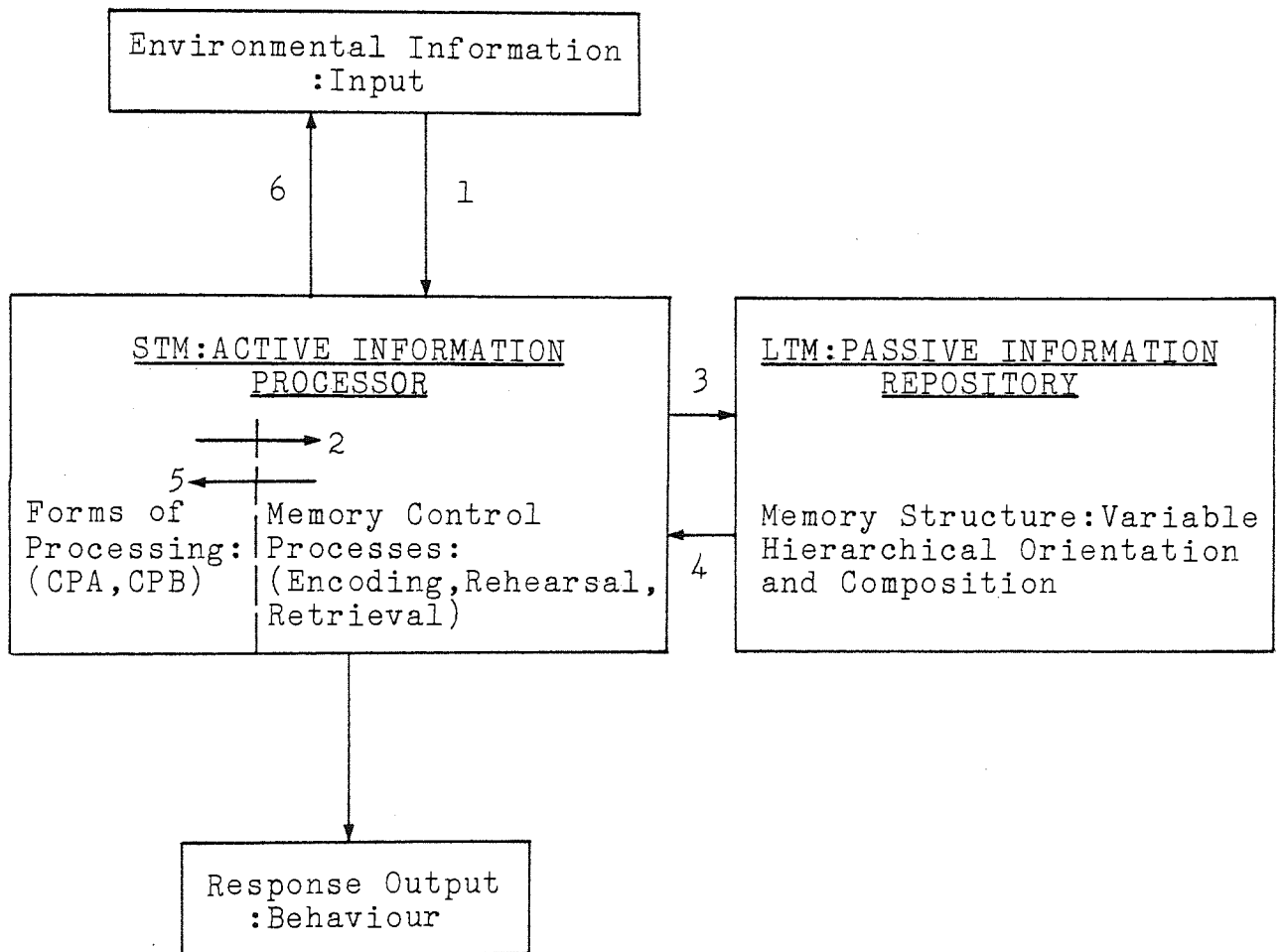
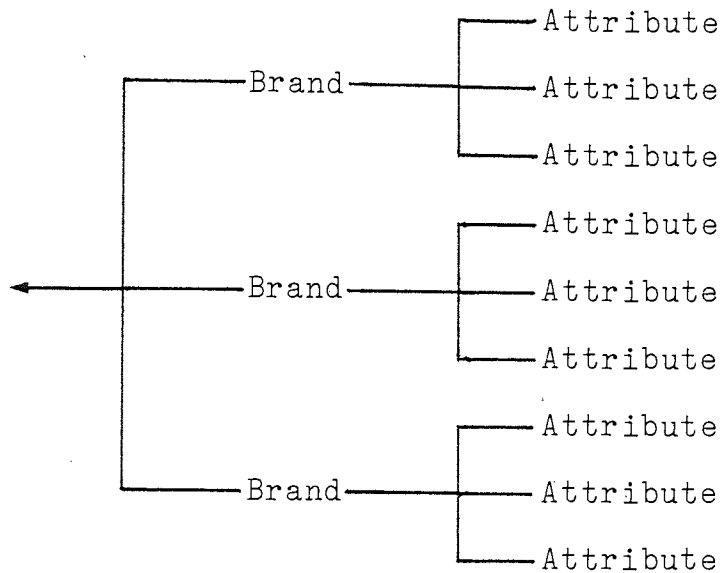


Figure 4.2. The Role of Memory in Consumer Information Processing Systems.

(i) Brand Oriented Hierarchy



(ii) Attribute Oriented Hierarchy

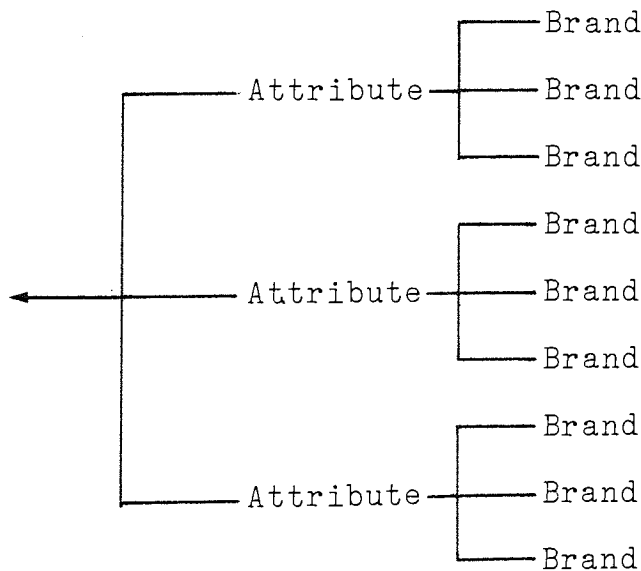


Figure 4.3. The Structural Organisation of Consumer Information in Memory (i) brand oriented (ii) attribute oriented.

Confectionery Brand
Information

1. Mars
2. Kit Kat
3. Dairy Milk
4. Yorkie
5. Twix
6. Milky Way
7. Bounty
8. Maltesers
9. Aero
10. Smarties
11. Flake
12. Double Decker
13. Whole Nut
14. Topic
15. Revels
16. Galaxy
17. Polo
18. Rolo
19. Fruit Pastilles
20. Opal Fruits
21. Marathon
22. Crunchie
23. Fruit and Nut
24. Chocolate Cream
25. Nutty

Confectionery Attribute
Information

1. Made from jelly
2. Minty
3. Cream filling
4. Hard filling
5. Many sweets in a packet
6. Eat when you're hungry
7. Costs more than 10 pence
8. Costs less than 10 pence
9. Eat at home
10. Eat at school
11. Hard sweets
12. All chocolate
13. Small sweets
14. Fruity
15. Toffee
16. Nuts in
17. Covered in chocolate
18. Milk chocolate
19. Dark chocolate
20. Chewy
21. Sugary sweet
22. Bar shaped
23. Break into pieces
24. Two centres
25. Two sticks in a packet

- | | |
|------------------|----------------------|
| 26. Fruit Gums | 26. Crunchie taste |
| 27. Texan | 27. Sharing sweets |
| 28. Toffee Crisp | 28. Bar of chocolate |
| 29. Toffo | 29. No chocolate |
| 30. Tots | 30. Coconut taste |

Figure 4.4. Confectionery brand and attribute information used as presentation and input items in the sort recall procedure.

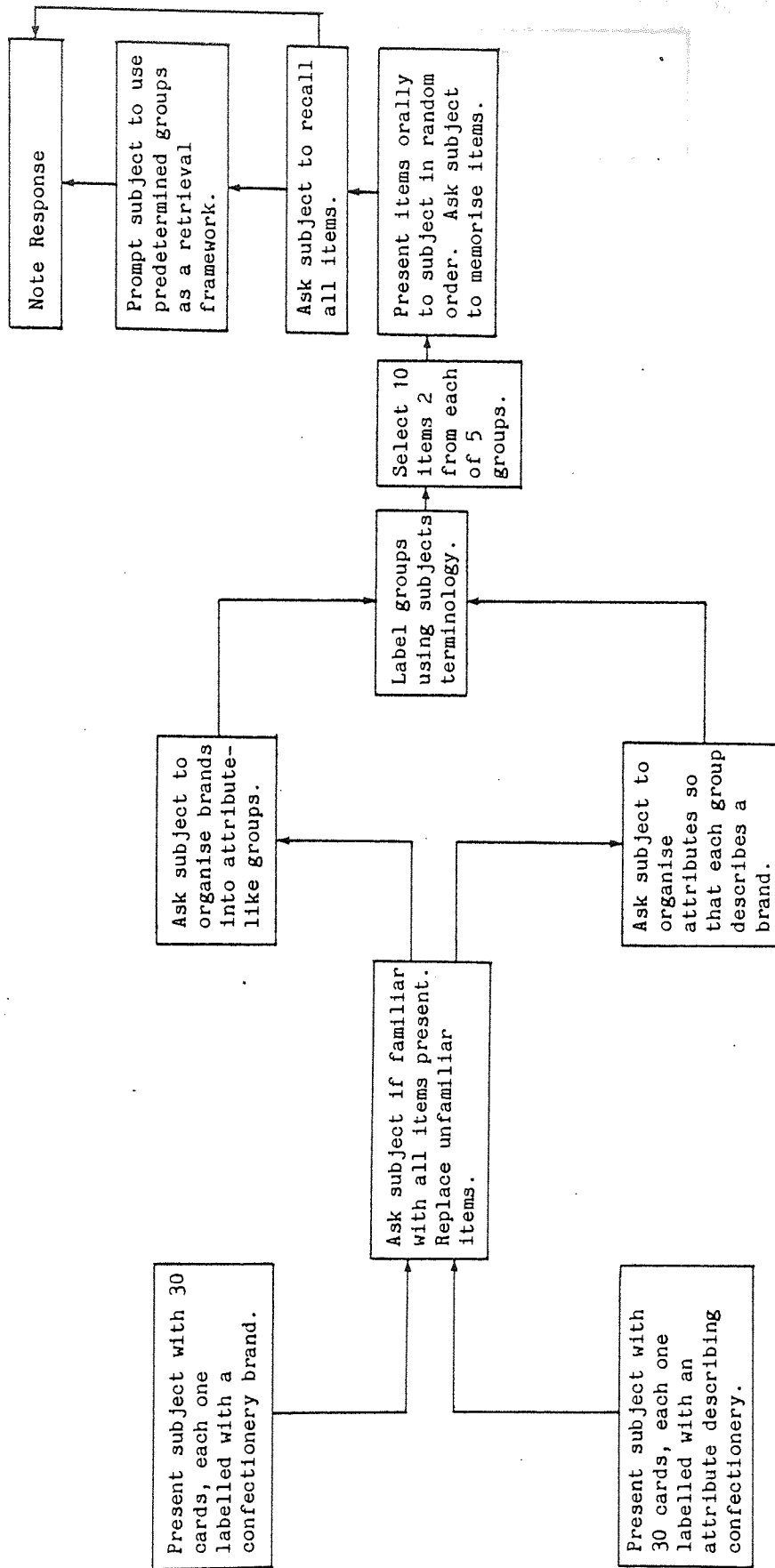


Figure 4.5. Flowchart illustrating research design.

		Orientation of Memory Hierarchy	
		Attribute Oriented	Brand Oriented
Experimental Task Condition	Prompted	<u>RESEARCH CONDITION 1</u> Prompted Retrieval of Brand Data from Attribute Oriented Memory Hierarchies (n=31)	<u>RESEARCH CONDITION 2</u> Prompted Retrieval of Attribute Data from Brand Oriented Memory Hierarchies (n=40)
	Non Prompted	<u>RESEARCH CONDITION 3</u> Non-Prompted Retrieval of Brand Data from Attribute Oriented Memory Hierarchies (n=25)	<u>RESEARCH CONDITION 4</u> Non-Prompted Retrieval of Attribute Data from Brand Oriented Memory Hierarchies (n=11)

Figure 4.6. The Four Research Conditions Used in the Research Design.

Chapter 5

ANALYSIS OF RESEARCH DATA

5.1. Introduction and Overview

A central tenet of this research is that information is structurally organised in the memory and, to impact upon contemporary information processing, this information must be retrieved from its stored position.

Numerous measures of subjective organisation have been developed including the Ratio of Repetition (Cohen, Sakoda and Bousfield 1954), the Proportion of Repetition (Moely, Olson, Halwes and Flavell 1969) and the Item Clustering Index (Robinson 1966). Despite these, and other techniques, Sternberg and Tulving (1977), state that "very little is known about their relations, about the reasons why any particular measure is used in a particular experiment, and about whether any one of the existing measures is better than the others and if so, why" (Pg. 539).

The choice of an analytical technique in this research has not been arbitrary. A technique which allowed distinction between and evaluation of two different, albeit related concepts (memory organisation and retrieval processing) using the output order of the recall protocol was required. Rejecting the majority of measures which deal with the amount of subjective organisation and which confound process and structure, the output order of the recall protocols are analysed using proximity analysis (Friendly 1977).

Proximity analysis is based upon the assumption that items which are coded together in subjective memory units will tend to be recalled contiguously during recall testing. Friendly uses the technique to measure "memory-grams". Because a sort-recall procedure is used in this research, proximity analysis is adapted to measure retrieval processing ease.

A previously introduced, but central theme recurs throughout this Chapter. That is, having predetermined memory structure, items which are known to be stored together in the memory should be recalled together. If they are not, then the discrepancy in the output order is indicative of retrieval processing ease.

In the first section of this Chapter, the technique of proximity analysis is described and applied to a worked example. Subsequently, proximity values are used to define memory structure; an "objective" measure of retrieval processing ease; and a "subjective" measure of retrieval processing ease. The derivation of these measures is illustrated using a worked example. The second part of this Chapter uses the objective and subjective measures of retrieval processing ease to generate research hypotheses, and a statistical model is selected to test these hypotheses.

5.2. The Completed Response Sheet

In order to explain how the information collected from each subject is analysed, the responses collected for one individual are referred to throughout this Chapter as a worked example (Figure 5.1.). The response sheet (Figure 5.1.) is subdivided into four sections. These

record the time taken for a subject to complete the sorting task of the experimental procedure; the resultant subjectively defined hierarchical groups; the target items used as input material during MFR testing; and the output orders for each of these recall trials. For convenience, the attribute and brand presentation data were numerically coded and these codes are replicated in Figure 4.4..

5.3. The Measurement of Interitem Proximity

Proximity analysis is a technique which has been traditionally used to evaluate the subjective organisation of the LTM (Friendly 1977). The technique measures the relative position of items in the output order of a series of recall protocols in terms of their distance apart. To obtain a measure of the distance between any two items of recalled information, T is denoted as the number of recall trials administered to a subject, and l_{it} represents the position of item i on trial T . The intraserial distance between two items, i and j , both recalled on the same trial is $l_{it} - l_{jt}$.

A more useful measure is the average intraserial distance (D), which assesses the average distance between two recalled items across all trials in which the pair was recalled. Thus:-

$$D_{ij} = \frac{\sum_{t=1}^T \phi_{ijt} (l_{it} - l_{jt})}{\sum_{t=1}^T \phi_{ijt}}$$

In this expression, ϕ_{ijt} is an indicator variable which equals 1 if both items i and j are recalled on trial t and 0 otherwise. The denominator of this equation represents the summation of the number of trials on which both i and j were recalled. Thus, for a pair of words which are recalled adjacently on all trials, the average intraserial distance has a minimum value of 1 and a maximum value occurs when two words are constantly recalled at opposite ends of the output order.

It is more convenient to assign a high numerical value to pairs of items which are recalled close together and correlate a lower value with items recalled further apart. To this end, the intraserial distance value can be transformed to an inverse measure, the interitem proximity (P), by subtracting the intraserial distance measure from a positive constant, the list length (L). Thus:

$$P_{ij} = L - D_{ij}$$

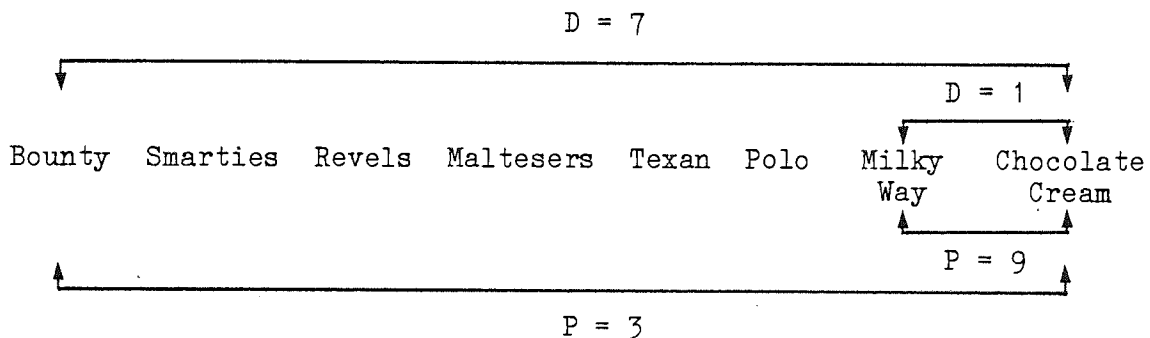
It is improbable that a subject recalls the same number of items on each recall trial. In order to compare interitem proximity values drawn from recall lists of varying length, a normalised proximity value (P') can be calculated by dividing the interitem proximity value by the list length minus 1. Thus:

$$P'_{ij} = \frac{P_{ij}}{(L - 1)}$$

It is this normalised proximity value which is subsequently used in the derivation of statistics which are used to assess retrieval processing ease.

A Worked Example The completed response sheet in Figure 5.1. shows that the brand data presented to this subject was sorted into five attribute oriented groups. Two items from each of these groups represented the to-be-recalled information of the MFR test. Ten recall trials were administered resulting in ten recall protocols.

Focusing on the third recall protocol, the subject recalled eight of the ten to-be-recalled items. Obviously, two target words in this trial (Nutty and Twix) were not recalled. The output order of the recalled items (i.e. Figure 5.1., Trial 3) is:



Two target words, Milky Way and Chocolate Cream, were recalled adjacently. They have an intraserial distance (D) value of 1 and a proximity (P) value of 9. Conversely, Bounty and Chocolate Cream were recalled at opposite ends of the output order. These items have an intraserial distance of 7 and a proximity value of 3. The proximity values for each item, with respect to every other item in the output order of trial 3, are recorded in column 3 of Figure 5.2.. The procedure is repeated for the remaining recall protocols.

Closer scrutiny of Figure 5.2. reveals the presence of a number of zero proximity values. In cases where one or both members of a pair of items is not recalled, it was considered that no information about the relatedness of these items could be generated. This assumption was made in preference to assigning purely ad hoc values based upon the experimenter's incongruous positioning of forgotten items into the recall protocols.

In the experimental procedure of this research, children had sometimes misinterpreted instructions, or were understandably nervous during the early stages of the recall testing. It was felt that the first two recall protocols could be omitted from the derivation of the proximity values without detriment to the statistic and therefore recall trials 3 to 10 were used as the data base.

The average interitem proximity value for each pair of items is determined by summing the non-zero proximity values derived for each pair of items on each trial and then averaging this value. The presence of zero proximity measures makes the derivation of an average proximity value, based for example upon just two values, comparatively unstable in relation to an average proximity value based on eight values. To avoid this undesirable condition, it was decided to define a threshold value for recall frequency. In normalising the average interitem proximity value, a pair of items recalled on one, or two recall protocols only, had its proximity value reduced to zero. The normalised proximity value was reduced by one fifth if a pair of items was recalled on just three trials only.

The average interitem proximity value (P) and the adjusted normalised proximity values (P') for the data of Figure 5.1. are illustrated in Figure 5.2.. The P' values are then incorporated into the matrix of Figure 5.3.. The upper half of this symmetrical matrix and the principal diagonal, in which D_{ii} equals zero, are omitted.

The Evaluation of Recall Failure Two antipodal perspectives could be used to deal with forgotten target information. On the one hand, the failure to recall an item may be considered to convey no information about retrieval processing ease; when an item is forgotten, it cannot have been retrieved and therefore cannot generate information about retrieval processing ease. Alternatively, it could be argued that a recall failure demonstrates that retrieval of the item of information was in some way prevented; retrieval was too difficult. In these terms, recall failure inherently defines the minimum value on an ease-of-processing scale.

Statistically, these perspectives are difficult to reconcile. The derivation of proximity values is based upon the relative position of recalled items in the output order of the protocols. Thus, the objective bestowal of a proximity value to a forgotten item is effectively prevented because of the closed nature of the system. Insertion of a forgotten item into a recall protocol would inevitably affect the proximity values derived for each of the "genuinely" recalled items. This situation is reconciled by asserting that a forgotten item does convey information about memory functioning, but in a manner which is incompatible to the analysis of retrieval processing ease. A zero value is justifiably bestowed in this way.

The use of threshold values in the derivation of the normalised proximity values is detrimental to the degree that the P' values are manipulated. Arguably though, the use of just one recall output order to derive P' values would be more detrimental in terms of representativeness, than the use of several output orders and the application of threshold levels. A more representative way of comparing the less frequent recall events is generated by the use of thresholds and this procedure is therefore justified.

5.4. The Use of Normalised Proximity Values in the Appraisal of Memory Structure and Retrieval Processing

It is clear that recall protocols (and thus P' values) embody both the effects of memory structure, as well as the effects of those retrieval processes which extracted stored information items from the LTM (Section 4.3.). How can P' values be used to distinguish the effects of these two cognitive entities? The answer to this problem is dealt with using three assumptions and is founded upon the fundamental acceptance that retrieval processes and memory structure are separable and not synonymous entities.

First, in using P' values to analyse memory structure, the output order of the recall protocols is automatically assumed to define memory structure: the closer together items are recalled, the closer they are cognitively positioned. Secondly, if retrieval processing is to be evaluated using P' values, then the output order in the recall protocols does not automatically define memory structure: the closer together items are recalled, the easier they were retrieved from an unknown position in the memory. Clearly, these two evaluative

processes can proceed using only the recall output order as a data source.

Thirdly, in using P' values to analyse retrieval processing ease from predetermined memory structures, two data sources are available; the position of items actually in the memory structure as determined in the sorting procedure by the individual; and the subjective organisation of items in the output order of recall protocols. A straightforward comparison between the proximity values of items which are expected to be recalled contiguously (according to the sorting procedure) and the items which in fact are recalled contiguously, evaluates retrieval processing ease from predetermined memory structures.

These assumptions are reiterated throughout the following sections. Accordingly, memory structure, an objective measure of retrieval processing ease and a subjective measure of retrieval processing are discussed and derived.

Normalised Proximity Values and the Assessment of Memory Structure

Friendly (1977) uses the single-link or nearest neighbour clustering technique to construct a hierarchical diagram of memory (Figure 5.5.). The underlying principle is that items with the highest P' values are cognitively stored most closely and are therefore diagrammatically most closely positioned.

Thus, using the P' values in Figure 5.3., Bounty and Twix possess the highest P' values. They are merged into the first non-trivial cluster to form the first branch of the tree. The next most proximal items to

this initial unit fall into two clusters, which have a P' value of 88.88. The first group comprises Bounty, Twix, Smarties and Revels. The second comprises Polo, Chocolate Cream, Texan, Maltesers and Milky Way. At a proximity value of 62.21 all these items are clustered into a single corporate unit. Alternative A (Figure 5.4.) summarises this procedure.

Normalised Proximity Values and the Assessment of Retrieval Processing

In using P' values to assess retrieval processing, the underlying principle is that items with the highest P' values were those which were most easily retrieved from the memory. The process of retrieval involves rehearsal, but it is considered here that the relative position of items stored in the memory may have no bearing on the retrieval process itself. Thus, retrieval processes are potentially able to extract items of information from their "inanimate" structural positions in any order whatsoever.

Nevertheless, task variables may be seen to influence the use of retrieval processes. One item of information may facilitate retrieval of a second, and a third, and so on; a chain of retrieval is set up. This chain has minimised cognitive strain. Therefore, the degree to which a stable output order is achieved reflects the ease with which the chain of retrieval processing was facilitated. Two points are important here; the chain of retrieval which minimised cognitive strain may be identified without knowledge of the structural positioning of stored items. It is defined purely as a function of assigning P' values to recalled items. Secondly, the higher a P' value between a

pair of items, the more easily were those items retrieved from their unidentified positions in the memory.

Conveniently, the single link clustering scheme defines the maximum P' value between pairs of items in the requisite branches of the hierarchical tree. The chain of retrieval which minimised cognitive strain is ascertained by extracting the ten values for each item and its most proximal neighbour (Figures 5.5. and 5.6.).

The objective measure of retrieval processing ease (ORP), designated "objective" because it is derived purely as a function of the recall output order, is derived by averaging the P' values for each of the recalled items which were accessible. For the items in the worked example (Figure 5.3.) an ORP measure of 86.58 is derived (Figure 5.6.). This procedure is summarised in alternative B (Figure 5.4.).

The Assessment of Retrieval Processing in Relation to Predetermined

Memory Structure The sort-recall procedure adopted in this research inherently identified the structure, content, and orientation of each individual's memory. Memory content varied whereas structure and orientation was predetermined. All three components were identified experimentally.

This procedure allows strong assumptions about the output order of each subject's recall protocol to be made. Two items which belong to the same category - and have been identified to belong to that category by the subject - would logically be recalled within that category. Conversely, it would be anticipated that items which belong to

different categories would be recalled further apart. In short, those items belonging to the same category would be assigned high P' values, whereas those belonging to different categories would be assigned lower P' values.

Therefore, if two items which are known to be stored together in the same memory category are not recalled together, then the cause of this variation in output order can logically be attributed to the ease of retrieval processing. Put another way, the ease with which items are retrieved from their predetermined positions in hierarchically oriented memory structures can be assessed. Because this capability is a function of each individual subjectively defining his idiosyncratic memory structure prior to recall, this "subjective" measure of retrieval processing ease (SRP) is defined.

With reference to the worked example (Figure 5.3.), the SRP measure is defined by establishing the category membership of each item. Twix and Bounty, for example, belong to the subjectively defined category "two in a packet and both chocolate". The P' value for these two items is 90.74. This represents the ease of retrieving Twix and Bounty from their known memory position.

Each pair of items is evaluated in this way and an average figure derived. In this example (Figure 5.6.), the SRP value is 82.77. This figure evaluates the ease of retrieving the accessible target items from their subjectively defined positions in the LTM. Alternative C (Figure 5.4.) summarises this procedure.

5.5. Summary of Statistics and Recapitulation of Research Goals

Three statistics have been examined and derived so far. The P' values were derived using the recall output orders and these embodied a measure of both memory structure and retrieval processing. The ORP measure was based purely upon the output order of the recall protocols; it measures the chain of retrieval processing which minimised cognitive strain. The SRP measure evaluates retrieval of information from its predetermined position in the memory structure.

It is now possible to recapitulate the way in which the research goals of Section 4.2. have been achieved;

- (i) brand and attribute oriented memory structures were stimulated by a speeded sorting task in which the type of consumer information presented was varied;
- (ii) brand and attribute oriented choice rules were stimulated by having a subject recall items of consumer information which were stored at a lower hierarchical level in the predetermined memory structure;
- (iii) by manipulating the sort-recall procedure, brand and attribute oriented retrieval processes operated on brand and attribute oriented memory structures;
- (iv) the resultant output order of the recall protocols was used to derive P' values. These P' values served as a data source to

generate ORP and SRP statistics. These statistics are incorporated into the research conditions of Figure 4.6.

5.6. Hypotheses Generation

The generation of research hypotheses has been deliberately postponed until this point, simply because they are differentially based upon the ORP and SRP statistics. Clearly, the ORP and SRP statistics have been detailed so now it is possible to consider the hypotheses themselves.

Nine research hypotheses are categorised into three groups (Figure 5.7.). The first four hypotheses are based upon and evaluated with respect to the SRP statistic; the fifth with respect to the ORP statistic and the remaining hypotheses consider the numerical discrepancy between the ORP and SRP values.

The Use of the SRP Statistic The SRP statistic evaluates the position of recalled items in the output order of the recall protocols with respect to their known position in the memory. Therefore, the higher the SRP statistic the more easily was retrieval from the LTM executed. An SRP value of 100 is the maximum possible. This value demonstrates that a subject recalled the five pairs of target items adjacently and in their correct, known categories, across all the recall trials. Thus, an SRP value of 100 demonstrates that target items were most easily retrieved from their LTM positions.

Arguably, the retrieval of brand or attribute items of information from the LTM should be equally cognitively facilitated. However, taking into account concreteness and encoding specificity (see Chapter 4), and

the fact that environmental information displays for confectionery are typically brand-oriented (e.g. shop displays, advertisements), it would be anticipated that retrieval from brand oriented memory structures would be facilitated in comparison to attribute oriented retrieval. Thus, it may be hypothesised that:

(H1) Under prompted conditions, brand oriented retrieval processing will be executed more easily than attribute oriented retrieval processing.

Clearly, (H1) compares research conditions in which subjects were prompted to use their predetermined memory structures during retrieval. Under non-prompted conditions however, it can be contended that subjects may not use this predetermined structure; this might represent a deliberate decision not to use this retrieval plan or, alternatively, may be regarded in terms of a subject's failure to recognise that the predetermined memory structure would facilitate retrieval (integration failure). Nevertheless, in the light of the direction of (H1), it may be contended that the existence of a brand, as opposed to an attribute oriented memory structure, had two potential effects; if an active decision to use a retrieval plan was made, the existence of a brand oriented structure might encourage a subject to use the predetermined memory structure; secondly, the easier to use brand oriented structure might minimise the occurrence of integration failure. Thus:

(H2) Under non-prompted conditions, brand oriented retrieval processing will be executed more easily than attribute oriented retrieval processing.

The comparison of retrieval processing ease in terms of a similarly oriented memory structure, but in the prompted and non-prompted conditions, would arguably show that the introduction of an explicit retrieval prompt minimises the occurrence of integration failure. Thus:

(H3) Prompted attribute oriented retrieval processing will be executed more easily than non-prompted attribute oriented retrieval processing.

(H4) Prompted brand oriented retrieval processing will be executed more easily than non-prompted attribute oriented retrieval processing.

The Use of the ORP Statistic The ORP statistic is an absolute measure of retrieval processing ease, based purely on the stability of the output order of the recall protocols. But the ability to evaluate the chain of retrieval processing which minimised cognitive strain is, by itself, a poor indicator of the effect of either memory structure, or the introduction of a prompt, upon retrieval processing. This is because the nature of the memory structure underlying retrieval remains unqualified in the derivation of the ORP measure.

At risk of over-labouring this point, consider two hypothetical subjects of research condition 4 (Figure 4.6.). On analysing their recall protocols, it is found that both subjects recalled 5 pairs of items adjacently on all the recall trials. Each subject, based upon these totally stable output orders, is attributed an ORP value of 100.

Despite this identical ORP value, a closer examination of the first subject's protocols shows that target items belonging to the same memory category were in fact recalled adjacently. A closer examination of the second subject's protocols shows that items which were previously identified as belonging to different memory categories were recalled adjacently. Clearly, when two recall output orders are equally stable, the ORP statistic is insensitive in its measurement of a subject who used a predetermined memory structure as a retrieval framework, in comparison to one who used any structure whatsoever as a retrieval framework.

In short, an equal distribution of ORP values would be expected across the four research conditions. Thus, a non-directional hypothesis is made:

(H5) Using the ORP statistic, retrieval processing will be equally facilitated irrespective of any variation in predetermined memory structure and irrespective of the existence of prompted retrieval conditions.

Clearly, because four research conditions are used, (H5) comprises four testable hypotheses; (a) conditions 1 x 2, (b) 3 x 4, (c) 1 x 3 and (d) 2 x 4 (Figure 4.6.). These are all non-directional hypotheses.

This fifth hypothesis crystallises the implicit deficiencies in evaluating retrieval processing, or indeed memory structure, based solely upon proximity values. The evaluative efficacy of proximity values is governed by the strength of the assumptions made about the

type of cognitive information conveyed in recall protocols. In the derivation of the ORP statistic, such assumptions are implicitly weak and unqualified; memory structure underlying retrieval processing remains an unquantified entity.

The Comparison of the ORP and SRP Statistics Three important points may be reiterated from the preceding discussion. First, the SRP statistic evaluates the ease with which items are retrieved from memory; implicitly, the content, structure and orientation of semantic memory is known. Secondly, the ORP statistic uses the most stable output order of the recall protocols to identify a chain of retrieval processing which minimised cognitive strain; implicitly, the content, structure and orientation of semantic memory need not be known in order to derive the ORP statistic. Thirdly, retrieval is seen as a process which is not dominated by memory structure. Indeed, the output order of the recall protocols does not automatically define memory structure, and nor does it automatically define retrieval processing ease.

In this light, a comparison between the ORP and SRP statistics can be regarded as a comparison between two sets of proximity values; proximity values derived for those items which were recalled most closely together; and the proximity values of items which belong to the same memory category and which were expected to be recalled most closely together. Experimentally, a subject may be deemed to have unequivocally used his predetermined memory structure as a retrieval plan, when both target items, belonging to each specific memory category, are recalled adjacently on each recall trial. Under these conditions, the ORP value is identical to the SRP value; both are 100.

Therefore, a comparison of the ORP and SRP statistics shows the degree to which a subject used the predetermined memory structure to facilitate retrieval. The smaller the discrepancy, the more the subject used his predetermined memory structure during retrieval.

In order to elucidate this concept, it is perhaps easier to consider a subject's potential responses during experimentation. Assuming rehearsal is required to recall the ten target items, a subject may adopt one of two alternatives in order to complete the recall task. He may first use the predetermined memory structure as a basis for recall. Secondly, he may create a new memory structure in response to the task demands in order to facilitate recall. Amongst other things, the propensity to create a new memory structure will logically depend upon the perceived difficulty of using the predetermined memory structure. In its simplest terms, the SRP statistic measures retrieval from the predetermined memory structure, whereas the ORP statistic is assumed to accommodate the subjective organisation pertaining to any newly created memory structure. The ORP-SRP discrepancy therefore evaluates a subject's propensity to use the predetermined memory structure as a retrieval plan, as opposed to creating and using any other memory structure whatsoever as a retrieval plan.

Thus, if retrieval from the brand or attribute oriented memory structures was perceived to be difficult, then a subject would minimise cognitive strain by creating a memory structure in order to complete the recall task (i.e. constructive use of memory) and the ORP-SRP discrepancy would be large. Conversely, if retrieval from the predetermined memory structures was perceived to be easy, then a

subject would use these structures in order to complete the recall task and the ORP-SRP discrepancy would be small.

In the light of the direction of (H1), it is likely that retrieval would be easier from brand oriented memory structures. Hence:

(H6) Under prompted conditions, the propensity for a subject to retrieve information from a brand oriented retrieval framework in preference to any other memory structure, will be greater than the propensity for a subject to retrieve information using an attribute oriented retrieval framework in preference to any other memory structure.

(H7) Under non-prompted conditions, the propensity for a subject to retrieve information using a brand oriented retrieval framework, in preference to any other memory structure, will be greater than the propensity for a subject to retrieve information using an attribute oriented retrieval framework in preference to any other memory structure.

It is important to emphasise that the term "in preference to any other memory structure" may be synonymously regarded as "the chain of retrieval which minimises cognitive strain". Again, as stated throughout this Chapter, retrieval processes and memory structure are inextricably related cognitive entities; yet a pedantic appraisal of any "chain of retrieval processing" implicitly demands recognition of the underlying presence of a memory structure from which information is extracted. The recognition that a memory structure exists in this way

does not, however, demand that the content, structure and orientation of that structure need be identified.

Finally, a comparison of the ORP-SRP discrepancy in the prompted and non-prompted conditions, but with a fixed predetermined memory structure, would likely show that prompted subjects' propensity to use the predetermined memory structure in preference to any other would be enhanced. Thus:

(H8) Subjects prompted to use an attribute oriented memory structure as a retrieval framework will adopt this retrieval framework, in preference to any other, more than will subjects not prompted to use the attribute oriented retrieval framework in preference to any other.

(H9) Subjects prompted to use a brand oriented memory structure as a retrieval framework will adopt this retrieval framework, in preference to any other, more than will subjects not prompted to use the brand oriented retrieval framework in preference to any other.

5.7. Results

Nature of the Results The four research conditions distinguished in Figure 4.6. are used as a basis for categorising the research data, using which the hypotheses (H1) - (H9) are examined.

In this Chapter, one subject's recall protocol has been used to derive the ORP measure, the SRP measure, the ORP-SRP discrepancy, the time

taken by each subject to complete the sorting task in the experimental procedure and the total number of target items recalled over trials 3-7 of the MFR test. This subject (No. 23) represents one member of the group of children who were presented with brand data, who created attribute oriented memory structure and undertook attribute oriented retrieval processing, and who were prompted. These details are recorded in A3.1. for the remaining subjects of research condition 1. In A3.2., A3.3., and A3.4., these details are exhibited for subjects of research conditions 2, 3, and 4 respectively.

The Choice of an Appropriate Statistical Test Retroactive interference, combined with the fact that a recall task can only be unfamiliar once, precluded using subjects as their own controls. Thus, although it would have been expedient to design a study in which the same subject was used in each of the research conditions, i.e. brand and attribute oriented retrieval under prompted and non-prompted conditions, it is clear that such a design would have generated biased, incomparable results. This fact, combined with the independent nature of the samples and their different sizes ($n = 11 - 40$) affected the selection of an appropriate statistical test. Moreover, the choice of an appropriate test to evaluate (H1) - (H9) is determined by the manner in which the ORP and SRP statistics were calculated.

One of the fundamental pre-requisites of using the parametric group of statistics is that the research data conforms to the assertions of the central-limits theorem. In deriving the ORP and SRP statistics, the use of threshold levels and zero values, which were justifiably assigned in order to compare proximity values derived from recall

protocols of varying lengths, effectively determined that these statistics are at best ordinal scale measures. In this light, it would be incorrect to assume that the ORP and SRP statistics are observations derived from normally distributed populations with equal variances. Further, it would be incorrect to use one of the more power efficient parametric tests unless such assumptions could be unequivocally made. Thus, the research hypotheses are tested using a non-parametric test, whose underlying assumptions need not be so unequivocal, but whose evaluative power is substantial for large sample sizes.

The Mann Whitney U test was chosen to examine the hypotheses (H1) - (H9). This test was deemed appropriate for three reasons; it is one of the most powerful non-parametric tests; it can be used to deal with ordinal scale data and it can be used on independent groups of different sample sizes. This test is fully described in Appendix A2. The data derived to test (H1) are evaluated using the U Test in this Appendix (A2.).

5.8. Summary

In this chapter, the way in which proximity analysis can be used to analyse and evaluate memory organisation and retrieval processing, has been discussed.

Two measures of retrieval processing ease have been calculated, the objective and subjective measures. Their derivation has been based upon slightly different assumptions and consequently, the information which these measures convey is also different. The SRP measure was derived especially to evaluate how easily items of stored information

were retrieved from attribute and brand oriented memory structures. An important pre-requisite to the calculation of the SRP measure was the identification of memory structure prior to analysis of the recall protocols. The sort-recall methodology implicitly allowed the SRP statistic to be derived.

The generation of research hypotheses was deliberately left until the second part of this chapter, simply because their generation was dependent upon first understanding the nature of the ORP and SRP statistics. The Mann Whitney non-parametric U test was selected as an appropriate statistical technique to test these hypotheses.

Against this background, it is now possible to discuss the validity of these hypotheses.

Stimulus Pair	Trial Number								*Average Proximity (P)	** Normalised Proximity (P')
	3	4	5	6	7	8	9	10		
CC-MW	9	9	0	9	5	8	0	7	$47 \div 6 = 7.8$	87.03
CC-Nutty	0	0	6	9	0	0	0	0	$15 \div 2 = 7.5$	0
CC-Texan	7	8	0	0	9	7	0	9	$40 \div 5 = 8.0$	88.88
CC-Twix	0	0	8	7	6	4	0	5	6.0	66.66
CC-Bounty	3	6	9	8	8	5	0	6	6.4	71.42
CC-Malt	6	9	7	0	7	9	0	0	7.6	84.44
CC-Revs	5	4	9	6	4	6	0	8	6.1	68.25
CC-Smart	4	5	8	0	0	0	0	8	6.2	69.44
CC-Polo	8	7	7	8	9	0	0	9	8.0	88.88
MW-Nutty	0	0	0	8	0	0	8	0	8.0	0
MW-Texan	8	7	0	0	4	9	9	7	7.5	83.33
MW-Twix	0	0	0	6	9	6	8	8	7.4	82.22
MW-Bounty	4	5	0	9	7	7	7	9	6.8	76.19
MW-Malt	7	8	0	0	8	9	0	0	8.0	88.88
MW-Revs	6	3	0	5	9	8	9	9	7.0	77.77
MW-Smart	5	4	0	0	0	0	6	6	5.2	58.33
MW-Polo	9	6	0	7	6	0	5	8	6.8	75.90
Nutty-Texan	0	0	0	0	0	0	9	0	9.0	0
Nutty-Twix	0	0	8	8	0	0	5	0	7.0	62.21
Nutty-Bounty	0	0	7	7	0	0	4	0	6.0	53.33
Nutty-Malt	0	0	3	0	0	0	0	0	3.0	0
Nutty-Revs	0	0	5	7	0	0	7	0	6.3	56.29
Nutty-Smart	0	0	4	0	0	0	3	0	3.5	0
Nutty-Polo	0	0	9	9	0	0	2	0	6.6	59.25
Texan-Twix	0	0	0	0	5	7	7	4	5.7	63.88
Texan-Bounty	6	8	0	0	7	8	6	5	6.6	74.07
Texan-Malt	9	9	0	0	6	8	0	0	8.0	88.88
Texan-Revs	8	6	0	0	3	9	8	7	6.8	75.90

Stimulus Pair	Trial Number								*Average Proximity (P)	** Normalised Proximity (P')
	3	4	5	6	7	8	9	10		
Texan-Smart	7	7	0	0	0	0	5	9	7.0	77.76
Texan-Polo	9	9	0	0	8	0	4	8	7.6	84.44
Twix-Bounty	0	0	9	5	8	9	9	9	8.1	90.74
Twix-Malt	0	0	5	0	9	5	0	0	6.3	56.29
Twix-Revs	0	0	7	9	8	8	9	7	8.0	88.88
Twix-Smart	0	0	6	0	0	0	8	3	2.8	50.37
Twix-Polo	0	0	9	9	7	0	7	6	7.6	84.44
Bounty-Malt	7	7	6	0	9	6	0	0	7.0	77.77
Bounty-Revs	8	8	8	4	6	9	8	8	7.3	81.94
Bounty-Smart	9	9	7	0	0	0	9	4	7.6	84.44
Bounty-Polo	5	9	8	6	9	0	8	7	7.4	82.53
Malt-Revs	9	5	8	0	7	7	0	0	7.0	77.77
Malt-Smart	8	6	9	0	0	0	0	0	7.6	68.14
Malt-Polo	8	8	4	0	8	0	0	0	7.0	77.76
Revels-Smart	9	9	9	0	0	0	7	6	8.0	88.88
Revels-Polo	7	7	6	8	5	0	6	9	6.8	74.60
Smart-Polo	6	8	4	0	0	0	9	7	6.8	75.55

* Values represented to one decimal place.
** Values represented to two decimal places.

Figure 5.2. The Derivation of Normalised Proximity Values for Recall Protocols of Figure 5.1..

Code	Stimulus Items	24	6	25	27	5	7	8	15	10	17
24	Chocolate Cream										
6	Milky Way	87.03									
25	Nutty	0	0								
27	Texan	88.88	83.33	0							
5	Twix	66.66	82.22	62.21	63.88						
7	Bounty	71.42	76.19	53.33	74.07	90.74					
8	Maltesers	84.44	88.88	0	88.88	56.29	77.77				
15	Revels	68.25	77.77	56.29	75.90	88.88	81.94	77.77			
10	Smarties	69.44	58.33	0	77.76	50.37	84.44	68.14	88.88		
17	Polo	88.88	75.90	59.25	84.44	84.44	82.53	77.76	74.60	75.55	

Figure 5.3. Matrix of Normalised Proximities for Recall Protocols of Figure 5.1..

Recall Protocols

Analysis of output order

Derivation of normalised proximity values (P')

Alternative A

assume P' values reflect only memory structure

apply single-link hierarchical clustering technique

obtain diagrammatic representation of memory structure (inherent in SL technique)

Alternative B

assume P' values reflect only retrieval processes

apply single-link hierarchical clustering technique

obtain objective measure of retrieval processing (ORP) (inherent in SL technique)

Alternative C

assume P' values reflect both structure and processes

account for effects of predetermined memory structure

obtain subjective measure of retrieval processing (SRP) (proportional effect of structure and process accounted for)

Figure 5.4. The Use of Normalised Proximity Values to Obtain Measures of Memory Structure and Retrieval Processing.

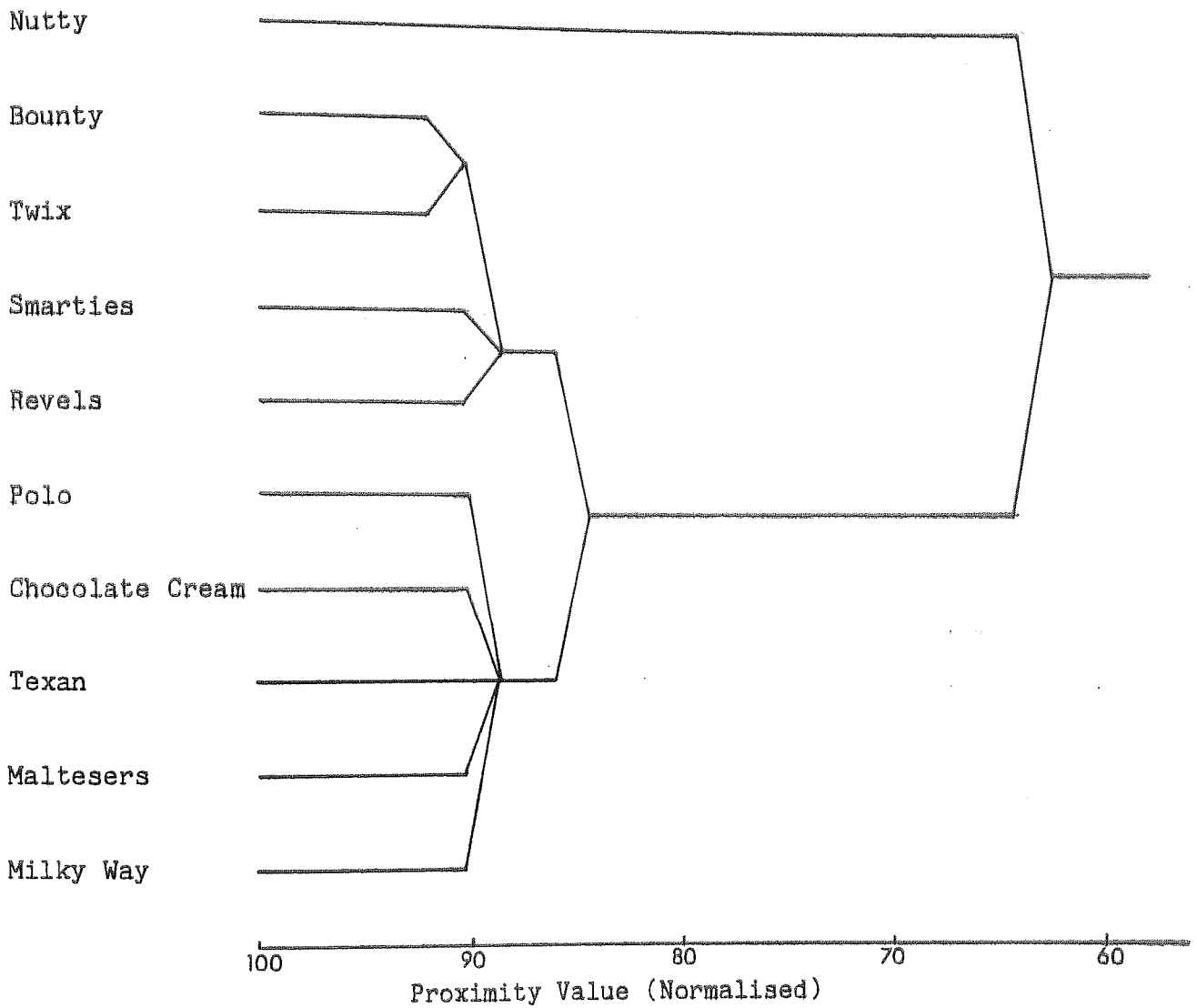


Figure 5.5. Single-link Hierarchical Clustering Scheme for the Recall Data of Figure 5.1..

Item	Maximum Proximity Value
Bounty	90.74
Twix	90.74
Smarties	88.88
Revels	88.88
Polo	88.88
Chocolate Cream	88.88
Texan	88.88
Maltesers	88.88
Milky Way	88.88
Nutty	62.21
ORP Value	86.58

The ORP measure derived using the single-link clustering technique.

Item	Maximum Proximity Value
Bounty	90.74
Twix	90.74
Smarties	75.55
Revels	77.77
Polo	75.55
Chocolate Cream	87.03
Texan	0
Maltesers	77.77
Milky Way	87.03
Nutty	0
SRP Value	82.77

The SRP measure derived with reference to each subjects predetermined memory structure.

Figure 5.6. Derivation of the Objective and Subjective Measures of Retrieval Processing.

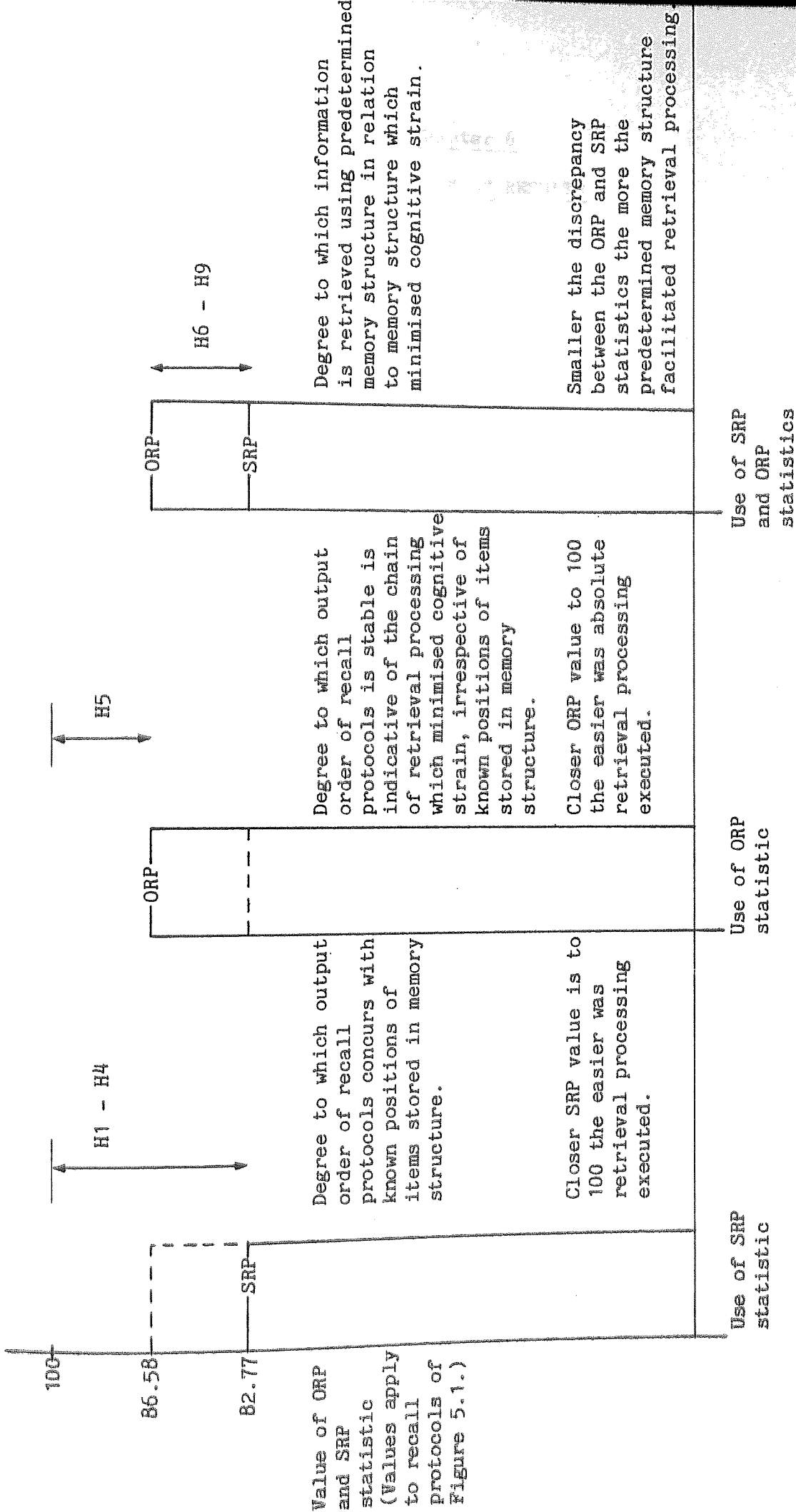


Figure 5.7. The Use of the SRP and ORP Statistics in the Generation of Research Hypotheses.

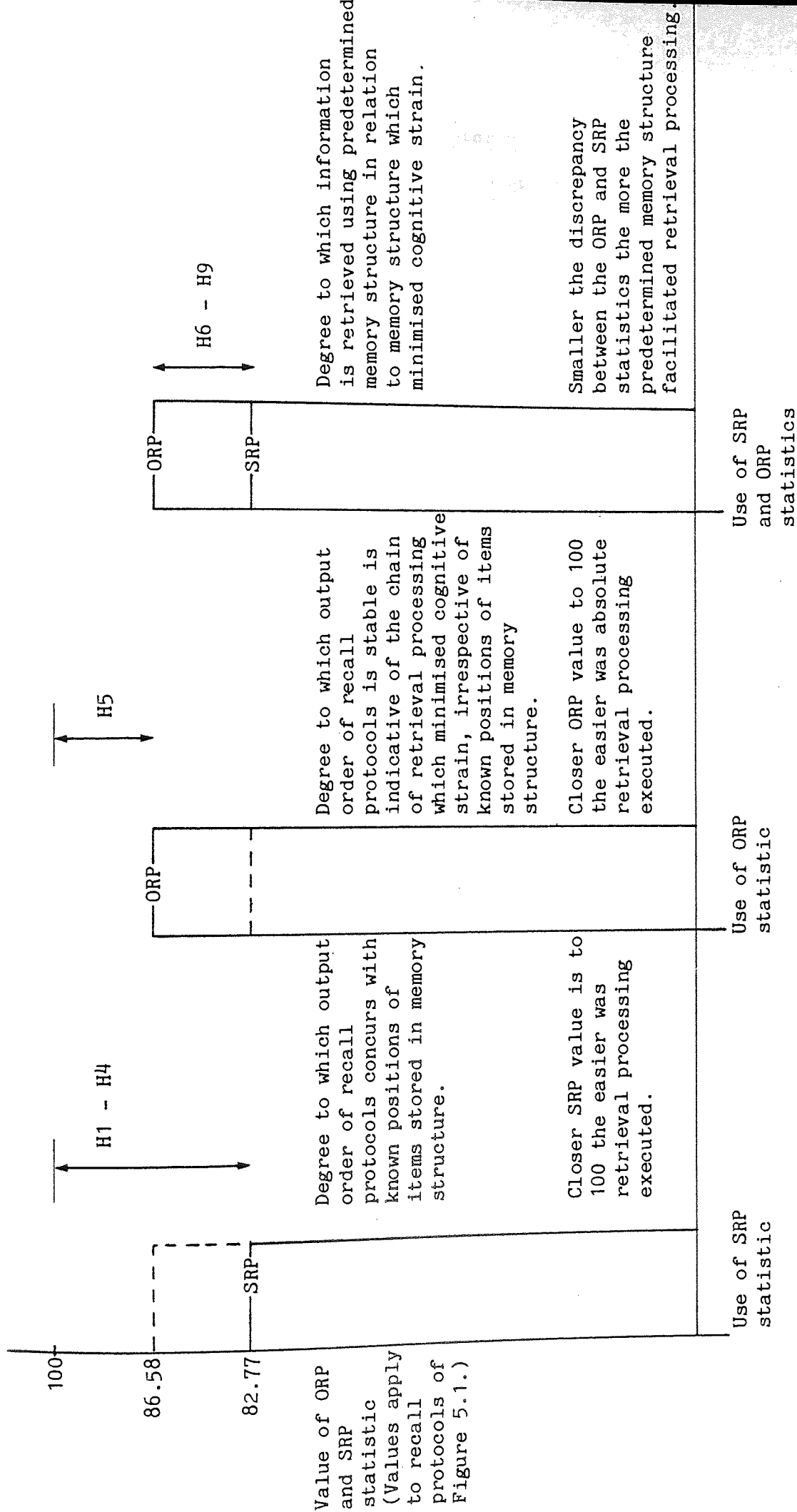


Figure 5.7. The Use of the SRP and ORP Statistics in the Generation of Research Hypotheses.

Chapter 6

DISCUSSION OF RESULTS

6.1. Introduction and Overview

This chapter discusses the results of this research. The evaluated research hypotheses are restated, the limitations of this study are presented, and the results are interpreted, discussed, and expounded in terms of other findings which have bearing upon retrieval processing ease in children.

6.2. Limitations in the Study

Khlar (1978) warns that much of what is observed when people solve problems is a direct consequence of the task environment, as opposed to any deep psychological properties of the human information processing system. The justification for this argument and the lack of consumer literature which deals with children's CIP, is related to an overriding limitation of organisational processing studies: the analysis of the information processing system is retrospective. Methodologies inherently generate data which represents the precipitate of processing. Analysis of active information processes can, therefore, at best be inferential; a fundamentally deep rooted and frustrating limitation which masks the nature of cognitive processing.

The sort-recall methodology is used here to define a representative memory structure which has validity as a cognitive referent. Given the previous limitation, it is clearly not possible to unequivocally prove that memory structure is hierarchically brand or attribute oriented, systematically structured, or that retrieval of just ten items of

information using only five distinct categories, validly addresses retrieval processing ease. Nevertheless, accepting that memory structure is plausibly a multi-dimensional entity, involving inter-category overlap and interaction, these limitations were countered first by evidence supporting the hierarchical concept of memory (Lynch and Srull 1982; Mandler 1973); secondly, by having subjects define their own categories; thirdly, by using a speeded sorting task to generate representative categories; and fourthly by the overt inability to distinguish memory structure from retrieval processing using recall output alone (J R Anderson 1978; Cavanaugh and Perlmutter 1982). Moreover, using speeded recall to create high arousal conditions biases memory search and retrieval processes towards more accessible information (Eysenck 1976). Thus, the characteristics of the sorting and recall tasks were structured so that valid retrieval conditions occurred. The introduction of a prompt accentuated this validity. Most importantly, this sort-recall procedure generates data otherwise unavailable experimentally. Nevertheless, the relationship between memory structures which store information over long periods of time and the structure of that information during current processing in response to contemporary task demands, will likely be fundamentally more sophisticated than the present conceptualisation.

Notwithstanding these limitations, this research deals with semantic coding and verbal memory. Yet sustained and extremely effective arguments have been put forward for recognising mental imagery as a primary mode of memory representation (Paivio 1971; Cramer 1976; Edell and Staelin 1983). Pictorial representation of information facilitates recall by a factor of 1.5 - 3.0 and vividness of imagery of words is a

most powerful predictor of that items memorability (Paivio 1971; Peterson 1977). Clearly, the fact that brand data is more susceptible to dual-coding than attribute data is a factor which lies outside experimental control in this thesis. Thus, although the degree of semantic association is accounted for in the research design, the effect of symbolic modality is not.

The veridicality of memory structure is also limited by the exclusion of affect in the reseach methodology and such non-representativeness of the experimental task in relation to actual consumer choice tasks, is evident in other facets of the design. Subjects were not asked to purchase a product, merely to retrieve data. Typically, consumer information displays in the environment are complex brand-attribute permutations; in this research brand and attribute stimuli were used mutually exclusively. Moreover, consumer decision making involves active synthesis, a process in which the accessibility and use of data is affected by the presence of external cues; in this memory-based research the use of cues was controlled and not spontaneous. Two other factors are important. In terms of content domain, thirty items of presentation data are not representative of the welter of environmentally occurring brand and attribute data. Finally, presentation items are not likely to possess uniform familiarity, a fact known to influence retrieval (Lachman and Forsberg 1981) and choice processing (Park and Lessig 1981). Arguably, this factor would enhance retrieval of brand data.

This array of task limitations is offset by the necessary requirement to use real world data, as opposed to fictitious, or homogeneous,

experimenter-defined data, of equisyllable form and length. Real world data is implicitly of varying familiarity. To change its characteristics is to change the external validity of results. Moreover, no method exists for unequivocally scaling real-world data familiarity, and although totally unfamiliar brands and attributes could be used, children are unable to categorise totally unfamiliar data representatively (Pryor and Ostrom 1981). Furthermore, recall levels would be low, unstable proximity values would be generated, and the research findings would be specifically limited to the task conditions; conditions using "unreal" data. The use of top-selling brands and the fact that proximity analysis is based upon the structure and not the volume of recall, tempers any non-equivalence of data familiarity per se. The range of task limitations are therefore unavoidable but acceptable research limitations.

The use of children as subjects and the selection of confectionery presentation data may have effected the external validity of the study. Certainly, children's use of memory varies with age, across individuals and across task domains (Flavell 1970b; Pressley 1982). However, in order to overcome the familiarity effect, confectionery data was necessarily used; subjects of a similar developmental stage, possessing similar processing characteristics (Roedder 1981) were selected; and the requirement for subjects to define their own memory organisations acted as a control, which hopefully tempered age-related differences in processing ability and semantic organisation skills (Ford and Keating 1981). However, between-subject processing capability, and the inability to use the same subject in prompted and non-prompted

conditions, represented factors outside experimental control, and a research limitation.

6.3. Synopsis of Results

The z values derived for (H1) - (H9) using the Mann Whitney U Test and their accompanying significance levels are shown in Tables 6.1. - 6.3.. The U Test compares the distribution of values in the smaller sample with those in the larger sample (Appendix A2.). A positive z value indicates that the statistical values comprising the smaller sample are lower than those of the larger sample and a negative value vice-versa. Adopting a 0.05 level of significance, the evaluated research hypotheses may be restated as follows:

(H1) Under prompted conditions, brand oriented retrieval processing is executed less easily than attribute oriented retrieval processing ($z = -2.68$; $p = 0.0037$).

(H2) Under non-prompted conditions, brand oriented and attribute oriented retrieval processing are executed equally easily ($z = 0.73$; $p = 0.2327$).

(H3) Prompted attribute oriented retrieval processing is executed more easily than unprompted attribute oriented retrieval processing ($z = 3.89$; $p = 0.0007$).

(H4) Prompted brand oriented retrieval processing is executed as easily as unprompted brand oriented retrieval processing ($z = 1.38$; $p = 0.0837$).

TABLE 6.1.

MANN WHITNEY U TEST. Z VALUES DERIVED FOR H1 - H4 USING SRP VALUES AS STATISTICAL MEASURE		
Hypotheses	z Value	Level of Significance (One-Tailed)
H1 (1 x 2)*	-2.68	0.0037
H2 (3 x 4)	0.73	0.2327
H3 (1 x 3)	3.89	0.0007
H4 (2 x 4)	1.38	0.0838

TABLE 6.2.

MANN WHITNEY U TEST. Z VALUES DERIVED FOR H5 (a - d) USING ORP VALUES AS STATISTICAL MEASURE		
Hypotheses	z Value	Level of Significance (Two-Tailed)
H5 a (1 x 2)	-0.26	0.7948
H5 b (3 x 4)	-0.73	0.4654
H5 c (1 x 3)	2.24	0.0250
H5 d (2 x 4)	0.89	0.3734

TABLE 6.3.

MANN WHITNEY U TEST. Z VALUES DERIVED FOR H6 - H9 USING SRP-ORP DISCREPANCY AS STATISTICAL MEASURE		
Hypotheses	z Value	Level of Significance (One-Tailed)
H6 (1 x 2)	2.08	0.0188
H7 (3 x 4)	1.27	0.1020
H8 (1 x 3)	-3.50	0.0002
H9 (2 x 4)	1.38	0.0838

Note: The numbers in parenthesis refer to the research conditions of Figure 4.6..

* See Appendix 2.

(H5) Using the ORP statistic, retrieval processing was not equally facilitated when comparing prompted and unprompted attribute oriented retrieval processing (H5c: $z = 2.24$; $p = 0.0250$ (Two tailed test) Conditions 1 and 3 Figure 4.6.). H5(a), (b) and (d) are all insignificant at the 0.05 level.

(H6) Under prompted conditions, the propensity for subjects to retrieve information using a brand oriented retrieval framework in preference to any other memory structure, is lower than the propensity for subjects to retrieve information using an attribute oriented retrieval framework in preference to any other memory structure ($z = 2.08$; $p = 0.0188$).

(H7) Under non-prompted conditions, the propensity for subjects to retrieve information using a brand oriented retrieval framework in preference to any other is equal to the propensity for subjects to retrieve information using an attribute oriented retrieval framework in preference to any other memory structure ($z = 1.27$; $p = 0.1020$).

(H8) Subjects prompted to use an attribute oriented memory structure as a retrieval framework adopted this framework in preference to any other, more than subjects who were not prompted in this way ($z = -3.50$; $p = 0.0002$).

(H9) Subjects prompted to use a brand oriented memory structure as a retrieval framework did not adopt this framework in

preference to any other to any greater degree than subjects who were not prompted in this way ($z = 1.38$; $p = 0.0838$).

6.4. Discussion of Mediational Processing Under Prompted Conditions

The major finding of this study, defined by (H1), is that under prompted conditions attribute oriented retrieval processing is executed more easily than brand oriented retrieval processing.

This observed result is clearly antipodal to the result anticipated to characterise (H1). In formulating the direction of (H1), a number of strong assumptions were made. It was assumed that brand oriented information displays dominate the consumer choice environment, that environmental information structure affects voluntary aspects of encoding and processing, and that these factors lead to a brand oriented LTM structure. Because the LTM was presumed to be brand oriented, it was further hypothesised that retrieval of information using brand oriented retrieval processes would be facilitated in comparison to retrieval using attribute oriented processes. The result of (H1) shows the reverse to be true, and implies that LTM structure is attribute oriented.

This finding contradicts Biehal and Chakravarti's (1982a) finding that "consumer memory for product information is primarily brand organised" (Pg. 439) and counters Russo and Johnson's (1980) contention that product knowledge is primarily brand organised in memory. In order to reconcile the observed result of (H1), one of three alternatives may be adopted.

(i) The concepts of concreteness and encoding specificity are observed and it is contended that attribute oriented displays are the more predominant environmental information formats. Thus, attribute oriented environmental displays affect the voluntary aspects of encoding, lead to attribute oriented LTM structure and would, in turn, favour attribute oriented retrieval processing (as observed in H1).

However, even a superficial examination of the consumer choice environment shows that branded goods and brand-oriented product displays monopolise choice environments. Branding is a deliberate policy used by manufacturers to focus attention onto single products, as opposed to inter-brand comparisons inherent in attribute-oriented displays. Moreover, because of the commercial desire to manipulate and reinforce product images, brand oriented formats predominate in the majority of choice environments. The first alternative is rejected.

(ii) A second alternative purports that despite the brand oriented nature of external displays, individuals may choose to ignore this format and may allocate the processing capacity required to develop dissimilar memory structures, presumably attribute oriented. Thus, attribute oriented retrieval would be facilitated.

If this alternative is accepted, then it is clear that the encoding chain (1 → 2 → 3; Figure 4.2.) must be questioned; yet the arguments underlying encoding specificity and concreteness are implicitly strong. Nevertheless, it has already been demonstrated that individuals are not governed by external stimulus characteristics; they may acquire external stimuli irrespective of format characteristics and as a

function of idiosyncratic learning and processing goals (Biehal and Chakravarti 1983). However, it is improbable that this discrepant information acquisition takes place all the time. Such a process places considerable demands on processing capacity. Thus, although this second alternative is feasible, it is unlikely to account for an attribute oriented memory structure predominating in the LTM.

(iii) A third alternative assumes that information in the LTM is brand oriented (i.e. conforming to the demands of encoding, concreteness and the nature of external formats) but simultaneously assumes that retrieval processing is attribute oriented. Such a situation seems irrational and indeed, a fundamentally broader range of issues are embodied in this third alternative. As a communication heuristic here, it is important to theoretically distinguish between the STM and the LTM in a way which precludes the difficulty of conceptualising the STM as a synonymous LTM component or function.

In Figure 6.1., the LTM is seen to comprise procedural-motoric data and sensory-perceptual information. These data are inanimate, but the former represent stored processes which provide cognitive capability, and the latter represent information stored in the various semantic, iconic and other sensory modes. In order for the former to interact with the latter, the process of retrieval must take place and as soon as heuristic retrieval occurs, specific sensory-perceptual data may be retrieved: the nature of the current task stimulates retrieval of the procedural-motoric heuristics which, in turn, leads to retrieval of salient sensory-perceptual data. This may take place unconsciously, almost automatically (Schneider and Shiffrin 1977) or may be a

conscious decision to consider information concerning issues A, B and C and so on. Thus, the activated data implicitly defines the act of thinking, or the site of active synthesis, referred to here as the current processor (CP).

The idea of a current processor is not new (Bower 1970; Norman 1969), but its importance has been obscured by the tendency to treat the structure of retrieval as a process of activating already structured data. That is, the pre-occupation with reconciling the multi-store and depth of processing memory models (Naus, Ornstein and Hoving 1978) has meant the structure of information in the LTM is replicated in retrieval processes and is therefore synonymous with the structure of information in the STM. In the consumer literature, this has led to the structure of heuristics, as depicted by decision nets, being independent from the actual information processing functions which heuristics perform (see Bettman 1979a Pg. 247). The situation is confused and has originated because of the tendency not to specify and distinguish the structure and function of the current processor from that of the LTM (sensory-perceptual) store.

A central and implicit feature of alternative three demands such a distinction to be made. Thus, sensory-perceptual memory information is stored in complex hierarchical patterns in several sensory modalities. This information is always available if not accessible, capacity is unlimited and, in this unactivated form, structure is rigid. Conversely, the current processor has limited capacity, limited duration, conforms to the strictures of cognitive strain, deals with information irrespective of modality and, above all, the structure of

information processed here is malleable. By "malleable" structure, the idea of associationism is invoked. The contiguous occurrence of two ideas in consciousness, for example, dog and pencil, creates an associative structure in the CP which is malleable for this structure is unlikely to characterise the structure which holds these items in the sensory-perceptual store.

Addressing (H1) in the light of this discussion, it may be possible for LTM structure over long periods to be brand oriented, whilst constructive choice processing in the CP is attribute oriented. The justification for this statement is found in relation to minimisation of cognitive strain (Shugan 1982).

In terms of brand oriented LTM, it is evident that brand oriented chunks which store information about a brand and its integral dimensions, do not require uniformity of those dimensions across chunks. Yet assuming an equivalent quantity of information is to be represented in attribute oriented chunks, each brand would need to be characterised by the same dimension (Figure 4.3.). Because brands are very rarely characterised by identical common dimensions, processing capacity considerations favour fewer, brand oriented LTM structures. Haber's (1964) and Lappin's (1967) findings which show, respectively, higher retrieval accuracy and faster learning times for object-coded versus dimension-coded information, support the assumption that information is more efficiently stored in brand chunks.

However, these same arguments do not hold if an individual's choice processing is considered. For example, a child may be hungry and wish

to select a product to satiate this hunger. Perhaps the most efficient method of achieving this goal is to consider the merits of a set of evoked products, perhaps six products, which are perceived to possess this common dimension. Assuming a child undertakes elaborative rehearsal and LTM structure is brand oriented, the evaluation process involves accessing information stored in six different brand chunks. Conversely, if memory structure is attribute oriented only one chunk need be accessed. Tversky (1969) uses this logic to argue that processing is facilitated by attribute oriented memory structures, and the same rationale is salient in the context of comparative advertisements generating significantly more processing (Wilson and Mudderisoglu 1980; Golden 1979). Moreover, Capon and Kuhn's (1980) work supports the idea that children undertake attribute oriented processing, and is reiterated by research which finds that children reduce the number of dimensions used during processing when a product possesses two or more attributes (Russo and Doshier 1975). Moreover, common sense argues that attribute oriented processing is more functional in everyday problem solving, for a brand has little processing value if its attributes are not considered first.

These two arguments are discordant. They contend that the most cognitively efficient method of storing data in the LTM is congruent with brand oriented structures, yet simultaneously purport that cognitive strain is minimised by attribute oriented processing in the CP. These arguments are difficult to reconcile and represent the crux of several little understood problems, for they focus upon retrieval relationships. Thus, the way in which complex, task specific

information configurations are stored in the LTM and indeed the way in which these historically processed configurations relate to current processing, remain unresolved, tacit issues. Whilst Nisbett and Wilson (1977) suggest that verbal protocols may not manifest these higher order cognitive processes, Biehal and Chakravarti (1982a) succinctly characterise this issue: "if the social context of verbalising led subjects to assume that brand organised information was preferred, the format in which information was reported may not have matched the format in which information was organised in memory" (1982a Pg 438). Clearly, Biehal and Chakravarti argue that the "point of output" from the cognitive system is the structure of the current processor, which may or may not concur with LTM structure.

In reconciling how brand oriented memory structure acts as a precursor for attribute oriented current processing, the third "type" of information in memory, propositional beliefs (Bower and Hilgard 1981) is equated with the concept of episodic memory (Tulving 1972). Episodic memory receives and stores information about temporally dated episodes or events, and temporal-spatial relations among these events.

"A perceptual event can be stored in the episodic system solely in terms of its perceptible properties or attributes and it is always stored in terms of its autobiographical reference to the already existing contents of the episodic store. The act of retrieval of information from the episodic store, in addition to making the retrieved contents accessible to inspection, also serves as a special type of input into episodic memory and thus changes the content of the episodic store" (1972 Pg. 385-386).

Thus, episodic memory represents the task-specific contextual representation of past processing. Episodic memory is the historical record of current processing (Figure 6.1.).

Clearly, the relationship between episodic memory and the sensory-perceptual store is intricate. However, adhering to Tulving's contention that semantic memory does not register perceptible properties of inputs, but rather "cognitive referents of input signals" (Tulving 1972), it is possible to justify the result of (H1) in terms of the third alternative discussed above. Thus, the sorting procedure undertaken by each subject stimulated attribute oriented or brand oriented current processing, a procedure which involved interaction of the procedural-motoric and sensory-perceptual data stores. The outcome of this processing - episodic memory - led to the construction of attribute oriented or brand oriented episodic memory structure. This process is clearly feasible, for processes "can be both stored in the data base and operated upon as data and also be activated and thereby actively operate upon other data" (Rumelhart, Lindsay and Norman 1972 Pg. 199).

During the MFR testing, the recall of ten target items overloaded processing capacity and initiated rehearsal. Moreover, the introduction of the prompt stimulated retrieval of information from the episodic contextual memory structure, generated during the earlier sorting task. In the light of the argument above, that cognitive strain is reduced by attribute oriented memory structures simply because such structures are more representative of cognitive functioning, Kintsch (1980) found that response times taken by subjects to verify category membership of representative exemplars are shorter than for non-representative exemplars. Moreover, mentioning the category name reduces the time taken for subjects to verify representative category exemplars but increases it for non-

representative exemplars. These robust findings are reiterated for semantic categories (Mervis and Rosch 1981), for colours (Rosch 1975), and for artificial categories, eg. representativeness defined by family resemblance (Rosch et al 1976).

Logically, that attribute oriented episodic memory structures are more representative than brand oriented memory structures concurs with the contention that attribute oriented processing is a more frequent and familiar function in the current processor. In this light, it would be expected that subjects whose episodic memory structure is brand oriented would find retrieval a more difficult process than subjects whose episodic structure was attribute oriented. Hence (H1) is justified.

It would be wrong not to consider the structure of sensory perceptual memory. It takes little reflection to see that because episodic memory uses the cognitive referents of the sensory-perceptual stores, the former may be regarded as a subset of the latter. However, for the law of concreteness to be obeyed in brand oriented environments and for the argument of attribute oriented current processing to hold, it seems necessary that the same information items are structured in dichotomous formats. Evidently, this problem is not easily resolvable. To suggest that two memory structures overlie the same information base fosters notions of interference, although Landauer's ideas are relevant here (Landauer 1975, 1978). To suggest two different memory stores, is to foster ideas of multi-encoding of the same information item, again illogical in terms of cognitive efficiency, but acceptable in terms of dual-coding, logogens and imagens (Paivio 1978). Moreover, it is

plausible that sensory-perceptual memory is simply a subset of episodic memory, and that brand oriented and attribute non-contextual and contextual referents co-occur. Accordingly, it is contended here that the more representative episodic memory is attribute oriented, that attribute oriented episodic memory facilitates retrieval processing in comparison to brand oriented structure, and that the law of concreteness combined with efficiency of brand oriented storage argues for a brand oriented sensory-perceptual memory structure.

6.5. Mediation Processing Under Non-Prompted Conditions

Dogmatically, the result of (H1) might be considered to reflect the enhanced familiarity of brand data as opposed to attribute data (Lindberg 1980). Indeed, more items of brand data were typically recalled than were items of attribute data (Figure 6.2.). By itself, (H1) would be unable to disprove this contention. The insignificant result of (H2) however, demonstrates two things; familiarity was not the major factor influencing retrieval processing ease and, secondly, under non-prompted conditions a different set of factors influenced retrieval processing.

The reasons why children fail to organise recalled information may be described in terms of input and integration failure (Lange 1978). The former refers to a subject's inability to establish a clearly definable and stable organisation of stimuli during the input phase of MFR, whereas the latter describes a child's failure to use any pre-existing input organisation to access items during recall. Yet, it is difficult to use input failure to account for (H2). Subjects were deliberately prompted to create stable organisations of stimuli during the sorting

phase. The more probable explanation is that integration failure took place. That is, the episodic representation generated by the sorting task was not utilised as a retrieval plan during MFR.

The two-stage nature of the research design fostered integration failure, which was accentuated in turn by the absence of a prompt. Thomson and Tulving (1970), dealing with the effectiveness of retrieval cues stress; "No cue, however strongly associated with the to-be-remembered (TBR) item, can be effective unless the TBR item is specifically encoded with respect to that cue at time of storage" (Pg. 255). Clearly, the retrieval prompt in this experimentation was differentially applied, and was introduced post-sort but prior to MFR. Therefore, integration failure would be expected. Arguably, the introduction of a prompt prior to the sorting procedure could have induced an episodic memory representation based upon superficial inter-item similarities, as opposed to one based upon "deep" cognitive processing. One thinks here of phonetic similarities, or the physical position of items in their groups on the table being used to structure episodic memory, with subjects using these cues to recall target items. Such a condition would be undesirable in the analysis of organisational processing.

It is a moot point whether the enhancement of recall, in both structure and amount, is a function of encoding changes - and hence changes in the structure of episodic memory - or whether enhancement is a function of qualitative improvement in retrieval processing itself (Ford and Keating 1981; Checile et al 1981). This debate is clearly part of a broader one which relates to the validity of distinguishing memory

structure from retrieval processes. This thesis adopts a perspective which accepts that retrieval is a process which is subservient to changes in the structure of episodic and sensory-perceptual memory. Thus improvement in retrieval processing is a function of encoding changes rather than qualitative improvement in the retrieval function itself.

Accepting integration failure as prognostic of (H2), the recall of target items may be accounted for using the strong argument that unprompted subjects used shallow, impermanent processing strategies to facilitate recall. This levels of processing theory focuses attention on the role and function of the current processor (Craik and Lockhart 1972). Thus, an array of strategies could have been used to facilitate recall. Recency and primacy effects, in which the items positioned last and first in the serial input order respectively, as well as verbal labelling, are strategies used by children to enhance recall (Hagen and Kingsley 1968; Wheeler and Dusek 1973). The rote repetition of serial input order, the combined use of verbal labelling and fingers, phonological similarities (eg. Polo and Rolo) and associationism (eg. Fruit Pastilles and Fruit Gums) were all observed to have been used as mnemonic devices by subjects, which "overrode" the use of predetermined structure during recall.

Craik and Lockhart suggest that this type of superficial maintenance rehearsal may be confined to the STM (i.e. the CP) and can take place without connecting target stimuli into existing LTM structures. Implicit in (H2) is that the output order of the recall protocols did not correspond to those groupings established during the sorting task,

which to some extent suggests that episodic memory structure was not accessed during recall. Adapting this discussion to Figure 6.1., and arguing that episodic structure must be retrieved in order for information to be processed contextually, it is plausible that maintenance rehearsal does in fact involve a process of cognitive recognition using for instance, semantic memory (Fruit Pastilles - Fruit Gums) and auditory memory (Rolo - Polo), as non-contextual cognitive referents.

Yet whilst such superficial processing conceivably accounts for some of the observed responses, limitations in processing capacity preclude the indefinite use of such strategies. To complete the recall task using superficial processing strategies would involve maintenance rehearsal of 10 target items, clearly a task which exceeds 10-11 year old childrens' structural processing capacity (Case 1974). Moreover, on trials 3-10 of the MFR testing, the smallest average number of target items recalled in either of the non-prompted research conditions was 7 (Figure 6.2.). Furthermore, because many subjects recalled more than 7 target items during MFR testing, it seems additionally improbable that maintenance rehearsal alone was responsible for unprompted recall by subjects.

A number of studies indicate that elaborative rehearsal (Pressley 1982) may be spontaneously initiated by children older than 10 years of age (Naus, Ornstein and Kreshtool 1977; Ornstein, Naus and Liberty 1975). Similarly, 9 year old children sense that briefly presented rote information is subject to memory loss, that items are easier to remember if meaningful connections are discovered or created between

them, and are also aware that semantic organisation produces better recall than no organisation (Kreutzer et al 1975; Flavell 1978; Bjorklund and Zeman 1982). However, 8 year olds tend not to grasp the fact that semantic organisation produces better recall than physical organisation (Palm and Yussen 1977). Generally, 10 year old children have the capability to use storage and retrieval strategies as a means for remembering information and at this age begin to spontaneously use these production strategies (Flavell 1970a; Roedder 1981), although Pressley (1982) emphasises the effect of individual performance differences.

Thus, (H2) manifests subjects' use of maintenance rehearsal, in which superficial aspects and associations between items facilitate their recall, augmented at some point by elaborative rehearsal, involving retrieval of information from episodic representations of the sorted target data. The point at which elaborative rehearsal was spontaneously initiated, the degree to which maintenance or elaborative rehearsal was used, and the nature of maintenance rehearsal strategies themselves would clearly vary across individuals and across research conditions.

To sum, the insignificant result of (H2) is justifiable as a manifestation of subjects' use of maintenance rehearsal and integration failure, bolstered by spontaneous use of elaborative rehearsal with episodic memory structures. This general lack of planful retrieval on the part of the majority of subjects suggests that when children begin to recall information they do so without a conscious retrieval plan. (Bjorklund and Zeman 1982). They seem to rely on fortuitously

discovered item similarities after recall has commenced and use a retrieval process which involves switching from recall strategy to recall strategy in a capricious manner.

6.6. Prompted Versus Unprompted Retrieval of Consumer Information

The results associated with the prompted and unprompted retrieval of consumer data from attribute oriented memory structures (H3), and from brand oriented memory structures (H4), can now be discussed.

Several developmental studies show that retrieval by children is enhanced by the presence of cues (Kobasigawa 1974; Moely 1977; Lange 1978). Consumer research also shows that recall accuracy is higher for information placed in memory under directed learning conditions than for information learned during choice (Biehal and Chakravarti 1982a), although this work used adults. Moreover, Kee and Bell (1981) demonstrate that a directed-cue test condition, relative to a non-cue test condition, enhances recall performance to the same degree for 7, 11 and college age subjects. Thus, the introduction of a prompt in this research was expected to enhance retrieval processing ease for subjects in the prompted conditions, irrespective of specific memory structure.

The research findings associated with (H3) and (H4) do not wholeheartedly support this contention. Undeniably, the introduction of a prompt markedly facilitated retrieval of brand data from attribute oriented memory structures (H3: $z = 3.89$, $p = 0.0007$). Yet although some enhancement of retrieval of attribute data from brand oriented memory structures occurred, the degree of enhancement was not

significant at the 0.05 level (H4: $z = 1.38$, $p = 0.0838$). Two interrelated questions arise. First, why was the prompt so effective in the former case and secondly, why was the impact of the prompt attenuated in the latter?

In the former case, it has already been argued that the introduction of a prompt prevents integration failure. Subjects understood, as part of the recall task, to undertake elaborative rehearsal using a tailor-made episodic memory structure as a retrieval plan. The result of (H3) in this light, implies that memory structure is a primary factor in enhancement of retrieval processing ease.

Notwithstanding previous discussion concerning the ability of recall amount to act as an indice of retrieval processing ease, retrieval of data under prompted conditions is easier than under non prompted conditions, and attribute oriented retrieval is easier than brand-oriented retrieval (Figure 6.2.). These distinctions are most accentuated during initial recall trials, presumably because prompted subjects immediately undertook elaborative rehearsal using the episodic memory as a retrieval plan to access target items during recall. A similar argument holds for retrieval of information from differently structured episodic memory; retrieval was facilitated more by attribute oriented organisations than by brand oriented structures. In short, retrieval is facilitated by the presence of a prompt compared to its absence, and by attribute oriented as opposed to brand oriented episodic structure. The results of (H3) and (H4) provide circumstantial evidence to support the result of (H1).

One reason why the effect of the prompt was attenuated in (H4) may be attributed to the relationship between memory structure, input failure and integration failure. Arguably, subjects who undertook brand oriented sorting were more prone to integration failure than those who undertook attribute oriented sorting (see H1). The precursor of this integration failure may plausibly be related to input failure. That is, subjects found it more difficult to establish clearly definable brand oriented organisations of stimuli initially and were subsequently more vulnerable to integration failure. In this light, Ornstein, Trabasso and Johnson-Laird (1974) argue that recall varies as a direct function of the extent and stability of organisations for TBR items. They contend that every combination of stimuli has an "optimal organisation" which is defined by subjects' past experiences with stimuli. "The more stable is this memory structure, the more salient are the cues which define the structure and the more likely it is that these cues will be accessible during retrieval" (Pg. 1015).

These ideas are extremely compatible with this thesis. Consumer choice processing involves comparison, which is executed most easily using attribute oriented strategies. These are likely to form more stable episodic memory structures (i.e. optimally organised representations) and are less prone to integration and input failure. The reverse is true for brand oriented processing; episodic memory would be prone to integration and input failure. One method of evaluating input failure is to examine the time taken by subjects to create specifically oriented information groups and to complete the sorting phase of the experimental design (Figure 6.3.). The longer subjects took to complete this task, the more cognitive effort was required by the task, and the

less optimally organised would episodic memory structure be. Evidently, subjects found it substantially more difficult to create brand oriented memory structures than they did to create attribute oriented structures. These findings dovetail with those above; subjects using brand oriented memory structures during recall are more prone to input and integration failure than those using attribute oriented organisations.

An important adjunct to this discussion concerns Biehal and Chakravarti's (1982a) contention that memory structure is brand organised. Interpreting their findings to have dealt with episodic memory, it would have been expected to find here that brand oriented sorting procedures were completed more quickly and that brand oriented memory structure was more prone to input and integration failure. That this is not the finding of this research, that Biehal and Chakravarti used fictitious consumer data which cannot possibly be representatively (optimally) organised, and that a doubt as to the efficacy of verbal protocols in the study of information processing exists, somewhat tempers their conclusions.

Ease of Retrieval Versus Amount of Recall In Figure 6.4., the SRP value derived for each subject has been plotted against the total number of target items recalled on trials 3-10 of the MFR procedure and a regression line has been derived for each research condition. Although these regression lines are retrospective and cannot be used to infer a chronological sequence of organisational processing, it is likely that the greater the degree to which task conditions facilitated retrieval, the more target items would be recalled and the more would a

particular memory structure be used as a retrieval framework.

This positive relationship is indeed observed for the prompted research conditions (1 and 2) and, moreover, the regression slope for the attribute oriented condition (1) is more positive than for the brand oriented condition (3). It is reasonable to infer, therefore, that when prompted to use the sorted groups as retrieval plans, subjects retrieved more items using an attribute oriented retrieval framework than subjects who used a brand oriented framework.

The same rationale can be applied to explain the less strongly and more strongly negative slopes, observed for non-prompted retrieval in conditions 2 and 4. The slope for brand oriented retrieval (4) is much more strongly negative than that for attribute oriented retrieval (2). These results can be explained in terms of attribute oriented retrieval being more easily executed than brand oriented retrieval; and prompted conditions facilitating use of retrieval hierarchies, and hence implicitly facilitating retrieval, to a greater degree than non-prompted task conditions.

Thus, in summary, the introduction of a prompt enhanced retrieval processing ease across both brand and attribute oriented memory structures. However, because brand oriented memory structure proved to be a cognitively more difficult retrieval framework to use, this organisational processing was more prone to integration and input failure, and the effect of prompting was attenuated.

The Anomalous H5(c) Whereas H5(a), (b) and (d) are not significant at the 0.05 level, H5(c) has a p value of 0.025 (two-tailed test). This result is anomalous and extremely difficult to account for, especially as H5(a), (b) and (d) are markedly insignificant.

This result is based upon ORP statistics, derived and compared across research conditions 1 and 3. It was argued (Section 5.6.) that there should be no significant difference in the distribution of ORP values across research conditions, because the ORP statistics are based upon the closest interitem proximities, irrespective of their allegiance to specific memory categories. That this is not the case indicates that items were consistently recalled in a more stable order in the prompted research condition (1) than the non-prompted condition (3). One can only suggest that the effect of prompting subjects to use the attribute oriented retrieval plan was so marked, that subjects constantly used this structure and thus the position of target items in the recall protocols was stable. Conversely, in the non-prompted condition interitem recall proximities were capricious, with items being retrieved in constantly fluctuating positions, hence depressing the ORP statistic.

That the same effect was not observed for H5(d), where brand oriented structures were used, perhaps indicates that the constant use of a retrieval plan in this prompted condition did not occur and indeed, that the difficulty inherent in using a brand oriented framework prevented its immediate and enduring use during retrieval.

6.7. Predetermined Memory Structure and Integration Failure

Whereas (H1) - (H4) evaluate the ease with which subjects retrieve data from brand and attribute oriented memory structures, (H6) - (H9) evaluate a subject's propensity to use the predetermined memory structure as opposed to developing a retrieval plan irrespective of this episodic memory structure.

During MFR testing, subjects were theoretically free to adopt any retrieval processing strategy in order to complete the recall task. Of course, the presence of differently oriented memory structures, as well as the differential introduction of a prompt, would impact upon a subject's propensity to use the episodic memory structure during recall. In relation to memory structure, it would be expected that when a predetermined memory structure was one which facilitated recall of target items, then this structure would be used as a retrieval plan. Integration failure would not occur.

Integration failure can be examined by comparing the discrepancy between the ORP and SRP values. If a subject perceived that episodic memory structure facilitated retrieval, the structure of recalled data would closely resemble that of the episodic (predetermined) structure and the ORP - SRP discrepancy would be small. Conversely, when the predetermined memory structure was not perceived to facilitate retrieval, this structure would not be replicated in the recall protocol and the ORP - SRP discrepancy would be proportionately larger.

Earlier discussion has shown the assumptions underlying the initial direction of (H1) and (H2) to have been incorrect, for subjects

retrieved data more easily from attribute oriented memory structures. These earlier findings are reflected and indeed confirmed by (H6). Under prompted conditions, subjects who possessed attribute oriented memory structure were much less prone to integration failure than subjects possessing a brand oriented structure (H6: $z = 2.08$, $p = 0.018$).

Combined, (H1) and (H6) demonstrate that subjects both preferred to use the attribute oriented memory structure to recall target data and that retrieval processing using this structure was, in itself, a cognitively easier task. A tacit feature of these results is that subjects of the brand oriented condition found retrieval using this alternative structure a cognitively more difficult task. They tended to construct retrieval plans which were not brand oriented to execute the recall task. This close relationship between a subject's enhanced propensity to use a specific memory structure and the enhanced ability to retrieve information from that structure, is really only to be expected. Clearly, this relationship is interdependent. Subjects will typically tend to retrieve information from structures which facilitate retrieval, for in this way cognitive strain is minimised.

It is perhaps inappropriate to consider a relationship between the predetermined memory structure and integration failure in the context of the non-prompted conditions which (H7) covers. When a subject was not prompted to use a specific structure as a retrieval plan, integration failure tended to take place (H2). Nelson (1969), Lange (1973), and Scribner and Cole (1972), have all examined the ability of children to exploit, and to be trained to exploit the conceptual

dimensions of presentation materials, with the purpose of organising retrieval. Scribner and Cole show that 7-11 year olds will categorise their retrieval organisation under cued, or constrained experimental conditions, but do not spontaneously categorise their recall in the absence of specific instructions to use a particular retrieval plan. Moely et al (1969) dealing with 5-6 year olds demonstrate that specifically teaching children, during both the sorting and retrieval procedure, enhanced their retrieval organisation. Flavell (1970; 1978), Bjorklund and Zeman (1982), and Roedder (1981), all note that children with production deficiencies are able to use storage and retrieval strategies to remember information but only use these when prompted to do so.

Thus the insignificant result of (H7) is not unexpected. Together, (H2) and (H7) show that despite the existence of an established and accessible memory structure, subjects will not use this structure unless specifically instructed to do so. As a consequence, the facilitating effects of attribute oriented memory structures are obscured, for when a memory structure is not utilised during retrieval, it is clearly impossible to evaluate the propensity of subjects to use that structure. Scribner and Cole (1972) summarise this situation by stating that it is important to distinguish between the "accessibility of higher order units and their actual utilisation in retrieval" (Pg. 855).

The two remaining hypotheses (H8) and (H9), compare the ORP-SRP discrepancies for subjects in the prompted as opposed to the unprompted

research conditions, the former based upon attribute oriented structure and the latter upon brand oriented structure.

In (H8), the ORP-SRP discrepancy is significantly smaller in the prompted compared to the non-prompted condition, indicating that the propensity to adopt an attribute oriented retrieval framework for prompted subjects exceeded that for subjects in the non-prompted condition. Again, (H8) complements (H3). A prompt to use the attribute oriented memory structure as a retrieval framework not only had an obvious effect of stimulating children to use this structure, but facilitated retrieval processing ease at the same time.

The differential effect of memory structure on retrieval processing enhancement or attenuation has already been observed, but is reiterated by (H9). The result of (H9) shows that the propensity for subjects who were prompted to use a brand oriented retrieval framework did not exceed that for subjects in the non-prompted condition. The cause of this result has already been discussed: if subjects perceived brand oriented retrieval to represent a cognitively difficult task, then they would be more prone to use superficial rehearsal strategies at the expense of using the predetermined memory structure as recall aids. Thus, prompted subjects would not use the brand oriented memory structure during recall for it did not facilitate retrieval, whilst unprompted subjects did not use brand oriented memory structure during recall because of production deficiencies.

6.8. Summary

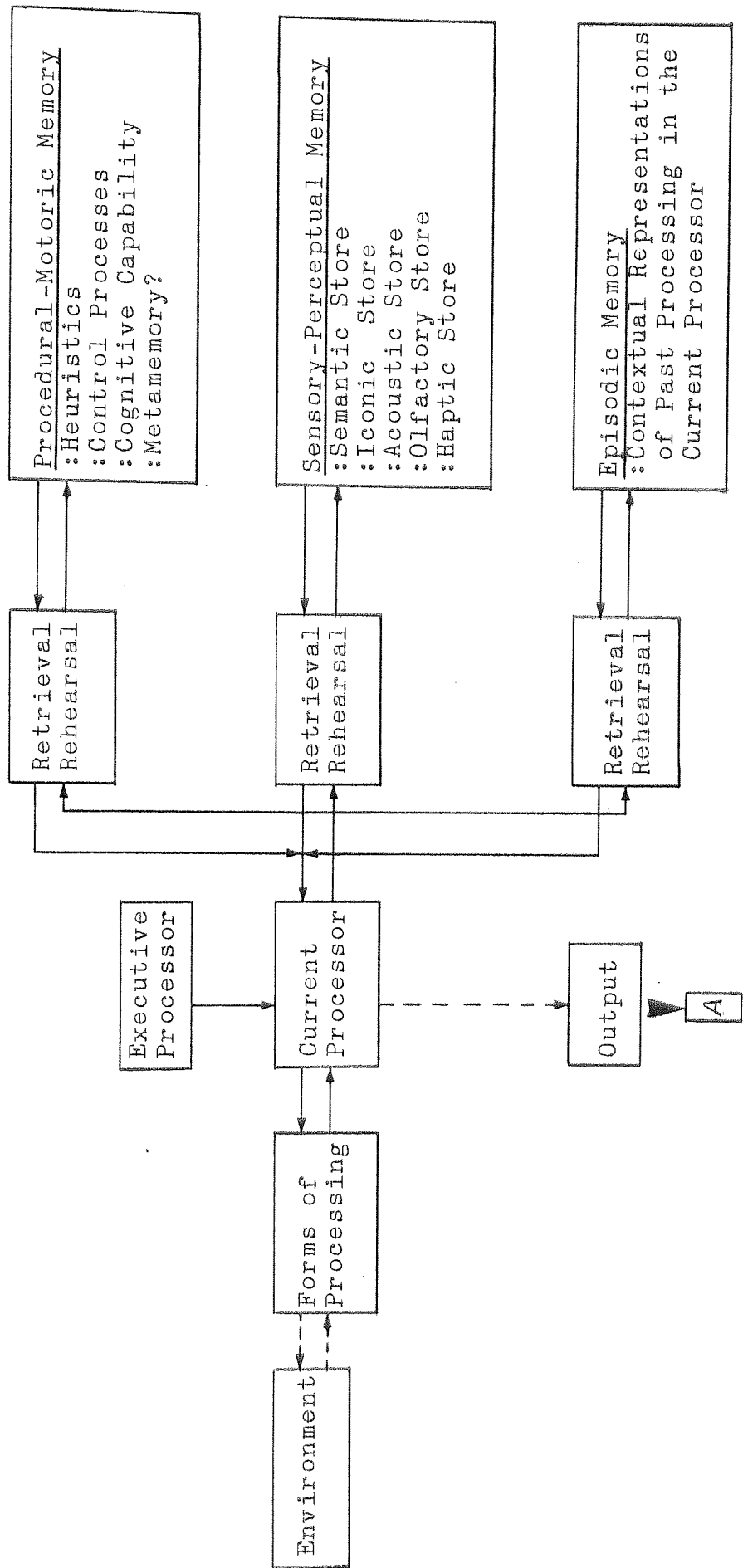
This chapter has demonstrated that 10-11 year old children will not spontaneously use a predetermined memory structure to facilitate their recall. They rely on fortuitously discovered item similarities, generated after recall has commenced to facilitate recall. A permutation of maintenance and elaborative rehearsal involving capricious switching from recall strategy to recall strategy characterises their information processing. They lack a planful retrieval strategy and suffer from integration failure.

Under prompted conditions, it has been argued that retrieval from episodic memory takes place. The structure of this episodic memory is seen to influence retrieval processing ease. Attribute oriented episodic memory structure facilitates retrieval processing more than brand oriented structure does, and the tendency for subjects to use attribute oriented memory structure, as opposed to any other memory organisation, is enhanced in comparison to subjects using a brand oriented organisation. Thus, brand oriented memory structure accentuates integration failure and fosters the use of capricious recall strategies.

Consumer choice processing which is attribute oriented minimises cognitive strain in comparison to brand oriented processing. This is because attribute oriented processing is more representative of everyday functioning in the current processor, creating more familiar episodic representations. It has been argued that because attribute oriented memory structure is more representative and more familiar,

this format of episodic structure has a facilitating effect on retrieval processing ease.

Figure 6.1. The Functional Morphology of Memory.



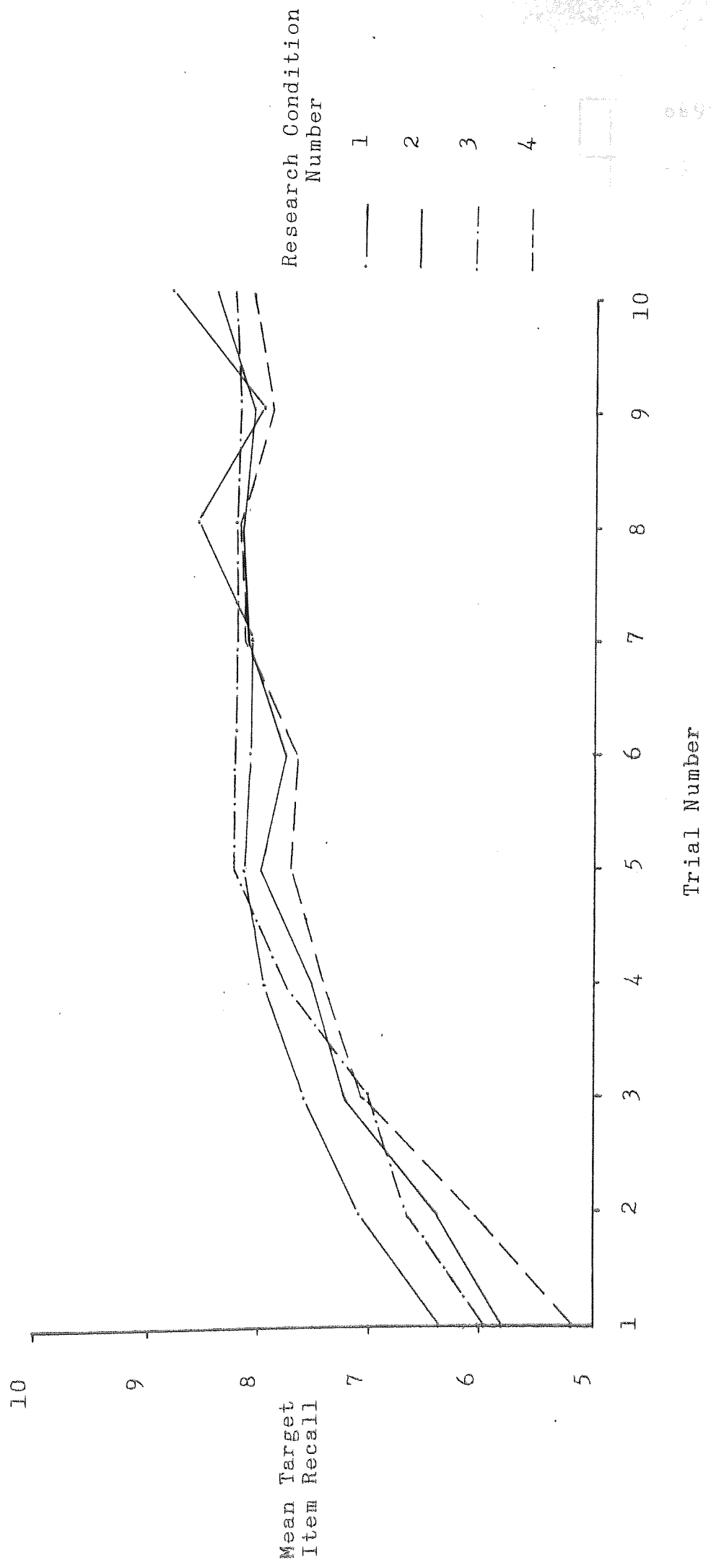


Figure 6.2. Subjects' Mean Target Item Recall.

Figure 6.3. Frequency Histograms: Time Taken By Subjects to Complete Sort Phase of Experimental Procedure.

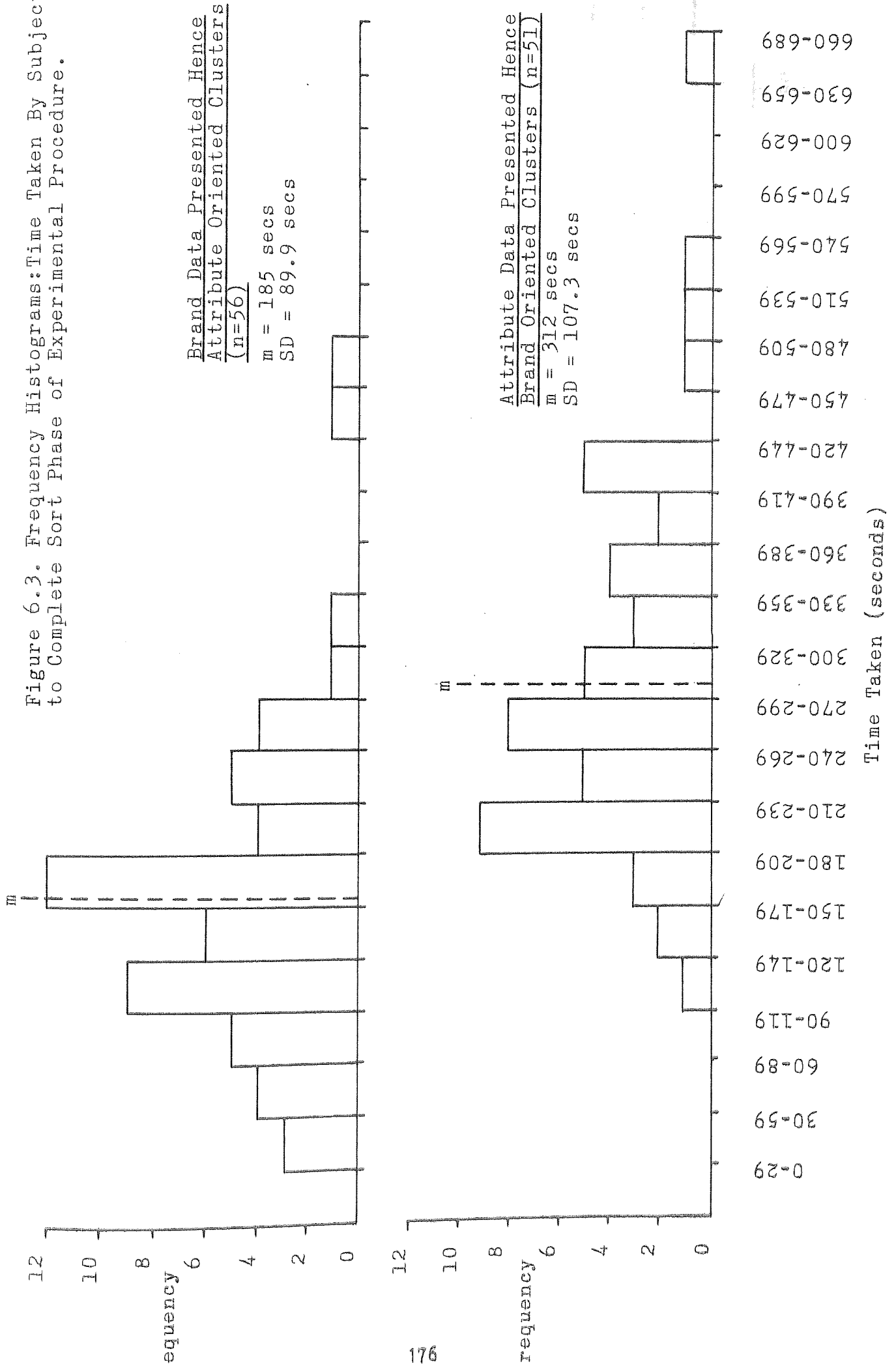
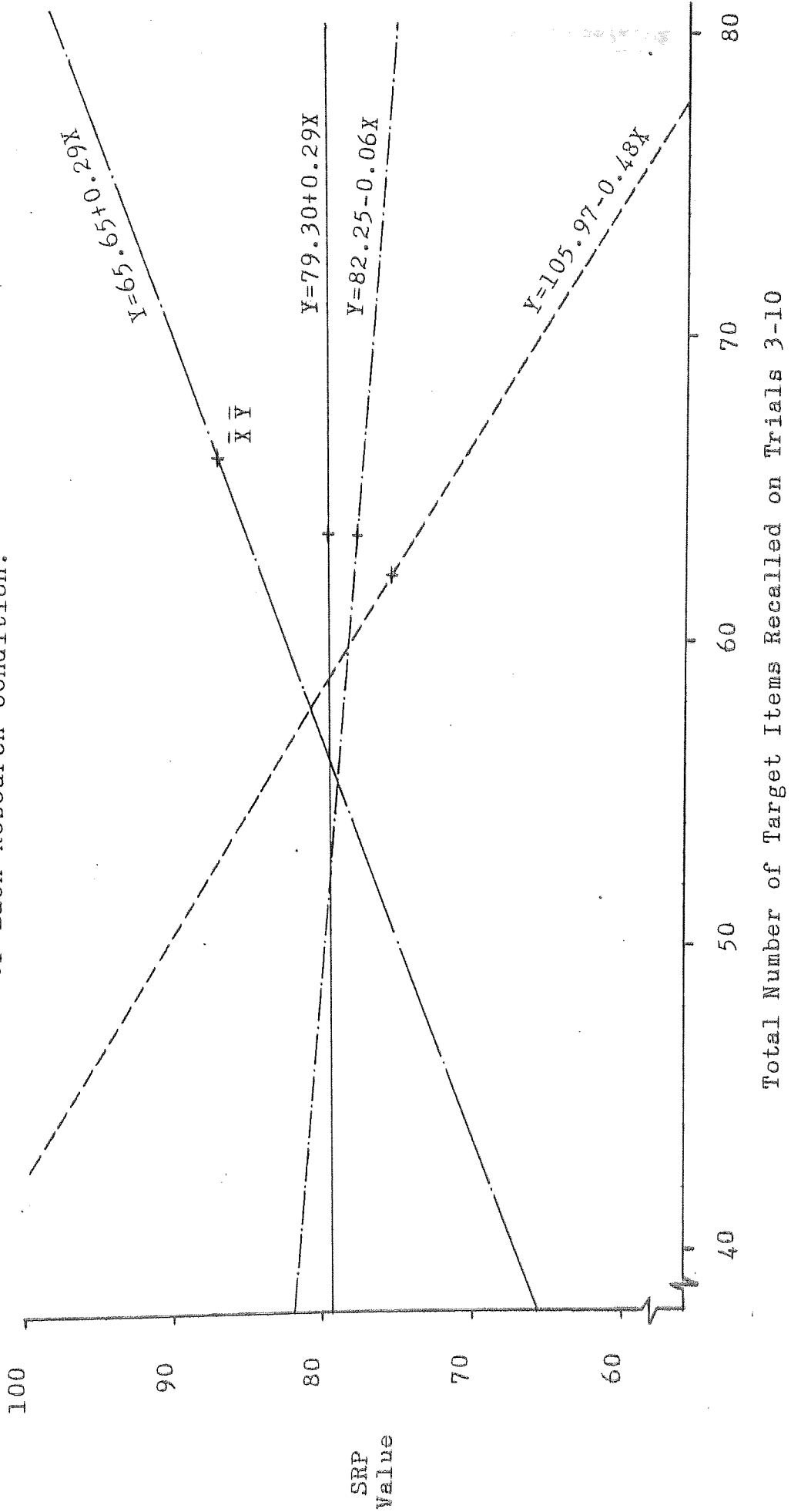


Figure 6.4. Subjective Retrieval Processing Values Regressed Against Total Recall Volume For Subjects of Each Research Condition.



Chapter 7

MARKETING AND CHILDREN : IMPLICATIONS OF THE INFORMATION

PROCESSING PERSPECTIVE

7.1. Introduction and Overview

In this chapter, a more commercial perspective of information processing theory is taken. The aim of this chapter is not to select a parochial product-market situation and bring to bear detailed strategies which may have relevance in such a context. Neither is it a realistic goal to identify the set of subject-task processing permutations and their diverse processing characteristics. A mid-course is charted between these extremes.

Inevitably, a descriptive framework must be established before a prescriptive use of processing theory in a marketing context can take place. Thus, a straightforward methodology for structuring marketing situations is put forward, a basis for segmenting children using their processing characteristics is adopted and criteria for effectively communicating brand support information to children of different age groups and in differing processing conditions are discussed.

7.2. Marketing Products to Children

A two stage methodology can be used to develop marketing philosophy in children's markets. Initially the marketing situation is structured. Subsequently, within that structure, marketing information is communicated to those children comprising the target market segment.

Problem Structuring Because marketing situations vary both in terms of scale and content, Ansoff's (1979) distinction between strategic problems and their tactical components is adopted here. Using this terminology, a "strategic" problem may represent a corporate, a market, or a brand issue. Clearly, the scale at which a strategic marketing problem is defined impacts upon the definition of the tactical components relevant to the problem. For instance, a multinational company's desire to increase profitability - a strategic problem - may involve consideration of national financial "units", or the company's performance in isolated markets, or groups of markets, and so on. Yet at a brand level, for example, the tactical components in a strategic marketing goal to increase market share involves manipulation of those company - market - product entities which impact upon the definition of the marketing mix. Zif (1980) adopts an analogous macromarketing - micro marketing distinction.

The essence of this methodology is to structure the marketing situation using a flexible and simplistic approach (Figure 7.1.). This simplicity is important; managers will use simpler approaches, but tend to shy away from superficially more complex methodologies. Moreover, simple problem structuring genuinely focuses attention upon the relationship between the desired marketing goal and the alternative strategies which can be used to achieve that goal, at a time when effective pre-emptive action can be taken. Problem structuring discourages retrospective decision making.

The dynamicism of markets is accounted for in this approach via the use of market research. Any ambiguity in, or ignorance of the relationship

between tactical entities is researched (Figure 7.1.). Remembering sales and profitability are the linchpins of marketing, it is important to conduct valid and functional research (Davidson 1979), which has commercial application.

In short, this simple structuring procedure serves to identify potential avenues of decision making in the marketing context.

The Provision of Consumer Information to Children

Because the decision to operate in children's markets is typically taken at a senior level, the majority of managers work within a pre-structured marketing situation. They have no need to structure corporate policy. They are, however, involved in the day to day "micromarketing" of products and this involves provision of brand support information via on-package, in-store and media advertising. Moreover, changes in product attributes - size, packaging, texture, distribution, and price - can also be considered as sources of consumer information under managerial control. A four stage methodology can be used to effectively communicate consumer information to children.

(i) Identification of marketing and communication goals. Adopting the strategic - tactical rationale again, but this time on a micromarketing scale, it is important for a manager to identify what information he wants the child to acquire and use during CIP (the micromarketing strategic goal) and to identify the (tactical) issues which may be manipulated to achieve this goal.

(ii) Determination of processing limitations of the child audience. As recipients of marketing communications, a primary variable which will affect the efficacy of those communications is the cognitive

ability of children of different ages to process and understand incoming information.

(iii) Selection of a structure, format and source of marketing communication. That is, how is information best provided?

(iv) Provision of consumer information in a manner which matches and reconciles the joint requirements of the marketer and the child.

Clearly, the broad, two-stage methodology outlined here can, because of the capricious nature of the strategic-tactical definition, be used to structure marketing philosophy at a corporate or brand level, in isolation or concurrently. The degree of unity is a reflection of communication proficiency between senior and junior management. Having outlined the steps involved in identifying marketing goals (Figure 7.1.), the nature of child audiences and of marketing communications are now discussed.

7.3. Child Audiences

There are two sources of information to which a child plays the role of audience. Externally, information is received by reading, watching television, listening to conversation, or by perceiving environmental objects and events. Humans try to comprehend, study and remember important external information. Internally, ideas, images, sounds, sentences and attitudes are generated and in this context thinking is a "listening" role. The listener may manipulate internally derived information, which may be encoded and communicated to an external audience to be "listened" to by other members of the audience.

Like the adult, the child receives messages of all kinds and these engender cognitive representations in him. If the child is spoken to, he automatically endeavours to interpret this semantic data. Unlike the adult, the child may be unaware that the message he has dealt with represents a tentative, or incomplete interpretation, that the message has meanings beside the one which he has understood, or that the interpretation which the message is eliciting in him is vague, unclear and possibly incorrect (Flavell 1978, Beal and Flavell 1983). Children may be processing deficient in their perception, comprehension, and use of marketing communications. Certainly, their processing capacity is restricted.

In order to clarify the nature of processing deficiencies in children, Roedders' (1981) classification of processing characteristics - limited, cued and strategic processors is adopted. This is based upon age-related changes. Although some researchers argue that age is not the best criteria to base developmental changes upon (Maier 1978), and that to do so automatically encroaches into the cognitive homogeneity - heterogeneity argument (Flavell 1982); age-related changes are used for three reasons. Age is a practical marketing heuristic used in contemporary markets; segmentation of children's markets using three age-groups is broad enough to deal with volume children's markets and fine-gained enough to account for psychological developmental changes; thirdly, using age abrogates the need to delineate children's processing in terms of memory factors, perception, and comprehension - a shortsighted distinction in the context of marketing communications. The characteristics of limited, cued and strategic processors can now be outlined.

Limited Processors Young children, under six years old, exhibit mediational difficulties (Flavell 1970). That is, they cannot use storage and retrieval strategies to enhance learning, even when prompted to do so. Additionally, it is appropriate to characterise limited processors in terms of Piaget's developmental stages and to simultaneously consider their processing in terms of Maccoby and Hagen's (1965) distinction between central and incidental learning. Thus, the concept of limited processor incorporates pre-operational stage children whose learning tends to be incidental in nature. Adopting age as the segmenting criteria, the age range of limited processors incorporates children upto 8 years old.

Limited processors are characterised in terms of intuitive thought, perceptual centration, cognitive irreversibility and by their egocentric perspective of events. They have a tendency to see a relationship between two items when in fact more exists. For example, "I haven't had a sleep, so this isn't the afternoon" would be a typical comment from a 5 year old child who misses a usual afternoon sleep (Wackman and Wartella 1977).

Limited processors concentrate on the dominant perceptual attributes of objects. This perceptual centration is best illustrated in relation to children's attention to television. Limited processors tend to learn incidental information, which is non-essential to the central plot of the communication (Calvert et al 1982). Wright and Huston (1981) stress that in order to understand content which is central in the communication, children have to become less dependent upon the formal features, such as auditory and visual production techniques, which they

attend to at the expense of the central important content. This perceptual centration prevents limited processors solving simple reasoning tasks, undertaking elementary conservation tasks, and effectively precludes their systematic classification of objects.

These cognitive constraints make the child's externally valid cognitive representation of his own actions difficult, and therefore limited processors view their environment from an egocentric perspective, in which the relationship between objects, events and ideas is unclear and in which the concepts of time and space are confused. Moreover, limited processors find it difficult to think about a sequence of events or to cognitively "backtrack" and to return to their original cognitive premise. In short, under eights have poorly organised ways of thinking about objects, events and ideas. They are undiscerning consumers.

Cued Processors The second age segment are cued processors who exhibit production difficulties. That is, children are capable of using storage and retrieval strategies when prompted to do so, but tend not to use them spontaneously. These 8-12 year old children relate to Piaget's concrete operations developmental stage. Their increasing cognitive development allows and accompanies a change from perceptual centration to perceptual decentration, and this is exhibited in the development of selective attention and a propensity to acquire more important conceptual and central message content (Collins et al 1978).

The term "operations" refers to "any representation act which is an integral part of an organised network of related acts" (Flavell 1970b).

Piaget (1972) identifies a series of cognitive changes which define the operational aspect of concrete operational thought. Primarily, a child is able to undertake reversible thinking and this thinking may proceed to find the original cognitive "starting" point unaltered. Moreover, the same cognitive point can be reached by two different paths without either one being intrinsically altered. In turn, two successive actions may be combined into one, and finally, when the same action is repeated, it either adds nothing to itself, or represents a new action with a cumulative effect.

These cognitive changes facilitate the logical, arithmetic and spatial-temporal operations, which are required to solve simple reasoning problems. Accordingly, the 8-12 year old child becomes more cognitively efficient and begins to take on elementary characteristics of the information processor as portrayed by Bettman (1979a). The cued processor, for example, is able to classify objects. Whereas nine year olds' groupings are egocentric and stress what "you or I can do with the objects that makes them alike", 11 year olds are able to construct a rule of inclusion based upon the functional, operating properties of the objects to cover all objects in the groups (Bruner and Olver 1970). In comparison, 6 year olds cannot generate a rule to uniformly account for all members of a group. Moreover, cued processors can integrate events temporally (Mervis and Rosch 1981). However, the processes of cognition and perception are not totally independent. The child must see the objects upon which cognitive operations are performed.

Strategic Processors Although 10-11 year olds begin to spontaneously use storage and retrieval strategies, strategic processors are able to

suppress processing of incidental information to ensure greater retention of central content without being prompted to do so. This ability characterises 13 year olds and older children.

Strategic processing corresponds to Piaget's formal operations developmental stage in which cognitive ability and thinking becomes much more flexible and adult-like. Operational skills can now be applied to ideas independently from perception. Perceptual decentration, combined with the ability to think about abstract ideas not specifically tied to the present, implicitly allows hypothesis testing. Strategic processors are much more active problem solvers; and now they conform much more to Bettman's (1979a) conceptualisation of information processing. They can envisage hypothetical relationships, acquire relevant information, and actively seek information; they can test propositions, monitor their cognitive performance and check the outcome of their problem solving behaviour. Their processing is mediational and they have gained proficiency at reconciling internal with external information, a process which is polished and refined as new problems and situations arise and are experienced.

To briefly summarise, three age segments have been used to characterise the processing abilities of children; limited processors (0-8 years old) cued processors (8-12 years old) and strategic processors (13 + years old).

7.4. Structure and Source of Marketing Communications

As a function of this research and that referred to in previous chapters, it seems reasonable to recognise two models of marketing communication based upon structure; the first brand oriented and the second attribute oriented. Golden (1979) refers to these structures in terms of non-comparative and comparative advertising.

In brand oriented communications, a single brand product is presented and its associated attributes are differentially emphasised. The majority of fast-moving consumer goods are supported by brand oriented advertising, a tacit feature of which is the assumption that the consumer will evaluate each brand comprising the evoked set according its attributes, and that the promoted brand will be favourably psychographically positioned.

Conversely, in attribute oriented communications, a product attribute or attributes are presented, and a series of competing products, each evaluated with respect to that attribute, are emphasised. The promotion of less frequently purchased consumer durables, house and car purchases and the majority of services are characterised by attribute oriented advertising. Nevertheless, because brand oriented communications focus on single products, whereas attribute oriented communications invite inter-brand comparisons, manufacturers typically adopt the former communications structure.

Although communication is often regarded as environmental input, marketing communication is also a function of recall from the LTM. In the preceding chapter, which dealt with the structure of marketing

communications and their retrieval from episodic memory, it has been argued that attribute oriented retrieval is facilitated in comparison to brand oriented retrieval. The basis of this argument is that the structure of the current processor is malleable; that attribute-oriented current processing minimises cognitive strain and is effective as a problem solving strategy, and that episodic memory stores contextual representations of past processing. Thus, marketing communications have both internal and external facets, and attention to external information is just as important as attention to (i.e. retrieval of) internal information. Moreover, just as numerous modes of external communication exist - television, radio, word of mouth, print advertisements, it is plausible that different sensory-perceptual data is encoded using different sensory stores and encoding systems (Grass et al 1983). The internal-external "locus of control" distinction is therefore important (Rotter 1966).

Thus, it can be seen that effective provision of consumer information to children involves consideration of several factors. The strategic and tactical marketing goals, the processing limitations of the target children and the source of format of the marketing communication. The provision of this information can now be discussed.

7.5. Children's Information Processing: Implications for Marketing

Strategy

Limited Processors: Marketing and Young Children The concept of goal directed consumer behaviour, involving goal switching, identification of initial and desired states, deliberate use of memory, and external,

deliberate information acquisition, involves cognitive skills which young children do not possess.

Limited processors must acquire an ability to distinguish situations which demand use of memory, they must learn how to use memory advantageously, and they must also learn about the major variables which affect memory performance (Flavell 1978); the young child learns and recalls information without any preconceived intention to learn or recall that data. Moreover, under eights don't understand that an explicit request to remember items of information requires them to scrutinise material carefully, or to name, or rehearse the data. They do not differentiate information (Appel et al 1972).

Such sporadic and non-purposive behaviour makes the limited processor difficult to predict. However, this inherently means that recognition is a much more important memory function than recall, and the combined effect of recognition memory usage, perceptual centration, and egocentric thinking, tends to make limited processor stimulus-bound. In marketing terms, a young child is impulsive, has little brand loyalty and a motive to buy a product may represent nothing more than a child noticing a perceptually eye-catching colour, shape, or a product within easy reach.

Although it is popularly believed that young children are little more than "passive vessels of reception" (Mander 1978), the relationship between attention and comprehension of environmental communications is the subject of substantial research (Roberts and Bachen 1981) and most recent research indicates that young children may not be such inanimate

information receivers (Lorch, Anderson and Levin 1979; Calvert et al 1982).

Undoubtedly, the spontaneous selective attention to the conceptual aspects of incoming information is a function of primarily overcoming the limitations of perceptual centration. Until this limitation is overcome, it is foolish to expect young children to undertake "deep" conceptual processing of the semantic material in messages. The limited processor is unable to spontaneously select the essential content of communications and as a consequence of this immature comprehension (Collins 1979), any meaningful representation of advertising messages is precluded.

However, young children do attend to salient features in a televised programme. Salience is best understood in terms of conflict (Berlyne 1968) which occurs when novel, incongruous events or variables - intensity, change, contrast, movement - are perceived. Put simply, children will pay attention to rapid character action, and visual or auditory special effects because they are conflict-arousing, perceptually salient features (Huston-Stein and Wright 1979). Clearly, if the important essential content of a message, which may represent the storyline in the message or the marketing information that is important to communicate, can be presented using salient features, then it may be possible to improve a child's comprehension of the material.

In fact, two concepts are invoked here. Young children may be encouraged to attend to the content of messages simply by varying the perceptual salience of the features used in the production. But

increasing a child's overall level of attention does not automatically equate with his increased understanding. Obviously, if incidental information is made perceptually salient at the expense of central content, then the comprehension of a communication is not enhanced (Lorch et al 1979). The clear lesson here, is that a child's attention should be guided by conveying central content using salient features.

Donohue, Henke and Donohue (1980) used cartoon characters in this way and demonstrated that young children's understanding can be enhanced. Another method of gaining the attention of young children is to use non-verbal auditory features, such as "zip" noise sound effects (Calvert et al 1982) and "sneaking up on you music" (Lesser 1974). Moreover, Calvert et al (1982) found that child dialogue is selectively attended to, whereas adult narration is selectively inattended to. Despite this fact, the central content of messages is usually conveyed to children using character dialogue, often using adult narration (Hayes and Birnbaum 1980). In such circumstances, it is not surprising that children fail to comprehend messages: they attend to non-relevant information.

Another aspect of this problem concerns encoding. When information is presented visually to young children it is recalled in pictorial form, whereas information presented using dialogue or narration is recalled verbally (Meringhoff 1980). Limited processors tend not to integrate their perceptual modalities. The plausible argument that iconic coding develops before symbolic encoding systems (Bruner et al 1966), that imagery improves recall by a factor of up to three in adults (Paivio 1971), and that visual recall is easier than verbal recall in young

children (Hagen 1972; Peterson 1977, Pressley 1982) suggests that stressing visual aspects in communications can be beneficial to young children's comprehension (Hayes, Chelemski and Birnbaum 1981).

In this context, a most effective method of conveying marketing information is to present central content using salient pictorial and auditory features, to gain further attention by using child dialogue which relates to these features directly (Anderson et al 1981), and to avoid using adult narrative which refers to content removed in time or place.

Despite these manipulations, Calvert et al (1982) show that 5 year olds find incidental (i.e. non relevant) content easier to understand than central content, presumably because it is concrete, discrete and factual information. In contrast, the comprehension of central content often demands using cognitive skills, such as understanding temporal relations in stories, which is beyond the ability of young preoperational stage children. Thus, it may be a worthless goal to guide children's attention if they are unable to understand the meaning of this selectively attended to data (Anderson et al 1981; Krull and Husson 1979).

Another important research topic which has bearing in this context, is the finding that cognitively immature children may simply be unaware that television commercials have persuasive intent. Ward and Wackman (1973) found that 56% of 5 year olds were unaware of the underlying selling motive in commercials, although this figure reduced to 12% of 8 year olds and 3% of 11 year olds. These results were reiterated by

Robertson and Rossiter (1974) who also found that 50% and 56% of 6 and 10 year olds respectively understood that "commercials tell you about things", that is, have an assistive intent. More recently, Donohue et al (1980) reiterate these latter observations. These findings may be viewed from two perspectives. First, because a substantial number of children are unaware of the selling content in commercials, they are unlikely to use the information during purchase. Alternatively, it can be argued that they would be prone to accept the information at face value.

It is this second moral and ethical implication which has triggered off objections to advertising being aimed directly at children, especially in the United States (Roberts et al 1978). As research allows a fuller understanding of the social effect of advertising, it is probable that directly child-oriented advertising will become more controlled in the U.K.

Drawing upon this research base, it seems that the direct promotion of products to under eights is not an overtly time or cost-effective process. Young children are unlikely to recall information; they are likely to attend to incidental and therefore product unrelated information. Although theoretically possible, the cost and practical difficulties implicit in the definition of perceptually salient data outweigh its potential marketing effects, for there is no guarantee that children will attend to or comprehend this data. Moreover, children of this age have limited spending ability, negligible brand loyalty and a brand awareness constrained by the physical presence and recognition of products in retail outlets. Difficulties can also be

anticipated as perceptually novel and conflict-arousing content quickly becomes "un-novel" (Axelrod 1980). Repeatedly different novel perceptual content tends to divorce the product from its advertising and of course advertising has a non-cumulative effect if children don't recall content. In this light, it is not surprising that novelty children's products have short life cycles.

Perhaps the most constructive strategy which may be used to develop young children's markets is to focus upon the development and control of children's behaviour as a function of the parent-child dyadic unit (Maier 1978). The need to please a parent may present a child with a loosely defined goal and a parent's desire to help and protect a child is a well known interaction. Ward and Wackman (1974) show that 50% of 5 year olds attempt to influence parental purchase of food products such as snacks, cereals and sweets, and 44% request brand names. Moreover, Atkin (1978) and Miller and Busch (1979) stress that parents are responsive to children's purchase requests. Two thirds are acceded to. Research also shows that children incidentally learn the meaning of goods through observational learning (Greer et al 1982) and that children model their parents' prejudices and preferences (Saunders, Salmi and Tozler 1973; Dix and Grusec 1983).

In a practical sense, a product designed for an under eight year old may be marketed using a multi-pronged strategy. The product should be perceptually very noticable in terms of colour, shape and packaging, for children rely on recognition of perceptual characteristics as opposed to recall of conceptual attitudes and opinions. It must be exceedingly well distributed, for young children will not specifically

ask for a product which they cannot see, and the product should be placed in the child's perceptual field for the same reason. Clearly in store promotion is an all-important pre-requisite to a successful product, underlining the importance of wholesaler and retail promotion.

The conceptual aspects of the products should be clearly aimed at parents. Thus educational, medical, or social approval are valuable techniques. An expert's approval of a child oriented product, or promotional offers with educational undertones, for instance collecting labels to acquire educational leaflets or to help charities, are strategies which might be useful here (Sternthal, Dholakia and Leavitt 1978).

The advertising of products should also be two pronged. Conceptually it can be targeted at adults, parents, teachers or other significant references. Perceptually, distinctiveness of the advertising is important and this may be achieved by using contemporary cartoon characters, or indeed creating non-copyright characters, with the explicit aim of enhancing product imagery, or using host-selling (Miller and Busch 1979).

In terms of mode of advertising, visual encoding and recognition of brand images, or names, characterises young children's processing. Radio and print advertisements which obviously incorporate semantics are difficult to process, will likely be ignored and are therefore precluded. The most cost-effective advertising is likely to be based upon enhancing brand awareness, and if phonetic similarities and associations can be incorporated into child dialogue, then so much the

better. Television advertising has been discussed already; but the clear implication is that short, frequent television promotion, stressing perceptual product attributes, or contemporary novelty of salient possibly cartoon characters (and imagery), and with the goal of stimulating brand awareness, is important. However, as it is quantity as opposed to advertising quality (ie perceptual versus conceptual content) the effects of advertising are likely to be short-lived and not particularly cost-effective. Again commercial "wearout" is likely to be rapid (Axelrod 1980) and advertising costly.

A long-term marketing strategy based upon frequent product introduction and range extension, stimulated by in-store promotions and emphasis on below-the-line expenditure would plausibly be more effective than heavy television exposure in low profit/high volume markets. In-store promotion is vital, for advertising and product purchase are not temporally separated, the use of recognition memory is encouraged and children are free to initiate product requests. Moreover, if television advertising proves too costly, educational material sent to schools, or stimulation of brand-related competitions represents a viable alternative strategy, and one which provides a valuable source of market research information.

Cued Processors: Marketing and 8-12 year old Children

There are three main themes in the following discussion. Initially a marketing philosophy related to 8-12 year old children is put forward. This philosophy is then justified in terms of the processing characteristics of cued processors. Subsequently, methods of translating this marketing philosophy into a practical marketing

strategy is discussed. At the outset, it is also important to note that the following discussion concerns high volume/low unit profit children's products: markets in which advertising plays a vital role. Implicitly, manufacturer-oriented, account-oriented and flexible markets, in which low cost production, personal, direct selling, and high product customisation may be respectively substituted for advertising (Shapiro 1979), are not directly considered. The logic here is straightforward. Children are rarely target consumers in these latter market types.

The philosophy advocated in the marketing of products to 8-12 year old children is simple. Products should possess a markedly superior or unique single product attribute. Marketing communications should then stress this superiority by having an attribute-oriented structure and by stimulating, in turn, attribute-oriented CIP. In the specific context of marketing communications, a three-fold goal is advocated. The communication must attract attention thereby initiating CIP. It must aim to maintain processing by stimulating metamemorial functioning and elaborative rehearsal in children. Thirdly, it must aim to guide the course of processing and direct the outcome of processing, a goal which involves manipulation of the nature of stored knowledge.

This philosophy is justified in terms of the information processing characteristics of 8-12 year old children. Cued processors gradually develop cognitive skills which enable them to transform incoming information. Their cognitive performance is enhanced by an increasing ability to systematically organise, encode, retrieve and elaborate information. Yet it is the lack of spontaneity in using these

abilities which is most relevant in the marketing context, for children who don't use cognitive strategies spontaneously-whatever these are- are susceptible to external prompts, and specific prompts markedly improve cognitive performance (Kobasigawa 1977; Ford and Keating 1981; Pressley 1982; Cavanaugh and Perlmutter 1982). Against this background, it is clear that whilst any type of consumer information can be considered as a potential prompt, and may indeed initiate behaviour which is commercially beneficial, not all types of consumer information serve to prompt CIP in 8-12 year olds. Clearly, invoking the internal-external locus of control concept (Miller and Weiss 1982), it can be seen that the source of a prompt may be environmental, but in order to be effective it must be used cognitively by the child. This is what is meant by introducing or activating metamemorial knowledge in children.

This concept can be easily explained in terms of Figure 6.1. Metamemorial knowledge is a child's knowledge or awareness that memory may be used in different ways and represents the domain of the CP. Memory knowledge refers to the characteristics of the stored information - its content, form and structure as defined in Chapter 4; Memorial knowledge characterises the procedural-motoric and sensory-perceptual data which is stored in both contextual episodic structures or in non-contextual form (Figure 6.1.). The aim of a marketing communication is therefore to stimulate metamemorial knowledge, analagous to functioning of the CP, by providing problem-solving heuristics. Moreover, to be effective, the prompt must stimulate retrieval of episodic memory; and for the system to be most efficiently used, the structure, content, and form of episodic memory must

facilitate information retrieval and processing. In short, the demands of the consumer choice task (e.g. the purchasing of a product) must generate enough conflict to initiate processing, whilst internal, episodic, and external (advertising) information must occur in a format to facilitate and maintain processing.

Capon and Kuhn's (1980) research throws light on the development of children's consumer information processing. Limited processors make judgements about products using a shifting single-dimension strategy; they buy products based upon their evaluation of a capricious attribute. This strategy gives way to one which involves making judgements using a single constant dimension. Thus, cued processors ignore other dimensions upon which preferences exist. Subsequently, products are assessed using two or more attributes, and preferences are integrated into a more complex judgement, considered to be a simple linear compensatory model (Capon and Kuhn 1980; Bettman 1979a). Moreover, numerous researchers contend that inexperienced CIP is characterised by attribute oriented processing (Bettman and Kakkar 1977; Russo and Johnson 1980; Bettman and Park 1980). Furthermore, the restrictive inability of children to selectively attend to information before perceptual decentration develops (Masters 1981; Miller and Weiss 1982) supports the contention that attribute oriented processing is a chronological prerequisite to brand processing. On balance, a strong case argues that cued processors use attribute oriented processing.

The results of this research show that when prompted, cued processors find attribute oriented retrieval easier than brand oriented retrieval. Using this finding, and arguing that information which is stored in a

form which minimises cognitive strain is both more likely to be retrieved and is more easily used during current processing, it seems clear that 8-12 year olds metamemorial awareness and current processing is enhanced by attribute-oriented episodic memory structure. Thus, it seems logical to present external information in an attribute oriented format with the aim of structuring the LTM in this way. In short, to present attribute oriented marketing communications is likely to stimulate and maintain children's processing, simply because the format of the communication matches the demands of the choice task and of current processing. This very process of matching the structure of internal and external information sources with that of consumer task demands, inherently tends to stimulate metamemorial strategies in cued processors.

The justification of the cued processors use of attribute structured internal and external communications during consumer choice processing ignores two just as important variables; the amount of information used during processing and the nature of the information content. In terms of volume of information, it is evident that every children's product possesses a series of attributes. Moreover, it is likely that only a small proportion of products which could be potentially purchased, and indeed only a small number of these products' attributes are in fact considered at any one time. A diverse array of issues have bearing in this context and many have already been mentioned in earlier sections. Information load, the role of chunking and information load reduction, the equivalence of brand and attribute information as sources of information load, and the use of heuristics to simplify complex processing tasks all have implications in the context of marketing to

cued processors (Malhotra 1982; Lussier and Olshavsky 1980; Simon 1974 Sheth 1979).

Because there is no robust method of identifying what the parameters of information chunks are in the context of consumer information, or indeed of identifying those cognitive processes which generate rules of chunking, the way forward here is to reconsider Capon and Kuhn's finding that children use only a restricted number of product dimensions during CIP. Accordingly, the importance of defining the upper limits of information load in marketing communications is abrogated and the rationale is inverted. Marketing communications should be focused upon conveying small quantities of salient information, for it is this information which is used during decision making and this information which is likely to be required by cued processors.

Just as central and incidental features of television content have been discussed in relation to limited processors, it is clear that if only small quantities of information are going to be communicated to cued processors, especial consideration must be paid to ensure that product information has both relevance and salience. Information which has both these characteristics is not only likely to be spontaneously recalled, but is also more likely to be used during choice processing. Of course, the identification of attribute information which fulfills those characteristics is confounded by a number of factors.

First, the idiosyncratic nature of information processing across individuals and across time, means that the relevance and salience of

attribute information is an ever-changing variable. Arguably, the content of advertising and product attributes would have to regularly change in order to accommodate such differences - a clearly expensive and impractical policy. Secondly, it can be argued that children don't in fact know, or at least cannot identify their information needs (Cavanaugh and Perlmutter 1982). The logical outcome therefore, would be for the company to take an aggressive role and to basically convince the child market that the product presented and the accompanying information is what they require-an extremely risk-laden policy, but one which Lastovicka and Bonfield (1982) argue is appropriate, at least for "low involvement" brands. That is, advertising creates attitudes.

The ideal goal here for the company, is to identify the set of attributes which characterises a particular product class. This defines the set of information which is relevant to the particular product class and which is plausibly represented in episodic memory. Having isolated these "information parameters" the next step is to identify the salience of these particular attributes so that this salient information may be used in product promotion. More simply, if a child considers product price to be relevant and salient in his selection of a product, then it is variation in this attribute which will represent the most important determinant of purchase behaviour and it is information about product price which must be communicated in any advertising. In the execution of this research, it was found that for confectionery products at least, relatively few dimensions were used to describe a large number of brands and there is no reason why this shouldn't be the case for other product classes. The relevant attribute set is plausibly small for the majority of products.

Thus, the simple sorting procedure used in this research (Section 4.4.) is a straightforward, cost and time effective method of determining the relevant attribute set for a class of products, using contemporary market characteristics and in dimensions important to the target children. Moreover, a simple frequency count of the attributes generated, represents as good a market research method as any for scaling the importance of these attributes. Thus, the isolation of those attributes which are relevant and salient in children's CIP can be identified. Further, the groups of sorted products generated indicate the nature of episodic memory chunks, and rules of class inclusion themselves generate sources of new product ideas.

Having discussed the rationale behind advocating attribute-oriented communication structure, and the selection of a single, relevant and salient product attribute as a method of bringing a child's attention to a product's competitive advantage, one aspect of highly competitive children's markets has been overlooked. "Me-too" products are typically the rule as opposed to the exception. And unfortunately, the very fact that several competing products are characterised by a common and usually identical attribute, decreases attribute salience and reduces competitive advantage. For example, if several products are all packaged in silver foil alone, the memory representation for one product can become distorted through its interactions with identical representations for other silver-foiled products. In short, whilst inter-brand processing may be facilitated by the existence of common comparative criteria (Kelly and Michela 1980), this commonality decreases salience of the product and ultimately its market strength.

In order to counter this tendency and to make products less prone to this interference, products must be made as perceptually and conceptually distinct as possible. The fundamental importance of marketing products which possess a truly unique selling point, or a markedly superior attribute, is a factor which is shown to be vital to the success of new products (Cooper 1981; Calantone and Cooper 1981). Moreover, although this statement is common sense, a surprisingly large number of products developed, possess no product attribute which consumers perceive to represent an advantage. It is worth stressing that however good administrative commercial support for product is, such factors rarely overcome product deficiencies (Davidson 1976).

This argument applies the von Restorff (1935) effect, a robust phenomena which demonstrates that if one item in a set of items is made to stand out perceptually, then that unique item is better remembered. Evidently, a much stronger marketing position is achieved if consumers perceive a product to possess attributes which are both valuable and unique, for the product effectively defines its own market segment. Moreover, unique objects or attributes define their own categories in children's memory (Mervis and Rosch 1982) and these cognitive reference points have important marketing implications. Children compare other products using these criteria and this very process increases brand awareness, reinforces brand strength, improves brand memorability and bolsters market leadership (Thompson and Barnett 1981).

The "averaging crossover" effect is also important in this context. Averaging crossover refers to the fact that when a single attribute of a brand is presented alone, any variation in this attribute has a

greater effect on subjects' overall evaluation of the brand than when information about several attributes is presented simultaneously. For example, a subject would rate a product which was advertised as having excellent price characteristics, higher than one which was considered to have excellent price characteristics and above average size, the logic being that the two attributes would be "averaged". Yamagishi and Hill (1982) account for this crossover effect in terms of subjects making the inference that a product with excellent price characteristics would also have excellent size attributes. Their inference argument is, however, tempered by Lynch and Srull (1982) who report a range of contrary findings: the principles of concreteness, the tendency for subjects to give greater processing weight to common as opposed to non common dimensions and the tendency for subjects to evaluate negatively missing relevant attribute data during CIP. In relation to 8-12 year olds, Paris (1978) demonstrates that children tend to recall only explicitly presented relationships as opposed to relationships which are inferential, but clearly cognitive development imparts this ability.

The fundamentally important implications of the averaging crossover and von Restorff effects are clear. When cued processors begin to use two or more attributes during choice processing, information about a single dimension will have more effect on the decision process when presented alone than when accompanied by other data. Moreover, when this attribute is relatively extreme (ideally positively extreme) this piece of information will receive additional weight at the expense of accompanying items of information (Huber, Payne and Puto 1982; Huber and Puto 1983).

The introduction of affect here involves attitudes and their characteristics, undoubtedly a topic which is extensively incorporated into behavioural psychology (Ajzen and Fishbein 1981; Moschis and Moore 1979; Kelley and Michela 1980; Comstock et al 1978; Etgar and Goodwin 1982). In relation to information processing by cued processors, and in the context of marketing, it is plausible to regard the "locus" of attitude control as changing more from an external to an internal source. That is, as cognitive processing ability improves, a child's predisposition towards an issue, event, object or person is more cognitively controlled and less dependent upon transient perceptual and environmental features.

Exactly how attitudes equate with the architecture and functioning of memory is conjectural. Plausibly, an attitude forms an integral part of memory structure, which affects the relative structure and positioning of stored information. That is, attitudes represent an integral, contextual component of memory as opposed to some cognitive tag appended to memory structure. In terms of Figure 6.1., an attitude is implicit both as a representation in the procedural-motoric store and in the episodic memory. And in terms of cognitive functioning, an attitude affects the role of motivation, the construction of a goal hierarchy and ultimately the nature and outcome of processing. However, Gibson (1983) argues that the relationship between recall and persuasion is checkered and weak: the relationship is indeed unclear.

Underlying the information processing theory of choice is the assumption that attitudes precede action, implying a high cognitive involvement: an awareness-attitude-adoption hierarchy. Ray (1974)

suggests that under low commitment conditions this hierarchy of effects does not hold, and that awareness and minimal comprehension occurs first, to be followed by trial, and then attitude formation or change. Thus, information processing need not precede product selection (Olshavsky and Granbois 1979).

Applying these perspectives in a developmental context, it seems reasonable that in limited processors pre-purchase information processing is not a vital prerequisite to the act of product purchase and that trial and error represent the source of attribute generation. As cognitive maturity develops, a switch from post-purchase product evaluation to pre-purchase processing develops, with cued processors undertaking relatedness searching of memory, stimulus analysis and checking (Baron 1979). Thus, it is again argued that advertising to cued processors using correctly structured message format will complement the processing needs of 8-12 year old children, for they will be actively searching the environment for relevant product information.

How can this philosophy be translated practically into marketing strategy? A few simple rules are important. Most importantly, ensure that products possess a single attribute which is unique or better than competitive products, as opposed to a series of competitively similar dimensions. Secondly, stress the strength of this attribute at every possible juncture. Third, ensure that the product attribute lives up to its advertised strength. To fail to do this makes advertising wasteful, introduces cognitive dissonance and risks changing a strong positive attribute into a strongly negative attribute, especially in

relation to new product advertising, for consumers tend to consider the negative attributes of new products whilst watching advertisements (Olson, Schlinger and Young 1982).

Be aware that cued processors tend not to spontaneously use episodic memory information in current processing, that recognition memory involves less cognitive strain than recall, and that 8-12 year olds are prone to using the environment as an external memory aid. Thus, in-store prompts can, unlike television advertising, directly induce sales, for prompt and purchase are temporally closer. The use of as much in-store promotion as possible is advocated, possibly at the expense of extended television advertising. On-product competitions, in-store use of display material re-iterating the salient product message, and perceptually eye-catching packaging, all have the effect of attracting attention and initiating processing of salient product attributes.

The declining direct dependence on parents is replaced by an increasing peer-group interaction. The influence of social norms on buying behaviour is acute in 8-12 year olds, and the extent to which significant others think behaviour should be performed will have marked effect on attitudes, motivation and behaviour itself. Markets are therefore dynamic when products don't satiate a "real" need.

In terms of television advertising, cued processors know to attend to important dialogue and central content, and formal production features (e.g. camera zooms) do not distract their attention (Calvert et al 1982). The form and content of advertising should be kept

linguistically simple with verbal and visual features co-occurring. Cued processors will tend not to infer hidden meaning or relationships in commercials. As far as possible salient product attributes should be explicit in the advertising copy. Because of the non-spontaneous nature of processing in cued processors, continuous or intermittent screening of commercials is advocated. Because advertising content is salient a level continuous, or level intermittent timing pattern is advocated (Kotler 1980). Even in 8 year olds frequent advertising significantly influence purchase behaviour (Gorn and Goldberg 1982). Again the role of conflict is important here and Krugman's (1983) research has implications in terms of targeting commercial exposure. Commercials for children may be most effective when they interrupt specific types of programmes.

In terms of market research, unstructured data collection techniques involving observation of behaviour are markedly preferable to structured techniques. Research goals should isolate product-attribute characteristics and range, and attribute salience. Although the role of pricing has been shown to have marked effect (Miller and Busch 1979) and little effect (Heslop and Ryans 1980) on children's choice of products, common sense argues that children's self-purchase products are price-sensitive, possibly due to parental and retailer influences. Thus, competitive pricing policy is important to adhere to.

Typically, marketing policy involves combatting the effect of adverse information in the market place. Information processing theory advocates two strategies to counter such information, one based on storage and one based on retrieval (Tybout, Calder and Sternthal 1981),

best demonstrated with reference to an example. Consider a confectionery product rumoured to accentuate tooth decay. To categorically refute this contention increases rehearsal of the rumour and strengthens the stored association, effectively making this negative attribute more strongly negative. The storage counter-strategy involves introducing information about other brands which possess this same negative attribute. The averaging crossover effect used inversely in comparative advertising effectively spreads the negative effect of the adverse attribute across several products, diluting its effect in relation to the particular brand rumoured to cause tooth-decay. Wilson and Muderrisoglu (1980) showed comparative (i.e. attribute oriented) advertising to produce more counter arguments, source derogations and negative ad-related statements than noncomparative advertisement, supporting the storage counter strategy.

The retrieval counter strategy invokes the von Restorff effect. By introducing a new product attribute concerning the confectionery product (e.g. a price reduction) the importance of the adverse rumour is superseded by the introduction of more important information, which is more likely to be retrieved. Thus, the effect of adverse marketing information is countered.

Strategic Processors: Marketing to children aged 13 and above

Consumer behaviour envelopes situations in which superficial and deep processing occurs, in which recall and recognition have variable effect on processing, in which level of familiarity and experience influence processing, in which processing may or may not be automatic, may or may not be contextual and may or may not involve metamemory. Clearly, CIP

could be described using any permutation of Jenkins' (1979) orienting tasks, materials, criterial tasks and subjects, or alternatively may be understood in terms of a combination of sensitivity knowledge and person, task, and strategy variables (Flavell and Wellman 1977). Yet in a practical sense, how can these perspectives, which are used to describe an individual's specific information processing and memory usage, be drawn upon in relation to the marketing of a particular product in a market relevant to a manager?

The approach put forward here in answer to this question is to first emphasise that developmental cognitive constrictions on processing are relaxed in older children; for strategic processors evaluate information spontaneously. Secondly, a distinction is drawn between high and low involvement types of CIP and similarly between the high and low risk characteristics inherent in marketing situations (Figure 7.2.).

High Involvement Consumer Information Processing High involvement processing is characterised by prediction and planning, active consideration of task relevant information and monitoring and checking of problem solving processes (Brown 1978). This involves voluntary and selective attention to stimuli, internal and external memory search, active synthesis of information and re-allocation of processing capacity as progression through the goal hierarchy alters task demands.

High involvement CIP involves between product comparisons using both evaluation of common attributes and inferential evaluation of non-common dimensions. Hence attribute-oriented processing and memory

structure is stimulated. In terms of memory usage, information which is represented in episodic memory tends not to be retrieved, simply because it has little relevance to current processing. High involvement processing takes place because contemporary processing demands cannot be dealt with heuristically by retrieval of episodic memory and past experience (Formaniano et al 1982). Memory use is therefore constructive, in the sense that inter-item associations, relationships and evaluations are generated as a function of current processing and are then stored in episodic memory. Non-contextual experience - generally applicable heuristics such as "Buy the cheapest", are combined with information indigenous in the environment and in the sensory-perceptual store to generate episodic memory representations. The "cost" of thinking must, however, be outweighed by the perceived benefits of choice processing (Shugan 1982).

The process of chunking and the construction of memory structure is unclear (Lindsay and Norman 1972; Rumelhart, Lindsay and Norman 1972; Kintsch 1980). However, it seems evident that the construction of episodic memory involves a chunking process in which the recall of a limited number of inter-item associations can be used to represent the meaning of a much larger number of associations. Three sets of research findings have bearing in this context. Bettman's idea of conditional decision processing (Bettman 1971; 1979a); Kintsch's (1972; 1980) notion of propositions and their relative importance in conveying the meaning of narrative; and Schank and Abelson's (1977) concept of scripts.

Bettman found that if a subject's processing sequence is represented using graph theory, then decisions based upon evaluation of a limited number of cues (attributes) predicted choice outcome just as well as decisions taken after evaluation of a much larger set of cues. He argues that as long as the relationships between those items which represent the configuration or pattern of environmental cues remain valid and stable, these may be discounted during processing, allowing a complex decision to be conditionally based on a restricted number of attributes. In short, a complex decision is based upon the condition that information configurations are stable.

Kintsch argues that the meaning of narrative can be represented in terms of topics or propositions, which share common ideas. In representing these propositions using a hierarchical, connected graph, the most important proposition is stored at the top of the hierarchy with less important propositions, and hence topics with decreasing idea commonality, related at structurally lower hierarchical levels. Clearly, the larger the "semantic distance" between propositions, the less likely they are to be recalled. Moreover, in recalling the meaning of narrative, the most important proposition is recalled and this subsequently allows a chain of recall to occur which elaborates the detailed meaning, or context of the narrative, should this be necessary.

Schank and Abelson have also argued that in understanding text or narrative, it is the ability to relate how one event leads to, or creates another, and how this casual chaining develops, which is the prime determinant of understanding. Much of Schank and Abelson's work

considers behaviour in terms of achieving goals. They argue that to understand behaviour, the way in which plans initiate actions, and the way in which both actions and plans relate to goals is important. Thus, understanding why a person behaves involves both inferring a goal and assuming that each action has some part in an overall plan for achieving that goal. The observer, in fact, brings to bear social, factual, or contextual information to explain a goal-plan-action sequence. More importantly, if a particular goal-plan sequence is repeatedly used by a person, Schank and Abelson contend that the behaviour which results becomes routinised and stereotyped; a conventionalised activity called a script.

Drawing upon these three areas of research, it seems plausible that if a consumer repeatedly processes information concerning a specific choice situation, then a script is developed. Thus, the semantic meaning of that script can be semantically represented in terms of differentially important propositions and decision making can be conditional upon re-evaluation of a limited number of salient attributes (Brown, Day and Jones 1983).

Moreover, in terms of high involvement processing, the process of script development is analogous to the process of current processing leading to the construction of episodic, contextual representations. Thus, high involvement processing incorporates the notion of active consideration of task relevant information, involves deep processing (Craik and Lockhart 1972), a central route to persuasion (Cialdini, Petty and Cacioppo 1981), constructive processing as Bettman (1979a) uses the term, and leads to relatively enduring attitude changes (Cook

and Flay 1978). Moreover, the outcome of high involvement processing, which can be equated with "subject-generated" information (Thompson and Barnett 1981) is better recalled than "experimenter-provided" information.

Low Involvement Consumer Information Processing Clearly, if memory structure becomes more and more chunked, less information need plausibly be processed in order to make a decision as effective as one made by reprocessing the entire set of task-relevant information. This is what is meant by low involvement consumer information processing: a reliance on episodic representations of past processing to offset the need to undertake repetitive re-evaluative information processing. Inherent in this reliance upon chunked experience is minimisation of cognitive strain, for a re-evaluation of only a few attributes clearly demands less processing than recycling through the task-relevant information.

A feature of low involvement CIP is that the chunked relationships which are tacit in this type of processing are, in fact, valid and stable with respect to current processing and are recognised as such. If this is not the case, any discrepancy has the effect of interrupting low involvement processing and initiating high involvement processing to reconcile the conflict generated. Conflict when recognised, therefore, has the effect of transforming low involvement into high involvement processing (Taylor and Durand 1979).

One other topic has important implications here: the relationship of low-commitment consumer behaviour (Robertson 1976) to low and high

involvement consumer information processing. Using Krugman's (1965) and Ray's (1974) work as a basis, Robertson argues strongly that when the risk inherent in purchasing a product is slight, intense cognitive processing is not justified and decision-making is not preceded by extensive examination of task-relevant data. Trial is proposed to represent the main information source for product evaluation. Clearly, the idea of low-commitment consumer behaviour opposes the concepts of low and high involvement processing outlined above. Nevertheless, these perspectives can be reconciled by considering the temporal sequence of CIP.

Arguably, consumers evaluate the nature of their purchases after a product has been consumed (Korgoanker and Moschis 1982). If a product is deemed to be subjectively good or bad, these positive and negative evaluations will respectively increase and decrease the propensity to repurchase. If a negative evaluation does not have this effect, a scenario in which consumers continue to buy products which they dislike can be envisaged, a clearly unlikely situation.

The important point here is that post-purchase evaluation takes place irrespective of whether low-commitment conditions exist. Logically, therefore, in order for attitudes to develop, high involvement processing must be initiated and episodic memory structure stimulated. Thus, although low-commitment consumer behaviour may initially occur as a function of a specific set of task situations - inexperience with the choice environment, lack of product knowledge and negligible risk - this "low-commitment" behaviour cannot persist unless high involvement processing has taken place. Evidently, this "low-commitment" scenario

may be interpreted as an impersistent initial phase in a sequential transition from high to low involvement consumer information processing. Accordingly, in the minority of markets whose task conditions foster low-commitment behaviour, post-purchase consumption, learning, and high involvement processing subsequently take place, therein demonstrating the ephemeral nature of low-commitment behaviour.

Finally, incidental learning (Postman 1975) in which learning takes place without any conscious attention to learn, is interpreted here as non-contextual data acquisition, which may be stored in the sensory-perceptual LTM and which is potentially available for subsequent task-relevant processing. To sum, high and low involvement CIP are broadly analogous to "bottom-up" and "top-down" processing respectively.

High Risk Marketing Situations In a marketing context, risk can be defined as the expected value of negative outcomes inherent when a product is purchased. Risk evaluation is clearly a subjective entity, but high risk in marketing situations may be induced by expensive purchase prices, or by products which are socially significant, or personally important. Implicitly, lack of product experience prevents an objective evaluation of the negative outcomes of choice (Korgoanker et al 1982). Thus, products which are irregularly purchased, those which are unfamiliar and goods which are in the early stage of their life cycles are risk laden. Similarly, new products and established brands which are repackaged, reformulated, retargeted, or relaunched acquire higher risk characteristics. The consumer reaction to high risk products is varied, but usually the purchase decision is delayed until the uncertainty falls below some acceptable threshold (Corbin

1980). In short, subjective uncertainty is reduced by further information acquisition (Meyer 1982).

Low Risk Marketing Situations Inevitably, low risk is a characteristic of choice situation in which the expected value of any negative outcomes is deemed to be lower than a subjectively acceptable maximum. Typically, low risk characterises older products in the mature life-cycle stage; these have been purchased on a more regular basis and the relationship between expected and actual performance is familiar. Low risk also characterises less expensive products, positioned as low priced alternatives of satisfactory quality. However, neither frequency of purchase or low price are guaranteed predictors of low risk. Consumers interpret price (Jacoby and Olson 1977) and often the high item marking is used to indicate high quality. Thus, risk and price can be negatively correlated. The same rationale applies to unfamiliar new products introduced under a generic brand name. The brand name infers quality and reduces risk. Finally, low risk typifies marketing situations in which conflict is either absent, is present but not attend to, or is present and discounted.

The Relationship Between Risk and Processing The criterion of risk and processing type are valuable in defining the processing conditions which surround the purchase of many products in diverse markets. The four sets of processing conditions, intuitive, conative, brand loyal and transitive (Figure 7.2.) cannot exhaustively characterise CIP in relation to all products in all markets. They do however aim to provide a framework which can be used to differentiate the changes in CIP which occur as a product evolves through its life cycle. Moreover,

having identified these conditions, a basis for developing marketing strategies to change these conditions, or to capitalise upon them exists.

The high risk-low involvement criterion used to define intuitive processing conditions are apparently contradictory. However, in some markets enough information to reduce risk to an acceptable level cannot be acquired or processed, and thus risk remains high. For instance, a purchase decision may be very complicated, not only in terms of the number of relevant attributes but also as a function of the complexity of those attributes. A consumer is therefore unable to interpret information when presented, is unable to develop criteria to allow product discrimination and this high processing load effectively abrogates processing. The purchase of unfamiliar technical or electrical equipment, such as computers and expensive consumer durables, the selection of a professional or non professional service, or the purchase of a product such as perfume, in which product differentiation is implicitly difficult are good examples of products purchased under intuitive conditions (Formisano, Olshavsky and Tapp 1982). This intuitive processing may be induced by time pressure with the same effect: risk is not reduced but demand is still present. Additionally, intuitive processing may be seen to almost anomalously characterise some low-priced products. Carlson and Gieseke (1983) show that consumers actively undertake extensive store searches in an attempt to buy products at their lowest offered purchase prices, reiterating the complexity of the price-risk relationship. Intuitive processing is inferential. Non-contextual stored heuristics are used to evaluate products and branding is used to discount risk. A product

may be purchased using superficial and readily processed criteria: "this product is the right colour, has a pleasing appearance, is manufactured by a well-known company".

Under conative conditions, high risk and high involvement processing co-occur and are reconciled. The positive and negative pre-purchase evaluation of product attributes allows risk to be reconciled. If a product is not perceived to fulfill expectations, more information is collected until the product is either rejected or its purchase justified (Punj and Staelin 1983). The purchase of expensive consumer durables, cars, holidays, and luxury goods are examples of conative products. The motives underlying conative processing may include novelty-seeking and desires for "social mobility" (Hirschman and Wallendorf 1982). Because high risk is inherent in conative processing, pre-purchase CIP is intense and persistent. Memory usage is constructive and attribute oriented. Moreover, high risk is possibly not fully dissipated immediately the product is purchased. Post-purchase information search may continue with selective acquisition of relevant information taking place. Products purchased under conative conditions are most prone to dissonance and are susceptible to enduring attitude change, for arousal levels are high (Korgaonkar and Moschis 1982).

Brand loyal conditions typify the processing associated with fast moving consumer goods. Because products are familiar and consumed on a much more frequent basis, product attributes are well known. Thus, any attribute change can be readily incorporated into the processing system and its value ascertained. Bettman (1979a) describes an association

between brand processing and the recall of stored rules to characterise the pictures of familiar brands (pg 307). A broadly similar stance is taken here. Assuming that the configuration of cues inherent in the episodic memory is recognised as being concurrent with those in the choice environment, plausibly a simple matching process of the most salient attributes, low involvement processing proceeds. The role that brand names play in chunking is important here. It seems reasonable that a brand name may be used as the most important proposition; a proposition which characterises those chunked attributes which are relevant in conveying the processed meaning of the specific product. Quite how a change from attribute oriented processing to a brand oriented memory structure occurs is conjectural. But it is evident that if brand and attribute information are alternatively stored in a hierarchical structure, then the object-dimension distinction is perhaps parochial when anything larger than a two-level hierarchy is considered. The argument put forward in section 6.4 is relevant here. Cognitive strain is minimised by both attribute oriented current processing and by brand oriented storage. The issue of the interrelation between the two is unclear and unresolved. However, under low involvement-low risk conditions, a tendency to repeat purchase is evident for there is no stimulus to evaluate competitive products when the existing purchase is satisfactory.

Under transitive processing conditions, the consumer is seen to be using a high involvement type of processing to evaluate low risk products, another superficially contradictory situation. But unless pre or post-purchase high involvement processing occurs, it is clear that the value of products in either subjective or objective terms

cannot be ascertained. And the concept of non-opinionated consumers muddling irrationally through choice environments is hard to contemplate. Because risk is lower in transitive processing, the motivation to undertake persistent and intense information search in order to allay risk, is not as strong as that inherent in conative conditions : the expected value of negative outcomes is lower when the purchase price of the two product is also depressed. Thus, if consumers find information irrelevant or difficult to process - for example evaluating price per gram of differently sized packages, (Capon and Kuhn 1982) or calculating nutritional content per portion, or if the volume of information which is task relevant is too large to process adequately, then purchase behaviour is volatile. Brand switching, trial and error purchasing, and short-term adoption of unfamiliar products in response to conflict, attention to, and acquisition of previously unprocessed data takes place. In other words, the negative outcome associated with not purchasing a regularly bought product is so small that new purchase patterns can be initiated. Evidently, transitive processing characterises new product introductions, the processing associated with products in the early stages of their life-cycles, and the processing stimulated by changes in the attributes of established fast-moving consumer goods.

Advertising : Its Marketing Function By changing the content, volume and mode for advertising, the processing conditions which characterise product purchase may be modified (Shimp and Bearden 1982). More specifically, advertising may reduce (or increase) risk in pre or post-purchase processing; may facilitate (or complicate) the processing of task relevant information; may demonstrate to the consumer and retailer

the manufacturers confidence in the product; and may act as a source of conflict, making the consumer aware that some change in the market place has occurred. As importantly, advertising cannot create product class demand on any large scale (Sturgess 1982) and nor it cannot overcome real product weakness (Ehrenberg and Barwise 1983).

The interplay between product quality, advertising, and price and their relationship to profit, is clearly central to marketing and commercial success. Farris and Reibstein (1979) show that those companies which have both high, stable market shares and maximise their return on investment, produce high quality products, charge high relative prices for that superior quality, and have a high advertising expenditure in comparison to their competitors. Moreover, they consistently follow this strategy. In effect, such a product can be seen to enter a market and be processed under conative conditions. Such processing evaluates and reconciles price and quality positively. This evaluation however, implicitly reduces the risk inherent in the product and allows a product with a high price and one which should induce high risk, to be characterised by brand loyal processing. Such a position is extremely competitively strong, for margins are high, perceived value for money is high, and quality offsets risk. Moreover, with high margins, marketers are more willing to advertise, positively reinforcing the strength of the product and its market share, for consumers use the high advertising and the superior quality-price relationship as a clue to the brands positioning (Raj 1982). Arguably, "popular products must be good and are likely to be advertised".

The role of advertising for products which are of assured high quality and fill a definite market need is therefore straightforward. Analyse the level of competitive advertising and at least match that level and if possible spend much more. The effects will be cumulative and reinforce positioning, will squeeze competitive margins and accentuate brand loyalty. There is, of course, a threshold above which advertising exposure generates negative responses (Belch 1982). Thus, an advertising balance must be achieved.

Some products enter markets characterised by conative processing are one unable to move into brand loyal processing conditions; high unit price and purchase infrequency may prevent this. When such a situation holds, it is not the volume of advertising which is important. The content and mode of advertising are much more relevant, for the goal of advertising is to guide processing and to help the consumer reduce risk below some subjectively defined standard.

Although no marketing strategy can be rigidly fixed, television advertising for conative products seems inappropriate. To be valuable, the content of advertising must be available, i.e. recalled at the time of purchase. The processing load placed by much television advertising would prevent this recall. A more efficient methodology is to transform this difficult recall task into a much easier recognition task by providing point of sale material, in which the functional meaning and relative importance of product attributes is presented. In short, this material provides evaluative criteria for the consumer to judge the product.

Print advertisements are also valuable in this context, for consumers are actively seeking information and will be able to acquire the higher information load of print advertisements by spending more time in the search process. The role of conflict in attracting attention under these acquisition conditions is much reduced and the role of imagery is much enhanced (Edell and Staelin 1983). Wright and Barbour (1977) stress that in complex choice environments consumers often use phased decision making, involving initial rejection of less strong brand names and subsequent, more intense, attribute oriented processing. Clearly, it is essential to market conative products under strong brand names, even at the expense of introducing new branding.

Having noted that arousal is high and hence processing intense, a relatively simple but effective method of reducing risk is the introduction of guarantees, the most powerful being a money-back guarantee (Shimp and Bearden 1982). Such a situation effectively reduces risk to zero, with the effect of positively reinforcing brand image. Evidently, the need for information acquisition in an effort to justify risk is abrogated and the buying process is markedly simplified.

The classic product failure is one which has a poor price - quality relationship. It enters as a transitive or conative product, depending upon price range, but cannot switch to brand loyal conditions. High advertising in fact depresses product sales by accentuating the product weakness (Belch 1982).

More usually, satisfactory products positioned at satisfactory price levels are introduced and these move straight from transitive to brand loyal conditions. The problem here, of course, is that distribution needs to be bolstered by advertising which aims to increase brand awareness. But if demand is low, volume advertising keeps margins relatively low and the ROI period is lengthened. Moreover, competitive positioning is vulnerable, especially if a product which has undergone the conative - brand loyal transfer is competing in the same market. The competitor has more capital to allocate to advertising, has a better price-quality relationship, yet the risk-processing characteristics are similar.

The majority of consumer goods fall into the brand loyal framework of Figure 7.2.. Although N. Anderson (1978) argues that the formation of attitudes is a constructive process and that a person "does not know his mind but is continually making it up", one of the characteristics of mature products is that attitudes tend to be enduring. Chapman and Chapman (1969) show that processing is guided by expectations and that people tend to see what they expect, even when it is not there. This illusory correlation is explained here as a shift from high involvement to low involvement processing. The consumer expects to find the configuration of environmental cues to be stable and the threshold at which conflict and the scanner and interrupt mechanism interrupts processing is somehow increased.

The number of marketing strategies which are used to boost market share are legion. But it is clear that if these effects are to be enduring, a switch from brand loyal low involvement to transitive high

involvement processing must occur. To simply increase risk in brand loyal conditions inevitably tends to depress sales. Although advertising in volume enhances product awareness and novel methods of introducing conflict into advertising are numerous (Sternthal and Craig 1974; Zielski and Henry 1980; Krugman 1983) enduring sales improvement involves improving the quality of the product. In competitive markets, one could argue that changing product composition involves new product development and creating new markets, and that such changes are perhaps not cost effective. Moreover, Jacoby and Olson's (1977) review of the way in which consumers use price - that unit price is often not stored in memory but acquired from the package in-store, that a brand name summarizes the approximate cost of a product and that broad price ranges are used to characterise products - suggests that price-cutting need not increase demand. In fact, using Zeithaml's (1982) work, which shows that sensitisation of the consumer to selectively pick out exact price levels is a prerequisite for exact-price recall, it is plausibly only price sensitive markets in which the traditional price-demand characteristics hold.

Thus, it can be argued that in order to interrupt the entrenched processing of brand loyal conditions, repackaging can increase the potential of a product for attaining valued states, or alternatively may reduce the risk. Undoubtedly, the major changes in market share in the confectionery market have been attributed to simple repackaging or reshaping of products. Moreover, the arguments which Twedt (1968) puts forward are still valid today; packages must be visible, informative, emotionally appealing and workable, for the message on the package

usually reaches far more consumers than any type of conventional advertising can afford.

One area of attitude research has direct bearing on repetition of advertising. The "mere-exposure" hypothesis (Zajonc 1967) suggests that the simple repetitive exposure to stimuli can induce affect towards that stimulus and Moreland and Zajonc (1977) have argued that stimuli need not be cognitively recognised on a conscious level for the effects of exposure to occur, a position supported by Wilson (1979). These findings can be interpreted as adding weight to the concept of sensory-perceptual memory acting as a store of "cognitive referents" (Tulving 1972). Stimuli, simply by co-occurring repetitively in the environment, are stored in "affect-free" configurations. Clearly, the role of concreteness is relevant in this context and, taken to its extreme, a process of no-involvement learning is absolutely plausible.

In the marketing context, Bukoff and Ellman (1979) show that if stimuli are initially disliked, this negative affect can be overcome by repetitive exposure and increased stimulus familiarity. However, this relationship does not hold for stimuli which themselves caused negative outcomes for the observer (Swap 1977). Thus, if a product which is initially disliked has attributes which are deemed satisfactory - presumably after post-purchase evaluation - repetition of advertising can enhance product image. But if post-purchase evaluation is negative, no amount of repetition of advertising can enhance brand image. Repetition may indeed induce negative responses (Belch 1982). Again, no amount of transitive processing and product advertising can overcome poor quality attributes, but repetitive advertising in brand

loyal markets can both stimulate market share and improve competitive brand imagery (Raj 1982).

So, in devising marketing and advertising strategies for 13 year old, and older children, it is important to evaluate the risk and processing characteristics which typify the specific product-market in question. Using these criteria, effective marketing strategies can be formulated to achieve specific and definable marketing goals.

7.6. Summary

In this chapter, an information processing perspective has been used as a basis for addressing children's consumer behavior and as a springboard for formulating marketing strategies in relation to children's markets. The importance of structuring marketing situations in terms of strategic and tactical components has been put forward, not least to avoid lag decision-making. The terms limited, cued, and strategic, have been adopted to segment the age-related cognitive and processing limitations of children. One distinction between an internal and external source of marketing communication has been made, and a second between attribute and brand oriented communication format has also been described.

In using these age-related criteria as a guide to formulating marketing strategies, the ways in which brand support information may be communicated to children have been discussed. The importance on in-store, on-package information and the media as sources of brand support data was emphasised. In dealing with strategic processors, whose processing is more akin to that of adults, risk and involvement were

used to describe the processing conditions surrounding product choice; intuitive, conative, brand loyal, and transitive conditions were described and were instrumental in formulating marketing strategies.

One possible reaction to this chapter may be that the discussion is common sense. Managers should be aware for example, of the need for consistency in pricing and advertising to maximise ROI; and that special attention must be paid to make advertising content salient to young children. A second reaction might be that the discussion puts forward broadly based marketing truisms which are always adopted in commercial environments. These reactions are countered in two ways. First, the descriptive basis put forward here is broad enough to incorporate product marketing in the diverse range of marketing situations which exist. The foregoing discussion can be used to develop, steer, justify or polish marketing strategies, irrespective of the idiosyncracies of the market, company, product, or personnel involved. Second, it is a fact that many marketing strategies are unsuccessful, that decision-making becomes subjective, twisted, and irrational, and that commonsense marketing truisms are ignored. Accordingly, the following chapter outlines a case study which, judging by the failure rates of products in contemporary markets, is not an untypical scenario. As will become apparent, a sound description of children as information processors is an invaluable prescriptive basis for appraising children's markets.

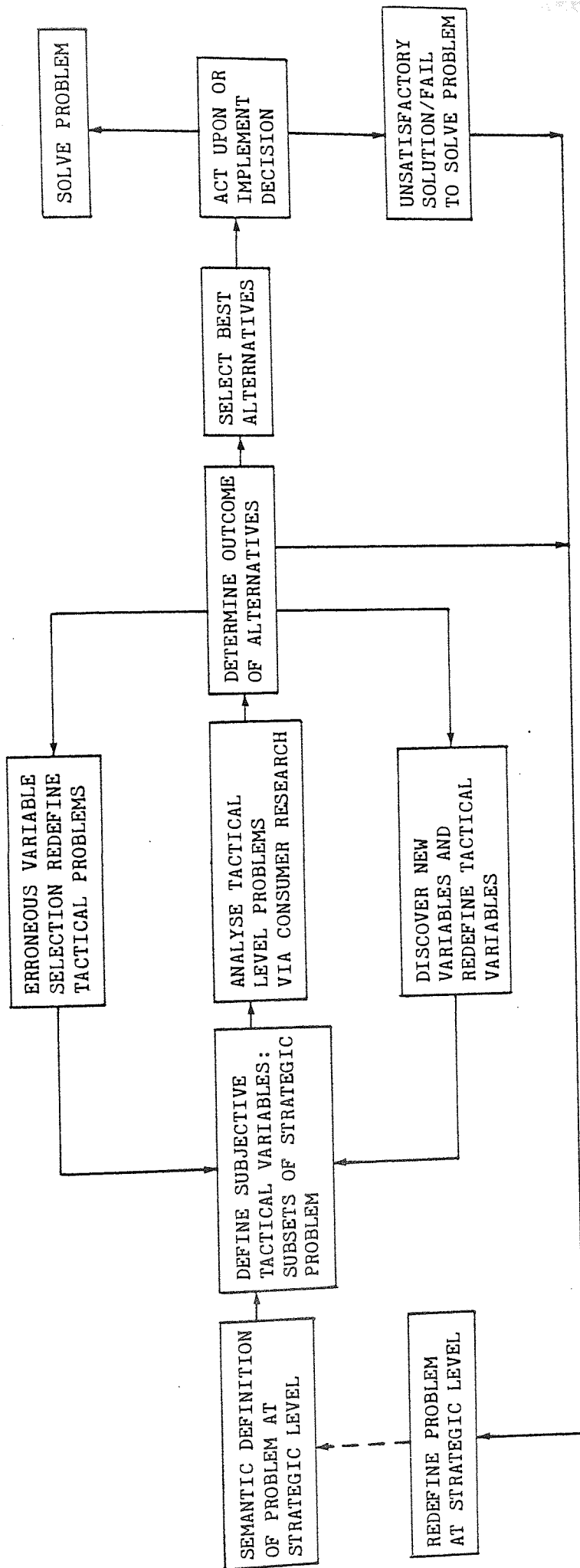


Figure 7.1. Structuring of Marketing Situations.

Risk Inherent in Marketing Situation	Type of Consumer Processing	Low Involvement	High Involvement
High Risk		Intuitive Processing Conditions	Conative Processing Conditions
Low Risk		Brand Loyal Processing Conditions	Transitive Processing Conditions

Figure 7.2. Taxonomy of Market Induced Consumer Information Processing.

Chapter 8

IPSO : A CASE STUDY

8.1. Introduction and Overview

New product development is "one of the most crucial yet deficient functions of the modern corporation" (Cooper 1981 Pg. 277). "Ipsos" is the brand name of a pellet sugar confectionery product launched onto the UK confectionery market in September 1979, and withdrawn from this same market less than 18 months later. Nicholas Laboratories expended a substantial amount of time, effort, and capital into the production and marketing of Ipsos, a product launched into a market unfamiliar to the company.

The company's goal of diversifying the product portfolio and strengthening corporate profitability was spearheaded by Ipsos. Unfortunately, the investment and sanguinity accompanying the product launch was invalidated by the sales performance of the product. Ipsos debilitated Nicholas' resource base, weakened the corporate trading position and represented an ill-conceived commercial venture. The failure of Ipsos redirected the nature of this research.

The case study detailed here describes the Ipsos project, identifies causes of the new product's failure, and puts forward strategies which may avert repetition of these marketing misjudgements.

8.2. The Need For New Products

Nicholas Laboratories' Business Position: Mid 1970's In 1974-1975, Nicholas International's sales turnover rose by 12% to A\$ 94.7m,

whereas pre-tax profits fell by an unprecedented 46% to A\$ 6.8m. This poor financial performance was attributed to a downturn in consumer spending, combined with 17% and 26% inflation in the company's major Australian and U.K. markets.

The situation was accentuated by Nicholas' product-market characteristics. In the pharmaceutical industry, the discovery and development of new drugs is historically heavily risk-laden and in the mid 1970's spiralling costs accentuated this risk. The situation was made worse by stringent controls which lengthened the time lag between discovery and launch of new drugs - a lag averaging 12 years in 1983. Moreover, the legislative fixing of the price of drugs meant that the development costs incurred were not being recuperated, and these low profit margins were both stretching Nicholas' limited resource base and beginning to favour the more resilient, larger pharmaceutical companies.

Internally, Nicholas' mainstay products, Aspro and Rennie, were approaching the mature stage of their life-cycles. Real growth would be difficult to achieve and sustain: growth, in all probability, would be inflation related. With flagging images, it was clear that an increasing budget would be required merely to sustain the market position of these brands. Moreover, the role of aspirin as a safe drug was being seriously questioned in Australia, where critics suggested a causal link between aspirin and kidney failure. In an effort to improve long-term profitability of Rennie, new tableting machinery was introduced to cut prime costs.

Elsewhere in the product portfolio, Radox bath additive was suffering severe competition, especially from the cheaper own-brands of retail chain stores. Similarly, Almay make-up was a licenced product whose future sales potential was good, but whose future was not indefinitely secure.

The corporate reaction to this unfavourable commercial position was to undertake a cost-cutting exercise, hopefully boosting short-term profitability. The UK development and research facility was closed and its function concentrated in Australia. Speculative research was terminated. Product licencing was vigorously adopted and 17 range-extensions and expansions occurred in 1976. More importantly, the company embarked on a policy of new product development, the first step of which involved the purchase of James Chocolates, an Australian confectionery company manufacturing a series of sugar and chocolate confectionery products.

The rationale behind this move was clear. The company could use its Australian confectionery business as a foundation upon which new confectionery products could be launched in its International markets.

The Attraction of Confectionery Pull and push factors combined both to override the overt absence of synergy in Nicholas' diversification into the confectionery market, and to justify the costly market entrance of a pharmaceutical company into an alien market.

Pushing the corporate strategy was the demonstrably unprofitable and precarious existing market situation. An urgency to widen the

company's product-market permutation and increase profitability was paramount. Secondly, the renewal of Rennie plant meant that useable tableting machinery was immediately available in the U.K. Thirdly, an in-house recognition that the patent for the design of "Lego" building bricks had expired in Europe, and a realisation that the company possessed the production capability to produce small sugar-based tablets, led to the conception of a new product concept: a sugar-based pellet confection called Ipso (Plate 8.1.).

Pulling the corporate strategy was the enormous potential of the confectionery market internationally, especially in one of Nicholas' major markets, the UK. By the anticipated year of launch (1979), the UK confectionery market would have a value of £1,700 million per annum, or £30 per head of population. The market was substantially larger than the company's traditional analgesic and bath additives markets. Confectionery consumption was projected to increase; it would rise to 5.97kg/head by 1979 (sugar confectionery), which represented the highest annual consumption rate in any market.

The chocolate and sugar segments of the confectionery market had totally different marketing characteristics, which were favourable to Nicholas. Mars, Rowntree and Cadbury Schweppes had an 80% oligopolistic hold on the chocolate segment, an impenetrable resource base and closely guarded their market shares. Conversely, the sugar sector was fragmented; the top 7 manufacturers held only a 52% share in this segment, with 219 companies competing for the remaining market. The sugar sector was lucrative, fragmented and implicitly vulnerable. A 1% share in the UK sugar confectionery market would generate sales of

£6 million per annum, whereas Rennie, the brand leader in its market and with a 40% brand share, generated sales of £3 million per annum.

To be weighed against these push and pull factors were the difficulties inherent in the sugar confectionery market. Nicholas' UK sales force operated in Chemists and Grocers, whereas 45% of confectionery sales were generated by Confectioners, Tobacconists and Newsagents (CTNs). Even assuming a 100% distribution of confectionery products in Nicholas' Chemist and Grocery outlets, only half the potential confectionery sales outlets were called upon by the existing sales force. Distribution would be costly. Secondly, the confectionery market was notoriously price sensitive and this would not only differ from the price-elastic nature of Nicholas' traditional markets, but would also be incongruous with the company policy of introducing brand leaders and operating a creaming pricing strategy. Clearly, a more competitively based pricing strategy, founded in turn upon high volume turnover would be required. Thirdly, sales of confectionery brand leaders were supported by heavy continual advertising, which would be costly and somewhat dissimilar to the marketing of pharmaceutical products. Finally, the competitive nature of the market and market forces were unknown. The template of experience was absent.

8.3. Capability Development

Capability development involves costing, evaluating and acquiring the organisational competence to exploit a new product concept. In relation to Ipsos, the multi-national structure of the company complicated the estimation of sales potential: a necessary prerequisite to any costing procedure. The unique forces in each market made

potential sales estimates sensitive to error. Of course, incorrect estimation of demand could lead to a chain of spare capacity, oversupply, high unit costs and surplus stocks on the one hand, and loss of potential sales and profit on the other. Neither could sales be estimated using experience as a precedent. None existed. Further, the use of competitive statistics would be risk-laden, simply because of the differential product-market-company characteristics.

In an attempt to fill this information gap, the Central European Region, based in France, was delegated the task of producing and test marketing a prototype Ipso product. Rennie machinery was seconded and four flavours of tablet were quickly developed; these were manufactured using a two stage process entailing production of a punched sugar core and its subsequent flavouring and coating.

Despite the relatively straightforward product-manufacturing process, the plastic, mould-injected, Lego-shaped box, could not be produced internally. Enquiries and initial costings to a Birmingham based moulding company indicated that economic production of Ipso boxes would be unfeasible below an output level of 50 million boxes per annum. To produce the 3 components of the box would involve using 11 moulding machines working on a constant 3 shift basis. The moulding manufacturer anticipated that an investment of £650,000 would be required, but was prepared to undertake this investment if the inherent risk could be allayed. Consequently, the moulding company proposed to manufacture the Ipso boxes on condition that Nicholas would guarantee a demand of 45 million boxes per annum for each of 4 consecutive years. Built into any agreement would be a financial clause entitling the

moulding manufacturer to a £200,000 penalty if the delivery level was terminated before delivery of 45 million units sliding to £50,000 if Nicholas reneged before receipt of 150 million units. Moreover, the cost of the moulds would be funded by Nicholas; this £470,000 outlay would depreciate quickly at the high production levels anticipated. The prime cost of the Ipso packaging would be high.

The market research commissioned in France in 1977 to quantify sales potential suggested a French demand of 400 million units per annum, a volume five times the existing pocket confectionery market. It's erroneous nature was attributed to two factors; an unrealistically low retail selling price; and a knowledge that research for "Tic-Tac" had exaggerated sales by a factor of eight. Accordingly, a sales potential of 50 million units per annum was settled upon, but in the light of competitive figures was reduced to 30 million units.

A second piece of consumer research showed a marginally superior flavour of Ipso compared to its competitors. A third piece of research, carried out in 10 retail outlets in France for a one month duration, indicated that Ipso sold more than its competitors, but was slightly highly priced. However, 39% of adults and 52% of all target consumers purchased Ipso twice in the one month test period, and 95% and 97% of these respective consumers indicated a definite repurchase desire in the future.

The Interim Marketing Proposal In May 1978, an interim marketing proposal to invest capital into a production unit with a manufacturing capacity of 50 million units per annum was presented to senior

management. The decision to proceed or reject the proposal was based upon several factors.

- (i) The capital expenditure could only be justified if a sales level of 50 million units per annum could be guaranteed. A high-risk moulding-related contract would have to be entered into, effectively requiring a 200 million unit sales level over 4 years.
- (ii) Sales potential in France was evaluated at 28-32 million units, but a proposal to gear up production to satiate French demand at 30 million units could be justified by offloading the remaining 20 million units into the UK market, thereby accounting for the 50 million unit capacity.
- (iii) This dual French - English proposal was costed. In France the financial incentives were formidable. A sales value of £2.4 million in year 1 at a prime cost of £1.5 million would leave a 37% gross profit of £882,000 and profit after tax, administration, advertising and additional selling costs, would leave £234,000 in year 1 and £338,000 in year 2 (1978 prices). In the UK, profit for the same period would be £188,000 and £253,000. Return on capital was excellent.
- (iv) A manufacturing site was favoured in Southern Ireland. On economic grounds, accentuated by tax concessions and development grants, a new production facility in Eire was financially opportune.
- (v) Three minus factors existed. The costings were based upon using a third party distributor: decision making would be

indirect which might cause difficulties and would erode profits. Secondly, no prolonged market research existed or had been undertaken; sales levels, product life cycle and long term positioning had not been determined. Thirdly, a decision was required quickly. Apart from the 18 month time lag required to establish a production facility, establish the moulding manufacturing capability, and to organise distributive and administrative facilities, the economic position of the company was precarious.

The strategic decision taken, committed resources to the establishment of a production base with a 50 million unit capacity. A second report would be presented in January 1979, detailing the full implications of this decision. In the intervening 8 months, a production run of 0.5 million Ipsos units would take place in France and these would be used in town tests in the UK, in order to refine sales estimates. Moreover, the moulding manufacturer was commissioned to begin production of the Ipsos box. Nicholas would guarantee to accept delivery of 200 million Ipsos boxes over the years 1979 - 1983, and accepted the financial penalties-risk therein.

Town Testing of Ipsos By October 1978, enough stock had been produced to undertake market testing in two demographically typical UK towns, Reading and Huddersfield. In each town, 90 retail outlets were chosen to reflect national distribution patterns and the product was sold at two RSP's (15p and 13p). There was no advertising and limited point of sale promotion.

The results of the town tests, which lasted eight months, were exceptional. Translated into a National Sales Potential, a potential UK Market for Ipso was indicated as being 107 million units per annum, representing a sales value of £15 million per annum. Simultaneous consumer research confirmed the potential, for 81% of randomly selected respondents had purchased Ipso in the preceding 2 weeks. Average consumption of Ipso in the towns represented a purchase rate of 1.8 units per person every two weeks throughout the test period. Moreover, 74% of adults and 94% of children stated a certainly/probably repurchase intention.

Accordingly, the decision to commit investment to a 50 million unit production facility appeared to be a justifiable underestimation. With a production facility in Roscommon, Eire, an apparently huge market demand in the UK and relatively uncertain French potential, the initial marketing proposal was modified. Ipso would be marketed in the UK. Moreover with high market potential a new sales force was recruited to enhance distribution.

8.4. Market Launch

Regional Launch Despite the identification of a large UK market for Ipso, it was clear that production capacity to satiate this demand would involve a gearing-up process. The major factor governing the level of production was the plastic box availability. It would take from May 1979 to March 1980 to produce and deliver the first 50 million units. The resulting marketing strategy was a regional launch of Ipso into Scotland. This restricted launch could be viewed positively as a training period for the newly recruited sales force, as a time to

polish advertising strategy and as an enforced but valuable test market extension. As more stock became available regional distribution in the UK could be accelerated.

Sales, post the May 1979 launch in Scotland, were exceptional. They exceeded those of the closest competitor ("Tic-Tac") by a factor of 8. On average, supermarkets sold 408 units per week and a single outlet of Woolworths' 708 units per week. Indeed, sales figures represented a 60% improvement over those based on the town-testing and were achieved without television advertising. Ipsos' future looked promising.

Product Advertising An advertising budget of £500,000 was allocated to promote Ipsos in its first launch year. This represented the second largest "media spend" in the sugar confectionery market and was deemed essential to stimulate retail and consumer demand; a view reiterated by Colman and Gordon (1983) who stress a positive relationship between advertising volume and sales in the U.K. confectionery market.

The advertising agency commissioned earlier to evaluate an advertising strategy which would "accentuate the strengths of Ipsos as perceived by the consumer" reported in May 1979 as Ipsos was launched in Scotland. The report identified "mixed feelings amongst respondents when it came down to discussing strengths of potential target areas". In short, 9-11 year olds recognised that Ipsos was lego-like, but the majority felt that this type of play item was restricted to younger 5-6 year olds. The older children argued that because of its pack shape the contents were intended for younger children. However, these children did not "manipulate, nor seemed motivated to discover whether the packs would

snap together, and they displayed low levels of interest in the pack for either its tactile or construction qualities".

Turning to price, there was universal agreement that 13p represented too high a price for self purchase on a regular basis. The reason was simple. Two packets of Polo could be bought for less than 10 pence, making Ipso comparatively poor value for money.

Adults felt that the product was firmly child-oriented, a precondition of the package style. They considered Ipso to have appealing and residual play value, but qualified this statement to the effect that they would not pay "over the odds" for this attribute. Most respondents found Ipso refreshing and acceptable and parents felt willing to respond to a child's purchase request for Ipso.

Two other points arose. The euphony of Ipso and Aspro was felt to confuse childrens' perception of confectionery and drug products. Secondly, the shape and size of the product and its bright colour range was felt to accentuate this confusion.

The conclusions of the agency's report recommended that Ipso's natural positioning was one of broad appeal, neither adult nor child oriented, that advertising must avoid structuring the likely purchaser profile and that any communication must explicitly avoid scenes relating to the drug connotation. This latter advice was sound, for parents hold attitudes towards stands on familiar social issues, much more than they do towards familiar products (Lastovicka and Bonfield 1982). Yet it contended that "an inconclusive or fairly vague route would leave

motivation for purchase more open-ended, but could feasibly include both adult and child appeal". In short, it was impossible to effectively target Ipso.

Nicholas accepted these recommendations and a non-targeted communication was adopted. The television commercial stressed the euphony of Ipso and Calypso and the copy centred upon a daydreaming commuter being encircled by Calypso dancers. Critics of the advert found it "puzzling and plainly aimed at adults" (Financial Times, Sept.13, 1979). The commercial largely ignored the unique interlocking nature of the product.

International Market Potential An evaluation of international market potential for Ipso indicated that Germany, Italy, Belgium and Spain, presented legal, competitive or import licence control problems, precluding the introduction of Ipso. The remaining markets of France, Japan, and Canada could be satiated with alterations to the Roscommon production base. These figures were based upon competitors sales levels, as opposed to the over-optimistic in-house research and were based upon the UK market taking up its 40 million unit first year budget, again a conservative estimation. However, the sales potential in the United States was calculated to represent a demand of 60 million units per annum. Elementary arithmetic showed that a decision to enter the U.S. market and to sell Ipso conservatively in Europe would overload even a modified Roscommon production facility. Thus, a long-term strategy for Ipso internationally, revolved around a decision to market the product in the U.S. This decision would be taken during early 1980, after the U.K. market had been developed.

The Extended Regional Launch In September 1979, four months after the Scottish launch, Ipso was launched into Yorkshire, Lancashire, Tyne-Tees and Border television areas.

Again the geographical distribution was smaller than anticipated. A design error in the automatic packaging system created a supply bottleneck. The manual packaging of 12,000 units per hour was costly and frustrating, for the redesign of the automatic line would take four months to complete and demand was high.

The rationale underlying the regional launch involved a 10 week post-launch wholesale and retail sell-in, with demand at wholesale level stimulated by the impending large advertising spend. Television advertising would then stimulate consumer demand and sales would be maximised.

A corporate statement accompanying the launch of Ipso into Northern England anticipated that confectionery sales would rise from 2-3% of company turnover to 25% of group sales by 1982-83.

8.5. Product Management

Price Ipso was marketed at an RSP of 14 pence, representing a 28% profit on return for the retailer. Pricing structure was justified in three ways. Consumer research indicated that consumers perceived unit price to be higher than average: "about 16p". Secondly, the high cost of manufacture, advertising and distribution made prime and additional costs high. Thirdly, "creaming" Ipso during the early life cycle would

generate high return on capital and would prop up Nicholas' older, flagging products. In short profitability would be maximised.

Distribution Ipsos was distributed using all four of Nicholas' sales forces. The Chemist, Grocery, Confectionery and National Account Sales Forces would generate 10%, 15%, 51% and 24% of Ipsos' sterling turnover respectively. In practice, selling via National Accounts was much more cost effective, for the buying function of chain-stores was centralised. Moreover, the logistics of using a 30 strong Confectionery field force to cover the 46,000 CTN outlets in the UK was formidable. To simply call on each outlet once a year, each salesman would need to call on 32 shops per week.

With limited distributive resources, and geographically dispersed outlets in some areas, the sales force was instructed to concentrate its efforts at the wholesale level and to sell-in in volume. In this way, confectionery retailers would purchase Ipsos on their visits to the wholesalers. Based on Scottish sales figures a typical CTN would order 4-6 weeks supply or 12 display boxes per visit. Thus, an order of 600 display boxes (30,000 units) at the wholesale level, was not considered large.

Limited supply, combined with distribution problems, demanded a careful consideration of stocking levels in the retail and wholesale trade. If too little stock was committed to the trade, sell-through would be rapid and other retail outlets would be deprived of stock. However, oversell was emphasised, for 50% of independent CTNs, 67% of grocers

and 50% of multiple grocery outlets were not targeted to stock Ipsos. Distribution was focused on CTN multiples, wholesalers and Woolworths.

Retail Perspective Over 90 U.K. confectionery products generated a National Sales Turnover of £3-60 million per annum. In small CTNs, retailers preferred to stock fast-selling lines, especially where space was restricted, as opposed to unproven new products. Moreover, the oligopolistic nature of the market meant that the majority of products could be purchased from a handful of companies and cash flow could be budgeted in advance of sales, for sales levels were familiar.

Nicholas' licenced confectionery products had generally sold poorly, the company's product range was limited, and retailers were averse to taking highly-priced products with the accompanying risk of being left with stock, especially at the expense of guaranteed top-selling lines. Nevertheless, the backing of £500,000 of advertising and the policy of presenting proven Scottish sales data, facilitated the sell-in of Ipsos to the retail trade. By February 1980, the regional launch of Ipsos into all UK regions was completed.

Modifications to the Marketing Mix In the period February to June 1980 ex-factory sales were buoyant reaching a value of £250,000 per month. Performance was marginally poorer than the budgeted 40 million units per annum, but this was attributed to lack of stock, poor distribution and to initial retailer reticence towards new products generally. Based upon this success, two important decisions were taken. A decision to increase production capacity at Roscommon (from 50 to 100 million unit capacity) was taken, and the RSP of Ipsos was increased from 14p to 15p.

The rationale used to justify this latter decision was that a 15 pence purchase represented a 2-coin transaction, whereas a 14p purchase represented at least a 3-coin transaction. Arguably, the buying behaviour was simplified.

The product itself was perhaps not received as well as was expected. Older stock had the words "Nicholas Laboratories" printed on the label and as a consequence a minority of consumers had complained that a drug company was promoting drug-resembling confectionery sweets and that these were often available in chemists. This Logo was quickly removed. Moreover, product quality could not be guaranteed and misshapen, speckled or badly-coated sweets were reaching the consumer.

In the period June to August 1980 sales fell to £130,000 per month, an annual sales level of only 20 million units. Clearly, Ipso was falling markedly behind budget. Sales data (Figure 8.1.) showed that whilst the value of orders still averaged over £70, the actual number of calls and number of orders taken by the sales force had fallen drastically.

The immediate management reaction was to increase the number of sales calls made, by first recruiting a temporary, independent sales force and secondly, by instructing the sales force to call on new retail outlets, as opposed to revisiting wholesalers who possessed sufficient stock. The immediate effect of this strategy was to boost the number of sales calls made; but the average value of October orders fell to £35.

Three arguments were used to explain these results. Marketing staff argued that only 25% of distribution targets were being met. If stock wasn't distributed, it couldn't sell and television advertising was wasteful and ineffective. Moreover, previous test marketing had proved product potential. Sales personnel argued that the result was attributable to calling on the lower hierarchical level of distribution. Small retailers would generate smaller orders. This discord was divisive.

To the sales force, the picture was clear. Because retailers were not repeat purchasing, wholesalers were not re-ordering. At retail level, a two-thirds completed advertising campaign, a restrictive, high retail price, the desire to stock top-selling lines, and the pre-Christmas stocking of seasonal products, suppressed demand. The sales force had few aggressive strategies to counter this situation. Often credibility was lost if the salesman had guaranteed sales levels of 574 units over 4 weeks to return and find the retailer had sold less than 100 units over that time period and was effectively left with 5 months supply. Furthermore, the costings of the project were based on a sales level of 40 million units and volume production was vital in keeping costs per unit down. The high fixed cost of the boxes effectively fixed RSP, much to the displeasure of the sales force.

The Downward Spiral This closed marketing situation created its own inertia. Often large companies offer retailers a "sale or return" promotion for new products, or agree to withdraw their worse selling product in exchange for stocking a new product. Nicholas could offer no such promotion.

With falling sales, salesmen's targets were not achieved, accentuating their tendency to oversell to gullable retailers; unit production costs rose; the shelf life of the stored product (6-8 months) decreased; and company morale fell. More importantly, the rigidity of the contract agreed with the moulding supplier meant that 600,000 Ipso boxes were delivered to Nicholas each week, and this delivery rate was intransigent without suffering the large fixed penalty for default. To incur this penalty would undoubtedly make Ipso totally unprofitable and jeopardise any long-term upturn in demand. The outcome of this situation was clear. Filled and empty Ipso boxes began to be stockpiled. Unprofitability became self-perpetuating.

Numerous lag-response changes in the marketing mix occurred. Competitions, promotions and in-store incentives were introduced. Some of these were parochially successful. The construction of large Ipso models, prominently displayed, enhanced sales. But these were short-lived, labour intensive and the salesman was implicitly not making trade calls. Furthermore, with salesmen making geographically more widespread calls, and with value of orders still falling, the cost of distribution was rising.

New Initiatives Two initiatives were taken in an attempt to offload the spare Ipso stock and capacity. First, surplus stock could be marketed in new U.S. markets. Secondly, the Ipso boxes could be used to market new products.

The former initiative was heavily risk-laden. Distribution channels involved brokers in individual States; shipping costs would increase

the already high production cost making the RSP in America uncompetitively high; Nicholas possessed no in-house experience of U.S. confectionery markets and these markets were culture-specific. For instance, sugar products tended to be consumed as breath fresheners and a back-lash against sugar products in response to dietary and dental lobbies was predicted. Moreover, there was no guaranty that the problems which were experienced in the U.K. would not recur elsewhere. It would be foolish to rush into an unresearched market.

The latter alternative involved rapid development of new confectionery products to package in the Ipso box (i.e. range extensions) or, conversely, rapid development of other new products, again packaged in the Ipso box (i.e. range diversifications). Both options were precluded. Although it was relatively simple and inexpensive to produce differently shaped pellets, the parameters of the package constrained product size, the technical resources available at short-notice to Nicholas constrained product type, and a change in these features would not markedly reduce unit cost. Stationery, angling and hardware items could undoubtedly be packed into Ipso boxes and simultaneously utilise the interlockability, but again totally new markets would inherently be entered and new market forces operated therein.

The obvious solution of altering the shape of the box was abrogated due to cost. The moulds were precision tools costing £50,000 each. Any change was irreversible and irreparably altered their nature. Moreover, the maximum alteration possible by modification to the existing moulds would result in a purely rectangular plastic box of similar dimensions to the Ipso package. The concept of smaller, curved, elongate building

boxes imparting flexibility to the Ipso building system was a falsehood.

Divestment and Ipso By December 1980, Ipso sales fell to a moving annual total of 13 million units. Average orders represented merely £23. Compared to February of that year, the number of sales calls had risen by 56%, orders had risen by 30%, yet the value of orders had fallen by 73%. And trade stocking levels were high.

By January 1981, Ipso sales represented £10,430 per week, merely 18% of the revised sales target of 37 million units. Nationally, 139,000 units were sold per week, a moving annual sales total of 7 million units. Nicholas' licenced products, which were sold alongside Ipso were pitiful, generating only £8,000 worth of sales per week. In comparison, Nicholas sold £120,000 worth of pharmaceutical products over a comparable period (Figure 8.2.).

Perhaps worse was the fact that 14.8 million filled units of Ipso were stockpiled and so were 13.6 million empty units. These empty units were accumulating weekly at a rate of 600,000, whilst sales accounted for only 150,000 units per week. Along with high stock levels in the trade, it was calculated that by January 1982, capacity to store 45 million Ipso units would be required. The withdrawal of a senior marketing manager to Australia at this time accentuated the lack of confidence in the Ipso project.

The conclusion of the television advertising stifled any residual consumer demand, incentive to stock Ipso collapsed, and the product

began to conform to the short life-cycle which typifies a large number of confectionery products.

The inevitable financial implications of this commercially lamentable situation are crystallised in Figure 8.3.. The expected sales level in the current (February 1981) budget was 44 million units, generating a 1.6 pence profit per unit. The forecast sales level was 20.3 million units and at this level Roscommon operated a loss of 0.7 pence per unit. Pertinently, actual sales in February 1981 represented merely 7 million units. The situation was intransigent and unprofitable. In March 1981, the sales personnel were made redundant, the marketing personnel were allocated other company positions, and the company effectively divested from the U.K. confectionery market.

In an attempt to offset as much of the loss as possible, and perceiving the problem of Ipso as one of distribution, the company negotiated a licencing and distribution agreement with a large sugar confectionery competitor. This agreement collapsed and strategies were actively taken to research market potential in international markets. This management was undertaken from Australia.

In 1982, Nicholas International and Kiwi Ltd, two Australian-based multinationals were merged.

8.6. Retrospective Analysis

The Causes of Failure Ipso was a new product which introduced Nicholas to a particularly unfamiliar set of market forces; product class was new, production techniques were strange, distribution and sales

characteristics were uncharted, advertising and promotion methods were unexplored and the company was faced with new competitors.

Ipsos was innovative to the extent that it offered a packaging form unique in the confectionery market: but the packaging itself was a "me-too" with respect to Lego. Ipsos did not meet customer needs substantially better than competitive products. Moreover, the product was targeted at a large and growing market, which was unfortunately highly competitive, both in terms of numbers and intensity of competition.

The Ipsos project lacked marketing and managerial synergy. There was a complete absence of product-company fit in the areas of market research skills, sales and distribution resources, advertising and promotion skills and financial expertise. Both the advertising-promotion and the sales force-distribution efforts were weak and poorly targeted.

Yet the most recalcitrant and anomalous aspect of Ipsos was the fact that an overt management recognition that new product development - especially in the confectionery market - is heavily risk-laden, could co-exist with an almost arrogant indisposition towards making careful, objective and reserved decisions. The literature emphasises these pitfalls and indeed reiterates the need for sound evaluation of risky projects (Factor and Sampson 1983).

This situation closely resembles Calantone and Cooper's (1981) description of products which they characterise as "The Better Mousetrap with No Marketing (Scenario 1)". Companies in this Scenario

are "smaller firms, with small R & D budgets, weak market research skills and advertising/promotion weaknesses". With particular reference to Ipsos, the product is perhaps better characterised as a "novelty mousetrap with poor marketing."

A Perspicacious Appraisal of Ipsos It is not an objective here to put forward a NPD plan which could serve as a framework for Nicholas to scrutinise and evaluate future developmental candidates. This topic has generated a literature which is legion (Douglas, Kemp and Cook 1978; Ansoff 1978; Crawford 1977, 1979; Andrews 1979; Cooper 1981). Nor is it intended to pretentiously criticise contextual management decisions using the benefit of hindsight. Such an appraisal would be regressive.

The perspicacious objective here is to apply the rationale developed in the preceding chapter - as a guide to approaching children's markets - in the context of Ipsos. In this way, the Ipsos project can be constructively evaluated.

8.7. Ipsos: Marketing Goals

The Strategic Corporate Context In the 1970's Nicholas' pre-tax return on assets and return on shareholders funds increased because the sales to asset ratio improved and the margin on sales remained constant. However, growth of the company's asset base was financed primarily from borrowed funds and not as a function of resorption of retained earnings (Figures 8.4.; 8.5.).

Nicholas' financially sustainable growth rate was low throughout the 1970's (Figure 8.6.). This growth rate represents the rate at which the sum of shareholders funds plus interest bearing debt can be compounded without recourse to new equity issues. This low growth rate was itself attributable to two factors; a low return on shareholders funds and a relatively high dividend payout. In short, growth was financed by an increase in Nicholas' debt/equity ratio. In this light, it is clear that if the limit of the sales/asset ratio was reached and the debt/equity ratio had also reached its permitted level, then the ability to sustain growth depended upon an improvement in fundamental profitability. It also seems clear, therefore, that at a corporate level, the financial goal of Nicholas was to improve fundamental profitability.

Tactical Corporate Issues A number of straightforward tactical issues impact upon profitability. Market leadership represents a desirable position for a company to be in. Market leaders have potential advantages in profitability and competitive security, they are difficult to dislodge because of their greater resource base, and their market shares are typically stable. Secondly, more volume is available in high growth markets and market share is perhaps more easily gained in these, compared to low growth markets. Furthermore, high growth markets are often characterised by shorter pay-back periods and market share can generally be acquired at a lower cost. Nevertheless, the relationship between market share and profitability is a carefully balanced one. Margins are reduced if short-term pricing policies are used to increase share; advertising may stimulate sales but inherently

represents an investment which effects margins; and an increase in production capacity ahead of demand erodes return on capital.

The translation of these tactical marketing issues into marketing philosophy is idiosyncratically applied by different companies. In Nicholas' case the strategic goal to increase profitability was accentuated by the simple fact that most of the companys' products were positioned in low growth markets. Moreover, Nicholas' marketing philosophy involved heavy branding, premium pricing and heavy advertising for the product portfolio. Such a philosophy could arguably be exchanging long-term growth of market share for short-term higher profitability, perhaps not an ideal marketing posture. For example, unit pricing of Radox over the period 1975-1979 had increased 115% whereas market price rise averaged only 32%. As the bath additives market was growing, a strong argument to adopt a different pricing policy and hence achieve longer-term growth of Radox's market share existed.

Tactical Issues in the Confectionery Market It seems reasonable to regard the introduction of Ipso into Nicholas' portfolio as a product specifically introduced to enhance fundamental corporate profitability. Thus, in defining increased profitability as the strategic problem, and the introduction of Ipso as a tactical issue impacting upon that strategic problem, it is now possible to consider factors which should have been analysed at the inception of the Ipso project. Figure 8.7. is a facsimile of Nicholas' acquisition and new product development guidelines, in-force in 1979. A corporate document, issued internally, specified that potential development candidates would require a rating

of 40 points, whereas divestment should be considered for products whose rating was less than 30 points.

An objective appraisal of the market which Ipsco was to enter using these criteria, would be expected to attribute Ipsco a high rating. Retracing these steps shows this not to be the case and indicates that either poor research, or subjective and over optimistic forecasting occurred. In terms of distribution, for example, budgeting for a 30 strong Sales Force to call upon 46,000 CTN outlets could neither match competitive call-rates nor hope to generate wide distribution; and Cooper (1981) isolates proficient distribution accompanying product launch as the most important factor contributing to success of new products. Secondly, the pellet confectionery market is not distinguished specifically by the Cocoa, Chocolate and Confectionery Alliance (CCCA); but in the years 1975-1977 the sugar sector of the confectionery market grew in volume terms by 3.74% whilst in consumer value it rose by 15.82% (CCCA Annual Report 1977). Such growth rates are attributed a low priority according to Nicholas' screening criteria. Moreover, knowing the extreme price sensitivity inherent in the confectionery market, and the spiralling consumer prices, a cautious approach to market growth characteristics would appear to have been essential.

Great play seems to have been made of the fragmented nature of the sugar confectionery manufacturing base, the argument being that market share could be acquired relatively easily in this sector as opposed to the chocolate sector. This argument is erroneous. Consumers are invariably unaware of the sugar-chocolate sector distinction, and

retailer's purchase motives would be profit-oriented, irrespective of manufacturer-type. Thus, although Nicholas may have been classified as a sugar confectionery producer, the company would compete with the confectionery giants; market shares would be closely guarded and costly to acquire. In these terms, the critical mass (Ansoff 1979) required by Nicholas to enter the confectionery market, would be high due to an absence of synergy. The market place would be expected to accentuate even the smallest flaw in Nicholas' marketing posture and consumers would indeed pick out product deficiencies rapidly (Olson, Schlinger and Young 1982).

Elsewhere in Nicholas' screening criteria, proficiency at tableting was effectively counterbalanced by an overt inability to produce the plastic box, which in fact represented a major cost of the product. The product's unique selling point (its interlockability) may be regarded as being "major" to the company, but to children it was novel, short-lived and relatively unimportant in the long-term. In terms of market extension characteristics, the same factors of novelty, absence of synergy the difficulty of internationally marketing just a single product, as well as the difficulties already encountered with the "Molly Bushel" range of products manufactured by James Chocolates, would logically temper international potential. Finally, the accuracy of financial criteria is clearly a function of the accuracy of sales forecasts. If this crucial variable is wrong - and with no prior experience of the confectionery market this possibility was real - a cumulative error enters the financial forecasts.

Two points are fundamentally important here. Product development was recognised as involving risk, but Ipsos was apparently not perceived as being an extremely risk-laden project. Much readily available research does, in retrospect, and should have historically identified this high-risk characteristic. Accordingly, the effect should have been to markedly under-emphasise sales, prospects, and profitability, and to reduce risk by proceeding with dogmatic caution. Secondly, even ignoring this first point, the evaluation of the U.K. potential for new confectionery products to fill validly defined market gaps, was not initiated until after Ipsos had been launched. Perhaps the most crucial flaw in corporate strategy was a failure to generate any fall-back products, should Ipsos have failed. Risk can only have been exaggerated by a one-product development strategy. Risk was accentuated by flaws in corporate policy. In the U.K., the product-development role was under-funded, viewed as a function of secondary importance in comparison to everyday administrative marketing, and brand managers generally allotted this difficult task to junior staff. Thus, an error in corporate strategy, a biased evaluation of product potential and an underestimation of the product development role are valid criticisms in the context of Ipsos.

8.8. Marketing Misjudgements

Structure of Decision - Making U.K. based marketing decisions were implicitly geographically distinct from Australian-based corporate decision making. Decision making was therefore two-pronged, and these dual sources inevitably fostered non-contextual judgements. Rigid adherence to carefully defined objectives would plausibly utilise this decision-making structure advantageously. However, interpersonal

discord between marketing personnel, combined with the fact that managers personally involved with Ipso represented the source of Ipso marketing information, effectively accentuated the non-contextual and subjective nature of corporate decision making. For example, poor distribution can be attributed to two causes which are antipodal; lack of distribution resource (implying substantial demand), or a retailer rejection of the product (implying limited demand). Presentation of the first alternative would induce a totally erroneous marketing response if the latter alternative was found to be correct. Poor interpretation of facts and bad communication fostered ill-conceived decision making. Piercy (1983) argues this point succinctly; marketing information is indeed a political resource in the struggle for organisational power.

Test-Marketing One cannot doubt the results of the town-testing of Ipso which illustrated an exceptional consumer pull for Ipso. Neither can the selection of nationally-typical retail outlets be criticised. Three criticisms are germane however. First, the conditions surrounding the test-market were ideal; experienced salesmen, a once weekly rate of call, total distribution, good in-store display, product novelty and indeed, the retailers' knowledge that the product was being tested, represented conditions which weren't duplicated in the "real" market place. These results were not, therefore, "sharp" enough to aid decision-making (Factor and Sampson 1983). Second, the test-markets were television-advertising deficient. Nicholas argued that the sales results were therefore underestimates. However, in the absence of television advertising, word-of-mouth advertising would predominate and thus the build up of consumer awareness would not be immediate. It is

plausible that the 8 month town testing occurred during the exponential growth phase of the product, and that for products with short product life-cycles, this exponential growth would be followed by as rapid a decline in sales. Thirdly, substantial capital had been committed to Ipso before the town-testing commenced. Arguably, it would be difficult to divest from the project at this stage, assuming the town-testing results to be even marginally positive. The town-testing should have been executed in order to commit the company to the Ipso concept and not in order to commit the company to the product launch (Crawford 1979).

Targeting Ipso Ipso represented an "order-based" marketing situation (Shapiro 1979) in which profit per unit was small, number of units ordered by retailers was small and in which the distribution system needed to be very efficient. Arguably, Ipso should have been targeted at two distinct groups of purchasers: retailers who stock the product and consumers who buy the product. That both these targeting operations were badly mismanaged was not only incomprehensible, but represented a major, and perhaps the major contributory factor in the project's failure. Moreover, Lunn (1978) emphasises the fundamental importance of carefully targeting products as a method of effectively allocating resources, exploiting market potential, and averting product failure; and the literature on this subject is substantial (Goldberg 1976; Wortruba and Vidali 1977; Saunders 1980).

The root cause of the badly targeted consumer product rests squarely with the advertising agency's explicit advice that "Ipso's natural positioning is one of broad appeal" and that a "vague or inconclusive

route" to product purchase involving neither a "child nor adult oriented purchaser profile" would be suitable. In their same report, the agency stated that "adults felt that the product was firmly child-oriented, a precondition of the package style "and" 9-11 year olds felt that this play item would be restricted to younger children".

A cardinal mistake was the failure to structure Ipso's target audience, for to ignore the interlockability of the product - surely its unique selling point - was to effectively cause Ipso to compete with other pellet-confections, and Tic-Tac for example, was cheaper, well distributed, and well advertised. To the adult consumer, the purchase of Ipso involved buying a more expensive, child-oriented product. In terms of the non-targeted television advertising, one can only reiterate other criticisms. A perceptibly children's product, advertised using copy which incorporated obscure concepts, conceptually difficult in themselves and confused in both time and space (ie day-dreaming commuter surrounded by Calypso dancers), as well as being devoid of any perceptual reference to the products' major feature, could never appeal to children. In short, a child's product was being advertised to an adult market.

That this situation arose, occurred as a result of three factors; Ipso's high price was necessitated by a heavy branding/heavy advertising/high profitability philosophy, but it overstretched children's purchasing capability. Secondly, the lack of synergy and experience precluded adoption of better, alternative strategies. Ipso represented an undifferentiated product (Shapiro 1979). Thirdly,

personnel were experience-deficient and failed to recognise these pitfalls.

This consumer non-targeting spilled over into the retail trade and affected distribution. A child's product with adult advertising and an expensive price-tag was difficult for retailers to position and Ipso's price was frequently criticised as the product's major disadvantage. The company's decision to increase the retail price from 14p to 15p was perhaps the worst possible marketing strategy that could be adopted and simply accentuated retailer-anxiety. Moreover, the extreme sensitivity of the demand/price relationship had been demonstrated in 1979. In the first half of 1979 confectionery sales increased by 1% as a whole, but following the increase of V.A.T. from 8% to 15%, sales fell by 5.5% in the second half of 1979 (compared with 1978). Such price sensitivity did not characterise Nicholas' other products. Thus, cost considerations should have never been allowed to override market pricing sensitivity. If costs were increasing, then a short-term cut in profitability should have been sustained. Further, if costs were so high that the project was unprofitable, then the project should have been vetoed at corporate level. There can be little excuse for increasing market price to maintain higher profitability demands per se.

Consumer Buying Behaviour Robertson (1976) argues that the purchase of low priced products involves low commitment consumer behaviour. That is, any complex processing of consumer information prior to purchase is not justified by the product cost. In such markets, high brand loyalty, a collapsed processing strategy involving the affect referral

heuristic, and the absence of post-purchase dissonance characterise buying behaviour.

In these terms, the high unit pricing of Ipso would tend to generate conflict and the subsequent interruption of low-commitment impulse purchase. In processing Ipso-related product information, Ipso's high price, poor value, "me-too" image, and its inability to meet a "real" demand would tend to stress Ipso's weak uncompetitive position at the expense of stronger, better value products. The absence of pre-existing goodwill towards the company's name, both at consumer and retailer level, and the failure to justify high price against enhanced value via advertising, clearly represented a serious misunderstanding of consumer behaviour and an implicit marketing flaw. These potential pitfalls are nevertheless clearly cautioned against in the literature (Olson et al 1982; Cooper 1981; Crawford 1979). Again, the process of committing financial resources to a single project and then making it succeed "at all costs" is a dangerous policy, for rational, objective appraisals of projects are clouded by an "all or none" policy.

Self Perpetuating Market Inflexibility Whilst recognising factors in the marketing mix which could have been modified, it is worth noting a number of factors which were, in fact, intransigent. The company was committed to receive 200 million boxes over a four year period. This fact constrained Nicholas' marketing philosophy in two ways; product life cycle was artificially fixed for a 4-year time period; and high packaging costs constrained pricing policy. This contract was naive in the extreme. Secondly, the absence of alternative projects into which Ipso resources could be diverted, dictated that the range of marketing

alternatives open to the company was also two-fold; either make Ipso work profitably, or divest from Ipso and accentuate an already poor corporate financial position. Clearly, a tendency to over-commit resources to Ipso existed. Thirdly, Nicholas was unable to quickly offload surplus U.K. stock into other markets, for these remained unresearched. Fourthly, there was no facility to change the Ipso package, either by altering the package shape and enhancing its building flexibility, or changing the package content; potential changes of this nature were cost-ineffective. Finally, a lack of synergy and experience can only be gained as a function of time. Thus, downward spiralling profitability was uncontrollable after a poor market entrance. The inflexibility of any one of these factors would be sufficient to undermine Ipso: their combined effect constrained any hope of managing Ipso out of a weak competitive posture.

8.9. Alternative Marketing Strategies

It is reasonable to generalise that successful companies not only know what functions to do well, but also manage to make all of their activities consistent with one another. In this way marketing and non marketing functions amplify each other and success is self-perpetuating. Nicholas performs well in the toiletries, OTC medicines and pharmaceutical-related markets. Here the company has substantial goodwill, excellent distribution and invaluable product-market experience internationally. In these markets, potential for new product success is most favourable.

One lesson to be learnt from Ipso is to rate synergy extremely highly as a screening criteria. Had this taken place, the considerable

expenditure used to support Ipso could have been used to develop products in Nicholas' more traditional markets. The lack of a sound NPD policy in the U.K., the failure of Nicholas' products such as "Temptake", "Lifeguard" and the "Field" range of products, and the fact that lag-response decision making occurred in times of low profitability, point to poor corporate strategy. A decline in traditional products should be foreseen, stimulating moves into new markets when profitability is robust. Potential developmental areas include contact lens fluid, diversifying the "Inter-Dens" range of dental products and analysing potential in medicated soap and creams segments. Such initiatives should be actively taken as opposed to being dismissed as "too competitive" or "inappropriate." Moreover, a hierarchical chain for communication of ideas and a system for idea generation are absent, but essential components of Nicholas' development policy.

Accepting a company commitment to Ipso, and adopting the rationale outlined in Section 7.2., several alternative and now hypothetical marketing approaches can be put forward in relation to Ipso.

(i) Prior to launch, a carefully researched portfolio of confectionery products should have been available, spreading corporate risk.

(ii) Ipso should have been more effectively targeted at under 10 year old children. This would not have precluded adult purchase, would have closely matched the concept of the package with the consumer characteristics, would have allowed a totally different advertising

approach, and would have better positioned the product in terms of in-store and on-package promotions (see Section 7.6.).

(iii) In relation to this point, strategies could have been taken to lengthen the product life cycle. For instance, collectable on-package labels, emphasis on in-store promotions and use of competitions to emphasise the product's "interlockability" and subsequent introduction of different flavoured/coloured boxes might all have been used to stimulate demand.

(iv) With high capital investment, and limited distribution resource, a limited, cautious and regional launch of Ipso would have been appropriate. Distribution, retailer, and consumer problems, a careful gearing up of production and the polishing of Ipso's marketing position over a 12 month period, would have plausibly reduced risk, increased experience and identified flaws in the marketing mix prior to national launch. The desire for rapid profitability and fast return on capital should have been subdued. The high retail price and its effect on demand were factors unappreciated until the situation was beyond remedy.

(v) It would have been better to employ personnel with direct market experience which could have been brought to bear during the project, than to rely on seconded managers and trial and error marketing.

(vi) At risk of repetition, the RSP of Ipso was clearly set at too high a level. RSP should have been set using market-place criteria which would have set an externally valid price, as opposed to the cost - plus internally valid criteria which satisfied corporate profitability goals and little else. Competitive pricing would have brought the product into the range of child self-purchase, making Ipso

equally good or better value than similar competitive products. A cost-plus system of pricing was inappropriate in markedly price sensitive markets.

(vii) With careful pricing, market forecasting, attention to detail and an effective regional launch of Ipso, a proper market-place evaluation of Ipso would have fostered risk reduction by identifying level of consumer demand. Recognising short life cycles, exponential early demand and market-place product attributes would have allowed exploitation of the product, for consumption and production would then have been more closely matched.

8.10. External Validity

An excellent series of papers review the characteristics of 100 successful and 100 unsuccessful new product developments, isolating reasons for failure (Cooper and Little 1979; Cooper 1981). Using Coopers' (1981 p282) properties, which best distinguish product successes from failures, the externally valid marketing lessons which may be drawn from the Ipso case study can be presented. In descending order of importance and in the context of Ipso these lessons are:

(i) executing new product development well. Nicholas must search for products during periods of high profitability, not as function of financial necessity. Product development should be initiated and enhanced, product ideas actively sought, criteria for identifying areas of search and realistic corporate criteria for identifying investment and divestment candidates developed. Thorough market research, the careful screening of ideas and the development of a portfolio of plausible new product possibilities are vital corporate functions;

(ii) rating a good product-company fit in terms of Sales Force-distribution and marketing functions highly. High volume, low unit profit items must be proficiently distributed. If an excellent idea is generated, and can be efficiently marketed and distributed, then those technical - production resources and investments required can be acquired - and more favourably disposed of; production experience can to some extent be purchased;

(iii) undertaking a lengthy, comprehensive prototype test of the product with the consumer. Realistic market testing serves to refine demand estimates, develop or polish advertising, gain knowledge of consumer and retailer attitudes and provides valid criteria for substantial capital investment and also for divestment;

(iv) knowing customer price sensitivities. Especially so with confectionery products;

(v) having the product targeted well. Careful consumer segmentation focuses company resources. In consumer markets targeting occurs at both distribution and consumer levels;

(vi) having a product which is superior. In Ipso's case, the superiority of the products salient perceptual features were discounted by high price and bad advertising;

(vii) proficiently launching the product. Proficient selling, promotion and distribution of a product "creates" its own synergy, and effectively generates confidence and goodwill in the retail trade;

(viii) employing experienced personnel.

8.11. Summary

One reason why new product development is more often unsuccessful than not, stems from the fact that the product-market and company product

characteristics are both unique and changing. Managerial experience, combined with careful planning can offset some of this uncertainty.

The Ipso case study demonstrates two points. Product development is an integral, fundamentally important component in the functioning of successful companies and assumes greater urgency in less successful companies. Secondly, despite the size or profitability of a company, the product development process must be treated with prudence, foresight and creative respect.

Plate 8.1. Ipso.



Aston University

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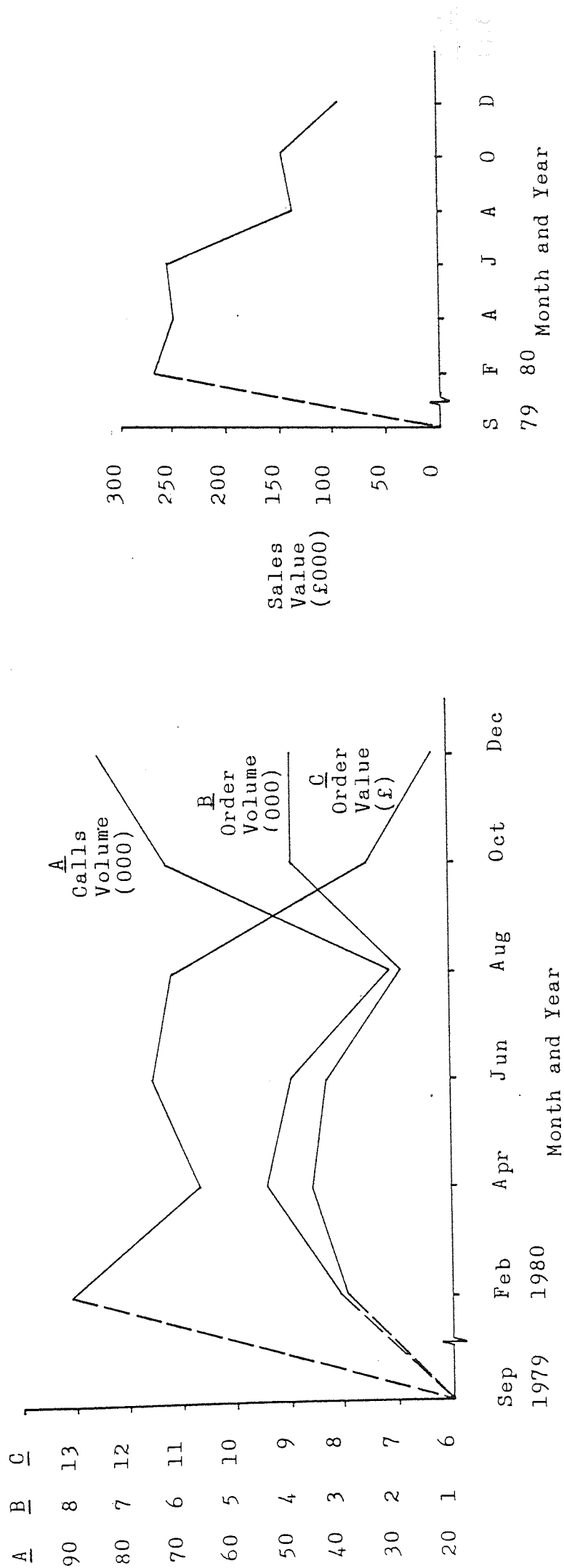
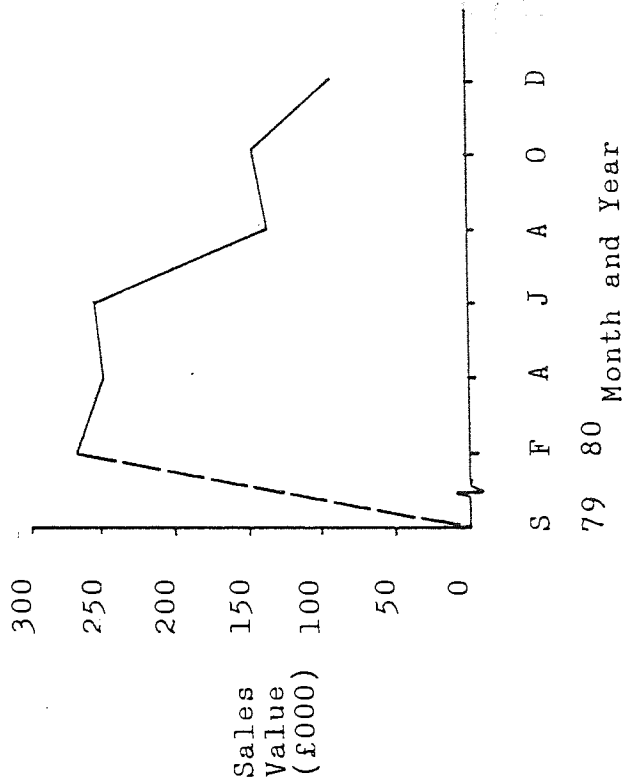
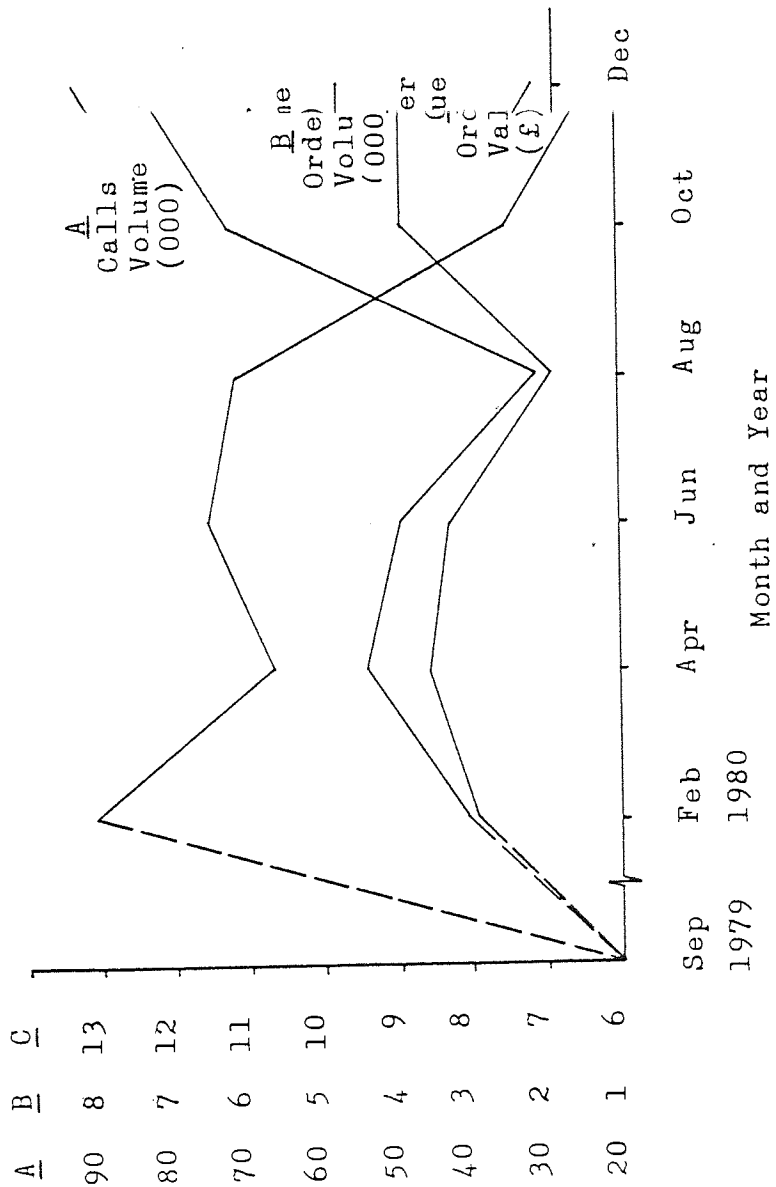


Figure 8.1. Ipso Sales Data 1979-1980.



1979-1980 Sales Data 1979-1980.

Summary of U.K. Weekly Sales (£) Week Ending 23/01/81

	Weekly Sales	Weekly Budget	Cum Sales This Period	Cum Budget This Period	% Achiev 3 of 4	Year Sales To Date	Year Budget To Date	% Achiev 6 of 7	Previous Year	% Achiev 6 of 9
	1	2	3	4	5	6	7	8	9	10
Professional Products	59,848	84,365	312,638	303,715	102.9	2,306,767	2,154,649	107.1	2,123,150	108.6
Pharmaceutical	120,867	119,439	457,725	429,982	106.5	3,286,046	3,337,884	98.4	3,088,442	106.4
Askit	20,756	70,500	70,100	63,000	111.3	464,635	440,000	105.6	395,867	117.4
Confectionery: Ipsos	10,430	53,936	35,134	194,170	18.1	588,428	2,020,410	29.1	736,643	79.9
: Others	8,247	11,896	16,654	42,875	38.7	190,651	291,730	65.3	310,930	61.3
Total	18,677	65,832	51,788	236,995	21.9	779,079	2,312,140	33.7	1,047,573	74.4
Coombe	26,182	23,056	100,294	88,167	113.8	574,659	849,067	67.7	N/A	N/A
Toiletries (Almay)	51,498	44,278	141,286	159,400	88.6	1,331,058	1,533,950	86.8	1,133,058	117.5
Toiletries	84,900	145,618	463,810	524,224	88.5	4,804,297	4,841,390	99.2	4,138,090	116.1
Total	382,728	500,088	1,597,641	1,805,483	88.5	13,546,541	15,469,080	87.6	11,926,180	113.6

Figure 8.2. Nicholas' (U.K.) Weekly Sales by Product Type: January 1981.

ROSCOMMON FINANCIAL STATISTICS (FEBRUARY 1981)

	Budget (Sales level 44 million units p.a.)		Forecast (20.33 million units p.a.)	
	£	per box (p)	£	per box (p)
Ex-factory Sales	3,229,500	7.35	1,440,500	7.05
Variable Costs				
Production Cost Standard	(1,953,500)	(4.45)	(925,500)	(4.55)
Production Cost Variable	-	-	(217,000)	(1.05)
	<hr/>	<hr/>	<hr/>	<hr/>
	(1,953,500)	(4.45)	(1,142,500)	(5.60)
Overheads	(137,500)	(0.30)	(63,500)	(0.30)
	<hr/>	<hr/>	<hr/>	<hr/>
	(2,091,000)	(4.75)	(1,206,000)	(5.90)
Marginal Contribution	1,138,500	2.60	234,500	1.15
Fixed Overheads	(433,500)	(1.00)	(373,500)	(1.85)
Profit (Loss)	705,000	1.6	(139,000)	(0.70)
	<hr/>	<hr/>	<hr/>	<hr/>

Figure 8.3. The Roscommon Budget 1981.

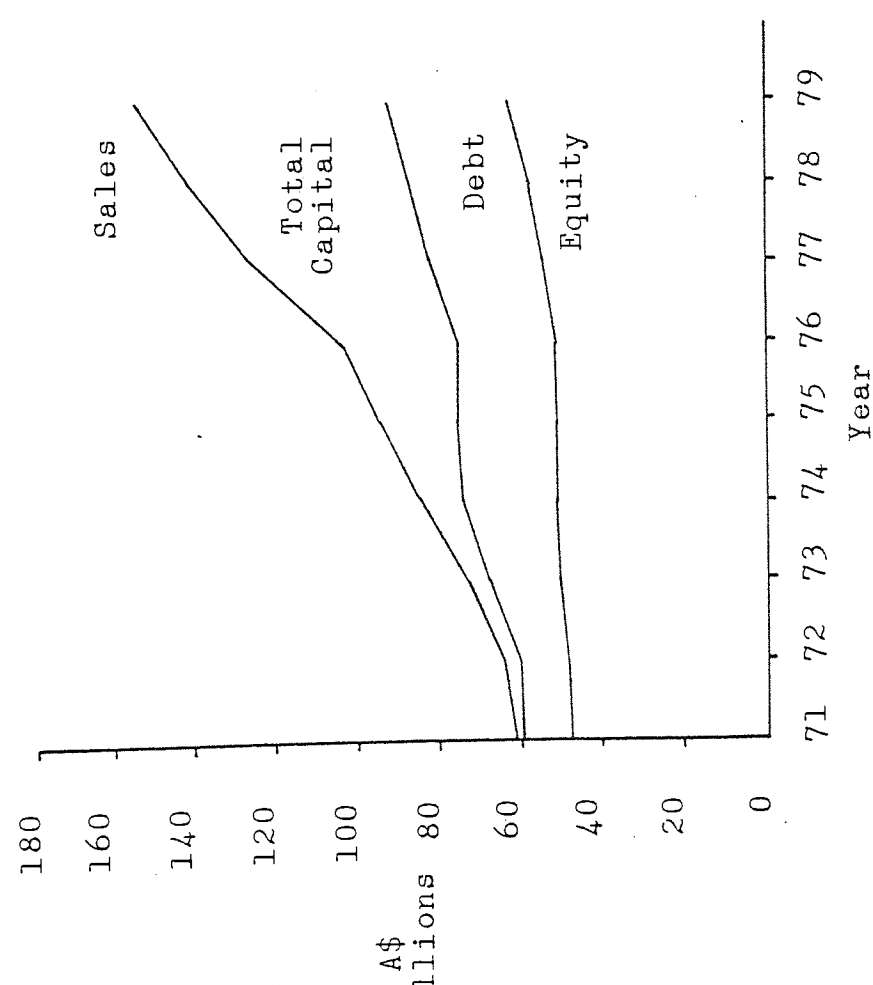
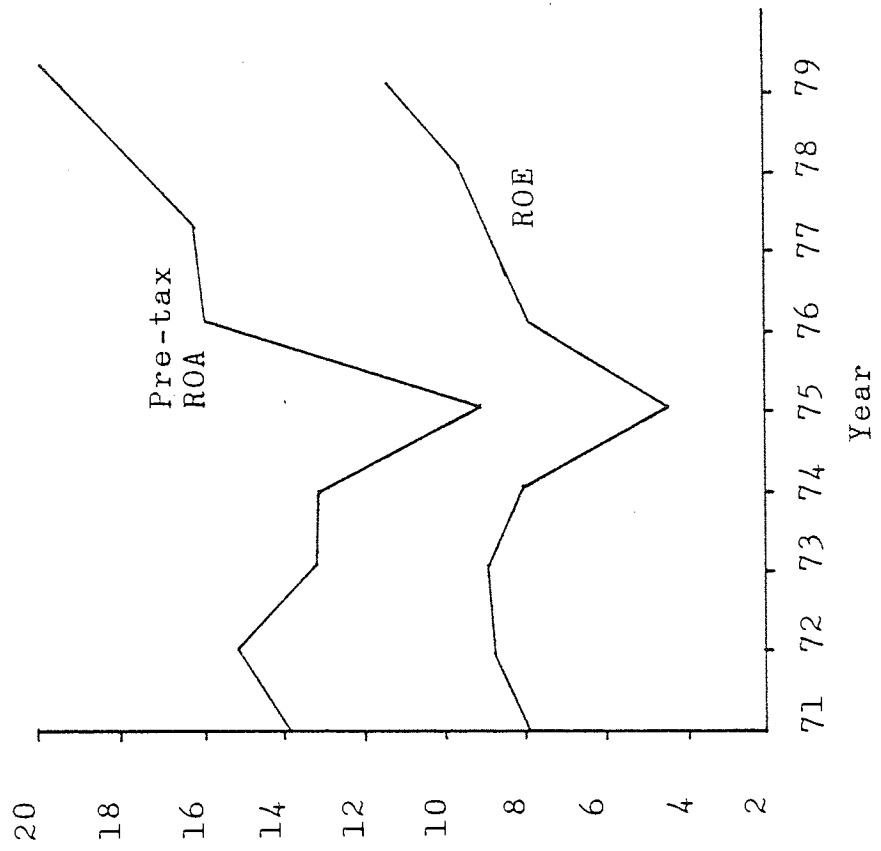


Figure 8.4. Nicholas' Financial Performance Financial Years 1971-1979.

	A \$ million			
	1972	1979	Increment	% of Total Increment
Shareholders' Funds	44.2	57.4	13.2	40
Minorities	3.5	3.7	0.2	1
Total Equity	<u>47.7</u>	<u>61.1</u>	<u>13.4</u>	<u>41</u>
Short Term Debt	2.5	11.5	9.0	27
Long Term Debt	8.9	19.4	10.5	32
Total Debt	<u>11.4</u>	<u>30.9</u>	<u>19.5</u>	<u>59</u>
Total Capital	<u>59.1</u>	<u>92.0</u>	<u>32.9</u>	<u>100</u>
Debt to Equity Ratio	.24	.51	1.45	1.45

Figure 8.5. Increase in Nicholas' Debt: Equity Ratio, 1972-1979.
Source: Company Accounts.

Year	Return on Equity (%)	Retention (%)	Sustainable Growth Rate (%)
1971	8.3	32	2.7
1972	8.8	28	2.5
1973	9.0	35	3.2
1974	8.2	31	2.5
1975	4.4	41	1.8
1976	8.0	35	2.8
1977	8.9	39	3.5
1978	9.4	38	3.6
1979	11.3	47	5.3
<u> </u>	<u> </u>	<u> </u>	<u> </u>
Average	8.5	36	3.1

Note: $\text{Retention} = \frac{\text{Profit after Tax} - \text{Dividend}}{\text{Profit after Tax}}$

Figure 8.6. Nicholas' Earning Retention, Return on Equity and Sustainable Growth Rate 1971 - 1979. Source: Company Accounts.

	<u>PRIORITY 1</u> <u>5 Points</u>	<u>PRIORITY 2</u> <u>3 Points</u>	<u>PRIORITY 3</u> <u>1 Point</u>
<u>FIT</u>			
Product Area	Home Medication Skin Care	Ethicals/ Hospital Products	Other
Country of Acquisition	U.S.A. Australia	Germany/ Switzerland	Other
Manufacturing Process		Tableting Powders/ Liquids/ Creams	Other
Distribution	Pharmacy/Drug Store/grocery		Other
<u>MARKET/MARKET</u> <u>DISTRIBUTION</u>			
Market Growth Rate (units)	>10% pa.	5-10% pa.	<5% pa.
Sales Growth Rate (units)	>5% pa.	<5% pa.	
Relative Market Share	> 1.5	1.0-1.5	0.25-1.0
Unique Selling Point	Major	Minor	Nil
Prospects For Market Extension	International	Regional	Local
<u>FINANCIAL</u>			
Sales	\$5-10m	<\$5 > \$10 m	
Profit Before Tax/ Sales		>7.5%	<7.5%
Return on Capital		>15%	<15%

Figure 8.7. Priority Rating for Initial Screening and Evaluation of Acquisition Products; Nicholas International.

Chapter 9

DIRECTIONS FOR FUTURE RESEARCH

9.1. Introduction and Overview

This chapter suggests areas for future research which may take place under the broad heading "children's consumer choice processing". Viewed from a narrow commercial perspective, it is the act of purchasing one product from an array of products, and the analysis of consumer responses to marketing and consumer information which are important topics for future research. From a narrow cognitive perspective, it is the development of cognitive phenomena, metamemory, attention, and use of processing patterns and strategies which are important future research topics.

These narrow perspectives are not antipodal, but are rarely considered in unison. The theme of this chapter is that future research should endeavour to compromise these perspectives, thus benefiting both the cognitive and commercial interests.

9.2. Bridging the Academic-Commercial Rift

Consumer psychology is a recent discipline which is often regarded indiviously. Marketing personnel, whose product portfolios are performing satisfactorily, are typically ill-disposed towards consumer psychology. They argue that the discipline is unusable because it is couched in unfamiliar terminology, it cannot demonstrably effect, or be guaranteed to immediately improve product performance, and daily administrative decision making, such as improving trade stocking levels, takes preference because of its concrete marketing relevance.

Conversely, the majority of cognitive research, upon which information processing theory is based, is rightly concerned with elucidating relationships in controlled environments, with integrating contemporary findings into foregoing specialist literature, and with formulating new academic perspectives and hypotheses (Calder, Phillips and Tybout 1981).

These antipodal positions remain antipodal, for there is typically little motivation for one party to use, or apply the findings of the other. The cause of much invective, therefore, can be succinctly understood in terms of secondary ignorance (Brown 1978), a truism which describes the phenomenon of "not knowing that one does not know". Marketing personnel are unaware that cognitive research is important in a commercial environment: cognitive psychologists are unaware that their findings may be applied commercially. Tauber (1980) discusses the somewhat negative reputation of advertising research in this context.

The criteria used to identify areas for future research are delineated here as cognitive - "this is how children can process information" and as marketing - "these are contemporary marketing situations". Evidently, if research is carefully conducted under these two headings, then the fundamental prerequisites for reconciling the central problem - "how children process information with respect to contemporary marketing situations" - can be generated.

9.3. Future Cognitive Research

Extending the Processing Framework Bettman's (1979a) monograph is an

excellent appraisal of consumer information processing. But, in its present form, it deals with adult consumers. In extending the theory to include children's information processing, it is clear that a developmental perspective should be taken. It seems reasonable that the focus of developmental changes involves improvements in memory use and the work of Flavell and Wellman (1977) and Flavell (1978;1982) is relevant here. Together with earlier work concerning the spontaneous use of memory strategies (Flavell 1970b), a developmental perspective of information processing strategies can be taken and readily related to Piaget's fundamentally important theory. The link, therefore, between the Piagetian appraisals of children's CIP (Ward, Wackman and Wartella 1978; Wackman and Wartella 1977) and Flavell's sensitivity and person variables types of memory knowledge, may be forged accordingly.

In this research, the use of limited, cued and strategic processors as used by Roedder (1981), acts as a sound foundation for characterising developmental processing strategies. A problem of course, is that cognitive development is multi-faceted and the use of encoding, storage, retrieval, and organisational strategies, is not fixed by age. Thus, whilst the notion of reiterative goal-directed processing may be worthwhile when considering strategic processors, it is clearly deficient in terms of limited processors. The research need, therefore, is to identify how children's consumer information processing systematically varies in terms of the relationships between the cognitive concepts of Bettman's model.

By developing such systematic criteria, the immediate result would be to incorporate the apparently divorced research area which considers

children's cognitive responses to television (Roberts and Bachen 1980; Pezdek and Hartman 1983; Adler et al 1980), with that which considers the recall, organisation, recognition, and retrieval of information by children (Ornstein 1978; Ford and Keating 1981; Bjorklund and Zeman 1982). Surely, the perspectives are analysing the same functions from a dissimilar standpoint? There is a need to integrate these research bases.

A Memory-Metamemory Distinction Bettman (1979a) argues that "basic research on internal memory structure in psychology seems to be adequate for the present" (Pg. 169). The exact opposite is contended here. In both the multi-store and the depth-of-processing models of memory, the memory system is viewed as static and unchanging (Naus et al 1978). In the developmental context, it must surely be viewed as a dynamic and evolving system. Moreover, the introduction of the metamemory concept adds an important new dimension to the conceptualisation of memory; one which does not feature explicitly in contemporary consumer processing models. Similarly, Cavanaugh and Perlmutter (1982) state that metamemory "in its present form has little value" and that "current conceptualisations of metamemory fail to provide a clear definition of the concept and fail to recognise explicitly the strengths and weaknesses of other domains that have influenced it" (Pg. 22).

It is clear that substantial scope for theoretical and experimental research to elucidate this memory-metamemory interaction exists and research is indeed required. Adopting and reiterating the stance taken in this research, the multi-store memory model is perhaps most able to

accommodate the concept of metamemory. The notion of information in the consciousness is a simple but effective model to view memory functioning within. Metamemorial knowledge, in these terms, can be considered in its inactive stored form as procedural-motoric data and in its active role as a component of the current processor. Thus, presence and absence of strategy transfer can be regarded as a function of retrieval, as well as a function of prior experience with the task situation. If metamemorial knowledge, which is surely implicit in processing, is neither available nor accessible, then strategy transformations cannot obviously occur (Hirschman and Wallendorf 1982).

Accordingly, it may be appropriate to consider metamemory as the cognitive capability to direct current processing, once retrieved from LTM. Logically, there must exist some residual core of consciousness which can be regarded as the source of this cognitive capability; the executive processor which initially animates metamemorial knowledge. Furthermore, if metamemorial data are seen to govern the propensity to recall LTM data, to selectively attend to salient data, to stop maintenance of information in the current processor and so on, a strong argument exists for calling heuristics "metamemorial knowledge". The two strategies perform the same function. This synonymy of terminology would be useful, for the techniques which are used to analyse heuristics (Bettman 1979a Pg. 190; Payne 1976) may be used to address metamemory. What is being argued, in fact, is that a child's more sophisticated information processing and problem solving may be advantageously regarded as reflecting a more sophisticated application of metamemorial information upon more complex memorial data.

The preceding discussion is tentative and theoretical and Cavanaugh and Perlmutter (1982) argue that the "inclusion of executive processes as an aspect of metamemory heightens conceptual confusion." The issue is open and the opportunities for research are numerous. Thus, how can the effect of prompts, probes and cues be reconciled in terms of metamemory - do they provide a metamemorial prompt? How can the concepts of elaborative rehearsal, recall and recognition be related to memory-metamemory? How are goal hierarchies constructed, how is their serial, hierarchical order determined and how may it be changed? Is motivation of internal or external derivation, and what factors affect the intensity of motivation? What process stops information processing - are these factors internally or externally controlled? Furthermore, how may these plausibly covert features be studied and measured? (Formanisanano et al 1982; Meyer 1982; Triandis 1982).

Another aspect of memory which does not seem to have been fully examined is the inter-relationship between information stored in different sensory modalities. Paivio's (1971;1978) research considers iconic and verbal memory representations in terms of distinct memory stores. The problem of unitisation of memory modalities seems fundamental to memory functioning and, indeed, information processing as a whole. It is perhaps erroneous to consider semantics as "the" currency of memory processes. Paivio's research, which shows that dual-coded words are markedly better retrieved in comparison to words which can only be represented semantically, suggests that processing models as they are typically regarded at the moment, are terribly simplistic. Moreover, the simple observation that iconic encoding exists before a semantic system develops, suggests that information

processing may be more dependent upon iconic storage than semantic coding and memory. In terms of marketing products, a potential research area of substantial significance concerns identification of the visual attributes of products; those which facilitate recall by attracting attention, and whose salience is thereby enhanced, are more prone to impulse purchase (Edell and Staelin 1983). The whole area of modality interactions provides substantial research potential, with implications for the top-down wholistic ideas of Gestalt psychology. Furthermore, product information is implicitly of visual and verbal modality. Thus, simple recall experimentation using a semantic presentation input compared with a visual input modality, and variations therein, seems to provide a convenient method of analysing the differential information loads exerted by information of different sensory modality. Age-related encoding variations represents a further avenue for consumer research. And Grass et al's (1983) work is relevant here in terms of attention demands imposed by information of different sensory modalities.

The Method of Converging Operations Information processing models may be analogously considered in terms of trains operating on an interconnected network of track. In terms of the level of research achieved, one could argue that the characteristics of the interconnected track network have been inferred: information is indeed processed and it is possible to travel from A to B using various routes. But the speed of the train, the number of carriages, the number of stops the train makes, the number of passengers and their characteristics, and the ability for more carriages to join the train at any stage of its journey and as a function of varying its route, are

unknown. Moreover, as there are numerous routes which could be taken by the train to reach its destination, and as each of the above characteristics varies as a function of the route taken, the permutations of factors impacted upon any one journey are infinite. Furthermore, and perhaps most importantly, simply observing the frequency of, or interactions between passengers as they leave the station, does not allow many inferences to be made about the preceding journey. Yet, more or less, it is the information which is output from the information processing system which must be used to characterise its previous processing.

This single feature perhaps confounds the study of memory structure and functioning more than any other. In cognitive field, verbal protocols, reaction time, peer tutoring, memory monitoring, pictorial techniques, and interviews and questionnaires have all been used to varying success (Cavanaugh and Perlmutter 1982; Ornstein 1978; Simon 1979). In the consumer research field, the same basic techniques have been used to analyse choice processing (Bettman 1979a; Lynch and Srull 1982; Biehal and Chakravarti 1982b; Kassarian 1982). The problems with these methods revolve around subjective interpretation of the experiment by the subject, then accentuated by the experimenter's interpretation of the subject's response. It is evident that innovative experimental rationales and methodologies are needed to explore processing. The methods of converging operations i.e. multiple assessments of memory, must become standard.

Extensions of the Sort-Recall Paradigm The sort-recall procedure used in this research is an attempt to overcome, at least to some degree, the difficulties of distinguishing the effects of memory structure from those of retrieval processes. In attempting to tap these semantic structures which hold information over long periods of time, the problem of proving that the sorting procedure actually represents such structures is recalcitrant. Speeding this task hopefully ensures that a representative series of memory categories is forthcoming. Another alternative is to have a subject sort all the items until stable groupings are recurrent. The advantages of this technique are self-evident. The subject defines his own groupings, using his own terminology, and in a way which avoids age-appropriate verbal-ability differences and also any problems associated with experimenter-defined categories.

Nevertheless, a valid criticism of the technique is its assumption that memory structure is hierarchical, as this abrogates the data identifying other memory structures. Furthermore, the arguments which counter the implicitly simple notion of one object being characterised by a set of dimensions which are mutually exclusive, are strong (Wicklegren 1981).

The use of proximity analysis in the evaluation of free recall protocols is a valuable technique for assessing memory structure, for it is based upon inter-item associations, derived for all recalled items as opposed to subsets of two or three items. Friendly (1977) outlines other applications of proximity analysis and Sternberg and Tulving (1977) and Roenker, Thompson and Brown (1971) discuss measures

of subjective organisation. These methodologies are powerful, important techniques for analysing organisational processing and should be more widely used in consumer research.

It is perhaps unfortunate that the data generated to analyse retrieval processing ease in this research is, at best, of ordinal level, for this precludes the use of parametric statistics in its evaluation. Quite how the use of threshold and zero values can be eradicated in the analytical process without detriment to the technique, thus permitting the stronger parametric statistics to be used, remains an area of needed research.

However, the basic paradigm put forward in Chapter 5 can be substantially strengthened by measuring the inter-response latencies between items of the recall protocols. Logically, the two sources of information would complement each other. It would be expected that items which are stored together most closely in the LTM would not only be recalled most proximally, but would also be recalled with the smallest inter-response latency. Clearly, this dual source of information would improve the validity of the technique, as well as its reliability.

The sort-recall procedure can be extended to include familiar products taken from different product classes. Category clustering for consumer information may accordingly be examined. Secondly, the technique can be used with subjects of different age groups in an attempt to explore the degree to which systematic versus incidental retrieval occurs as a function of age. An evaluation of the role of familiar and unfamiliar

stimuli on retrieval strategies may also be potentially explored. Arguably, confectionery data which is extremely familiar to children would be more prone to systematic organisation, and enhanced retrieval, than data which is known but perhaps has not been personally processed - makes of car for example. The role of task domain can therefore be appraised.

More importantly, a great potential for examining the effects of information load on processing exists here. First, the number of target items used in the input phase may be increased: for example by using 20 items, two taken from each of ten categories. The category load is therefore variable. Secondly, the number of items taken from each category may be varied: for example by using 10 items, five taken from two categories. Theoretically, the differential load placed on memory would be reduced as the number of categories was, for fewer higher order chunks would need to be retrieved in order for category contents to be recalled. Third, it is evident that the experimental rationale may be systematically altered such that both the number of categories used and the number of items per category is varied. Thus, the category may comprise 2 items, a second or third category 2,3,4 or more items. All three of these paradigms could be overlain in terms of brand and attribute oriented hierarchical structures, and all may be varied in terms of subject age and prompt presence or absence.

Another modification to the sort-recall paradigm discussed above concerns inclusion of probes amongst input (target) items. Accordingly, the subject sorts information into like groups and identifies the attributes and brands which characterise those groups. In the recall

phase of the experimentation, both brand and attribute data which belong to the same hierarchical grouping is presented in random order. Thus, if brand data represents the hierarchically lower level information (Figure 4.3.), then two items of brand data and the appropriate high level attribute item are used as target items. In effect, an attribute probe is incorporated into the recall task and, logically, a subject would retrieve the attribute feature first and then the two brand objects which represent category exemplars. Again, varying the number of categories and the number of items per category, would prove extremely valuable in examining the nature of memory chunks, and indeed the propensity for subjects to use a probe as a retrieval cue. The paradigm has some bearing on metamemory, as the term was described above, for the technique introduces a metamemorial prompt into current processing. Moreover, the comparison of research conditions in terms of crossing the use of experimenter introduced prompts (conditions 1 and 2, Figure 4.6.) with target items which include probes, would throw invaluable light upon children's processing strategies.

The Right Perspective: The Wrong Level of Analysis A characteristic of human cognitive processing is that it can be appraised using several levels of analysis: a neural level of analysis, the level of elementary information processes involving, for example, memory retrieval and comparison of simple symbols, and the level of higher mental processes, including problem solving and concept attainment (Simon 1979).

It is evident that contemporary theories of consumer choice processing are couched within this third analytical level: the level of higher

mental processes. This is understandable, for choice processing takes place in environments which are composed of complex configurations of stimuli and which can be processed by individuals in a unique manner. Accordingly, it is the problem solving perspective and the gross characteristics of consumer processing which have been the focus of research, for an appraisal of an individual's elementary information processing would fail to uncover more generally applicable processing characteristics.

However, there is now a need to study consumer information processing at the level of elementary processes, by drawing upon the methodologies of cognitive psychology and by applying these to consumer behaviour. In this light, Wicklegren (1981) makes a distinction between macro and micro levels of cognitive analysis with regard to learning, storage and retrieval. Microlearning concerns the learning of a single association, or small set of associations, encoding a single chunk, or small set of chunks. Microstorage deals with consolidation or forgetting of these "molecules" of learned information, and microretrieval is concerned with a single elementary act of recalling or recognising some unit of information (Wicklegren 1981, Pg. 38). This thesis has dealt with the micro level of storage and retrieval and, as advocated above, extensions of the sort-recall paradigm are feasible. But extremely few micro-appraisals of CIP exist. When a need to justify a processing strategy on this level exists, the issue is deflected into the related cognitive psychology literature. Thus, it is argued that contemporary consumer research takes the right (information processing) perspective, but deals with processing at the

wrong (higher mental) level of analysis. A micro appraisal of CIP is required.

Specific Node Encoding Perhaps the one factor which separates the elementary from the higher level of mental processing is the distinction between the way information is structured in semantic memory and the way in which that information is functionally used during current processing. In making such a distinction in this thesis, episodic memory was considered to represent past information processing, whilst non-episodic, sensory-perceptual memory was seen to represent an associated memory store which acted as a non-contextual source of information.

Wicklegren (1981) argues that the micro unit of analysis in semantic memory revolves around specific node encoding. That is, it is assumed that for every idea which can be represented in the human mind a particular set of elements represents or stands for that idea. This set of elements is the specific node representing the idea. Through the process of chunking, nodes are associated and the particular meaning of a word or phrase is represented.

These concept nodes arguably account for the semantic structure of memory and Wicklegren states that a "very high level of integrative theoretical understanding of human learning and memory is possible today" (1981 Pg .22). Theoretically, the position adopted is strong. Input links between nodes specify the constituent, propositional and procedural meaning of concepts, and through repeated experience with different instances of a concept, the links between chunk nodes are

selectively strengthened and weakened. Moreover, it is possible to argue that a concept can be characterised in terms of an "ideal set of attributes" (the so called prototype hypothesis), that direct access retrieval (in which the properties of an input pattern determine exactly where in the memory that pattern will be stored) characterises retrieval from associative memory; and that episodic and semantic memory are not different forms of memory with different coding structure or different cognitive processes.

However, in a practical sense, consumer behaviour is a semantically rich domain (Simon 1979) in which successful performance in a task domain calls for both the use of specific knowledge (i.e. semantic memory) and general problem solving skill. It is therefore important to understand the (Macro) control system which draws upon semantic memory as well as the (Micro) structural associations inherent in that memory. Wicklegren (1981) deals vaguely with the problem of this control system by using propositions (sets of concepts comprising declarative knowledge) and plans (units of procedural knowledge), arguing that the former are unordered sets of concepts whilst the latter are ordered sets of concepts.

It is perhaps this very fact, that theoretical ideas about semantic memory can be generated, but that semantic representations of the procedural knowledge which govern the functional use of information stored in semantic memory are unclear, which represents a topic for future research. The way ahead here, is perhaps couched in the idea of production systems. A production system is the set of instructions which controls the sequence of thought (metamemory?) and it comprises

conditions and actions (Simon 1979). For example, if three conditions hold - A, B, and C, an action based upon these conditions may be D. It is noteworthy here that these notions of production systems have similarities to heuristics and the notion of low involvement processing (Chapter 7). In consumer choice, the conditions may be price, quality and size attributes and the action may be select product D. The heuristic may be "attend to price, quality and size and if these attributes are comparably good, then select the brand".

In effect, the preceding discussion points to three areas of research. First, how is consumer information stored in semantic memory, secondly, how is semantic information used during CIP (i.e. procedural processing of semantic data) and thirdly, how is the structure of semantic memory altered after it is used in current processing. Lynch and Srull (1982) provide a review of methodologies which may be used to address the role of memory (and attention) in CIP. The ultimate goal here of course, is to understand how individual differences in choice processing relate to broader generalisations about problem solving behaviour in consumer psychology. To understand cognitive processing on a micro scale must add to our understanding of cognitive processing on a macro scale.

9.4. Future Marketing Research

Processing Demands in Marketing Situations An apparent conflict of interests is inherent in any research which deals with marketing and children. There is an obvious ethical consideration: don't conduct research which can be used to "exploit" children commercially under the auspices of academic research. Alternatively, there is the as-obvious commercial consideration: don't conduct academic research for its own

sake, for if there isn't a commercial (profit) motive incorporated into the procedure, the research funding is hard to justify. Of course, these two perspectives are accommodated under the banner of "public policy". If we can understand how children behave with respect to consumption and product purchase, steps can be taken to prevent malicious exploitation. This banner has been the root motivation for most of the research which concerns the effects of television on children, but has important implications for marketing, as noted earlier.

An objective resume of research which deals with children's consumer behaviour shows that secondary ignorance and an absence a framework within which research can be conducted retards progress in this field. In developing such a framework, Flavell and Wellman's (1977) work is again drawn upon. Just as developmental cognitive research may arguably take place under the sensitivity and person variables categories (see Section 9.3.), marketing research may be undertaken within the task and strategy categories. That is, marketing research can be conducted with the goal of identifying and examining task factors which influence children's CIP and strategies which children use to deal with consumer choice environments.

More specifically, the way forward is to isolate the factors in marketing situations which induce processing in children. What are these variables? An initial distinction can be made between product-intrinsic and product extrinsic features. Product intrinsic factors include price and packaging, shape and size, and their evaluated interrelations. Product extrinsic factors include the role of parents,

peers, and the various modes of advertising which exist. The number of research areas which are incorporated under these headings are both numerous and give rise to many unanswered questions, about which little direct research has been conducted. In posing some of these questions and relating these to directly applicable, but in many cases the parallel adult literature, areas of needed marketing research are identified.

Thus, do children attend to price, how do children draw up price quality evaluations, how price sensitive are children and how do they evaluate risk? (Ward, Wackman and Wartella 1978; Jacoby and Olson 1977; Zeithaml 1982; Miller and Busch 1979; Heslop and Ryans 1980). Do perceptual features of products represent determinant attributes in children's product purchase and if so what strategies can be taken to make products perceptually salient (Berlyne 1968; Huston-Stein and Wright 1979). In this same light, how can the properties of a marketing task be altered to influence processing motivation or attenuation (Wilson and Mudderisoglu 1980; Weiner 1972; Wheeler and Dusek 1973; Raj 1982; Robertson and Rossiter 1974). In relation to young children, does the notion of bounded rationality - in which a simplified model of the world is constructed and then acted upon (Simon 1967) hold? If it doesn't what criteria may be used to characterise their behaviour: is their locus of control external and are the notions of concreteness and stimulus-based decision making valid (Rotter 1966; Runyon 1977; Lynch and Srull 1982a; Wackman and Wartella 1977).

The notion of children suddenly behaving as complex problem solvers in the way that Newell and Simon (1973) and Bettman (1979a) depict is

clearly shortsighted, for the development process must be evolutionary. The crux of this issue - acquiring the ability to mediate information - is clearly cognitively-determined (Roedder 1981) and perhaps accompanies the structural increase in processing capacity which develops (Case 1978). Although it is easy to characterise older children as cognitively mature problem-solvers (Brown 1978), it is considerably more difficult to identify processing strategies which cognitively immature children use, if any (Gibson 1983). Logically, however, the use of choice heuristics involving brand-oriented wholistic processing and dimensionwise attribute oriented choice processes must originate during childhood in order to be identified in adolescents (Bettman 1979a; Wallsten 1980; Payne 1979). The motivation for children to initiate discriminatory processing may therefore be considered in terms of the sequence: low commitment consumer behaviour (enforced by cognitive restrictions) leading to trial and error learning (akin to the S-R model) with perceivably bad choice outcomes, or product purchases, providing the motivation to undertake more complex CIP in future choice situations (Krugman 1965; Robertson 1976; Cialdini et al 1981; Korgoanker and Moschis 1982). Of course, motivation for information processing may be external: peers, parents and other significant references provide models for children's consumer behaviour and reinforce choice outcome (Moschis and Moore 1979; Moschis and Churchill 1978; Kelly and Michela 1980). All these issues represent subjects of future research.

An intense focus of adult research has considered the overt features of consumer choice tasks which induce processing. Thus, how extensive is information search in children and at what age and for what reason is

search initiated? With limited capacity and an assumed desire to minimise cognitive strain (Shugan 1982), extensions of the sort-recall paradigm to examine the effects of processing load have already been advocated above. In this light, research which has considered the effects of information format (Bettman and Zins 1979) of cognitive processing limitations (Henry 1980), of education (Crosby and Taylor 1981) of changes in types of processing used (Russo and Johnson 1980) and in terms of information load (Malhotra 1982; Scammon 1977) in CIP, all need replicating with children. Capon and Kuhn (1980) directly study how children of four age groups use brand and attribute data when they evaluate products (notebooks in this case). The sparsity of research on this topic using children as subjects is apparant in this piece of research, but the technique used - an extension of Anderson's (1978) information integration methodology - is valuable as an experimental paradigm.

Capon and Kuhn's findings demonstrate that young children are unable to integrate information extensively. The obvious extension of this line of research is to see whether these constrictions vary with respect to familiar versus unfamiliar products, (Park and Lessig 1981) as a function of time, how children may be instructed to improve their performance, and whether children and more efficient information processors (consider more information or make "justified choices") as a function of product class (Johnson and Russo 1981; Wright and Weitz 1977; Naus et al 1977; Moely and Jeffrey 1974). Again, these notions are closely related to metamemorial knowledge, memory chunking and a child's more sophisticated use of memory (Wilson and Mudderisoglu 1980).

Turning away from those product intrinsic factors which induce childrens CIP, it is evident that the effects and influence of television has been much more extensively researched, and, indeed using an information processing perspective. As noted in previous chapters, the main research thrusts have involved identification of the features of televised material which attract children's attention and children's ability to comprehend the material presented to them (Alder et al 1980; Lorch et al 1979; Wright and Huston 1981). In a more commercially practical vein, Gorn and Goldberg's (1982) work has much more marketing importance, for it uses 5-8 year old children, uses real world products, actual commercials and the subjects were unaware of participation in the experiment. The findings that children are influenced by exposure to commercials and that, at least behaviourally, young children's purchase behaviour can be manipulated, are clearly directly relevant findings. They should be replicated using the same rationale but using different products and different age groups. Moreover, using the findings related to attention and comprehension, it should be possible to devise commercials which have different formal features and to anticipate their effect upon children's behaviour in real-world situations. This last point should perhaps be re-emphasised. The importance of television commercials is stimulating behavioural changes is clearly fundamental to marketing, yet represents an ill-defined commercial relationship (Tauber 1980; Raj 1982).

This relationship between advertising expenditure and sales fluctuation is typically little understood because few, if any criteria, can be used to evaluate the efficacy of commercial messages. Research in this area would undoubtedly be cost-effective.

Aside from the processing demands of television, a just as important goal is to understand the efficacy of commercials in terms of repetition, again with the aim of setting down criteria for judging effects of repetition. Factors such as a subject's motivation to attend to the message, the degree to which elaboration occurs, the complexity of the message, the threshold at which repetition becomes tedious and the effects of source credibility, are but a few factors which can influence the validity of repeating commercials (Sternthal et al 1978; Anderson 1978; Cook and Flay 1978; Petty and Cacciopo 1979; Bukoff and Ellman 1979; Belch 1982; Olson et al 1982; Atkin and Block 1983).

In addition, a recent research offshoot has considered the differential effects of auditory and visual facets of televised material on children's attention and comprehension (Pezdek and Hartman 1983). The obvious implications here concern auditory-only (radio) commercials, a mode of advertising which is largely ignored by marketers for the simple reason that children's radio usage is minimal. However, by identifying those auditory features which are attended to by children, auditory cues can be effectively used to redistribute visual attention (Lorch et al 1979). The "non-listening attention demand" (NOLAD) deserves further research in this context (Grass, Wallace and Robertshaw 1983).

Much the same research needs can be identified in relation to narrative: not only as printed commercials but also in terms of on-product and in-store material. Very little research has considered

these topics using a marketing and processing perspective (Merrinohoff 1980; Brown, Day and Jones 1983; Edell and Staelin 1983).

Increasing interest has meant that the parent-child interaction is being considered much more in a marketing perspective. Mothers mediate child behaviour in supermarkets, but the relationship is bidirectional, with children influencing purchase decisions for certain products and with parents reinforcing and modelling behaviour (Holden 1983; Galst and White 1976; Atkin 1978; Comstock et al 1978). Again, a systematic approach in this field in the marketing context would be valuable both in terms of the mother-child interaction across product classes and in terms of strategy transfer across consumer choice situations. More than anything, there is a need to integrate the various sociological issues which have bearing upon parent-child relationships into the consumer literature (Maier 1978; Kassarjian and Robertson 1981). Triandis's (1982) perspective of choice behaviour, especially his "behavioural intentions" component may be usefully applied in this context.

Research Methods Cavanaugh and Perlmutter (1982) note that the "two most serious and recurrent concerns ... inherent in any method used to assess knowledge about cognitive processes ... relate to accessibility of cognitive processes for introspective analysis and veridicality and completeness of verbal report"(pg.16). In the context of consumer behaviour, those concerns are complicated by the complexity of consumer information patterns, which makes it difficult to replicate task situations, and by the desire to use real-world stimuli, whose characteristics are difficult to control.

An ideal situation would exist if it was possible to recommend a number of valid, reliable, and robust research methods which could be used to analyse children's CIP. Unfortunately, whilst many methodologies have been developed within the cognitive literature, very few have been applied in the context of children's CIP. Bettman (1979a) reviews the value of correlational approaches, information integration methods, protocol analysis, information monitoring, eye movement analyses and response time analysis. His comments are germane and need not be reiterated. Cavanaugh and Perlmutter (1982) discuss the appropriateness of independent, or concurrent methods of analysing metamemory, the distinction being based upon the respective absence or presence of simultaneous memory activity during data collection. Kassarian (1982) outlines physiological techniques which may be used to analyse processing.

Undoubtedly, verbal protocols are a favoured research method in consumer literature (Bettman and Park 1980; Biehal and Chakravarti 1982b) but have obvious problems with young children where verbal ability is constrained. As noted above, the use of Anderson's information integration rationale is valuable and readily accommodates the use of consumer stimuli (Capon and Kuhn 1980). And peer tutoring - in which one child is taught a memory strategy and relates it to a second - has apparent application to children's CIP.

Nevertheless, possibly the most valid comment in relation to research methodologies is that most can be justifiably criticised. There is an evident research need to observe how children behave in consumer environments, especially in an unobtrusive manner, and to draw up

hypotheses based upon such observations (Tauber 1980). Gorn and Goldberg's (1982) research provides an excellent example of relating cognitive cause to marketing effect. Moreover, a careful appraisal of developmental child research, combined with some experimenter-innovation, would undoubtedly allow some of the research methodologies detailed there to be used in relation to consumer choice situations (Ornstein 1978; Borkowski et al 1983; Dix and Grusec 1983). Lynch and Srull's (1982) review is as good a base as any to draw upon as a source of valuable research methodologies. Jenkins' (1979) framework is invaluable as a springboard for developing new methodologies in relation to memory.

9.5. Summary

In analysing children's consumer choice processing, a developmental perspective, incorporating changes in cognitive capability, is a fundamentally important factor to consider. Within that framework, it is then possible to consider the effects of task characteristics upon the potential processing strategies which are used by children to address choice environments.

Consumer choice tasks vary in their characteristics: familiarity, information load, time pressure, sources of conflict, the roles of advertising, parents, and peers, are but some of the factors which may dominate information processing. Research must aim to identify and elucidate the relative importance of product extrinsic and product intrinsic factors on processing. It must use real-world stimuli wherever possible; it must use existing research methodologies to appraise the covert aspects of processing: retrieval, encoding, and

metamemory; it must develop innovative methodologies and extensions of established ones to address the more overt aspects of children's consumer behaviour: parent-child relationships, attention to commercial messages and product self-purchase.

The potential for research in this area is both large and interesting. This chapter has endeavoured to identify some of these future research directions.

Chapter 10

SUMMARY AND CONCLUSIONS

10.1. Introduction and Overview

The purpose of this thesis has been to present some research and thinking on children's consumer behaviour in order to fulfill two fundamental goals; to elaborate one aspect of memory functioning, namely the ease with which different types of consumer information are retrieved by children from antipodally structured memory hierarchies; and to appraise how the information processing perspective of consumer choice may be used as a basis for formulating marketing strategies with respect to children's markets.

At its conception, this research had a much more commercially aligned goal involving the development of new confectionery products as range extensions to Ipso. This pellet confection was manufactured and marketed by a pharmaceutical company whose languid commercial posture had necessitated rapid product development. That the Ipso venture did not fulfill its commercial expectations provided material for a case-study, one which demonstrates that high risk products in unfamiliar markets must be very carefully managed. This chapter draws this thesis to a close by recapitulating the salient contentions, results, and discussions, which have characterised the preceding chapters.

10.2. Foregoing Perspectives

Why an Information Processing Perspective? It is undoubtedly true that contemporary consumer psychology takes an information processing perspective of consumer behaviour. The reasons for adopting this

perspective here are straightforward. First, consumers are difficult to depict as passive observers in choice environments. They actively participate in the choice process and are not simply stimulus-bound. Secondly, it is as difficult to treat consumer choice behaviour simply as a function of motivation or attention, or purely as a memory issue. Choice is an outcome of interactions between many cognitive phenomena whose relative importance is variably permuted across tasks, individuals, and indeed in individuals over time. Thirdly, it is conceptually easy to use an information processing framework when relating the various facets which comprise, or have bearing upon children's consumer behaviour. This is especially relevant when developmental considerations, advertising effects, or the role of selective attention, are treated in literature divorced from a processing perspective. Information processing theory acts as an excellent referential framework, unlike perhaps other models of choice (Horsky and Sen 1982).

Yet it is this very point which plausibly represents a deficiency in adopting this processing perspective. There is a danger of treating choice behaviour purely as a higher mental process, or in terms of a black box, problem solving flowchart; inevitably detail is obscured. Thus, it is shortsighted to regard processing as a straightforward, sequential procession of events comprising attention to information - use of memory - acquisition of information - making a choice - and evaluating that choice. It is germane to remember that whilst most things do gain their meaning from the larger context in which they form parts, it is the appraisal of those parts in isolation which enables the larger context to be initially defined. Moreover, it is clear that

a "bottom up" examination of processing phenomena at an elementary level, can potentially redefine the characteristics of a higher level perspective. These comments are especially significant in the context of those children whose cognitive characteristics prevent selective attention, restrict memory function, and retard data acquisition.

The Focus on Memory The paucity of research into children's memory functioning in consumer choice processing is offset only by the extensive research which has focused upon memory within the framework of cognitive and developmental psychology. It is difficult to justify the existence of such a dichotomous situation. Memory is evidently ubiquitous and it would seem that the use of real-world consumer stimuli which are, after all, everyday objects of processing, are as likely to reflect representative memory functioning as more traditional experimental stimuli. In some cases, possibly moreso.

Thus, in focusing upon memory functioning in children, a two-part goal was foreseen. The first to apply some of these existing findings in the context of consumer psychology and in a way which would have commercial implications. The second to generate some new information about memory processing.

The Validity of a Hierarchical Model The most obvious, but nevertheless important feature of memory functioning and structure, is that it is covert, impossible to directly observe, and its functioning is subject to interpretative error. It is indeed possible to change the nature of assumptions made about the characteristics of memory and to subsequently use verbal output from the processing system to confirm

any number of interpretations. Realistically, there is no totally watertight method of overcoming this constriction. But with improvements in measurement techniques, it may become possible to more directly observe the physiological basis of cognitive functioning. At the present time however, this situation means that the "morphology" of cognition is not unequivocal and, from a processing standpoint, it is impossible to argue that the absence of specific cognitive response is directly attributable to failures in attention, elaboration, retrieval, storage and so on.

In narrowing down this ambiguity, it seems reasonable that long-term memory is content addressable as opposed to non-associative, may be classified into active and passive functions, and that the amount of information which is active in the system at any one point in time is limited. Accordingly, it is also reasonable to assume that in trying to most effectively allocate processing capacity, items which are most closely cognitively related will tend to be recalled most closely in any output from the system. These relationships are perhaps more valid if the recall task is speeded, for there is less opportunity for stored relationships to be modified by intermediary processing. Nevertheless, this mediational opportunity cannot be totally eradicated. Thus, a fundamental problem exists if a distinction between memory structure and retrieval processing is desired. Unless a template of memory structure is predetermined, a circular argument of being unable to differentiate the effects of memory structure from those of retrieval processing in the recall protocol exists. And evidently, how can such a template be defined without entering into the same argument?

Against this background a hierarchical model of semantic memory structure was adopted. The primary motivation here was steeped in adult consumer research which demonstrates two methods of collecting information from consumer choice environments, one brand oriented and the second attribute oriented. These forms of processing do not categorically demand that LTM structure is hierarchical; an hexagonal closest packing network, comprising central nodes and links to peripheral storage locations could plausibly perform the same storage function. Logically though, the functional usage of information infers such a hierarchical structure: one specific type of consumer information is systematically acquired, to be followed by systematic acquisition of a second type of information. In short, a hierarchical memory structure would be a likely outcome of hierarchical processing and, combined with notions of chunking, a hierarchical model of memory structure is justifiable. Furthermore, if antipodal forms of hierarchical processing are observed, antipodally oriented structural hierarchies may also be justified.

Having selected a sample of subjects of an age-group whose memory use could be prompted, it was evident that a hierarchical model of memory structure could not be used as a processing template unless memory content was representative; and representative using subjectively defined criteria. A sorting procedure using familiar real-world confectionery brand names and these products' dimensions, served to predetermine associations between items of consumer information in a simplistic, but hierarchically representative manner.

Chunking and Retrieval Processing The retrieval of information from its stored position in the LTM is inextricably related to the nature of memory chunks. In order to minimise cognitive strain, whilst simultaneously enabling complex processing situations to be effectively dealt with, re-iterative processing of salient information is avoided during problem solving by retrieving higher order chunks of stored information. These higher order chunks are in some way representative of lower order associative meanings. Complex choices can be cognitively simplified by processing fewer higher order memory chunks.

Clearly, chunking is an obscure and little understood process, for there is apparently no method of distinguishing the fundamentally basic chunks in the system from those which represent the topmost nodes. Moreover, there is no method of identifying how many nodal levels are present in an acropetal movement up the hierarchy.

Accordingly, in the simplistic, micro-hierarchies stimulated in this research, it was assumed that an attribute chunk comprised a single, attribute and its associated lower level brand, and a brand chunk comprised a brand name and its lower level attributes. Hierarchical retrieval processing would, in turn, involve accessing information at a higher structural level before information stored at the lower levels could be retrieved.

By carefully selecting two items of lower level information from five subjectively defined attribute or brand oriented groups, hierarchical retrieval processing would be stimulated during the MFR testing phase of the experimental design. Because ten target items were selected

subjects' STM capacity was overloaded. Elaborative rehearsal would logically be required to complete the recall task. However, 10-11 year olds would tend not to spontaneously use the predetermined memory structure as a template for elaborative rehearsal during MFR. The strictures of encoding specificity and developmental level preclude such a strategy. Thus, an opportunity to evaluate input and integration failure in cued processors was identified. Moreover, the selective introduction of a direct prompt, post the sorting task but prior to recall, enabled retrieval processing ease to be evaluated, by comparing the output orders of non-prompted (control) subjects with those of prompted subjects.

Measurement of Retrieval Processing Ease The derivation of measures of retrieval processing ease was based on a simple assumption. If two items in a predetermined and identified memory structure are stored together, they should be recalled together. If this is not the case, then the degree to which they are separated in a recall output order will be indicative of the ease with which retrieval processing occurred. This assumption revolves around the assumed veridicality of the predetermined memory structure, for it is this LTM-template against which the SRP measure is clearly founded. The veridicality argument is, however, recalcitrant if argued to its extreme; but the subjective nature of the sorting procedure hopefully offsets the criticism that the predetermined memory structure is totally unrepresentative of those structures which hold information over long time-periods in children's memories.

The use of normalised proximity values in the derivation of both ORP and SRP measures took into account the interitem associations between target stimuli on seven recall trials. The ORP measure was derived purely as a function of the objective bestowal of proximity values to the target stimuli, and the measure was used to define the chain of retrieval processing which minimised cognitive strain. A comparison of the ORP-SRP discrepancy provided an indice of the degree to which subjects used interitem associations, dissimilar to those identified in the predetermined memory structure, during retrieval.

Structure of Current Processing : Structure of Processed Data Having hypothesised that LTM structure was brand oriented, simply because the law of concreteness combined with predominantly brand oriented environmental information configurations would indicate so, it was consequently hypothesised that brand oriented retrieval processing would be facilitated in comparison to attribute oriented retrieval. To find the reverse to be true, and for attribute oriented retrieval to be executed significantly more easily than brand oriented retrieval inferred LTM structure was attribute oriented and seemed to defy the principle of concreteness. In accounting for this result, it was argued that whilst attribute oriented structure minimises cognitive strain during current processing, brand oriented structure represents a more efficient mode of storing information in the LTM.

A fundamental problem, however, concerns the storing of a memory representation of attribute oriented current processing. An encoded trace of attribute oriented information processing must, logically, generate an attribute oriented memory structure. Evidently, to

reconcile the demands of concreteness with the results of this research involved delineation of co-occurring, dissimilarly structured memory traces. The problem was reconciled in terms of episodic memory and sensory-perceptual memory, the former representing a contextual representation of past processing, the latter representing a store of referential material. Yet to argue that this solution is a totally watertight one would be erroneous. Despite the contention that purposive use of information may be distinguished from its non-purposive use, and that different memory structure occurs accordingly, there is no evidence to suggest that the encoding processes in semantic and episodic memory are anything but identical. Accordingly, semantic and episodic memory may be justifiably described as being one of the same thing; information semantically structured in the memory. As an adjunct, the notion of incidental learning, involving information acquisition under negligible processing conditions is perhaps relevant here. How is this presumably non-purposive information structurally organised in the LTM, is a fundamentally important conundrum in this respect.

Other findings demonstrate that brand oriented memory structure accentuates integration failure, with prompted subjects tending to create inter-item associations to facilitate recall as opposed to using their predetermined memory structure as a retrieval plan.

Turning to non-prompted subjects, it is clear that 10-11 year olds will not spontaneously use a predetermined memory structure to aid their recall. Their organisational processing was not planful; it involved a permutation of maintenance and elaborative rehearsal and reliance on

fortuitously discovered item similarities. A capricious switching from recall strategy to recall strategy typified their information processing. It is correct to characterise 10-11 year olds as cued processors. They are able to mediate information but tend to not to use storage and retrieval strategies spontaneously. When they are prompted to do so, the structural characteristics of the stored data impinge upon their processing efficiency.

Effective Child Marketing The risk inherent in operating in children's markets can be reduced by structuring the marketing issues present. This initial identification of the strategic and tactical phenomena inherent in most marketing situations, serves as a useful reference framework within which marketing strategies may be generated and considered. This simple process helps to eradicate lag-response decision making.

An information processing perspective of children's consumer choice behaviour cannot serve as an all-knowing framework to guarantee excellent product performance. Excellent marketing can rarely overcome fundamental product deficiencies. Neither can advertising. The soundest marketing advice is therefore common sense. Ensure the product does not possess fundamental deficiencies. Yet against this backdrop, effective marketing may be considered in terms of matching the processing characteristics of both the child target market, and the processing load inherent in the structure, format and source of marketing communications, with the contemporary marketing goals.

Age is a practical heuristic which is used to segment children's markets. The classification of children's processing characteristics into limited, cued and strategic age-groups is based upon documented improvements in memory use and is simultaneously related to developmental acquisition of cognitive skills.

It has been argued that marketing products to under eight year olds necessitates a multi-pronged strategy. The product must be perceptually noticeable, well distributed and the subject of strong in-store promotion. This is because young children's memory use is non-purposive, their recall is incidental, and their purchase behaviour is impulsive and easily moulded by recognition of external stimuli. Moreover, limited processors are unable to perceptually decenter, fail to classify data using anything but ephemeral criteria and are susceptible to accepting information at its face value. Despite such facts, children of this age are not passive vessels of reception. Advertising can be effective in eliciting short-term manipulation of choice behaviour if the central content of messages is actively attended to by children. The use of salient auditory and pictorial features, their co-occurrence in commercials, and the use of conflict generating events, can all be used to guide attention and enhance comprehension of marketing messages.

Arguably, however, the time and cost involved in structuring commercial messages in this way may not be justifiable in the long-term, especially if unit pricing is low and moreso in the light of ethical considerations. The better tack here is to aim any conceptual advertising at parents, in the knowledge that the bidirectional parent-

child interaction represents a major influence in choice behaviour in these markets, to emphasise in-store and on-product promotion, and to restrict advertising goals to improving brand awareness amongst children.

In summarising marketing in relation to cued processors, it was noted that 8-12 year olds are both susceptible to external prompting and that such prompts markedly improve cognitive performance. It was argued that the processing demands related to product purchase must generate enough conflict to initiate processing, whilst the nature of internally and externally located information must occur in a format to facilitate and maintain processing.

Knowing that attribute oriented current processing characterises cued processors' pre-purchase information processing, but being cognisant of the fact that comparative advertising can over-complicate processing, a strategy of developing products with strong unique attributes and overtly stressing this attribute strength throughout product-related advertising was advocated. In this way, a strong positive association between a brand name and a salient attribute is fostered. Such strong associations are more likely to be recalled in out-of-store environments, to benefit from impulse purchase, to be requested by name and to define points of cognitive reference. Advertising, in which only a limited amount of chunks are presented, cannot overload the processing capacity constrictions of cued processors. But the information presented must be both salient and relevant. Market research involving a simple product sorting procedure effectively generates the information set of relevant attributes. The frequency of

occurrence of inclusion rules would provide a measure of attribute salience.

In attempting to make products less prone to interference the van Restorff and averaging crossover effects demonstrated that when cued processors begin to use two or more attributes during choice processing, a single dimension has more effect when presented alone than when bolstered by other data. The effect is accentuated if the information is extreme. Thus, advertising a poor product effectively shortens its life cycle.

The non-spontaneous nature of processing in cued processors enhances the importance of advertising, especially television advertising in these markets. A continuous or level intermittent pattern of exposure was advocated, with the form and content of advertising being kept conceptually simple and with attention being drawn to central content that is, the salient product attribute. In countering competitive strengths, two strategies were put forward, one based on storage, the other on retrieval. The effect respectively, is to dilute competitive advantage by demonstrating the ubiquity of the advertised strength, or by introducing more important, superceding information into the advertising copy.

Taxonomy of Market-Induced Processing By classifying strategic information processing into low and high involvement categories and by characterising the risk present in consumer choice situations as low and high, a taxonomy of market-induced processing conditions was put

forward. Four conditions, brand loyal, transitive, conative, and intuitive were postulated.

The fundamental distinction between high and low involvement processing revolves around consumers actively considering information hence creating memory chunks, as opposed to relying on already stored chunks, with choice being conditional upon recognition of stable cue configurations. The former characteristically involves attribute-oriented current processing. In the latter, brand names are used to chunk the outcomes of past choice processing. The fundamental distinction between high and low risk choice situations revolves around a subject's perception of the value of negative choice outcomes therein. When negative outcomes are evaluated as being lower than a subjectively defined threshold, risk is low. When such a situation does not hold, risk is high.

Using these criteria, and postulating transitions from one processing condition to another, strategies were put forward to demonstrate how changes in marketing information may affect the relative strength of products in a variety of markets. The relationship between product quality, advertising and price with respect to profit was discussed and incorporated into the processing taxonomy. The role of conflict, changes in advertising content, packaging and price were discussed, with the goal of demonstrating how marketer-controlled factors may be used to enhance product positioning. The importance of equating the processing of 13 year old and older children with that of adults was emphasised throughout this section, and it was argued that the creation

of a sound taxonomy for describing CIP inherently created a sound basis for prescribing marketing strategies.

Ipsos As a Prognostic Case-Study Undoubtedly, Ipsos will not be the last product to be entered into, and then withdrawn from the UK confectionery market as a commercial failure. With the benefit of hindsight, numerous errors of judgement can be identified; price setting, distribution, poor targeting and shortsighted purchasing of Ipsos boxes, to name but a few. But it is the very fact that misjudgements of a remarkably similar nature contribute to the failure of so many products, and are documented widely as doing so, which is perturbing. On the one hand, marketers are apparently unable to undertake strategy transfer, and to use documented experience to guide their decision-making. On the other, however, there is no rationale which guarantees new product success.

In using the Ipsos case-study to reconcile these two apparently contradictory statements, it is clear that the stronger the desire to improve profitability, the more prone to distortion is a company's evaluation of market data and risk. Far-sighted management initiates product development when profitability is high and when the consequences of failure are perhaps not so drastic. Secondly, few product development plans are faultless. Yet many problems, faults and errors can be eradicated by careful, realistic, and restricted consumer testing. Risk is inherently lower when market testing is used as an indice to commit resources, as opposed to justifying an historic level of resource commitment. Thirdly, there is perhaps no substitute for actual market experience when introducing new products. Finally, there

is a lot of truth in the adage that a company should "do what it can do but do it well". An introspective analysis of company strengths is an excellent foundation for the development of new products.

Future Research The intense focus on children's processing of television, will plausibly act as the spearhead for future research into children's information processing. Logical extensions to this body of research seem likely to incorporate memory functioning and analysis of children's use of televised information, with a shift away from studies of selective attention.

Undoubtedly, there is a chronic need to explore the ways in which scientific knowledge can be used to solve practical problems. The rift between academic research and its commercial application is notably large and there is perhaps an in-built reticence towards closing this gap. This seems to be short-sighted and detrimental both academically and commercially (Carter 1983).

Perhaps the greatest research priority is to apply some of the research techniques and methodologies which abound in cognitive and developmental psychology to consumer psychology; and especially to children's consumer choice processing. Some of these methodologies will require innovative modification in order that children's processing, under a range of real-world conditions, can be examined and explored. The effects of time pressure, conflict, peers and parents, in-store and retained advertising information, of information load characteristics, and of product price and packaging characteristics, all form research topics by themselves. Their cumulative effects on

processing clearly involves considering the components of human intelligence on neural, elementary and higher level mental processing levels. Indeed, there is a need to integrate current research so that consumer choice processing is not simply regarded as a higher order cognitive process, or as an adult-specific process. Consumer choice behaviour develops both as a function of relaxation of cognitive developmental strictures, and as a function of increased task familiarity. It should be regarded as such.

To pick out specific topics and emphasise their overriding importance in choice processing, perhaps belies the integrated, iterative nature of processing. However, changes in the structure of memory represents a topic of priority for future research. To date, a stumbling block in the analysis of CIP is the absence of research which can be used to describe how stored information interacts with incoming data such that a change in memory structure occurs. Inevitably, this involves analysing the rules which lead to chunking of consumer information. Although a major facet of the process of chunking is steeped in complex language understanding, it seems precarious to divorce chunking into categories of language chunking and categories of imaginal chunking, especially in relation to consumer choice processing, and moreso in relation to children's choice processing. It is important to consider memory as a store of information in which meaning is internally held using a number of sensory modalities, despite the fact that verbal output is the vehicle which is typically used to assess such meaning. Without wishing to over emphasise truisms, the verbal input-verbal

output sensory modality has no equivalent visual input-output system which can act as a "primary" data source.

There are no straightforward unequivocal methodologies which can be used to identify memory structure per se, its use during problem solving, or to appraise changes in its structure as they occur. Nevertheless, the combined use of research methods, for example simultaneously using reaction times, eye-movements and verbal protocols, will undoubtedly improve the efficacy of research methodologies, with an inherent improvement in memory insights.

From a commercial standpoint, it is research which relates marketing stimuli to behavioural effects which is most relevant. Surprisingly little research along these lines is available, although companies presumably conduct their own extensive testing. Again, Gorn and Goldberg's (1982) research, and Zeithaml's (1982) work is especially relevant in this context, for their methodologies allow for changes in the characteristics of stimuli which are fundamentally real-world, to be related to overt changes in behaviour. Inherently, such research provides findings which can be applied commercially, as opposed to more traditional work which perhaps overconcentrates on specifics in choice tasks and rarely specifies related to consumer choice task. Hopefully, as more and more relationships are uncovered and the ways in which both children and adults utilise information become clearer, the art of marketing will become a more cost and time effective science.

The Literature Cited

Because children's consumer choice behaviour is a subject which envelopes and embraces so many disciplines, it would be

shortsighted to assume that each one has been thoroughly applied in this thesis. A balance between breadth and depth has been sought. It is hoped that in the literature cited herein, enough cross-linkages between disciplines have been made to provide a comprehensive as opposed to exhaustive appraisal of children's consumer choice processing and behaviour.

10.3. Conclusions

In this thesis, I have used an information processing framework as a foundation for addressing children's consumer choice behaviour. Central to this perspective is that choice is an outcome of interactions among various cognitive components, yet is simultaneously stimulated, modified, and manipulated by environmentally occurring task factors. In this way, the theory acts as a springboard for reconciling cognitive psychology, whose gamut of research concerns internal interactions, and marketing, which projects consumer information into task situations.

The terms of reference in which this thesis are couched involve applying academic findings to practical marketing problems. Aside from the ethical considerations of using profit maximisation as a research impetus, and the traditional academic desire to secede from such research, the bridging of the academic-commercial rift is plagued by a much more intransigent problem. It is extremely difficult to develop an all-knowing, all-enveloping theory of consumer choice which can be applied across task situations, whilst at the same time expecting such a theory to prophesy a choice outcome. This difficulty, on reflection, tends to be self-perpetuating, simply because the complexity of human intelligence confounds the simplicity of contemporary analytical

techniques. It is, unfortunately, like trying to catch a very large animal with a very small net.

Nevertheless, the more observations which can be made, the more proficient will our ability to predict consumer choice become. I believe that the information processing framework is a valuable rubric within which choice processing can be described, but that in order to accommodate children's consumer choice processing, metacomponents must be incorporated into the theory. Pendentically, a distinction between metacognitive and metamemorial components can be made, with the former relating to stage-related changes and improvements in cognitive capability and the latter concerning children's acquisition of knowledge about their memory usage.

In this thesis, the role of metacomponents has been incorporated into the processing model by emphasising the term "current processor" and by delineating the current processor as the active site of information processing. In order to parsimoniously include the role of metacomponents here, it was argued that metamemorial knowledge may be stored as inactive, procedural-motoric data, very much akin to the nature of stored choice heuristics. Stored metamemorial data can be retrieved: strategy transfer may then occur. However, a second aspect of what may be called metamemory involves both the cognitive parameters within which current processing takes place and the cognitive impetus which directs planful processing. In order to incorporate these cognitive functions, the term executive processor was adopted. This executive processor constrains processing in terms of capacity limitations and in terms of skill availability, and guides processing

by determining which cognitive strategies may be used during processing. Clearly, the role of the executive processor is therefore metacognitive: the ultimate control of the system must be subordinate to the metacognitive impetus of the executive processor.

It might be argued that it would be better to treat the metacomponents of processing in a manner which divorces them from memorial aspects of current processing. I believe that such a classification demands that ever-more superordinate metacomponents are defined, generating an endless hierarchical chain of cognitive command. It is, consequently, more desirable to regard the current processor as comprising activated cognitive components, performing varied functions within developmental strictures.

At the heart of children's consumer choice processing is the functioning of memory. One of the most penetrating deficiencies of contemporary processing models is the inability to specify the mental representation of information and the knowledge structures upon which cognitive components operate. Finer grained analysis of this memory template, its construction, modification and development is essential if processing across task domains is going to be fully understood. The simple hierarchical memory structures put forward here, and the analysis of retrieval processing ease carried out, do not provide a total account of what is surely a tremendously complex human mind. They do however, provide an insight as to the nature of preferred flows of information in the processing framework and indeed some notion of how memory structure does impact upon current processing.

Practical decision making by children in consumer choice environments has been barely considered. Here, it is important to classify the type of processing which children are capable of performing and to classify the processing demands which are inherent in task domains of various sorts. The matching of processing strategy and task situations would then represent a research goal which, if achieved, would enable a more compelling account of children's choice processing to evolve. The classifications of this sort put forward in this thesis aim to provide a foundation which not only throws light on children's choice behaviour, but does so in a manner which has commercial significance. However, such a classification is not rigid. A good deal of research might address the notion of "no processing" as an alternative to low and high involvement processing, embracing the concept of irrational product selection and its effects on subsequent consumer behaviour.

Turning to Ipsos, it is a pity that a substantial capital loss occurred, when so much of it could have been averted had a more assiduous marketing approach been taken. The reasons for adopting marketing strategies are always more difficult to understand out of context and much easier to correct with the benefit of hindsight. Nevertheless, fundamental errors were made and these caused the project to accrue such heavy losses. It is hoped that the appraisal of Ipsos presented here draws attention to some of the pitfalls of marketing products to children, and that the material in this thesis can be used to preclude the re-occurrence of such errors in future marketing ventures.

In closing, the fundamental goal of this thesis has been to conduct academic research which has commercial significance. One factor which

precludes academic and commercial research goals being totally miscible is the nature of theories which account for children's choice processing and consumer behaviour. They are incomplete and fragmented, partly because research has been scant, and partly because the subject is both multidisciplinary and truly interdisciplinary. Accordingly, the future research opportunities here are prodigious, interesting, and amenable to innovative theorising, examination, and application. It is my hope that this thesis may be regarded and used as a vehicle which facilitates the application of academic research to practical commercial and marketing problems.

Appendix 1

THE INFORMATION PROCESSING THEORY OF CONSUMER CHOICE

A1.1. Introduction

This appendix abridges Bettman's (1979a) theory of consumer choice. There are essentially three reasons for putting forward this abridged version here. First, the theory most ably deals with the components which underlie consumer choice using an information processing perspective. Secondly, it was inappropriate to consider a single facet of the integrated, re-iterative theory in isolation (Section 2.4.). Thirdly, it is hoped that this presentation forms a background to this thesis which can be used by managers whose experience with the psychology of consumer choice is limited.

A1.2. Overview

The information processing theory of consumer choice is outlined using seven cognitive components: processing capacity; motivation; attention and perceptual encoding; information acquisition and evaluation; memory; decision rules and processes; and consumption and learning.

The relationship between these components is diagrammatically shown in Figures A1.1. and 2.1., as a series of looping and branching interactions. Section 2.4. has outlined the way in which choice is the outcome of processing, how a person's processing may be represented in terms of attending to, acquiring and evaluating information and how information processing represents a movement through a goal hierarchy, with the ultimate goal representing a desire to purchase a product or, of course, to reject a product.

A1.3. Processing Capacity

Humans are limited in their capacity to process information and, typically, when humans make choices, a good deal of mental effort (M-power) is used. Clearly, a distinction can be made between the structural capacity which a person possesses (M_s), and the amount of mental effort which a subject actually uses, the functional processing capacity (MF). The value of MF can oscillate between zero and M_s , depending upon how motivated an individual is to use his available capacity to its full extent (Norman and Bobrow 1975). This concept of processing capacity was developed from studies of cognitive development (Pascual-Leone and Smith 1969), and has important implications for consumer choice theories; it governs the amount of information a person can process.

Utilisation of Capacity Some individuals tend to utilise their maximum functional processing capacity whilst others do not. This is due to individual differences. In certain situations "field dependent" individuals tend to cling to the external environmental framework of a

visual field, whereas "field independent" individuals tend to rely more on their own bodily sensations (Witkin et al 1962). It has been argued that this dependence - independence distinction is related to differences in usage of processing capacity (Pascual-Leone 1970). Field dependent individuals are assumed to be habitually low M-processors and assign a higher weight to perceptual cues than to goal hierarchies in choice situations (Case 1974).

In utilising processing capacity, the brain can only deal with a specific number of schemas, or subjective units of thought (Case 1974). Miller (1956) suggested that the number of "chunks" that can be held in short-term memory is seven, and "chunks" may be described as "internal representations of items of information with which a subject is familiar or of perceptual configurations which he can recognise" (Case 1974). Variation in processing capacity can be caused within age groups by biological considerations and such differences in "content-free intelligence" have been recognised for many decades (Spearman 1927).

Variation in capacity across age groups can be analysed in terms of levels of operativity and cognitive development (Piaget 1970). Cognitive maturation increases a child's capacity and a theory modelling intellectual development in these terms stresses the structural increase in processing capacity (Case 1978).

Choice and Capacity This limitation in processing capacity has overriding impacts on choice. In choice situations where more information than can be processed exists, heuristics are used to combine and simplify data (Wright 1975), and these heuristics bring complex tasks within the strictures of limited processing capacity (Payne 1976; 1980). A fundamental problem in understanding how different individuals allocate processing capacity is deriving objective measures of analysis. The situation is complicated by the fact that small changes in the information configurations in choice environments can markedly affect the timing and degree to which capacity is allocated (Lynch and Srull 1982; Bettman and Zins 1979).

The constraints of processing capacity are especially important in relation to children. Their developmental levels preclude sophisticated (adult) application of heuristics until after information can be selectively attended to, until memory use becomes polished, until perceptual decentration occurs and until accompanying increases in Ms occur (Roedder 1981; Wackman and Wartella 1977; Calder et al 1975). Children's choice processing, however, need not necessarily be less complex than adult processing. It may entail different, but just as complex permutations of cognitive components.

A1.4. Motivation

Motivation is a crucial component of choice. In all theories of choice an individual must be motivated in some way to cause him to act, or to move from an initial state to a desired one. Motivation is the factor which controls the intensity as well as the direction of behaviour. In

information processing terms, motivation is the mechanism which determines the amount of processing capacity which is allocated to achieve goals.

Classification of Motives Murray (1938) grouped 20 basic psychological needs, such as achievement and affiliation, into six classes. Maslow (1970) stressed the hierarchical nature of human motivation and postulates that lower order biological needs have to be achieved before higher order cognitive and aesthetic needs can be actualised. McGuire (1976) draws up a classificatory system of human motives based upon four dichotomies and subsequently generates 16 "cells", each cell representing a partial view of human personality.

Within the consumer literature, the tendency has been to take an information processing perspective and to put aside motivations such as fear as a method of stimulating demand (Sternthal and Craig 1974) and the role of "deep-seated" needs as stimulants to consumer behaviour (Dichter 1964). The cognitive processing approach proposes that thought processes affect not only the structure of goals but their interpretation as well (Weiner 1972). For instance, a biologically based hunger motive can be affected by presenting information uncomplementary to that motivation, whilst a hunger motive can be induced in a similar manner by supermarket shopping behaviour (Nisbett and Kanouse 1968). In this light, motives are both biologically and cognitively based and consumers actively respond to stimuli in the choice environment.

Goals and Goal Hierarchies Newell and Simon (1972) describe choice as "search through a problem space". Motivation is the mechanism which drives this search. Inherent in choice described in these terms, is that information is collected and that this acquisition facilitates progression through the problem space. Information processing theory regards behaviour as being goal-oriented and the desired state can therefore be considered as the goal object. In trying to achieve this goal object, information is collected to achieve goals. Goals represent specific states which must be achieved to allow progression towards the goal object.

More simply, the consumer is conceptualised as developing a goal structure which comprises goals and sub-goals. Attaining lower level sub-goals enables goals to be achieved, which in turn leads to attainment of the goal object. Choice is the process of collection of information to satiate the goals present in the goal hierarchy.

The goal hierarchy itself represents a flexible structure which can be modified, reconstructed and developed as information relevant to the choice is collected. The hierarchy's flexibility allows information to be incorporated into different levels of one hierarchy and into different hierarchies altogether.

Heuristics, or simplifying rules, are often employed to bring information into processing limitations. Usually heuristics are learned through experience with choice situations and using such rules,

or learned responses, simplifies processing in future goal hierarchies.

Processing of many goals may take place simultaneously, but the flexibility of the goal hierarchy makes it impossible to fix the initial and desired states objectively. Obviously some goals will be more important to the choice in question than others and consequently more important goals are allocated more processing capacity.

In this light choice can be seen as a very complex progression through the goal hierarchy which is constantly being reconstructed and changed as a function of information collection. Individual differences such as personality, experience with the choice situation and education, will be reflected in the complexity and detail of the goal hierarchy which is constructed.

The complexity of the goal hierarchy is also directly affected by the nature of the choice. A very complex choice, such as buying a piece of technical machinery, would require a substantial amount of information and be reflected in a complex goal hierarchy. A person who has experience with such machinery would learn from experience, utilise heuristics and develop a much less complex hierarchy.

In short, the choice process represents a consumer's progression through a set of goals and motivation represents the allocation of processing capacity to achieve goals. More important goals are allocated more processing capacity and the nature of experience and the choice itself governs the use of learned heuristics.

Interrupt and Scanner Mechanisms The ideal case has been described above where progression through a goal hierarchy takes place without interruption. Human beings are rarely so conscientious in pursuing goals and often events around them cause distractions. Simon (1967) proposes that individuals possess a scanner, which represents a mechanism that constantly monitors the environment around. Quite regularly, events happen which demand that progression through the current goal hierarchy should temporarily be suspended. An interrupt mechanism (Simon 1967) achieves this aim and allows the individual to adapt to environmental conditions which are possibly more important (Figure A1.2.).

Interrupting events are of three main types;

- (i) Something in the environment does not correspond to a person's expectation e.g. a new brand, changed price, or re-arranged supermarket;
- (ii) Physiological events, such as hunger and thirst;
- (iii) Cognitive events, such as suddenly remembering a forgotten task.

An individual's reaction to interrupting events is variable. An increase in arousal and physiological activity is well known; automatic turning movement in response to loud noises for example. Hansen (1972) suggests however, that most interrupts stem from environmental stimuli such as changes in a shopping feature. If such information is deemed as being valuable, then it may be incorporated into the current hierarchy or stored for subsequent use. Alternatively one reaction to

an interrupt may be to ignore it. Time pressure or the importance of achieving current goals might make this response occur (Sheth 1979).

The existence of a scanner demands that processing capacity is allocated between achieving current goals and between appraising the environment (Neisser 1963). The ratio of this allocation and the level at which information pertaining to choice is decided as being sufficient varies from individual to individual. The existence of scanner and interrupt mechanisms also emphasises the point that the consumer actively adapts to the choice environment, as opposed to passively responding to it.

A1.5. Attention and Perceptual Encoding

Attention and perceptual encoding comprise the third element in the information processing theory of consumer choice. These are important aspects because they govern what information, from the vast array present in the environment is selected, and also how meaning is attributed to that information.

The number and diversity of stimuli which surround every individual is so great that, despite complex sensory systems, only a very small proportion will be dealt with. This is fundamentally because processing capacity is limited: only a selected number of stimuli can be attended to.

Voluntary Attention Attention can be defined as the allocation of processing capacity to a stimulus (Kahneman 1973). During progression through the relevant goal hierarchy certain stimuli in the environment become important in achieving goals and subgoals. It is this progression which causes an individual to allocate processing capacity and such allocation of capacity is called voluntary attention (Bettman 1979a). In short, information is actively sought in response to goal directed behaviour.

The amount of processing capacity which is allocated varies from stimulus to stimulus but is proportional to the importance of achieving a goal in the hierarchy. Obviously, a high level goal will demand that more processing capacity is allocated to stimuli relevant in attaining it as opposed to a lower level goal. Motivation plays an integral role in defining the intensity which a stimulus is attended to.

Perceptual Encoding Having selectively picked out a stimulus from the environment, this information needs then to be assessed and interpreted and such perceptual encoding comprises two stages. The first stage involves an examination of an object's basic features, its angles, colours and brightness for example, and this analysis takes place on all levels from the very basic analysis of primary characteristics up to a very complex one (Lindsay and Norman 1972). Eventually an object or event is categorised as having a set of distinct features, some complex others mundane. Salapatek (1975) and Maurer and Salapetek (1976) indicate that an elementary ability to distinguish shape, distance and colour exists at birth, and work with eye-movements shows

that elementary shapes and angles are the first things about objects which adults visually attend to (Russo and Rosen 1975).

The second encoding stage involves the use of information which is stored in the memory. Although a stimulus appears to have fixed characteristics, feature analysis is not sufficient for developing interpretations. The context of a stimulus is very important as individuals actively construct interpretations in the current context of events (Wallsten 1980; Slovic et al 1977).

Active Synthesis of Information Information in the memory plays a crucial role in the interpretation and perception of stimuli and the context of the stimulus is just as important as the stimulus itself. Therefore, before any stimulus is attended to, information stored in the memory biases the perceptual readiness.

Lindsay and Norman (1972) refer to the process whereby information stored in the memory constructs and changes the process of perception as an "active synthesis model of perceptual interpretation". Information is modified in this way so that it is consistent "with our knowledge about the world".

Such an active synthesis of information, between the actual characteristics of a stimulus and what an individual expects these to be, has important implications. Perceptually, patterns of information have to be built up over time as experience with particular stimuli in specific contexts is acquired. Eventually frequently occurring stimulus/context associations may simply be recognised as total configurations, eliminating the need to process objects at a lower level. Such "gestalts" (Lindsay and Lindsay 1966) have been used to account for such behavioural phenomena as stereotypes, prejudice, habits and brand preference (Bither and Miller 1969). Preconceptions about the source of a message, for example whether an 'expert' delivered it or not, has an effect on the persuasion of individuals, and underlines the importance of the context of stimuli and the active synthesis of information (Sternthal, Dholakia and Leavitt 1978; Cialdiani et al 1981).

The result of perceptual encoding of information can have profound effects on the behaviour of individuals. Re-ordering and modification of the goal hierarchy due to active synthesis of information may cause the allocation of attention to be modified as new goals are constructed. In this way the chain link between attention, perceptual encoding, active synthesis and re-direction of attention via modified goals, acts as a method whereby selective stimuli are gleaned from the many which comprise the environment.

Involuntary Attention and Conflict In the section discussing motivation, behaviour was described as being goal-directed with attention and perception fitting into the theory quite snugly. However, the environment often contains stimuli which do not conform to the contemporary goal-hierarchy and which were described as representing interrupts (Figure A1.2.).

When an interrupt does take place the processing of goals temporarily stops and the interrupt is attended to. This involves the allocation of involuntary attention, the term involuntary being self explanatory. Such involuntary attention often totally redirects behaviour. For example, a loud noise will generate a reflex or orientation reaction involving physical adjustments, an increase in physiological arousal, automatic termination through any goal hierarchy, and a marked re-allocation of processing capacity to interpret the interrupt. Pupil dilation and increased sweating and skin response are used as measures of physiological arousal (Kassarjian 1982).

Although physical stimuli may represent the cause of interrupts, Bettman (1979a) recognises such stimuli as being only one source of conflict. Conflict occurs when an individual is faced simultaneously with competing and incompatible response tendencies. In other words an individual could choose any of several responses but only one can be performed. For example there may be several methods of getting from home to work, yet only one could be chosen and hence a conflict situation exists. The degree of conflict is related to the number, absolute strength, degree of incompatibility and the nearness in terms of equality of the response tendencies. Berlyne (1968) argues that conflict is generated by novelty, complexity, or unexpectedness, and it is this perceptual salience stimuli which acts as a source of conflict in young children's attention to television (Huston-Stein and Wright 1979).

Other causes of conflict in the consumer choice environment include several stimuli competing for attention simultaneously, as well as the possibility that one stimulus can have several different meanings and interpretations. A most important source of conflict is generated when disagreement between what was expected and what is experienced occurs. In all these cases, involuntary attention must be allocated to resolve this conflict before progression through the goal hierarchy can be re-established.

Response to Conflict One result of conflict is that the goal hierarchy is modified and a process of re-allocation of capacity to other stimuli occurs as has been outlined above (Figure A1.2.).

Another result of conflict is that additional learning about the environment may occur. Once voluntary progression through the goal hierarchy has been interrupted, incidental learning about products and other stimuli in the environment may take place. For example, a novel package may be noticed by a shopper who may temporarily stop and look at it. The consumer learns about something in the environment which is outside the immediate goal hierarchy. Such learning about the environment suggests that little attention and therefore capacity is allocated to the stimulus in order for learning to take place.

Work in this area includes low involvement learning (Krugman 1965), incidental learning (Postman 1975) and spectator learning (Posner 1973).

Essentially, a distinction in processing "types" is used to account for low involvement learning and this has been set out in the literature

using various terminology. Craik and Lockhart (1972) distinguish between controlled and automatic processing, Chaiken (1980) between systematic and heuristic processing. Petty and Cacioppo (1980) describe two basic routes to persuasion; a central route which occurs when a person is motivated and able to think about an issue, and a peripheral route which occurs when either motivation or ability is low. The central route emphasises that a large amount of processing capacity is allocated resulting in enduring attitude change. The peripheral route is likely to produce a change which lasts only if the change is reinforced at a later date. This low involvement route involves allocation of little processing capacity.

This notion of learning under conditions of low levels of attention is important, especially as much advertising aims first to gain attention and then to deliver a message about a product (Ehrenberg and Barwise 1983). In terms of information processing theory, it is adequate to recognise that two types of learning, one under high levels and one under low levels of attention, exist (See Section 7.5.).

Other points concerning attention and perception, are the effect which individual differences have on these components. The threshold level at which an interrupt may occur varies from person to person and what may appear novel to one person - and cause an interrupt - may not to another. Similarly, reactions to conflict situations may vary between individuals; some may ignore conflict by refusing to recognise that competing responses exist, and others may deliberately process every possible response. Obviously, the presence or absence of relevant goals may be used to account for these different modes of behaviour. Cognitive tempo, referring to the tendency to reflect, or not to reflect before responding to problem solving tasks (Kagan 1965) is also relevant here (Borkowski et al 1983). Moreover, individual differences, such as the degree to which goals for learning about the environment are present and the degree to which passive as opposed to active learning strategies are used, further affect the relative importance of attention and perception.

One final point concerns the number and diversity of familiar chunks or patterns of information which a person holds in memory. The way information is perceived will vary greatly as a function of the characteristics of stored patterns of information and in this way methods of building up such information patterns comprise important aspects of the theory of information processing (Simon 1974; Wicklegren 1981).

In summary, attention and perceptual encoding are the processes involved in selecting and interpreting patterns of stimuli. Attention is defined as the allocation of processing capacity to a stimulus. It is allocated voluntarily when a stimulus is instrumental in reaching a goal, thus allowing progression through a hierarchy. Involuntary attention takes place because a stimulus has caused an interrupt. After a stimuli has been attended to, it is attributed meaning by interacting with information already stored in the memory and this active synthesis biases the stimulus. Interrupts and conflict lead to learning about the environment, a process which can also take place under conditions

of low attention. Often interrupts modify goals and affect the direction and intensity of goal-oriented behaviour.

A1.6. Information Acquisition and Evaluation

Information acquisition and evaluation involves the gathering of information to attain goals and hence make a choice. In progressing through the goal hierarchy, the consumer needs to possess a specific amount of relevant information in order to achieve goals. If the consumer deems that he possesses sufficient information, then he can progress to the comparison of alternatives stage of the theory. Regularly, however, a consumer does not possess enough relevant information to allow him to make a choice and therefore he must acquire and evaluate necessary data.

Information can be acquired using one of two methods. The first method involves a person voluntarily searching for that information and the second involves a person being confronted with information. The latter method, where information confronts the individual, has been discussed in the last section with regard to the allocation of processing capacity due to interrupts and in terms of low involvement learning.

The former method involves the consumer voluntarily searching for information and this search can take place either internally through the memory store, or externally in the environment (Figure 4.2.).

Internal Search The internal search for information can be discussed in terms of three sub headings, the direction of search, the degree of search and the pattern of search. Each is affected by numerous factors.

The direction of internal search refers to the assessment of which actual pieces of information should be extracted from the memory. The current goal hierarchy determines this selection, for if information about the price of the product represents a goal in the hierarchy, then this is the information which will be extracted. Such a search can take place irrespective of the characteristics of the task situation which a consumer is in, but a stimulus already present in the environment could initiate the search for information.

The degree of internal search describes how much information is required to achieve a goal. Again individual consumers have different ideas as to how much information is required in achieving a goal and thus a threshold for one person may not represent enough information to another. A more intense search is likely to take place if relevant information is actually present in the memory and this would correspond to the degree of experience and prior learning which has taken place about the choice in question. Conversely, if substantial information is available in the environment, then a very intense memory search involving extensive allocation of capacity, is unlikely to take place (Bettman 1979b; Biehal and Chakravarti 1982a).

Another factor pertinent in controlling the degree of internal search concerns the suitability of the stored information. Based on actual

experience with a product, a goal may dictate that further information is acquired before a product can be chosen for a second time. This may result in a more intense search through the memory and the acquisition of relevant information overlooked during previous processing. However, if a long period of time has expired between purchases of a product, then it is likely that information will be less accessible. Again a more intense search would have to take place.

As mentioned, and in conjunction with this previous point, low involvement learning, involving peripheral processing, causes information to be less deeply processed (Petty and Cacioppo 1980). Under such conditions, the ease with which information can be retrieved varies as a function of storage and therefore salience is an important factor in controlling the degree of search.

Thus, the direction of internal search is controlled by current goal characteristics and by the choice situation which confronts the consumer. The degree of internal search reflects the amount of information which is actually present in the memory, its suitability in relation to the current choice situation and the degree of conflict which exists. If several incompatible, but competing response tendencies co-exist, then more information about each would be required before a choice could be made.

The third factor affecting internal search is the pattern of search. Clearly, the sequence which information is extracted from the memory will reflect the methods used to actually place the information there primarily. The mechanisms of perceptual encoding assume relevance here. Similarly, the use to which the information is to be put and the characteristics of the goal hierarchy will influence the pattern of memory search.

External Search External search can again be considered in terms of the direction, degree, and pattern of search. External search, by definition, involves scouring the environment for information, that is from friends, packages or advertisements. Usually an initial internal search is followed by a subsequent external search.

One major factor controlling the external search for information is how much relevant information is already present in the memory: there is little point in searching for already known information. Another factor controlling the direction of external search is the availability of the information itself, reflecting the characteristics of the choice environment. If many attributes and many brands comprise the environment then almost endless search could take place. Conversely, if only a few brands exist then the direction of search is severely restricted, for only a few types of information could possibly be attended to.

Other factors, such as the purpose to which the information is going to be used, influence the type of information which is examined. Interrupts, of course, can lead to the development of goals which themselves alter the direction of external search. Obviously, the direction of external search can be influenced by interrupts, but this also varies between individuals. Some will prefer to look for

information in journals or reports, others would be content with television commercials or package information. Similarly, if a person is well advanced in the choice process then the information that he is likely to search for would be dissimilar to that required by the same individual earlier in the choice process. This reflects the characteristics of the form of processing and heuristics which are used (Wright and Borbour 1977).

The degree of external search is again influenced by many factors. How much information is acquired will reflect the costs of getting it versus the benefits of having it. The availability of the information in the environment, the difficulty of the choice itself, and factors such as time pressure, all affect how much information is collected. Individual differences, such as a preference to use information inside the store as opposed to outside the store, would directly control how much external information is present and hence much could be processed. The actual abilities of the consumer, his education and affluence, also control the amount and type of information sought. More educated consumers engage in more extensive search, although the relationships are complexed by experience and time factors (Miller and Zickmund 1975). Another important consideration is the different levels at which consumers consider that enough information has been acquired to make a choice. An optimal level for one person may be incorrect for another, and consumers tend to relate the amount of risk inherent in the choice with the amount of information which is required.

Finally, levels of conflict can be related to the degree of external search. When conflict needs to be reduced, collection of more information occurs (Howard and Sheth 1969). Alternatively, when low levels of conflict exist, novel or discrepant information may be actively sought (Hansen 1972), and therefore the degree of search is influenced. This, in itself, may lead to increased conflict (Woodruff 1972).

The pattern of external search describes the strategies which people use when acquiring information. Two patterns of information have emerged from research (Russo and Doshier 1975). In the first subjects examine brands, one at a time. In the second, subjects acquire information by choosing one attribute and determining values for each of several brands using that attribute. Then, a second attribute is chosen and the process repeated. The first pattern of acquisition is called Choice by Processing Brands (CPB) and the second Choice by Processing Attributes (CPA).

Several factors affect the form of processing including the use of phased strategies by individuals, the amount of experience a person has with a choice, and the way in which information is actually presented (Bettman and Kakkar 1977). These acquisition strategies have been discussed more fully in Chapter 4.

At any time during the process of information acquisition and evaluation the scanner and interrupt mechanism can be activated, terminating current collection and search for information and leading to restructuring of the goal hierarchy.

To summarise, information acquisition and evaluation takes place in order to attain goals. If sufficient information is already stored, then the consumer may proceed to the decision stage of the choice process. Typically, insufficient information is stored and hence an internal memory, or external environmental search takes place. Both searches are characterised in terms of their direction, degree and pattern, and numerous factors impact upon these search processes. When consumers are confronted with information, contemporary progression through the goal hierarchy is interrupted, processing capacity is involuntarily allocated and one outcome of such interruptions may be low involvement learning.

A1.7. Memory

Memory is a central component in the theory of consumer choice processing and the type and amount of information stored in the memory plays a vital role in the process of choice.

Theories of Memory As noted elsewhere (Section 4.2.), the multi-store theory of memory distinguishes an LTM and an STM, with each store possessing different properties and performing different functions (Atkinson and Shiffrin 1971). The single store notion proposes that only limited portions of memory are active at any one time and assumes a limited capacity for activation, leaving an unactivated section redundant (Collins and Loftus 1975). Craik and Lockhart (1972) propose that limited processing capacity is allocated to the evaluation of incoming stimuli, that superficial processing corresponds to those tasks which are easier to perform and that a deep level of processing occurs when tasks are more complex. It is these tasks which are best memorised. Landauer (1978) proposes a memory which is effectively unorganised, a point of departure from the preceding models which all assume memory to be content addressable.

The basic sequence of processing involves information being passed from the sense organs to the activated portion of the memory. Information is lost unless it is further attended to, and this involves allocation of processing capacity. Information in the LTM may be transferred into the temporary store as and when it is required to interact with co-occurring stimuli. The STM is the site of active synthesis and of current processing. Simultaneously, information may be transferred from the STM back to the LTM after its perceptual encoding has taken place.

The LTM has an infinite capacity to store information, which is available if not always accessible. It is considered to be content addressable (Wicklegren 1981) and comprises a neural network of nodes and links between nodes. Chunking is the process by which information is stored such that retrieval of higher order nodes allows lower order information to be summarised and its meaning brought within the capacity constraints of the individual.

Memory Control Processes The concept of memory adopted in the information processing model not only comprises a series of stores, but also takes into account the mechanisms or strategies which are used to

facilitate the two way 'movement' of information, both into the memory and conversely from it. Such memory control processes, (Atkinson and Shiffrin 1971) include rehearsal, coding, transfer, placement, retrieval and response generation (Bettman 1979a). Each of these is briefly discussed.

Rehearsal is the process of further analysing a stimulus and is carried out in the short term memory after a stimulus has been received there. The intensity which rehearsal takes place corresponds both to the amount of processing capacity allocated and to the strength which the information is memorised. The intensity of rehearsal itself is related to the goals which the individual possesses and is not simply a function of the length of time over which processing takes place.

Coding refers to the way which an individual structures information so that the process of rehearsal can take place. For example mnemonics and associations (For instance, Roy G Biv, representing the colours in the rainbow) facilitate encoding and retrieval.

The third control process, transfer, deals with what information should be stored in the memory and in what form it should be stored. Again the importance of information in respect of the current goal hierarchy effectively ascertains how important information is and which information will be dealt with first.

The importance of conflict and reactions to events causing conflict has already been described, but inconsistent and surprising information generally attributes a priority to information.

Placement is the term which describes the process of placing information into the organisation of the memory. Each memory make up will contain unique associations between groups of facts, each coded in a specific manner, and the nature of that coding will determine the placement of information. For example, two types of processing consumer goods, by brand and by attribute exist. Usually brand processing requires allocation of less capacity than processing by attribute and, under such conditions, placement of information concerning brands is likely to be stored in a different memory category to that concerning attributes (See Section 6.4.).

Retrieval concerns those processes which recover information from the long term memory. In this way, placement, coding, and the other processes described, must be retrieved from memory in order to deal with pertinent information, as must all other items of data. One important point is that the long term store cannot "lose" information, and information "loss" is accounted for as a failure in retrieval processes. Usually a stimulus must be presented to activate retrieval processes (direct access retrieval) and these allow retrieval of information from the memory to occur. Commonly, this cue lies in the goal hierarchy.

A distinction between recognition, that is the ability to recognise and distinguish one stimulus from a set, and recall, which involves the ability to actually reconstruct the stimulus is important, for retrieval may not be required for recognition to take place. Research

indicates that retrieval may be involved in the recall of information (Anderson and Bower 1972).

A final group of processes controlling movement of information in the memory are those which are termed response generation. Memory is subject to bias as it is believed that information is not stored in the memory exactly as it was entered. Information from the memory is not simply recalled but is reconstructed (Jenkins 1974) and this involves combining what actually happened with what the person wants to believe happened. The outcome of this reconstruction is obviously important as it controls the type of information which is put back into the active short term memory.

In summary, memory can be regarded as comprising one or more sensory stores and a number of mechanisms which control the movement of information, its importance and "where" it is stored. Capacity to process information is dependent upon current goals, actual structural capacity (M), and the demands of the choice task in hand. Long term memory has unlimited storage capacity and stores semantic associations, visual images and auditory events, these being physiologically represented as neural linkages between different parts of the brain. Control processes govern the access to information and are learned by trial and error and by interaction with the environment.

One final point concerning memory and consumer choice environments is that artificial external memories, such as shopping lists, advertisements and point of sale display material often eliminate the need for the consumer to engage in "deep" processing, as recognition strategies are used to supply all the information that is required.

A1.8. Decision Processes

The sixth component of the theory of information processing comprises the decision processes involved in the actual selection of an alternative.

In the simplest case of choice amongst alternatives, the consumer has by this stage formed some goals, acquired and evaluated some information and must ultimately choose some alternative. Although the number and diversity of alternatives can vary, one invariable prerequisite to choice is that these alternatives are compared. Then a decision to choose one is made.

Choice Heuristics Individuals do not possess enough processing capacity to evaluate all information which may be relevant to making a choice. Processing capacity is limited. Consequently, a comparison of choice alternatives comprising the task situation is undertaken using choice heuristics. Choice heuristics bring complex decisions within the processing capacity of the consumer by simplification, and by preferential selection of subjectively important information.

Choice processes have three characteristic aspects:

- (i) They specify how some value is assigned to an alternative.

- (ii) They specify the process whereby one alternative, which has been assigned a value, is selected from the set of alternatives present. This is the choice criterion.
- (iii) They specify the form of processing which is used.

Form of Processing The process of evaluating alternatives, as well as the nature of the choice criterion used, varies according to which heuristic is used and this is described presently. However, the two basic forms of processing which have been outlined in the consumer behaviour context - CPA and CPB - are similar to object and dimension processing in psychological literature (Wright 1973). Using CPB, each alternative is considered as a whole entity and processing takes place in these terms, with choice being subsequently made using this overall evaluation as a basis. Using CPA each alternative is considered and compared using a single attribute, followed by comparisons based on a second and third attribute. This distinction in form of processing has important implications for the decision process, as attribute processing may clearly not yield a direct, overall evaluation of alternatives.

If CPA is used, some alternatives will be eliminated from the choice set when they do not perform satisfactorily against other alternatives in terms of the attribute which is being considered. Price, for example, may cause very expensive, or very cheap alternatives, to be excluded from the choice set immediately. These eliminated alternatives can be grouped together into one class, simply because they have been evaluated as possessing one unifying, but undesirable characteristic (ie cheap or expensive).

A similar process will recur each time a second, third and fourth attribute is used to distinguish between alternatives. Eventually, only one product remains and this is selected. However, this selection is derived and is a function of elimination as opposed to direct comparison.

Types of Heuristic Many structured heuristics exist and the repertoire which each person possesses and uses is idiosyncratic. Each one can be described in terms of the evaluative processes, choice criterion, and form of processing it uses (Figure A1.3.). Three different types of heuristic are now described: Bettman describes ten (1979a; Pg 184).

The simplest heuristic, affect referral (Wright 1975), involves recalling from memory a previously formed overall evaluation about an alternative. The consumer does not examine attributes or beliefs about each alternative, but selects the "best" alternative. Because previous processing about each alternative must have taken place, affect referral is used in situations where a lot of experience with the task environment (the available alternatives) has been gained. Similarly, the form of processing is indeterminate because it is impossible to identify whether this heuristic has been constructed using CPA or CPB. Clearly, either could have been invoked. In situations where a product class requires little involvement and hence limited processing, affect referral may be used (Robertson 1976).

A conjunctive heuristic involves a consumer setting up thresholds for each dimension which is deemed important about a product. If an alternative does not pass every threshold, it is rejected. The form of processing is by brand, for each alternative is dealt with as a whole entity and the evaluation is derived. For example, one important dimension which may be used could be price, and using a conjunctive heuristic a series of brands could be judged as being higher than the threshold, in which case they are accepted. A second and third dimension would then cause elimination of further brands until one product, which has passed each threshold, is selected. An overall evaluation and hence brand processing is inferred.

The lexicographic heuristic is an example of a heuristic which uses attribute processing. This heuristic assumes that the attributes of a product can be ordered in terms of importance. Alternatives are then first compared with respect to the most important attribute. If one alternative is preferred over all others for this attribute, then that alternative is chosen, irrespective of the other values the alternatives have on other attributes. If two alternatives are deemed equal, the process is repeated using the second most important attribute.

The distinction between CPA and CPB becomes indistinguishable when phased strategies are used (Wright and Barbour 1977). In situations where time is short, or the number of alternatives is very large, rapid elimination of alternatives may be required. A phased strategy uses one heuristic to eliminate a large number of alternatives and a second rule to make comparisons between the remaining set.

Implementing Choice Heuristics Two methods of implementing or applying choice heuristics have been distinguished (Bettman 1979a). The stored rule method involves storing whole heuristics in the memory with later recall of the relevant heuristics when they are required.

The second method assumes that only fragments of heuristics are stored in the memory e.g. specific price/value relationships or information concerning quality. In implementing choice heuristics, each specific fragment relevant to the choice is recalled from memory and then amalgamated with other sub parts to form a new heuristic. This method of implementation has been termed the constructive method and assumes that each choice situation generates a new heuristic.

Bettman further distinguishes three situations which have direct bearing upon the way in which heuristics are implemented.

- (i) Situations where elements are available in memory for production of a heuristic and are deemed sufficient for the situation.
- (ii) Situations where elements are available but are not sufficient.
- (iii) Situations where elements are not available in the memory.

In the first case, where elements are available and sufficient, constructive and stored rule implementation of heuristics can take place. In cases (ii) and (iii) modification and development of the elements in the memory must take place before implementation can proceed. Individual differences, which affect the number and type of

elements held in memory, markedly control the implementation of choice heuristics.

Two other factors affect choice heuristic implementation. These are the distinction between recall and recognition use of memory and secondly, the importance of in store and out of store processing.

Consumers process information depending upon how that information is expected to be used in the future (Tversky 1973). Recall, the ability to reconstruct a stimulus, involves allocation of more processing capacity than recognition, which is the ability to recognise and distinguish one stimulus from a set. When confronted with a choice situation which is unfamiliar to a consumer, several assumptions can be made about the choice process. First, little organised knowledge about the products comprising the choice set is held and little ability to draw upon memorised information exists as a consequence. Secondly, stored elements for production of heuristics are not available. Third, some processing must take place before a decision can be reached.

Howard (1977) suggests that when information about a product class is badly organised, or is absent, recognition strategies place less strain on the memory. Therefore, a relationship between recognition and construction of choice heuristics is identified. A consumer recognises that a choice situation may not require collection of information which would need, in the future, to be recalled. A very technically complex situation, or one in which many alternatives existed, may therefore exclude the use of recall strategies. Having reached the choice environment, in-store analysis of alternatives involving construction of heuristics and recognition of alternatives represents the method of implementing choice heuristics. Conversely, in a choice environment where the advantage of recalling information outweighs the "costs" of allocating capacity, for example a situation where a lot of experience about the products is held, a different form of processing is envisaged. Stored heuristics can be recalled directly from memory even before the store is entered.

In this way, two different combinations of factors influencing heuristic implementation are defined. The first association is between recall, out of store processing, and stored heuristic implementation. The second is between recognition, in store processing, and use of constructive methods in heuristic implementation. The former association is used in situations where a lot of experience with the products in the choice environment is held, the latter where negligible prior experience has been accrued.

Effects of Task and Individual Differences on Heuristic Use A multitude of task and individual differences affect the application of heuristics in consumer choice processing, many of which have been considered already (Section 4.2.). However, the number of alternatives available for processing is important. Complex task environments, where information overload is likely, induces heuristic simplification and elimination of alternatives using phased processing (Park 1978; Wright and Barbour 1977;) A third "checking" phase may occur after processing during which a consumer may review his selection and obtain an overall picture of processing.

Format of the task environment affects acquisition and storage (Tversky 1969; Bettman and Jaccoby 1976; Bettman and Zins 1979; Biehal and Chakravarti 1982a) as does the degree of prior knowledge held (Bettman and Park 1980). Russo and Doshier (1975) examined attribute processing and argued that when three or more attributes were present, dimension reduction took place, followed by a comparison between the remaining salient attributes in order to decide which alternative would be selected. They put forward a second heuristic, the "majority of confirming dimensions", in which an alternative is selected according to how many favourable dimensions it possessed.

Time pressure and distractions cause individuals to overweigh negative information about alternatives (Wright and Weitz 1977) and common dimensions are attributed more weight in the choice process if information across products is absent (Slovic and MacPhillamy 1974).

Howard and Sheth (1969) and Newell and Simon (1972) propose that the effects of the outcome of choice is a two step process of assessing how closely the perceived and actual product performance match and then applying either simple or complex processing to deal with the outcome. When positive or negative hits occur, positive feedback and learning may take place, even though the choice heuristics reinforced may be poor. False positive and negative outcomes lead to interrupts and it is under such conditions that complex processing involving cognitive restructuring may occur.

Other Sources Leading to Changes in Choice Heuristics Although the process of drawing inferences about the outcomes of choice are important in restructuring heuristics, information from advertisements and from interpersonal contacts, also represent sources which cause heuristic restructuring. Advertisements can bring to the attention of consumer information which causes interrupts. Such incongruent information may lead to heuristic restructuring.

Similarly, the effect of personal recommendation about a product may have marked effects on the choice process used. Parental influences, and the buying behaviour of close friends and significant references, may all affect the process of socialisation and build up of choice heuristics (Calder and Burnkrant 1977, Burnkrant and Cousineau 1975).

An overriding control on implementation of decision processes are processing abilities, and these vary individually. Perceptions of the difficulty of the task environment, and an individual's prior experience with specific heuristics in specific situations, combine to make each person's use of heuristics unique.

Finally, individuals tend to use heuristics which have performed satisfactorily for them in the past and which are easiest for them to apply. In this context, relatively few and theoretically poor heuristics may be repeatedly used in the decision process.

A1.9. Consumption and Learning

The theory of information processing does not treat consumption as the final step in the process of making a decision, but stresses that one outcome of consumption involves vital learning about the choice situation.

Learning Theories Two basic approaches to the study of learning can be distinguished (Bower and Hilgard 1981): the first is a stimulus-response approach and the second a cognitive one.

In both classical conditioning, in which a conditioned stimulus elicits a conditioned response, and instrumental conditioning, where the frequency of reward and punishment control the frequency of response, the individual is seen as inactive and outcomes of events are linked directly to reinforcement. This stimulus-response approach to learning does not allow for the meaning of an outcome to be interpreted or assessed and, therefore, such an approach is inapplicable to information processing theory.

The cognitive approach to learning stresses a process of active interaction of individual with environment. The consumer possesses hypotheses about the nature of the choice environment (Bower 1975) and can actively generate the meaning of an outcome. Cognitive learning does not regard meaning as being automatically inherent in the outcome of choice, but incorporates the stimulus-response notions of association and reinforcement as part of the general inference process. Cognitive approaches to learning "use" the outcome of choice to provide information which can then be used to form inferences about the choice situation. A negative outcome would not necessarily lead to a decreased likelihood of repurchase if, for example the outcome is deemed by the consumer to be caused by a failure to follow package instructions. Such learning approaches more realistically account for real-life situations.

Attribution Theory An important part of consumption and learning involves the consumer forming inferences about causes for events. An outcome has little meaning unless its cause can be recognised and this process is dealt with under attribution theory (Kelley and Michela 1980).

"Attribution is a psychological construct referring to the cognitive processes through which an individual infers the cause of an actors behaviour" (Calder and Burnkrant 1977). In social psychology, Kelley (1967) and Jones and Davis (1965) regard attribution theory in terms of any conditions which determine whether a behaviour is attributed to internal, personal causes or to external forces.

In context of consumer behaviour, Kelley states that an outcome can be attributed to a cause if four criteria are present:

- (i) Distinctiveness: i.e. the outcome occurs when the cause is present yet does not occur in its absence.
- (ii) Consistency over time: each time that the cause is present the outcome should be the same or nearly so.

- (iii) Consistency over modality: the outcome should occur if the cause is present even if other aspects of the method of using the product vary.
- (iv) Consensus: the attribution is made in the same way by other observers.

The importance of attribution theory to consumer behaviour lies in the fact that if little experience with a product is held, then it is likely that a consumer will be unable to attribute an outcome to a cause. In this event, Kelley (1971) suggests that the individual uses "causal schemata". These are based on the individual's perception of expected causal patterns and represent simplified inferences about expected outcomes. These schemata differ from individual to individual and in one individual through time.

Actual and Expected Outcomes After consumption of a product has taken place, an individual may form opinions about the product. Outcomes may be good, in which case the choice process which leads to selection is unlikely to be altered. Alternatively, the outcome may be unfavourable and this can often be related to a poor product performance.

The process of judging product performance is important in consumer behaviour models. A product is assessed as good or bad only when some subjective standard against which judgment can take place exists. Similarly, an actual performance can be assessed in the light of what the consumer expected the performance to be. Thus two variables, actual performance and expected performance, can be used to define the accuracy of productions in the light of actual consumption of a product.

Einhorn (1980) combines judgement (expected performance) and performance (actual performance) to define four cells which an individual could use to determine the accuracy of predictions (Figure A1.4.). There are classified into two types of correct predictions, positive and negative hits, and two types of error, false positives (expected product to be good but performance was bad) and false negatives (expected product to be bad but performance was good). Each criterion has a cut-off point (x_c and y_c) which serve as subjective thresholds for evaluating the outcomes of judgement.

Einhorn indicates that judgement of the strength of the relationship between a prediction and an actual performance takes place in terms of the number of times a positive hit occurred. However, respondents ignore information if it falls within the three other cells. In terms of learning, Einhorn indicates that even when all of the relevant outcome information is available it is not used. One conclusion drawn from this is that the outcome information, without knowledge of task structure, can be irrelevant for providing self-correcting feedback about poor heuristics.

Effects of Outcomes One reason used to explain this phenomena of ignoring information, is to assume that individuals are unaware that the heuristics they are using are inadequate. However, positive feedback enforcing these inadequate rules can take place despite this predictive ability, rather than as a function of it. Clearly, as a

result, poor rules can be reinforced. Wason (1960) concludes that large amounts of positive feedback leads to reinforcement of a non valid rule. The information which is available to people, and which is used to make a choice, may not be comprehensive enough to justify a totally rational choice. Again, reinforcement of invalid heuristics, based on poor information, can take place.

Bettman (1979a) characterises the effect of outcomes which do not conform to expectations, that is false negatives and false positives, as prerequisites to elaboration of choice heuristics. Elaboration causes alteration of those heuristics which govern information search and acquisition, motivational mechanism changes, or addition of new heuristics, which themselves change perception. Thus, elaboration results in collection of more information.

One major type of heuristic elaboration involves the addition of a heuristic which allows better discrimination between choices to take place. A rigid model used to account for discrimination learning is the Elementary Perceiver and Memoriser (EPAM) model. (Feigenbaum 1963). This model assumes that previous heuristics have deemed a product to be acceptable but that actual performance shows this judgement to be incorrect. The EPAM model therefore demands the addition of a new heuristic to the decision path which had previously led to acceptance of the product. This heuristic would cause the product to be associated with poor performance and in the future lead to rejection (Simon 1979).

One criticism of this approach to choice heuristic elaboration is that it demands that a decision net or path is recalled in its entirety and this would be contrary to the process of constructing heuristics. Also, the reorganisation of heuristics is regarded as being a more complex process and modification of heuristics, as opposed to addition of new "pieces", is not accounted for in the EPAM model.

Another effect of an outcome may be to simplify the choice heuristic used. Bettman (1971), using simple decision net models to account for choice, develops the notion of a "conditional decision process". It is suggested that the choice process can be represented as a progression through a series of nodes and arcs, which depict respectively tests about particular cues and the actual processing steps taken from node to node. When a particular set of cues is presented to the consumer some nodes and arcs may be eliminated from processing, conditional upon prior processing experience with those cues being held. For example, the price and taste of a product may have been assessed as favourable, thus eliminating the need to process these nodes and arcs in a future buying situation (See Section 7.5.).

The presentation of a product possessing specific already adequately processed cues, would cause simplification of the heuristic used to assess that product. The choice process would therefore be simplified. Thus, a simpler model can be derived from a more complex one by looking at the complex model conditional on some pattern or configuration of cues. Much consumer choice behaviour involves habitual, relatively non conscious processing and the use of simplified choice heuristics, based on conditional models, reiterates such a view.

The importance attached to expectations and anticipated perceptual patterns, suggests that individuals perceive the world in terms of compound cue configurations rather than in terms of separate cues. Frequently, the structure of the consumer choice environment is characterised by sets of cues and by expectations about those cues. If expectations and actual performance match, then a simple conditional model, using only a small set of cues, may be invoked for a large part of the time. Extended use of processing is not required in situations where previously learned information about cues can be used to infer outcome. Simple rules are used to make buying behaviour decisions. This process of using simple rules based on sets of cues to make decisions, also rests upon one other assumption. Simplification involves chunking separate cues therefore developing larger and larger patterns which characterise the task environment. A simplification of the choice process corresponds with increases in the size of conditioned information configurations (chunks). Formation of larger chunks theoretically allows further compounding of individual cues and already formed chunks, although this restructuring is not comprehensively understood (Rumelhart and Norman 1978).

A1.10. Summary

This appendix has described the information processing theory of consumer choice, presented in its entirety by Bettman (1979a), as a backdrop to this thesis. The aim has been to identify and interrelate the cognitive components and cognitive functioning which occurs during consumer choice, and to demonstrate that memory is one, albeit central component in choice processing.



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Figure A1.1. Detail of the Information Processing Theory of Consumer Choice. Source : Bettman 1979a.

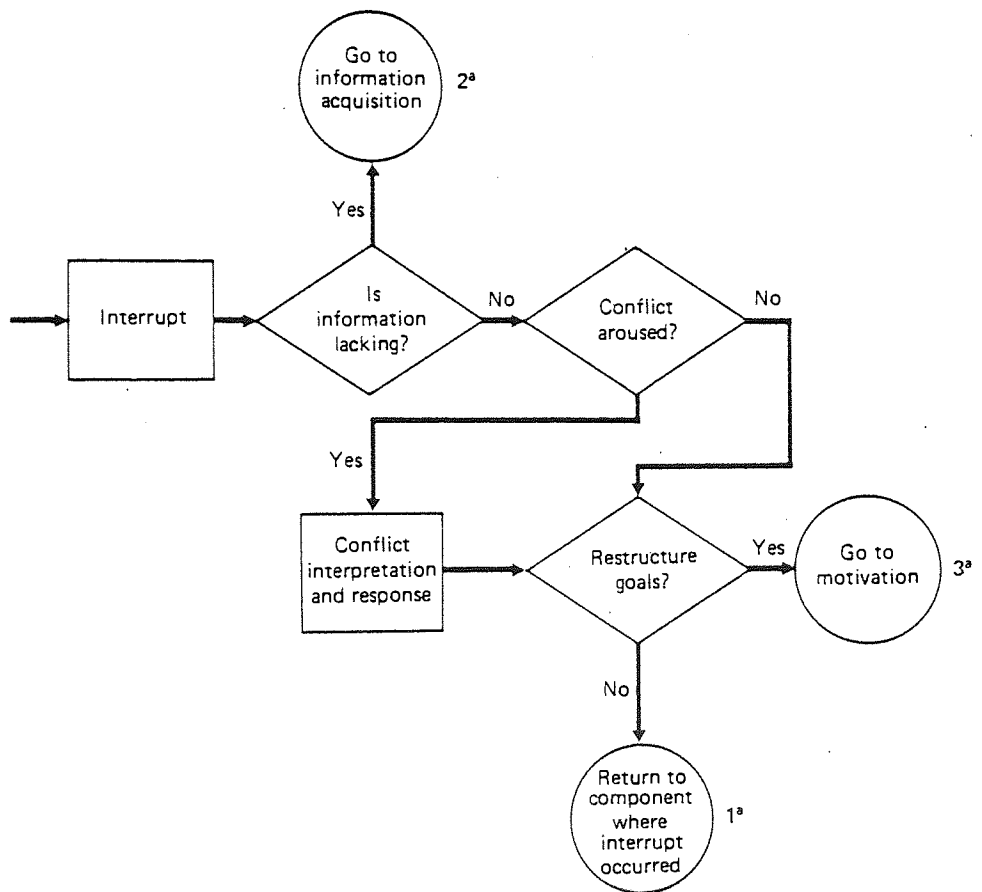


Figure A1.2. The Scanner/Interrupt Mechanism.

Heuristic	Evaluation Process	Choice Criteria	Form of Processing
Affect Referral	Wholistic	Choose the best	Indeterminate
Linear Compensatory	Weighted Sum	Choose the best	Brand
General Information Integration	General Function	Choose the best	Brand
Conjunctive	Derived	Unspecified	Brand
Disjunctive	Derived	Unspecified	Brand
Lexicographic	Derived	Unspecified	Attribute
Sequential Elimination	Derived	Unspecified	Attribute
Elimination by Aspects	Derived	Unspecified	Attribute
Lexicographic Semi Order	Derived	Unspecified	Attribute
Additive Difference	Relative	Choose the best	Attribute

Figure A1.3. Heuristic Types (Source: Bettman 1979a; Pg 184).



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A1.4. The Accuracy of Predictions; Source: Wallsten 1980.

Appendix 2

THE MANN-WHITNEY U TEST

A2.1. Function

The Mann-Whitney U Test is one of the most powerful of the non-parametric test (Siegel 1956) and assesses whether two independent samples have been drawn from the same population. By denoting n_1 as the number of members in the smaller sample and n_2 as the number of cases in the second, the value of the "U" statistic is a function of the number of times that a score in the larger (n_2) group precedes a score in the smaller (n_1) group.

Consider two samples, A and B, with H_0 asserting that A and B have the same distribution, and H_1 asserting that A is stochastically larger than B. If a is one observation from sample A, and b is one observation from B, then H_1 may be accepted if the probability that a score from A is larger than a score from B is greater than one-half, i.e. H_1 is that $p(a > b) > 0.5$.

Conversely, if it is predicted that B is stochastically larger than A - implying that the majority of B is higher than the bulk of A, then H_1 would be that $p(a > b) < 0.5$. For a two-tailed test, i.e. a non-directional hypothesis, H_1 would be that $p(a > b) \neq 0.5$.

A2.2. Method

In the case of (H1) - (H4), the U test is applied to the SRP values which were calculated for every subject in each of the research conditions. With respect to (H5), the ORP values represent the data base and, because the hypotheses H5a - d are non-directional, a two tailed test is used. In the case of (H6) - (H9), the U test is applied to the ORP - SRP discrepancy which was again calculated for each subject in all four of the research conditions.

The methodology in applying the U test is simple. The two samples, comprising a sequence of either ORP, SRP, or ORP - SRP discrepancy values, are combined and ranked. The lowest rank is assigned to the lowest algebraic value present, and any ratings which are tied are assigned the average of the tied ranks. Because the sampling distribution of the U statistic under H_0 is known, and the associated probability of a U value under H_0 can be determined, the procedure simply involves calculation of the U statistic.

For small samples, in which neither n_1 or n_2 is larger than 8, U can be calculated relatively quickly. Obviously, however, the larger n_2 becomes, the more tedious is this calculation. As a heuristic under these conditions, the value of U can be found by summing the value of the ranks for the two independent samples to generate R_1 and R_2 . Accordingly, U is found by the following equation.

$$U = n_1 n_2 + \frac{n_1 (n_1 + 1)}{2} - R_1$$

When n_2 is greater than 20, the sampling distribution of U rapidly approaches the normal distribution with:

$$\text{Mean} = \mu_u = \frac{n_1 n_2}{2}$$

$$\text{and Standard Deviation} = \sigma_u = \sqrt{\frac{(n_1) (n_2) (n_1 + n_2 + 1)}{12}}$$

Thus, when $n_2 > 20$, the significance of an observed value of U may be determined in the following way.

$$z = \frac{U - \mu_u}{\sigma_u} = \frac{U - \frac{n_1 n_2}{2}}{\sqrt{\frac{(n_1) (n_2) (n_1 + n_2 + 1)}{12}}}$$

A2.3. A Worked Example

The research hypothesis (H_1), noted in section 5.6., is used to demonstrate the application of the Mann-Whitney U test.

(i) Null Hypothesis. H_0 can be asserted as; the ease of retrieval processing is equally facilitated under prompted conditions by both brand oriented and attribute oriented memory structure. H_1 can be stated as; under prompted conditions brand oriented retrieval processing is executed more easily than attribute oriented retrieval processing.

(ii) The SRP data generated to evaluate retrieval processing ease represents an ordinal measure and the two samples of children are independent. The non-parametric U test is, accordingly, an appropriate statistical test to use here.

(iii) Significance Level. The 0.05 level of significance is adopted. The number of children who undertook prompted, attribute oriented retrieval (n_1) is 31. The number of children who undertook prompted brand oriented retrieval (n_2) is 40.

(iv) Sampling Distribution. As $n_2 > 20$, the formula above can be used to determine z . The sampling distribution for probabilities under H_0 for z can be found in Siegel (1956), page 247.

(v) Rejection Region. Because H_1 is directional, the region of rejection is one tailed and comprises all values of z whose probability of occurrence under H_0 is $\leq .05$.

(vi) Decision. The rank allotted to each of the member of n_1 and n_2 and their respective SRP values is shown below. Tied values are assigned an average of the tied ranks.

Thus, for these data $R_1 = 1347.5$ and $R_2 = 1208.5$. The value of U is found by substituting these observed values into the formulae:

$$\begin{aligned}
 U &= n_1 n_2 + \frac{n_1 (n_1 + 1)}{2} - R_1 \\
 &= (31) (40) + \frac{31 (31 + 1)}{2} - 1347.5 \\
 &= 388.5
 \end{aligned}$$

$$\begin{aligned}
 z &= \frac{U - \frac{n_1 - n_2}{2}}{\sqrt{\frac{(n_1) (n_2) (n_1 + n_2 + 1)}{12}}} \\
 &= \frac{388.5 - \frac{(31) (40)}{2}}{\sqrt{\frac{(31) (40) (31 + 40 + 1)}{12}}} \\
 &= - 2.68
 \end{aligned}$$

The z value of $- 2.68$ has a one-tailed probability under H_0 of $p < 0.0037$. It is therefore concluded that the bulk of the SRP values in n_2 are significantly lower than the bulk of the SRP values in n_1 . Remembering that a high SRP value corresponds to more easily executed retrieval processing and a low SRP value corresponds to more difficult retrieval processing, H_0 is rejected. Prompted attribute oriented retrieval was executed significantly more easily than prompted brand oriented retrieval processing, for the z value of $- 2.68$ has an associated probability of 0.0037 (one-tailed).

FIGURE A3.1. SYNOPSIS OF DATA COLLECTED FOR SUBJECTS OF RESEARCH CONDITION 1

(Subject sorted brand data, hence attribute oriented memory structure and attribute oriented retrieval processing : Subjects prompted)

Subject No.	ORP Measure	SRP Measure	ORP-SRP Discrepancy	Total Number of Target Items Recalled	Time taken to sort (secs)
21	94.81	93.34	1.27	73	275
22	90.22	77.18	13.04	74	120
23	86.58	82.77	3.76	62	245
24	88.03	74.62	13.41	74	180
25	90.07	84.23	5.84	70	130
26	88.05	75.81	12.24	56	75
27	91.10	84.84	6.26	73	185
28	86.01	76.64	9.37	72	115
29	86.95	78.72	8.23	51	210
30	95.79	94.54	0.25	75	100
31	86.82	78.19	8.63	59	270
32	93.23	88.36	3.87	64	130
33	91.29	86.14	5.15	67	245
34	89.15	82.99	6.16	73	280
35	88.94	83.28	5.66	64	290
36	84.71	83.38	1.33	73	225
37	92.45	84.95	7.50	67	120
38	88.51	88.10	6.41	46	140
39	89.68	85.83	3.85	68	180
40	92.36	90.16	2.20	73	185
41	91.05	79.97	11.08	54	260
42	91.29	90.76	0.53	73	340
43	86.24	80.72	5.52	66	135
55	92.44	86.40	6.04	69	185
58	93.64	91.74	1.90	65	145
89	94.10	93.22	0.88	65	170
95	92.69	86.28	6.41	55	180
96	89.19	78.14	5.32	50	185
99	95.96	95.96	0	80	185
104	88.08	79.90	8.18	65	150
107	93.78	92.90	0.88	66	100
N=31					

FIGURE A3.2. SYNOPSIS OF DATA COLLECTED FOR SUBJECTS OF RESEARCH CONDITION 2

(Subject sorted attribute data hence brand oriented memory structure and brand oriented retrieval processing : Subjects prompted)

Subject No.	ORP Measure	SRP Measure	ORP-SRP Discrepancy	Total Number of Target Items Recalled	Time taken to sort (secs)
44	88.30	82.10	6.20	57	310
45	88.94	83.28	5.66	55	400
46	94.29	86.98	7.31	46	365
47	83.29	79.46	3.83	55	370
48	87.53	80.37	7.16	51	300
49	85.28	68.37	16.91	67	515
50	87.76	69.63	18.31	70	445
51	91.39	70.21	21.18	54	230
52	91.85	73.01	18.84	61	195
53	91.55	79.55	12.00	62	455
54	93.84	80.21	13.63	68	310
56	90.21	81.40	8.81	61	420
57	88.15	83.67	4.48	62	300
58	85.45	79.98	5.47	52	685
59	89.58	75.95	13.63	61	175
60	88.24	85.40	2.84	52	215
61	89.06	70.29	18.77	66	280
62	88.41	77.04	11.37	71	295
63	97.77	80.80	16.97	71	260
64	87.75	71.93	15.82	67	220
65	87.28	74.55	12.73	68	175
66	86.54	80.63	5.91	62	320
67	90.27	79.63	4.48	70	360
68	89.19	78.02	11.17	68	340
69	92.04	71.37	20.64	69	250
70	86.46	77.23	7.23	61	295
71	90.56	81.32	9.24	69	295
72	89.47	72.62	16.85	73	270
73	90.07	81.44	8.63	68	278
74	87.27	72.10	15.17	49	215
75	88.99	73.94	15.05	70	560
90	98.88	98.88	0	80	220
91	95.71	94.07	1.64	69	425
92	91.33	81.41	9.92	61	120
93	98.72	95.83	2.89	76	440
94	95.31	93.75	1.56	63	255
97	86.89	79.22	7.47	65	435
98	100.00	100.00	0	77	215
103	93.15	92.44	0.71	59	205
106	97.77	80.80	16.97	71	260

FIGURE A3.3. SYNOPSIS OF DATA COLLECTED FOR SUBJECTS OF RESEARCH CONDITION 3

(Subjects presented with brand data hence attribute oriented memory structure and attribute oriented retrieval processing : Subjects not prompted)

Subject No.	ORP Measure	SRP Measure	ORP-SRP Discrepancy	Total Number of Target Items Recalled	Time taken to sort (secs)
1	90.17	83.32	6.85	56	183
2	86.07	70.20	15.87	73	200
3	87.47	77.33	9.74	59	155
4	88.68	78.50	10.18	72	100
5	89.74	80.06	9.68	70	125
6	88.32	74.37	13.95	65	55
7	86.71	72.61	10.50	69	200
8	93.48	86.36	7.12	70	60
9	86.09	76.65	9.44	65	105
10	88.05	82.92	5.13	70	185
11	91.76	77.86	13.90	57	150
12	88.00	82.47	5.53	65	35
13	83.46	74.44	9.02	78	155
14	93.13	82.95	10.68	67	60
15	88.01	77.64	10.37	57	30
16	90.91	80.14	10.77	57	495
17	88.46	79.95	8.51	64	160
18	88.40	83.34	5.06	75	120
19	86.92	68.75	18.17	67	245
20	87.80	76.25	11.55	62	217
76	87.35	81.10	6.35	46	455
77	89.08	76.06	13.02	60	85
78	92.59	82.09	10.50	45	240
82	89.47	72.62	0.69	52	220
84	87.27	72.10	5.91	65	300
N=25					

FIGURE A3.4. SYNOPSIS OF DATA COLLECTED FOR SUBJECTS OF RESEARCH CONDITION 4

(Subjects presented with attribute data hence brand oriented memory structure and brand oriented retrieval processing : Subjects not prompted)

Subject No.	ORP Measure	SRP Measure	ORP-SRP Discrepancy	Total Number of Target Items Recalled	Time taken to sort (secs)
79	87.14	85.01	2.13	63	360
80	88.01	79.43	8.58	52	230
81	89.05	78.28	10.77	53	246
83	92.39	71.11	21.28	65	335
85	84.44	76.97	7.47	68	350
86	91.32	86.00	5.32	66	285
87	87.24	63.18	24.06	72	220
100	89.75	62.76	26.99	65	275
101	89.08	71.37	17.71	59	390
102	91.95	82.07	9.88	60	255
105	90.73	76.41	14.32	61	205
N=11					

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